DOE/EIS-0106-F

Great Falls-Conrad Transmission Line Project Montana

Final Environmental Impact Statement

U.S. Department of Energy

1984

DOE/EIS-0106-F

GREAT FALLS-CONRAD TRANSMISSION LINE PROJECT

FINAL ENVIRONMENTAL IMPACT STATEMENT

U.S. DEPARTMENT OF ENERGY

1984

FINAL ENVIRONMENTAL IMPACT STATEMENT (FEIS)

GREAT FALLS-CONRAD TRANSMISSION PROJECT
CASCADE, TETON AND PONDERA COUNTIES, MONTANA

Prepared by:

Western Area Power Administration
U.S. Department of Energy

For Further Information Contact:

Mr. James D. Davies
Area Manager
Billings Area Office
Western Area Power Administration
P.O. Box EGY
Billings, MT 59101
(406) 657-6042

ABSTRACT

The Western Area Power Administration (Western) proposes to construct, operate and maintain a 230kV transmission line from Great Falls to Conrad, Montana, with one intermediate substation at Bole, northeast of Fairfield, Montana. The electrical needs of the Conrad-Shelby-Browning area in north-central Montana are presently served from a 115kV loop. System studies and operational experience show an urgent need for improvements to this loop. The proposed action would provide continued service to area loads, improve system reliability, extend the capability of the underlying subtransmission system, and provide flexibility for future expansion in the area transmission systems. Alternatives considered include no action, energy conservation, alternative generation, alternative transmission systems and technologies and the proposed action with routing and design alternatives. The major impacts from the proposed action would be the effect of the transmission line on visual resources and land uses, including agricultural practices and resources.

PREFACE

The Environmental Impact Statement (EIS) prepared for the Great Falls-Conrad Transmission Line Project consists of the Draft Environmental Impact Statement (DEIS) (DOE 1983) and this document, the Final Environmental Impact Statement (FEIS). The two documents are intended to be reviewed together. The DEIS includes a separate map volume and a set of supporting environmental reports (Great Falls-Conrad Transmission Line Study, WIRTH Environmental Services, 1983).

The DEIS, issued in March 1984, contains a statement of purpose and need for the proposed project, a discussion of the scoping process and project-related studies, a discussion of alternative actions, and an analysis of the affected environment and environmental consequences of the proposed action for routing alternatives studied. The DEIS underwent extensive public review by government agencies, organizations and individuals during an official comment period that included public hearings in the project area.

This document contains:

1. A comprehensive summary of the DEIS and FEIS.

2. A description of the public review process, comments from letters and hearings on the DEIS, and Western's responses to comments (Chapter 1).

3. Supplemental resource data on waterfowl collision hazards, in response to numerous comments and data requests (Chapter 2).

4. Corrections and revisions of data in the DEIS, and new information (Chapter 3).

Copies of the FEIS have been sent to all agencies, organizations and individuals listed in Chapter 6 of the DEIS, and to all agencies, organizations and individuals who have since requested copies.

SUMMARY

INTRODUCTION

The Western Area Power Administration (Western) is proposing to construct, operate and maintain a 230kV transmission line between Great Falls and a new 230/115kV substation near Conrad, Montana, with an intermediate interconnection at a new 230/69kV Bole Substation, northeast of Fairfield. This environmental impact statement (EIS) was prepared in compliance with the National Environmental Policy Act and the regulations of the Council on Environmental Quality, and the Department of Energy, the Federal review agency responsible for approval of the proposed action.

PURPOSE AND NEED

The electrical needs of the Conrad-Shelby-Browning area in north-central Montana are presently served from a 115kV transmission loop. Subtransmission service between Great Falls and Conrad is supplied by an area 69kV system. Power system simulation studies and operational experience show an urgent need for improvements to the 115kV loop. Low voltages, overload and loss-of-load conditions presently occur with an outage of the Great Falls-Conrad section of the line. In the future, system voltages and facility loadings will be unacceptable during both normal and contingency situations.

The proposed action would (1) provide continued service to area loads, (2) improve system reliability, (3) extend the capability of underlying subtransmission systems, (4) contribute to energy conservation, and (5) provide flexibility for future expansion of the area high voltage transmission systems.

ALTERNATIVES INCLUDING THE PROPOSED ACTION

Five general alternatives were considered for meeting the stated need: no action; energy conservation; alternative generation; alternative transmission systems and technologies; and the proposed action, with routing and design alternatives.

In this EIS, the no action alternative has been interpreted to mean that no new transmission or generation facilities would be constructed by Western between Great Falls and Conrad. The consequences of the no action alternative would be: (1) during an outage of a single 115kV line segment, area loads would experience low voltage, overload and loss-of-load conditions; (2) the existing 115kV loop would not be able to support area electrical loads under system intact conditions in the near future; and (3) the 69kV subtransmission system would experience increasing incidences of overloaded lines and poor voltage regulation, due to lack of high voltage support.

Western could attempt to mitigate these adverse effects by mandatory load curtailments, rolling blackouts, planned voltage reductions, and refusal to serve new loads, but these measures are considered unacceptable in terms of normal utility practice.

Western encourages energy conservation, which refers to the elimination of wasteful or unnecessary uses of energy and has the advantage of reducing energy consumption with no documented adverse environmental impacts. While conservation measures employed by Western and its customers will result in some energy savings and reductions in loads, they will not reduce area loads or area load growth in amounts sufficient to eliminate the need for the proposed line between Great Falls and Conrad.

Plans for new generation and associated transmission facilities in the project area were considered as alternatives to the proposed action. Montana Power Company (MPC) plans to construct their 330 MW Salem Project east of Great Falls in 1995-1996. They also plan to build the 100 MW Carter Ferry Hydroelectric Project after 2000. However, these generation projects and associated transmission additions would give negligible transmission support to the system served by the proposed action, and would not defer or eliminate the need for the action. Potential low-head hydroelectric sites also have been identified at the Gibson and Sun River diversion dams in Teton County, Montana. However, even if such sites were eventually developed, they would not provide sufficient load relief to defer or eliminate the need for the proposed action. Therefore, there are no known plans for generation facilities which would preclude the need for the proposed action.

Another alternative for meeting the stated need would be for Western to transfer energy from Great Falls to Conrad using other existing or planned transmission systems or new technologies. Western presently has contractual rights to use transmission capacity available on certain lines owned by other utilities in the project area. However, these lines are loaded to or above their capability under present system conditions, and cannot provide adequate, reliable service to area loads. None of the other area utilities plan to construct any additional high voltage lines to correct this problem. Therefore, there are no existing or planned transmission facilities owned by other utilities which could meet the stated need for Western's system.

A direct current (dc) transmission system was considered as a possible alternative to an alternating current (ac) system, but a dc system with the power transfer capability of a 230kV ac line would cost aproximately two to three times as much as an ac line, with no apparent environmental benefits. Underground systems were also evaluated but eliminated because of technical complications, economic and environmental costs, and accessibility, although some aesthetic impacts would be avoided.

After investigating the above alternatives, Western concluded that the most reasonable alternative for meeting the stated purpose and need would be a new overhead ac line constructed between Great Falls and Conrad. Design alternatives for voltage, structures and conductor were considered. Results of

design-alternative evaluations are incorporated in the description of the proposed action, the fifth alternative, which is described below and includes routing alternatives.

PROPOSED ACTION

Western proposes to construct, operate and maintain a single-circuit overhead 230kV ac transmission line between Great Falls, Montana and a new 230/115kV substation near Conrad, Montana, with an intermediate 230/69kV substation at Bole, north of Fairfield, Montana. At Conrad, the new line would interconnect with the existing MPC Great Falls-Cut Bank 115kV line. At Bole Substation, the new line would interconnect with MPC's existing Rainbow-Bole 69kV line and a new 69kV line which would be constructed by Sun River Electric Cooperative. (See Chapter 4 for a discussion of cumulative impacts of proposed 69kV lines.)

The proposed line would be constructed and operated at 230kV. Single-pole structures, either steel or concrete, would be used to minimize disturbance to agricultural land in the rural project area.

Construction of the proposed project is scheduled to begin in October 1984 and to be operating in December 1985. The expected useful life of the project is defined as 100 years.

ALTERNATIVE CORRIDOR AND SUBSTATION COMPARISON

The impact assessment of the Great Falls to Conrad 230kV Project was accomplished through a rigorous, systematic process involving five major phases: (1) determining the scope of the environmental studies and assessments to be conducted; (2) selecting alternative corridors and substation sites for detailed study; (3) assessing the potential impact of constructing and operating the project at each alternative location, and mitigation measures which could reduce or eliminate those impacts; (4) identifying the "least impact" location and selecting a proposed line route and substation sites for the project; and (5) preparing the EIS for review and obtaining other required environmental reviews and approvals.

Environmental studies, including regional-scale and corridor-scale studies, were conducted for more than 40 alternative transmission line routes between Great Falls and Conrad, and for seven intermediate substation sites. The principal studies, through which the environmental baseline for impact assessment and mitigation planning was developed, inventoried existing conditions for climate and air quality, earth resources, paleontological and ecological resources in the natural environment; visual resources, existing and planned land use, recreation and preservation land use, and socioeconomic construction- and fiscal-analysis in the human environment; and archaeological, historical, and Native American cultural resources in the cultural environment. In addition, studies were also conducted to analyze potential electrical, biological, health and safety effects from the proposed project.

PUBLIC INVOLVEMENT AND REVIEW PROCESS

An extensive program was conducted early in the planning process to provide information on the proposed project to agencies, groups and individuals; to solicit input and obtain data for the environmental studies; to identify issues and concerns about the project; and to obtain input on alternative routes and substation sites, including refinements to "least impact" alternatives.

The public review process for the DEIS consisted of soliciting comments from approximately 120 government agencies, institutions, organizations and individuals to whom the document was sent. Comments were received in the form of letters and remarks made during public hearings conducted by Western in Conrad, Choteau and Great Falls, Montana.

In response, 12 letters were received commenting on the DEIS, and two people presented oral comments for the record at the public hearings. Responses to specific comments are included in Chapter 1 of this FEIS.

THE AFFECTED ENVIRONMENT

The project study area in north-central Montana is characterized by cold winters and warm summers. The mean minimum January temperature is 14°F, and the maximum July temperature is 88°F. Mean annual precipitation averages 11 to 14 inches, nearly half of which occurs as rain between May and July.

The study area lies along the western margin of the Northern Great Plains Physiographic Province. Area seismicity damage-risk is classified as moderate. There are 27 soil map units within the study area, including those presenting problems of erosion potential, salinity, slumping potential, and compaction.

The study area lies within the Missouri River Basin. The southern part of the area is drained by the Sun River and Muddy Creek, a tributary to the Sun. The middle section of the area is drained by the Teton River and the extreme northern part of the Marias River. These streams generally flow west to east, and are tributaries to the Missouri River. Present over large portions of the study area are internally drained basins that do not supply direct flow to the river systems. Benton and Freezeout lakes are contained within the most prominent of these basins. A significant influence on surface water quality and flow in the study area is the irrigation on the undissected uplands. The Muddy Creek drainage system lies entirely within the study area. The area drained by Muddy Creek is approximately one-third dry cropland, one-third irrigated cropland, and one-third rangeland.

The area is vegetated primarily by mixed prairie, characterized by short and mid-grasses. The five major vegetative communities within the study area are prairie, shrubland, rough breaks, agriculture and riparian. No Federal- or state-protected plant species were identified within the study area.

Big game wildlife species in the study area are primarily mule deer, white-tailed deer and pronghorn antelope. Waterfowl include geese, surface-feeding ducks, bay ducks and sea ducks. Canada geese are year-round residents in the study area. They breed on the Sun and Teton rivers, and at Freezeout and Benton lakes. Waterfowl use at these lakes is very high. Up to one million birds have been reported at Freezeout Lake during spring migration.

The vast majority of lands within the study area are privately owned. Public Land jurisdictions are limited, and include lands administered by the U.S. Bureau of Reclamation, Bureau of Land Management, U.S. Fish and Wildlife Service, Montana Department of State Lands, Montana Department of Fish, Wildlife and Parks, and the counties of Cascade, Teton, Pondera and Chouteau.

Agriculture is the predominant land use in the study area. Large-scale wheat and barley farms comprise the majority of the land area in the study area, while irrigated lands are concentrated in the Greenfield and Ashuelot Bench areas between Muddy Creek and Freezeout Lake. Irrigated lands are characterized by smaller farms and denser development than dry cropland. Most of the irrigated lands are flood irrigated, although center-pivot and roller-line sprinkler systems are common in the Greenfield and Ashuelot Bench areas.

Urban areas within the study area include Great Falls, Conrad, Choteau, Dutton and Fairfield. Oil and gas resources are concentrated in the northern part of the study area. Military facilities associated with the U.S. Air Force's ICBM Minuteman missile launch system also occur within the study area.

Designated recreation and preservation areas within the study area include the Benton Lake National Wildlife Refuge, Freezeout Lake State Game Management Area, Arod Lake Fishing Area, and the Giant Springs-Heritage State Park.

No Class A scenic quality areas occur in the study area. Landscapes in the area are predominately Class C. Class B landscapes comprise approximately 10 percent of the study area, and primarily include the Teton River Corridor, Freezeout Lake area, and the Greenfield Bench.

There are no archaeological sites in the study area which are listed on the National Register of Historic Places (NRHP). Two historic sites in the study area are listed on the NRHP: the Adams Stone Barn and buildings in the city of Conrad. Four other historic sites have been nominated for the NRHP. There were 54 other historic sites identified during the regional inventory.

Native American sites within the study area include: religious and burial sites, habitation sites, trails and crossings, and historical events sites.

ENVIRONMENTAL CONSEQUENCES

Environmental consequences from the proposed action and alternatives are the residual impacts derived through a process that first identified, and

subsequently evaluated and integrated, initial impacts and appropriate mitigation measures. The process involved assessing impacts, by comparing the proposed project with the pre-project environment; determining mitigation that would avoid, effectively reduce or eliminate impacts; and identifying "residual" impacts, or impacts remaining after the application of mitigation.

The principal types of environmental impacts associated with earth resources are those that would increase or accelerate the natural rate of soil erosion and those that would affect water quality.

Typical impacts to biological resources include any impact that affects any officially classified threatened or endangered species or critical habitat; affects any relatively undisturbed, rare or unique vegetation types, species or communities; creates a barrier to the migration or movement of any wildlife species; alters the diversity of biotic communities or populations of plants or animal species; affects important habitat; affects areas of low revegetation potential; or decreases potential for wildlife.

Potentially significant impacts would occur to biological resources near Benton Lake, Freezeout Lake, and the wetlands associated with both of them. Project construction in these areas could create a hazard to low-flying migratory waterfowl.

Characteristic direct and long-term impact types for social and economic land uses include any impact that displaces, alters or otherwise physically affects any existing, developing or planned residential, commercial or industrial use or activity, existing or planned agricultural operation, existing or planned air facility, or affects general or regional planned and/or approved, adopted or officially stated policies, goals or operations of communities or governmental agencies.

The most significant potential land use impacts occurring within the alternative corridors are physical conflicts with present and future agricultural activities and removal of cropland from production. Long-term impacts to agricultural resources would be interference with cultivation and weed-control operations around transmission towers, interference with sprinkler irrigation equipment, and potential conflicts with aerial applications.

Potential significant residual land use impacts were also identified for individual and clusters of residences scattered throughout the study corridors.

The socioeconomic impact analysis addressed potential negative effects of construction crews and expenditures that would result from the construction of the proposed facility. The maximum demand by construction workers for temporary accommodations could be met with existing facilities in area communities, where community services would be adequate. Personal income in the region would rise slightly as a result of project expenditures, which would be a small beneficial impact for the region.

Visual impacts were considered to be adverse, direct and long-term. Typical impacts included those affecting the quality of any scenic resource; the view from any residential, commercial, institutional or other visually sensitive land use; the view from any established or planned park, recreation or preservation areas; and visual contrast resulting from conflicting tower types and/or materials.

Visual intrusion of the transmission line would continue throughout the life of the proposed project. The line would be constructed using nonspecular conductor to minimize visual impacts. The greatest residual visual impacts would occur in areas where the line would be in close proximity to residences, major travel routes, or other sensitive viewing locations.

Impacts to archaeological resources, which are nonrenewable, would be adverse and permanent. Construction and operation activities could result in impact types affecting: archaeological resources physically and/or visually; sites or districts eligible for inclusion in the NRHP; or sites or areas identified as having special archaeological value. Impact levels were probability levels determined by a predictive model.

Types of impacts to historical resources were identified as direct physical impacts resulting from construction-related activities; indirect physical impacts resulting from increased access; and visual impacts created by the presence of towers and lines during the life of the project.

Three types of impacts to Native American cultural resources were assessed: physical, visual and aural. No specific identification of Native American cultural resources will be disclosed in this document because of Native American concerns for the sacred nature of many sites, and the desire to protect the resources.

ELECTRICAL EFFECTS

The electrical effects considered were those resulting from corona and electric fields. Corona is the electrical breakdown of the air into charged particles. Effects of corona, which are greatest during wet weather, include audible noise, visible light, photochemical oxidants, and radio and television interference. No significant adverse effects from audible noise, visible light or photochemical oxidants are anticipated. Impacts from radio and television interference, if they occur, are expected to be minimal and would be mitigated by Western to the satisfaction of the complainants.

Field effects from electrical and magnetic fields created by the proposed transmission line include induced currents and voltages. Although there are no national standards for electric fields from transmission lines, maximum field strengths of the proposed transmission line would be well within the recommended limits set by states that have established such limits. Also, the induced short-circuit current to the largest anticipated vehicle under the

proposed line would be less than the National Electric Safety Code criterion of 5 mA.

Primary shocks from steady-state current would not be possible from the induced currents because of the relatively low field strengths and grounding practices of Western. Secondary shocks are not likely to occur very often, and, when they do, would represent a nuisance rather than a hazard. Spark discharges from induced voltages could occur on objects inadequately grounded under the proposed line; however, shocks of this type would be rare.

Whether long-term direct exposure to electric fields from transmission lines causes biological or health effects in humans is controversial. Research results are often contradictory and inconclusive. The electric-field levels of the proposed line would be less than levels at which effects have been reported and below the perception levels for humans, and no adverse health or biological effects are anticipated.

Adverse electrical effects on agriculture are not anticipated because the electrical fields from the proposed transmission line would be below levels where effects have been observed on honeybees or crops.

Magnetically induced currents and voltages from the proposed transmission line would be minimized because of grounding practices of Western and available mitigating techniques that would be applied. It is highly unlikely that exposures to the magnetic fields from the proposed line would have adverse biological or health effects because of the low levels of magnetic fields generated by the line, which are equal to or less than those of appliances in the home. Reversion of pacemakers is the most substantial effect noted to wearers of pacemakers and is not considered a serious problem. To date, no evidence that a transmission line has caused a serious problem to the wearer of a pacemaker has been found (see Appendix D of the DEIS).

ENVIRONMENTALLY PREFERRED CORRIDOR

Based upon review of impact characterizations, significant unavoidable adverse effects, individual resource routing preferences and agency/public comments, the cumulative environmental consequences of each route were summarized. The least potential impact or "environmentally preferred" route was identified based on a review of these data, and was refined with input from affected landowners and further field reconnaissance.

The preferred corridor is approximately 74 miles long, originating at the existing MPC Great Falls Substation. It proceeds west out of the substation, then generally north and west to the proposed Bole Substation site, approximately seven miles north of the town of Fairfield. From here, the line proceeds northward to the Conrad Substation site, approximately three miles south of the City of Conrad.

While potential environmental impacts along the preferred route can be generally characterized as moderate to low, there remain some significant unavoidable adverse effects. Of the 45.2 miles of agricultural land crossed by the route, 1.8 acres would be eliminated from productive use for the life of the project. The Bole and Conrad substations would remove about 12 and 17 acres, respectively, from agricultural production. There are 44 residences within 0.5 mile of the preferred route, from which the line would be visible. There is one residence within 0.5 mile of the Conrad Substation site. Moderate potential impacts to the visual integrity of four historic structures would result from construction of the proposed line. These structures would be within 1.0 mile of the preferred route.

A summary of the environmental data associated with the final alternative corridors between Great Falls and Conrad is presented in Tables 2-10 and 2-11 of the DEIS. A summary of assessment criteria, corridor selection issues and impact assessment issues is presented in Table 2-6, Assessment Summary (DEIS). The locations of the alternative corridors and substation siting areas are shown in Figures 2-10 and 2-11, and the environmentally preferred corridor is shown in Figure 2-14 (DEIS).

