

**WOLF POINT, MONTANA TO WILLISTON, NORTH DAKOTA  
TRANSMISSION LINE REBUILD PROJECT  
FOR THE  
WESTERN AREA POWER ADMINISTRATION**

**SUPPLEMENTAL  
ENVIRONMENTAL ASSESSMENT**

**Montana Department of Environmental Quality  
Major Facility Siting Program  
1520 East Sixth Avenue  
Helena, MT 59620-0901**

**October 2003**

# TABLE OF CONTENTS

	Page
<b>INTRODUCTION</b> .....	1
<b>SUPPLEMENTAL INFORMATION TO WESTERN’S ENVIRONMENTAL ASSESSMENT</b> .....	2
<u>DEPARTMENT DECISIONS TO BE MADE</u> .....	2
<u>BASIS OF NEED FOR THE FACILITY</u> .....	3
<u>ANALYSIS OF ALTERNATIVES TO THE PROPOSED ACTION</u> .....	3
<u>ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION</u> .....	5
<u>COMPLIANCE WITH STATE LAWS FOR WATER QUALITY AND SOLID AND HAZARDOUS WASTE</u> .....	11
<u>CORRECTIONS, MODIFICATIONS AND UPDATES TO WESTERN’S ENVIRONMENTAL ASSESSMENT</u> .....	13
<u>CONSTRUCTION MONITORING</u> .....	15
<b>DRAFT DEPARTMENT FINDINGS</b> .....	16
<b>DRAFT DEPARTMENT DECISION</b> .....	19
<b>PREPARERS AND CONTRIBUTORS</b> .....	21
<b>REFERENCES</b> .....	22

## **INTRODUCTION**

The Department of Environmental Quality (Department) has completed an evaluation of the Montana portion of the proposed Western Area Power Administration (Western) Wolf Point, Montana to Williston, North Dakota Transmission Line Rebuild Project. Under the Montana Major Facility Siting Act (75-20-101, et seq., MCA) (Siting Act) the Department must evaluate the proposed project to determine whether it complies with substantive standards of the Siting Act. After the Department issues a Determination of Compliance with the Siting Act, Western can initiate project construction in Montana. The Department review and actions under the Siting Act are sufficient to fulfill requirements of the Montana Environmental Policy Act (MEPA) and administrative rules.

Western is proposing to rebuild a 95-mile segment of 115-kV transmission line between the Wolf Point substation, west of Wolf Point, Montana, and the Williston Substation, west of Williston, North Dakota. The proposed project would improve transmission reliability and extend the useful life of the transmission line by replacing existing wood-pole structures, insulators, ground wires, and conductor. The existing line was placed in service in 1949 and has exceeded its useful service life. The new components would meet 230-kV design standards. As part of the rebuild, a new 230-kV substation would be constructed adjacent to the existing substation at Williston, North Dakota. The system would continue to be operated at 115 kilovolts after the line rebuild.

Western conducted public scoping for the proposed project in October 2001. In January 2003, Western issued its Draft Environmental Assessment (Draft EA) for the Wolf Point, MT – Williston, ND Transmission Line Rebuild. Western solicited public comment on the Draft EA during a 30-day comment period. In September 2003, Western issued its Environmental Assessment (EA) for the proposed project and the Finding of No Significant Impact and Floodplain Statement of Findings Wolf Point, Montana to Williston, North Dakota Transmission Line Rebuild (FONSI).

As part of the Department review under the Siting Act, the Department submitted scoping comments for the proposed project together with comments from the Montana Department of Transportation and Montana Department of Fish, Wildlife, and Parks. The Department reviewed preliminary drafts of the Western EA in March and September 2002. The Department also reviewed the Draft EA in January 2003 and submitted comments together with those from the Department of Transportation and the Montana State Historic Preservation Office.

Based on the Department evaluation and information contained in this document, the Department:

- Adopts the Western Environmental Assessment (August 2003), DOE/EA-1401, as supplemented by this document and with additions, changes, and modifications outlined herein, as the Department Environmental Assessment for the proposed project;
- Adopts Western's Construction Standards – Standard 13 Environmental Quality Protection for the proposed project as supplemented by the Department Environmental Specifications for the Wolf Point to Williston Transmission Line Rebuild Project;
- Presents information on compliance of the proposed project with the Montana Water Quality Act, the Montana Solid Waste Act, and the Montana Hazardous Waste Management Act; and
- Presents the Department's Draft Findings and Draft Decision regarding compliance with the Montana Major Facility Siting Act (75-20-101, et seq., MCA).

