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Appendices

DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

STB Finance Docket No. 30186 (Sub–No. 3)

Tongue River Railroad Company, Inc. – Construction and Operation – Western Alignment

Tongue River III - Rosebud and Big Horn Counties, Montana

Lead Agency:

Surface Transportation Board
Section of Environmental Analysis
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U.S. Bureau of Land Management
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Appendix D

Information Requested by the U.S. Army Corps of Engineers

1. Tongue River Railroad Section 404(b)(1) Showing, July 2004
2. Waters of the US Conceptual Habitat Mitigation and Monitoring Plan Tongue River Railroad, April 1999
3. Revised Initial Analysis of Waters of the U.S., Tongue River Railroad Alternatives, October 1, 2003
4. Fish and Wildlife Species Occurrence by Habitat, Tongue River Railroad Project Area, 2004

Draft

REVISED DRAFT
TONGUE RIVER RAILROAD SECTION 404(b)(1) SHOWING

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DRAFT July 2004

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EXECUTIVE SUMMARY

The Tongue River Railroad Company, Inc. (TRRC) is applying for a Section 404 permit for an approximate 120 mile rail line in Custer, Powder River, Rosebud and Big Horn Counties, Montana. In 1986 the Interstate Commerce Commission (ICC) approved an 89 mile routing from Miles City to Ashland (TRRI). In 1996 the Surface Transportation Board (STB), the successor to the Interstate Commerce Commission, approved a 41-mile extension of the rail line from Ashland to Decker (TRRII).

In 1998 TRRC filed an application with the STB to construct and operate the railroad utilizing a different alignment, know as the Western Alignment, for the southernmost 17.3-miles of the extension approved by the STB in 1996 (TRRIII). In the 1998 application, TRRC also proposed minor refinements to the alignment between Miles City and Ashland to improve operations and reduce construction costs. The Western Alignment and the alignment modifications were analyzed in detail by the STB in the 2004 Draft Supplemental Environmental Impact Statement (2004 DSEIS).

The purpose of the Tongue River Railroad is to provide for the transport of low-sulfur coal from existing and future coal mines in southeastern Montana and to provide an alternate routing for coal originating from Wyoming mines. The railroad would provide a more efficient means of transporting coal from existing mines and would enable the development of proposed mines in the Ashland and Otter Creek area to go forward.

The project must be evaluated by the US Army Corp of Engineers (USCOE) to determine its compliance with the 404 (b)(1) Guidelines for Specifications of Disposal Sites for Dredged or Fill Material (Guidelines). The purpose of this Showing Document is to demonstrate to the USCOE that the route approved by the ICC and the STB, modified as described in this Showing Document (the Proposed Action), fully complies with the Guidelines. TRRC believes that the Proposed Action is the least environmentally damaging practicable alternative and that this Showing Document and the material referenced herein provide sufficient information for such a determination. Therefore the 404 permit should be granted.

This document presents the results of the evaluation conducted pursuant to USCOE's Practicable Alternatives Evaluation-Section 230.10A Guidelines. The alternatives evaluation includes the entire TRRC rail line from Miles City to Decker. Table 1 on page 3 summarizes the analyses conducted during the Level 1A, 1B and 2 Screening Analyses for the various alternatives considered in TRRI, TRRII and TRRIII.

The Proposed Action has the least impact on the total acreage of Waters of the U.S. The Environmental Impact Statement (EIS) in TRRI found that it was the only alternative that did not impact areas with significant aquatic habitat value and significant aquatic species value. While it has the potential to impact the Miles City Fish Hatchery the identified impacts can be mitigated as discussed at page 50 below. The Proposed Action meets the project's purpose and needs as well as the railroad's operational criteria.

The Tongue River Road and Moon Creek Alternatives can be eliminated due to their substantial environmental impacts, including greater impacts to Waters of the U.S. Moreover, because of adverse grades, the Colstrip Alternative would have substantially higher long-term operational and maintenance costs, and result in greater fuel consumption and increased air emissions as compared to the Proposed Action. The Four Mile Creek Alternative has significant adverse grades resulting in operational and safety concerns that would severely impact the viability of the railroad. In addition, it would impact more acres of Waters of the US than the Proposed Action. Moreover, the Four Mile Creek Alternative is longer than the Proposed Action, has additional road crossings, requires reconstruction of State Highway 312 and is closer to more residences than the Proposed Action. The No Action Alternative using the existing BNSF lines provides no service to the proposed Ashland and Otter Creek area mines and no improvement in service to the Decker area mines.

Given all of the above factors, TRRC believes that the best practicable and least environmentally damaging alternative is the Proposed Action. The Proposed Action meets the design and the operational criteria for the railroad, provides for the economic transport of coal for the proposed Ashland/Otter Creek area mines and reduces the transportation distance for the Decker and some Wyoming area mines. The Proposed Action thus meets the purpose and need of the project. The Proposed Action also impacts the fewest acres of Waters of the US and has the least impacts to sensitive aquatic habitats. While initial concerns were raised about the Proposed Action impacting the Miles City Fish Hatchery, various studies have shown that there is little to no likelihood of negative impacts due to vibration connected with the construction and operation of the line. Other potential impacts regarding protection of the Hatchery's water supply lines and weed control management would be mitigated through measures the Applicant has developed in consultation with the Montana Department of Fish, Wildlife & Parks. Thus with mitigation, the Proposed Action would have no significant impacts on the Hatchery. The Proposed Action also limits impacts to the research on sustainable development of rangeland resources at USDA Ft. Keogh Livestock and Range Research Station.

Table 1
Summary of Screening Analyses

Alternative	Level 1A	Level 1B	Level 2
Miles City to Ashland			
Proposed Action	Pass	Pass	Pass/ Least Environmentally Damaging, Practicable Alternative
BN Option	Pass	Pass	Included in Proposed Action
Milwaukee Road	Fail	NA	NA
Custer County/LARRS Option	Fail	NA	NA
IntraSearch/LARRS Option	Fail	NA	NA
LARRS/Tongue River Option	Pass	Pass	Modified alignment consistent with ROW across LARRS; included in the Proposed Action.
Initial Option through LARRS	Fail	NA	NA
IntraSearch, East of Miles City	Fail	NA	NA
Option in T4N R47E	Fail	NA	NA
Ashland NW Alignment	Pass	Pass	Greater impacts on the Ashland community and the Tongue River than Ashland SE Alignment
Optional Route through Ashland	Fail	NA	NA
Ashland SE Alignment	Pass	Pass	Pass/ Least Environmentally Damaging, Practicable Alternative; included in Proposed Action
Decker Route	Fail	NA	NA
BLM Route	Fail	NA	NA
Tongue River Road Route	Pass	Pass	Fail
Moon Creek Route	Pass	Pass	Fail
Colstrip Route	Pass	Pass	Fail
Ashland to Decker Extension			
Four Mile Creek	Pass	Pass	Approved in TRR II
Original Preferred Alignment	Pass	Pass	Fail
Prairie Dog	Fail	NA	NA
Canyon Creek	Fail	NA	NA
Hanging Woman Creek	Fail	NA	NA
Western Alignment	Pass	Pass	Pass; Least Environmentally Damaging, Practicable Alternative; included in the Proposed Action

INTRODUCTION

The Tongue River Railroad Company, Inc.[1] (TRRC) has received approval from the Surface Transportation Board (STB) to construct approximately 120 miles of railroad in Custer, Powder River, Rosebud and Big Horn Counties, Montana. The STB's predecessor, the Interstate Commerce Commission (ICC), in 1986, approved an approximate 89-mile routing from Miles City to Ashland (TRRI).[2] The northern terminus of the proposed rail line originally included a tie-in through the abandoned Milwaukee Road Rail Yards near the center of Miles City. Subsequently, a Burlington Northern (BN) Option was developed which includes a direct tie-in with the BNSF line south and west of Miles City. The BN Option was analyzed in detail in the 1984 Supplement to the Draft Environmental Impact Statement[3] (1984 SDEIS) and became part of the Proposed Action approved by the ICC in 1986.

A 41-mile extension from Ashland to Decker was approved by the STB in 1996 (TRRII).[4] In 1998 TRRC filed an application with the STB to construct the railroad utilizing a different alignment for the southernmost 17.3-miles of the extension than the alignment previously approved by the STB in 1996 (TRRIII).[5] This new alignment is

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[1] All of the assets of Tongue River Railroad Company, a limited partnership, were acquired by TRRC, Inc., a corporation, in 1998. See Tongue River Railroad Company, Inc. – Acquisition and Operation Exemption – Tongue River Railroad Company, Finance Docket No. 33644 (served November 13, 1998). The STB approved substitution of TRRC, Inc. for the limited partnership as the applicant. Tongue River Railroad Company – Construction and Operation – Western Alignment, Finance Docket No. 30186 (Sub. No. 3) (served Aug. 28, 2003).

[2] See Tongue River Railroad Company – Rail Construction and Operation – In Custer, Powder River and Rosebud Counties, Montana, Finance Docket No. 30186 (Miles City to Ashland) (not printed) (served Sept.4, 1985), modified, (not printed) (served May 91, 1986).

[3] Supplement to Draft Environmental Impact Statement Finance Docket No. 30186 January 19, 1984.

[4] Tongue River Railroad Company – Rail Construction and Operation Of An Additional Line from Ashland to Decker, Montana, Finance Docket No. 30186 (Sub. No. 2) (not printed) (served Nov. 8, 1996).

[5] In March 2000, TRRC requested that the STB suspend further work on its application. In December 2002, TRRC advised the STB that it was now in a position to move forward and asked the STB to resume its work. STB published an Amended Final Scope of the Supplemental Environmental Impact Statement on August 22, 2003. 68 Fed. Reg. 50,829 (2003).

referred to as the Western Alignment. In addition to requiring STB authorization to construct and operate the Western Alignment, the project will require the issuance of a Section 404 Permit from the U.S. Army Corps of Engineers (USCOE) for actions along the entire route that involve the discharge of dredged and fill material into the waters of the United States, including streams and wetlands.[6] The project also will require the issuance of Right of Way (ROW) easements from the U.S. Bureau of Land Management (BLM) to cross certain BLM administered lands, ROW easements from the Montana Department of Natural Resources and Conservation (MDNRC) to cross certain state lands including certain state school trust lands, an easement from the Montana Department of Fish, Wildlife and Parks (FW&P) to cross the Fish Hatchery at Miles City, as well as various state permits related to construction of the railroad. The U.S. Department of Agriculture (USDA), Agricultural Research Service, granted an easement deed for crossing the Livestock and Range Research Station (LARRS) facility to the TRRC in May 1989.

The purpose of this document is to demonstrate, from the Applicant's perspective, that the construction of the rail line from Miles City to Decker via the Western Alignment ("the Proposed Action") complies with the 404(b)(1) Guidelines and to facilitate the issuance of the Section 404 Permit to the TRRC for the construction of the Tongue River Railroad. It does not necessarily represent the USCOE's conclusions with regard to the project and should not be construed as the USCOE's 404(b)(1) evaluation.

In connection with the application for the Western Alignment, the STB is preparing a Supplemental Environmental Impact Statement (SEIS) that will address the impacts concerning the construction of the Western Alignment and also address impacts related to changed circumstances along the remainder of the Miles City to Decker line. The STB is the "lead Federal Agency" for the SEIS. The USCOE, the BLM, and the MDNRC have been designated as "Cooperating Agencies" for the SEIS and are participating throughout the SEIS process. The USCOE also participated as a Cooperating Agency in the preparation of the 1985 EIS for the Miles City to Ashland routing. USCOE was not a Cooperating Agency for the 1996 EIS for the extension from Ashland to Decker; however, the STB's Section of Environmental Analysis requested and received input from USCOE on the 1996 EIS.

The 2004 DSEIS, the 1985 EIS and the 1996 EIS are intended to serve as the NEPA compliance decision documents for the USCOE Section 404 Permit for the Proposed Action. In addition to addressing the requirements of NEPA, the USCOE must evaluate whether the Proposed Action meets the requirements of Section 404 of the Clean Water Act (33 U.S.C. 1344) and the EPA Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 C.F.R. Part 230)(hereinafter EPA Guidelines). This document will address the latter requirements.

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[6] USCOE previously issued a Section 404 permit for the rail line from Miles City to Ashland; however, that permit has expired.

PRACTICABLE ALTERNATIVES EVALUATION – SECTION 230.10A

The following section describes the steps taken to identify and evaluate alternatives to the Proposed Action for the Mile City to Ashland line and the Ashland to Decker extension and explains how the steps were used to consider and evaluate various alternatives.

PRACTICABILITY SCREENING METHODOLOGY

The following sequential steps have been taken to evaluate potential alternatives including the Proposed Action, and to identify the practicable alternative that would reasonably have the least amount of impact to the Waters of the U.S. and aquatic resources. The 1985 EIS considered alternatives for the Miles City to Ashland routing and the 1996 EIS considered alternatives for the Ashland to Decker extension. In both cases the EISs considered alternatives that are deemed to be reasonable as required under NEPA; however this document addresses alternatives strictly on the basis of practicability as defined in 40 C.F.R. § 230.3 (q)[7].

Step 1. Define the Project's Purpose and Need.

Step 2. Identify a Range of Practicable Alternatives.

Step 3. Level 1 Screening.

Level 1A Screening

Identify and determine the practicability of routes based on the project's purpose and evaluate the routes using specified criteria regarding impact to land and water resources, railroad design and operation standards and costs. For this step the Miles City to Ashland line, approved by the ICC in 1986, and the Ashland to Decker extension, approved by the STB in 1996, are considered separately. At the time TRRC filed its original application seeking authorization to construct the Miles City to Ashland rail line, the construction of the Ashland to Decker extension was not envisioned. The ICC granted TRRC's original application in 1986 -- five years before TRRC filed its application to construct the Ashland to Decker extension. Thus, it was after TRRC received authorization from the ICC to construct the Miles City to Ashland rail line that TRRC decided to extend that rail line to Decker, Montana and began to identify potential routes for an Ashland to Decker extension.

[7] The regulations define "practicable" as "available and capable of being done after taking into consideration costs, existing technology, and logistics in lights of overall project purpose." 40 C.F.R. § 230.3(q).

Level 1B Screening.

Perform practicability analysis on those alternatives that were reviewed in detail in the environmental documents from the prior two Tongue River proceedings. Consistent with the Level 1A screening, the Miles City to Ashland line is considered separately from the Ashland to Decker extension, as the alternatives for each were considered separately in the two prior Tongue River Proceedings.

Step 4. Level 2 Screening.

Identify environmental impacts of the practicable alternatives, compare impacts to the Waters of the U.S. among the identified practicable alternatives and determine whether any of the alternatives would have other significant adverse environmental impacts.[8] Identify those alternatives with very similar environmental consequences.

STEP 1 PROJECT PURPOSE AND NEED

The purpose of the Tongue River Railroad is to provide for the transport of coal from existing and future coal mines in southeastern Montana and to provide an alternate routing for coal originating from Wyoming mines. The Proposed Action would provide a more efficient means of transporting coal from existing mines in the region and would enable development of proposed mines in the Ashland area to go forward.

At its southernmost point, the TRRC will connect with the Burlington Northern Santa Fe Railway Company (BNSF) at Spring Creek/Decker. At the northernmost point, TRRC will connect with BNSF at Miles City. Use of TRRC's line will reduce the current transportation distance for coal mined in the upper Powder River Basin (both in Montana and Wyoming) by approximately 160 to 175 miles on 750 to 1,000 mile hauls to electric utilities in the upper Midwest and Great Lakes regions (or round-trip mileage savings of 320 to 350 miles). Significant savings in transportation, maintenance and equipment costs would result, as well as reductions in the use of diesel fuel.

Construction of the Tongue River Railroad also will provide, for the first time, rail service to the largest remaining undeveloped reserves of low sulfur, high Btu, sub-bituminous coal in the United States, which is located near Ashland, Montana. The U.S. Clean Air Act Amendments of 1990 have created a strong market for low-sulfur coal that can be burned in electric utility boilers without the need for costly flue gas desulfurization units. In addition, the increasing demand for electrical generating capacity in the U.S. continues to focus the utility generation industry on the availability of high quality, economic coal reserves. The Powder River Basin of Wyoming and

[8] In determining if there is a practicable alternative which would have less of an impact on the aquatic ecosystem, USCOE must consider whether the alternative has other significant adverse environmental consequences. 40 C.F.R. §230.10(a).

Montana contains the great majority of the U.S. reserves of low-sulfur coal. Existing mines near Decker will yield less production as their resources dwindle, but this can be offset by new mine development in the Ashland area. The Tongue River Railroad is essential to the development of the Ashland area mines, which have no alternative means of economic transport without the railroad. The State of Montana has recently acquired an estimated 530 million tons of coal reserves from the federal government in the Otter Creek Tracts near Ashland and is actively pursuing the timely development of these coal assets.

Wyoming and Decker area mines also could use the Tongue River Railroad. The three existing low-sulfur coal mines in the Decker area (East and West Decker and Spring Creek) currently transport their production to Midwestern utilities by way of the BNSF line through Sheridan, Wyoming and Hardin, Forsyth and Miles City, Montana. The Tongue River Railroad would allow this coal to be shipped directly to Miles City saving up to 350 miles on each roundtrip coal train to the Midwest. In addition to Decker area coal, BNSF currently transports some Wyoming coal over the circuitous Sheridan-to-Miles City route to these upper Midwestern markets. At least some of this Wyoming coal is likely to move over the TRRC line.

Thus, the Tongue River Railroad is a critical element in the future of Montana coal production and will produce benefits that will accrue to the state and to local governments from the tax revenues associated with this production. The TRRC has attracted broad political support in Montana, as well as support from BNSF and from the utilities that would benefit from the coal transported by the Tongue River Railroad.

A more detailed discussion of the purpose and need for constructing the Tongue River Railroad is provided in Chapter 2 of the 2004 DSEIS.

STEP 2 IDENTIFY RANGE OF PRACTICABLE ALTERNATIVES

Potential routing alternatives were identified separately for the Miles City to Ashland line and for the Ashland to Decker extension. This occurred because, as stated above, at the time TRRC filed its original application seeking authorization to construct the Miles City to Ashland rail line it had not yet envisioned constructing the Ashland to Decker extension. Thus, it was after TRRC received authorization from the ICC to construct the Miles City to Ashland rail line that TRRC decided to extend that rail line to Decker, Montana and began to identify potential routes for an Ashland to Decker extension.

The initial TRRC line and the extension will therefore be addressed separately here and in the Level 1 screening discussions. The Level 2 screening analysis looks at the practicable alternatives for the Miles City to Ashland line and the Ashland to Decker extension and also considers the Western Alignment and proposed modifications to the Miles City to Ashland line.

Miles City to Ashland Line

The first step in the development of the Miles City to Ashland line was to identify routes to meet the project's objectives. Prior to the selection of any rail alignments certain design, operational and environmental criteria were developed. These criteria were:

- Identify and try to avoid to the extent practicable developed agricultural, residential and commercial properties;
- Minimize the encroachment of the railroad on the alluvial floor of the Tongue River Valley;
- Minimize the number of crossings of public and private roads, trails and other transportation features including water storage and transmission structures, such as irrigation reservoirs, canals and ditches;
- Avoid grades on main track in excess of 1.0 percent compensated for curve;
- Provide for maximum degree of curve for main tracks not in excess of 3 degrees;
- Allow for a rate of change for vertical curves of 0.05ft. /100 ft. in sags and 0.10ft/100ft. at summits;
- Minimize the distance of the coal haul;
- Maximize the operating characteristics of the rail line.

Ashland to Decker Extension

The Ashland to Decker Extension is an extension of the Miles City to Ashland alignment and the same criteria set forth above were used in developing and considering the alternatives for the extension.

STEP 3 LEVEL 1 SCREENING

Level 1A Screening

Miles City to Ashland Line

The topography of the region limits the number of feasible alignments meeting the criteria noted above. Initially TRRC attempted to develop and evaluate possible alignments into and out of both Miles City and Ashland as well as optional alignments to connect the approaches to the two cities considering various operational, construction and environmental factors. In addition, a no action alternative and alternative modes of transportation were considered.

The No Action Alternative is discussed in the 1985 EIS and in the Level 1B screening and will not be discussed further here. The alternative modes of transportation,

all of which were ultimately rejected due to feasibility and/or environmental concerns, are summarized in Table 2. Six alternatives were considered in the Level 1A screening and the 1985 EIS. In addition, several options that generally followed the proposed route but provided alternatives to it are discussed on pages 18 to 26. These routings, which were variations on the routings around Miles City and Ashland, were developed in response to public and agency comments. Moreover, the 1984 SDEIS looked at impacts of a modification of the proposed routing near Miles City, including impacts to the Miles City Fish Hatchery and the USDA Livestock and Range Research Station, and is discussed below.

Alternative Modes of Transportation

The ICC's Section of Energy and Environment (SEE), the predecessor to the STB Section of Environmental Analysis, looked at four alternative modes of transportation: (1) coal slurry pipeline; (2) conveyor belt system; (3) hauling by truck: and (4) mine - mouth generation of electricity. The discussion from Appendix B of the 1983 draft EIS[9] on each of these alternatives is summarized briefly below and in Table 2 on page 12. Each of the alternative methods of transportation poses a number of engineering, legal and environmental problems and is not feasible.

A Coal Slurry Pipeline would require several components including: (1) a coal slurry preparation facility; (2) a water supply system; (3) a 24-inch pipeline; (4) pump stations; and (5) a dewatering plant and loading facility. Such a system would require a minimum 30-foot ROW and could consume an estimated 7,200 acre-feet of water per year. Appendix B at B-4. Appendix B concluded that a slurry pipeline would not be economically competitive with a unit train over the distances to be considered for the Miles City to Ashland segment. Moreover, there are numerous legal and environmental constraints on the construction of a slurry pipeline in Montana, including water rights. Water availability also is an important environmental concern given the relatively arid nature of southeastern Montana. Appendix B at B-11 and B-12.

A Conveyor System also would require several components including: (1) storage and loading facilities; (2) a series of sections of conveyor belts; and (3) unloading, storage and loading facilities at the railhead. The conveyor system would be covered and would contain a belt, 48 inches wide, on which the coal would be transported. Appendix B at B-5. The conveyor system was eliminated as not economical given the 89-mile distance. The additional costs of this mode of transportation would have a negative impact on the ability to market the coal. While Appendix B concluded that construction of a conveyor system would pose environmental problems similar to the building of a railroad, it also concluded that a conveyor belt would have significantly greater impacts on air quality. In addition, it would present a significant barrier to wildlife, and its operations would raise issues related to security of the system and maintenance of the system. Appendix B at B-12.

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[9] See Appendix B 1983 Draft Environmental Impact Statement, Finance Docket No. 30186.

Hauling by Truck to an existing railhead would require approximately 300, 50-ton trucks and the construction of a separate, hard surface roadway and storage and loading facilities at the railhead and vehicle maintenance shops for the trucks. Appendix B at B-5. Hauling by truck was eliminated due to its higher costs and significant environmental impacts. Appendix B concluded that truck haulage of coal would impact air quality due to fugitive dust from the road and significant impacts from the trucks' diesel exhaust. In addition, Appendix B concluded that the large number of trucks that would be required could increase the number of vehicle accidents. Appendix B at B-12 through B-14.

Locating a Mine-Mouth Electrical-Generating Plant in the Ashland/Birney area would require the construction of the generating plant and high voltage transmission lines to a destination where they could join the existing transmission grids serving the same customers as would coal transported by the railroads. A large volume of water would be required for the operation of the power plant, typically 7 to 8 tons of water per ton of coal burned. Appendix B at B-5. This alternative was rejected due to the environmental difficulties with establishing a mine-mouth generating plant. The availability of the large amount of water needed for the plant would be questionable in the arid southeast Montana area, according to Appendix B at B-14.

Table 2
Level 1A Screening Analysis
Comparison of Alternative Modes of Transportation

Alternative	Engineering, Cost and Environmental Factors	Results
Railroad	More economical than other transportation methods; less impact to water resources than coal slurry or mine-mouth generation; less air impacts than conveyor system or truck haulage.	Feasible; ICC approved construction of a line from Miles City to Ashland in 1986.
Coal Slurry	Higher cost than rail transportation; use of water for transport of coal outside of Montana is contrary to Montana state law; impacts to water availability and quality	Not Feasible
Conveyor	Higher cost than rail would have a negative impact on ability to market coal; concerns regarding the security of the system; right-of-way acquisition would be difficult; greater air impacts than rail; presents a significant barrier to wildlife	Not Feasible
Truck Haulage	Higher cost than rail; additional acreage disturbed; impacts to air quality; noise and vibration concerns; energy consumption; increase in vehicle accidents due to large number of trucks required	Not Feasible
Mine-mouth Generation	Issues with the construction of transmission lines including ROW issues; water quality and socioeconomic impacts	Not Feasible

Alternative Rail Alignments

TRRC developed and evaluated possible alignments into and out of Miles City and Ashland that met the criteria outlined in Step 2 and which considered the following factors.

- Impact on agricultural, residential and commercial properties;
- Impact to the USDA Livestock and Range Research Station (LARRS) (also known as the Fort Keogh Range Experimental Station);
- Number of crossings or conflicts with the Tongue River;
- Number of county or state highway crossings;
- Number and length of bridges;
- Total curvature;
- Total cut;
- Total fill;
- Ruling grade[10];
- Length of ruling grade;
- Total length;
- Total costs;
- Operating characteristics.

Taking into account the engineering constraints, environmental concerns and comments from private landowners, further refinements were developed.

Appendix B to the 1983 draft EIS discusses several alternatives that SEE identified. SEE solicited input and suggestions regarding possible alternatives from a number of sources including several federal, state and local agencies and groups which were designated as ("cooperating agencies"), and the public at large. The designated cooperating agencies were USCOE, the U.S. Department of Agriculture, the Federal Railroad Administration, the Montana Department of State Lands, the Custer County Planning Board, the Powder River County Commissioners and the Northern Cheyenne Indian Tribe.

In addition to the proposed alignment, five alternatives, summarized in Table 3, were considered. The five, which are identified on Map 1 on page 26, were:

- Decker Route
- Bureau of Land Management (BLM) Route

[10] "Ruling grade" is the maximum adverse grade that governs the amount of locomotive power required for a certain operating rail line. Some short-sections of grade may be steeper than the ruling grade, but because they are shorter than the length of the train (usually about 6,400 feet long for a unit coal train) they usually do not hinder the operational capacity of the locomotives. Ruling grades are usually the steepest grades that exceed the length of the loaded train.

- Tongue River Road Alternative
- Moon Creek Alternative
- Colstrip Alternative

Two of these alternatives, the Decker Route and the Bureau of Land Management Route, were eliminated as not meeting the operational and design criteria outlined above. Each is discussed briefly below. The three remaining alternatives: Tongue River Road, Moon Creek, and Colstrip, as well as the Preferred Alignment, are discussed in the Level 1B screening.