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CHAPTER 1 - PUBLIC COMMENTS AND RESPONSES

INTRODUCTION

This chapter describes the public review process for the Draft Environmental Impact Statement (DEIS) for the Great Falls-Conrad Transmission Line Project. Public comments were solicited from agencies, organizations and individuals, and were received in the form of letters and remarks at public hearings. Table 1-1F provides an index to comments and responses.

PUBLIC REVIEW PROCESS

The Environmental Protection Agency (EPA) published a Notice of Availability of the DEIS on March 2, 1984. Western published a notice of the filing, and dates and locations of public hearings in the Federal Register on March 8, 1984, and in local newspapers in the project area during the week of March 22, 1984. The public comment period ended on April 16, 1984.

Copies of the DEIS were sent to approximately 120 Federal, state and local government agencies, institutions, organizations, and individuals for review and comment. In response, a total of 12 letters were received by Western, and are reproduced and responded to in Table 1-2F of this document.

Western reviewed and carefully considered all comments, and responded to those substantive comments that presented new data, questioned findings or analyses, or raised questions or issues relevant to the potential environmental impacts of the proposed project and alternatives, as required by the National Environmental Policy Act and related regulations.

Formal public hearings on the DEIS, at which two people presented oral comments for the record, were conducted by Western in Conrad, Choteau and Great Falls, Montana, on March 26, 27, and 28, respectively. Table 1-3F summarizes the comment received at the Great Falls public hearing. Hearing transcripts are available for review at the following locations:

Western Area Power Administration
Billings Area Office
2525 4th Avenue North
Billings, MT 59101

Western Area Power Administration
Office of Environmental Affairs
1627 Cole Boulevard
Golden, CO 80401

TABLE 1-1F
INDEX TO PUBLIC COMMENTS

TABLE I-2F
COMPLETE LETTERS AND RESPONSES

1

United States Department of the Interior

OFFICE OF THE SECRETARY
OFFICE OF ENVIRONMENTAL PROJECT REVIEW
Room 188, Building 67
Denver Federal Center
Denver, Colorado 80225

IN REPLY
REFER TO:
1797 (930)
ER 84/273

April 17, 1984

Mr. James D. Davies
Area Manager
Western Area Power Administration
Attention B2000
P.O. Box EGY
Billings, Montana 59101

Dear Mr. Davies:

This is in response to your request for the Department of the Interior's review and comments on the draft Environmental Impact Statement for the proposed Great Falls-Conrad 230-kV transmission line project in Cascade, Teton and Pondera Counties, Montana.

A Areas of high ground water levels occur along the routes under consideration (page 3-6) and herbicides are to be used for weed control. The statement should include plans to mitigate possible adverse effects of herbicides on ground water quality in these areas.

B Page S-6 states that potentially significant impacts would occur to low-flying migratory waterfowl near Benton Lake, Freezeout Lake and associated wetlands as a result of constructed hazards.

We recommend mitigation in the high-bird-strike areas. Table 2-7 could be expanded on page 5 of 5 (Tower and Conductor Design) to include marking of identified high-bird-strike areas with orange aviation marker balls and to set up a monitoring program to determine the significance of losses.

C We further recommend that agencies with legal concerns for fish and wildlife have the opportunity to participate as team members in preconstruction field reviews.

D Finally, we recommend a firm commitment to mitigate adverse effects to fish and wildlife resources. For example, the statement on page 4-7 that "Western will comply with requirements of 10 CFR 1022 and EOs 11988 and 11990" should be reflected in Table 2-7.

E Also, where it is explained that the preferred route crosses steep slope areas with high erosion potential (page 3-4), we recommend that Western identify how vegetation is to be reestablished and strongly recommend the use of native grasses, forbes and shrubs for disturbed areas.

A Western will use EPA registered herbicides for weed control only when absolutely necessary and they will be applied by a certified applicator, in strict compliance with label directions and other approved guidelines. Considering the fact that only small quantities of herbicide will be applied, we do not feel there will be any detectable impact to the quality of groundwater in the area.

B Research conducted by various agencies and individuals indicates that most avian mortality resulting from inflight collisions with powerlines occurs in specific areas where topography and the relative position of the powerline create an unusual hazard. There are two (2) rather broad areas within the preferred transmission line corridor where potential bird strike hazards have been identified. These areas total over eight (8) miles in length. Western believes that to indiscriminately install aviation ball markers or otherwise mark the entire length of these potential problem areas would be an unwise commitment of resources. An approach which Western prefers is to develop a monitoring program in consultation with the U.S. Fish and Wildlife Service (FWS) and Montana Department of Fish, Wildlife and Parks (DFWP) to identify specific parts of the transmission line, if any, where bird strikes are in fact a problem. If significant bird strikes are identified, Western will consult with FWS and DFWP to develop appropriate mitigation measures which could include installation of aviation ball markers on specific spans of the transmission line.

C If FWS, DFWP, or other agencies with legal concerns for fish and wildlife resources would like a preconstruction field review, Western will arrange to conduct such a review.

D Western is committed to first avoiding impacts to all sensitive resources. Where sensitive resources including fish and wildlife connot be avoided, Western will work with appropriate agencies, groups, and/or individuals to mitigate project impacts.

E A reclamation plan will be developed by Western in consultation with individual landowners and appropriate State and Federal agencies. The gool will be to as nearly as possible return the impacted areas to their pre-construction condition.

1

Any questions concerning endangered species should be directed to the Helena Office of the U.S. Fish and Wildlife Service (FTS 585-5225). Questions concerning fish and wildlife issues other than endangered species should be directed to the Billings Office (FTS 585-6750).

Sincerely,

Robert F. Stewart
Regional Environmental Officer

Table 1-2F (continued)
Complete Letters and Responses

2

U.S. Department of Housing and Urban Development
Denver Regional Office, Region VIII
Executive Tower
1405 Curtis Street
Denver, Colorado 80202

March 28, 1984

Mr. James D. Davies
Area Manager
Western Area Power Administration
PO Box EGY
Billings, MT 59101

ATTENTION: B2000

Dear Mr. Davies:

Thank you for the opportunity to review and comment on the Draft Environmental Impact Statement for the Great Falls-Conrad Transmission Line Project, Montana.

Your draft has been reviewed with specific consideration for the areas of responsibility assigned to the U.S. Department of Housing and Urban Development. This review considered the proposal's compatibility with local and regional comprehensive planning and impacts on urbanized areas. Within these parameters, we find this Document adequate for our purposes.

If you have any questions regarding these comments, please contact Mr. Howard S. Kutzer of my staff, at 837-3102.

Sincerely,

Robert J. Matuschek
Director
Office of Community Planning
and Development, 8C

No response necessary.

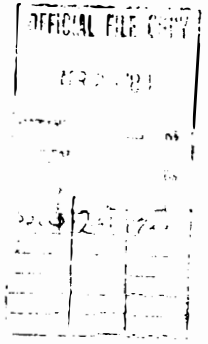
Table 1-2F (continued)
Complete Letters and Responses

3

U.S Department
of Transportation
Federal Aviation Administration

Northwest Mountain Region
[illegible] Idaho, Montana
Oregon, Utah, Washington
Wyoming

[illegible] Pacific Highway, South
C 68138
Seattle, Washington 98168



APR 19 1984

Mr. James D. Davies
Area Manager, B2204
Western Area Power Administration
P.O. Box EGY
Billings, Montana 59101

Dear Mr. Davies:

We have reviewed your draft Environmental Impact Statement for the proposed Great Falls-Conrad Transmission Line Project and do not foresee any impact on aviation or its activities.

Thank you for the opportunity to review your proposed project.

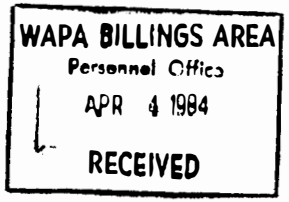
Sincerely,

Joseph W. Harrell
Policy and Planning Officer

No response necessary.

Table 1-2F (continued)
Complete Letters and Responses

4



Mr. John Ogrin
1011 Sixth Ave. N. W.
Great Falls, Montana 59404
April 3, 1984

Department of Energy
Western Area Power Administration
Billings Area Office
P. O. Box 35. D. Y.
Billings, Montana 59101

Gentlemen:

This letter is in response to your meeting held at the Casco Building on March 28, 1984, Great Falls, Montana concerning an electric power line beginning East and North of Great Falls, Montana and extending to Conrad, Montana.

A I oppose any more power lines crossing my property as I had stated during this meeting.

In your records you must have a letter in Feb. I opposed this line crossing my property before you made a conclusive direction of the course of this line.

Yours truly,

John Ogrin

A In siting the proposed transmission line in the vicinity of the land in question, Western attempted to avoid cultivated cropland to the greatest extent feasible. The line, as presently conceived, would cross less than 1,500 feet of cropland on Mr. Ogrin's land involving two (2) new transmission line structures. In order to avoid Mr. Ogrin, Western would have to cross over 1½ miles of cultivated cropland owned by other individuals, or cross extremely rugged land and through lands which have been subdivided and have a number of residences. In addition, the proposed route is below the higher land to the north, thus reducing potential impacts to waterfowl moving southward out of the Benton Lake National Wildlife Refuge.

While Western regrets the problems the line may create for any individual landowner, the proposed route would create the fewest overall impacts to all of the resources considered in the environmental studies. Landowners are compensated through the right-of-way negotiation process for the right for Western to construct, access, operate, maintain, rebuild and/or modify a transmission line.

5

Department of Water and Power the City of Los Angeles

April 10, 1984

Mr. James D. Davies
Area Manager
Attention B2000
Western Area Power Administration
P. O. Box EGY
Billings, Montana 59101

Dear Mr. Davies:

Reference: B2204
Draft Environmental Impact Statement (DEIS)
Great Falls - Conrad Transmission Line Project

This is in reply to your letter dated February 24, 1984 transmitting the DEIS for the above-named project.

We have reviewed the DEIS and have determined that the project will not impact any facilities of the Power System at the Department of Water and Power.

Therefore, we have no further comments. If you have any additional questions or desire further information, you may contact Mr. James P. Mieding at (213) 481-8637.

Very truly yours,

CARL D. HAASE
Engineer of Environmental
and Governmental Affairs

cc: Mr. James P. Mieding

No response necessary.

6

DEPARTMENT OF STATE LANDS

TED SCHWINDEN, GOVERNOR

STATE OF MONTANA

(406) 444-2074

1625 ELEVENTH AVENUE
HELENA, MONTANA 59620

(406) 444-2074 ENVIRONMENTAL ANALYSIS BUREAU

1625 ELEVENTH AVENUE
HELENA, MONTANA 59620

RECEIVED
APR 13 1984
MONT. DEPT. OF NATURAL RESOURCES & CONSERVATION

April 12, 1984

MEMORANDUM

TO: Paul Stolen, Project Coordinator
Facility Siting Bureau

FROM: Reed Lorrien, Bureau Chief
Land Management Bureau
Land Administration Division

RE: Comments on Great Falls to Conrad
Transmission Line Draft EIS

Enclosed are our comments on the Great Falls to Conrad Draft EIS. It is hard to nail down specifics on such a general oriented document. We will reserve specific recommendations for the Board of Natural Resources in late June.

Thank you for the opportunity to comment on the draft EIS.

jd

cc: Ralph Driear, Administrative Assistant, Governor's Office

6

COMMENTS ON GREAT FALLS TO CONRAD
TRANSMISSION LINE DRAFT EIS

A (1) The Department of State Lands would like (WAPA) to provide specific State-owned parcels in their preferred route maps.

B (2) On Pages 3-7 of "The Affected Environment", the vegetation section begins with Northeastern and should be Northcentral. Also, it is mentioned within the same pages under sub-heading "Prairie", that Buffalo Grass is a common species in the study area. Buffalo Grass is not common in this region.

C (3) WAPA will be required to obtain aerial easements in the crossings of the Teton and Sun Rivers from the Department of State Lands, along with the overland easements.

D (4) The Department of State Lands recommends that WAPA perform an archaeological survey on all new access roads, prior to construction.

E (5) The Department of State Lands requests that WAPA include DSL as early as possible on the cultural resource studies and proposed mitigations for School Trust lands.

(6) The Department of State Lands would like copies of site-forms for those archaeological surveys performed on School Trust land.

A Figure 3-7 of the Maps, Diagrams and Tables volume of the DEIS identified the location of State-owned land in the preferred and alternate corridors. Land ownership maps prepared for use by Western's Division of Land identify State-owned parcels along the preliminary preferred route. A set will be provided to DSL.

B Comment noted.

C Comment noted.

D Western is conducting an intensive archaeological survey of access roads to be used in the proposed project.

E Western will provide DSL with a copy of the Report of the Cultural Resources intensive survey and site forms for all sites located on all State-owned lands.

Table 1-2F (continued)
Complete Letters and Responses

7

DEPARTMENT OF HIGHWAYS

STATE OF MONTANA

April 13, 1984

RE: Great Falls to Conrad
230-KV

RECEIVED
APR 13 1984
MONT. DEPT. OF NATURAL RESOURCES & CONSERVATION

Mr. Paul Stolen
Facility Siting Bureau
Department of Natural Resources
and Conservation
32 South Ewing
Helena, MT 59620

Dear Mr. Stolen:

Thank you for the opportunity to review the draft EIS for the above captioned proposal.

A The applicant should be advised that the Montana Department of Highways issues permits for all aerial highway crossings. We do not anticipate any problems with the proposed crossings at this time; however, we would like to have the transmission line towers located as far away from the PTW as possible to allow for future reconstruction. We also are requesting that the applicant provide adequate clearance of the power lines from the highway surface to prevent any conflicts with the traveling public.

As you are probably aware, I 15 is a controlled access highway and therefore the applicant will be unable to access the utility corridor from the interstate.

Please advise the applicant that we would appreciate knowing of the exact tower locations, in relation to the location of the highway corridor, at their earliest possible convenience.

It may be possible to locate the transmission line towers in such a manner to make the power lines as inconspicuous to the traveling public as possible.

Sincerely,

William S. Strizich

William S. Strizich, P.E., Chief
Project Analysis Bureau

WSS/DWC/SK/5cc
cc: Robert Champion
Don Gruel
Tom Barnard
Homer Wheeler

A Western will coordinate structure siting for the proposed line with the Department of Highways. All highway clearances will meet or exceed the National Electric Safety Code. Access to the transmission line ROW will be via routes other than I-15.

Table 1-2F (continued)
Complete Letters and Responses

8

DEPARTMENT OF COMMERCE
AERONAUTICS DIVISION

STATE OF MONTANA

RECEIVED

April 20, 1984

Mr. Paul Stolen
Facility Siting Bureau
Department of Natural Resources
and Conservation
Helena, MT 59601

Dear Paul:

From the information provided our office regarding the proposed Western Area Power Administration 230 kV transmission line from Great Falls, Montana, to Conrad, Montana, it appears that from an aeronautical safety standpoint our major concern is for adequate marking of the Interstate Highway 15 crossing north of Great Falls.

Because of the high volume of air traffic to and from Great Falls International Airport and hospitals in the area, during inclement weather the I-15 crossing must be adequately marked. We recommend strobe lighting, painted towers on each side of the highway, and 36" marker balls of alternating color (international orange, yellow, and white) spaced a maximum of 150 feet apart on the static line. There is a possibility of need for similar marking should the final siting of this transmission line again cross I-15 near Conrad or be located nearer the Conrad Airport than this proposal indicates.

Sincerely,

Michael D. Ferguson, Administrator
Aeronautics Division

Fred Hasskamp, Chief
Safety and Education

mk

A Western will comply with all applicable regulations regarding aeronautical safety. Those regulations do not include marking of highway crossings with strobe lights, ball markers, etc. The structures at the I-15 crossing will be a maximum of 120 feet tall. That is well beneath a prudent flight altitude.

9

TED SCHWINDEN
GOVERNOR

STATE OF MONTANA
DEPARTMENT OF AGRICULTURE
OFFICE OF THE DIRECTOR
AGRICULTURE/LIVESTOCK BLDG
CAPITOL STATION
HELENA, MONTANA 59620-0201

TELEPHONE
AREA CODE 406
444-2402

KEITH KELLY
DIRECTOR

April 17, 1984

MEMORANDUM

TO: Wayne Wetzel, Acting Bureau Chief
Facility Siting Bureau, DNRC

FROM: Keith Kelly

RE: Review of Western Area Power Administration DEIS

A Thank you for the opportunity to comment on Western's DEIS. The need for the transmission line was clearly documented and the alternatives were described very well. The impact analysis was also very complete and thorough. Western seemed to identify the route with the least environmental damage. We support their selection of the environmentally-preferred route for the transmission line.

B We also support the mitigating measures that Western proposed to reduce damage to agricultural lands and operations. Single-pole towers and routes along field boundaries should minimize the amount of agricultural land removed from production. The preferred route avoids all irrigated land and crosses only 2.6 miles of potentially irrigable land. The 16-foot minimum ground clearance should be enough to operate most farm equipment where the power lines cross fields. Aerial pesticide operations may be more difficult, but this shouldn't be a significant problem.

C Landowners will be paid for the easement across their property and will also be compensated for crop loss or damage during construction. Nevertheless, the power line should follow existing utility rights-of-way or roads, where the routes do not conflict with other values, to minimize the cumulative impacts of several separate rights-of-way.

D The preferred corridor avoids flood plains, wetlands, etc. whenever possible. Erosion caused by construction activities should not affect water quality in Muddy Creek significantly compared to the existing sediment load. The preferred route crosses 10 miles of steep slopes with high erosion potential, which should be quickly revegetated after construction. The route also crosses

A Comment acknowledged.

B Comment acknowledged. It should be noted that the minimum ground clearance for the transmission line conductors will be 28 feet.

C Western attempted to parallel existing utility easements, roads and similar features where feasible.

D Western will consult with revegetation specialists in designing a reclamation and monitoring plan for the proposed project. Every reasonable effort will be made to revegetate disturbed areas with suitable plant species.

9

5.1 miles of saline soils which may present some revegetation problems. Salt-tolerant species or cultivars should be selected to revegetate these areas.

E We are concerned about the possible establishment and spread of weeds near the towers and along roads and trails that may be built for construction and maintenance. The most practical weed control method is to prevent weeds from becoming established in the first place. Construction equipment and supplies should be washed off, if practical, before entering new fields to prevent the introduction of weed seeds, especially if the equipment has travelled long distances. Rangeland areas should be quickly reseeded with adaptable species like crested wheatgrass or smooth brome with legume mixtures that establish quickly and compete successfully with weeds. Near cropland, we recommend annual applications of Atrazine at lower rates for more effective weed control than the proposed applications at 3-year intervals. The label rate of 12.5 to 25 lb. active ingredient per acre for non-crop areas should provide adequate control of even hard-to-kill annual and perennial weeds, especially in dry climates with short growing seasons.

We hope that these comments prove useful.

JEL/emr

E Following construction in areas designated by local weed control boards as noxious weed areas, the construction contractor will be directed to thoroughly clean all earth-moving equipment to remove all plant parts and seeds prior to leaving the noxious weed area. Construction of the line is scheduled to be completed in December 1985. A revegetation plan will be implemented prior to that time, if possible, or as soon thereafter as weather and other conditions permit. Only EPA registered herbicides will be used for weed control by Western. Atrazine, or other suitable herbicides, will be applied as needed in accordance with label directions.

Table 1-2F (continued)
Complete Letters and Responses

10a

MONTANA HISTORICAL SOCIETY

HISTORIC PRESERVATION OFFICE

225 NORTH ROBERTS STREET • (406) 449-4584 • HELENA, MONTANA 59601

April 12, 1984

Mr. James D. Davies, Area Manager
Attention: B2000
Western Area Power Administration
P.O. Box EGY
Billings, Montana 59101

Re: Great Falls-Conrad Transmission Line Project DEIS

Dear Mr. Davies:

A This office reviewed the above-referenced document with respect to its treatment of potential cultural resource impacts. My comments focus on Section 12 of Table 2-7, which presents generic mitigation measures outlining how your agency's cultural resource protection responsibilities called for under Section 106 of the National Historic Preservation Act will be carried out. The measures contained under "Preconstruction Cultural Resource Studies" are fairly general; the following comments are intended to expand upon them slightly by stating what this office perceives as the proper steps to be followed in planning this undertaking in accordance with the procedures prescribed under 36CFR800.