## **SUPPLEMENTAL INFORMATION TO WESTERN'S ENVIRONMENTAL ASSESSMENT**

### **Department Decisions to be Made**

Under the Siting Act the Department determines whether the proposed project is in compliance with its substantive standards. The Department also determines whether the proposed project would be in compliance with applicable air, water quality, and solid and hazardous waste laws administered by the Department. Under 75-20-103, MCA, the Siting Act preempts all other state laws and regulations except those pertaining to air quality, water quality, and other laws administered by the Department and those for the protection of employees engaged in the

construction, operation, or maintenance of the facility. Western cannot initiate project construction in Montana until the Department issues a Determination of Compliance with the Siting Act. The Department review and actions under the Siting Act are sufficient to fulfill requirements of the Montana Environmental Policy Act (MEPA) and administrative rules.

### **Basis of Need for the Facility**

The Department has reviewed the basis of need for the proposed facility. Results of system studies conducted by Western and presented in the EA indicate that the existing line experiences a high level of outages when compared with 230-kV lines in the region. While the existing line has averaged 2.33 outages per 100 miles per year since 1996, 230-kV transmission lines in the Mid-continent Area Power Pool Bulk Transmission System have an average rate of 1.24 forced outages per 100 miles per year for the period from 1991 to 2000. Western's studies also indicate that the existing line becomes overloaded when there is an outage on other parts of the 230-kV transmission system, and that generation at Fort Peck must be reduced during these occurrences.

Benefits of the proposed line are its higher level of reliability through a reduced rate of forced outages, and the ability to maintain generation levels at Fort Peck Dam under single contingency outage conditions on the 230-kV system. The Department's analysis indicates that these benefits of line rebuild at 230-kV design standards, together with annual loss savings and increased flexibility for future system needs, are reasonably likely to outweigh the increased cost of rebuilding at the higher design voltage of 230 kilovolts, and that the proposed line has the greatest net benefits. Specific requirements and costs to upgrade substations at Wolf Point, Poplar, and Culbertson for operation at 230 kilovolts are not known at this time.

### **Analysis of Alternatives to the Proposed Action**

The Department's analysis indicates that Western considered reasonable project alternatives:

- The no action alternative with operation of the line at its current voltage and replacement of structures as needed;

- Replacement of existing structures with those meeting 230-kV design standards, and use of the existing 115-kV conductor until a 230-kV conductor is needed; and
- Retirement of the existing 115-kV line and provision of other transmission improvements to transfer generation out of Fort Peck Dam.

These alternatives would not provide the benefits of increased reliability and increased power transfer capacity of the proposed action that would be attained by replacing the existing line with new structures and line components meeting 230-kV design standards. In addition, an alternative that would replace existing structures with those meeting 230-kV design standards, with later installation of 230-kV conductor, would result in two separate and more costly construction periods compared to a single construction operation.

The Department considered an alternative that would place segments of the proposed line underground. Overhead construction for a 230-kV transmission line constructed by non-Western personnel averages \$203,000 per mile, while cable and other facilities for underground construction can cost \$2.3 million per mile. In addition to this large cost difference, typical repair times for an overhead line can be from a few hours to several days, while typical repair time and duration for an outage on an underground line can last from several days up to two weeks (personal communication from Mark Buchholz, Western, to Nancy Johnson, Department of Environmental Quality, April 4, 2003). For underground lines it is more difficult to locate the source of a problem, and more costly to repair the damage than for an overhead line. Because the cost of placing a transmission line underground can exceed overhead construction by a factor of 11, and because the duration of an outage for an underground line typically exceeds that for an overhead line, the Department did not analyze in detail an alternative that would place portions of the proposed line underground.

The Department evaluated relocating portions of the existing line to parcels of State Trust Land that are in public ownership and are located within 1 mile of the existing 115-kV transmission line.

The parcels are located in:

- T28N R55E Section 36
- T28N R56E Section 30 S1/2 NE1/4 and S1/2 NW1/4
- T28N R56E Section 35
- T28N R56E Section 36 NE ¼
- T28N R58E Section 16 SE1/4, SW1/4, and NE1/4

Land uses on these parcels are similar to surrounding lands, and include grazing, CRP enrollments and dry cropland. Relocating segments of the existing line to these parcels would increase line length and cost and create angle structures where none currently exist. Since these scattered parcels do not provide a continuous linear corridor, siting a line through them would result in higher impacts to agricultural land uses than the existing line. Use of these parcels for line location would not be as economically practicable as the use of the existing right-of-way.

### **Environmental Consequences of the Proposed Action**

The following information supplements the analysis of impacts presented in Western's EA.

#### Land Use

The Department agrees with Western's analysis that impacts to existing land uses and agricultural practices would be reduced by siting structures in areas that have been previously disturbed and in areas where agricultural practices have already been modified in response to the existing line. This would occur along large portions of the existing right-of-way that cross agricultural and range land.

Project construction activities would affect crop productivity. These effects would be short-term and less than significant. Environmental impacts such as soil disturbance, soil compaction and erosion, and reduced crop yield would be minimal and short-term following restoration of disturbed areas to pre-construction conditions as proposed by Western. Noise and dust would occur in localized areas during periods of line reconstruction. Since these effects would be short term and would occur in sparsely populated areas, adverse impacts would be less than

significant. Risk of spreading noxious weeds is present on the existing route for both the proposed action and no action alternative.