The Decker Route would originate at a point just west of the Tongue River Reservoir, where it would join the Burlington Northern Santa Fe (BNSF) spur now serving the Spring Creek Mine. The route heads north for approximately 10 miles from the BNSF line before turning due east for approximately 8 miles. At that point, the route would cross to the east side of the Tongue River and follow the river in a generally northeasterly direction to the site of the proposed Montco Mine, about 8.9 miles south of Ashland. From the Montco site, the route would continue north to an area near Ashland suitable to turn up the Otter Creek drainage and form a terminus some 7.7 miles southeast of Ashland. This route was rejected because it would result in increased operational costs, environmental concerns and potential negative impact to rail traffic in Sheridan, Wyoming. The number of locomotives needed to transport coal over the line due to the steep ruling grade raises the operational and maintenance costs significantly. Marketing problems for coal hauled over the Decker Route would be substantial. Coal traveling over this route would have an initial terminus in Sheridan, Wyoming. The coal would then have to be shipped via BNSF to Hardin, Montana, and then to Miles City for eventual transportation to markets in the Midwest. Finally, the direction of coal transport through the Sheridan, Wyoming, area could create a "bottleneck" at that point. Further concentration of coal shipment would not only affect the movement of coal and other commodities, but might have significant socioeconomic impacts on northern Wyoming communities. For these reasons SEE eliminated the Decker Route from further consideration as a reasonable alternative to the proposed rail line. Appendix B at B-16.

The Bureau of Land Management (BLM) Route is essentially a high ground route, starting at a juncture with the BNSF line west of Miles City and heading in a southwesterly direction across the hilly country west of the Tongue River valley. Generally, this route would parallel the Tongue River drainage for approximately 40 miles, at which point it would drop into the valley, cross the Tongue River, and continue south past Ashland via the route of the proposed rail line. This route would include a crossing of the Moon Creek drainage near the Tongue River/Yellowstone River divide. This route was rejected because of increased construction and operation costs and environmental problems. The suggested railroad route would have to climb approximately 400 feet from the valley before eventually dropping into the Moon Creek drainage. Extra locomotives would be required to pull a unit train up this grade, thereby adding to operating costs. Furthermore, this alignment would necessitate substantial amounts of cut and fill in order to cross the rougher terrain. The amount of cut and fill necessary to cope with the rough terrain would impact more acreage during the

construction phase. The U.S. Fish and Wildlife Service expressed concern over the possible effects of this alignment to wildlife populations in the area. For these reasons, the BLM Route was eliminated by the SEE from further consideration as a reasonable alternative to the proposed rail line. Appendix B at B-16.

Table 3
Level 1A Screening
Rail Alternatives: Miles City to Ashland

Alternatives	Operating Characteristics	Issues	Results
Proposed Action	0.2% ruling grade against loads, 30-ft total rise against load, 15,000 ft total length of ruling grade, requires 2 locomotives for operations.	Disturbance of research at LARRS	Included in Level 1B Screening and EIS.
Decker Alternative	1.0% ruling grade against loads, 1,000-ft total rise against load, 80,000 ft length of ruling grade against loads, requires 5 locomotives for operations.	Greatest rise against load of all the alternatives. Steep grades and additional locomotives substantially increase the long-term operating and maintenance costs of the alternative. Increased mileage and cost to markets in upper midwest	Eliminated from further consideration due to engineering, operating and environmental reasons.
BLM Alternative	1.0% ruling grade against loads, 450-ft total rise against load, 40,000 ft length of ruling grade against loads, requires 4 locomotives for operations.	Increased mileage, increased ROW acreage required, substantial cuts/fills, increased mileage to market place. Steep operating grades and additional locomotives result in high long-term operating and maintenance costs.	Eliminated from further consideration due to engineering and environmental reasons.
Tongue River Road Alternative	0.85% ruling grade against loads, 380-ft total rise against load, 18,500 ft length of ruling grade against loads, requires 4 locomotives for operations.	Substantial cuts & fills, rebuild Tongue River road, require right of way from County. Steep grades and added locomotives result in high long-term operating and maintenance costs.	Included in Level 1B Screening and EIS, potential reasonable alternative, uses existing transportation right-of-way,

Alternatives	Operating Characteristics	Issues	Results
Moon Creek Alternative	1.0% ruling grade against loads, 400-ft total rise against load, 40,000 ft length of ruling grade against loads, requires 5 locomotives for operations.	Substantial cuts & fills, additional rail mileage, impact to wildlife resources. Steep grades and additional locomotives result in high long-term operating and maintenance costs.	Included in Level 1B Screening and EIS, potential reasonable alternative, avoids LARRS.
Colstrip Alternative	0.85% ruling grade against loads, 600-ft total rise against load, 31,000 ft length of ruling grade against loads, requires 4 locomotives for operations.	Substantial cuts & fills, additional rail mileage, significantly longer hauls to upper midwest market. Very high long term operating and maintenance costs. Also must factor in the additional mileage from Colstrip to Forsyth to Miles City.	Included in Level 1B Screening and EIS, potential reasonable alternative though longer hauls result.

Additional Options For Routings Around Miles City and Ashland

In addition, SEE also considered several options which generally followed the proposed route, but presented various alternatives to it. The alternatives were considered to address potential impacts to LARRS, the Miles City Fish Hatchery and the City of Ashland. These routes are briefly described below and in Table 4 on pages 23 to 25. In addition, Map 1 on page 26 also shows nine of these options. The eleven alternatives considered were (1) Custer County/LARRS Option; (2) IntraSearch/LARRS Option; (3) LARRS Tongue River Option; (4) Proposed Rail Line through LARRS; (5) IntraSearch, East of Miles City; (6) Option in Township 4 North/Range 47 East; (7) Ashland N.W. Alignment; (8) Optional Route through Ashland; (9) Ashland SE Alignment; (10) BN Option; (11) Milwaukee Road Option. Options 3, 7, 9 and 10 were incorporated into the Preferred Alternative considered in the 1985 EIS and are discussed in the Level 1B screening. The reasons for rejecting the other options are described briefly below.

Options Related to Potential Impacts to LARRS

Early in the consideration of the Proposed Action USDA raised concerns about potential impacts to LARRS. LARRS was originally established as an army cavalry post, Ft. Keogh, in 1876 and in 1924 jurisdiction of the Ft. Keogh Military Reservation was transferred to the U.S. Department of Agriculture for experiments in stock raising and growing of forage crops. LARRS now occupies approximately 55,357 acres near the Miles City Fish Hatchery, which was built on land donated from LARRS. Approximately 1,800 acres at LARRS are under irrigation in the Yellowstone River Valley west of the laboratory headquarters while approximately 625 acres are in cultivated crops and 1,150 acres are in irrigated pastures. The remainder of the laboratory is rough, broken, lands typical of range cattle producing areas of the Northern Great Plains. The research program focuses on improving efficiency of beef cattle production for range land in the Northern Great Plains. These range lands, approximately 150 million acres stretching through Montana, North Dakota, South Dakota and Wyoming, are both ecologically fragile and vital to the economic well-being of the region. The work at LARRS involves studies in genetics, reproductive physiology, nutrition and growth of beef cattle and in range pasture development improvements and management. The research emphasizes the efficient and sustainable use of rangeland resources for livestock production with an emphasis on basic research to meet the immediate and future needs of farmers and ranchers in the region. For example, nutrition studies conducted at LARRS have demonstrated the importance of proper winter supplementation regimes for optimum rates of subsequent conception, calve survival and cow and calf weight gains. The cattle and farming operations at LARRS serve to support the research work including husbandry practices to meet the specific research protocols and maintaining farming operations to provide quality feedstuffs for research livestock using proper conservation and agronomic practices.

The USDA was concerned that alignments that divided research plots or resulted in the loss of lands to non-research use could severely damage, and in some instances destroy, the research at LARRS. For example, an alignment that followed the Tongue

River flood plain could eliminate most rangeland research. In addition, concerns were raised that changing the size, shape and livestock use patterns of large research pastures would make it impossible to compare new results with those obtained previously. A number of research projects at LARRS rely on the data base that has been collected over a period of many years. This enables researchers to statistically account for experimental results attributable to variables such as seasonal precipitation and pasture-stocking rate. The long-term consistency in the research plots is important to the overall research and cannot be mitigated except by avoidance of the plots.

Based on these concerns and other issues raised by the public and agency officials the following options were considered to minimize impacts to the research at LARRS.

The Custer County/LARRS Option is an approximately 10-mile link between the BNSF rail line in the Yellowstone Valley and the proposed rail line. It connects to the BNSF line about 5 miles southwest of Miles City and reaches the Tongue River bottom just north of Pumpkin Creek. The route would require more cuts and fills than other options and probably would create more environmental impacts to the research facility. In addition, the Custer County route bisects the LARRS and has more impact on research at the facility than would a route nearer the station's extremities. For these reasons, the SEE eliminated this option from further consideration. Appendix B at B-18.

The IntraSearch/LARRS Option is an approximately 4-mile line connecting the BNSF line in the Yellowstone Valley with the proposed rail line. Connections would be made with the BNSF about 3 miles southwest of Miles City and with the proposed rail line about 4 miles south of Miles City. This option would have a more adverse grade than other routes through the LARRS. As with the other alignments through the range station, it could affect activities at the facility and bisect research plots. However, this option could have a more serious impact to the station than other alignments in that it would cross several irrigated fields north of Interstate Highway 94. Therefore, SEE eliminated the option from further consideration. Appendix B at B-18.

The LARRS/Tongue River Option is an approximately 6-mile divergence from the proposed rail line route just south of Miles City. It follows the Tongue River more closely than the proposed rail line, remaining on the west side of the valley. It leaves the proposed rail line 1 mile south of the BNSF line just outside Miles City, rejoining the proposed route about 7 miles out of town. Selection of this option would dictate raising the grade above the Tongue River flood plain. The route's proximity to the river could present aquatic and hydrological problems. This option was initially retained for further study. Appendix B at B-18-19. After negotiations with the USDA for ROW across LARRS, a slightly different alignment was developed consistent with the LARRS ROW requirements, which is incorporated in the Proposed Action.

The Proposed Rail Line Through LARRS follows the west side of the Tongue River, through the LARRS, about a mile from the nearest river meanders. This option represents the best route from an engineering perspective. It is further from the Tongue River than the LARRS/Tongue River option, yet it has the same engineering

characteristics (0.2 ruling grade against load). The main constraint to selection of this option is its significant impact to range research plots at the LARRS. Due to this consideration, this option was eliminated from further consideration. Appendix B at B-19.

The IntraSearch, East of Miles City is an approximately 10-mile line which would have connected with the abandoned Milwaukee Railroad just northeast of Miles City and with the proposed rail line about 6 miles south of Miles City. This alignment would require an additional crossing of the Tongue River. This option has significant engineering and environmental consequences associated with it. This route would bisect agricultural, commercial, and residential properties on the south and east side of Miles City. The city's future residential expansion to the east would directly conflict with the option. In addition, selection of this option would necessitate a second crossing of the Tongue River and two additional highway crossings. Greater socioeconomic, aquatic, and hydrological impacts are associated with this option than with other options or alternatives, and therefore, it was not retained for further study. Appendix B at B-19.

The Option in Township 4 North/Range 47 East route is an approximately 2-mile divergence from the route proposed by TRRC. The proposed rail line route curves to the southeast in this area, generally following the river's curve; this option would curve to the northwest, away from the river. This option presents some additional engineering constraints when compared to the proposed rail line. It would require more cuts and fills and would result in additional adverse grade. The possible benefits that might result from this option were not significant enough to warrant its retention for further consideration. Appendix B at B-19.

Potential Impacts to Miles City Fish Hatchery

The 1984 SDEIS focused, among other things, on the impacts of the Proposed Action on the Miles City Fish Hatchery and looked at two options within the proposed action: the BN Option and the Milwaukee Road Option, which included a tie-in through the abandoned Milwaukee Road Rail Yards. The 1984 SDEIS concluded that the BN Option would (1) result in a reduction in overall traffic delays and the elimination of one at-grade crossing; (2) eliminate the need for a large cut through the "Camel's Back" and a large fill for a overpass of the Burlington Northern Line; (3) reduce air quality impacts to Miles City; (4) reduce noise impacts to Miles City; and, (5) reduce the numbers of acres of the hatchery impacted from approximately 15 to approximately 9. However, the 1984 SDEIS also recognized that vibrations from the operations of the trains as well as dust during construction could impact the fish hatchery. The 1986 FEIS required mitigation measures to address these impacts. Rather than dictating specific measures, the ICC determined that the proper forum for detailed mitigations plans would be the process for acquiring the right of way from the State. The BN Option alternative was incorporated into the Proposed Action, recognizing that mitigation would be required and TRRC has continued discussion with the State regarding specific mitigation measures.

As a result of the discussions between TRRC and FW&P, TRRC commissioned a study by Womack & Associates[11] based on a study plan that was developed in connection with and approved by FW&P. The study evaluated (1) the potential effects of vibration on the physical plant and the fish, (2) the potential for vibration to affect the stability of a erosional remnant bedrock (hogback), which is between the east side of the Hatchery and the proposed alignment, (3) possible water pollution due to blowing coal dust and herbicides, (4) potential effects on fish reproduction from the construction and operation of the TRRC, and, (5) corrosive effects of soil chemistry on buried fish hatchery piping.

The report concluded that the alignment would have no effect on the Hatchery structures or the hogback. The report also concluded that the sounds produced by the vibration resulting from the operation of the rail line would be heard by the fish, but would be below levels known to cause physiological damage to fish, eggs or zooplankton and are below levels used to effect or influence fish. With regard to coal dust emissions the report concluded that train speeds will be about 20 mph in the vicinity of the Hatchery, due to the connection with the BNSF, which is well-below the threshold velocity of 47 mph required to mobilize coal dust from the unit coal trains. Moreover, several studies have indicated that coal dust settles to the bottom of the rail car during the first few miles of transport and the coal will have traveled at least 80 miles by the time it is near the Hatchery. The study concluded that coal dust emissions are not anticipated. The report concluded that the herbicides planned for use were not likely to harm the fish. Nevertheless, the report recommended that mechanical weed control methods should be used near the Hatchery. If mechanical means did not control the weeds, then any use of herbicides should be pursuant to a specific plan that addresses potential drift. Finally, the data collected showed that the soil is corrosive in areas and is likely to affect iron valves and concrete structures.

The 2004 DSEIS included additional analyses related to the potential impacts to the Hatchery of proposed changes in the alignment near the Hatchery and changes at the Hatchery since the initial approval for the rail line. Changes at the Hatchery include the construction of additional ponds, a second intake line and the new recovery program for the pallid sturgeon. The proposed alignment changes include moving the staging sidings to a location south of Interstate 94 and constructing a modified "Wye" connection with the existing BNSF line.

In May 2004 Womack & Associates prepared a supplemental report which addressed questions raised by FW&P and others on the original report and incorporates findings of vibration analyses conducted for the proposed DM&E rail line in Minnesota, South Dakota and Wyoming. The supplemental report confirmed that vibrations from the Proposed Action would not have detrimental effects on the Hatchery.

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[11] Womack & Associates received technical assistance from SK Geotechnical, Cooksley Geophysics, Radian International and James Anderson, Ph.D., Associate Professor, School of Fisheries, College of Ocean and Fisheries Sciences, University of Washington.

In addition, TRRC has proposed certain mitigation measures regarding weed control and protection of the Hatchery's water supply lines, which were identified in the report as areas where there were potential adverse impacts. These mitigation measures are discussed in more detail on pages 50 and 51.

FW&P also had initially raised concerns about impacts of the rail line on river access. However, there are relatively few points where the Proposed Alternative would be between the Tongue River and the roads that provide public access to the river and the land in those instances is privately owned. FW&P has agreed that this issue is best addressed during the right of way acquisition process with the individual private landowner.

Potential Impacts to Ashland

Based on issues raised by the public, three options were considered regarding the connections in Ashland.

The Optional Route Through Ashland is an approximately 3-mile divergence from the route around Ashland proposed by TRRC. The proposed rail line is west of Ashland; this option would swing east of Ashland about a mile north of town, cross Highway 212 about a mile east of town, then swing back near the river about 2 miles south of town. The principal difficulty in constructing a rail line along this optional route is the amount of earthwork that would be required. Conceivably, a substantial amount of fill would be needed through the Otter Creek drainage. This work might increase sedimentation to the creek and impact water quality and aquatic resources. This option was eliminated since it did not appreciably differ from the rail line proposed by TRRC. Appendix B at B-19.

The Ashland Northwest Alignment presents the best engineering route around Ashland. However, it might affect some residential areas of Ashland and could isolate the community from the fire station. However, it was retained for further consideration in the DEIS.

The Ashland Southeast Alignment provides a more direct access to the Otter Creek Terminus and minimizes direct flood plain encroachment near the Tongue River/Otter Creek confluence. However, a large quantity of fill would be needed to cross the Otter Creek drainage, which could impact to water quality and aquatic resources. The route was retained for further evaluation and ultimately became part of the Proposed Action.

Table 4
Level 1A Screening
Additional Options Miles City to Ashland[12]

Alternative	Operational and Construction	Environmental Factors	Result
Proposed Action (including BN Option)	Ruling grade against load is 0.2%; total length of ruling grade of 15,000 ft; total rise against load 30-ft; estimated construction cost $129.2 mm*	Reduces impact on research at LARRs, impacts fewer acres of Hatchery	Included in EIS
Custer County/LARRS Option	Ruling grade against load is 1.0%; total rise against loads is 400 ft; length of ruling grade against loads is 40,000 ft; estimated construction cost $132.5 mm*	requires more cuts/fills and right-of-way acreage; bisects LARRS impacting research at the facility	Eliminated from further consideration
IntraSearch/LARRS Option	Ruling grade against loads is 0.83%; total rise against loads is 78-ft; length of ruling grade against loads is 9,000 ft; higher adverse grade than other routes through LARRS; estimated construction cost $132.3 mm*	Crosses several irrigated fields north of Interstate 94; severely impacting research at LARRS	Eliminated from further consideration
LARRS/Tongue River Option	Ruling grade against loads is 0.2%; total rise against loads is 30-ft; length of ruling grade against loads is 15,000 ft; option requires raising grade above Tongue River flood plain; estimated construction cost $129.2 mm*	Proximity of river necessitates rip-rap; may avoid impact to research but proximity to river presents aquatic and hydrologic problems	Retained for further study because of limited impact on LARRS; route was modified to be consistent with USDA ROW requirements across LARRS and modified version is incorporated in Proposed Action
Initial Option through LARRS	Ruling grade against loads is 0.2%; total rise against loads is 30-ft; length of ruling grade against loads is 15,000 ft; represents best route from engineering perspective, estimated construction cost $129.2 mm*	Further from Tongue River; significant impacts to range research plots on LARRS	Eliminated from further consideration due to significant impacts to LARRS

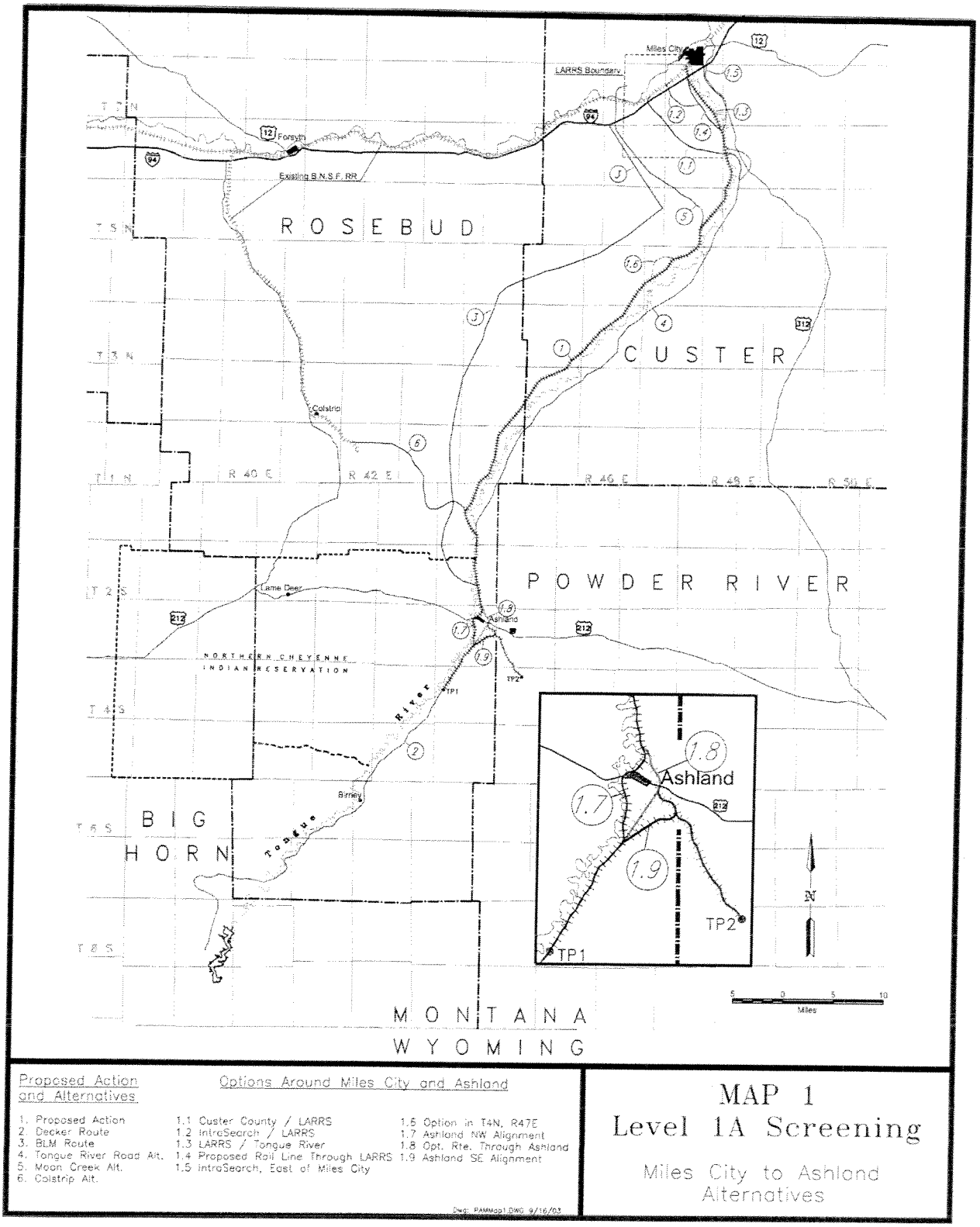
[12] This table presents various options, which generally followed the proposed route and which were developed in response to comments from the public and various agencies.

Alternative	Operational and Construction	Environmental Factors	Result
IntraSearch, East of Miles City	Ruling grade against loads is 0.24%; total rise against loads is 36-ft; length of ruling grade against loads is 14,000 ft; significant engineering and environmental consequences; estimated construction cost $133.7 mm*	Bisects agricultural, commercial and residential properties on east side of Miles City; requires additional crossing of Tongue River and two additional highway crossings; greater socioeconomic, aquatic, and hydrological impacts	Eliminated from further consideration
Option in T4N R47E	Ruling grade against loads is 0.4%; total rise against loads is 32-ft; length of ruling grade against loads is 8,000 ft; minor additional engineering constraints; results in additional adverse grade; possible benefits that might result from the option were not significant enough to warrant further consideration; construction cost estimate $129.7 mm*	Requires more cuts and fills than Proposed Action	Eliminated from further consideration
Milwaukee Road Option	Requires rehabilitation of the abandoned Milwaukee Rail Yard Interchange; requires an additional public grade crossing and high fills over BN Tracks, U.S. Highway 10 and I-94.	Requires large cut through Camel's Back; greater impact on Emergency Services in Miles City; impacts fewer acres of LARRS than BN options.	Eliminates from further consideration.
BN Option	Eliminates overpass of BN track and eliminates need to acquire property used by Miles City Livestock Yard, BLM and City of Miles City.	Eliminates one at grade crossing; eliminates need to cut through Camel's Back; reduce air quality and noise impacts to Miles City.	Included as part of Proposed Action.
Ashland NW Alignment	Ruling grade against loads is 0.6%; total rise against loads is 36-ft; length of ruling grade against loads is 6,000 ft; best engineering route around Ashland; affects some residential areas and might isolate the community fire station; socioeconomic impacts associated with option are possible constraints to selection; construction cost estimate $128.9 mm*	Proximity to Tongue River	Included in Level 1B Screening and EIS.

Alternative	Operational and Construction	Environmental Factors	Result
Optional Route through Ashland	Ruling grade against loads is 0.5%; total rise against loads is 50-ft; length of ruling grade against loads is 10,000 ft; requires additional earthwork (fill); construction cost estimate $136.5 mm*	Could increase sedimentation and impact water quality and aquatic resources in Otter Creek Drainage	Eliminated from further consideration since it did not appreciably differ from proposed rail line.
Ashland SE Alignment	Ruling grade against loads is 0.2%; total rise against loads is 30-ft; length of ruling grade against loads is 15,000 ft; similar difficulties as Optional Route through Ashland; better direct access to Otter Creek coal reserves; construction cost estimate $131.1 mm*	Potential impact to water quality and aquatic resources	Retained for further evaluation and became part of the Proposed Action.

*1985 dollars.

MAP # 1 - Level 1A Screening Miles City to Ashland Alternatives



As a result of the Level 1A screening process four alternatives were identified for further evaluation: (1) the Proposed Action, which included two alternative routes through Ashland -- Options 7 and 9 --discussed above and the BN Option at Miles City; (2) Tongue River Road Alternative; (3) Moon Creek Alternative; and (4) Colstrip Alternative. Each of these four alternatives is discussed in the Level 1B screening process below.

Ashland to Decker Extension

Given the existing end-points, (i.e., the end of the Miles City to Ashland segment on one end and the Spring Creek Mine Spur near Decker on the other end), desired operating characteristics and the topography of the region, there were a limited number of alternatives available for this extension. Criteria similar to those for the Miles City to Ashland line were considered for the Ashland to Decker extension including:

- Impact on agricultural, residential and commercial properties;
- Number of crossings or conflicts with the Tongue River;
- Number of county or state highway crossings;
- Number and length of bridges;
- Total curvature;
- Total cut;
- Total fill;
- Ruling grade;
- Length of ruling grade;
- Total length;
- Total costs;
- Operating and maintenance features and costs.

Initially five alternative routes were studied for the Ashland to Decker Extension, including:

- Four Mile Creek Alternative
- Original Preferred Alignment
- Prairie Dog Creek Alternative
- Canyon Creek Alternative
- Hanging Woman Creek Alternative.

A sixth alternative – the Western Alignment – was developed after the 1996 FEIS for the Ashland to Decker Extension proceeding was completed and is discussed in the 2004 DSEIS.