It appears that we are now at the stage where the study area to be covered by the intensive archaeological survey should be established in consultation with this office as called for under subsection 12(e) of Table 2-7. We believe that the results of the reconnaissance inventory presented in the technical report prepared during the earlier siting plan phase can provide the basis from which to determine appropriate survey methods, study parameters, and objectives prior to undertaking the fieldwork for identifying archaeological and historic properties along the preferred route. Specifically, we will need to discuss with you the rationale behind selecting survey corridor widths in relation to anticipated impacts in transmission line rights-of-way, access road construction, and any other disturbance areas caused by construction, operation, and maintenance activities. The discussion of visual impact to cultural resources on page 4-17 of the DEIS is an important acknowledgement that visual intrusions are a valid consideration in historic sites' and certain classes of archaeological sites' integrity of setting and, therefore, also in terms of their National Register eligibility. Incorporating

A Western has completed the intensive survey for cultural resources of the preferred corridor and submitted a preliminary draft of the cultural resource report to the State Historic Preservation Officer (SHPO) for review and comment. Western requested the Montana Department of Natural Resources and Conservation (DNRC) to review the Statement of Work and Work Program for the environmental studies during the development of each of those documents prior to the initiation of environmental studies. Both of those documents discussed the methodology which would be employed in the intensive survey of the preferred corridor. As indicated in the April 23, 1984 letter from the SHPO, DNRC requested their review of the Work Program. A copy of SHPO comments was furnished to Western by DNRC; however, neither DNRC nor SHPO indicated that the SHPO review was confined to the Class I and other preliminary cultural resource survey methodology. Western assumed that a thorough review had been made and has proceeded with the work necessary to complete the cultural resources surveys.

The DEIS does state that the survey study area will be established. That statement should not have been included in the DEIS.

10a

this premise into viable survey methodology (e.g., aerial coverage to identify some of the historic roads and trails crossed by the preferred route) deserves some attention then during our pre-survey consultation.

A sound evaluative framework in which to assess each of the four basic elements of the cultural resource study--historical, ethnographic, architectural, and archaeological--should allow us to reach an agreement on the National Register eligibility status of individual properties identified during the intensive inventory. This office requests the opportunity to comment on the significance and any special avoidance measures that may be warranted either prior to or concurrently with the submission of such information to transmission line engineers for siting and designing purposes. This type of review may also help reduce the paperwork and time requirements for fulfilling compliance responsibilities. Formalizing the decisions reached among your agency, this office, and the Advisory Council on Historic Preservation on avoidance and/or mitigation of impact for all eligible sites in a preservation plan as described under Table 2-7.12(e) should ensure that cultural resources are seriously considered as a siting concern in the planning of this undertaking.

Thank you for the opportunity to comment.

Sincerely,

Marcella Sherfy
State Historic Preservation Officer

10b

MONTANA HISTORICAL SOCIETY
HISTORIC PRESERVATION OFFICE
225 NORTH ROBERTS STREET • (406) 444-4584 • HELENA, MONTANA 59620

APR 2 1 1984

April 23, 1984

Mr. James D. Davies, Area Manager
Department of Energy
Western Area Power Administration
Billings Area Office
P.O. Box EGY
Billings, MT 59101

ATTN: Mike Skougard RE: Great Falls to Conrad DEIS Comments

Dear Mr. Davies:

We understand your concern regarding our comments on consultation to determine intensive cultural resource survey methodology when, in fact, that intensive survey is almost complete. We are equally concerned for different reasons.

We were asked to review the Work Program for the project by the Department of Natural Resources and Conservation insofar as it pertained to development of Class I material with field checking as needed for both DEIS material and MSF review of alternative routes. DNRC did not need and did not ask for comment on specific field methods for intensive inventory. They assume as does the Work Program itself that methodology will be developed using the information gathered from Class I effort. The statistics presented in the Work Program for field inventory are there for budget purposes: they even include hypothetical site numbers. Although portions of the MFSA process are comparable to work that must be done for compliance with Section 106 of the National Historic Preservation Act, Section 106 consultation is a distinct process.

We note that our anticipation of reviewing a specific survey strategy, based on the overview work done by HRA is strongly reinforced in the language of the DEIS itself. In Section 12(e) of Table 2-7, you state that the survey study are will be established by WAPA in consultation with the SHPO. If, in fact, you assumed that the strategy had already been established, the public and our office would be better served by that clear statement.

At this point, we recommend that you send us the results of the survey accomplished as soon as possible along with very specific information on impacts. We can then recommend to you whether the strategy adopted appears to have encompassed project impacts--especially visual ones.

We recommend that you add this letter to our previous one for inclusion in the DEIS, but do not treat it as a replacement.

Sincerely,

Marcella Sherfy,
State Historic Preservation Officer

11

DEPARTMENT OF NATURAL RESOURCES
AND CONSERVATION
ENERGY DIVISION

STATE OF MONTANA

April 16, 1984

Steve Fausett
Western Area Power Administration
Billings Area Office
Box EGY
Billings, MT 59101

Dear Steve:

Enclosed is DNRC's report presenting comments on Western's Great Falls-Conrad 230-kV Transmission Line Project Draft Environmental Impact Statement. The staff found the document to be generally well prepared. We have attempted to indicate in which areas additional information would be desirable.

Included with the report are environmental specifications DNRC compiled specifically for the Great Falls-Conrad project. We expect the Board of Natural Resources and Conservation to adopt these specifications as a condition of Western's project compliance with the Major Facility Siting Act. As was the case with the Fort Peck-Havre project, Western can satisfy this condition by incorporating the intent, if not the actual language of, these environmental specifications into the contract specifications. DNRC will monitor construction of the project for substantive compliance based on the specifications adopted by the Board.

I suggest that our staffs meet to discuss either these comments or to review Western's initial responses to DNRC's comments when they are prepared. The environmental specifications are in draft form and are being submitted for your review. The Department would like to discuss these specifications with you at a meeting sometime in the future before submitting a final version to the Board.

11

There will be a Board meeting on May 11. Since there is a possibility of Board action on this project in the near future, it would be helpful to start the briefing process. It is requested that Western attend the May 11 Board meeting and present a brief description of the project and a synopsis of public comment received at recent hearings on the draft EIS.

The working relationship that has developed between our agencies during the Fort Peck-Havre project seems to have served both organizations well, and we look forward to working with Western on the Great Falls-Conrad project.

Sincerely,

Laurence Siroky
Administrator

LS/jb
Enc.

COMMENTS BY THE MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT,

GREAT FALLS TO CONRAD TRANSMISSION LINE PROJECT

BY THE U.S. DEPARTMENT OF ENERGY AND

WESTERN AREA POWER ADMINISTRATION

11
SOCIAL AND ECONOMIC RESOURCES

A 1) Design characteristics: currently proposed tower configurations, tower heights, circuit configurations, span lengths, right-of-way widths, and possibly other transmission project design features may be different from those described in draft. The final EIS should clarify final design specifications. If different design characteristics would cause noteworthy differences in impact magnitudes (e.g. acres of dry cropland permanently displaced or access road requirements), estimates should be adjusted accordingly.

B 2) The economic information provided should be supplemented with discussion of local versus non-local construction employment, labor force skill requirements, duration of employment by skill or task, total man months, wages to be paid or prevailing hourly rates by skill type, and contractor and WAPA purchases from local businesses

C 3) The summary of public concerns is generally adequate, though the final EIS could benefit from discussion of land owner concern regarding weeds, trespass, and timing of construction activities (i.e. conflict and damage during planting).

D 4) It is still unclear why centerline locations for the preferred route are located as far inside field boundaries as they are, rather than adjacent to roadsides. If there is a federal or state law or standard which is being applied here, it should be explained in the final EIS.

E 5) It is unclear whether construction activities would be timed to minimize interference with farming operations.

A See Chapter 3 of the FEIS "Errata and Changes," for a description of the revised structure design.

B Origin of Labor Force. There is no way to predict the origin of the workforce that will be employed on this project. There is probably an adequate supply of skilled labor in the Montana area to meet project requirements. However, the option to employ that labor force or to use other sources belongs to the successful low bidder on the project. Western cannot constrain the contractor as to the source of labor used on the project.

Labor Force Skill Requirements. The composition of a typical construction force is listed in Table 2-5 of the DEIS and the activities of this force are described on pages 2-12 through 2-14. These activities require a labor force of surveyors, equipment operators, linemen, carpenters, laborers and electricians.

Duration of Employment and Total Man Months. Once again, these data are not predictable. The construction period of the project will begin in October 1984 and be completed by December 1985. The duration of employment by skill will vary from contractor to contractor, dependent on the equipment employed on the project, productivity of the workforce, effectiveness of supervision, mix of labor skills, weather, and project work plan. The DEIS does not attempt to speculate on this subject since these detailed data are not relevant to the salient environmental issues involved in the project.

Wages. As a Federal agency, Western requires that the construction contractor's employees be paid under the provision of the Davis-Bacon Act, 40 U.S.C. 276(a), as amended, which periodically sets minimum wage rates by locality. These rates are available to the public and well known to labor organizations.

Purchase from Local Businesses. It is reasonable to expect that the contractor will purchase certain materials and other items from the local economy. In the case of construction materials such as gravel, ready-mix concrete, and fill material, local sources will probably be the only economical source. However, the contractor will be under no obligation to Western to purchase from local sources.

C Weed Control. Weed control measures are discussed in the DEIS in Table 2-7, Item 4, Generically Committed Mitigation, and pages 4-8, 4-9 and 4-11. In addition to these measures, Western will consider seeding around certain structures (or compensate the landowner so he/she can seed) to establish a stand of grass for weed control.

Trespass. Measures to prevent trespass are discussed in the DEIS, Table 2-7, Item 4, Selective Mitigation. All access trails which remain after construction will be barred from public use by gates. Locks will be provided for the gates if requested by the landowner. Access used for line maintenance will not result in any increased incidence of trespass in the project area.

Timing of Construction Activities. The majority of the project is scheduled to be built in one full construction season. Therefore, construction activities cannot be timed to minimize interference with farming operations. Where Western's actions cause crop losses for any reason, reasonable damage claims will be paid to the appropriate party.

11

D The desirability of locating the transmission line centerline on field boundaries is an important factor in line location, but only one of several criteria used in siting the line. Others are the avoidance of residences, location of guyed structures in grassland in lieu of cropland, safe clearance from existing structures and utilities, visual impacts, effects on wildlife, and many others. Often these other criteria require that the line be located off field boundaries. Also, it should be noted that field boundaries are frequently not colinear. To attempt to route the centerline to follow non-colinear field boundaries would result in a substantial increase in the number of turning structures with attendant penalties of additional costs and adverse land use impacts due to guy wires.

E See Response C above regarding timing of construction activities.

11

F 6) There should be a statement as to whether local government officials are concerned about WAPA's construction and ownership of the transmission line rather than construction of the line by a private-taxpaying entity. Further, it is not clear what compensation, if any, local government will receive from WAPA for damage or wear-and-tear on facilities, and use of services and facilities during construction and operation of the project. There should be clarification of this in the final EIS.

G 7) Unclear in the draft EIS is how resource conflicts, if any, were resolved between dissimilar land use categories (e.g. agricultural and residential). Also, land ownership considerations apparently were used in selection of preferred route over parallel route alternatives. A narrative description of what such considerations were would clarify WAPA's preference for the preferred route.

H 8) The draft EIS still does not explain why WAPA took over what was originally a Montana Power Company (MPC) project, nor does it address the impact this action would have on taxes paid to local governments. Both these issues need to be addressed in the EIS. If the line is needed, then the "no action" alternative--that is no construction of the line by WAPA--could be equivalent to MPC eventually constructing the line as originally proposed. This would have some significant effects, many of them favorable, on local government and the local economy, It also would mean that many of the statements on p. S-1, last paragraph, are not true, since another alternative--MPC construction of the line--exists.

AGRICULTURE AND BIOLOGY

A 1) The EIS summary should at least mention the high level of use, especially spring use, of the Freezeout Lake and Benton Lake areas by waterfowl.

F During scoping meetings and subsequent meetings with county commissions and planning boards, there were some questions raised regarding the payment of taxes or payments in lieu of taxes by Western to local governments. The response to those questions was that Western is neither required nor allowed to make such payments.

Western will not compensate local governments for "wear-and-tear on facilities." The only public facilities which would be utilized during construction of the transmission line would be roadways and appurtenances which are available to all private and commercial activities in the area. The construction contractor would be required by the State of Montana to pay pro-rata (and/or other licensing) fees for vehicles used in the state. Those fees, along with taxes the contractor would pay for locally purchased fuel, would represent due compensation for road use. The contractor will be subject to claims from state and local governments for excessive damage to roads, bridges or other public facilities, just as any other private citizen or company would be.

G Determination of the preferred route was not a matter of choosing to impact one land use over another but, instead, of minimizing potential conflicts with all land uses within the alternative corridors. Generally, all corridors contain the same types of land uses, though in differing quantities and areal patterns. Therefore, the comparison of routes involved minimizing the amount of initial, potential land use impacts and considering the potential for mitigating those impacts that would be unavoidably encountered in all corridors. Table 2-10 of the DEIS shows the comporison of all routes, and demonstrates that all alternative corridors cross the same general types of land use.

Landowner preferences for line placement were considered as much as possible. For example, some owners prefer transmission line structures to be placed directly along fence lines, while others prefer structures to be set further into the fields so they can farm around them. These kinds of data from landowners were considered when possible to further reduce impacts to land use.

H It should be noted that Western did not "take over" an existing Montana Power Company (MPC) project. Although MPC had done some preliminary planning and engineering work on a second Great Falls-Conrad 115kV line and had solicited participation by other area utilities, they ultimately dropped the project. MPC took this action because they believed their existing Great Falls-Conrad-Cutbank 115kV line and extensive 69kV system in the area was more than adequate to reliably serve MPC's loads in the area. Area cooperative loads are served by federal resources which are wheeled over the MPC system on an availability of excess capacity basis. MPC was under no obligation to construct new facilities to insure continued, reliable service to these loads. MPC's response to the areawide overall declining quality of service would be to restrict deliveries to cooperative loads by frequent service interruption or permanent disconnection. At the direction of Congress, Western initiated the Great Falls-Conrad Transmission Line Project to solve this problem in the same manner as their other projects. The need for the project was studied, alternatives identified, environmental and engineering analysis begun, and public involvement initiated. The "No Action" alternative as discussed on page 2-1 of the DEIS is correct as is the discussion of other utilities' plans on pages 2-3 and 2-4. Construction and operation of the project by MPC is not an alternative or part of the "No Action" alternative. Therefore, there could not be any impact on taxes paid to the local economy as a result of MPC not constructing the line. The question on local taxes is addressed on pages 4-13 and 4-14. The referenced statement on page S-1 is correct as written.

A The FEIS Summary has been revised as suggested. Reference should also be made to Chapter 2 of the FEIS for additional waterfowl information.

11

B 2) Page S-8: This section and Table 4-2 indicate that 20 acres of cropland would be taken out of production by the two new substation sites. But page 2-12 indicates that only 18 acres of land would be affected, and page 4-19 states that only six acres (non-irrigated cropland) would be affected. Maps of existing land use in relation to the proposed substation design should be provided in the EIS.

B A revised estimate of the amount of land that would be acquired for the two new substations is about 12 acres at Bole and 17 acres at Conrad. Final substation design, grading and drainage will determine the amount of land actually acquired. Existing land use is shown on Figure 3-8 in the DEIS. It should be noted that non-irrigated cropland is indicated on this map in solid blue-green shading (not shown in the map legend).

C 3) Page 2-15: Atrazine would be the primary herbicide applied to the ROW to prevent weed growth. How would the herbicide be applied, and in what amounts per mile? Would this be spot application or general coverage? How effective is Atrazine in controlling weeds in wheat? BPA, in its 1983 final EIS on its Transmission Facilities Vegetation Management Program, said that Atrazine is used by BPA exclusively for substations, rather than transmission lines, and that none was proposed for use in 1983. Why was Atrazine selected as the primary herbicide to be used by WAPA, and what are its advantages as compared to other available herbicides?

C The DEIS did not state that Atrazine would be used to the exclusion of any other EPA approved herbicide to control weeds in the ROW. Atrazine has been used by Western in Montana, as have other herbicides. If another EPA approved herbicide would be more effective for a specific application, Western would use it.

Because of the nature of the vegetation which grows in the area of the proposed line, Western would not use a broadcast method for applying herbicides. Rather, specific trouble spots would be sprayed by a hand-held apparatus in compliance with the label directions.

In the past, Western has used Atrazine for vegetation control. Recently, target vegetation has acquired a tolerance to the herbicide. In Montana, Western presently is using Pramitol 5PS for control of vegetation at substations and around transmission line structures.

D 4) Page 2-21: This section implies that WAPA did not consider impact magnitude, severity, significance, or likelihood as criteria by which to assess sensitivity of alternative routes. It implies that the worth, importance, or protective status of resources were alone used to judge sensitivity, without consideration of the likely magnitude of effects, or of the extent to which impacts can be mitigated or compensated for. Some explanation is needed as to how WAPA considered these criteria in judging the sensitivity of alternate routes.

D As stated on page 2-21 of the DEIS, the goal of the sensitivity analysis is to identify transmission line corridor and substation site alternatives which have the highest probability of being acceptable locations for the proposed project. In other words, the sensitivity analysis was conducted prior to the impact assessment as a means of narrowing down the study area to reasonable, viable corridors and substation sites. Subsequently, criteria such as impact magnitude, severity, significance and potential for mitigation are used in the impact assessment of alternatives, and in the determination of an environmentally preferred corridor and substation site.

Appendix A of the DEIS provides detailed explanations of the entire process used in delineating and assessing alternatives. Impacts are described and assessed in Chapter 4 of the DEIS, and are mapped on Figures 3-6, 3-9, 3-11, 4-1, 4-2, 4-3 and 4-4. Table 2-6 of the DEIS presents a summary of the impact assessment, including a description of impact types and levels for each resource. Table 2-10 presents the impact assessment results for alternative corridors.

E 5) A map should be provided showing the location of USFWS waterfowl production areas and other USFWS lands in the study area, in addition to the Benton Lake NWR.

E The lands administered by the U.S. Fish and Wildlife Service in the project area are shown of Figure 3-7, Land Jurisdiction, of the DEIS. These lands are those categorized on the map as "National Wildlife Refuges," and include Benton Lake NWR and small waterfowl areas southwest of Power and north of Vaughn.

11

F 6) The final EIS should contain some quantitative description of the extremely high waterfowl use levels in the Freezeout Lake-Benton Lake areas, especially in the fall. Use by up to 1,000,000 birds, including 250,000 snow geese, has been reported at Freezeout Lake during the peak of spring migration. The reports of Ellig (1955), Knight (1965), and Hook (1973) should be cited in relation to waterfowl habitat and use levels at Freezeout Lake.

F The high waterfowl use at Benton and Freezeout lakes is acknowledged. Refer to Chapter 2 of the FEIS.

G 7) It should be noted that at Lake Broadview in eastern Montana, where bird use was estimated at up to 60,000 birds per year (up to 7.7 million bird use days), wire strike rates as high as 4.8 birds per kilometer per day were reported. How does the level of bird use and the predicted rates of wire strikes near Freezeout Lake compare to that reported for Lake Broadview? It appears that, at least seasonally, bird use at Freezeout Lake exceeds that at Lake Broadview by an order of magnitude. What are the predicted waterfowl wire strike rates for the various segments of line near Freezeout Lake?

G According to the U.S. Fish and Wildlife Service (Faanes 1984), the Lake Broadview situation is unique, and bears no similarity to the proposed Great Falls-Conrad project. Given the consideration for waterfowl migration patterns and use areas in routing the proposed line, the high wire-strike rates reported at Lake Broadview cannot be considered indicative or relevant to those which would be expected for the proposed line. The line at Lake Broadview crosses directly through the water (a concentration area for waterfowl); the proposed Great Falls-Conrad line will be located no closer than four miles to Freezeout Lake. Refer to Chapter 2 in this document for further information regarding waterfowl collision hazards.

H 8) The EIS does not contain enough data on seasonal abundance, feeding areas, and low-level flight paths to allow the reader to predict collision rates for the various segments of the line. Specifically, data are needed on typical densities of feeding ducks and geese in the vicinity of the Bole substation and adjacent segments of powerline during the spring migrations. Data in MDFWP files regarding seasonal abundances in the Freezeout Lake area should be summarized.

H There is no reliable way to predict collision rates for waterfowl, regardless of the amount of use or flight-pattern available (Faanes 1984). Refer to Chapter 2 of the FEIS for a summary of available use data, and o discussion of collision hazards and mitigation.