Upgrading the existing 115-kV line to 230-kV specifications would slightly increase long-term impacts to farming operations. The distance between upright poles in a typical H-frame structure would increase about 10 feet, and typical structure height would increase from 5 to 10 feet. Impacts to farming operations would result from increasing the distance between the poles in an H-frame structure. This wider structure would remove additional land from production by increasing the area that cannot be seeded, cultivated, or harvested around structure bases. Most cultivated areas crossed by the proposed project are used for dryland wheat production with large farming equipment that is not very maneuverable. Most wheat producers using this equipment do not attempt to cultivate between the poles in an H-frame structure and the area between poles becomes a refuge for weedy plants. Some operators treat the land between poles with herbicide to control these weedy species. Additional impacts to farming operations also could result where increased structure height creates more interference for aerial applicators.

The amount of land removed from production at a structure site depends on several factors: size of the structure; placement of the structures in fields relative to the edge of the field; and for H-frame structures, orientation of the structure relative to tilling and cropping patterns. For existing H-frame structures located well away from the edge of a field and oriented with structures parallel to cropping patterns, an area of about 7 to 8 feet by 21 to 22 feet is typically not cultivated at the base of the structure. Using the existing 230-kV H-frame structures of the Fort Peck to Wolf Point line as an example, an uncultivated area of about 9 to 11 feet by 28 to 30 feet would be typical around a structure base oriented parallel to the cropping pattern. Structures located at or very near the edge of a field and oriented parallel to the cropping pattern may take somewhat less land out of production.



Structures located at or within one implement width of the edge of a field, those structures oriented perpendicular to or at an angle relative to the cropping pattern, and those with guy wires supporting the structures would remove more land from production. The exact amount of land removed from production depends on width of equipment used by an individual operator, operator skill, and placement and orientation of individual structures. These land use impacts resulting from location of structures in cultivated land would continue for the life of the project.

No significant increases in long-term impacts to ranching operations are expected compared to the existing line because disturbed areas would be reclaimed to pre-construction conditions. In addition, Western will apply necessary mitigation to eliminate problems of induced currents and voltages onto conductive objects sharing the right-of-way.

#### Proposed Line Reroutes

The Western proposal includes relocation of about five miles of line in two areas: near Two Mile Hill west of Brockton and at Shotgun Creek near Bainville (see Figure 2-1 Reroute Map (Structure 71/2-72/7) and Figure 2-2 Reroute Map (Structure 104/8-108/4) Western EA August 2003). The Department compiled land use information along the existing and proposed line locations to compare environmental advantages and disadvantages of the proposed reroutes (Tables 1 and 2).

Information in Table 1 for the Two Mile Hill Reroute indicates that the proposed reroute would cross more cropland than the existing location, but less pasture and hay land. The primary benefit of the proposed reroute would be elimination of two crossings of Highway 2 and four structures guyed in the highway right-of-way. Estimated construction costs for the proposed reroute would be lower than for the existing line due to its slightly shorter length. Some disturbance would occur along the existing line as structures and conductor are removed if the new location were used.

Table 1. Two Mile Hill Reroute – Structures 71/2 to 72/7<sup>1</sup>

	Existing Line	Proposed Reroute
Estimated construction cost <sup>2</sup>	\$ 213,000	\$ 190,000
Total length	1.64 mi	1.46 mi
Range/pasture/hay	0.8 mi	0.2 mi
Crop (small grains)	0.7 mi	1.25 mi
County road crossings	0	1
Number of Highway 2 crossings	2 (0.1 mi)	0
Number of guyed angle structures	4	0

<sup>1</sup> Distances for land use categories are based on field review, CRP maps provided by NRCS, and interpretation of air photos.

<sup>2</sup> Based on estimated costs provided by Western.

Information in Table 2 shows that estimated construction costs for the proposed reroute at Shotgun Creek and for the existing location would be comparable based on their similar length. The proposed reroute would move the line away from a higher impact location where the existing line passes between farmhouses and associated outbuildings and barns. The new location would increase safety to people working near these buildings. Total length of the existing line and proposed reroute are similar. The proposed reroute could affect less wetland acreage than the existing line with careful placement of new structures that would span wetlands. However, the proposed reroute has the potential to affect more cropland than the existing line location. Western has indicated they would work with affected landowners to avoid cropland and follow fence lines where possible when selecting new structure locations (personal communication from Al Wood, Western, to Nancy Johnson, Department of Environmental Quality, February 18, 2003).