Three of these alternatives were screened out as not meeting the operational and design criteria outlined above. The three alternatives that were eliminated at this stage were the Prairie Dog Creek Alternative, the Canyon Creek Alternative and the Hanging

Woman Creek Alternative. Each is discussed briefly below and in Table 5 on pages 30 and 31 and shown on Map 2 on page 32. The remaining routes are discussed in the Level 1B screening.

The Prairie Dog Creek Alternative is discussed at page 18 of the 1994 SDEIS. This alternative would leave the Tongue River Valley at milepost 22 and climb westerly approximately 960 feet in elevation toward the divide with Rosebud Creek. When it reached the divide, it would turn south and tie in with the north end of the Four Mile Creek Alternative. This alternative was rejected as not practicable because grades (ascending and descending) would exceed 2% creating safety concerns, and it would not meet engineering or operational criteria, due to undesirable curvature, length and safe speeds. This alternative also is significantly longer than the Original Preferred Alignment with a total length of 58 miles as opposed to 39.7 for the Original Preferred Alignment.

The Canyon Creek Alternative is discussed at pages 18-19 of the 1994 SDEIS. This alternative would leave the Tongue River Valley at milepost 25.4 and then climb westerly toward the divide with Rosebud Creek. When it reached 900 feet above the Tongue River Valley, it would turn south to tie in with the north end of the Four Mile Creek Alternative. This alternative also was rejected as not practicable because grades (ascending and descending) would exceed 2% and it would not meet design or operational criteria, such as curvature and safe speed. In addition, it would be significantly longer than the Original Preferred Alignment -- 54 miles v. 39.7 miles.

The Hanging Woman Creek Alternative is discussed at page 19 of the 1994 SDEIS. This alternative would separate from the Original Preferred Alignment at milepost 14.8 just north of Birney and proceed south following Hanging Woman Creek until a few miles north of the Montana/Wyoming border. At that point, the alternative would turn west and climb toward the divide between Hanging Woman Creek and the Tongue River. After crossing the divide, the alternative would turn northwest and descend toward the East Decker mine where it would join the East Decker rail spur. This alternative was rejected because it would have excessive grades against loads exceeding 2%, would fail to meet engineering or operational design criteria, such as curvature and safe speed and would be significantly longer than the Original Preferred Alignment -- 56 miles vs. 39.7 miles.

Based upon the rough topography of the area and evaluation of the engineering designs in consultation with engineering and operations experts, SEA concluded that these three alternatives would not be feasible. See 1994 SDEIS at 19-20.

Initially as a result of the Level 1A Screening Process for the Ashland to Decker Extension only two alternatives, the Original Preferred Alignment, as modified, and the Four Mile Creek Alternative were identified for further evaluation. These two alignments plus the No Action Alternative are discussed in the Level 1B screening process below as well as in the 1992 DEIS, 1994 SEIS, 1996 EIS. Subsequently in 1998, TRRC proposed an additional alternative for the Ashland to Decker Extension.

This alternative routing, known as the Western Alignment, is discussed in the Level 2 Screening and in the 2004 DSEIS.

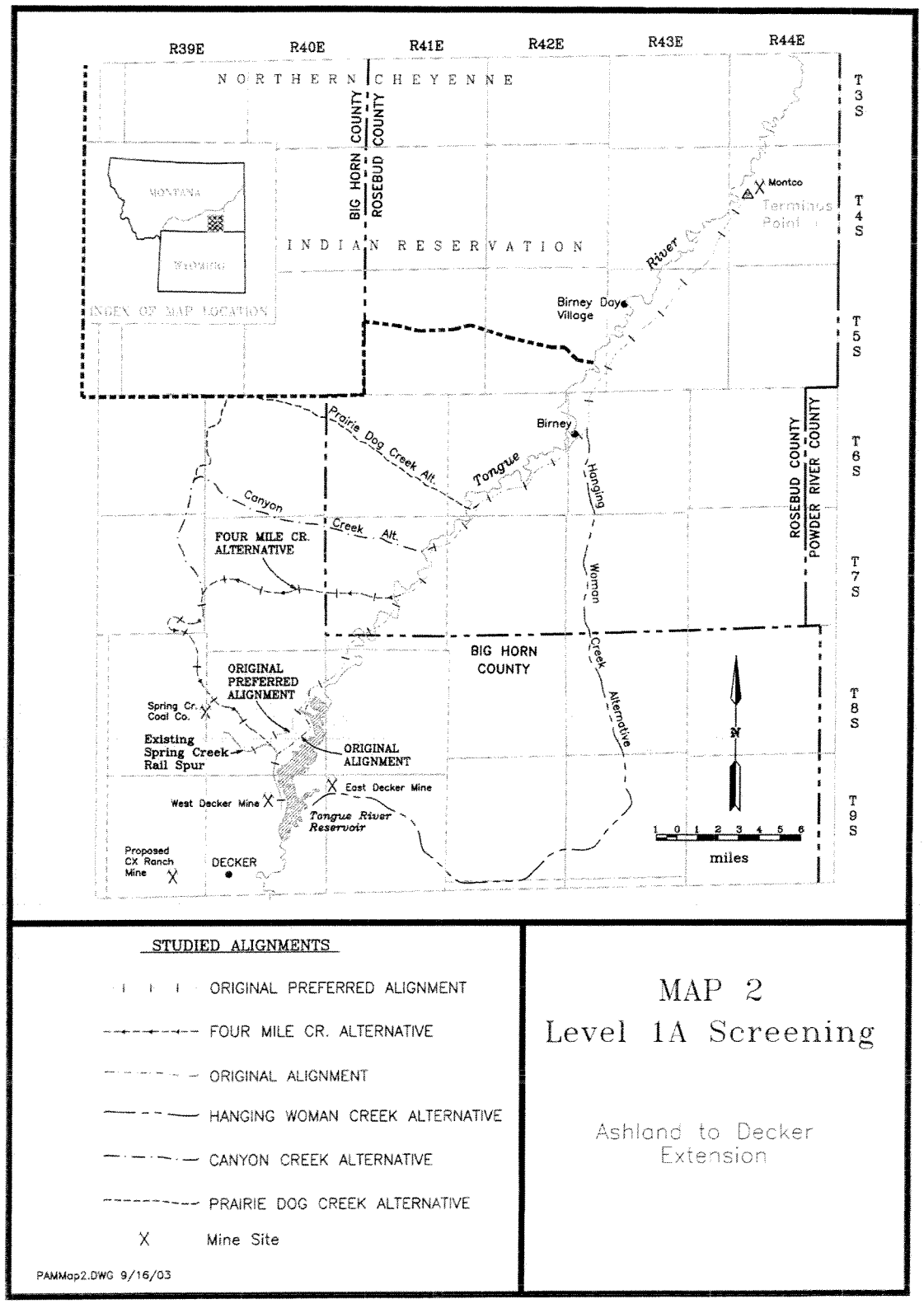
Table 5
Level 1A Screening
Ashland to Decker Extension

Alternative	Operating Characteristics	Issues	Results
Four Mile Creek	Maximum ascending grade of 1.5% for approximately 13 miles and a maximum descending grade of 2.3%	51 miles in length; route traverses pronghorn habitat and ROW could inhibit pronghorn migration;	Included in Level 1B screening, 1996 EIS and 2004 DSEIS STB approved this alignment in 1996
Original Preferred Alignment[13]	Maximum ascending grade of 0.5% for approximately 2 miles and gradual descending grade to Miles City	41 miles in length. Would require the construction of five bridges and a tunnel in the Tongue River Canyon	Included in Level 1B and 1996 EIS; not included in 2004 DSEIS
Prairie Dog Creek	Ascending and descending grades exceed 2% creating safety concerns;	58 miles long (significantly longer than the Original Preferred Alignment); steeper topography requiring greater land disturbance than the Original Preferred or Four Mile Creek Alignments.	Eliminated from further consideration
Canyon Creek	Ascending and descending grades would exceed 2%; curvature does not meet operational and design criteria;	54 miles long (significantly longer then the Original Preferred Alignment); steeper topography requiring greater land disturbance than the Original Preferred or Four Mile Creek Alignments.	Eliminated from further consideration

[13] Approximately 4 miles of this routing was modified as a result of comments from the Montana Department of Natural Resources and Conservation. This modification, which was considered in the 1994 SDEIS, changed the proposed route on the west side of the Tongue River Reservoir. At the northern end of the modification the alignment was moved approximately 300 feet west to avoid fishing access, private cabins and the recreational access road. At the southern end, the alignment was moved ¾ to 1½ miles west to provide a larger buffer between the proposed railroad and the state recreational area.

Alternative	Operating Characteristics	Issues	Results
Hanging Woman Creek	Grades against load would exceed 2%; fails to meet operational criteria for curvature;	56 miles long (significantly longer than the Original Preferred Alignment). Steeper topography requiring greater land disturbance than the Original Preferred or Four Mile Creek Alignments.	Eliminated from further consideration

MAP # 2 - Level 1A Screening Ashland to Decker Extension



Level 1B Screening

Miles City to Ashland Line

Four alternatives and the No-Action Alternative were discussed in the 1985 EIS for the Miles City to Ashland line. These four alternatives, the TRRC Preferred Alternative (the Proposed Action), the Tongue River Road Alternative, the Moon Creek Alternative and the Colstrip Alternative, are summarized in Table 6 on page 36. Each of these alternatives is discussed below. In addition, Map 3 on page 37 shows the four alternatives.

The No Action Alternative would provide no rail service to the Ashland area, and, thus, foreclose economic transport for the new mine production of low-sulfur coal from the Ashland area. The 1985 EIS concluded that due to "various environmental, economic, engineering and legal considerations" there was no alternative mode of transporting coal from the area. See 1985 EIS at iii. The No Action Alternative would provide no service to the proposed Ashland mines and, therefore, does not meet the stated purpose and need for the Proposed Action and is not a practicable alternative.

The Proposed Action would provide a direct link with the existing BNSF mainline at Miles City. From Miles City the route would bear south along the west side of the Tongue River to a point approximately 10 miles north of Ashland. The route would cross the Tongue River and continue south along the east side of the Tongue River drainage. Near Ashland the route would divide with one branch following approximately eight miles southeast along the Otter Creek drainage to Terminus Point 2 and the main branch would continue along the east side of the valley about nine miles to Terminus Point 1.[14]

From an engineering and operational standpoint, the Proposed Action is the most desirable route. The 0.33-percent ruling grade against loads is less than the ruling grade for any of the other alternatives. The 1985 EIS recognized that this would be the most desirable route from an engineering standpoint and stated that the environmental impacts associated with the Proposed Action would be comparable to those that are anticipated

[14] Two alternative routes around Ashland were considered and both were approved by the ICC. The two routes are the Ashland Northwest Alignment (Option 7) and the Ashland Southeast Alignment (Option 9). The Ashland Northwest Alignment runs through the west side of Ashland, swinging southwest toward the river about a mile north of Ashland and closely following the east side of the Tongue River for about 2 miles. The Ashland Southeast Alignment swings east of Ashland about a mile north of the town, crosses Highway 212 east of town, then swings back to the west about 2 miles south of town. TRRC ultimately selected the Ashland Southeast Alignment as part of the Proposed Action because it had fewer impacts on the Ashland community and the Tongue River.

for the Tongue River Road Alternative and the Moon Creek Alternative, but would be greater than those for the Colstrip Alternative. Taking into account the engineering and marketing considerations[15] in addition to the environmental impacts, the 1985 EIS concluded at page i that the Proposed Action and the Colstrip Alternative were the only feasible alternatives. However, as discussed in the Level 2 Screening, the Proposed Action has fewer impacts on aquatic resources than the Colstrip Alternative. Further, the 1985 EIS did not consider the environmental impacts associated with rebuilding the Colstrip to Forsyth spur which, as discussed below, would be required to meet current mainline railroad specifications.

The Tongue River Road Alternative would follow the Proposed Action south from Miles City on the west side of the river for about eight miles and then cross to the east side of the river near the mouth of Pumpkin Creek. It would then parallel the Tongue River Road until it would rejoin the Proposed Action approximately 10 miles north of Ashland.

From an engineering standpoint, the route would not be as desirable as the Proposed Action. The 0.85-percent ruling grade against load would result in higher construction and ultimately higher operational and maintenance costs. Because this alignment attempts to parallel an existing road it has many changes in elevation, which would result in significant earthwork, and, thus, increased construction costs. The 1985 EIS found at page 42 that the Tongue River Road Alternative would require two additional locomotives per train over most of the line. The Tongue River Road Alternative follows the same alignment through the LARRS as the Proposed Action, and would pose the same potential for impact to ongoing research and research plots. While the 1985 FEIS concluded at page i that the environmental impacts of the Tongue River Road Alternative and the Proposed Action were comparable, it also concluded that the Tongue River Road Alternative was not feasible because of marketing and engineering factors.

The Moon Creek Alternative would cross the Yellowstone River near Miles City and head west along an abandoned railroad right of way for approximately eight miles, then cross the Yellowstone River again and head southeast up the Moon Creek drainage, cross a ridge dividing the Yellowstone and Tongue Rivers and descend to join the Proposed Action approximately 14 miles south of Miles City.

This alternative was examined primarily as a means of limiting the potential impacts to the LARRS. It traverses only 2.5 miles of the southwest corner of that facility and would not be likely to significantly affect ongoing research activities. The 1985 EIS concluded at page xiii that a 1% ruling grade against load renders this route less favorable in terms of engineering constraints, energy efficiency and ultimate consumer costs. The

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[15] The main market for coal transported on the Tongue River Railroad would be the Upper Midwest. Factors such as the length of the line, construction costs and operation and maintenance costs all impact the transportation costs of the coal, and, thus, the competitive marketability of the coal.

1985 EIS noted at page 43 that the Moon Creek Alternative would require three additional locomotives per train because of the rough topography encountered on this alignment. While the 1985 EIS concluded at page i that the environmental impacts of the Moon Creek Alternative and the Proposed Action were comparable, it also concluded that the Moon Creek alternative was not feasible because of marketing, engineering, and operational factors.

The Colstrip Alternative would begin west of the town of Forsyth on the BNSF rail line at a point about 50 miles west of Miles City. It would use the existing Colstrip Spur running about 30 miles south to the town of Colstrip. However, much of this spur would have to be rebuilt to handle the tonnage projected for the Tongue River Railroad. From Colstrip the route would cross Cow and Rosebud Creeks, then head southeast up the Greenleaf Creek drainage. It would cross the divide between the Rosebud Creek and Tongue River drainages, then parallel Roe and Cooper Creeks as it descends into the Tongue River Valley, where it would join the TRRC Preferred Alignment north of Ashland.

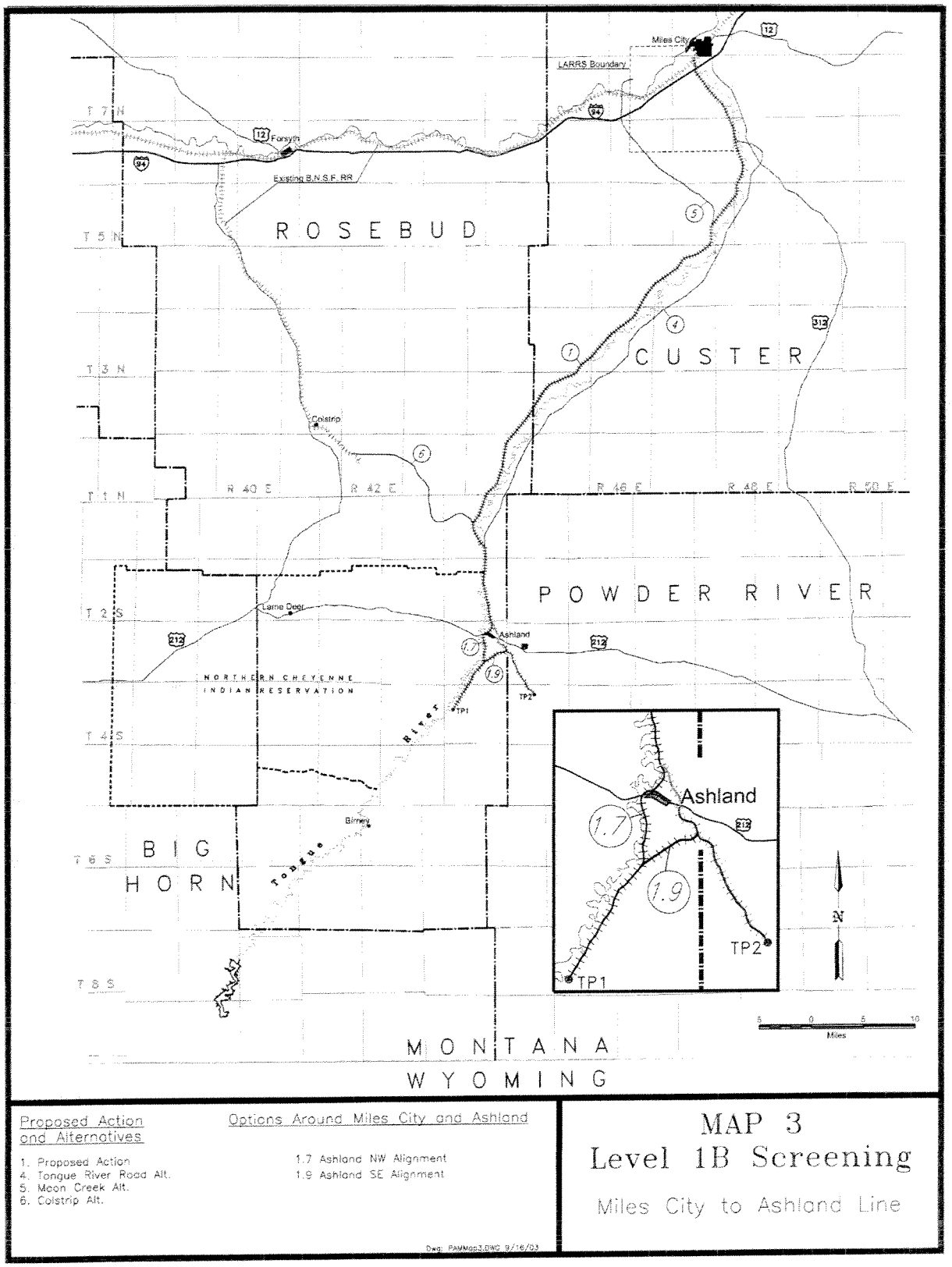
The Colstrip Alternative has higher operation and maintenance costs than the Proposed Action. The 1985 EIS at page 44 found that the Colstrip Alternative would require two additional locomotives per train because topography for this alignment would be rougher than that for the Proposed Action. The 1985 EIS concluded that Colstrip and the Proposed Action were feasible alternatives. However, it also concluded that the Colstrip Alternative would have fewer environmental impacts than the Proposed Action. In reaching this conclusion, the 1985 FEIS did not consider the impacts of rebuilding the Colstrip to Forsyth spur, which would increase the cost of the alternative and, as discussed below, have significant environmental impacts.

Table 6
Level 1B Screening
Rail Alternatives Miles City to Ashland

Alternatives	Marketing, Operational and Engineering Costs
No Action Alternative	Does not meet project objectives
Proposed Action	89-mile rail line. Requires 2 locomotives for operations. Vegetation and wildlife habitat lost due to ROW 1,278 acres. Estimated 430 to 690 million tons of coal hauled from project area during analysis period, fuel used to transport coal within project area is 61 million gallons. Construction cost estimate $137.3 mm*
Tongue River Road Alternative	88-mile rail line. Requires 4 locomotives for operations due to adverse grades. Greater grade and curvature specifications requires additional maintenance. Vegetation and wildlife habitat lost due to ROW, 1,413 acres. Estimated 430 to 690 million tons of coal hauled from project area during analysis period, fuel used to transport coal within project area is 85 million gallons. Construction cost estimate $146.5 mm*.
Moon Creek Alternative	Requires 5 locomotives for operations due to adverse grades. Greater grade and curvature specifications necessitate more frequent maintenance. Vegetation and wildlife habitat lost due to ROW, 1,323 acres. Estimated 430 to 690 million tons of coal hauled from project area during analysis period, fuel used to transport coal within project area is 92 million gallons. Construction cost estimate $140.8 mm*
Colstrip Alternative	47-mile rail line, increased total hauling distance to Miles City and markets in the upper midwest. Requires 4 locomotives for operations. Greater grade and curvature specifications necessitate more frequent maintenance. Vegetation and wildlife habitat lost due to ROW, 838 acres, not including acres necessary to upgrade rail alignment north from Colstrip to the BNSF mainline. Estimated 430 to 690 million tons of coal hauled from project area during analysis period, fuel used to transport coal within project area is 66 million gallons, not including fuel consumption to move coal from Colstrip to Miles City. Construction cost estimate $74.5 mm*, not including costs to upgrade rail spur from Colstrip north to the connection with the BN mainline.

*1985 dollars.

MAP # 3 - Level 1B Screening Alternatives Miles City to Ashland Line.



Ashland to Decker Extension

Two alternative routings for the Ashland to Decker extension and the No Action Alternative were considered in the 1996 EIS. The two alternatives are: the Original Preferred Alignment and the Four Mile Creek Alternative. Subsequently, the Western Alignment was developed in 1998 and is considered below and in the 2004 DSEIS. Each of these alternatives are discussed below and summarized in Table 7 on page 40.

The No Action Alternative would not offer the same transportation distance advantages to the Decker area mines. These mines would continue to use the existing BNSF route through Sheridan, Wyoming. This circuitous route is significantly longer than the Proposed Action. The Proposed Action would save approximately 320 to 350 miles on each round trip. The No Action Alternative provides no transportation savings to the Decker mines, and, therefore, does not meet the purpose and need for the Proposed Action and is not a practicable alternative.

Original Preferred Alignment. From Terminus Point 1 on the Miles City to Ashland segment, this alternative would follow the east side of the Tongue River Valley to the mouth of the Four Mile Creek drainage. The alignment then would cross the river five times and pass to the west of the Tongue River Reservoir before it joins the existing Spring Creek mine spur. The alternative was TRRC's preferred route in the Ashland to Decker extension proceeding. The Original Preferred Alignment and the environmental impacts associated with it are discussed in detail in the 1992 DEIS, 1994 SEIS and 1996 EIS. This alternative is shown on Map 4 on page 41. The 1996 EIS concluded at page iv that the Four Mile Creek Alternative would be environmentally preferable to this alternative because the Four Mile Creek Alternative would avoid the environmentally sensitive Tongue River Canyon.

The Original Preferred Alignment has certain engineering advantages over the Western Alignment (TRRC's current preferred route and part of the Proposed Action) and the Four Mile Creek Alternative. The Original Preferred Alignment would require fewer cuts and fills and would disturb less acreage overall than the Western Alignment or the Four Mile Creek Alternative. The Original Preferred Alignment has a maximum ascending grade for loaded trains of 0.5% for approximately 2 miles and then a gradual descending grade to Miles City. This is almost identical to the Western Alignment and is preferable to the more severe grades of the Four Mile Creek Alternative. Loaded trains on the Original Preferred Alignment would not require helper locomotives as would be required for the Four Mile Creek Alternative. However, the Original Preferred Alignment would cross the Tongue River five times as compared to only once for the other two alternatives. It is also 1.4 miles longer than the Western Alignment. The Original Preferred Alignment could result in greater impacts to the Tongue River due to the river crossings and would be closer to a bald eagle nest site than the other two

alternatives. The STB decided not to approve the alignment. This alternative is not considered in the 2004 DSEIS.

Four Mile Creek Alternative. The Four Mile Creek Alternative would be identical to the Original Preferred Alignment from Terminus Point 1 on the Miles City to Ashland segment paralleling the east side of the Valley until the confluence of the Tongue River and Four Mile Creek. This alternative would then diverge from the Original Preferred Alignment and extend westerly along Four Mile Creek, climbing steeply away from the Tongue River. It would then turn southwestward approximately three miles from the divergence point and continue southwesterly. It would then turn south and east until it connects with the Spring Creek rail spur. This alternative is shown on Map 4 on page 41. While recognizing that there are potentially significant environmental impacts associated with this alternative, the 1996 FEIS concluded at page iv that the Four Mile Creek Alternative would be environmentally preferable to the Original Preferred Alignment.

The Four Mile Creek Alternative poses significant operational problems due to the adverse grades and curves on the alignment. The Four Mile Creek Alternative has a maximum ascending grade for loaded trains of 1.5% for a distance of approximately 13 miles and a maximum descending grade of approximately 2.3% extending for 3.18 miles. In comparison, the Original Preferred Alignment and the Western Alignment both have a maximum ascending grade for loaded trains of 0.5% over 2.1 miles and then a gradual descending grade to Miles City. There would be significantly higher operating and maintenance costs associated with the Four Mile Creek Alternative that would impact the viability of the railroad. In addition, this alternative would require the use of three helper locomotives for over 16 miles, while the Western Alignment would require a helper locomotive only for that portion of the Spring Creek mine spur that would connect to the Tongue River Railroad from the West Decker mine. The extra locomotives required for the Four Mile Creek Alternative would result in increased fuel consumption and air emissions. The alignment is longer than the Western Alignment and is closer to residences. The Four Mile Creek Alternative would require more disturbance of earthwork than the Original Preferred Alignment, but less than the Western Alignment.

Western Alignment (Proposed Action). The Western Alignment is part of the Proposed Action. The Western Alignment separates from the Four Mile Creek Alternative and the Original Preferred Alignment approximately nine miles north of the mouth of the Four Mile Creek. At that point, the Western Alignment crosses to the west side of the Tongue River Valley approximately 3,000 feet downstream from the existing county road bridge over the Tongue River. The alignment then generally parallels the existing Tongue River county road for four miles, at which point it separates from the county road and continues to climb away from the Tongue River Valley. After approximately two miles, the Western Alignment crosses the Four Mile Creek drainage continuing south and away from the Tongue River Valley. After approximately six miles, the Western Alignment passes about one mile west of the Tongue River Dam and proceeds directly southwest to tie with the Spring Creek mine spur. The Western Alignment and the environmental impacts associated with it are discussed in detail in the 2004 DSEIS. This alternative is shown on Map 4 on page 41.