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I 9) Data also are needed on the frequency of low-level flights in the Lake Creek drainageway. According to the wildlife technical report, "Drainageways can function to 'funnel' bird movements and, based on previous research, a great amount of bird mortality occurred at transmission lines that span natural drainageways (Faanes 1983). It is predicted that introduction of a transmission line within any of the alternative corridors in question would increase avian mortality." The USFWS has expressed concern that Lake Creek may be such a drainageway, but insufficient data are available to draw any hard conclusions regarding collision hazard in this drainage.

I Refer to Chapter 2 for information on collision hazards posed by drainageways.

J 10) It appears that the only field inspection made by WAPA's contract biologist was in January. Was any field work conducted during the peak of migration in early April?

J No field work was conducted during spring migration in 1983; however, field work was done during peak migration in the fall of 1982. Freezeout Lake personnel were consulted on numerous occasions regarding numbers of birds, flight patterns, etc., during the development of the DEIS.

K 11) What are the predicted wire strike rates where the potholea region south of Conrad is crossed?

K The Arod Lake area, shown on Figure 3-6 of the DEIS, is a local area of concern in the prairie pothole region south of Conrad. There are olso other, small potholes in the vicinity (Links 47 and 48). The preferred line route is approximately one mile east of the Arod Lake area, where a low impact potential was identified. Frequency of waterfowl use in the small pothole areas is not known. It is not possible to predict wire-strike rates.

L 12) The USFWS has suggested that the section of line near the Bole substation be monitored for two years after line construction to determine the actual wire strike rates. What specific methods would WAPA use to monitor in this area? What steps would be taken to mitigate impact if waterfowl wire strike mortality was documented? MDFWP has asked WAPA to consider the possibility of off-site mitigation of waterfowl losses, in the event that losses occur. This possibility was not discussed in the draft EIS; it should be discussed in the final EIS.

L Refer to Letter 1 (from USDI), Responses B and C. Off-site mitigation would be considered along with other, alternative mitigation measures. Mitigation commitments will be based on severity of impact to the resource. Off-site mitigation would be considered only if on-site mitigation measures were ineffective.

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M 13) Page 4-6 says that "no known grouse leks occur within the preferred corridor." How was the absence of grouse leks determined? What were the dates of field surveys, if any? Does WAPA plan any field surveys for grouse leks during the centerline study?

M No field surveys were conducted for grouse leks. No leks were found during the course of other field work in the project area. Based on literature and agency contacts, it is not expected that construction of the proposed project will have any significant impact on grouse habitat in the area.

N 14) Page 4-6 also says that "as part of the mitigation program, Western will have an ecological review conducted in these areas, prior to construction, to identify any site-specific impact issues and appropriate mitigation measures that may reduce collision hazards." Will this include construction monitoring? What types of mitigation would be possible after the final centerline location is determined? How will WAPA determine requirements for off-site compensation of impacts that cannot be mitigated, as suggested in the April 2 letter from MDFWP?

N Page 4-6 of the DEIS incorrectly stated that monitoring would be conducted prior to construction for the 4.2 miles of moderate impact for waterfowl collision. Monitoring will be done after construction, as described in Letter I (from USDI), Response B. Refer to Response L above for discussion of off-site compensation.

O 15) Page 4-9 lists permanent loss of cropland under and around transmission towers as a long-term adverse impact. How much cropland would be lost for each structure? How mucb land is effectively lost to production around each of these towers due to the difficulty in maneuvering farm machinery around the poles? What would be the annual loss in farm revenue resulting from this loss of land? Would the landowner be compenaated for tbis under the Uniform Relocation Assistance and Real Property Acquisition Policies Act? If so, would this mean there is no net economic impact to the farming operation as a result of the project?

O Each structure will occupy approximately 14 square feet (.00032 acre). The maximum area around each structure which may be effectively lost from production due to difficulty in maneuvering will be approximately 290 square feet (.0067 acre). The annual loss in farm revenue due to this loss of production will be insignificant, probably less than $100.00 for the entire line length. Landowners are compensated through the right-of-way negotiation process, so there will be no net economic loss.

P 16) Page 4-9 says that a long-term impact would be reduced crop yield around towers due to reduced weed and pest control and soil compaction resulting from farm equipment maneuvering around towers. By how much are yields expected to decrease? Is this a significant amount? Why would there be reduced weed and pest control if WAPA is planning to treat the base of the poles with Atrazine every three years?

P The amount of crop yield that would be lost due to soil compaction and reduced weed and pest control would be difficult to estimate, but certainly would be insignificant. If a farmer must make more passes over a particular area to cultivate around the structures, some increase in soil compaction may result. It would be a slight increase, and would have little or no discernible effect on crop yields. Decreased crop yields due to compaction are compensated for on the cost-to-cure through the negotiation process between Western and the landowner.

Western will treat the area around structures or any other areas where its activities cause a weed problem. This will be done with a suitable EPA-registered herbicide at the request of the landowner or where weeds create a fire hazard. Therefore, there would not be any crop yield loss expected due to weeds or pests. The DEIS statement "reduced weed and pest control" refers to a reduction from pre-construction levels, requiring applications of an herbicide around structures.

Table 1-2F (continued)
Complete Letters and Responses

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Why would there be more soil compaction near tower bases than on any other part of a field which is crossed over by farm machinery? Will weed control be limited to structure bases, or will weeds be controlled on all disturbed areas on or off the ROW, such as access roads?

Q 17) Would WAPA replace or provide substitute irrigation equipment in areas where the towers would conflict with existing or proposed sprinkler irrigation systems? What options are available to irrigate around transmission towers? Would there necessarily be any net loss in irrigated acreage aside from the area lost to the pole bases? In particular, what are the options in designing irrigation systems that would allow irrigation around poles?

Q The proposed line does not cross any irrigated cropland. Because of the severity of impact to sprinkler-irrigated land, as compared to nonirrigated land, the former was considered an exclusion area in corridor siting. As much as possible, the line route follows property lines and field edges, so potential for interference with future sprinkler irrigation is minimal. Western would not replace or substitute irrigation systems.

R 18) Page 4-9: Why would feedlots in the ROW have to be relocated?

R Feedlots would not be relocated unless they posed a constraint on operation or maintenance of a transmission line. No feedlots occur within the proposed right-of-way for the Great Falls-Conrad line.

S 19) Page 4-9 lists as a long-term adverse impact the permanent modification of farming operations near and around towers, resulting in increased farming time and soil compaction. How much additional time would be required to farm around the poles? Would this be a significant impact? Several studies (Henderson and Scott, 1979; deWaal Malefyt, 1979) have indicated that the amount of time lost in maneuvering around towers is insignificant.

S Western agrees with the studies cited which indicate that the amount of time lost from maneuvering around structures would be insignificant. In fact, where the line is sited along field edges, the amount of additional time required would be negligible.

T 20) Page 4-9: How would the proposed single-pole structures conflict with flood irrigation systems? How could this be mitigated?

T The proposed line route does not cross any flood-irrigated cropland. If it did, it would not interfere with the irrigation system.

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U 21) Page 4-9: There seems to be a tradeoff required between the increased height (and hence visibility) of single-pole structures and the decreased interference with agriculture. The EIS needs to address this tradeoff, and in order to do so it is necessary to judge the significance of the agriculture impact of single poles vs. H-frame structures.

U The area occupied by 230kV H-frame structures would be approximately 0.0078 acre per mile, compared to about 0.0019 acre per mile for single-pole structures. For the proposed line, which crosses about 45 miles of cropland, the use of H-frame structures would remove 0.35 acre of cultivated land. Single-pole structures would remove 0.08 acre. While neither structure would result in significont losses of agricultural land, single-pole structures do reduce the amount of land dedicated to structure placement. Additionally, single-pole structures ore easier to farm around, because they present only one-half the numer of obstacles (i.e., poles) to farm equipment.

Agricultural concerns were foremost among environmental issues in the determination of a structure type. In the agrarian project area, visual concerns were not as dominant as agricultural land use concerns.

V 22) Page 4-9: What is the economic value of the reduced crop yields referred to in this section, and would auch losses be fully compensated for during the right-of-way easement settlement?

V Refer to Response O above.

W 23) Page 4-11: The discussion of aeronautical hazards needs to be expanded. To what extent are croplands now crossed by crop-dusting aircraft? How significant is the cost increase due to additional amounts of pesticides required when spray planes must make clean-up passea under powerlines? Would landowners be compensated for this cost increase? How often do aircraft collide with powerlines in other agricultural areas of Montana? How can the potential for aircraft collisions be reduced? Did WAPA communicate with the Montana Diviaion of Aeronautics?

W Western was unable to obtain specific data on the extent of crop dusting or the frequency of aircraft collisions in Montana. The actual dollar amount of additional pesticides for clean-up passes is not known, but the economic effect to individual landowners would be insignificant. The landowner is compensated through negotiations during easement acquisition.

Crop dusters recognize the potential hazard posed by transmission lines. They should familiarize themselves with an area before spraying to identify all potential obstacles. According to an area flying service (Cadwell 1984), transmission lines routed along fences or field edges are less hazardous than those that diagonally cross fields. The Great Falls-Conrad line was routed along field edges as much as possible, thereby minimizing the hazard to aerial applicators. The Montana Division of Aeronautics does not anticipate that the proposed line would cause a significant hazard to area crop dusters (Hasskamp 1984).

X 24) How doea WAPA propose to correct soil compaction problems created by movement of construction machinery? How will it be determined which areas need corrective action, and which do not?

X If a landowner desires, Western will scarify or otherwise loosen soil or will pay him to perform the work. Western's field representative will determine areas in need of corrective action.

VISUAL RESOURCES

A 1) More information should be provided about the people who participated in the viewer sensitivity workshop (p. 3-23) and about the results of this efforts. Specifically, how many participants attended the workshop? How were participants selected and what were their backgrounds? Did they repreaent a cross-section of

A The visual workshops were designed to represent as comprehensive a cross-section as possible while limiting the group to a manageable size. Twenty individuals were invited to participate; thirteen of them attended. Those participating represented interested/involved agencies and counties, including Freezeout Lake, Benton Lake, Soil Conservation Service, Greenfield Bench Irrigation District, Bureau of Land Management, Montana Department of Natural Resources and Conservation, Great Falls City and County, and Cascade, Choteau and Pondera counties.

Out of the 13 responses, 2 were not tabulated. One participant's results were eliminated because they indicated a lack of understanding of the process. Another's results were not used because it was clear that he had evaluated land use rather than visual resources.

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study area residents and their views? Where participants' results were "clearly inconsistent with the determination of objective visual characteristic" (p. 16, visual resources technical report), how much variation was allowed before results were not tabulated? How many "inconsistent results" were not used? Such information would help determine the validity of scenic quality and sensitivity ratings.

B 2) If the proposed project would use any structures different than the typical design shown in Figure 2-2, these should be discussed in the final EIS. Figures 2-2 and 2-4 contain conflicting information regarding these structures. The discussion in the final EIS should include information on structure design, circuit configuration, span length, or number of structures per mile, and how any modification may change assessed impact levels.

B Refer to the discussion of the proposed structure type in Chapter 3 of the FEIS.

C 3) Agency contacts mentioned on page 2 of the visual resources technical report, should be cross-referenced to the Public Involvement/Demography report to make them easier to find. Literature sources mentioned on page 2 of the Visual Resources technical report should be listed in Appendix B, Bibliography.

C The suggested change has been made to the technical reports as requested. Appendix B of the DEIS is amended in Chapter 3 of the FEIS "Errata and Changes."

D 4) It should be stated which segments of the line would require site-specific mitigating measures. A list of areas where such measures would be applied on a case-by-case basis should be compiled in summary tables or charts. Further explanation is needed regarding the statement that mitigating measures would not reduce initial impact levels (p. 4-13, draft EIS). Are there study area characteristics and/or facility characteristics that decrease the effectiveness of mitigating measures discussed in the draft EIS?

D Site-by-site mitigation cannot be determined until a final centerline, including exact structure locations, is developed. At the current stage in the project, potential mitigation measures have been outlined, and will be applied as required at the centerline stage. The mitigation options are listed in the DEIS in Table 2-7, Item 8 (Generic Mitigation), and Items 5 through 9 (Selective Mitigation).

While visual mitigation measures can reduce visual impacts somewhat, none can reduce an intial impact level by as much as one entire impact level. That is, an intial Moderate impact may be reduced through mitigation, but could not be reduced to the next lowest impact level (Low). In most of the agrarian project area, the land is nearly flat, providing no topographic screening for a transmission line. Therefore, a substantial reduction in visual impacts can only be accomplished through increased distance between the line and sensitive viewpoints.

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RECREATION RESOURCES

A 1) In the section on existing environment, WAPA said, "Hunting and fishing opportunities exist on private and public lands " (p. 3-20). This statement is repeated in the section on how the preferred route will affect dispersed recreation.

The discuasion of impacts makes no mention of any possible effects on these dispersed activities, leaving the reader to conclude that either these activities will not be affected, or that any of the alternative routes would equally affect them. Another possibility is that WAPA did not believe it was worthwhile to find any parts of the study area where these activities may be concentrated.

If the existing environment description identifies recreation opportunities in the study area, the impacts section should address them, whether or not the activities take place at designated settings. If it is not possible to identify areas of concentration of dispersed activities, then the final EIS should say so.

A While it is not possible to identify all areas of concentration for dispersed recreation, the following areas provide recreation opportunity: the Teton Ridge area presents hunting opportunities, but the area is primarily held in private ownership so public access is limited; the Arod Lakes area offers dispersed recreation opportunities and does have State-controlled public access; and the Teton River corridor undoubtedly offers recreational opportunity but access is generally poor in this area.

B 2) A second related concern is WAPA's implied framework for discussing impacts to recreation resources. It appears that WAPA assumes that if a recreation setting is not physically crossed, then the impact to it is only visual. However, access road construction can increase access to recreation areas (such as hunting areas), changing the nature of recreation experiences there.

B Off-right-of-way access will be overland or by existing roads. In a few areas, where terrain is especially rugged, some grading work may be required for overland access ways. Off-right-of-way access is used where access in the right-of-way would require extensive earth movement. Use of off-right-of-way access generally has a net effect of reducing impacts.

It is doubtful thot access requirements for the project will disrupt any dispersed recreation, since the proposed route crosses either agricultural lands or grassland areas where much of the construction access will be overland, and will not result in permanent access road construction. In addition, Western will gate all fences crossed by its transmission line right-of-way or access easements and install locks to discourage unauthorized entry to the land at the landowner's request.

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The draft EIS and supporting materials contain conflicting statements on access roads. The EIS says that "It may be necessary to construct some new access trails" (Table 2-7, p. 4 of 5), while the Atmospheric and Earth Resources Technical Report says, "It was assumed that all access would be overland or by existing roads" (p. 16). Perhaps there is a distinction between access roads and access trails; if so, it is not made explicit. The designated recreation settings are far enough away from the line that this should not be a problem, but possible effects of increased access on dispersed recreation are not mentioned. Given the nature of dispersed recreation in the study area, this is not likely to be a problem, but it still merits discussion.

NEED AND ALTERNATIVES

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1) It appears that 69 kV system weaknesses in the Boles-Fairfield area are used to determine the need for a substation at Boles; this then appears to basically determine the general route of the line and constrains the range of possible alternatives. Studies should be presented evaluating other alternatives. For example, building a 230 kV line from Great Falls to Conrad without a substation at Boles might provide sufficiently stronger voltages at Conrad to support Boles under outage conditions. Such an alternative would be $3.9 million less costly even if it followed the same route as the proposed line. Following a more direct route, such as routing adjacent to the Interstate right-of-way, would reduce the mileage to 66.9 miles for an additional savings of between $1.5 and $2 million. This alternative should at least be discussed. If load flow studies indicate that this alternative does not provide sufficient reinforcement to the Boles area, then an alternative along the Interstate with a tie between the 230 kV line and the 69 kV system at

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General. The DEIS does not contain the voluminous system powerflow simulation study documents used to identify the electrical design parameters of the project. However, these documents are referenced in the DEIS and were furnished to DNRC for information.

Direct Line From Great Falls to Conrad. The engineering, land use, and environmental reasons for rejecting this proposal are discussed on pages 1-1 and 1-2 in Appendix E of the DEIS. The inherent weakness in the 69kV transmission system serving the Fairfield/Choteau area requires that the 230kV line be routed through this area. The construction of a 230kV loop or 230kV radial line from a direct Great Falls-Conrad 230kV line route would be uneconomic and more environmentally damaging. It is important to note that there was significant public opposition to the proposal to parallel the existing Great Falls-Conrad 115kV line because of the diagonal crossings of cultivated cropland.

Direct Great Falls-Conrad 230kV Line Routed Through Power. This is a variation of the plan described above and the same comments apply. An additional 69kV line from Bole to Fairfield/Choteau area will not adequately meet area needs and would actually increase project costs without reducing environmental impact.

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Boles and Power. (These alternatives must be compared with the proposed solution on a consistent basis, that is, by including the cost of all necessary additions to the 69 kV system as well as the costs of the 230 kV line and substations to WAPA.)

B 2) WAPA promised to include in the draft EIS a discussion of the future expansion of the 230 kV system between Conrad, Cut Bank, and Havre. This was not done but should be.

C 3) It was also promised that the draft EIS would include a discussion of the reasons why strengthening the 69 kV system is not a suitable means of solving the problems of the area. The only item added to the draft from the preliminary draft is a sentence saying the situation cannot be effectively relieved by reconductoring. The EIS should contain a more detailed explanation.

EARTH RESOURCES

A 1) In the impact discussion dealing with compaction on page 4-9, a reference should be cited for the statement that short term impacts to agriculture could include "Reduced crop yields in staging areas due to soil compaction (usually lasting for one to three seasons, depending on soil reconditioning techniques)."

B The possibility of future expansion of the 230kV system is discussed on pages S-1, 1-3 and 2-7 of the DEIS. At the present time, Western is still studying the need for additional support to the Havre-Browning 115kV line section and, if needed, what engineering alternatives would be satisfactory.

C It is assumed that the term "strengthening the 69kV system" refers to a reconductoring of existing 69kV lines and not the construction of new 69kV lines since new construction would have many of the same impacts as construction of the proposed facility. The inadequate voltage performance of the existing 115kV and 69kV systems cannot be solved by simple reconductoring of the 69kV system. The voltage drop on a high-voltage line is largely a function of the effective per-unit impedance of the transmission line. This impedance is primarily determined by voltage and conductor spacing conductor size having less impact. The following table of impedance values for various voltage/conductor combinations illustrates this relationship:

Item	Voltage (kV)	Mileage (Miles)	Conductor (ACSR)	Impedance (Z) (P.U. on 100 MVA Base)	Ratio to Item 1
1.	69	10	4/0 AWG	0.2031	100.0%
2.	69	10	336.4 MCM	0.2005	98.7%
3.	115	10	336.4 MCM	0.0631	31.1%
4.	115	10	795.0 MCM	0.0564	27.8%
5.	230	10	795.0 MCM	0.0160	7.9%
6.	230	10	1272.0 MCM	0.0154	7.6%

As illustrated, the effective impedance of a 4/0 AWG 69kV line is decreased to 98.7% of its existing value by reconductoring with 336.4 MCM conductor. However, 115kV and 230kV construction reduces impedance to 31.1% and 7.9%, respectively, of the 4/0 AWG 69kV value.

A According to the Soil Conservation Service (Ferguson 1984) compaction occurring in the top one foot of soil will be ameliorated within one to three years by normal tillage, water, freeze-and-thaw action, etc. There are no existing data for Montana or the Great Plains region that indicate how long impacts would remain if the compaction is deeper than approximately 12 to 15 inches. No data presently exist with which to determine the actual depth of compaction from various activities, including transmission line construction.

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B 2) Areas with saturated soils will pose a constraint if construction does not take place in the winter when the ground is frozen or during a dry period. The technical report says that in areas of high water tables, "the stability of the transmission line poles is questionable." In light of this statement, further clarification of the method of crossing the wet and saline portion of link 30R and the wet area near the junction of links 3 and 5R is needed.

B Geological investigations have not revealed any areas where saturated soils would pose a problem with stabilizing structures along the preferred route. If problems are encountered during construction, the holes for the structures could be backfilled with crushed rock and water with vibration. Methods used for vehicular crossing would be left up to the contractor, but could include the use of tracked vehicles or mats, or waiting until a time when soils are dry.

C 3) The EIS addressed seismicity in the study region and notes that no events with a magnitude greater than 1 have been recorded. The key point in the draft EIS is that according to Algermissen (1960) the study area lies entirely within the moderate earthquake damage risk zone (Zone II). Because the area is classified as Zone II, substation facilities structures should be designed for seismic events of potentially moderate risk.