Table 2. Shotgun Creek Reroute – Structures 104/8 to 108/4<sup>1</sup>

	Existing Line	Proposed Reroute
Estimated construction cost <sup>2</sup>	\$ 385,000	\$ 380,000
Total length	2.96 mi	2.92 mi
Range/pasture	1.25 mi	1.65 mi
Crop (small grains)	0.15 mi	0.35 mi
Farm/ranch buildings adjacent to ROW	Yes	No
CRP – enrollment	1.5 mi	1.0 mi

<sup>1</sup> Distances for land use categories are based on field review, CRP maps provided by NRCS, and interpretation of air photos.

<sup>2</sup> Based on estimated costs provided by Western.

Some long-term adverse impacts on land use at the Shotgun Creek Reroute would occur where the new line would result in loss of cropland, modification of farming practices around structures, modification of planned irrigation projects, and the slightly increased risk of spreading noxious weeds.

In 1994 the Montana Board of Natural Resources and Conservation approved reservations of water for future beneficial uses in this area, including a large irrigation project near Shotgun Creek. The existing line crosses a planned wheel line irrigation system, while the proposed reroute would cross two of several planned center pivots. All three of these planned systems are part of a larger irrigation project. Regardless of line location selected, this planned irrigation project would have to be redesigned and the project sponsor would have to obtain an authorization from DNRC to change the place of use for the water reservations.

The longer-term adverse impacts associated with these two reroutes are expected to be less than significant. The reroutes would avoid areas of higher impact along the existing line near farms and highways. The proposed reroutes minimize impacts considering cost and the nature of impacts along the alternatives.

#### Proposed Relocations of Transmission Line Structures

Western is proposing to relocate transmission line structures within the existing right-of-way at several locations to improve alignment, reduce the overall number of structures, or avoid buildings and other sensitive areas. Some structure relocations would eliminate encroachment onto the Highway 2 right-of-way. Where existing structures are located adjacent to or within the highway right-of-way, the Montana Department of Transportation would review proposed locations to determine adequate safety clearance from the highway.

#### Wildlife

As part of the proposed action, Western would install avian marking devices at 16-foot intervals on each overhead ground wire across Big Muddy Creek valley, Poplar River, and on sections of line where wetlands occur in and within ¼ mile of the ROW. The proposed marking devices

have been shown in some studies to be 80 percent effective at decreasing avian collisions (Avian Powerline Interaction Committee 1994).

The Department agrees that use of larger diameter conductor, larger diameter fiber optic overhead ground wire, and installation of avian marking devices would reduce potential collisions compared to the no action alternative. Types of marking devices are not specified at this time because construction activities would be phased over an 8-year period, and improved marking and lower cost devices could be developed during this period. The most cost-effective marking devices available that would meet the 80 percent criteria for effectiveness could be identified for use as each segment of line is upgraded.

#### Social and Economic Effects

Social effects of the proposed project would be short-term and less than significant. The proposed project would occur over a 7 to 8 year period as segments of line are rebuilt. A total of 42 to 58 personnel would be required for line re-construction, with crew size varying from 2 to 3 persons for gate installation to 15 to 25 persons for conductor stringing. Because Western's existing maintenance crews who live in the area would be used to rebuild the transmission line, there would be little or no direct effect on Roosevelt County in terms of jobs or income. There would be a positive, secondary economic effect on business and service providers in Roosevelt County during construction. Benefits would come from increased sales at local businesses such as gas stations, grocery stores and restaurants. This would especially be the case in towns along Highway 2 like Wolf Point, Poplar, and Culbertson, Montana, although these effects would be less than significant.

Benefits from line rebuild would also go to electricity customers and include improved transmission reliability and an extension of the useful life of the line. Capacity for future system expansion would be provided following substation upgrades at Williston, Wolf Point, Poplar, and Culbertson. This benefit to electricity customers would be felt over a longer time period and allow additional economic growth in the area. It is beyond the scope of this supplemental EA to quantify these social benefits of the rebuild to electricity customers.

### Unavoidable Adverse Impacts

The following impacts that would occur during project construction would be unavoidable. Soil disturbance and compaction and increased erosion potential would occur at work sites as old structures are removed and new structures erected, and at conductor pulling sites. Fugitive dust, vehicle emissions, and noise would also occur on a short-term basis during construction along the right-of-way and access roads. Some unavoidable land use effects would occur over the long term on both the existing line and on re-route sections. These effects could include modification of farming practices and loss of cropland at structure sites, increased costs to control weeds, and costs associated with potential redesign of an approved irrigation project. Avian collisions with the conductor and ground wire would occur over the life of the project, but would be decreased over current conditions through use of larger diameter conductor and larger diameter fiber optic overhead wire and installation of avian marking devices. Visual impacts resulting from the line's presence in area views and contrast of structures with surrounding landscapes would continue over the life of the project.