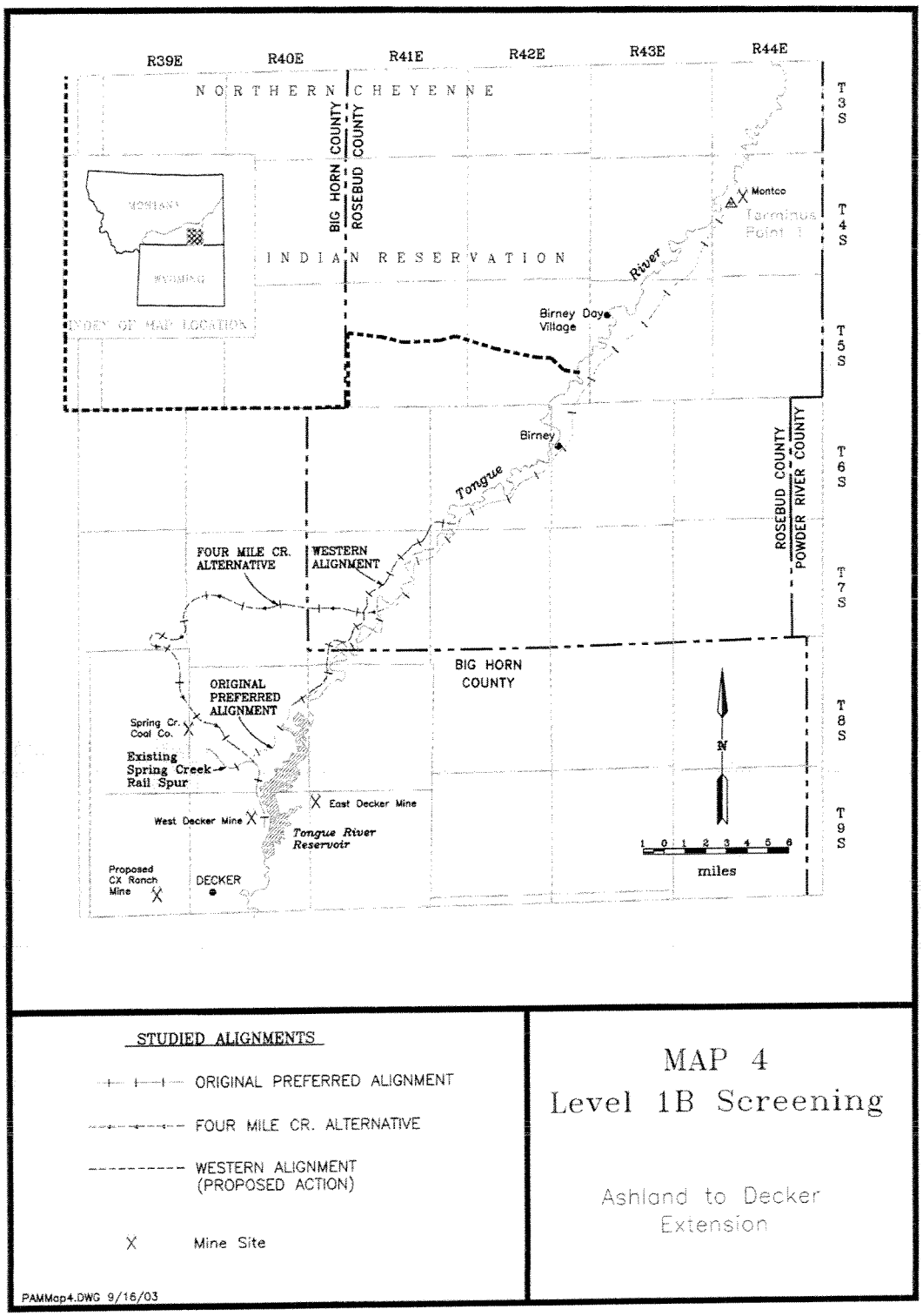
The Western Alignment has significant engineering and operational advantages over the Four Mile Creek Alternative. The grades and curves are much less severe than the Four Mile Creek Alternative and are comparable to those in the Original Preferred Alignment. The Western Alignment has a maximum ascending grade for a loaded train of 0.5% for approximately 2 miles and then a gradual descending grade to Miles City. The maximum descending grade for loaded trains is 0.93%. Unlike the Four Mile Creek Alternative, helper locomotives would not be required for the Western Alignment. While the volume of earthwork for the Western Alignment is greater than for the Four Mile Creek Alternative or the Original Preferred Alignment, the total number of disturbed acres is less than for the Four Mile Creek Alternative.

Table 7
Level 1B Screening Analysis
Ashland to Decker Extension

Alternative	Marketing, Operational and Engineering Costs
No Action Alternative	Does not meet project purpose and needs
Original Preferred Alignment	Approximately 41 mile rail line extension. Requires 2 locomotives for operations; maximum ascending grade of 0.5 % and gradual descending grade for loaded coal trains. Vegetation and wildlife habitat lost to due to ROW 637 acres; would require the construction of five bridges and a tunnel in the Tongue River Canyon. Estimated construction costs $76.8 mm.*
Four Mile Creek Alternative	Approximately 50 mile rail line extension. Requires 5 locomotives; maximum ascending grade of 1.5% and maximum descending grade of 2.3% for loaded coal trains raises safety, engineering and operational concerns; Vegetation and wildlife habitat lost to due to ROW 781 acres; Estimated construction costs $84.3mm.*
Western Alignment (Proposed Action)	An alternative alignment for the southernmost 17 miles of an approximately 40 mile extension of the rail line was proposed in 1998. Requires 2 locomotives; maximum ascending grade of 0.5% and maximum descending grade of 0.93% for loaded coal trains. Vegetation and wildlife habitat lost due to ROW 672 acres. Estimated construction costs $92.6mm.*

*1998 Escalated dollars.

MAP # 4 - Level 1B Screening Ashland to Decker Extension



STEP 4 LEVEL 2 SCREENING.

In the Level 2 Screening Process the practicable alternatives as identified from the Level 1A and Level 1B screenings are considered in three parts coinciding with the information considered in TRR I, TRR II, and TRR III.

Miles City to Ashland (TRRI)

The four alternatives considered from Miles City to Ashland in TRRI are:

- Proposed Action
- Tongue River Road Alternative
- Moon Creek Alternative
- Colstrip Alternative

These alignments are shown on Map 3 on page 37. Table 8 on page 45 provides a comparison of the alternative alignments evaluated by TRRC and ICC for the portion of the rail line between Miles City and Ashland. The ICC studied these alternatives in TRRI and approved the Proposed Action in 1986. Table 8 compares the length, total number and total acreage of Waters of the U.S. impacted, cultural resources potentially impacted, air emissions, public grade crossings, fuel consumption, required locomotives, number of potential accidents, potential number of threatened and endangered species, and aquatic impacts for each of these four alternatives.

In addition to the information in the 1985 EIS or 1996 EIS, information on the impact of each of these alternatives on the Waters of the U.S. was reviewed in 2003 and has been incorporated in the "Initial Analysis of Waters of the U.S., Tongue River Railroad Alternatives" ("Initial Analysis Report"), which is attached as Appendix D to the 2004 DSEIS. Each of these alternatives is discussed below. Two of these alternatives, Tongue River Road and Moon Creek, only questionably pass the Level 1B screening for practical alternatives due to engineering and operational concerns. Nevertheless, these two alternatives are included in the Level 2 screening as each was discussed in detail in the 1985 EIS.

The Proposed Action is the proposed Tongue River Railroad route approved by the STB and its predecessor, the ICC, in prior proceedings. The Proposed Action impacts less total acreage of Waters of the U.S. than any of the other alternatives. See Initial Analysis Report at Table 1. The Proposed Action impacts 33.54 total acres of Waters of the U.S. as compared to 49.42 acres for the Colstrip Alternative. Moreover, it is aligned away from the river to the extent practicable. In addition, because it would use the least number of locomotives, it would result in lower fuel consumption and air emissions than the other alternatives. Its impact on cultural resources is similar to those of the other alternatives. The proposed action would have the same impact on threatened and

endangered terrestrial species as the other alternatives. It would have fewer impacts on aquatic resource due to the fewer stream crossing and according to the EIS in TRRI it is the only alternative that does not impact areas with significant aquatic habitat values and significant aquatic species values. It would have some impacts on the Miles City Fish Hatchery, but these impacts could be addressed through mitigation, which the Applicant has proposed and the STB and its predecessor, the ICC, have required. The Proposed Action avoids dissection of major research plots at LARRS.

Tongue River Road Alternative would utilize portions of an existing transportation corridor, thereby limiting, to some extent, the necessity to sever agricultural parcels and disturb irrigation systems. The alignment would potentially disrupt access to residences and agricultural fields along the Tongue River Road. The 1985 EIS at page xiii found that the potential for grade-crossing accidents along the Tongue River Road Alternative would be higher than for any of the other alternatives. The Tongue River Road Alternative also impacts the largest acreage of Waters of the U.S. Moreover, the acres especially affected are classed as river with wetland fringe and abandoned meanders. See Initial Analysis Report at Table 1. The large acreage in these two categories is due to the fact that the centerline for this alternative passes within 200 feet of the Tongue River or its abandoned meanders at several locations. Upon final design the number of the sites might be reduced, but this alternative would still have a more significant adverse impact on Waters of the US than the Proposed Action. This alternative would have the same potential impacts on the Hatchery as the Proposed Action and would also impact Pumpkin Creek, which carriers a high aquatic species habitat value. The alignment would have a similar impact to LARRS as the Proposed Action.

Moon Creek Alternative would require the construction of a railroad bridge across the Yellowstone River and the rehabilitation of an existing bridge across the Yellowstone River. The bridge construction is on an area of the Yellowstone River that the DEIS has categorized as a "high priority fishery resource." None of the other routes under consideration include a Yellowstone River crossing. The Initial Analysis Report found that this alternative would impact 42.40 acres of Waters of the U.S. This alternative has the highest number of potential cultural resources within the right of way. It would take some research land from LARRS, but it would be less than the Proposed Action or the Tongue River Road Alternative.

Colstrip Alternative would be comprised of about 30 miles of reconstructed route from the BNSF line approximately 6 miles west of Forsyth to Colstrip and about 22 miles of new route from Colstrip southeast to the Tongue River Valley where it would connect with the Proposed Action. The greater length of this alternative would result in longer haul distances, higher rail rates, greater fuel consumption and higher air emissions than the Proposed Action. This alternative would avoid impacts to the LARRS entirely. However, the 1985 EIS concluded at page xiii that increased rail traffic in the Colstrip and Forsyth areas would result in more vehicular delays. In addition, the adverse grades associated with this alternative would require two additional helper locomotives resulting in higher fuel consumption and air emissions than for the Proposed Action. The 1985

EIS concluded at page xiii that by virtue of the considerably shorter distance involved, Colstrip would result in proportionally fewer environmental impacts than the Proposed Action. However, the 1985 EIS did not consider the environmental impacts of rebuilding the existing spur north of Colstrip. The spur would have to be rebuilt to meet the specifications for the projected tonnage for the Tongue River Railroad. The Initial Analysis Report showed that the Colstrip Alternative, although representing the shortest newly constructed route, impacts more acreage of Waters of the US than the Proposed Action because it follows the existing railroad from Forsyth to Colstrip along or in the floodplain of Armells Creek, a perennial stream. It also would require the crossing of Rosebud Creek, which the DEIS found is a significant aquatic species habitat. It would avoid impacts to the Hatchery.

Table 8
Level 2 Screening
Miles City to Ashland (Alternatives Considered in TRRI)

Alternative	Approx. Length (Miles)	Total Number Waters of the US	Total Acreage WUS	Cultural Resources Impacted Within the ROW	Potential Cultural Resource Sites within 1,500 Feet of the Centerline	Air Emissions Operation	Number of Public At Grade Crossings*	Fuel Consumption per round trip Miles City to Ashland	Required Locomotives	Number of Potential Accidents	Number of T&E Species Potentially Impacted Terrestrial	Aquatic Impacts
TRRC Proposed Route (approved 1986)	89	195	33.54	4	34	TSP 2.4 ug/m^3 SO_2 0.002 ppm NO_2 0.016 ppm CO 0.08 ppm HC 0.024 ppm	2	989 gals.	2	7.6	1 (Bald Eagle)	Potential impacts to Hatchery required additional study; subsequent study showed vibration and coal dust impacts not likely; other impacts addressed in mitigation; two bridge crossings of Tongue River could have short-term impacts but are not in high sport fishery value areas
Tongue River Road Alternative	88	207	89.84	4	48	TSP 3.3 ug/m^3 SO_2 0.003 ppm NO_2 0.023 ppm CO 0.112 ppm HC 0.034 ppm	4	1456 gals.	4	8.2	1 (Bald Eagle)	Same potential impacts to Hatchery as Proposed Action; plus requires a bridge across Pumpkin Creek, which carries a high species/habitat value
Moon Creek Alternative BN to Miles City	89 +7 96	192	42.40	7	32	TSP 3.6 ug/m^3 SO_2 0.003 ppm NO_2 0.025 ppm CO 0.124 ppm HC 0.037 ppm	3 +0 3	1573 gals +90 gals 1663 gals	5	7.9	1 (Bald Eagle)	Similar to proposed action in impacts to the Tongue River plus requires bridge crossing of the Yellowstone River in section of the river which is "high priority fishery resource."
Colstrip Alternative Colstrip to Miles City	46 +80 126	206	49.42	2	20	TSP 5.4 ug/m^3 SO_2 0.005 ppm[c] NO_2 0.038 ppm CO 0.18 ppm[d] HC 0.055 ppm	2 +6 8	1118 gals +1385 gals 2503 gals	4	5.7	1 (Bald Eagle)	Requires crossing of Rosebud Creek, which holds a significant species/habitat area

*Using the Ashland SE Alignment

Ashland to Decker (TRRII)

The alternatives considered in the extension from Ashland to Decker in the 1996 FEIS include the route originally proposed by the TRRC and the Four Mile Creek alternative. Table 9 on page 47 provides a comparison of the alternate alignments studied by TRRC and STB in TRRII. The STB approved the Four Mile Creek alternative in 1996.

Original Preferred Alignment. This alternative would follow the east side of the Tongue River Valley from the terminus point of the Miles City to Ashland segment to the mouth of the Four Mile Creek drainage where it would then cross the Tongue River five times and pass to the west of the Tongue River Reservoir before joining the existing Spring Creek Mine Spur. The Original Preferred alignment would require fewer cuts and fills and disturb less acreage overall than the Four Mile Creek Alternative. It has a maximum ascending grade for loaded trains of 0.5%. However the alignment would cross the Tongue River five times and could result in greater impacts to the Tongue River Canyon. In 1996 the STB's Section of Environmental Analysis determined that the environmental impacts of this alternative were greater than those of the Four Mile Creek Alternative and the STB decided not to approve this alignment. This alignment is discussed in detail in the 1996 EIS. It is not included in the 2004 DSEIS.

Four Mile Creek Alternative. This alternative would follow the east side of the Tongue River Valley from the terminus of the Miles City to Ashland segment until the confluence of the Tongue River and Four Mile Creek, extending westerly along Four Mile Creek and climbing steeply away from the Tongue River. It would then turn southwesterly approximately three miles from the divergence point and continue southwesterly until turning south and east to connect with the Spring Creek rail spur. The Four Mile Creek Alternative and the environmental impacts associated with it are discussed in detail in the 1996 EIS and the 2004 DSEIS.

The 1996 EIS noted at pages 4 to 6 that while the Four Mile Creek Alternative segment would avoid ranching and farming operations and impacts to nesting and wintering bald eagles and wintering waterfowl immediately below the Tongue River Dam, it would cross more residential access roads, and would be as close as 100 feet to two residences. In addition, it would require more locomotives during operations, resulting in more fuel consumption and air emissions. It also would require reconstruction of a portion of State Highway 312. The Four Mile Creek would impact more acres of Waters of the U.S. than the other alternatives. In addition, the Initial Analysis Report found that this alternative encounters the greatest number of potential Waters of the U.S. as it follows the drainage of Four Mile Creek.

Table 9
Level 2 Screening
Ashland to Decker Extension (Alternatives Considered in TRRII)

Alternative	Approx. Length (Miles)	Intermittent streams Perennial Streams River Crossings	Cultural Resources Impacted Within the ROW	Potential Cultural Resource Sites within 1,500 Feet of the Centerline	Air Emissions Operation	Number of Public At Grade Crossings	Fuel Consumption per round trip Decker to Ashland	Required Locomotives	Number of Potential Accidents	Number of T&E Species Potentially Impacted Terrestrial	Aquatic Impacts
Original Preferred Alignment (TRRC's Preferred Alignment in 1996)	40.3	98 1 5	8	44	PM-10 0.58 SO_2 - 0.61 NO_2 7.09 CO - 2.96 HC 0.65	5	890 gals.	2	<1	1 (Bald Eagle)	Bridge construction results in temporary impact to invertebrates in fishery zone V; construction impacts to bass and pike spawning area near Hanging Woman Creek
Four Mile Creek (Approved 1996)	50.3	43 1 1	5	40	PM-10 0.69 SO_2 0.61 NO_2 8.44 CO 3.52 HC 0.77	5	1951 gals.	5	<1	1 (Bald Eagle)	Primary impacts are at stream crossings and reduced number of crossings resulted in reduced impacts

Ashland to Decker Alternate Route (TRR III including the Western Alignment)

In 1998 TRRC sought STB approval of an alternate route for the southernmost 17 miles of the Ashland to Decker Extension to address many of the concerns with the Four Mile Creek Alternative. This alternative, known as the Western Alignment, was reviewed in the 2004 DSEIS and is included in the Proposed Action summarized on Table 10 on page 49.

The Western Alignment separates from the Four Mile Creek alignment approximately nine miles north of the mouth of Four Mile Creek and crosses to the west side of the Tongue River Valley where is parallels the existing Tongue River County Road for four miles before climbing away from the valley. This alignment would avoid the environmentally sensitive Tongue River Canyon. The grades and curves are significantly less severe than the Four Mile Creek Alternative with a maximum ascending grade of 0.5% per day. Moreover the Western Alignment impacts a lower number of disturbed acres and potential Waters of the US than the Four Mile Creek Alternative. The Alignment is discussed in greater detail in the 2004 DSEIS.

TRRC also proposed minor modifications to the alignment between Miles City and Ashland to improve operations and reduce construction costs. These alignment modifications were studied by the STB and are discussed in detail in the 2004 DSEIS. Table 10 on page 49 provides a comparison of the Miles City to Decker alternatives considered in TRRIII.

The alternatives compared in Table 10 on page 49 include the following: the Approved Route without modifications (via the Four Mile Creek alternative); the Approved Route without modifications via the Western Alignment; the Modified Route via the Four Mile Creek alternative; and, the Modified Route via the Western Alignment (Proposed Action).

Table 10
Level 2 Screening
Miles City to Decker (Alternatives Considered in TRRIII)

Alternative	Approx. Length (Miles)	Total Number Waters of the US	Total Acreage WUS	Cultural Resources Impacted Within the ROW	Potential Cultural Resource Sites within 1,500 Feet of the Centerline	Air Emissions	Number of Public At Grade Crossings *	Fuel Consumption per round trip Miles City to Decker	Required Locomotives	Number of Potential Accidents	Number of T&E Species Potentially Impacted	Aquatic Impacts
Approved Route w/out modification (via Four Mile Creek)	131.4	338	67.16	9	74	**	7	3354 gals.	5	7.6	1 (Bald Eagle)	Potential impacts to Hatchery required additional study; which showed vibration and coal dust impacts not likely; other impacts addressed in mitigation; bridge crossings of Tongue River may have short-term impacts but are not in high sport fishery value area; potential impact due to construction sediments, but could be mitigated; may be restricted access to fishing near the bridge at Four Mile Creek
Approved Route w/out modification via Western Alignment	119.4	310	39.70	9	76	**	5	1707 gals.	2	7.6	1 (Bald Eagle)	Same as above except that Western Alignment would not impede access to fishing.
Modified Route via Four Mile Creek	127.6	325	65.51	**	**	**	7	2877 gals.	5	**	**	Potential impacts to Hatchery required additional study, which showed vibration and coal dust impacts not likely; other impacts addressed in mitigation; bridge crossings of Tongue River may have short-term impacts but are not in high sport fishery value area; potential impact due to construction sediments, but could be mitigated; may be restricted access to fishing near the bridge at Four Mile Creek
Modified Route via Western Alignment (Proposed Action)	115.6	297	38.05	**	**	**	5	1546 gals.	2	**	**	Same as above except that Western Alignment would not impede access to fishing.

*Using the Ashland SE Alignment
** To be completed when the information from the 2004 DSEIS is available for review.

Mitigation Measures Regarding the Miles City Fish Hatchery

FW& P has raised concerns about potential impacts to the Hatchery including (1) the potential effects of vibration on both the physical plant and the fish; (2) the effect of vibration on the stability of an erosional remnant bedrock (hogback), which is between the east side of the Hatchery and the proposed alignment; (3) possible water pollution due to blowing coal dust; (4) potential pollution from air borne herbicides used to treat the right of way near the Hatchery; (5) potential effects on fishery production and from construction operation of the railroad; (6) effects on the water supply pipelines; and, (7) the corrosive effects of soil chemistry of buried fish hatchery piping. As noted earlier, reports were prepared by Womack & Associates in 1999 and were subsequently updated in May 2004 in response to questions raised by FW&P. The 2004 report also incorporated findings on the vibrations analysis conducted for the proposed DM&E line in Minnesota, South Dakota and Wyoming.

Both these reports concluded that there would be no structural damage to the Hatchery facilities from vibration from the Proposed Action. The reports concluded that the sounds produced by the vibrations would be heard by the fish but would be well below levels known to cause physiological damage to fish, eggs, and zooplankton and are also below the levels used to effect or influence fish.

The 1999 report also concluded that there would be no impact from coal dust emissions. Several studies, referenced in the 1999 report, have indicated that coal dust settles at the bottom of the rail car during the first few miles of transport and the coal will have traveled at least 80 miles by the time it reaches the Hatchery. Second, due to the configuration of the connection with the BNSF near the Hatchery, the maximum train speed will be 20 miles per hour in the vicinity of the Hatchery. The threshold velocity required to mobilize coal dust from unit coal trains is 47 mph.

Tongue River Railroad has proposed to the Hatchery the following mitigation measures to ensure the protection and long-time viability of the water supply pipelines serving the Hatchery from both the Yellowstone River and the Tongue River. There is a 24 inch diameter water supply line from the Yellowstone River and a second 14 inch diameter line from the Tongue River. The following measures will be undertaken to protect and ensure the integrity of these water supply pipelines during construction and operation of the railroad. The Tongue River will be responsible for all costs associated with implementing these measures which include:

1. Relocating, as necessary, portions of the Yellowstone River and Tongue River Water Supply Pipelines so that each pipeline crosses the rail right of way at a right angle or perpendicular to the rail alignment, which is considered to be the most protective of the pipelines.

2. Each portion of the water supply line lying perpendicular beneath the rail alignment will be encased in a reinforced concrete pipe, to

ensure the structural integrity of the water supply pipelines. The reinforced concrete pipe will be of sufficient size to allow for inspection and maintenance of the water supply pipelines.

3. Access to the pipelines beneath the rail alignment will be provided by installation of reinforced concrete manholes located on each side of the rail alignment. The reinforced concrete pipe and the manholes will meet or exceed the American Railway Engineering Association's standard specification for installation of utilities underneath railway embankments.

4. In those locations where the water supply lines will be relocated to cross the rail alignment perpendicularly, new pipe and connectors will be installed that meet or exceed the diameter and pressure requirements of the existing water supply pipeline.

5. The final design plans for the relocation of sections of the water supply pipelines and the installation of the concrete pipe and manhole components will be prepared by the railroad during the final engineering and design and submitted to FW&P for approval prior to construction.

6. All features will be designed to meet or exceed the American Railway Engineering Association Standard Specifications and the Montana Public Works Standard Specifications.

In response to concerns about impact from herbicides used for weed control management, Radian Corporation performed an evaluation on the use of herbicides along the railway as part of the Womack Report. The report found that while it was unlikely that herbicides could reach and impact the Hatchery that certain mitigation measures should be implemented. As a result of these recommendations, TRRC intends to use only mechanical means of weed control in the right-of-way adjacent to the Hatchery between the point the rail alignment crosses Interstate 94 North and the connection with the BNSF mainline. If it becomes necessary to utilize herbicide applications to control noxious weed infestation along the right-of-way between Interstate 94 North and the BNSF mainline, any herbicide application would be subject to prior approval from FW&P and the use of the herbicide would be under controlled means of applications such as by hand sprayer. FW&P's prior approval will include the type of herbicide to be applied, the application rate and means of application, and will take into consideration windspeed and wind direction at the time of herbicide application.

Least Environmentally Damaging Practicable Alternative

Based on a side-by-side comparison, the Proposed Action is the only practicable alternative in terms of costs, existing technology and logistics as shown on Table 11. Although the Proposed Action dose not have the lowest construction costs, it has the most efficient operating costs.

Table 11 Practicability Matrix

Category	Modified Route via Western Alignment (Proposed Action	Modified Route via Four Mile Creek	Approved Route w/out modification via Western Alignment	Approved Route w/out modification via Four Mile Creek	Tongue River Road Alternative	Moon Creek Alternative BN to Miles City	Colstrip Alternative Colstrip to Miles City
Costs							
Minimize construction costs	NO(Western alignment has greater construction costs)	YES	NO	NO	NO	NO	NO
Minimize operating costs	YES	NO	YES	NO	NO	NO	NO
Existing Technology (Engineering)							
Avoid ruling grades ≤1 %	YES	NO	YES	NO	YES	NO	YES
Maximize the Operating Characteristics	YES	NO	NO	NO	NO	NO	NO
Minimize Number of Locomotives and Fuel Consumption	YES	NO	NO	NO	NO	NO	NO
Logistics							
Minimize Distance of Coal Haul	YES	NO	NO	NO	YES	NO	NO
Minimize crossings of transportation features	YES	NO	YES	NO	NO	NO	NO

The Proposed Action also is the least environmentally damaging alternative as shown in Table 12.

Table 12 Resource Matrix

Category	Modified Route via Western Alignment (Proposed Action)	Modified Route via Four Mile Creek	Approved Route w/out modification via Western Alignment	Approved Route w/out modification via Four Mile Creek	Tongue River Road Alternative	Moon Creek Alternative BN to Miles City	Colstrip Alternative Colstrip to Miles City
Minimizes Impacts to Waters of US	YES	NO	YES	NO	NO	NO	ON
Avoids Impacts to Areas with Significant Aquatic Habitat Values	YES	NO	YES	NO	NO	NO	NO
Impacts Fish Hatchery	YES (impacts can be mitigated)	YES (impacts can be mitigated)	YES (impacts can be mitigated)	YES (impacts can be mitigated)	YES (impacts can be mitigated)	NO	NO
Minimizes land needed for ROW	YES	NO	YES	NO	NO	NO	YES
Minimizes impacts to terrestrial wildlife	YES	YES	YES	YES	YES	YES	YES

COMPLIANCE STATEMENT

As shown on Tables 8 through 10, the Proposed Action (which includes the Western Alignment) complies with the requirements in Section 230.12 of the Guidelines as it is the least environmentally damaging practicable alternative. None of the other practicable alternatives would have less adverse environmental effects and others would have more. For example, the Tongue River Road, Moon Creek and Colstrip Alternatives would have substantially greater environmental impacts, including greater impacts to Waters of the U.S. Moreover, because of adverse grades, the Colstrip Alternative would have substantially higher long-term operational and maintenance costs, and result in greater fuel consumption and increased air emissions as compared to the Proposed Action. The Four Mile Creek Alternative has significant adverse grades resulting in operational and safety concerns that would severely impact the viability of the railroad. In addition, it would impact more acres of Waters of the US than the Proposed Action. Moreover, the proposed Four Mile Creek Alternative is longer than the Proposed Action, has additional road crossings, requires reconstruction of State Highway 312 and is closer to more residences than the Proposed Action. The No Action Alternative using the existing BNSF lines provides no service to the proposed Ashland and Otter Creek area mines and no improvement in service to the Decker area mines. Sufficient information exists in the 1984 SDEIS, the 1986 FEIS, the 1994 SDEIS, the 1996 FEIS and the 2004 DSEIS and has been relied upon in this Showing Document to determine compliance with the requirements of Section 230.12.