C Western design engineers evaluate various potential loading cases in designing transmission lines and substations. Seismic risk is one of these, along with wind and ice loads. The facilities are then designed to meet the most critical of the loading cases. Seismic loading is determined by the risk zone in which the facility would be built.

D 4) The final EIS should include site-specific mitigation plans for geological and soil concerns.

D Site-by-site mitigation cannot be determined until a final centerline, including exact structure locations, is developed. At the current stage in the project, potential mitigation measures have been identified, and will be applied as necessary at the centerline stage (see Table 2-7 in the DEIS). For areas requiring revegetation, a reclamation plan will be developed on a site-specific basis.

E 5) Although the list of mitigating measures which WAPA has committed itself to is clearly presented in the EIS, several additional measures are implied but not specifically stated. For example, page 4-10 says , "Western does not anticipate any long-term soil compaction would result from operation of the proposed project. Previous agricultural studies have recommended deep ripping as mitigation where soil compaction occurs." On page 4-3, the EIS says, "Reclamation and revegetation of disturbed areas would effectively mitigate soil erosion or compaction impacts." WAPA will be responsible for all reclamation work. Two questions remain. Does WAPA propose to mitigate compaction by deep ripping? If so, at what time of the year does WAPA propose to do this?

E See Response X above. If ripping is necessary, it will be done in the fall of the year.

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F 6) There seems to be a difference between the mitigation that the impact assessment in the technical report said was necessary and that which was committed to in the EIS (Table 2-7). Measures ER1 and ER2 (dealing with eroaion control and revegetation) mentioned in Table IV and the Impact Assessment/Mitigation Planning Charts in the technical report appear to be essential in reducing high initial impacts. However, these are not included in the list of measures WAPA is clearly committed to in the EIS. Will WAPA implement recommended measures ER1 and ER2 in those areas identified as having high potential for erosion along the preferred route?

F Mitigation measure in ER1 is: "Minimize topsoil disturbance, return to originol contour, prepare seed bed, seed and hydromulch." Mitigation measure ER2 is: "Minimize topsoil disturbance, return to original contour and/or removal on steep slopes; water bars should be constructed on steep slopes; prepare seed bed, seed and hydromulch. Monitor reclomation of these soils for ot least two (2) years."

Western will take reasonable precautions to minimize topsoil disturbance. Where this is not possible, and where future operation and maintenance of the line would not be impaired by so doing, disturbed areas will be returned to their original contours as closely as possible. Wherever Western's activities create a need for revegetation, a reclamation plan will be implemented. The plan will be developed by Western in consultation with appropriate agencies.

G 7) The EIS does not mention any adverse impacts to groundwater but given the comment at the last public meeting some mention of potential groundwater impacts should be made. Although it is difficult to imagine initiating artesian flows by digging a 15-22 foot deep footing hole, without the drilling logs done by Northern Testing it is hard to say for sure. This information was requested of WAPA but has not yet arrived.

G DNRC was furnished the entire report on geological investigotions conducted for Western by Northern Testing Laboratories.

There is no reason to think that Western's activities could cause artesian flaws. If such a thing did occur, there are means to correct the problem if implemented swiftly. These means include backfilling the hole with a cement and sand grout.

Western's geologist, construction engineering personnel, and a soils expert from the Tri-Counties Conservation District have conducted a ground survey of areas where these problems could exist. If potential problem areas are identified, Western will take necessary precautions to ensure no permanent damage is created.

8) As mentioned in the section dealing with erosion, some low level aedimentation is likely to occur as a result of the project. However, there is no statement of how this will affect water users. If no adverse effect to water users is expected, then this should be clearly stated. It should be recognized that DNRC'a system of classifying potentially irrigable land (cited by WAPA) ahould be used with caution because it does not include economic criteria in determining what is potentially irrigable.

H The project will have no effect on water users.

Table 1-2F (continued)
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ELECTRICAL EFFECTS

A 1) On page 4-23, it says that the State of Montana has not recommended field limits for transmission lines. This is incorrect; the Board of Natural Resources and Conservation established a 1 kV/m limit in residential and subdivided areas on a 500 kV transmission line in 1983, and this limit would apply to a 230 kV line also.

A Comment noted.

B 2) No information is presented concerning electrical and magnetic fields generated at substations. The final EIS should include information on electrical field strength at the right-of-way edge.

B Western has calculated an electric field strength of less than 0.4kV/m at the fence line of the proposed Bole and Conrad substations, assuming a distance of 60 feet between the outside phase conductor and the fence. The exact distance between the outside conductor and the fence will be determined during the design phase for the project. If the distance is greater than 60 feet, the electrical field will be lower than 0.4kV/m. The electric and magnetic field effects associated with the proposed substations are the same as those caused by the proposed transmission line, and are described in Appendix D of the DEIS.

C 3) No analysis of radio frequency interference from substations is presented in Chapter IV, "Environmental Consequences." The final EIS should contain this.

C As is the case with the proposed transmission line, corona from substation conductors and equipment can generate electromagnetic noise at the frequencies at which radio signals are transmitted. The predicted fair-weather L50 radio interference level at 100 feet from the outside conductor within the Bole and Conrad substations is 33.0 dBuV/m (decibels above 1 microvolt per meter). The foul-weather level is 50.0 dBuV/m. Both levels are within acceptable guidelines. There are more corona generators in a substation than there are along a transmission line, so a spark-gap situation could occur at a substation. If the radio interference generated by the proposed substations proves annoying, Western will take measures to minimize the annoyance, as described in Table 2-7 of the DEIS.

D 4) Honeybee research of the type cited in Appendix D has been continuing, and the most recently available report describes some effects on hives from electric fields as low as 2 kV/m rather than the 7 kV/m cited on p. 4-25 in the draft EIS (Rogers et al. 1982). Some adverse effects might occur to hives if they were located in the right-of-way, since the maximum field expected under the 230 kV line is 2.1 kV/m. DNRC recommends that WAPA advise all beekeepers along the proposed final route of the known effects of electrical fields on bees and of the uncertainties involved; WAPA should assist the beekeepers in relocating hives prior to energization of the line.

D It is acknowledged that effects on honeybees in hives have been observed down to 2kV/m. Since the effect appears to be in the hive and related to induced hive current, the effect could be present at lower electrical fields in taller hives than those used by Rogers et al. (1982). Similarly, effects might be absent in shorter hives at higher fields. Therefore, there is uncertainty about the threshold electric field for effects on bees, and the possibility of such effects exists for the proposed line. Elimination of the possibility of effects on bees is most easily accomplished by not locating hives near the low point of the conductors. Beekeepers will be notified of this by Western, and Western will compensate them fairly for relocation of hives.

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CULTURAL RESOURCES

A 1) WAPA should consult with SHPO now to establish the survey study area to be covered by the intensive archaeological survey. Survey methods, areal extent, study parameters, etc. should all be discussed with them before the field work is undertaken for the identification of archaeological and historic properties. This information should then be used in designing final tower and access road location.

A See response to Letters 10a and 10b, from Montana State Historic Preservation Office (SHPO).

B 2) The generic mitigation measure #10 dealing with instructing supervisory construction personnel on the legal basis of cultural resource protection supplemented by sample illustrations to make them aware of what the term "cultural resources" would be a particularly conscientious approach. This approach should be used and coupled with "site information in siting towers, access roads, and other construction areas to avoid, to the extent possible, the cultural resources along the route" (per Table 2-7, Part F), in order to give cultural resources due consideration as a siting concern.

B Your comment is noted.

GENERAL COMMENT

A The final EIS should discuss the impacts that would result from the additional 69 kV lines that would connect with the proposed Bole substation in the future (page 4-27). These impacts would ensue directly from the location of the substation in that it would be an end point for such lines; for example, the line that MPC plans to build from Fairfield, and thus would ensure that line would be routed to this site.

A Western acknowledged that there would be a cumulative effect created by the Great Falls-Conrad Transmission Line and that there would be additional lower voltage distribution/sub-transmission lines constructed as a result of the project. Figure 2-12 of the DEIS identifies the approximate location of these new lines, which would be constructed by Montana Power Company and Sun River Electric Cooperative. As was stated on page 4-27 of the DEIS, "Additional impacts would result from potential conflicts with aerial spraying, migratory waterfowl, and additional visual impact." The DEIS dealt only with conceptual plans for additional low voltage line construction. Pursuant to the National Environmental Policy Act of 1969 and relevant regulations, guidelines and policy, Western requires utilities to furnish sufficient data to provide an appropriate level of environmental review before granting permission for interconnection with the Federal electric transmission system.

11

GENERAL MITIGATION

A Table 2-7 contains some general mitigation measures that WAPA will follow when building the proposed project. DNRC has developed standard mitigation measures to be applied by the Board of Natural Resources and Conservation to transmission lines. These measures are intended to be selectively applied, as appropriate, to specific projects, depending on the location and size of the facility. An earlier draft of general measures was sent to Steve Fausett of WAPA on January 5, 1984.

Along with its report and recommendations to the Board concerning the Great Falls/Conrad project, DNRC will recommend adoption of a final version of these environmental specifications and, where appropriate, site-specific mitigation measures. Any mitigation measures adopted by the Board will be monitored during construction by DNRC to ensure that substantive compliance has been achieved.

DNRC hereby submits, as a comment on WAPA's draft EIS, a list (attached as Appendix A) of the general mitigation measures, in addition to the list in Table 2-7, which we feel should apply to the Great Falls/Conrad project. This list is a modification of the general specifications sent in January.

Certain sections of the specifications contain procedural requirements which would not directly apply to Western. These include section 0.12(2) and 2.2.2, which concern waivers of advance notification requirements, authorizations to proceed, and compliance orders.

A The specifications have been discussed by Western and the DNRC, and are being handled as a separate issue from the FEIS. Numerous modifications to the specifications have resulted, including a change in title from "specifications" to "stipulations."

The environmental stipulations will be treated as mitigation measures. DNRC's original environmental specifications appear in Appendix A of this FEIS.

11

Certain other sections, particularly 2.1.5, 2.1.7, 2.2.1, 2.2.2, 2.2.3, 2.5.5, 2.6.1, 2.7.12, and 2.11.6, describe inspection requirements for specific mitigation measures. DNRC requests that WAPA compare the intent of the measures listed above with its own procedures regarding enforcement of mitigation measures, and respond in the final EIS.

COMMENTS FROM OTHER AGENCIES

A Department of Fish, Wildlife and Parks

We have reviewed the draft EIS and have the following comments:

The DEIS does a good job of putting everything into perspective. Some adjustments have been made to reduce the potential for conflicts with waterfowl by moving the Bole substation farther east than originally planned. However, even with this change, there will be a moderate impact to waterfowl.

We feel that the wildlife mitigation section should be strengthened. Certain mitigation measures may be adopted, but losses will still occur. In light of this, a commitment to compensation for these losses should be made. Impacts to private resources are compensated for, so we feel that the same should hold true for impacts to public resources - in this case, waterfowl.

Compensation for waterfowl losses from powerline strikes has been negotiated at several sites in Montana for the past several years. The Department of Natural Resources and Conservation and Fish, Wildlife and Parks have been the lead agencies in these negotiations and they should be contacted to get the process underway.

A See response to Letter 1 from USDI.

11

B

Department of Health and Environmental Sciences

The Department of Health and Environmental Sciences (DHES) has reviewed the Western Area Power Administration's (WAPA) draft environmental impact statement (EIS) on the construction of a 230 kV transmission line from Great Falls to Conrad. The DHES had the following comments and concerns:

Water Quality - The DHES received a concerned letter from attorney Charles Joslyn, Choteau, MT, on behalf of his client Ted Sorenson, regarding high ground water in the Teton Ridge area (enclosure 1). The DHES is also concerned. If WAPA plans to follow its stated objective to "...avoid or minimize contact with steep slopes, slumping areas, saline areas and saturated soils." (p. 4-2), there should be few problems. However, the DHES would like to know if WAPA has contingency plans for dealing with such areas and if a possible option is to exclude sensitive areas?

Air Quality - Overall, the air quality impacts appear to be minimal. However, under certain meteorological conditions, as discussed in Chapter 4-1, there is a possibility of temporary detrimental impacts. Under these situations, some form of dust control, such as watering roads, must be undertaken. Also, as indicated in the analysis, care must be taken to comply with the open burning rules as well as with fugitive dust rules.

B

Slumping areas and steep slopes have generally been avoided by the preferred route. Western has developed contingency plans for saline areas and saturated soils. See Responses B and G under "Earth Resources." Dust will be controlled by the contractor per Western's construction specifications. No open burning will take place for this project.

11

LITERATURE CITED

de Waal Malefyt, J.J. 1979. Farms and wires. Pages 12-1 and 12-14 In Proceedings of the Second Symposium on Environmental Concerns in Rights-of-way Management.

Ellig, J. 1955. Waterfowl relationships to Greenfields Lake, Teton County, Montana. Montana Department of Fish and Game, Technical Bulletin No. 1.

Henderson, J.A., and W.S. Scott. 1979. The economic effect of high voltage transmission lines on agricultural lands. Pages 11-1 - 11-12 In Proceedings of the Second Symposium on Environmental Concerns in Rights-of-way Management.

Hook, D. 1973. Production and habitat use by Canada Geese at Freezeout Lake, Montana. M.S. Thesis, Montana State University, Bozeman.

Knight, R.R. 1965. Vegetative characteristics and waterfowl usage of a Montana water area. J. Wildlife Manage. 29:782-288.

TABLE 1-3F
PUBLIC HEARING COMMENTS

Speaker No.	Name/Organization	Issue/Comment	Response
1	Robert Pearson, USDI Fish and Wildlife Service	The USFWS would like to propose that Western consider funding a monitoring program along the 4.2 miles of moderate impact to waterfowl, identified in Link 38a-41a-44R, to determine what the actual collision hazard is. The other area of concern is in Link 30R along the Lake Creek drainage. We do not know what hazards are there, but feel it is another area that should be monitored.	Western proposes to conduct a post-construction monitoring program in these areas of concern. Refer to Table 1-2F, Response to Letter 1 from USDI.
2	Ted Sorenson Choteau, Montana	Mr. Sorenson expressed concern about the effects of drilling on high ground water in the Teton Ridge area.	Refer to Table 1-2F, Response to Letter 11, Comment B, under "Comments from Other Agencies."

CHAPTER 2 - SUPPLEMENTAL DISCUSSION ON WATERFOWL COLLISION HAZARDS

INTRODUCTION

Two principal waterfowl concentration areas occur within the study area for the Great Falls-Conrad Project: Freezeout Lake Game Management Area and Benton Lake National Wildlife Refuge (refer to Figure 3-6 in the DEIS). These areas were studied in detail for the DEIS, because of the potential for avian collision hazards associated with transmission lines. The discussion below summarizes waterfowl use data for the study area, potential impacts, proposed monitoring and mitigation, and expected residual impacts. This discussion supplements the responses to comments regarding waterfowl received from the Montana Department of Natural Resources and Conservation (DNRC), Letter 11 in Chapter 1 of this FEIS.

WATERFOWL USE IN PROJECT AREA

Freezeout Lake Game Management Area

Freezeout Lake is a major migratory stopover area and is used by a large number of various species of waterfowl. Spring and fall migration periods produce the heaviest use of the area. Up to one million birds, including as many as 250,000 snow geese, are estimated to use the lake during spring migration (Childress 1982). Besides snow geese, other species of waterfowl and shore birds use Freezeout Lake, including Canada geese, whistling swans, various species of ducks, and gulls.

While residing at Freezeout Lake, many birds make daily flights to nearby cultivated fields to feed. Snow and Canada geese use the region north and east of the lake for feeding. The snow geese generally move in a north-south direction, west of Bole Bench, northeast of the lake, and feed in the Teton River area about 15 miles north of Freezeout Lake. Canada geese generally use the area northeast of the lake, feeding heavily in nearby grain fields (Childress 1982).

During fall migration, birds generally leave Freezeout Lake via two major flyways: a large natural drainageway or coulee to the west, and a broad, expansive area at the southern end of the lake. The birds generally leave Freezeout Lake and fly over the Rocky Mountains to wintering areas (Childress 1982).

Benton Lake National Wildlife Refuge

From Benton Lake, foraging flights of geese tend to be in a northeasterly direction from the refuge. In addition, daily flights of Franklin's gulls are reported to occur between Benton Lake and the Missouri River to the east. Black Horse Lake, an alkali wetland on the east side of Benton Lake, holds

water five out of every ten years and most likely supports large numbers of waterfowl, gulls and shorebirds when conditions are amenable. In addition, based upon reports of refuge personnel, there is some interchange of birds between Benton and Freezeout lakes. It is felt that these interchange flights are generally concentrated through the Lake Creek drainage (Pearson 1984).

COLLISION MORTALITY POTENTIAL

The potential mortality of migratory birds due to the collision hazard posed by transmission lines is a well-documented concern. The major collision hazards are posed by transmission line conductors and overhead ground wires. Although transmission line structures also are a cause of collisions, the occurrence is much less frequent due to the high visibility of the structures. It appears that birds often see conductors also but, in flaring to avoid them, may collide with the overhead ground wire. Overhead ground wires, used for lightning protection, are usually no more than 3/8-inch in diameter, and are not as visible as the larger-diameter conductors.

Species vary in their collision rates. Generally, low-altitude, fast-flying birds that travel in tight flocks or birds flying at the same altitude as transmission line conductors are most vulnerable to collisions. Body size and the ability to maneuver also influence the susceptibility of a species to collision.

Thompson (1978) summarizes a number of past studies on the subject. Large migratory waterfowl appear to be the most consistent victims. Foraging and other local flights by puddle, or dabbling, ducks are generally at line height and those ducks are particularly susceptible to collisions with wires due to the high speed and low altitude of their flights (Boyd 1961, Krapu 1974, Stout and Cornwell 1976, Willard et al. 1976, Lee 1978, Meyer 1978, James and Haak 1979, Beaulaurier 1981). Pelicans, cranes, swans and some geese are also vulnerable because of their great size, flocking behavior and relatively low maneuverability (Beer and Ogilvie 1972, Harrison 1963, Ogilvie 1967, Perrins and Reynolds 1967, Willard et al. 1977). Raptors are seldom victims of collisions probably because of their visual acuity, slow flight, and high maneuverability (Kroodsma 1978). Although collisions can occur at anytime, losses in waterfowl concentration areas appear to be greatest during periods of inclement weather and nighttime when visibility is reduced.

There is no known methodology for accurately predicting wire-strike rates, regardless of the amount of use data available for a given area (Faanes 1984). Previous and on-going studies do provide guidance for avoiding or reducing collision potential. These known techniques were and will continue to be used for the Great Falls-Conrad Project.

MITIGATION

Avian collision studies recommend a number of mitigative measures to avoid or reduce the potential for wire strikes. These measures include both pre- and post-construction procedures, described in the following subsections.

Pre-Construction Mitigation

The most effective means of avoiding significant avian collision hazards is to site transmission lines away from waterfowl concentration areas. In the corridor planning process for the Great Falls-Conrad Project, waterfowl production and feeding areas were a primary siting factor, and were considered Exclusion/Avoidance Areas (see Table 2-6, DEIS). Benton and Freezeout lakes and their associated waterfowl collision zones were excluded from alternative corridor and substation locations. Peripheral waterfowl migration areas were avoided to the extent possible. Therefore, potential for high impacts from avian wire strikes was avoided through the corridor planning process. Nonetheless, some areas of concern still remain.

Migratory waterfowl often feed in agricultural fields located northeast of Freezeout Lake. Because the preferred transmission line corridor passes through some of these fields, the first 4.2 miles north of the Bole Substation (Figure 3-6, DEIS) were identified as having potential for moderate impacts due to avian collision hazards. The USFWS has requested that post-construction monitoring be conducted along this portion of the proposed line.

Studies suggest that topographic features such as natural drainageways can influence avian mortality due to collisions with power lines. Drainageways apparently can function to "funnel" bird movements and thereby increase the likelihood of wire strikes (Faanes 1983a; 1983b). Natural drainageways that occur south and west of Freezeout Lake are avoided by the preferred line route. There are no waterfowl use data for the Lake Creek drainage, located in Link 30R west of Benton Lake. While this drainageway was not specified as an area of concern during the project field review in 1983, it was identified by the USFWS as an area potentially warranting post-construction monitoring (See Public Hearing Comment #1, Table 1-3F, Chapter 1).

Post-Construction Monitoring Program

Western proposes to develop a post-construction monitoring program for areas of concern, in consultation with the USFWS and Montana Department of Fish, Wildlife and Parks (DFWP). Monitoring would be conducted for about two years in areas of concern to identify specific portions of the line, if any, that pose collision problems. If monitoring indicates that significant wire strike impacts are occurring, Western will implement mitigation measures in consultation with appropriate agencies.