### **Compliance with State Laws for Water Quality and Solid and Hazardous Waste**

Under Section 75-20-216(3), MCA, the Department reviews transmission line projects to determine if construction will be in compliance with applicable air, water quality, and solid and hazardous waste laws administered by the Department. For the proposed project, the Department would issue any decision, opinion, order, certification, or permit required for the project under the air and water quality laws administered by the Department. The Department evaluated Western's Draft EA to determine whether the proposed project would be able to comply with air, water quality, and solid and hazardous waste laws administered by the Department. Review by the Department's Air and Waste Management Bureau determined that an air quality permit would not be required for the proposed action.

The proposed project would comply with substantive requirements of the Montana Water Quality Act, the Montana Solid Waste Act and the Montana Hazardous Waste Management Act if Western follows Department rules and regulations for the following water quality permits and for the handling of solid and hazardous waste.

### 318 Authorization

For any chosen line location where construction would cross state waters – either perennial or ephemeral – a 318 Authorization (Short Term Exemption from Numeric Water Quality Standards for Turbidity) would be required. The authorization replaces the existing numeric standard for turbidity and the narrative standard for total suspended solids with temporary narrative standards, which must include conditions on construction that limit total suspended solids and turbidity. The Department of Fish, Wildlife and Parks may issue a 318 Authorization under the 124 Permit – Stream Protection Act. If the DFWP does not issue the 318 Authorization, an application must be submitted to the Department and approved for those crossings.

### MPDES General Permit for Stormwater Discharge

Storm water discharges associated with this construction project will require coverage under the Montana Department of Environmental Quality's MPDES (Montana Pollutant Discharge Elimination System) *General Permit for Storm Water Discharges Associated with Construction Activity*. In order to obtain coverage under this General Permit, all operators as defined in the General Permit (typically the owner and contractor) will have to submit the following by the construction start date:

- a "Notice of Intent" form which provides information about the construction activity project;
- a Storm Water Pollution Prevention Plan. This plan provides descriptions of site characteristics and details, sources of potential pollutants such as sediment to storm water runoff and receiving surface waters, and measures to develop/implement Best Management Practices which alleviate potential pollutants from reaching storm water discharges; and
- the required application fee and first-year annual fee.

In some circumstances and based on a number of contributing factors, larger and/or longer lineal construction projects may require the submittal of more than one Notice of Intent. Coverage under the General Permit would be necessary from the initiation of disturbance associated with the construction activity through to final stabilization of disturbed areas as defined in the General Permit.

## Solid and Hazardous Wastes

Any solid and/or hazardous wastes which may be generated as a result of this project must be handled in accordance with DEQ rules set forth in Title 17, Chapter 50, Subchapters 4-8 and Title 17, Chapter 53, Subchapters 1-14, MCA. Any such wastes must be sent or delivered for disposal or treatment to facilities licensed or permitted for the management of those specific types of wastes.

## **Corrections, Modifications and Updates to Western's Environmental Assessment**

The Department adopts the Western EA with the following corrections, modifications and updates.

Page 2-18, column 2, bullet 3: Western would place approved line marking devices (e.g., ~~flappers~~ Bird Flight Diverters) at 16-foot intervals and staggered on each overhead ground wire across the Big Muddy Creek valley, Poplar River, and on sections of line where wetlands occur within or adjacent to the ROW.

Page 3-13, Table 3-2 Federally Listed Threatened, Endangered, and Proposed Species in North Dakota and Montana: In September 2003 the USFWS withdrew its proposed rule to list the mountain plover as a threatened species under the Endangered Species Act.

Page 3-16, column 1, paragraph 3 under Whooping Crane: However, due to the addition of larger diameter and presumably more visible fiber optics to one of the ground wires and the use of marking devices as described in Chapter 2, collisions would be minimized.

Page 3-16, column 2, paragraph 1: Based on the above, Western determined, in a December 9, ~~2003~~ 2002 letter to USFWS, that the proposed Project would not affect endangered or threatened fish...

Page 3-23, column 1, paragraph 3 under Spark-discharge shocks: However, the magnitude of the electric field would be low, and spark-discharge shocks would infrequently occur under the line near mid-span.

Page 3-23, column 2, paragraph 2 under Magnetic Fields: These magnetic field strengths compare with levels of magnetic field measured near common household appliances, and are much less than the direct current magnetic field of the earth (~~0.6 gauss~~) which varies from about 0.65 gauss at the poles to 0.25 gauss at the equator. The earth's magnetic field is a static (0 hz) field as opposed to the 60 hz magnetic field from the proposed line. Near Culbertson the earth's magnetic field has varied from about 0.58 to 0.59 gauss over the last 10 years (NOAA 2003).

Page 3-25, column 1, paragraph 3 under Long-term Exposure to Electric and Magnetic Fields:

While pooled analyses of Greenland (2000) and Ahlbom (2000) have found a relationship between childhood leukemia and magnetic fields greater than 3 to 4 mG (0.3-0.4 microT), Kavet and Zaffanella (2002) point out that two factors argue against the magnetic field itself being the cancer-causing agent. First, biopsies for cancer in rodents directly exposed to magnetic fields are generally negative for cancers of various types and leukemia in particular. Second, typical magnetic fields in the home away from appliances (<10 mG) produce electric fields in the body well below those believed to affect living systems.