Given all of the above factors, TRRC believes that the least environmentally damaging and best practicable alternative is the Proposed Action. The Proposed Action meets the design and the operational criteria for the railroad, provides for the economic transport of coal for the Ashland/Otter Creek area mines and reduces the transportation distance for the Decker and some Wyoming area mines. The Proposed Action thus meets the purpose and need of the project. The Proposed Action also impacts the fewest acres of Waters of the US and encounters the lowest acreage of probable wetlands. The Proposed Action also has the least impact on aquatic resources, while there are some impacts to the Fish Hatchery these can be mitigated.

TRRC strongly requests that the USCOE consider all of the above in evaluating the issuance of the 404 Permit for the Tongue River Railroad. TRRC believes that the Proposed Action will bring needed economic and efficient rail transportation to the Ashland/Otter Creek area with the least damaging environmental impacts.

WATERS OF THE U.S.
CONCEPTUAL HABITAT MITIGATION
AND MONITORING PLAN
TONGUE RIVER RAILROAD

Prepared for:

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April 1999

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1.0 PROJECT DESCRIPTION

1.0 PROPOSED PROJECT AND PURPOSE

1.1.1 Project Description

The Tongue River Railroad Company, Inc. (TRRC) is proposing to construct approximately 116 miles of rail line from Miles City, Montana to near Decker, Montana. The new railroad would begin at the southwestern edge of Miles City, where it would tie into the existing Burlington Northern-Santa Fe (BNSF) mainline. From Miles City, the route would bear south along the west side of the Tongue River to a point approximately 10 miles north of Ashland, Montana. The route would then cross the Tongue River and continue south along the east side of the river. Near Ashland, the route would divide, with one branch following approximately eight miles southeast along the Otter Creek drainage to Terminus Point 2, while the main branch would continue south along the east side of the Tongue River Valley about nine miles south of Ashland to Terminus Point 1. This portion of the TRRC line was considered the "proposed action" in the Interstate Commerce Commission's (ICC) 1985 Final Environmental Impact Statement (FEIS) for the Tongue River Railroad and is referred to as the Miles City to Ashland segment. This route was approved by the ICC in 1986 ("Tongue River I").

From Terminus Point 1, the railroad would continue south along the east side of the Tongue River valley for about 21 miles. This portion of the route was considered part of the "proposed action" in the Surface Transportation Board's (STB) 1996 FEIS for the Tongue River Railroad Additional Rail Line from Ashland to Decker, Montana and is referred to as the 21-mile segment. This portion of the route along with the Four Mile Creek Alternative was approved by the STB in 1996 ("Tongue River II").

From a point about 21 miles south of Terminus Point 1, the TRRC line would follow the Western Alignment (instead of the Four Mile Creek alignment), which is a "proposed action" currently under NEPA consideration by the STB. The Western Alignment is about 17 miles long and would cross to the west side of the Tongue River, then gradually leave the Tongue River valley as it would proceed south to the final terminus near Decker, Montana.

The 21-mile segment combined with the Western Alignment is referred to as the Ashland to Decker segment.

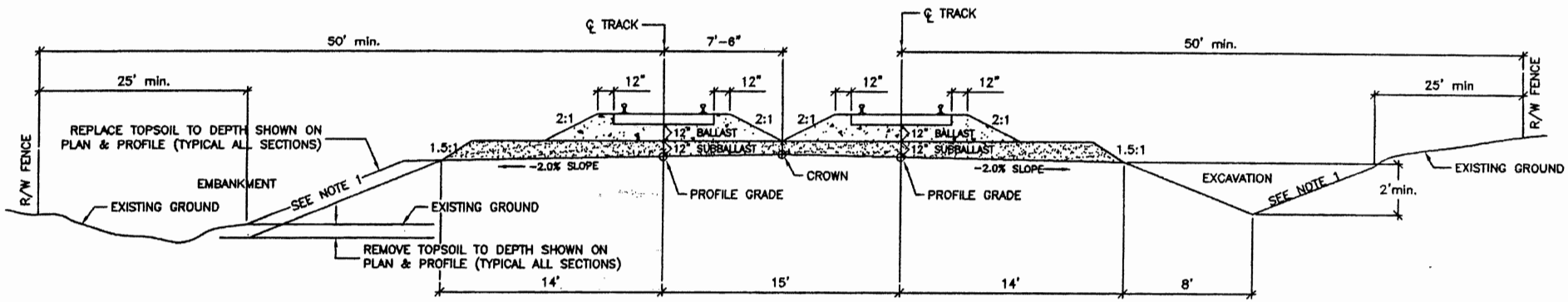
The project includes the railroad and necessary facilities for the construction and operation of the railroad. These facilities include sidings, possible terminal facilities, signal and communication systems, relocated roads, bridges and culverts, construction camps, equipment laydown and construction centers, borrow areas and temporary construction access roads.

Railroad Construction

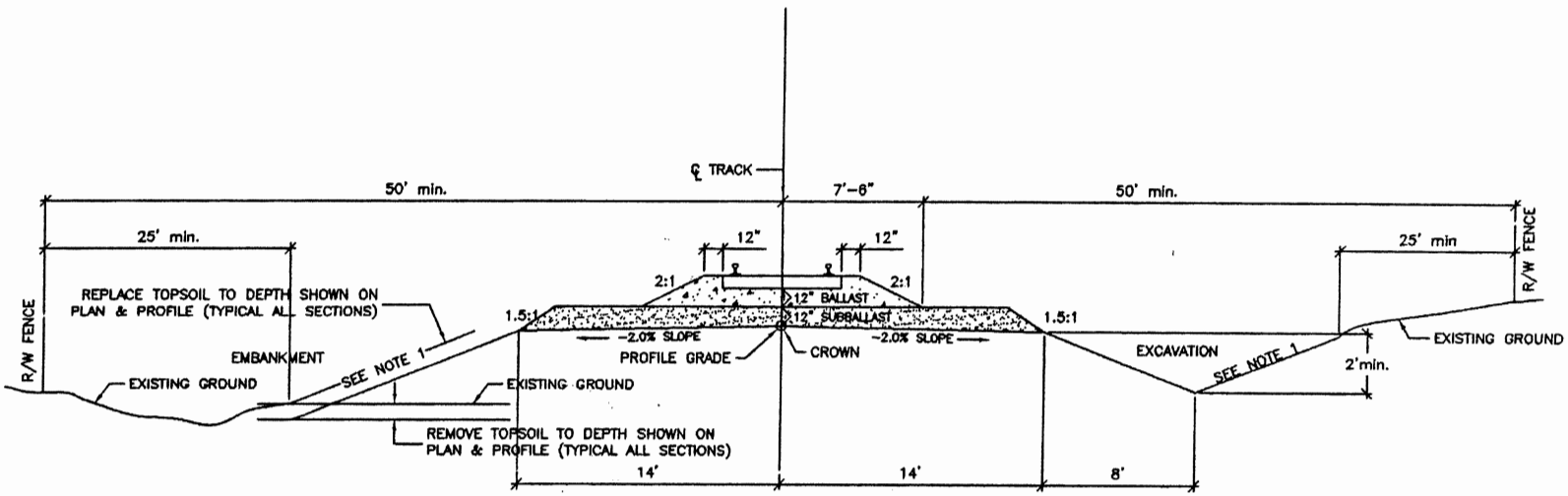
Figure 1 shows typical cross sections of a single track and a single track with siding. The ROW width would average approximately 200 feet, ranging from 100 to over 300 feet depending on cut and/or fill requirements. Cut and fill slopes would generally be constructed at angles between two horizontal to one vertical (2H:1V) and one and one-half horizontal to one vertical (1.5H:1V). Steeper slopes may be appropriate in some areas based on soil conditions and to reduce surface disturbance. The 136-pound continuous welded track would rest on 12 inches of subballast, 12 inches of ballast and concrete ties.

Sidings

The sidings also would be constructed with 136-pound continuous welded rail on 12 inches of compacted granite ballast and 12 or more inches of graded rock as subballast. Initial design specifications for the railroad include the construction of seven passing sidings, each



SINGLE TRACK WITH SIDING



SINGLE TRACK – TANGENT

NOTES:

1. FILL AND CUT SLOPES SHALL BE AS INDICATED ON PLAN & PROFILE.

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SCALE: 1" = 10'	TYPICAL CROSS SECTIONS RAILROAD CONSTRUCTION
DATE: APRIL 1999	TONGUE RIVER RAILROAD
DRAWN BY: MEI	
CHECKED BY: MEI	
FILE: TYP XSEC.DWG	FIGURE 1

approximately 8500 feet long (between clearance points). Planned design will provide for capacity to meet TRRC's needs for a number of years. The 8500 foot length would accommodate potential future increases in train size, and also allow for comfortable stopping margins. Siding locations and the number of sidings would be based on minimizing train delays in both (particularly the loaded) directions. One of these sidings would be located on the Western Alignment.

In addition to passing tracks, additional set-out tracks would be constructed for set-out and storage of maintenance-of-way (MOW) equipment, bad-order cars, and other operational equipment. At least one of these would be on the Western Alignment. Each set-out track would be at least 550 feet in length, sufficient to accommodate permanently-coupled carsets that may operate on this line. Set-out tracks would be provided at each double (passing) track location and at four additional locations along the main line.

Terminal Facilities

New terminal facilities may be constructed at Miles City. These facilities would consist of buildings for train and engine crews, dispatching, headquarters operation, limited servicing and maintenance, and MOW activities. Three additional sidings, 7800 feet long, would be constructed to handle yard activities. Construction of the Miles City terminal depends upon whether the TRRC and the BNSF reach an agreement that would allow the BNSF to operate over TRRC tracks. A new terminal would not be required if such an agreement is reached since the BNSF would operate its own facilities.

Signal and Communication Systems

Signal System: The railroad would be dispatched and operated under a Track Warrant Control System with identical rules and procedures used by BNSF. Under this system, train control signals would be located only in advance of the facing points of main line power or spring

switches. Power would be provided by batteries, charged by solar power panels. No power or communication lines are proposed to be constructed along the TRRC's ROW. The signal system and the operating rules and procedures under the Track Warrant Control System will conform to the best railroad industry practices to maximize safety to personnel and equipment.

Communication System: The communication system would consist of two radio frequency channels as assigned by the Federal Communications Commission (FCC) in an application to be submitted prior to commencing operations. Repeater stations (signal boosters) would be located as appropriate to assure continuous communications with train crews with no signal loss under extremely adverse weather conditions. Repeater stations may be located every 10 to 20 miles, or less in some areas. All repeater stations would be battery powered, with batteries charged by solar panels. All other communications would be via commercial or leased telephone lines. Repeater stations would be sited to avoid placement of fill in Waters of the U.S.

Road Relocation

Portions of public and private roads would be relocated along short sections of the railroad. Road relocations would be necessary to minimize curvature, minimize the number of road crossings and accommodate landowner access across the ROW.

Culverts and Bridges

Culverts would be placed according to the final engineering design. Coated with either a galvanized or bituminous coating (not "asbestos-bonded" material), culverts would be designed to safely withstand a 25-year flood peak flow with one pipe diameter of headwater. They would be designed so water from a 100-year flood event will not overtop the track.

Bridge construction would entail the driving of sheet pilings around the proposed pier locations to provide cofferdams for the placement of the bridge foundations. With foundations

and piers in place, prestressed concrete beams would then be set on the piers and abutments to form bridge decking. Bridges would be constructed at the two crossings of Tongue River and at Otter and Hanging Woman creeks.

Construction Camps

There may be two construction camps. The primary construction camp would be an approximately 10 acre leased site in or near Ashland. The camp would include provisions for approximately 200 recreational vehicle (RV) trailer hookups (electric power, water, and sewage connections). The camp would also include a bunk facility and a kitchen, dining room and restrooms/showers to serve 200 persons. In total, the camp could house 400 persons (although its capacity would be more than 400 because each trailer could accommodate more than one person). No permanent foundations would be required as all structures would be temporary. Solid and sanitary wastes would be collected and transported to a licensed landfill or sewage treatment facility. No disposal would occur on site.

A smaller (five-acre) construction camp would be located at the southern end of the railroad near the connection with the Spring Creek Mine Spur. It would consist entirely of about 100 trailer hookups with a single central facility for restrooms, showers, and laundry. A small convenience store would be located on site. As with the larger camp in Ashland, this complex would not involve the use of permanent structures and would not entail on-site disposal of solid or sanitary wastes. Following completion of the railroad construction, both camp areas would be restored pursuant to agreements with the individual landowners.

Equipment Laydown and Construction Centers

Three equipment laydown and construction centers would be utilized including a 15-acre area near Miles City, a five-acre area near Ashland, and a 10-acre area near the Spring Creek Mine spur. These three centers would operate only during construction. The two larger centers at

either end of the line would contain a track welding shop, engineering and construction offices, materials stockpiles, and fuel and equipment storage. The site near Ashland would be primarily devoted to equipment and fuel storage. Fuel storage and loading would occur in bermed sites with an impervious barrier to avoid ground and surface water contamination.

Borrow Areas

Project design would maximize a cut/fill balance where fill material would be generated from cuts thus minimizing the need for off-site borrow areas. Likewise, subballast would be obtained from suitable cut areas or would be imported from commercial suppliers. Ballast would be obtained from commercial sources. If material suitability or volume, or haul distance precluded use of on-site materials for all needs, off-site borrow areas would be developed. Off-site borrow areas would be located to avoid placement of fill in Waters of the U.S. and would be permitted in accordance with applicable federal, state and local requirements.

Construction Access Roads

During construction a road may be built within the proposed ROW. Most heavy equipment would be confined to this temporary road. Where the proposed rail line is isolated due to the Tongue River, other stream crossings, or large parcels of private land, temporary construction access roads, 20 feet in width, may be built. The location of the roads would be negotiated with affected landowners or land management agencies. After construction, the temporary construction roads would be reclaimed unless otherwise requested by landowners.

Final Design

The proposed route and associated facilities are based on preliminary design engineering. Prior to construction, final design engineering, including ROW staking and a detailed

geotechnical investigation would be completed. Project elements discussed above would be finalized based on the pre-construction design survey. Any design modifications would take into account avoiding or minimizing the placement of fill into Waters of the U.S.

1.1.2 Purpose

The purpose of the Tongue River Railroad is to provide for the transport of coal from existing and future coal mines in southeastern Montana and to provide an alternative, shorter routing for coal from Wyoming mines. The Tongue River Railroad would provide a more efficient means of transporting coal from existing mines in the region and would enable development of proposed low sulfur mines in the Ashland area. Without the Tongue River Railroad, there would be no economically viable transportation for the proposed mines.

The TRRC line will connect with BNSF at the northernmost point at Miles City and at its southernmost point at Spring Creek/Decker. Use of TRRC's line would reduce the present transportation distance for coal mined in the upper Powder River Basin (both in Montana and Wyoming) by approximately 160 to 175 miles on 750 to 1000 mile one-way hauls to electric utilities in the upper Midwest and Great Lakes regions (or round-trip mileage savings of 320 to 350 miles). Significant savings in transportation, maintenance and equipment costs would result.

Construction of the Tongue River Railroad also will provide, for the first time, rail service to the largest remaining undeveloped reserves of low-sulfur, high Btu sub-bituminous coal in the United States. This coal is needed to help utilities comply with the sulfur limitation in the U.S. Clean Air Act Amendments of 1990.

The U.S. Clean Air Act Amendments of 1990 has created a strong market for low-sulfur coal which can be burned in electric utility boilers without the need for costly flue gas desulfurization units. The Powder River Basin of Wyoming and Montana contains the great

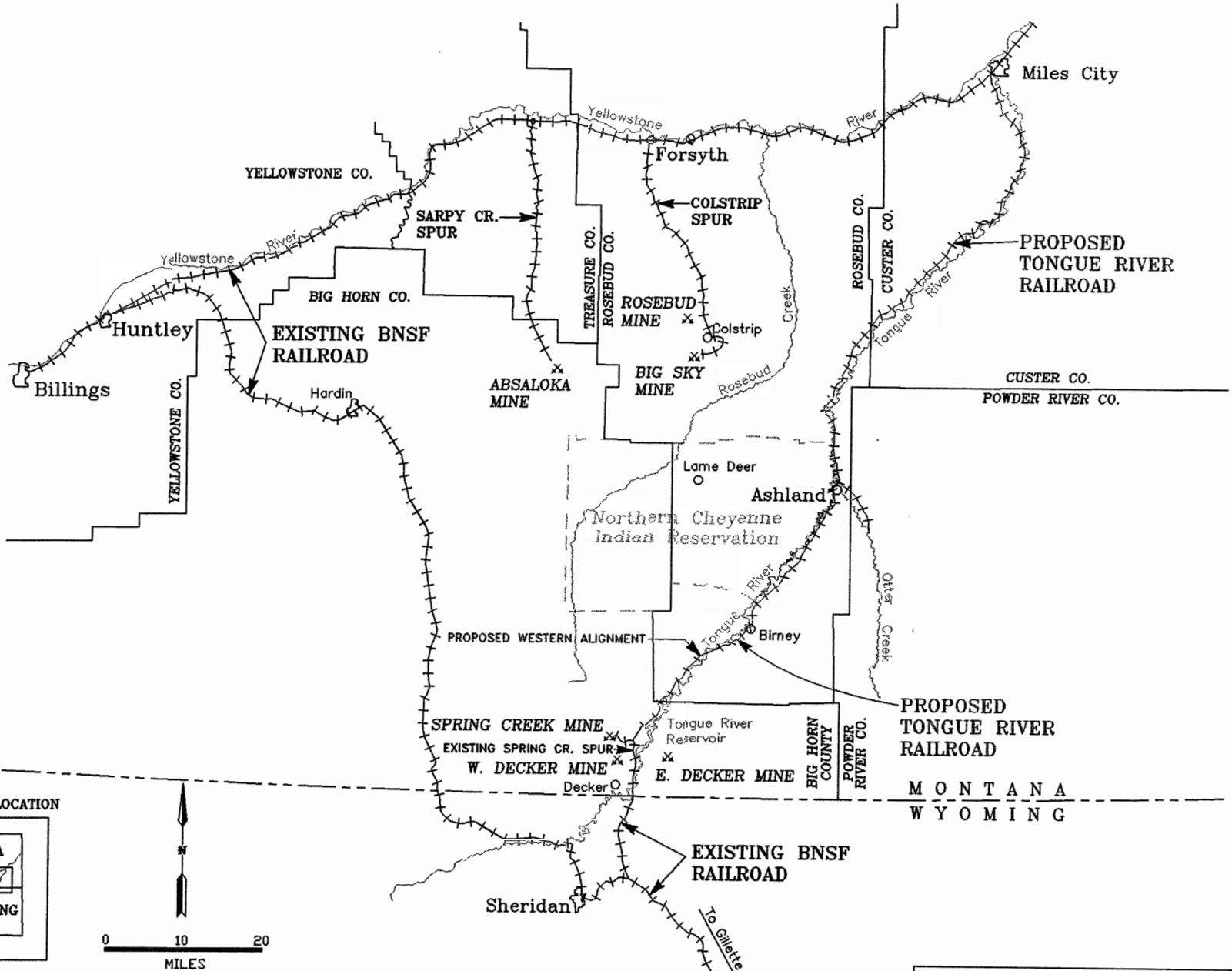
majority of the U.S. reserves of low-sulfur coal. Existing mines near Decker will yield less production as their resources dwindle, but this can be offset by new mine development in the Ashland area. The Tongue River Railroad is essential to the development of the Ashland area mines, which have no alternative means of economic transport without the railroad.

Wyoming and Decker area mines also could use the Tongue River Railroad. The three existing low-sulfur coal mines in the Decker area (East and West Decker and Spring Creek) currently transport their production to Midwestern utilities by way of the BNSF line through Sheridan, Wyoming and Hardin and Forsyth, Montana. The Tongue River Railroad would allow this coal to be shipped directly to Miles City thereby saving up to 350 miles on each round trip coal train to the Midwest. In addition to Decker area coal, BNSF currently transports some Wyoming coal over the circuitous Sheridan-to-Forsyth route to these upper Midwestern markets. At least some of this Wyoming coal is likely to move over the TRRC line as well.

Thus, the Tongue River Railroad is a critical element in the future of Montana coal production and will produce benefits that will accrue to the state and to local governments from the tax revenues associated with this production. The TRRC has thus attracted broad political support in Montana, as well as support from BNSF and from the utilities that would benefit from the coal transported by the Tongue River Railroad.

1.2 LOCATION

The general location of the project is shown on Figure 2, and a written description is included in Section 1.1. A more detailed location is shown on the Waters of the U.S. maps attached to this plan (map pockets). These maps depict the route location, state and federal surface ownerships, general topography, roads, drainages, locations of Waters of the U.S. (from the initial photo-interpretation analysis), sections and townships.



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DATE: APRIL 1999
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CHECKED BY: MEI
FILE: TRRR99A03.DWG

LOCATION MAP

TONGUE RIVER RAILROAD

FIGURE 2

Access to the northern terminus of the route at Miles City is reached by exiting Interstate 94 at the western Miles City exit (exit no. 138), traveling Business Route 94 (Highway 10/12/312) north to the southern edge of the Eastern Montana Fairgrounds and then southeast to the BNSF tracks and Miles City Fish Hatchery.

The middle portion of the route is reached by traveling U.S. Highway 212 to Ashland. The proposed route crosses the highway about 0.85 mile east of the eastern edge of Ashland.

The southern terminus is reached by exiting Interstate 90 just north of Sheridan, Wyoming, traveling north on Wyoming Highway 338 for about 14 miles to the Montana/Wyoming border, thence north on Highway 314 to the terminus with the Spring Creek railroad spur.

Road access along the route is sporadic and is provided mainly by Highway 312, the Tongue River Road (FAS 332, FAS 447, FAS 566) and other county roads, private roads and trails. Roads are depicted on U.S. Geological Survey (USGS) maps and Bureau of Land Management (BLM) Surface Management Status topographic maps of the area (Miles City, Forsyth, Lame Deer, and Birney). The BLM maps are the basis for the Waters of the U.S. maps and are attached to this plan (map pockets).

1.3 RESPONSIBLE PARTY

The party responsible for this mitigation plan, mitigation implementation, monitoring, maintenance and any necessary contingency measures is:

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1.4 DESCRIPTION OF JURISDICTIONAL AREAS

An initial analysis of Waters of the U.S. was conducted in 1998 using available National Wetlands Inventory (NWI) maps and interpretation of 1997 aerial photography (WESTECH Environmental Services 1998), hereafter "Initial Waters Report". Methods used for the analysis and limitations of the analysis are discussed in the Initial Waters Report. The majority of the Waters of the U.S. along the proposed ROW are non-wetlands, primarily ephemerally or seasonally flowing drainages with a defined bed and bank but without associated wetlands. Wetlands are relatively uncommon and are found along the Tongue River, larger tributary streams and on the periphery of ponds. Open water is found in the channels of major drainages (Tongue River, Otter and Hanging Woman creeks) and in ponds, primarily constructed for livestock watering, within or adjacent to the ROW. Although non-wetland

incised drainages outnumber wetlands by a ratio of about 5 to 1, most non-wetland waters are small compared to wetlands and open water sites. Total acreage of wetlands and open water is greater than non-wetland incised drainages by a ratio of about 5 to 1. Table 1 summarizes the number of sites and acreages by type.

1.4.1 Non-wetland Waters

Non-wetland Waters include incised drainages, channels of major streams and rivers and standing water portions of deep ponds. These sites lack wetland vegetation.

Types

Non-wetland Waters were typed based on the "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin and others 1979). The type for each site is listed in Table 2.

Incised Drainages (Riverine-Intermittent-Streambed)

Incised drainages potentially meeting U.S. Army Corps of Engineers' (COE) criteria are common in the dissected topography of the Tongue River Valley and are crossed frequently by the proposed railroad. The Waters of the U.S. maps (map pockets) show the locations of these drainages. Within the standard 400-foot wide evaluation corridor, 276 non-wetland drainage sites were identified totaling about 6.5 acres. Since the width of the evaluation corridor (200 feet either side of the centerline) substantially exceeds the average ROW width of 200 feet, acreage of non-wetland Waters impacted should be substantially less. Assuming an average ROW width of 200 feet (half of the corridor evaluated), a total of 3.2 acres of non-wetland Waters would potentially be impacted by construction of the 116-mile rail line.

Most ephemerally flowing drainages with a small drainage basin are classified as R4SBA while drainages with larger drainage basins are classified as R4SBC. These alphanumeric

designations refer to intermittent riverine streambeds that are temporarily or seasonally flooded. Footnote 3 to Table 2 presents the classification system.

Major Drainages (Riverine-Lower Perennial-Open Water)

Major drainages crossed by the standard 400-foot wide evaluation corridor include the Tongue River (two crossings and six sites within 200 feet of the centerline), Otter Creek (one crossing and two sites within 200 feet of the centerline) and Hanging Woman Creek (one crossing). These riverine sites are classified as lower perennial since the gradient is low and water velocity is generally slow. Open water too deep to support emergent vegetation is generally present in the deeper portions of the channel. The non-open water portion of major drainages frequently support palustrine wetlands (emergent, scrub-shrub or forest) along the banks or on lower terraces.

Twelve riverine-lower perennial-open water sites as discussed above were identified within the 400-foot wide evaluation corridor comprising about 15.8 acres. Except for the four crossings, most of these sites are more than 100 feet from the centerline and are unlikely to be filled by railroad construction. The four crossings, two of the Tongue River and one each for Otter Creek and Hanging Woman Creek would be crossed by bridges further reducing fill in this type.

Palustrine-Open Water

Palustrine-open water sites are usually associated with man-made impoundments and generally have water too deep to support emergent vegetation. Seven sites have been identified including ponds at the Miles City Fish Hatchery and deeper stockwater ponds within the 400-foot ROW. About 4.2 acres are present in the evaluation corridor.