Post-Construction Mitigation

Post-construction mitigation measures have been recommended in numerous studies on avian collision mortality, and are highly effective in reducing wire-strike rates. In areas where wire strikes occur, the object of mitigation measures is to increase the visibility of the transmission line so that birds will see and avoid it in flight.

According to Faanes (1983a), it appears that flying birds tend to avoid the airspace within approximately 50 meters of transmission line structures, probably due to the high visibility of the structures. Most birds fly over transmission lines in the mid-span region. Additionally, a number of studies have shown that the highest incidence of avian mortality from power lines results from collisions with the overhead ground wire, rather than the larger-diameter conductor.

Marking ground wires to increase their visibility to flying birds is an effective means of reducing avian collisions. Orange aviation marker balls or black-and-white ribbons placed on conductors or ground wires are among the most successful visibility devices (Beaulaurier 1981). Markers placed at mid-span appear to be most effective (Faanes 1983a).

The majority of avian collisions with transmission lines usually occur at one or two specific spans where local topography tends to concentrate bird flight (Faanes 1983a). Therefore, where reliability of the transmission line would not be decreased due to lessened lightning strike protection, the most effective post-construction mitigation measure may be removal of the overhead ground wire at problem spans.

Residual Impacts

Given Western's commitment to post-construction monitoring and mitigation, as needed, residual impacts regarding avian collision mortality are expected to be low. Areas with the highest potential hazard were avoided in corridor siting, leaving a few, isolated areas where some hazard may remain. Based on previous industry experience with post-construction mitigation, it is anticipated that any residual wire-strike rates can be reduced to an insignificant level by marking mid-span areas of the transmission line conductor or ground wire (Faanes 1984).

CHAPTER 3 - ERRATA AND CHANGES TO THE DEIS

Page vii, Figure 2-5: Change "Equiment" to "Equipment."

Page 1-2, first paragraph, last sentence should read: "This situation cannot be relieved by simple reconductoring of the 69kV system, since the effective per unit impedance of a high voltage transmission line is primarily a function of voltage and spacing, with conductor size having less impact."

Table 1-1 has been revised, based on revised load projections by Western's customers and Montana Power Company (MPC). See Table 3-1F in this section. The revised 1981 (actual) load data for Bole is the result of MPC changing its sectionalizing in the area.

Table 2-1: Under "Structure Type" for 115kV, change "H-fame" to "H-frame."

Page 2-11, "Line Design": In the DEIS, Western proposed the use of single-pole concrete or steel structures to support the conductors and ground wire for the Great Falls-Conrad transmission line. This structure type was preferred because of (1) reduced impacts to agricultural land use, as compared to H-frame structures; (2) reduced visibility, as compared to larger steel lattice towers or dark-colored wood structures; and (3) longer service life of concrete or steel, as compared to wood.

Figure 2-2 of the DEIS illustrated a typical 230kV single-pole structure. Figure 3-1F of this document more closely resembles the typical tangent structure that would be used for this project. This revised structure design would reduce potential for damage and associated line outages caused by ice loading and conductor galloping in high winds.

The new conductor configuration would result in electric and magnetic fields different than those cited in the DEIS. Based on a conductor ground clearance of 29 feet, the maximum electric and magnetic fields at 3.3 feet above ground were calculated to be 2.869 kV/meter and 0.17605 gauss/1000 amperes, respectively. At the edge of the right-of-way, the figures would be 0.642 kV/meter and 0.04156 gauss/1000 amperes, respectively.

Residual visual impact levels would remain the same as those described in the DEIS, even though the structures could be as much as 15 feet taller than those originally shown in the DEIS. The majority of the study area is flat, agrarian land where topography offers little screening potential. The only measure that can substantially reduce visibility in this landscape is increased distance between the structures and sensitive viewpoints. Therefore, the critical areas for visual resources already identified in the DEIS would remain the same (Figure 3-9, DEIS), and use of the revised structure design would not raise or lower any residual impact levels for visual resources.

Impacts to earth resources, land use, and biological and cultural resources would also remain the same as those described in the DEIS.

Page 2-12, line 6 under "Right-of-Way Acquisition": Change "18 acres of land" to "28 acres of land."

Page 2-12, Line 4: Change "whenever" to "wherever."

Table 2-7, page 2 of 5, Item E: Delete last sentence.

Table 2-7, page 3 of 5, Line 6, Item F: Change "Applicant's" to "Agency's."

Table 2-7, page 4 of 5, Line 3, Item 2: Add close parenthesis.

Table 2-7, page 4 of 5: Add Item 8: Western will comply with the requirements of 10 CFR 1022 and Executive Orders 11988 and 11990.

Page 3-7, Line 18: Change "Northeastern" to "Northcentral."

Page 3-7, Lines 38 and 39: Delete "Stoleniferous buffalo grass."

Page 3-28, Line 1: Change "$541.7" to $541.7 million."

Page 3-28 and 3-29, Archaeological Resources, Cultural History: This section should be replaced with the following:

The location of the project area in the Rocky Mountains near the edge of the Great Plains provides interesting research for the archaeologist. Human lifeways are largely dictated by (1) the resources available within their territory, (2) the physiographic characteristics of the territory, and (3) the nature and numbers of surrounding populations. Accordingly, there are basic differences between people whose territory is primarily mountainous and people whose territory is characteristically plains. Aspects of both cultural traditions are apparent in the archaeological record of the intermontane areas of Montana. Furthermore, Middle Missouri, Columbia Plateau, and Great Basin influences affected the Northwestern Plains throughout much of prehistory. The resultant overlapping and blending of cultural traits in this intermediate area creates a clouded picture of the past. Although confusing, it is an intriguing area from an archaeological and anthropological perspective which will benefit from "problem oriented" research.

Malouf considers the area that encompasses the project area to be within a distinct archaeological region, the Montana Western Region, "along the continental divide in Montana and southern British Columbia, and extended for two or three hundred miles on each side of the crest" (Malouf 1956:9). Most other researchers consider the project area to lie within the Northwestern Plains (Frison 1978; Mulloy 1958; Reeves 1970; Wedel 1961). This intermontane region is rich in prehistory, although relatively few professional archaeological studies have been conducted in the area. Because of the scarcity of well-stratified archaeological sites and the shortage of radiocarbon dates from excavated sites in the area, the existing chronology is extrapolated from surrounding areas. It may be that a hybrid sequence will be most appropriate.

In order to accommodate so many varied influences from surrounding cultural traditions, only the most general chronology can be applied at this time. This general chronology is as follows:

(1) The Early Prehistoric or Paleo-Indian Period (ca. 11,000-5500 BC) was a time when the area's earliest occupants based their economy on large game supplemented by various plant foods and small game. Diagnostic materials from this period consist of large, lanceolate spear points.

(2) The Middle Prehistoric Period (ca. 5500 BC-AD 400) has been subdivided into three subperiods. The Early Middle Period (ca. 5500-2500 BC) is characterized by large side-notched points found at sites located primarily in caves and rock shelters in the foothills and mountains. The Middle Middle Period (ca. 2500-1000 BC) is characterized by a variety of projectile point forms, including indented base, lanceolate forms; sloping shoulder, straight stemmed forms; shouldered, expanding stem forms; and the frequent occurrence of milling stones presumably for plant processing at some sites. The Late Middle Period (ca. 1000 BC-AD 400) is characterized by corner-notched projectile points early in the period; side-notched points often associated with pottery late in the period; and abundant campsites and bison kill sites throughout the 1,400-year period.

(3) The onset of the Late Prehistoric Period (ca. AD 200-1700) is marked by the decrease in projectile point size, probably associated with the introduction of the bow and arrow and, in some cases, by the introduction of pottery. Climatic fluctuations and population pressures caused extensive movement of people throughout the area. Bison hunting appears to have peaked after AD 1400, as evidenced by numerous labor-intensive jump sites.

(4) Protohistoric Period (ca. AD 1700-1800) sites are identified primarily on the basis of the presence of Euro-American trade goods. This period begins with the introduction of the horse, which substantially changed many Northwestern Plains cultures. Known Native American groups who lived in or near the project area include Flathead, Shoshone, and Blackfeet, with a number of additional tribes using the area during buffalo hunts.

Page 3-30, last sentence: After "In 1881, there were over" add "100,000 head."

Page 4-6, last sentence: Change to "As part of the mitigation program, Western will monitor these areas after construction to identify any site-specific impacts and, if necessary, implement mitigation measures to reduce collision hazards."

Page 4-12, Line 19: Change "asessing" to "assessing."
Line 34: Change "exlusion" to "exclusion."

Page 4-19, Line 5 under "SUBSTATIONS": Change sentence beginning "Each proposed substation" to "Substation construction will remove about 12 acres of nonirrigated cropland at Bole, and about 17 acres at Conrad for the life of the project."

Table 4-2, page 1 of 2 and page 2 of 2, under "Substation Sites": Change "10 acres/substation" to "10 acres at Bole Substation and 18 acres at Conrad Substation."

Page 6-2, Line 3: Change "Geolgocial" to "Geological."

Appendix B

The following citations should be included in the DEIS bibliography:

U.S. Department of the Interior, Bureau of Land Management. 1978. BLM Manual, 8400 - Visual Resource Management (VRM).

Wedel, W.R. 1961. Prehistoric Man on the Great Plains. University of Oklahoma Press, Norman.

Appendix C

Page C-7, under definition of Megawatts: Change "1/756th" to "1/746th."

Page C-8, under definition of Middleground: Change first sentence to "This zone includes viewed areas in which details of foliage and fine features cease to be perceptible."

Page C-11, under definition of Selective Mitigation: Change "Applicant" to "Agency."

Appendix D

Page D-1, first paragraph, last sentence: Change "At maximum capacity of approximately 1000A will flow..." to "At maximum capacity, approximately 1000 A will flow...".

Appendix E

Page E-5, Item 2, first sentence: Delete the word "occur."

Appendix F

Page F-6: Change heading "Nutchatches" to "Nuthatches."

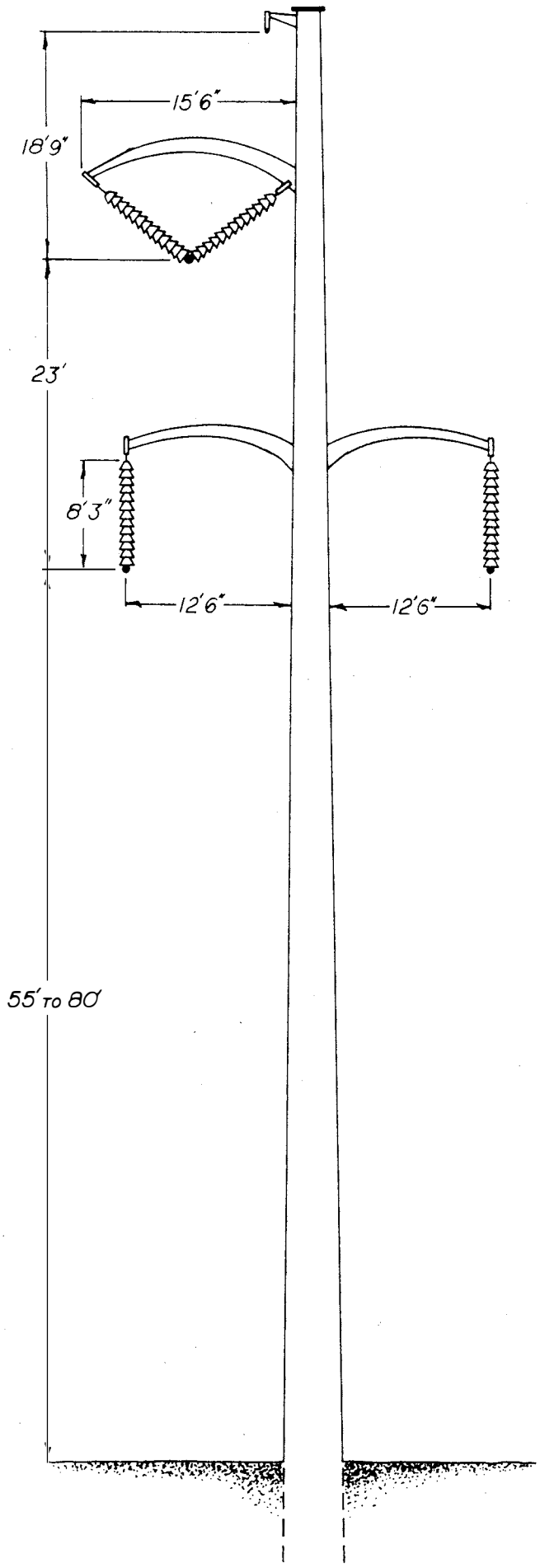
DEIS Maps, Diagrams and Tables Volume

Figure 3-8, "Land Use": In the legend, the category of Nonirrigated Cropland should be indicated by solid blue-green shading.

TABLE 3-1F
ELECTRICAL LOAD DATA (MW)
Great Falls-Conrad-Cut Bank-Havre 115kV Loop

High Voltage Delivery Point	1981 (Actual) Summer	1981 (Actual) Winter	1985 (Estimate) Summer	1985 (Estimate) Winter	1990 (Estimate) Summer	1990 (Estimate) Winter
Bole 230kV[1]						
Federal	11.2	9.8	13.7	11.2	20.9	12.5
MPC	4.9	6.3	5.6	8.3	7.9	11.0
TOTAL	16.1	16.1	19.3	19.5	28.8	23.5
Dutton Pump 115kV						
MPC	-	1.0	0.9	0.9	0.9	0.9
Conrad 115kV						
Federal	9.9	6.0	13.3	7.6	18.0	9.0
MPC	6.7	8.3	8.0	9.2	9.2	10.4
TOTAL	16.6	14.3	21.3	16.8	27.2	19.4
Valier-Williams 115kV						
MPC	3.5	2.2	3.4	2.5	3.8	2.6
Cutbank Pump 115kV						
MPC	1.8	2.0	2.4	2.4	2.4	2.4
Cutbank 115kV						
Federal	11.0	19.2	13.9	21.7	17.6	27.7
Browning 115kV						
Federal	6.7	9.0	9.1	15.8	11.7	20.3
Shelby 115kV						
Federal	10.5	15.9	14.3	23.0	20.2	34.7
Tiber 115kV						
Federal	0.9	0.4	0.9	0.4	1.0	0.5
Rudyard 115kV						
Federal	2.6	2.5	2.6	3.6	2.8	3.9
TOTALS						
Total Federal	52.8	62.8	67.8	83.3	92.2	108.6
Total MPC	16.9	19.8	20.3	23.3	24.2	27.3
Total Load	69.7	82.6	88.1	106.6	116.4	135.9

[1]This load is currently being served by MPC's Rainbow to Bole 69kV transmission line, and will be served by the proposed Great Falls to Conrad 230kV line in 1985.



TYPICAL SINGLE-POLE STRUCTURE

Figure 3-1F

APPENDIX A

SUGGESTED MITIGATION MEASURES SUBMITTED BY THE MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

APPENDIX A

STATE OF MONTANA

ENVIRONMENTAL SPECIFICATIONS

WESTERN AREA POWER ADMINISTRATION

GREAT FALLS-CONRAD

230 kV TRANSMISSION LINE

Draft

April 1984

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APPENDICES

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O. State laws having permit requirements applicable to exempt facilities

N/A

P. Aeronautical hazard markings

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DEFINITIONS

BOARD:	Montana BOARD of Natural Resources and Conservation
OWNER:	The owner(s) of the facility, his agent, or his contractor
DNRC:	Montana Department of Natural Resources and Conservation
DFWP:	Montana Department of Fish, Wildlife, and Parks
DSL:	Montana Department of State Lands
DOH:	Montana Department of Highways
DHES:	Montana Department of Health and Environmental Sciences
CONTRACTOR:	Constructors of the Facility (agent of owner)
EXEMPT FACILITY:	A facility meeting the requirements of 75-20-202, MCA and accompanying rules
SHPO:	State Historic Preservation officer
LANDOWNER:	Owner of private property or managing agency for public lands

INTRODUCTION

The purpose of these specifications is to incorporate environmental considerations and mitigation into the construction of a transmission facility.

These specifications are intended to be incorporated into the texts of contract plans and specifications. Site-specific appendices will be developed by the OWNER in consultation with DNRC and will be approved by the BOARD at the time the centerline is approved.

Table 1.
Statutes Which May be Applicable to Transmission Line Construction.

TOPIC	STATUTE OR RULE
Department of Health and Environmental Sciences	
Forest Areas: Burning Permits	7-23-2205; 75-2-221; 76-13-121, MCA; 16.8.1405; 26.6.301-304, 501-503, ARM
Water Pollution: Discharge Permits	75-5-101-403, MCA; 16.20.633(3)(a) et seq., ARM
Pesticides	80-8-101 et seq., MCA; 4.10.201 et seq., ARM; 7-22-2101(3), MCA; 16.20.633(g) et seq., ARM; 16.20.616(3)(h) et seq., ARM
Air Pollution Permits	75-2-211, 212, 301, MCA; 16.8.1101 et seq., ARM; 16.8.1401 et seq., ARM
Solid Waste Disposal	75-10-201 et seq., 75-10-401, et seq., 75-3-201, 302, MCA; 16.14.501 et seq.; 16.44.101 et seq., ARM; 16.20.633(9) et seq., ARM
Department of State Lands	
Forest Areas: Burning Permits	7-33-2205; 75-2-221; 76-13-121, MCA; 16.8.1405; 26.6.301-304, 501-503, ARM
Forest Areas: Removal of Timber	7-8-2608, 2609; 77-5-204, 211, 212, 213, MCA
Forest Areas: Slash Disposal	76-13-407-413, MCA; 26.6.501-503, ARM
Timber Sales	77-2-303, 77-5-201 et seq., MCA; 76-15-701 et seq., MCA
Hardrock Mining	82-4-301 et seq., MCA; 26.4.101 et seq., MCA; 50-72-101 et seq., MCA; 24.30.1301, ARM
Open Cut Mining	82-4-401 et seq., 50-72-101 et seq., MCA; 26.4.201 et seq., 24.30.1301, ARM
Stone, Gravel, etc.	77-3-201 et seq., MCA
State Lands	77-1 thru 6, MCA; 26.213, ARM

Department of Highways

Highway ROW: Approach Permits	18.5.104 et seq., 18.2.104, ARM
Highway ROW: Encroachments/easements	7-14-2139, MCA; 18.7.101-108, ARM
Highway Utility Easements	7-13-4101, 7-13-2101, MCA; 18.7.221-241, ARM

Department of Agriculture

Pesticides	80-8-101 et seq., MCA; 4.10.201 et seq., ARM; 7-22-2101(3), MCA

Department of Fish, Wildlife and Parks

Stream Beds, Stream Banks, Wetlands	75-7-101, et seq., MCA; 87-5-501 et seq., MCA
Pesticides	80-8-101 et seq., MCA; 4.10.201 et seq., ARM; 7-22-2101(3), MCA

Montana Historical Society

State Antiquities Act	22-3-401 thru 442, MCA

0.0 GENERAL SPECIFICATIONS

0.1 SCOPE These specifications apply to all lands affected by the project except as requested otherwise by the landowner. The OWNER shall cooperate with the landowner to ensure that the impacts of the project are kept to a minimum.

0.2 ENVIRONMENTAL PROTECTION The OWNER shall conduct all operations in a manner to protect the quality of the environment and to reduce impacts to the greatest extent practical.

0.3 CONTRACT DOCUMENTS These specifications shall be part of or incorporated into the contract documents; therefore, the OWNER and the OWNER'S agents shall be held responsible for adherence to these specifications in performing the work. If the OWNER'S agents fail to operate within the intent of these specifications, the BOARD or its authorized agent shall direct the OWNER to correct operating procedures.

0.4 BRIEFING OF EMPLOYEES The OWNER shall ensure that the CONTRACTOR and all field supervisors are provided with a copy of these specifications and informed of which sections are applicable to specific procedures. The OWNER is responsible for ensuring that the construction supervisors are adequately trained and utilized in work appropriate to that training. Supervisors shall inform all employees on the applicable environmental constraints spelled out herein prior to and during construction, and shall post reminders of applicable items on job sites. Site-specific measures spelled out in Appendices B through K shall be incorporated into the line list, plan and profile maps or other appropriate contract document.