In a small study of 36 homes in Pittsfield, Massachusetts, Kavet and Zaffanella (2002) suggest contact current as an explanation for the relationship between power frequency magnetic fields and childhood leukemia. The researchers found two sources of voltages that may cause a contact current in residences. Contact currents occur when a person touches two conductive objects that are at different voltages. The first source of voltage sufficient to cause a contact current was in the grounding wire that extends from a house electrical service panel neutral to the service water line. This voltage could cause a contact current to flow through a body when touching a metal faucet and a metal appliance that is grounded back to the service panel at the same time. The second source of voltage was between metal water pipes and metal drainpipes. This second source of voltage can be induced in metal plumbing by magnetic fields from nearby distribution lines and transmission lines. In their study they measured magnetic fields ranging from about 0.2-0.65 microT (2-6.5 mG) in homes near transmission lines. In homes near transmission lines the induced voltage ranged from about 180 to 1,100 mV. There was not a consistent relationship between measured magnetic field from transmission lines and induced voltage, but both were generally higher for transmission lines than for distribution lines. The authors suggest that "exposure to contact current associated with voltage on residential water pipes could lie at the heart of the association between magnetic fields and childhood leukemia." Laboratory studies have not verified this theory to date. Likewise there is no epidemiological evidence that contact currents are associated with childhood leukemia.

It should be noted that such contact current effects would be markedly diminished in homes with newer plastic plumbing. The authors also noted that in some houses studied, a contact current situation did not exist because water pipes and drainpipes contacted each other or otherwise short-circuited. Further follow-up investigations are necessary to confirm or refute the contact current theory. The Electric Power Research Institute is funding additional follow-up studies that are now under way.

For the proposed project, magnetic field strength from the rebuilt line operating at maximum load would be less than 10 mG at distances greater than approximately 100 feet from the centerline. At more normal operating loads magnetic field strength would drop off to less than 10 mG within 100 feet of the centerline. Along the proposed route, there are few if any homes located within 100 feet of the line. Magnetic fields of more than 2 mG could extend 200 to 300 feet out from the centerline under maximum line loading, as indicated in Appendix B of Western's EA. There are only a few residences that are located within this distance from the line. If subsequent study indicates that magnetic fields equal to those near the proposed line are great enough to cause contact currents large enough to cause cancer, Western could at the request of a resident measure contact current. If contact currents are sufficiently high, sections of plastic plumbing might be installed to mitigate the impact.



In conclusion, a recent analysis by the Bonneville Power Administration (2002) summarizes the state of our knowledge on electromagnetic fields and health effects:

The issue of whether there are long-term health effects associated with exposure to fields from transmission lines and other sources has been investigated for several decades. There is little evidence that electric fields cause long-term health effects. Estimates of magnetic-field exposures have been associated with certain health effects in studies of residential and occupational populations. Research in this area is continuing to determine whether such associations might reflect a causal relationship.

Scientific reviews of the research on EMF and health have stated that there is insufficient evidence to conclude that EMF exposures lead to long-term health effects, such as adult cancer or adverse effects on reproduction, pregnancy, or growth and development of the embryo. Based on epidemiology studies, some uncertainty remains about the possible effect of magnetic-field exposure above 4 mG on the risk of childhood leukemia. However, as the scientific reviews also indicate, animal or cellular studies provide little support for the idea that the statistical associations reflect a causal relationship, i.e., that magnetic-field exposure increases the risk of childhood or adult cancer. Furthermore, national and international organizations have established public and occupational EMF exposure guidelines on the basis of short-term stimulation effects, rather than long-term health effects. In so doing, these organizations did not find data sufficient to justify the setting of a standard to restrict long-term exposures to electric or magnetic fields.

#### Appendix A2. STANDARD MITIGATIVE PRACTICES under measure 5:

The contractor shall exercise care to preserve the natural landscape and shall conduct its construction operations so as to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work. Except where clearing is required for permanent works, approved construction roads, or excavation operations, all trees, native shrubbery, and vegetation shall be preserved and shall be protected from damage by the contractor's construction operations and equipment. The edges of clearings and cuts through tree, shrubbery, or other vegetation shall be irregularly shaped to soften the undesirable visual impact of straight lines. ~~Where such clearing occurs in the Lake Mead National Recreation Area, the contractor shall consult with the on-site Park Representative.~~

#### **Construction Monitoring**

The Department has developed a set of environmental specifications to reduce or avoid impacts during line construction and operation. These measures would be applied during pre-construction planning, construction, post-construction reclamation, and line operation. The measures would be in addition to those contained in Western's Standard Construction Practices (Appendix A1) and Standard Mitigative Measures for Construction, Operation, and Maintenance of Transmission Lines (Appendix A2) of Western's EA. The Department would work with

Western before and during line construction to identify and implement measures that would reduce or avoid impacts. The Department will monitor construction of this project to ensure compliance with conditions of approval and environmental specifications.