Functional Assessment

The primary function of incised drainages without associated wetlands is the transport of temporary or seasonal surface water to receiving drainages. Smaller drainages without floodplain terraces generally transport high sediment loads, especially if channels are unvegetated. Larger streams have developed terraces dominated by non-wetland riparian vegetation (often silver sagebrush) that serve as sediment traps. Silver sagebrush terraces provide forage for pronghorn and mule and white-tailed deer, and nesting and forage for sage grouse, sharp-tailed grouse and a variety of non-game wildlife.

Major drainages with open water for most or all of the year (Tongue River, Otter and Hanging Woman creeks) serve as important general fish habitat, primarily for warm water species. These drainages are also important habitat for water-dependent birds and animals including waterfowl, beaver, snapping turtles and amphibians.

Although the Tongue River provides regular use habitat for bald eagles, no known active nests are located within a half mile of the ROW. The lower Tongue River also provides habitat for the sturgeon chub, a federally proposed threatened species. The Tongue River is habitat for several state listed sensitive species including blue sucker, snapping turtle and spiny softshell turtle.

Palustrine-open water types serve as important general wildlife habitat receiving moderate to substantial use. The Miles City Fish Hatchery ponds provide intensive specific fish habitat. Stockwater ponds serve several functions including general wildlife habitat, livestock watering, flood attenuation and storage, sediment retention and dynamic surface water storage.

1.4.2 Wetlands

Wetlands were typed based on the "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin and others 1979). The type for each site is listed in Table 2. Since NWI maps and mapping criteria were used for the initial analysis of Waters of the U.S., some sites identified in that analysis may not meet all three COE parameters for wetlands: wetland hydrology, hydric soils and hydrophytic vegetation. NWI mapping does not require that all three parameters be present whereas COE criteria require a positive indicator for each of the three parameters. A final pre-construction survey would be conducted to identify and delineate Waters of the U.S. using COE methods (Environmental Laboratory 1987).

Types

Palustrine wetlands identified within the standard 400-foot corridor include emergent, scrub-shrub and forested types. The riverine beach/bar type was shown on the NWI map at the southern crossing of the Tongue River.

Palustrine - Emergent (PEM)

Twenty-four (24) sites were identified as palustrine - emergent totaling about 5.4 acres within the evaluation corridor. Most PEM sites occur along drainages as an herbaceous fringe, in stream oxbows, low areas in the channel, or in or on the periphery of ponds. This type is dominated by herbaceous wetland species including prairie cordgrass, sedges, rushes, foxtail barley, common cattail and various forbs. Species composition varies considerably with hydroperiod and soil conditions (e.g. salinity).

Palustrine - Scrub/Shrub (PSS)

The palustrine - scrub/shrub type was identified at four sites totaling 1.6 acres within the evaluation corridor. The type occurs along major streams (e.g. Otter Creek).

Palustrine - Forested (PFO)

Nine (9) forested palustrine sites were identified along the ROW within the standard 400-foot evaluation corridor comprising about 4.3 acres. Most of these sites occur on the Tongue River floodplain or at the mouths of tributary drainages. Plains cottonwood is usually the dominant tree at these sites.

Palustrine - Flat (PFL)

NWI maps identified two palustrine flats on the southern portion of the ROW within the standard 400-foot evaluation corridor totaling less than 0.1 acre.

Riverine - Lower Perennial - Beach/Bar (R2BB)

The R2BB type occurs along the Tongue River and was shown on the NWI map within the standard 400-foot wide evaluation corridor only at the southern crossing of the Tongue River. Estimated acreage within the corridor at this site is about 0.2 acres. The site occurs on an inside bend of the river and was mapped by the NWI as seasonally flooded sands.

Functional Assessment

Palustrine wetlands provide the following functions:

Habitat for federally listed Threatened or Endangered (T/E) species: the forested palustrine type provides regular use habitat for the bald eagle.

General wildlife habitat: all palustrine types provide moderate to substantial use for non-aquatic and aquatic/semi-aquatic wildlife. Palustrine flats may receive less wildlife use because of their small size.

Flood attenuation and storage: flowing water from overbank flooding is detained for short periods especially by the scrub/shrub and forested types.

Sediment retention and removal: emergent, scrub/shrub and forested types retain sediment from channel flow and overbank flooding.

Food chain support: all vegetated palustrine types produce food for living organisms.

The riverine - lower perennial - beach/bar type varies seasonally with deposition and removal of river sediments. This type serves as general wildlife habitat and food chain support.

2.0 PROPOSED MITIGATION

2.1 AVOIDANCE

The primary approach to avoid impacts to Waters of the U.S. was to select a route from identified practicable alternatives that resulted in both the least amount of WUS filled and that minimized impacts to other resources. This approach is described in detail in TRRC's "Draft Tongue River Railroad EIS Section 404(b)(1) Showing" hereafter "Draft 404(b)(1) Showing".

The Draft 404(b)(1) Showing identifies alternatives that were evaluated for the Miles City to Ashland segment and the Ashland to Decker segment as well as the five alternatives for the entire TRRC line from Miles City to Decker considered in the Initial Waters Report. The Draft 404(b)(1) Showing concludes that the TRRC Preferred Alignment is the least environmentally damaging and best practicable alternative that meets the design and operational criteria for the railroad.

Table 3 is from the Initial Waters Report and presents a comparison of Waters of the U.S. potentially impacted by construction of the TRRC Preferred Alignment and the four alternatives for the entire line. It demonstrates that acreage of Waters of the U.S. potentially impacted by construction of the TRRC Preferred Alignment is less than other alternatives considered (Tongue River Road, Moon Creek, Colstrip and Four Mile Creek).

Additional avoidance to Waters of the U.S. has been achieved by refinements to the alignment previously considered in Tongue River I and Tongue River II associated with routes approved by the STB and its predecessor, the ICC. Along the Miles City to Ashland portion of the route, there are five locations where the originally proposed alignment and the currently proposed alignment differ nearly one-half mile or more. The net effect of these alignment refinements has been to increase the distance of the railroad from the Tongue River and its floodplain. In

one case, the refinement avoids direct impact to a large stock pond near Yank Creek (approximately Milepost 25.3).

On the northern 21 miles of the Ashland to Decker portion of the route, one alignment refinement near Birney has shifted the railroad east, away from the Tongue River. An evaluation of alignment refinements is presented in the "Analysis of Changed Circumstances" reports (Radian International LLC and others 1998a and 1998b).

2.2 MINIMIZATION

Methods to minimize disturbance to Waters of the U.S. include: 1) alignment refinements; 2) stream crossing techniques; 3) design criteria; and 4) mitigation to reduce indirect impacts.

2.2.1 Alignment Refinements

As discussed above under 2.1 AVOIDANCE, TRRC has refined portions of the alignments considered in Tongue River I and Tongue River II. In addition to avoiding some Waters of the U.S., these refinements also serve to minimize fill placement in the Tongue River floodplain. By moving the alignment away from the Tongue River, impacts to tributary drainages also are minimized since the wider mouths of tributary drainages are avoided and crossings occur in narrower upstream segments of the streams.

TRRC has evaluated additional alignment refinements to further avoid or minimize impacts to Waters of the U.S. However, additional refinements do not meet design, operational or safety criteria for the project. Unlike other linear projects such as pipelines, powerlines, or, to a lesser extent roads, railroad alignments are less conducive to realignment. Curvature, grade, and cut and fill balance affect the feasibility of additional rail route modifications.

2.2.2 Stream Crossings

The placement of fill in major stream crossings would be minimized by using bridges. Bridge crossings are proposed for the two crossings of the Tongue River, and for Otter and Hanging Woman creeks. Drainages with ephemeral or seasonal flow would be crossed using culverts and fill. Figures 3 to 7 depict typical plans for stream crossings and fill placement.

Construction of all stream crossings, including bridges, culverts and activities requiring stream bank encroachments (riprap, for example), would occur during periods of low flow in the streams affected.

2.2.3 Design Criteria

Design criteria that would be used to minimize disturbance include:

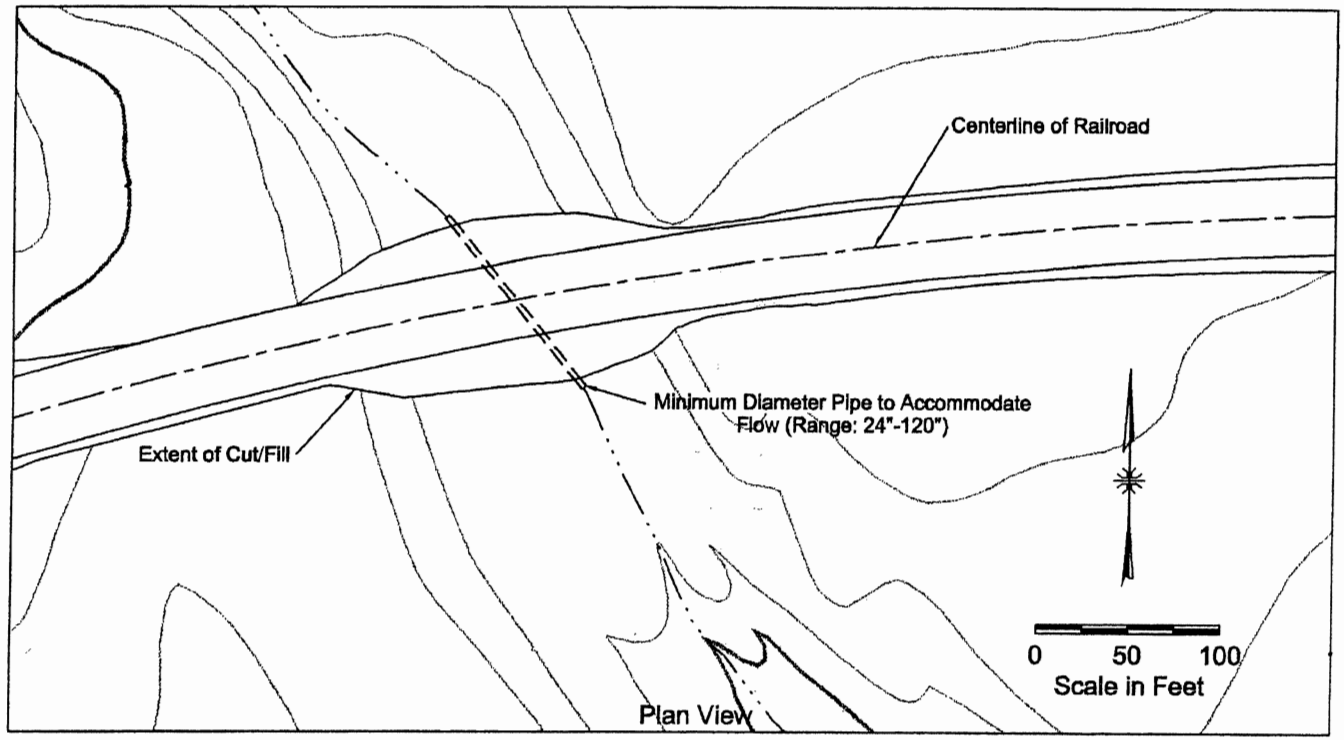
- evaluate whether steeper cut or fill slopes may be appropriate to minimize disturbance width in wetlands. TRRC would construct the steepest slope that would be stable for operations and not pose an erosion problem. For example, if a 1.75H:1V slope would be stable and would reduce fill placement, it would be constructed rather than a flatter 2H:1V slope.

- locate ancillary facilities and sidings to minimize fill placement in Waters of the U.S.

2.2.4 Mitigation to Reduce Indirect Impacts

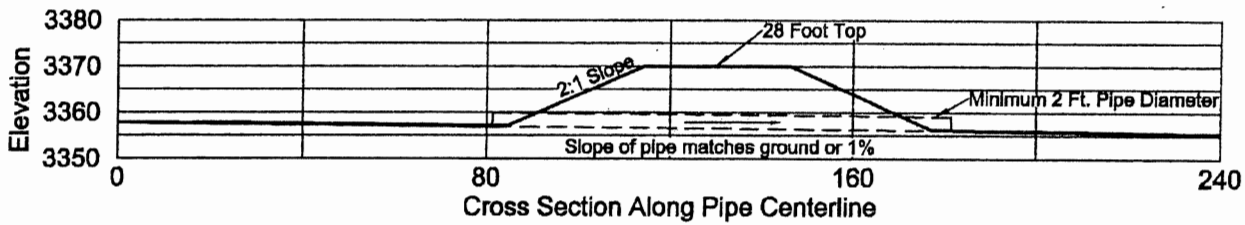
Measures that would be implemented to reduce the probability of indirect impacts include:

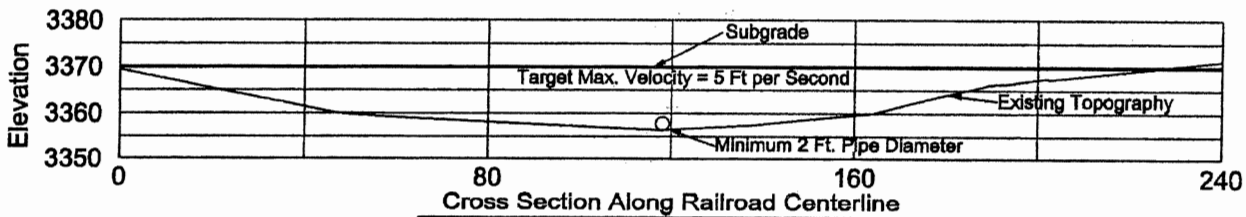
- avoid fill placement in perennial streams by constructing bridges with clear spans and concrete abutments (Figure 7) where possible. If clear spans are not feasible on longer stream crossings, concrete piers could be installed. The use of concrete structures rather than earthen fills would reduce potential downstream sedimentation.



NOTES:

1. Design flow velocity is 5 feet per second.
2. Downstream end treatments to be used (contingent on necessity):
   - Manufacturer's end section
   - Rock splash pad
   - Rock trench
3. Culvert slope matches ground slope or is reduced to 1%.
4. Design discharges:
   - Pass 10-year peak with inlet control
   - Pass 25-year peak with 2 pipe diameters upstream head
   - Safely pass 100-year peak without overtopping the track





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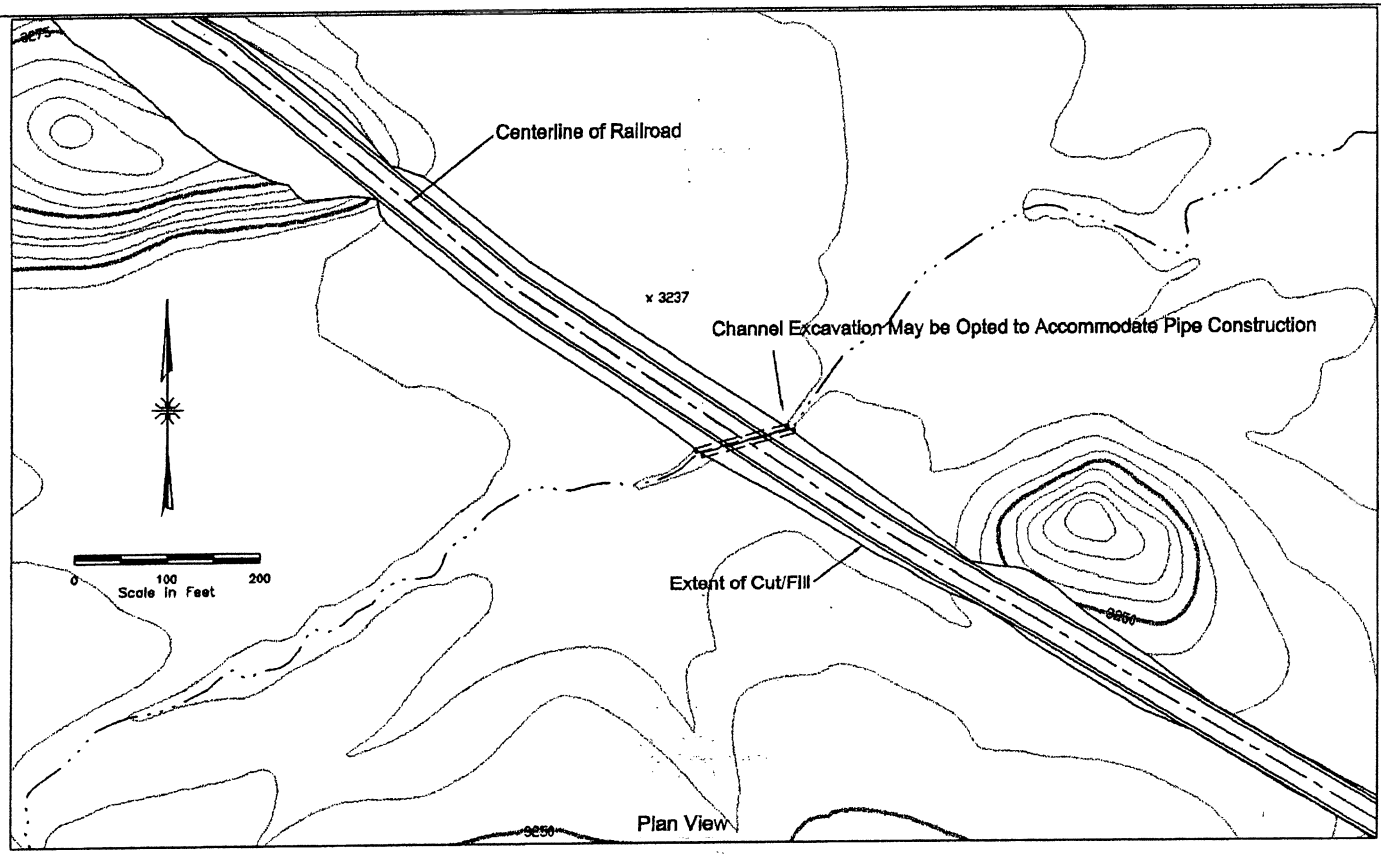
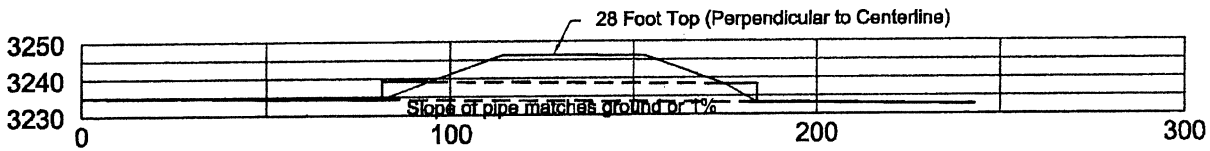
SCALE: AS NOTED	TYPICAL SIMPLE DRAINAGE CROSSING
DATE: APRIL 1999	TONGUE RIVER RAILROAD
DRAWN BY: MEI	
CHECKED BY: MEI	
FILE: SIMPLCHN.DWG	FIGURE 3

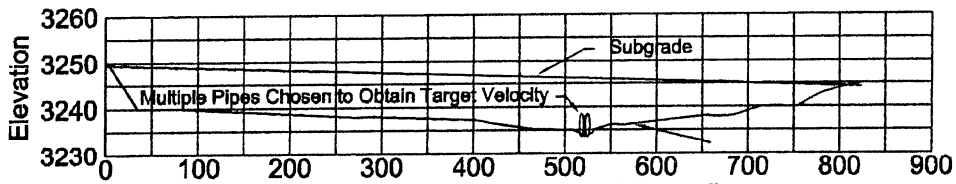


NOTES:

1. Design flow velocity is 5 feet per second.
2. Downstream end treatments to be used (contingent on necessity):
   - Manufacturer's end section
   - Rock splash pad
   - Rock trench
3. Culvert slope matches ground slope or is reduced to 1%.
4. Design discharges:
   - Pass 10-year peak with inlet control
   - Pass 25-year peak with 2 pipe diameters upstream head
   - Safely pass 100-year peak without overtopping the track



Cross Section Along Pipe Centerline



Cross Section Along Railroad Centerline

Vertical X5

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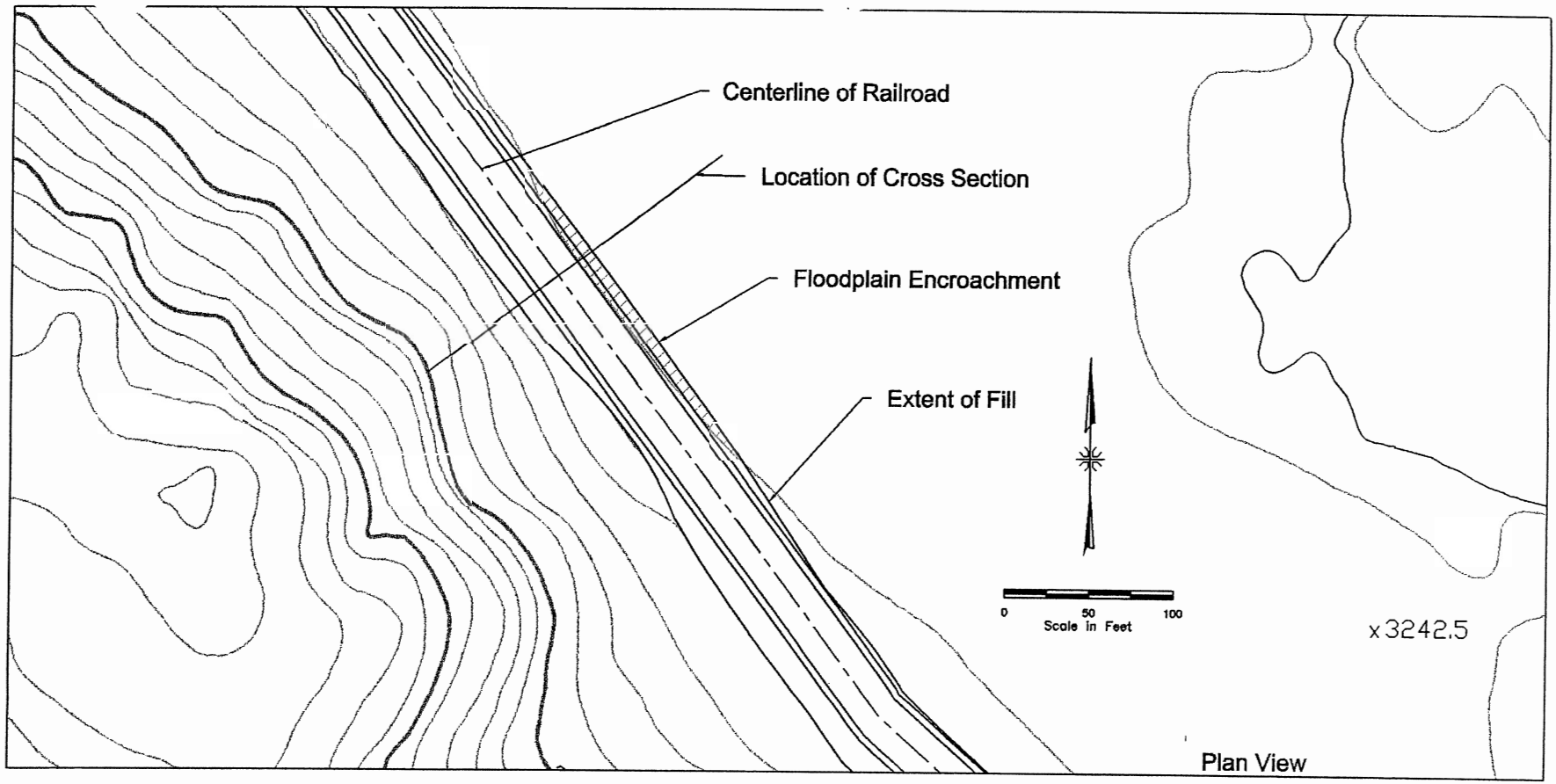
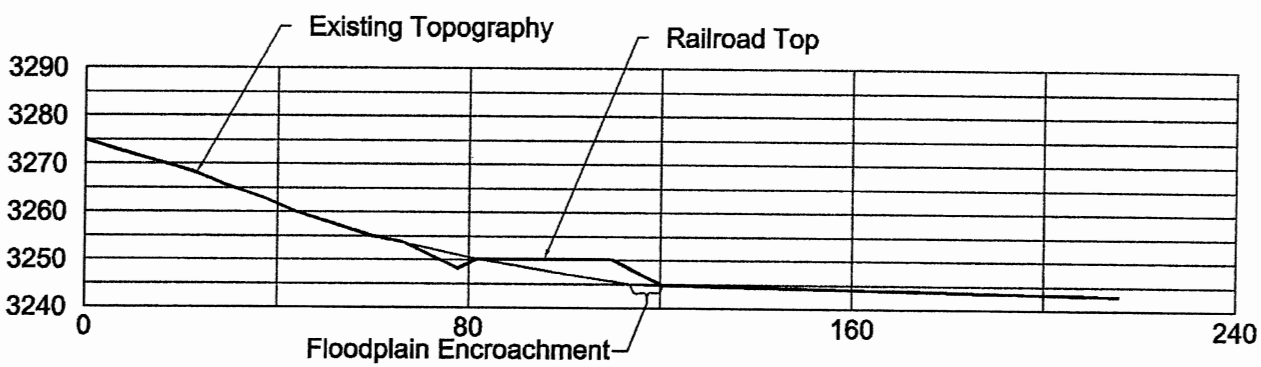
SCALE: AS NOTED	TYPICAL CROSSING OF DRAINAGE WITH FLOODPLAIN
DATE: APRIL 1999	TONGUE RIVER RAILROAD
DRAWN BY: MEI	
CHECKED BY: MEI	
FILE: COMPCHAN.DWG	FIGURE 4