0.5 COMPLIANCE WITH REGULATIONS All activities of the OWNER shall comply with all applicable local, state, and federal laws, regulations, and requirements. A non-exempt facility which has received a Certificate of Environmental Compatibility and Public Need from the BNRC does not need to obtain environmental permits from state agencies with the exception of laws dealing with air or water quality, protection of employees, surface and groundwater diversions, and easements across school trust lands, or the beds of navigable streams or rivers from low water mark to low water mark, as provided by 75-20-103 and 401, MCA (see Appendix O which

contains a list of these laws). Compliance with the requirements of these environmental specifications will ensure that the intent of state laws which are superceded by MFSA is met.

0.6 DESIGNATION OF ENVIRONMENTALLY SENSITIVE AREAS The DNRC, in its evaluation of the project, has designated certain areas along the right-of-way or access roads as Environmentally Sensitive Areas. The location of all such Environmentally Sensitive Areas is described in Appendix C. These areas may include, but are not limited to, scenic, historical, and archaeological areas, critical fish and wildlife habitats, municipal watersheds, public recreational areas, areas with fragile soils, or unique ecosystems and old-growth forests. Special precautions shall be taken in these areas during construction, operation, and maintenance, as described elsewhere in these specifications or in the attached appendices. The OWNER shall take all necessary actions to avoid adverse impacts in these Environmentally Sensitive Areas.

0.7 PERFORMANCE BOND N/A

0.8 WAIVERS AND ADDITIONS The BOARD may waive certain of the specifications listed herein if it finds that they are not applicable to the project or are not necessary to ensure that the impacts of the facility are mitigated. The BOARD may also add any additional standards necessary to ensure minimal impact. Sections of these specifications which have been waived for this project and new specifications added specifically for it are listed in Appendix B.

0.9 DESIGNATION OF STRUCTURES Each structure for the project shall be designated by a sequential number on plan and profile maps. References to specific poles or towers in Appendices A through F shall use these numbers. If this information is not available because the survey is not complete, locations along the centerline shall be indicated by station numbers or mileposts. Station numbers or mileposts of all angle points shall be designated on plan and profile maps.

0.10 ACCESS N/A

0.11 DESIGNATION OF DEPARTMENT LIAISON Prior to designation of the STATE INSPECTOR, all communications regarding the project shall be directed to DNRC's project liaison designated by the Administrator of the Energy Division, DNRC. The STATE INSPECTOR, once designated, shall assume the role of liaison.

0.12 DESIGNATION OF STATE INSPECTOR DNRC shall designate a STATE INSPECTOR to monitor the OWNER'S compliance with these specifications and any other project-specific mitigation measures adopted by the BOARD. The INSPECTOR shall be the OWNER's liaison with the State of Montana on construction, post-construction, and reclamation activities. The name of the INSPECTOR can be obtained by contacting the Administrator of the Energy Division, DNRC.

For non-exempt facilities. responsibilities of the INSPECTOR include but are not limited to:

1) Review of site-specific facility location maps submitted by the OWNER.

2) Granting of any waivers to the advance notification requirements contained in Section 1.0.

3) Field inspection of construction activity and those sites identified in the centerline evaluation as requiring specific construction techniques or precautions.

4) Determining compliance with these specifications.

5) Documentation of field observations and discussions with CONTRACTOR and/or OWNER's representative.

6) Preparation of periodic monitoring reports.

7) N/A

8) Contacting other state agencies and arranging review or inspections by them as necessary.

0.13 SALVAGE Removal of existing structures replaced by the present line, or removal of the present line following its abandonment, shall be done in accordance with these specifications. Removal of any unused existing structures, if necessary, shall be done within twelve months after energization of the new line.

0.14 EXEMPT FACILITIES N/A

1.0 PRECONSTRUCTION PLANNING AND COORDINATION

1.1 PLANNING

1.1.1 Planning of all stages of construction and maintenance activities is essential to ensure that construction-related impacts will be kept to a minimum. The CONTRACTOR and OWNER will plan the timing of construction, construction and maintenance access and requirements, location of special use sites, and other details before the commencement of construction.

1.1.2. Before the start of construction of any segment of the line, the location of the centerline and of all construction access roads, maintenance access roads, structures, clearing backlines, staging sites, pulling sites (if known), batch plant sites, splicing sites (if known), borrow pits, campsites, and storage or other buildings shall be plotted on ortho photomosaics and/or plan and profile maps, at a scale of 1:24,000 or larger, or on available USGS 7.5' topographic maps (scale: 1:24,000), and submitted to the STATE INSPECTOR. All locations shall be submitted at least 30 days before the beginning of construction at the site.

1.1.3. For lines of a design voltage 230 kV and above, the OWNER shall provide to DNRC a list of subcontractors, estimated number of workers, description of the types of heavy equipment required, and a proposed time schedule of construction activities at least 30 days prior to the beginning of construction and 15 days before the preconstruction conference for each segment of line. DNRC is to be notified immediately of any significant changes or updates in this time schedule.

1.1.4. Long-term maintenance routes to all points on the line should be planned before construction begins. New construction access roads to be used for line maintenance shall be differentiated from those not used for maintenance on the maps required under 1.1.2 above.

1.2 PRECONSTRUCTION CONFERENCE

1.2.1. At least 15 days before commencement of any construction activities, the OWNER shall schedule a preconstruction conference. DNRC's liaison (Section 0.11) shall be notified of the date and location for this meeting. The purpose of this conference shall be to brief all involved persons regarding the content of these specifications and other Board-approved mitigating measures, and to make all parties aware of the role of the STATE INSPECTOR.

1.2.2. The OWNER's field representative, the CONTRACTOR's environmental inspectors, the STATE INSPECTOR, all contractors involved in construction or maintenance of the facility, representatives of affected state and federal agencies, and the applicant shall be invited to attend the preconstruction conference.

1.3 PUBLIC NOTICE

1.3.1. For all lines of a design voltage of 230 kV or above, the OWNER'S field representative or the CONTRACTOR shall meet with local public officials in each affected community at least thirty days before the beginning of construction to provide information on the temporary increase in population, when the increase is expected, and where the workers will be stationed. Officials contacted shall

include the county commissioners, city administrators, and law enforcement officials. It is also suggested that local fire departments, emergency service providers, school officials, motel operators and others who could provide transient lodging, and a representative of the Chamber of Commerce be contacted. Maps of the line and access roads must be available so that service providers can determine where and when any problems could arise.

1.3.2. N/A

1.3.4. The OWNER shall meet with landowners or the managing agency of affected property to determine the best location for access roads, and the need for gates.

1.3.5. The OWNER shall maintain, and upgrade as necessary, all roads and bridges used or damaged by construction, and shall install necessary road signs to ensure adequate safety. The OWNER shall contact local government officials regarding implementation of these safety measures.

1.4. Historical and Archaeological Survey.

1.4.1. The OWNER must develop and carry out a plan approved by the State Historic Preservation Office (SHPO) to identify, evaluate, and avoid or mitigate damage to cultural resources potentially impacted by the project. All steps of an approved plan must be carried out prior to the start of project construction except those steps designed to coincide with construction such as monitoring. If the OWNER and SHPO cannot reach agreement on the plan or components of it, the OWNER must secure Board approval for the plan or components in question. Nothing in these specifications should be construed to exempt or alter compliance by the OWNER or a federal agency with 36CFR800.

1.4.2. Appendix F contains a list of sensitive cultural resource sites and treatments which must be followed during project construction.

2.0 CONSTRUCTION

2.1 GENERAL

2.1.1. The preservation of the natural landscape contours and environmental features shall be a primary consideration in the location of all construction facilities, including roads, construction camps, storage areas, and buildings. Construction of these facilities shall be planned and conducted so as to minimize destruction, scarring, or defacing of the natural vegetation and landscape. Any necessary earthmoving shall be planned and designed to be as compatible as possible with the natural landforms.

2.1.2. Construction sites and staging areas shall be kept no larger than necessary and shall be located where most environmentally compatible, such as on the flattest available ground where there is no fragile soil or vegetation. After construction, these areas shall be restored, reshaped, seeded, and mulched, as specified in Section 3.0 of these specifications. All work areas, as designated on the map referred to in Section 1.1.2., shall be maintained in a neat, clean, and sanitary condition at all times.

2.1.3. Trash or construction debris will be regularly removed during the entire construction period.

2.1.4. Topsoil removed on temporary construction sites will be stockpiled so that it may be spread over subsoil during site restoration.

2.1.5. Environmentally Sensitive Areas listed in Appendix C, and all cultivated and planted areas and vegetation such as trees, plants, shrubs, and grass on or adjacent to the right-of-way which do not interfere with the performance of work, shall be preserved. The OWNER shall take all necessary actions to avoid adverse impacts to Environmentally Sensitive Areas. The STATE INSPECTOR shall be notified 48 hours in advance of any clearing or construction activity in these areas.

2.1.6. N/A

2.1.7. The OWNER shall acquire a temporary construction easement that covers as much as is practical the land area that will be disturbed by construction. The OWNER shall flag the boundaries of the construction right-of-way in certain environmentally sensitive areas as designated in Appendix C. All construction operations must be conducted within this area. The width of the temporary construction and permanent right-of-way for this project shall be as specified in Appendix D.

2.1.8. Flow in a streamcourse may not be permanently diverted. If temporary diversion is necessary, flow will be restored before a major runoff season or the next spawning season, as determined by the STATE INSPECTOR in consultation with the managing agency (see 2.11.6).

2.2 CONSTRUCTION MONITORING

2.2.1. After the BOARD approves the OWNER's centerline location, the responsibility for follow-up actions lies with the STATE INSPECTOR. These actions consist of communication with the CONTRACTOR and OWNER's representative, documentation of field observations, and preparation of monitoring reports. The STATE INSPECTOR shall maintain discussions with the OWNER and the OWNER's agents in order to stay informed of construction activities in areas of concern to the state. The STATE INSPECTOR will observe construction at these areas when possible and necessary, and shall monitor OWNER compliance with the State Environmental Specifications and project specific mitigating measures.

2.2.2. The STATE INSPECTOR, the OWNER, and the OWNER'S agents will rely upon a cooperative working relationship to reconcile potential problems relating to construction in sensitive areas. Enforcement action will occur only when the CONTRACTOR fails to follow stipulated construction techniques and procedures. When the INSPECTOR determines that construction activities will cause excessive environmental impacts due to seasonal field conditions or encounters with sensitive features, he will talk with the OWNER about possible changes in construction techniques or minor rescheduling to avoid these impacts. The INSPECTOR will be prepared to provide the OWNER with written documentation of the reasons for the temporary modifications in procedures or scheduling within 24 hours of imposing the modification. The STATE INSPECTOR will use the following administration tools:

Authorization to Proceed (ATP). This authorization to the OWNER consists of written permission for the OWNER to begin work on a construction project or segment thereof. It will be issued only after the OWNER has complied with the required prerequisites (see Sections 1.4 and 2.9.3.). The ATP notice may be given over the telephone to expedite the OWNER's schedule, and will be followed up in writing within three working days.

Compliance Order. This order is a directive issued to the OWNER's representative by the STATE INSPECTOR. The Compliance Order is used to advise the OWNER of the need to comply with specific elements of the construction specifications or project mitigation measures. The Compliance Order may also be instructional in nature. All orders shall be in writing, but in emergencies may be issued orally provided written confirmation is made within 24 hours. In the event that the OWNER fails to comply with a valid Compliance Order and fails to provide acceptable evidence that he will comply, the STATE INSPECTOR shall file an incident report to the DNRC Director within 48 hours. Subsequent legal judgments against the OWNER may result in civil penalties up to $10,000 per day of continued violation, in accordance with 75-20-408, MCA.

2.2.3. The STATE INSPECTOR may require modification of construction methods at some sites besides those listed in Appendix C in order to minimize environmental damage due to unique circumstances that arise during construction, such as unanticipated discovery of a cultural site or bald eagle nest. The STATE INSPECTOR will issue written instructions to the OWNER for all such locations after consultation with the OWNER'S agent at least 48 hours in advance of construction in that area.

2.3 TIMING OF CONSTRUCTION

2.3.1. Construction and motorized travel may be restricted or prohibited at critical sites which differ seasonally in sensitivity to construction-related disturbances. These sites, listed in Appendix E, may include, but are not limited to, the following sites:

a. The vicinity of heavily used recreation sites on weekends or holidays;

b. On or near winter ranges or other areas important to deer and antelope;

c. Sage and sharp-tailed grouse leks;

d. Raptor nesting sites or water bird colonies;

e. In or near streams during seasons of migratory fish spawning;

f. Areas with soils having low bearing strength in conjunction with high moisture conditions.

2.3.2. N/A

2.4 PUBLIC SAFETY

2.4.1. All construction activities shall be done in compliance with existing health and safety laws.

2.4.2. N/A

2.4.3. Aeronautical hazard markings shall be installed at the time the wires are strung, according to the Montana Aeronautical Division's specifications listed in Appendix P.

2.5 PROTECTION OF PROPERTY

2.5.1. Construction operations shall not take place over or upon the right-of-way of any railroad, public road, public trail, or other public property until the necessary permits or approvals have been obtained from the managing agency. Designated recreational trails as listed in Appendix C will be protected and kept open for public use. Where it is necessary to cross a trail with access roads, the trail corridor will be restored. Adequate signing and/or blazes will be established so the user can find the route. All roads and trails designated by government agencies as needed for fire protection or other purposes shall be kept free of logs, brush, and debris resulting from operations under this agreement. Any such road or trail damaged by this project shall be promptly restored as nearly as possible to its original condition.

2.5.2. Reasonable precautions shall be taken to protect, in place, all public land monuments and private property corners or boundary markers. If any such land markers or monuments are destroyed, the STATE INSPECTOR shall be notified immediately and the marker shall be reestablished and referenced in accordance with the procedures outlined in the "Manual of Instruction for the Survey of the Public Land of the United States" or, in the case of private property, the specifications of the county engineer. Reestablishment will be at the expense of the OWNER.

2.5.3. Construction shall be conducted so as to prevent any damage to existing transmission lines, distribution lines, telephone lines, railroads, ditches, and public roads crossed. If such improvements are damaged by operations under this agreement, the OWNER shall restore them immediately to a condition satisfactory to the landowner.

2.5.4. Care shall be taken to ensure that all gates are reclosed after entry or exit and the landowner shall be compensated for any losses to personal property due to construction or maintenance activities. Gates shall be inspected and repaired and missing padlocks shall be replaced when requested by landowner. The OWNER shall ensure that gates are not left open at night or during periods of no construction activity. Any fencing or gates cut, removed, damaged, or destroyed by the OWNER shall immediately be replaced with new materials to the original standard. Fences installed shall be of the same height and general type as the fence replaced or nearby fence on the same property, and shall be stretched tight with a fence stretcher before stapling or securing to the fence posts, subject to the desires of the landowners or managing agency. Temporary gates shall be of sufficiently high quality to withstand repeated opening and closing during construction, to the satisfaction of the landowner.

2.5.5. The CONTRACTOR must notify the OWNER, the STATE INSPECTOR, and, if possible, the affected landowner or managing agency within 48 hours of unavoidable or accidental damage to land, crops, or irrigation facilities, contamination or degradation of water, or livestock injury caused by the OWNER's construction activities, and the OWNER shall restore any damaged resource subject to the landowner's desires or provide compensation to the affected party.

2.5.6. Pole holes and anchor holes must be covered or fenced in any fields, pastures, or ranges used for livestock grazing or where the landowner requests it.

2.5.7. All fences crossed by permanent access roads shall be provided with a gate no less than 16 feet wide. All fences crossed by access roads shall be braced before the fence is cut. Fences not to be gated should be restrung temporarily during construction and permanently within 30 days following construction, subject to the desires of the landowner.

2.5.8. Temporary cattleguards or closures shall be placed at all fence crossings on temporary roads, as requested by the landowner. Cattleguards, when required, shall be aligned at right angles with the roadway and shall be accompanied by an off-road gate wide enough for all construction equipment.

2.5.9. Any breaching of natural barriers to livestock movement by construction activities will require fencing sufficient to control livestock.

2.6 TRAFFIC CONTROL

2.6.1. At least 30 days before any construction within or over any highway right-of-way, the OWNER will notify the STATE INSPECTOR. The STATE INSPECTOR will arrange an on-site inspection with the OWNER and a representative of the DOH field office to review the proposed occupancy and to resolve any problems. The STATE INSPECTOR will prepare recommendations based on consultation with DOH. The OWNER must comply with any measures recommended by the STATE INSPECTOR following this inspection, including measures related to traffic control requirements.

2.6.2. In areas where the construction creates a hazard, traffic will be controlled according to the recommendations of DOH. Safety signs advising motorists of construction equipment shall be placed on major state highways, as recommended by DOH. Proper road signing will be the responsibility of the OWNER.

2.6.3. The managing agency and the STATE INSPECTOR shall be given adequate notice when it is necessary to close roads to public travel for short periods to provide safety during construction.

2.6.4. Construction vehicles and equipment will be operated at speeds safe for existing road and traffic conditions. Speed limits will be posted as approved by DOH.

2.6.5. Traffic delays will be restricted on primary access routes, as determined by the Montana Department of Highways.

2.6.6. Access for fire and emergency vehicles will be provided for at all times.

2.6.7. Public travel through and use of active construction areas shall be discouraged.

2.7 ACCESS ROADS AND VEHICLE MOVEMENT

2.7.1. Construction of new roads shall be held to the absolute minimum reasonably required to construct the facility. State, county, and other existing roads shall be used for construction access wherever possible. Roads intended to be used as permanent maintenance roads should be initially designed as such. The location of access roads and towers shall be established in cooperation with affected landowners and landowner concerns shall be accommodated wherever reasonably possible.

2.7.2. All new roads, both temporary and permanent, shall be constructed with the minimum possible soil disturbance to minimize erosion, as specified in Section 2.11 of these specifications.

2.7.3. All roads shall be initially designed to accommodate one-way travel of the largest piece of equipment that will eventually be required to use them; road width shall be no wider than necessary.

2.7.4. Roads shall be located in the right-of-way insofar as possible to enable traffic to avoid cables and conductors during conductor-stringing. Road crossings of the right-of-way should be near support structures.

2.7.5. Where practical, temporary roads shall be constructed on the most level land available. Where roads cross flat land they shall not be graded or bladed unless necessary, but will be flagged to show their location and to prevent travel off the roadway.

2.7.6. Unless otherwise requested by the landowner or managing agency, no cutting and filling for access road construction shall be allowed in areas of 9 percent sideslope or less. In areas of over 9 percent sideslope, roadbuilding that may be required shall conform to a 4 percent outslope. In these cases, the roads shall be constructed so that sidecast material that would disrupt road drainage will not accumulate in piles. The road surface will be crowned, if necessary, to prevent channeling of runoff, and shoulders or berms that would channel runoff shall be avoided.

2.7.7. The OWNER will maintain all permanent access roads, including drainage facilities, which are constructed or used during the period of construction.

2.7.8. Any use damage to joint use roads, including rutting, resulting from construction operation shall be repaired and restored to condition as good or better than original as soon as possible.

2.7.9. N/A

2.7.10 N/A

2.7.11. At the conclusion of line construction, final maintenance will be performed on all public access roads used by the contractors. They will be returned to a condition as good or better than when construction began. A joint inspection and agreement of the final condition will be made by the OWNER, STATE INSPECTOR, and a representative from the local government agency responsible for continued maintenance.

2.7.12. At least 60 days prior to construction of a new access road approach intersecting a public street or highway, or of any structure encroaching upon a highway right-of-way, the OWNER shall submit to the STATE INSPECTOR a plan and profile map showing the location of the proposed construction. The STATE INSPECTOR shall arrange for inspection of the site by the Department of Highways. The OWNER shall comply with any modifications recommended by the STATE INSPECTOR following this inspection.

2.8. EQUIPMENT OPERATION

2.8.1. During construction, unauthorized cross-country travel and the development of roads other than those approved shall be prohibited. The OWNER shall be liable for any damage, destruction, or disruption of private property and land caused by his construction personnel and equipment as a result of unauthorized cross-country travel and/or road development.

2.8.2. The limits and locations of access for construction equipment and vehicles shall be clearly marked or specified at each new site before any equipment is moved to the site to prevent travel in unauthorized areas. Construction foremen and personnel should be well versed in recognizing these markers and shall understand the restriction on equipment movement that is involved.

2.8.3. Construction activities and travel shall be conducted to minimize dust. Water, straw, wood chips, dust palliative, gravel, combinations of these, or similar control measures may be used. Oil or similar petroleum-derivatives shall not be used.

2.8.4. Work crew foremen shall be qualified and experienced in the type of work being accomplished by the crew they are supervising. Earthmoving equipment shall be operated only by qualified, experienced personnel.