## **DRAFT DEPARTMENT FINDINGS**

1. The need for replacement of the Western Area Power Administration (Western) Wolf Point to Williston 115-kV transmission line is based on reliability of service. The age of the existing transmission line, its higher than average rate of forced outages compared to other Western transmission lines, and the increasing likelihood of customer service interruptions if no action is taken demonstrate the need for line replacement based on reliability of service (Section 75-20-301(1)(a), MCA). Benefits of the proposed line are its higher level of reliability through a reduced rate of forced outages, and the ability to maintain generation levels at Fort Peck Dam under single contingency outage conditions on the 230-kV system. The Department's analysis indicates that these benefits of line rebuild at 230-kV design standards, together with annual loss savings and increased flexibility for future system needs, are reasonably likely to outweigh the increased cost of rebuilding at the higher design voltage of 230 kilovolts.
2. The nature of the probable environmental impact that would result from the proposed rebuild of the Wolf Point to Williston 115-kV transmission line has been identified in the Department's supplemental environmental assessment and the Western environmental assessment for the proposed project (Section 75-20-301(1)(b), MCA).
3. Reasonable system alternatives to solve the electrical problems occurring in the Wolf Point, Montana area were considered in Western's environmental assessment for the 115-kV Wolf Point to Williston transmission line. Reasonable location alternatives were considered in Western's environmental assessment for the Wolf Point to Williston transmission line. The information evaluated by the Department indicates that none of the system or location alternatives examined for the proposed line would have less impact on the environment and the citizens of Montana than Western's proposed rebuild of the 115-kV transmission line (Section 75-20-301(1)(c), MCA).

4. None of Western's 115-kV Wolf Point to Williston transmission line will be built underground because the cost of underground construction can exceed the cost of overhead construction by a large factor and the duration of outages for underground lines typically exceeds that for overhead line (Section 75-20-301(1)(d)(i), MCA).
5. Western's proposed rebuild of its 115-kV Wolf Point to Williston transmission line to 230-kV design standards is consistent with regional plans for expansion of the Western transmission system serving Montana. Line upgrade to 230 kilovolts will provide flexibility for future system needs when transformers within the substations are upgraded to accommodate operation at 230 kilovolts. (Section 75-20-301(1)(d)(ii), MCA).
6. Western's rebuild of its 115-kV Wolf Point to Williston transmission line will serve the interest of utility system economy and reliability. Information evaluated by the Department indicates that the value of the savings from reduced outages plus the value for increased reliability of service is reasonably likely to exceed to cost of the proposed project. (Section 75-20-301(1)(d)(iii), MCA).
7. The Department evaluated the use of public land for siting of portions of Western's Wolf Point to Williston transmission project and determined that the use of public land was not as economically practicable as the use of private land and that use of public land was not compatible with a finding of minimum adverse environmental impact for the proposed project (75-20-301(1)(h), MCA).
8. The Department shall monitor construction of the Montana portion of the Wolf Point to Williston transmission line rebuild project to ensure that the substance of environmental specifications developed by Western and the Department are carried out, that reclamation and re-vegetation efforts are successful, and that mitigating measures identified by Western and the Department are implemented.
9. The proposed rebuild by Western of the Montana portion of a 115-kV transmission line

between Wolf Point and Williston complies with the substantive standards of the Major Facility Siting Act and the Administrative Rules adopted by the Board, if Western rebuilds, maintains, and operates the transmission line in compliance with the following:

(A) Prior to the start of construction, Western shall obtain any necessary water quality decision, opinion, order, certification or permit as required by Section 75-20-216(3), MCA.

(B) Western shall rebuild the Wolf Point to Williston transmission line project in Montana within the existing right-of-way except for two segments proposed for relocation as shown in Figure 2-1 (Reroute Map Structure 71/2 – 72/7) and Figure 2-2 (Reroute Map Structure 104/8 – 108/4) of the Western EA and for proposed locations for new structures where Montana DOT determines that adequate safety clearance along Highway 2 would not be maintained. For the two segments proposed for relocation, the line shall be constructed within 250 feet of locations depicted on the referenced figures. For any structure relocations that may be necessary for adequate safety clearance along Highway 2 the structures shall be located no more than 250 feet from the existing line in a manner that minimizes impacts to existing land use, unless otherwise approved in writing by the Department.

10. If Western rebuilds, maintains, and operates the Montana portion of its 115-kV Wolf Point to Williston transmission line in compliance with the requirements of the conclusions stated herein, the Department finds that:

(A) The probable environmental impact from the rebuild, operation, and maintenance of the facility will be minimized (Section 75-20-301(1)(c), MCA).