Cross Section Across Railroad

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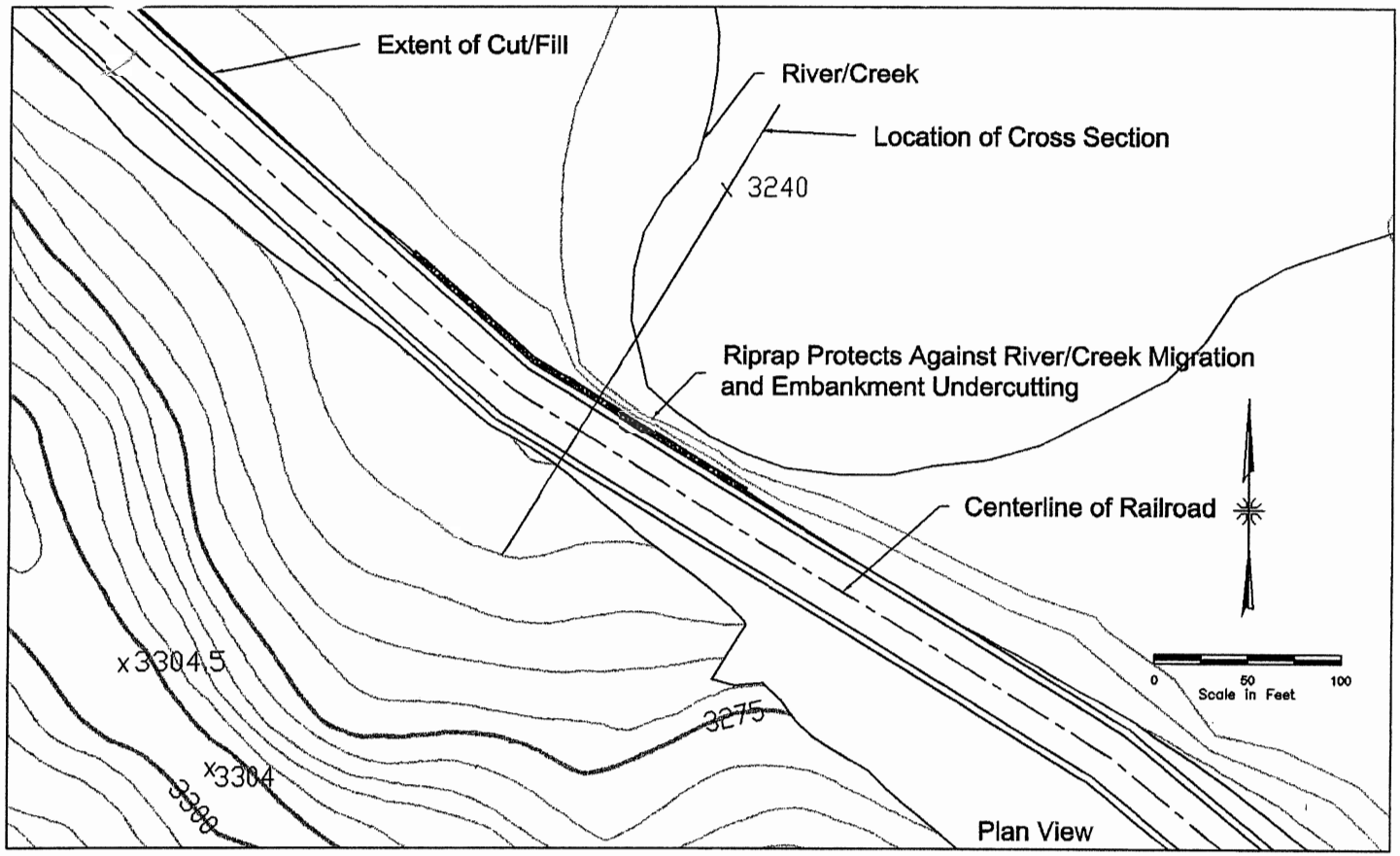
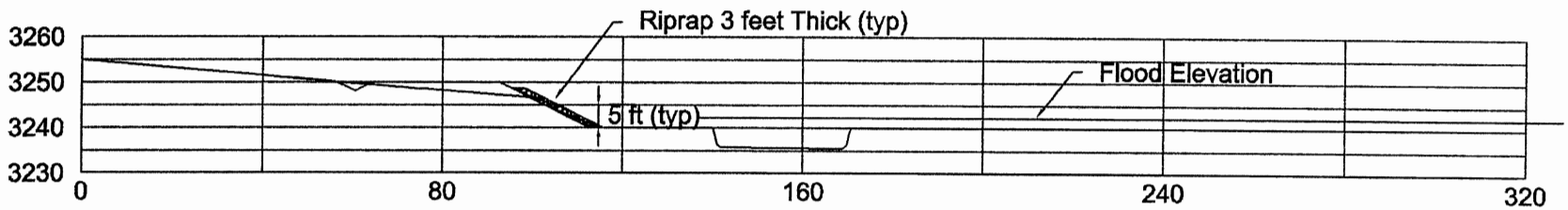
SCALE: AS NOTED	TYPICAL SECTION SMALL FLOODPLAIN ENCROACHMENT
DATE: APRIL 1999	TONGUE RIVER RAILROAD
DRAWN BY: MEI	
CHECKED BY: MEI	
FILE: FPENCRO.DWG	FIGURE 5





Cross Section Across Railroad

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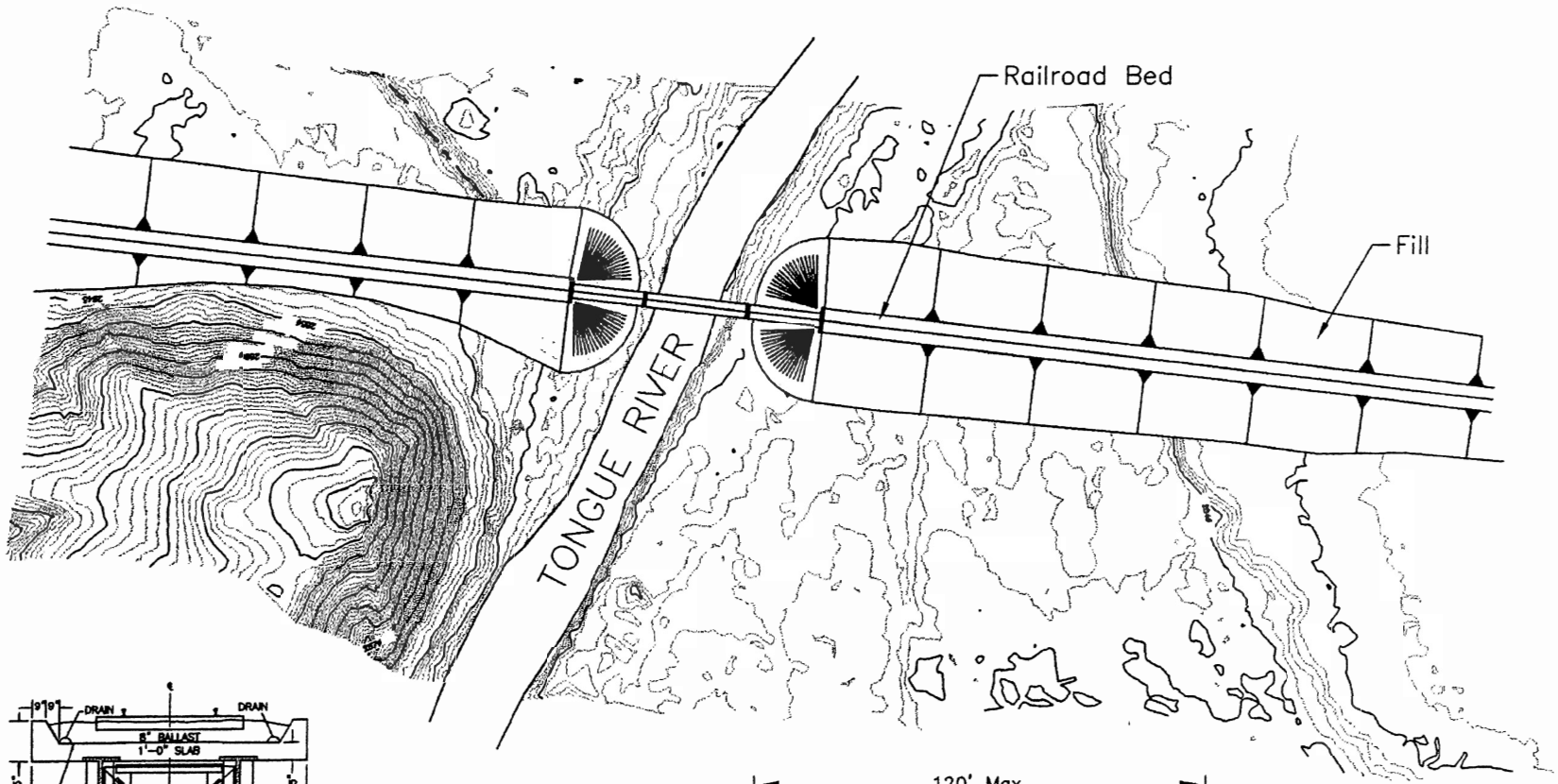
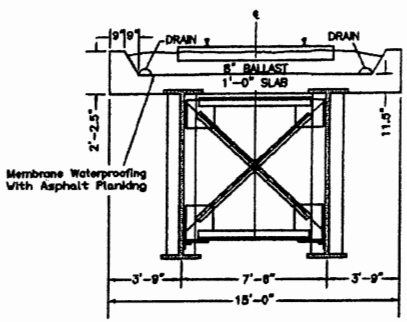
SCALE: AS NOTED
DATE: APRIL 1999
DRAWN BY: MEI
CHECKED BY: MEI
FILE: AFPLNRR.DWG

TYPICAL SECTION ABOVE FLOODPLAIN WITH RIPRAP PROTECTION

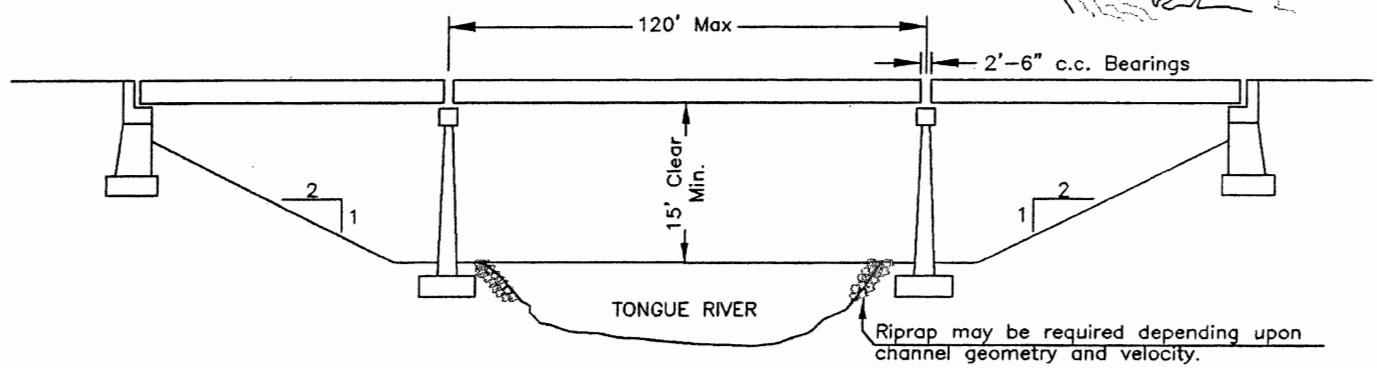
TONGUE RIVER RAILROAD

FIGURE 6





TYPICAL LONG SPAN BRIDGE
FOR RIVER AND/OR STREAM CROSSINGS
NO SCALE



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SCALE: NTS	TYPICAL BRIDGE CROSSING
DATE: APRIL 1999	TONGUE RIVER RAILROAD
DRAWN BY: MEI	
CHECKED BY: MEI	
FILE: TYPBRDG.DWG	FIGURE 7

- provide properly engineered bank stabilization on fill slopes susceptible to erosion from high flows. Figures 6 and 7 show conceptual bank stabilization using riprap. TRRC would consult with the Environmental Protection Agency (EPA) to implement EPA's river bank stabilization methods at bridge crossings and riprap areas to prevent soil erosion and sedimentation loading to streams and the Tongue River. Some of these methods would include placing logs, root wads, and vegetative plantings with rock riprap along the bridge sites and stream encroachment areas. To prevent unnecessary degradation of water quality due to erosion, revegetation efforts would begin as soon as possible after construction is completed in a given area. EPA's design specifications for river bank stabilization are presented in Appendix E to TRRC's Environmental Report for the Western Alignment (Radian International LLC 1998).

- where the railroad grade infringes upon the floodplain, install drainage structures to assure that the grade does not restrict or reroute the 25-year flood.

- prepare a Stormwater Pollution Prevention Plan and Erosion Control Plan in accordance with MPDES Stormwater Permit requirements and Montana Department of Transportation guidelines. Best Management Practices (BMPs) which are currently planned for erosion control during construction include:

  - spreading stockpiled topsoil, seeding, fertilizing, and mulching of approximately 20 percent of the slopes in cut and fill areas. The remainder of the slopes are expected to contain a large amount of rock and clinker material which will not support vegetation and which should provide a degree of armoring to the slope surface to reduce erodibility
  - silt fences
  - slope drains
  - run-on diversion control
  - waterway protection at the Tongue River and other perennial stream crossings (includes various BMPs)
  - pipe inlet/outlet protection
  - ditch sediment traps
  - runoff interception ditches
  - benching systems to route runoff transversely across the face of higher cuts and fills. Drainage routed to rock riprap-lined flumes
  - sediment traps
  - rock check dams

- conduct aquatic resource sampling (stream habitat survey, benthic macroinvertebrate and fish spawning surveys) where the rail line would cross

the Tongue River or where extensive riprap would occur and develop appropriate mitigation measures that could include:

- preparation of a construction schedule which, if possible and practical, provides for instream work at those times that are 1) least critical to the specific fishery or aquatic resource occurring at a site, and 2) least conducive to sediment transport. These periods could differ by stream and species affected
- development of special procedures for the handling of displaced materials and petroleum products in order to prevent introduction of such materials into the aquatic system. These procedures would be dictated by site specific geographic and construction criteria
- filtering water, resulting from dewatering for footing construction, through settling pond systems
- assuring that riprap is washed and essentially silt free
- double-shifting of work crews at river crossing sites to minimize the duration of construction activities in or near stream banks

- implement reclamation and revegetation of the ROW at the earliest possible time after clearing has been completed. Revegetation would be implemented only in those ROW areas with adequate substrate and grade. In most cases, revegetation could not begin until construction is complete. However, wherever possible, construction and attendant revegetation would be expedited. The following are general practices that would be employed in the reclamation/ revegetation process:

  - conduct thorough preconstruction planning
  - commence reclamation as soon as practicable after construction ends, with the goal of rapidly reestablishing ground cover on disturbed soils that could support vegetation by mulching and seeding as they are completed
  - avoid reclamation when soil moisture is high or the ground is frozen
  - analyze site soil requirements and seasonal precipitation patterns to identify planting dates for optimal revegetation success
  - use rapidly establishing plant species for thorough and rapid ground surface protection
  - retain a reclamation specialist to determine specific procedures for reclamation on steep slopes or locations near waterways
  - prepare seed mixes, fertilizer rates and other soil amendment application based on soil chemical and physical properties, with emphasis on native species where possible
  - segregate topsoil from subsoil and stockpile soil for later application on the ROW

- use appropriate seeding techniques, such as drill seeding on level terrain and broadcast or hydroseeding on slopes, to ensure seed distribution
- apply mulch, such as straw, as a temporary erosion control measure and to minimize soil temperature fluctuations and soil moisture loss. Mulch would be applied more heavily on slopes than on level terrain and nitrogen levels would be adjusted if necessary to reflect the increased demand during mulch decomposition
- conduct monitoring on reclamation and implement remediation as necessary

2.3 COMPENSATION

Although avoidance and minimization have been employed to the extent practicable to mitigate impacts to Waters of the U.S., unavoidable impacts would result from the project. These unavoidable impacts would be mitigated by a combination of measures implemented during and following construction.

The primary mitigation for non-wetland incised drainages would be placement of culverts through the fill to ensure surface water flows are maintained.

TRRC is evaluating alternative methods to mitigate for wetlands filled by construction and is currently considering two alternatives: 1) TRRC wetland creation near the proposed alignment and 2) wetland mitigation by government agencies or conservation organizations ("third parties"). Wetland mitigation by parties other than TRRC could include wetland creation, restoration of former wetlands or enhancement of existing wetlands. TRRC involvement in wetlands mitigation by others could involve providing technical expertise, financial support and/or obtaining suitable property for wetland mitigation. Mitigation alternatives will be explored during the 404 permitting process.

TRRC has not yet contacted agencies or conservation organizations to assess the feasibility of wetland mitigation by a third party, therefore it is not discussed further in Section 3.0. Section 3.0 addresses the alternative of wetland creation by TRRC.

3.0 COMPENSATORY MITIGATION IMPLEMENTATION PLAN

This section describes TRRC's approach to mitigate unavoidable impacts to Waters of the U.S. Section 3.1 addresses non-wetland drainageways and Section 3.2 addresses wetlands and the open water component of ponds. As discussed above (Section 2.3), wetland creation by TRRC is one alternative being considered. If wetland mitigation by a third party becomes a feasible alternative, wetland creation discussed in Section 3.2 may not be implemented.

3.1 NON-WETLAND WATERS

3.1.1 Goals

The goals of mitigation for non-wetland drainages are to:

- maintain stream flow
- avoid changes in downstream channel morphology
- minimize increased sediment loading from railroad construction or erosion of fill slopes

Methods to achieve these goals are presented in Section 3.1.4.

3.1.2 Types of Habitats to Be Created

Non-wetland drainages are currently classified in one of the following types:

Type	Code
Riverine - intermittent - stream bed - temporary flow	R4SBA
Riverine - intermittent - stream bed - seasonal flow	R4SBC
Riverine - lower perennial - open water	R20W

Mitigation will retain the flow status, however, where culverts are used the stream bed characteristic will change from a natural soil, rock or vegetated channel to a culvert for the width of the embankment.

3.1.3 Functions of Habitats to Be Created

The modification of ephemerally or seasonally flowing channels from a natural condition to a culvert would not affect the primary function of the drainage which is transport of surface flow. The hydrological regime at drainage crossings would not be substantially altered by construction.

Since the primary function of non-wetland drainages would be maintained, TRRC does not propose to create off-site non-wetland drainages.

3.1.4 Construction

Construction methods would be designed to achieve the goals listed above. Construction methods appropriate to each goal are:

Goal	Construction Method
Maintain stream flow	Install culverts properly designed for each drainage to accommodate temporary and seasonal flow preventing over-topping of the fill. Culvert intakes would be protected as necessary. Bridge perennial streams.
Avoid changes in downstream channel morphology	Design and install dissipators or channel stabilization devices below culvert outlets where flow may alter the downstream channel.
Minimize increased sediment loading from railroad construction or erosion of fill slopes	Implement Best Management Practices (BMPs) during construction to control sedimentation. Fill slopes across drainages would be vegetatively stabilized or, where necessary, armored with rock to reduce erosion and sedimentation. Erosion control practices would be in accordance with TRRC's Stormwater Permit.

3.1.5 Schedule

Since most affected drainages flow ephemerally or seasonally, these crossings are likely to occur in dry streambeds. If flow is present, TRRC would install culverts (flumes) such that equipment would not be working in a flowing stream. Temporary bridges (such as railroad flat cars or timber mats) also would be installed where necessary across flowing streams to minimize equipment fording.

Culvert installation would occur early in the construction schedule so that equipment may travel along the ROW.

Temporary erosion control products would be in place prior to construction or would be available on-site for installation prior to anticipated precipitation or flow events.

Final erosion control, including revegetation or slope stabilization products, would be conducted during the first appropriate season following construction with the goal of completing final erosion control prior to the next runoff season.

Maintenance would occur throughout the operational life of the railroad.

3.1.6 Abandonment

TRRC will adhere to regulatory requirements applicable to the rail line at the time of any abandonment.

3.2 WETLANDS

3.2.1 Goals

The goals of wetland creation are to:

- create self-sustaining wetlands and open water habitat
- locate created wetlands in the Tongue River Valley as close to disturbed wetlands as possible
- establish wetlands with types and functions as similar to those disturbed as possible
- minimize impacts to existing wetlands at mitigation sites

3.2.2 Types of Habitats to Be Created

Mitigation would be designed to create palustrine wetlands and open water habitat with elements of the following types:

Type	Code
Palustrine - open water	POW
Palustrine - emergent	PEM
Palustrine - scrub/shrub	PSS
Palustrine - forested (deciduous)	PFO

3.2.3 Functions of Habitats to Be Created

The primary functions of proposed created wetlands include:

- general wildlife habitat: moderate to substantial use by aquatic/semi-aquatic and non-aquatic species
- flood attenuation and storage
- sediment retention and removal
- food chain support

3.2.4 Wetland Creation Sites

Location

Figures 8 through 11 show the locations of alternative sites tentatively identified for wetland creation. Sites are located on the northern, central and southern portions of the ROW near the proposed railroad. The potential sites occur on Sixmile, O'Dell and Monument creeks, at an oxbow of the Tongue River near Garland School and on terraces of the Tongue River near the mouth of O'Dell Creek. Subsequent site screening may add new sites or delete identified sites. The ultimate size of created wetlands would depend on final delineation of impacted wetlands.

Stockwater ponds may be constructed as part of mitigating impacts to livestock operations. Where feasible, these stockwater ponds would be designed to create wetlands.

Ownership

Identified wetland creation sites are on private ownership as follows:

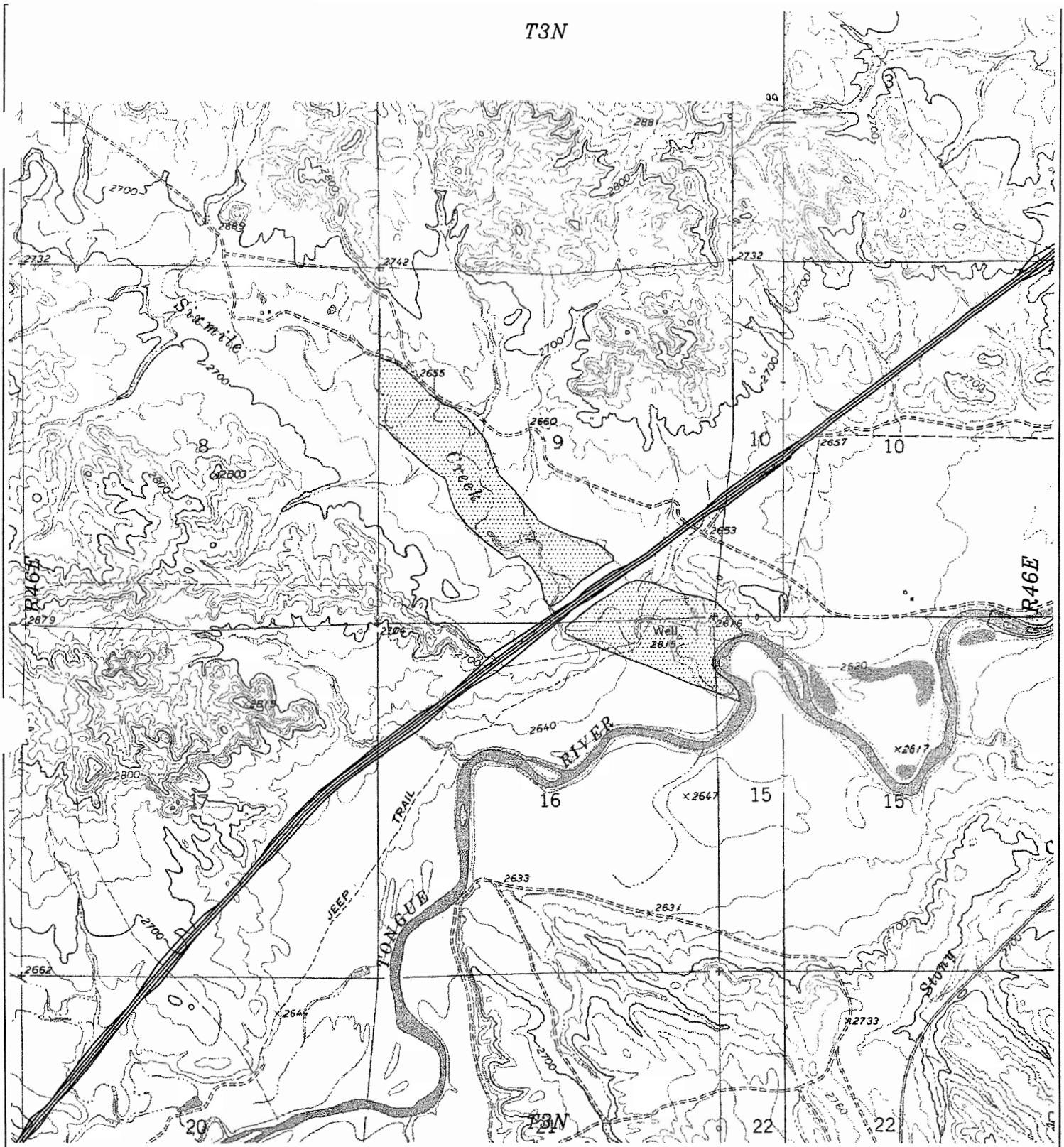
Alternative Site	Landowner
Tongue River oxbow near Garland School	L. and D. Hirsh
Sixmile Creek	K. and G. Shaw
O'Dell Creek/Tongue River terraces	Jack Knobloch/Jay Nance
Monument Creek	MonTaylor Corp.