2.8.5. Motorized overland vehicles shall be used to string socklines only where terrain warrants, or where it can be done from existing access roads. Areas where motorized vehicles can be used shall be jointly determined by the OWNER, the STATE INSPECTOR, and the landowner or managing agency.

2.8.6. Following construction in areas of noxious weeds, the CONTRACTOR shall thoroughly clean all vehicles and equipment to remove plant parts and seeds prior to entering a new construction area.

2.9 RIGHT-OF-WAY CLEARING AND SITE PREPARATION

2.9.1. N/A

2.9.2. During clearing of survey lines or the right-of-way, shrubs shall be preserved to the greatest extent possible. Shrub removal shall be limited to crushing where possible or cutting where necessary. Plants may be cut off at ground level, leaving roots undisturbed so that they may resprout.

2.9.3. Right-of-way clearing shall be kept to the minimum necessary to allow construction access.

2.9.4. N/A

2.9.5. N/A

2.9.6. N/A

2.9.7. Soil disturbance and earth moving will be kept to a minimum.

2.9.8. N/A

2.9.9. N/A

2.9.10 N/A

2.9.11. The OWNER shall make sure that necessary crane landings are constructed in accordance with accepted construction practices. Construction of crane landings on level ground is not necessary and shall not be allowed except for extreme conditions (such as soft or marshy ground). Construction of more than one crane landing per tower site will require prior approval of the STATE INSPECTOR.

2.9.12. N/A

2.9.13. N/A

2.9.14. Floodplain slash resulting from project clearing shall be removed and piled outside the floodplain before December 1. Instream slash must be removed within 24 hours.

2.9.15. Streamside trees will be felled away from streams rather than into or across streams.

2.10. GROUNDING

Grounding of fences, buildings, and other structures on and adjacent to the right-of-way shall be done according to the specifications of the National Electric Safety Code and any other specifications listed in Appendix N.

2.11 EROSION AND SEDIMENT CONTROL

2.11.1. Clearing and grubbing for roads and rights-of-way and excavations for stream crossings shall be carefully controlled to minimize silt or other water pollution downstream from the rights-of-way. Sediment retention basins will be installed as required by the STATE INSPECTOR or landowner.

2.11.2. Roads shall cross drainage bottoms at sharp or nearly right angles and level with the streambed whenever possible. Use of temporary bridges, culverts, or other structures to avoid stream bank damage is required at the crossings listed in Appendix C.

2.11.3. Under no circumstances shall streambed materials be removed for use as backfill, embankments, road surfacing, or for other construction purposes.

2.11.4. No excavations shall be allowed on any river or perennial stream channels or floodways at locations likely to cause detrimental erosion or offer a new channel to the river or stream at times of flooding.

2.11.5. Installation of culverts, bridges, or other structures in perennial streams will be done with normal construction procedures following on-site inspections with DNRC and DFWP and approval by the STATE INSPECTOR. All culverts shall be installed with the culvert inlet and outlet at natural stream grade or ground. Water velocities or positioning of culverts shall not be such that fish passage is impaired.

2.11.6. At least 60 days prior to the construction of access roads, bridges, fill slopes, culverts, or impoundments, or channel changes within the high-water mark of any perennial stream lake, or pond, the OWNER shall submit to the STATE INSPECTOR the following: location of the activity and property boundaries on plan and profile maps or photo mosaics; dates of proposed construction; names and addresses of surrounding property owners; and culvert size and description of proposed construction activity including culvert and bridge size (where applicable) and method of size determination. Within 30 days of the submission of this material, the STATE INSPECTOR will arrange a site inspection, if necessary, with the OWNER and representatives of MDFWP and the local Conservation District. The OWNER will comply with any construction stipulations or procedures recommended by the STATE INSPECTOR following this field inspection. If the STATE INSPECTOR determines that construction activity will result in a significant increase in turbidity, then the STATE INSPECTOR shall contact the OWNER and DHES to discuss options for compliance with Montana Water Quality Standards.

2.11.7. N/A

2.11.8. The OWNER shall maintain roads while using them. All ruts made by machinery shall be filled or graded to prevent channeling. In addition, the OWNER must take measures to prevent the occurrence of erosion caused by wind or water during and after use of these roads. Some erosion-preventive measures include but are not limited to installing or using cross logs, drain ditches, water bars, and wind erosion inhibitors such as water, straw, gravel, or combinations of these.

2.11.9. The OWNER shall prevent material from being deposited in any watercourse or stream channel. Where necessary, measures such as hauling of fill material, construction of temporary barriers, or other approved methods shall be used to keep slash, excavated materials, and other extraneous materials out of watercourses. Any such materials entering watercourses shall be removed immediately.

2.11.10. The OWNER shall be responsible for the stability of all embankments disturbed during construction. Embankments and backfills shall contain no muck, frozen material, large roots, sod, or other deleterious matter. The OWNER shall prevent the escape of fill material by the construction of toe ditches or by the erection of rock, boulder, earth, or log barriers at the toes of embankments, or by other suitable methods.

2.11.11. Culverts or arch bridges shall be installed at all crossings of flowing or dry watercourses where fill is likely to wash out during the life of the road, as specified in Appendix I. Culvert or bridge installation is prohibited in areas of important fish spawning beds identified by MDFWP and during specified fish spawning seasons on less sensitive streams or rivers. All culverts shall be big enough to handle approximately 15-year floods, as specified in Appendix I. Culvert size shall be determined by standard procedures which take into account the variations in vegetation and climatic zones in Montana, the amount of fill, and the drainage area above the crossing, and shall be approved as specified in 2.11.6. All culverts shall be installed at the time of road construction.

2.11.12. No fill material other than that necessary for road construction shall be piled within the high water zone of streams where floods can transport it directly into the stream. Excess floatable debris shall be removed from areas immediately above crossings to prevent obstruction of culverts or bridges during periods of high water.

2.11.13. No driving of vehicles across a perennial watercourse shall be allowed, except via authorized construction roads.

2.11.14. No perennial watercourses shall be permanently blocked or diverted.

2.11.15. N/A

2.11.16. Construction methods shall prevent accidental spillage of solid matter, contaminants, debris, petroleum products, and other objectionable pollutants and wastes into watercourses, lakes, and underground water sources. Catchment basins shall be installed at storage areas to contain accidental spills of fuel, chemicals or oil.

2.11.17. Construction equipment service areas will be located at least 300 feet from all streamcourses. In any event, the service areas shall not be located within a 100-year floodplain as designated by the Engineering Bureau, Water Resources Division, DNRC.

2.11.18. Unless otherwise required by the landowner, and where possible, a buffer-filter strip of undisturbed vegetation will be provided between areas of disturbance (road construction or tower construction) and streamcourses, and around

first order or larger streams that have a well-defined streamcourse or aquatic or riparian vegetation. Buffer strip width is measured from the high water line of a channel and will be as determined by the STATE INSPECTOR and managing agency. For braided streams with more than one discernible channel (ephemeral or permanent) the high water line of the outermost channel is used. In the event that vegetation cannot be left undisturbed, structural sediment containment, approved by the STATE INSPECTOR, must be substituted before soil disturbing activity commences.

2.11.19. When no longer needed, all temporary structures or fill installed to aid stream crossing shall be removed and the course of the stream reestablished to prevent future erosion.

2.11.20. All temporary dams built on the right-of-way shall be removed within five years of their construction or be upgraded to permanent structures with either spillways or culverts, and a continuous sod cover on their tops and downstream slopes. Spillways may be protected against erosion with riprap or equivalent means.

2.11.21. Damage resulting from erosion or other causes shall be repaired after completion of grading and before revegetation is begun.

2.11.22. Point discharge of water will be dispersed in a manner to avoid erosion or sedimentation of streams.

2.11.23. Riprap or other erosion control activities will be planned based on possible downstream consequences of activity, and during the low flow season if possible.

2.11.24. Water used in embankment material processing, aggregate processing, concrete curing, foundation and concrete lift cleanup, and other waste water processes shall not be discharged into surface waters without a valid discharge permit from DHES.

2.12. ARCHAEOLOGY AND HISTORY

2.12.1. Areas likely to be of archaeological and historical significance, as determined by a field survey prior to construction, are listed in Appendix C. All construction activities shall be conducted so as to prevent damage to such areas.

2.12.2. Any relics, artifacts, fossils or other items of historical or archaeological value shall be preserved in a manner agreeable to both the landowner and the State Historic Preservation Officer. If any such items are discovered during construction, all work which could disturb the materials or surrounding area must cease until the site can be inspected by the STATE INSPECTOR and the State Historic Preservation Officer or designee (but in no case more than 15 days). Recommendations of the State Historic Preservation Officer must be followed by the OWNER.

2.12.4. The OWNER shall conform to treatments recommended for cultural resources by either the Montana State Historic Preservation Office (SHPO) or the Advisory Council on Historic Preservation (ACHP), as specified in Appendix F.

2.13. PREVENTION AND CONTROL OF FIRES

2.13.1. Fire prevention and control shall comply with the fire plan in Appendix L. The fire plan shall meet the requirements of the managing agency and/or the fire control agencies having jurisdiction. The STATE INSPECTOR and the Contracting Officer shall be invited to attend all meetings with the agency to discuss or prepare the fire plan. The STATE INSPECTOR, in turn, shall notify DSL of all such meetings.

2.13.2. The OWNER shall direct the CONTRACTOR to comply with regulations of any county, town, state or governing municipality having jurisdiction regarding fire laws and regulations.

2.13.3. Blasting caps and powder shall be stored only in approved areas and containers and always separate from each other.

2.13.4. N/A

2.13.5. The OWNER shall direct the CONTRACTOR to properly store and handle combustible material which could create objectionable smoke, odors, or fumes. The OWNER shall direct the CONTRACTOR not to burn refuse such as trash, rags, tires, plastics, or other debris, except as permitted by the county, town, state, or governing municipality having jurisdiction.

2.13.6. N/A

2.14. WASTE DISPOSAL

2.14.1. The OWNER shall direct the CONTRACTOR to use licensed solid waste disposal sites. Inert materials (Group III wastes) may be disposed of at Class III landfill sites; mixed refuse (Group II wastes) must be disposed of at Class II landfill sites.

2.14.2. Emptied pesticide containers or other chemical containers must be triple rinsed to render them acceptable for disposal in Class II landfills or for scrap recycling pursuant to ARM 16.44.202(12) for treatment or disposal. Pesticide residue and pesticide containers shall be disposed of in accordance with ARM 16.20.633(9).

2.14.3. All waste materials constituting a hazardous waste defined in ARM 16.44.303, and wastes containing any concentration of polychlorinated biphenyls must be transported to an approved designated hazardous waste management facility (as defined in ARM 16.44.202(12) for treatment or disposal.

2.14.4. All used oil shall be hauled away and recycled or disposed of in a licensed Class II landfill authorized to accept liquid wastes or in accordance with 2.14.2 and 2.14.3 above. There shall be no release of crankcase oil or other toxic substances into streams or soil.

2.14.5. Sanitary waste shall not be discharged into streams or streambeds. The OWNER shall direct the CONTRACTOR to provide refuse containers and sanitary chemical toilets, convenient to all principal points of operation. These facilities shall comply with applicable federal, state, and local health laws and regulations.

2.14.6. N/A

2.15.7. Refuse burning shall require the prior approval of the landowner and a Montana Open Burning Permit must be obtained from MDHES. Any burning of wastes shall comply with section 2.13 of these specifications.

3.0. POST-CONSTRUCTION CLEANUP AND RECLAMATION

3.1. CLEANUP

3.1.1. All litter resulting from construction is to be removed from the right-of-way and along access roads leading to the right-of-way and legally disposed of within 30 days of completion of wire stringing and splicing. If requested by the landowner, the OWNER shall provide for removal of any additional debris after this initial cleanup.

3.1.2. Insofar as practical, all signs of temporary construction facilities such as haul roads, work areas, buildings, foundations or temporary structures, stockpiles or excess or waste materials, or any other vestiges of construction shall be removed and the areas restored to as natural a condition as is practical, in consultation with the landowner.

3.2. RESTORATION, RECLAMATION, AND REVEGETATION

3.2.1. Restoration, reclamation, and revegetation of the right-of-way, access roads, crane pads, splicing or stringing sites, borrow sites, gravel, fill, stone, or aggregate excavation, or any other disturbance shall be in accordance with the Reclamation and Revegetation Plan in Appendix G.

3.2.2. Scarring or damage to any landscape feature listed in Appendix C shall be restored as nearly as practical to its original condition. Bare areas created by construction activities will be reseeded to prevent soil erosion.

3.2.3. After construction is complete, and in cooperation with the landowner, temporary roads shall be closed by approved means after revegetation.

3.2.4. Where soil has been compacted by movement of construction equipment, the OWNER shall direct the CONTRACTOR to rip the soil deep enough to restore productivity, or if complete restoration is not possible, the OWNER shall compensate the landowner for lost productivity.

3.2.5. Earth next to access roads that cross streams shall be replaced at slopes less than the normal angle of repose for the soil type involved.

3.2.6. All drainage bottoms shall be restored to a gradient and width which will prevent accelerated gully erosion.

3.2.7. Drive-through dips, open-top box culverts, waterbars or cross drains, shall be added to roads at an angle and as close together as necessary depending upon the road grades. Table 3 should be used by the CONTRACTOR as a guide.

Table 3
Spacing of Cross-drains on Access Roads

Guide 1 - Nonsensitive Soils

Road Gradient (%)	Cross-drain Spacing (feet)
0-3	800
4-6	450
7-10	200
11-15	100
15-20	75
21+	50

Guide 2 - Sensitive Soils*

Road Gradient (%)	Cross-drain Spacing (feet)
0-4	200
5-6	120
7-9	75
10+	50

*Sensitive soils include those derived from glacial till, glacial lake sediments, granitics, and shales. Other sensitive soils are identified in Appendix C.

3.2.8. N/A

3.2.9. Interrupted drainage systems shall be restored.

3.2.10. Seeding prescriptions to be used in revegetation, requirements for hydroseeding, fertilizing, and mulching, as jointly determined by representatives of the OWNER, DNRC, DSL, and other involved state and federal agencies, are specified in Appendix G.

3.2.11. Any existing waste material moved or disturbed shall be placed on the right-of-way so that it does not form fire hazards or stock barriers, nor block access to the right-of-way or to tower sites. Waste material includes disposable material such as brush, buildings designated for disposal, building debris, and other disposable debris. The degree of disposal to be performed depends on the existing land use.

3.2.12. Piling and windrowing of material for burning shall use methods that will prevent soil from being included in the material to be burned and minimize destruction of ground cover. Nonmechanized methods will be used if necessary to minimize soil and vegetation disturbance. Piles shall be located so as to minimize danger and damage to ground cover.

3.2.13. During restoration, the topsoil will be replaced on the surface of the disturbed site and graded to near natural contours.

3.2.14. Excavated material not suitable or required for backfill shall be evenly filled back onto the cleared area, prior to spreading the stockpiled soil material identified above. Large rocks and boulders not buried in the backfill will be disposed of as approved by the STATE INSPECTOR and the landowner or managing agency.

3.2.15. Application rates and timing of seeds and fertilizer, and percentage purity, germination, and inert material of seeds, shall be as specified in Appendix G.

3.2.16. Where appropriate, hydroseeding or drilling and seeding shall be used to aid revegetation. Mulching with straw, wood chips, or other means shall be used where necessary. Areas requiring such treatment are listed in Appendix H.

3.2.17. All temporary roads shall be obliterated and reclaimed (with the concurrence of the landowners or managing agency), as specified in Appendix G. All temporary roadways shall be graded and scarified as specified to permit the growth

of vegetation and discourage traffic. Permanent unsurfaced roadbeds not open to public use will be revegetated as soon after use as possible, unless specified otherwise by the landowner.

3.3. MONITORING

3.3.1. Upon notice by the OWNER, the STATE INSPECTOR will immediately schedule initial post-construction field inspections following clean up and road closure. Follow-up visits will be scheduled as required to monitor the effectiveness of erosion controls, reseeding measures, and the OWNER's right-of-way management plan.

The STATE INSPECTOR will contact the landowner for post-construction access and to determine landowner satisfaction with the OWNER'S restoration measures. Revegetation objectives shall be consistent with Section 2.1.23 of these Guidelines.

The STATE INSPECTOR shall document observations for inclusion in reports to the BOARD regarding the success of mitigation measures required by the BOARD.

3.3.2. Revegetation shall not be considered complete until the following criteria are met:

a. In rangeland, coverage of perennial species shall be 30 percent or more of that on adjacent rangeland of similar slope and topography the year following revegetation, and 90 percent or more of the coverage of adjacent rangeland of similar slope and topography within the five years following revegetation.

b. N/A

c. Adequacy of revegetation effects on cutslopes will be determined by the STATE INSPECTOR.

3.3.3. N/A

4.0. OPERATION AND MAINTENANCE

4.1. RIGHT-OF-WAY AND ROAD MAINTENANCE

4.1.1. Maintenance of the right-of-way and permanent access roads shall be according to the right-of-way maintenance plan in Appendix M.

4.1.2. Vegetation that has been saved through the construction process and which does not pose a hazard or potential hazard to the powerline, particularly that of value to fish and wildlife, as specified in Appendix C, shall be allowed to grow on the right-of-way.

4.1.3. Vegetative cover shall be maintained in the areas immediately adjacent to transmission towers in cooperation with the landowner.

4.1.4. Environmentally sensitive areas identified during centerline study, as listed in Appendix C, shall be recognized and incorporated into the right-of-way management plan (Appendix M).

4.1.5. Grass cover, water bars, cross drains, and the proper slope shall be maintained on access roads and service roads in order to prevent soil erosion.

4.2. MAINTENANCE INSPECTIONS

4.2.1. Inspection and ground maintenance activities of the powerline shall include observations of soil erosion problems, and conditions of the vegetation on the right-of-way or access roads that require attention. Appropriate corrective action will be taken where necessary.

4.2.2. Operation and maintenance inspections using ground vehicles shall be timed so that routine maintenance will be done when access roads are firm, dry or frozen, wherever possible. Maintenance vegetative clearing in environmentally sensitive areas listed in Appendix C shall be done according to criteria spelled out in Appendix I.

4.3. CORRECTION OF LANDOWNER PROBLEMS

4.3.1. The OWNER shall advise all known beekeepers along the final centerline of the known effects of electrical fields on bees and of the uncertainties involved in locating hives under the lines. If necessary, the OWNER shall assist the beekeepers in relocating lines prior to energizing the line. If beehives are placed on the right-of-way during operation, the OWNER shall inform the beekeeper that honey production may be affected.

4.3.2. When a complaint about radio and TV interference occurs as a result of the construction or operation of the transmission line, the OWNER will resolve the problems by appropriate methods, including mechanical corrections to insulators and antennas, and installation of remote antennas or of repeater stations.

4.3.3. N/A

4.4. HERBICIDES

4.4.1. Any application of herbicides in the right-of-way will be in accordance with recommendations of the Montana Department of Agriculture, and in accordance with the right-of-way maintenance plan in Appendix M.

4.4.2. Herbicides will not be used in certain sensitive areas identified by DNRC, MDFWP, and DHES, as listed in Appendix J or as requested by the landowner.

4.4.3. Proper herbicide application methods will be used to keep drift and nontarget damage to a minimum.

4.4.4. Herbicides must be applied according to label specifications and in accordance with 4.4.1. above. Only herbicides registered in compliance with applicable federal and state laws may be applied.

4.4.5. Herbicides shall not be sprayed during heavy rains or threat of heavy rains. Vegetative buffer zones shall be left along all identifiable stream channels. Herbicides shall not be used in any public water supply watershed identified by the Department of Health and Environmental Sciences, or listed in Appendix J.

4.4.6. In areas disturbed by transmission facilities, the OWNER will cooperate with landowers in control of noxious weeds, as designated by the weed control board having jurisdiction in the county crossed by the line.

4.4.7. The OWNER shall notify the STATE INSPECTOR in writing 30 days prior to any broadcast or aerial spraying of herbicides. The notice shall provide details as to the time, place, and justification for such spraying. DNRC, DFWP, DHES, and the Montana Department of Agriculture shall have the opportunity to inspect the portion of the ROW or access roads scheduled for such treatment before, during, and after spraying.

4.4.8. All applications of herbicides must be performed by a licensed applicator.

4.5. MONITORING

4.5.1. DNRC may continue to monitor operation and maintenance activities for the life of the project in order to ensure compliance with the specifications in this section.

4.5.2. N/A

APPENDIX B

REFERENCES

REFERENCES

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