(B) The Montana portion of the Wolf Point to Williston transmission line project represents the minimum adverse environmental impact considering the state of available technology and the nature and economics of the various alternatives (Section 75-20-301(1)(c), MCA).

11. If Western rebuilds, maintains, and operates the Montana portion of its Wolf Point to Williston transmission line project in compliance with the conclusions stated herein, then

environmental impacts specified in the Administrative Rules of Montana 17.4.609(3)(d) and (e) have been properly considered and the facility will represent the minimum adverse environmental impact considering the state of available technology and the economics of the various alternatives (Section 75-20-301(1)(c), MCA).

12. If Western rebuilds, maintains, and operates the Montana portion of its Wolf Point to Williston transmission line in compliance with the requirements of the conclusions stated herein, the location of the transmission line will conform to applicable state and local laws and regulations (Section 75-20-301(1)(e), MCA).

13. If Western rebuilds, maintains, and operates the Montana portion of its Wolf Point to Williston transmission line project in compliance with the requirements of the conclusions stated herein, then the effects of the facility on public health, welfare, and safety can be minimized (Section 75-20-301(2)(d), MCA).

14. If Western rebuilds, maintains, and operates the Montana portion of its Wolf Point to Williston transmission line project in compliance with the requirements of the conclusions stated herein, the facility will serve the public interest, convenience, and necessity. The EA and state supplement describe and the department has considered: the basis of need for the facility, the nature of impacts associated with this project, benefits to the state and the applicant, effects of the economic activity resulting from the proposed facility, and the effects of the proposed facility on the public health, welfare, and safety (Section 75-20-301(2), MCA).

## **DRAFT DEPARTMENT DECISION**

The portion of Western's proposed Wolf Point, Montana to Williston, North Dakota transmission line project that is located within Montana complies with the substantive standards of the Montana Major Facility Siting Act if Western rebuilds, maintains, and operates the Montana

portion of this transmission line and associated facilities in compliance with the Findings of the Department herein stated. The Montana portion of Western's proposed Wolf Point to Williston transmission line project complies with the substantive standards of the Montana Major Facility Siting Act only if Western rebuilds, maintains, and operates the transmission line in compliance with the Findings of the Department herein stated.

## **PREPARERS AND CONTRIBUTORS**

The following people were involved in the writing and review of this document:

Jeff Blend, DEQ  
Sarah Denali, DEQ  
Nancy Johnson, DEQ  
Jade Nicolay, DEQ  
John North, DEQ  
Tom Ring, DEQ  
Warren McCullough, DEQ

The following agencies for the State of Montana were consulted during the review of Western's EA for the Wolf Point, MT – Williston, ND Transmission Line Rebuild and in the preparation of the State Supplemental EA:

Montana Department of Fish, Wildlife & Parks  
Montana Department of Natural Resources and Conservation  
Montana Department of Transportation  
Montana State Historic Preservation Office

## REFERENCES

Avian Powerline Interaction Committee. 1994. Mitigating Bird Collisions with Powerlines: the State of the Art in 1994. Edison Electric Institute. Washington, D.C.

Brain, J.D. and R. Kavet et al: Childhood leukemia: electric and magnetic fields as possible risk factors. Environmental Health Perspectives 111:962-970, 2003.

Bonneville Power Administration. 2002. Grand Coulee- Bell 500 kV Transmission Line Project Draft Environmental Impact Statement. DOE/EIS-0344, August 2002. Portland, Oregon.

Electric Power Research Institute. 2003. EPRI Journal Online at <http://www.epri.com/journal/default.asp>. From Research Results Strengthen EMF Hypothesis at <http://www.epri.com/journal/details.asp?doctype=discovery&id=183&flag=archive>.

Kavet R. and LE Zaffenella. Contact voltage measured in residences: Implications to the association between magnetic fields and childhood leukemia. Bioelectromagnetics 23:464-474, 2002.

Linnet, M.S. and S. Wacholder et al. Interpreting epidemiologic research: lessons from studies of childhood cancer. Pediatrics 112:218-232, 2003.

Moulder, John E. Electromagnetic Fields and Human Health. Medical College of Wisconsin. <http://www.mcw.edu/gcrc/cop/powerlines-cancer-FAQ/toc.html>.

NOAA 2003. National Geophysical Data Center, International Geomagnetic Reference Field Model. <http://www.ngdc.noaa.gov/cgi-bin/seg/gmag/fldsnth1.pl> run for 2000 feet elevation at Culbertson.

Western Area Power Administration. January 2003. Draft Environmental Assessment – Wolf Point, MT-Williston, ND Transmission Line Rebuild.

Western Area Power Administration. August 2003. Environmental Assessment – Wolf Point, MT-Williston, ND Transmission Line Rebuild.