PROPOSED TONGUE RIVER RAILROAD ROUTE

ALTERNATIVE WETLAND CREATION/ENHANCEMENT SITE

N

WESTECH Environmental Services, Inc. P.O. Box 6045 Helena, Montana 59604	SCALE: 1:24,000	ALTERNATIVE WETLAND CREATION/ENHANCEMENT SITE - TONGUE RIVER OXBOW NEAR GARLAND SCHOOL
	DATE: APRIL 1999	
	DRAWN BY: DC	TONGUE RIVER RAILROAD
	CHECKED BY:	
	FILE: TRRR99A12.DWG	FIGURE 8



PROPOSED TONGUE RIVER RAILROAD ROUTE

ALTERNATIVE WETLAND CREATION SITE

N

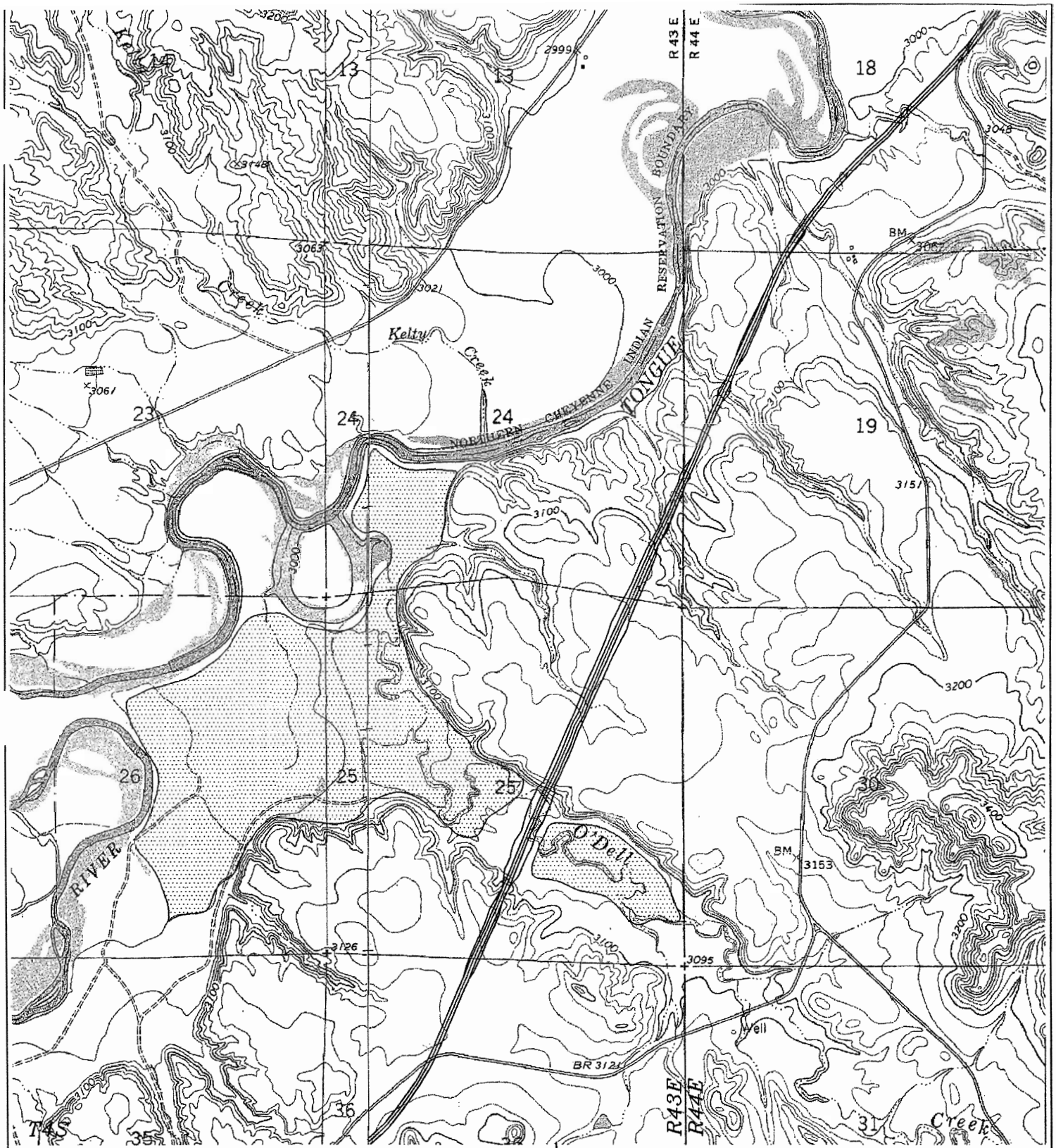
ALTERNATIVE WETLAND CREATION SITE - SIXMILE CREEK

TONGUE RIVER RAILROAD

FIGURE 9

WESTECH
Environmental Services, Inc.
P.O. Box 6045
Helena, Montana 59604

SCALE: 1:24,000	
DATE: APRIL 1999	
DRAWN BY: DC	
CHECKED BY:	
FILE: TRRR99A13.DWG	



PROPOSED TONGUE RIVER RAILROAD ROUTE

ALTERNATIVE WETLAND CREATION SITE

N

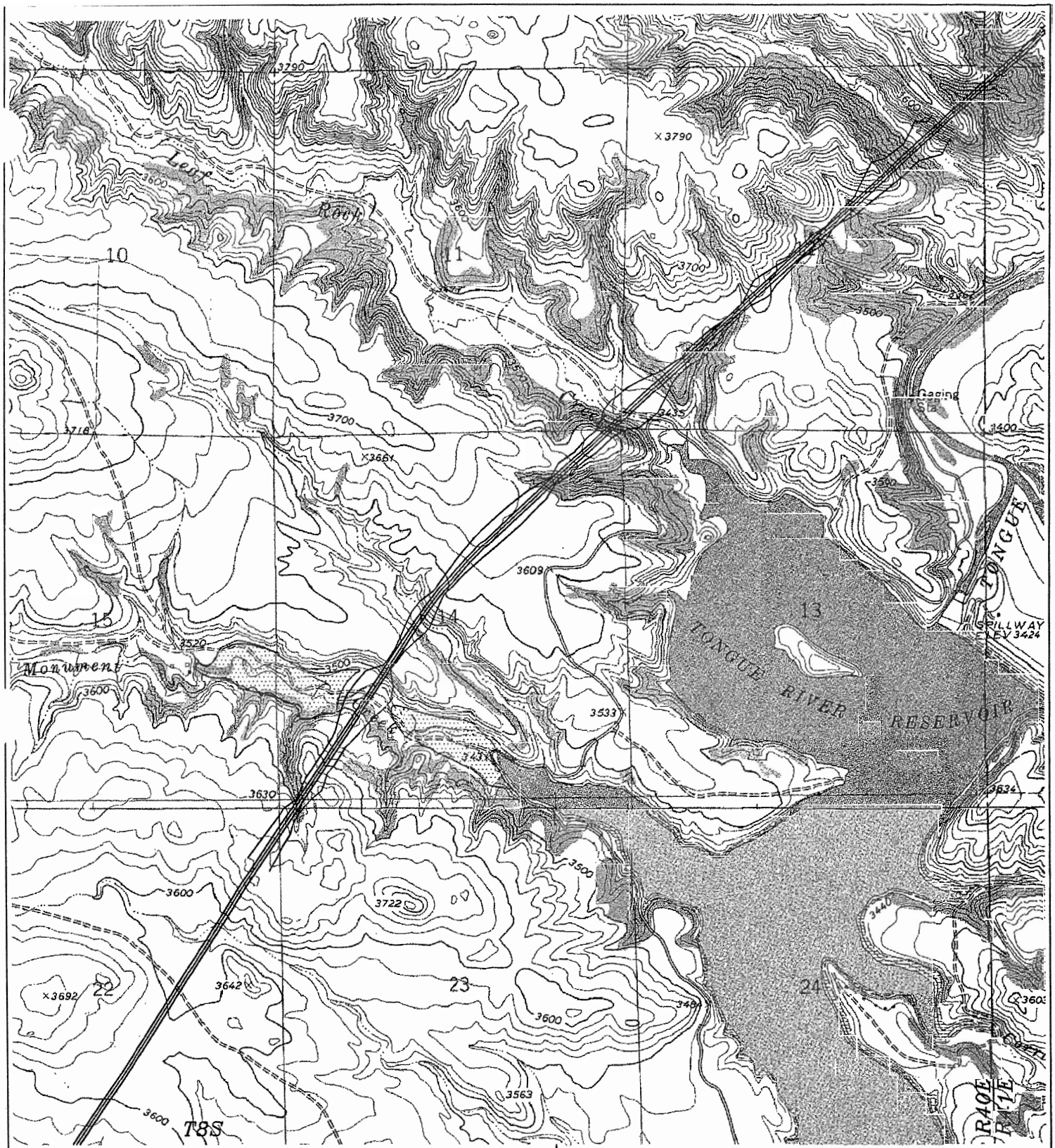
ALTERNATIVE WETLAND CREATION SITE - O'DELL CREEK AND TONGUE RIVER TERRACE

TONGUE RIVER RAILROAD

WESTECH
Environmental Services, Inc.
P.O. Box 6045
Helena, Montana 59604

SCALE: 1:24,000	
DATE: APRIL 1999	
DRAWN BY: DC	
CHECKED BY:	
FILE: TRRR99A05.DWG	

FIGURE 10



PROPOSED TONGUE RIVER RAILROAD ROUTE

ALTERNATIVE WETLAND CREATION SITE

N

WESTECH Environmental Services, Inc. P.O. Box 6045 Helena, Montana 59604	SCALE: 1:24,000	ALTERNATIVE WETLAND CREATION SITE - MONUMENT CREEK
	DATE: APRIL 1999	
	DRAWN BY: DC	TONGUE RIVER RAILROAD
	CHECKED BY:	
	FILE: TRRR99A06.DWG	FIGURE 11

Landowner negotiations have not been initiated and, pending results of these negotiations, some sites may be unavailable. Additional sites would be identified if necessary to achieve mitigation goals.

Site Characteristics

A review of the Initial Waters Report, aerial photos, and county soil surveys (NRCS 1977, 1996 and 1999) provided the following general description of each site:

Site	Characteristics
Tongue River oxbow near Garland School (Figure 8)	Waters of the U.S.: This site is outside the standard 400-foot wide ROW corridor and was not evaluated as part of the Initial Analysis Report. It was, however, observed during a site visit on March 17, 1999. The lowest portions of the oxbow are palustrine - open water (POW) with an adjacent palustrine - emergent (PEM) type. Non-wetland riparian forest and riparian grassland border the existing wetland. Soils: Mapping Unit 451A, Glendive fine sandy loam, 0 to 2 percent slopes, occasionally flooded, is present at the site. This well drained, deep soil formed in stratified calcareous alluvium of the Tongue River. Vegetation: The PEM wetland is dominated by bulrushes and common cattail. Mature cottonwood with an understory of western snowberry is present in the riparian forest while prairie sand reedgrass and inland saltgrass dominate the riparian grassland. Hydrologic regime: Water is present in the lowest portion of the oxbow throughout most of the growing season. Saturated soils adjacent to the standing water likewise occur throughout most of the growing season. The riparian forest and grassland are likely subirrigated at depths greater than 18 inches below the surface. Land use: The mitigation site and surrounding area are used for livestock grazing. The Hirsh property is under Conservation Easement (CE) to the Montana Department of Fish, Wildlife and Parks (MDFWP). The CE limits the land use to "livestock grazing and directly related agricultural land management activities". The CE provides for public recreational hunting.

Site	Characteristics
Sixmile Creek (Figure 9)	Waters of the U.S: Sixmile Creek (WUS site NE-85) has been tentatively classified as a riverine - intermittent - streambed - seasonal flow channel (R4SBC) with the palustrine - emergent type (PEM1C) present along the channel and in low areas in the floodplain. See Table 2. Soils: The Yamacall and Havre series (mapping unit 30C) are present in the valley bottom. These very deep, loamy soils are formed from alluvium. Slopes are 0 to 8 percent and occasionally flooded. Vegetation: Dominant species in the existing wetland along the creek include Baltic rush, spikesedge, bulrush and sedge species. The non-wetland portion of the site is dominated by silver sagebrush, western wheatgrass, alkali sacaton, inland saltgrass and various forbs. Hydrologic regime: The Sixmile Creek valley receives seasonal surface flows from snow melt and precipitation events and may receive groundwater inflow from a coal seam that outcrops in cut banks along the valley. Land use: The mitigation site and surrounding area are used for livestock grazing. The Shaw property is under CE to MDFWP. The CE limits the land use to "livestock grazing and directly related agricultural land management activities". The CE also provides for public recreational hunting.
O'Dell Creek (Figure 10)	Waters of the U.S.: O'Dell Creek (WUS site #NE-199) is classified as a riverine - intermittent - streambed - seasonal flow channel (R4SBC) with a fringe of the palustrine - emergent type (PEM1C). See Table 2. Soils: Mapping Unit 36 - Borollic Camborthids - Ustic Torrifluvents Complex, 0 - 8 percent slopes are present at the site. These very deep (>60 inches) sandy loam to clay soils formed from alluvium on alluvial fans, stream terraces and floodplains. Vegetation: Silver sagebrush/western wheatgrass and greasewood/western wheatgrass communities occur on terraces with scattered plains cottonwood along O'Dell Creek. Hydrologic regime: O'Dell Creek flows seasonally in response to snow melt and precipitation events. Because of the large drainage basin which includes higher elevations to the east, runoff may extend well into the growing season in some years. Land use: The wetland mitigation area and surrounding areas are used for livestock grazing.

Site	Characteristics
Tongue River terrace at O'Dell Creek (Figure 10)	Waters of the U.S.: This site is outside the standard 400-foot wide ROW corridor and was not evaluated as part of the Initial Waters Report. It was, however, inventoried during baseline studies for the proposed Montco Mine. Most of the terraces at the site are upland, however the Tongue River oxbow at the mouth of O'Dell Creek is comprised of palustrine - open water and palustrine - emergent types dominated by common cattail. Soils: Three soils mapping units are present: 97 - Harlem silty clay loam, 0 - 2 percent slopes, occasionally flooded 99 - Havre loam, 0 - 2 percent slopes 198 - Yamac loam, 2 - 8 percent slopes Vegetation: Most of the site is covered by the greasewood/western wheatgrass and western wheatgrass/blue grama community types. Other types also present include common cattail marsh, silver sagebrush/western wheatgrass, riparian forest and agricultural land. Hydrologic regime: The lowest terrace (Harlem soil) is occasionally flooded while higher terraces are rarely flooded. The depth to water is greater than six feet over most of the site except in and adjacent to the common cattail marsh in the Tongue River oxbow. Land use: The majority of the site is used for livestock grazing. Flood irrigated hay meadows are present on lower terraces.
Monument Creek (Figure 11)	Waters of the U.S.: Monument Creek (WUS site #NE-289) is identified as a non-wetland incised drainage classified as riverine - intermittent - streambed - seasonal flow (R4SBC). See Table 2. Soils: Soils along the creek are mapping unit CG - Chugter complex, 2 - 15 percent slopes while adjacent hillsides are Wp - Wibaux loam. Vegetation: Dominant vegetation includes silver sagebrush, western wheatgrass and needle-and-thread grass. Big sagebrush, grassland and ponderosa pine types dominate the hillsides above Monument Creek. Hydrologic regime: Monument Creek flows seasonally in response to snow melt and precipitation events. The lower valley west of the Tongue River Reservoir will be flooded by the reservoir as a result of the current reconstruction of the Tongue River dam. Land use: The site and adjacent areas are used for livestock grazing. Proximity to Tongue River Reservoir likely increases wildlife use of the area.

3.2.5 Conceptual Construction Plan

Site Inventory

Pre-construction surveys and inventories would be conducted on proposed mitigation sites to assess site suitability for wetland mitigation and to develop specific construction plans. These inventories would include:

- topographic survey
- Waters of the U.S. identification and delineation
- stream characteristics survey (channel location, depth, width and bank configuration)
- floodplain delineation
- hydrologic characterization (drainage basin size, hydroperiod, flow rates)
- soils inventory and assessment of suitability for ponding and support of wetland vegetation
- vegetation survey and assessment of sensitive plants
- wildlife reconnaissance to assess T/E animals, prairie dog colonies and general wildlife use
- cultural resource inventory
- water rights evaluation
- potential conflicts with land uses such as mineral extraction

Grading/Contouring

Sites would be graded and contoured to provide a mix of palustrine types including open water, emergent, scrub/shrub and forested.

Grading would be designed to avoid steep banks unsuitable for establishment of wetland vegetation. Gentle slopes and terraces would be installed as appropriate to reflect hydroperiod and fluctuating water levels. Islands would be constructed within larger open water areas.

Grading could involve excavation or embankment construction, or creation of ditches or spreader dikes depending upon site conditions. Structures would be designed in accordance with sound engineering practices. Agencies or organizations experienced in constructing similar facilities (such as the Natural Resources Conservation Service, Bureau of Land Management, MDFWP, Montana Department of Natural Resources and Conservation, Montana Department of Transportation, Ducks Unlimited, and The Nature Conservancy) may be consulted as appropriate to determine design criteria found to be successful in the region.

Wetland Hydrology Establishment

Wetland hydrology would be established by detaining surface waters or excavating to ground water. Detention of surface waters would be appropriate for those sites occurring along intermittent drainages. Detention would be accomplished by constructing flow barriers (dams, dikes or embankments) or by excavation. Depending on stream flow characteristics, detention would be inline (in the stream) or offline (on a stream terrace with water diverted to the terrace).

Ground water interception would be suitable where ground water occurred within a reasonable excavation depth. The alternative mitigation sites at the Tongue River oxbow near Garland School, Tongue River terrace near the mouth of O'Dell Creek and Sixmile Creek may meet this criterion. Existing wetlands at these sites could be expanded by excavation using a shared water supply.

Soil Handling

It is unlikely that hydric soils are available in appreciable quantity at the alternative mitigation sites along intermittent streams. Although hydric soils are present on portions of the Tongue River sites, these wetlands would not be disturbed by construction of additional wetlands. Since hydric soils would be unavailable for mitigation, existing on-site soils would be salvaged and used for mitigation.

The pre-construction inventory would assess the suitability of these soils to support wetland vegetation. Organic matter, nutrients or other soil amendments may be necessary to provide a suitable plant growth material.

On-site subsoils would be evaluated to determine suitability as construction material and to assess suitability to detain water. If texture, coarse fragment content or other physical parameters resulted in permeability rates not suitable for detaining water, suitable soils would be imported, on-site soils would be amended with clay, or a clay liner would be installed to achieve desired water retention characteristics.

Revegetation

Revegetation would be accomplished by natural succession and by supplemental seeding and planting depending on site conditions and proximity to suitable adjacent wetlands that provide a seed source. Species that may be included in mixtures, if available, for the three palustrine types include:

Type	Species	
Emergent	Prairie cordgrass	Nuttall's alkaligrass
	Nebraska sedge	American bulrush
	Clustered field sedge	Alkali bulrush
	Woolly sedge	Softstem bulrush
	Common spikesedge	Slender wheatgrass
	Needle spikesedge	Western wheatgrass
	Basin wildrye	Alkali sacaton
	Foxtail barley	Sand dropseed
	Baltic rush	Inland saltgrass
	Torrey's rush	Common cattail
	Alkali bluegrass	
Scrub/Shrub	Selected herbaceous species from emergent list	
	Bebb willow	Skunkbush sumac
	Sandbar willow	Bristly currant
	Yellow willow	Wood's rose
	Red-osier dogwood	Black greasewood
	Round-leaved hawthorn	Silver buffaloberry
	Silverberry	Silver sagebrush
	Common chokecherry	American plum
Forested	Selected herbaceous and shrub species from emergent and scrub/shrub list	
	Boxelder	Peachleaf willow
	Plains cottonwood	Green ash

Herbaceous species and shrubs amenable to seeding would be drill or broadcast seeded depending on site conditions, seed characteristics and size of the area. Most shrubs and trees would be planted using containerized or bare root stock of a size suitable to ensure maximum survivability. Where appropriate, planted stock would be inoculated with applicable mycorrhizae.

If available, transplants, sprigs or sod plugs would be used to enhance rapid revegetation and diversity.

Plant communities would be patterned at each site to provide biodiversity.

Site Protection

Since mitigation sites would likely be used by livestock and grazing which could compromise revegetation success, the sites would be fenced or otherwise protected to preclude livestock use until plants were well established (two to five years). If necessary to accommodate livestock operations, downstream tanks or impoundments would be installed or created outside the fenced area.

Wildlife depredation of shrubs and trees would be controlled by repellants or protective devices.

3.2.6 Schedule

The proposed habitat mitigation schedule would be:

Prior to railroad construction:	Landowner/agency negotiations:	March - July[1]
	Site inventories:	July - September
	Water rights appropriations:	May - October
	Final mitigation plan:	October - December
During railroad construction:	Permitting:	January - May
	Wetland mitigation	May - November
Post-construction period:	Monitoring/maintenance:	Five years following wetland mitigation unless success criteria are achieved prior to five years.

[1]Months are listed as an example reflecting a typical schedule; an actual schedule would be developed as mitigation planning is finalized.

3.2.7 As-built Conditions

Within six (6) weeks of completion of mitigation, an as-built report would be submitted to COE describing the mitigation completed. The report would include topographic maps showing as-built contours, location of revegetation types, fences and any other structures.

4.0 MONITORING

Monitoring would be conducted to evaluate wetland creation success and to determine if remediation may be necessary. Specific objectives include:

- quantification of hydrologic, soils and vegetation parameters
- assessment of created wetland size
- delineation of reestablished wetland types
- evaluation of wetland functions
- identification of potential problems

4.1 PARAMETERS AND METHODS

Wetland hydrology, hydric soils, and hydrophytic vegetation will be assessed at created wetlands using methods and criteria established by COE (Environmental Laboratory 1987). Specific field sampling techniques and intensity will be determined in consultation with COE prior to field investigations.

4.1.1 Hydrology

The following field indicators will be monitored as primary evidence of wetland hydrology:

- inundation (area and depth of standing water)
- saturation (area and depth to saturated conditions if area is not saturated to the surface)
- high water marks and low water as observed

4.1.2 Soils

Soils will be evaluated by digging 12 to 18 inch deep pits in each wetland type. Parameters to be recorded include soil drainage, soil saturation, evidence of past inundation, presence of sulfidic materials, mottles or gleying, matrix color, mineral or organic soil, and aquic or peraquic soil regimes.

4.1.3 Vegetation

Vegetation will be inventoried in each wetland type by recording canopy cover of all species encountered. Each plant species will be classified based on its relative fidelity to wetlands using the "National List of Plant Species That Occur in Wetlands: 1988" (Reed 1988 and 1997). Plant species recorded for each sample site will be classified for wetland indicator status and for dominance as determined by percent canopy cover. Each vascular plant species encountered will be classified into one of the five following groups.

1) *Obligate Wetland Plants (OBL):* These plants almost always (estimated probability >99 percent) grow in wetlands under natural conditions.

2) *Facultative Wetland Plants (FACW):* These plants usually grow in wetlands (estimated probability 67 to 99 percent), but occasionally grow in non-wetlands.

3) *Facultative Plants (FAC):* These plants are equally likely to grow in wetlands or non-wetlands.

4) *Facultative Upland Plants (FACU):* These plants usually grow in non-wetlands (estimated probability 67 to 99 percent), but are occasionally found in wetlands.

5) *Obligate Upland Plants (UPL):* These plants almost always occur in non-wetlands (estimated probability >99 percent), based on their relative fidelity to wetlands.

4.1.4 Functions

Functions for each wetland type will be assessed using methods and forms described by Berglund (1996). This methodology is currently used by the Montana Department of Transportation and has been found to be appropriate for use on linear projects.

4.2 SCHEDULE

Monitoring would begin the first growing season following creation and would continue for five years unless success criteria are met prior to five years. Monitoring may be discontinued for any parameter (hydrology, soils, vegetation or functions) after the success criteria for the parameter has been met.

4.3 REPORTING

Annual reports presenting the results of monitoring would be submitted to COE during the first quarter of the year following monitoring. The reports would include:

- names and affiliation of persons collecting and analyzing data and preparing the report
- description of methods
- results by parameter (hydrology, soils, vegetation)
- assessment of functions
- maps or figures identifying monitoring areas, transects or plots and wetland types
- photographs (color) of each site taken from one or more established photo point(s)
- a discussion of potential problems and recommendations for remediation if applicable

4.4 MAINTENANCE DURING MONITORING PERIOD

Monitoring would be designed for early detection of conditions that may jeopardize achieving success criteria. These conditions could include:

- widely fluctuating water levels that do not support wetland vegetation
- loss of wetland hydrology by excessive leakage through the soil substrate
- flood damage
- rapid siltation and filling of open water habitat
- erosion/sedimentation
- development of adverse soil properties (e.g. increased salinity by capillary rise) that could affect species composition of various palustrine types established, primarily scrub/shrub and forested types
- poor seeding or planting success
- vegetation damage from livestock or wildlife grazing/browsing
- invasion by weedy vegetation (noxious or non-noxious)
- non-attainment of desired functions

Most potential problems would be avoided by proper pre-construction design. If problems developed during the monitoring period, however, TRRC would develop maintenance or remediation measures specific to the condition. These measures could include:

- modification of factors affecting the water balance (e.g. increased inflow, reduced outflow)
- installation of erosion control products
- sediment removal
- addition of soil amendments (organic material, fertilizer, pH modifiers) or removal and replacement of poor soils
- supplemental seeding or planting
- grazing/browsing protection
- weed control measures

Any structures associated with construction of the mitigation sites would be inspected to assess proper functioning and stability. Repairs would be made as necessary.

5.0 SUCCESS CRITERIA

In order to be considered successful, created wetlands must meet all criteria listed below.

5.1 COE CRITERIA

Created wetlands would be successful when they meet wetland hydrology, hydric soil and hydrophytic vegetation criteria of the 1987 COE manual (Environmental Laboratory 1987).

Target hydrologic regimes would be established appropriate to the mitigation site. Mitigation sites along intermittent drainages would be expected to have fluctuating water levels reflecting runoff amount and duration in addition to other variables. The mitigation sites on the Tongue River would likely have less fluctuation depending upon water contributed by ground water in addition to surface water input. Hydrologic balances would be prepared for each mitigation site developed to assess probable hydrologic regime.

Hydric soils would be assumed for those portions of the site meeting wetland hydrology criteria. Since physical and chemical characteristics of hydric soils are unlikely to develop within the monitoring period, inundation or saturation is an appropriate measure of hydric soil at the mitigation sites.

For hydrophytic vegetation, more than 50 percent of dominant plant species must be wetland species (facultative or wetter). Vegetation criteria specific to the three common palustrine types are:

Type	Vegetation Criteria
Emergent	Herbaceous species must dominate the site. Composition must be comprised of grasses, sedges, rushes and forbs typical of herbaceous wetlands in the Tongue River Valley. Total cover must be adequate to prevent erosion.
Scrub/Shrub	Shrubs must be established at a density to eventually develop a canopy cover appropriate for wildlife cover and browse.
Forested	Tree density must be adequate to eventually develop an open canopied stand suitable for wildlife habitat.

5.2 FUNCTIONS

Created wetlands must provide comparable functions to disturbed wetlands. Functions of undisturbed wetlands are discussed in Section 1.4 and functions of habitats to be created are discussed in Section 3.2.3.

5.3 ACREAGE AND MITIGATION RATIOS

The total acreage of Waters of the U.S. (WUS) created must equal total acreage disturbed plus additional acreage calculated from mitigation ratios. Actual acreage impacted will be determined as a result of the pre-construction Waters of the U.S. inventory. The size, number and location of wetlands to be created will reflect the acreage and types of wetlands impacted.

TRRC proposes the following minimum mitigation ratios for WUS types identified in the Initial Waters Report:

Type (code)	Proposed Mitigation Ratio	Rationale/Comments
Riverine		
Intermittent - temporary flow (R4SBA)	1:1	Mitigation will be accomplished on-site by installing culverts maintaining temporary flow. Acreage impacted in this type would not be added to wetland creation sites.
Intermittent - seasonal flow (R4SBC)	1:1	Mitigation will be accomplished on-site by installing culverts maintaining seasonal flow. Acreage impacted in this type would not be added to wetland creation sites.
Lower perennial - open water (R20W)	1:1	Bridging will minimize acreage disturbed in this type.
Lower perennial - beach/bar (R2BB)	1:1	May be avoided by bridging.
Palustrine		
Open water (POW)	1:1	Mitigation sites would likely establish more POW than disturbed by railroad construction.
Emergent (PEM)	1:1	Herbaceous vegetation develops rapidly on properly designed mitigation sites
Scrub/Shrub (PSS)	1.5:1	Shrub development may take several years to achieve comparable functions.
Forested (PFO)	2:1	Tree development may take many years to achieve comparable functions.
Flat (PFL)	1:1	Herbaceous vegetation develops rapidly on properly designed mitigation sites

5.4 SCHEDULE/REPORTING

To minimize the amount of time wetland functions are lost, TRRC would implement wetland mitigation concurrently with railroad construction.

When TRRC considers that success criteria have been achieved, the COE would be notified via the annual monitoring report. The report would document attainment of success criteria and would include a current jurisdictional delineation of the wetland mitigation site(s) accompanied by legible copies of all field data sheets.

Following receipt of the report, the COE may require a site visit to confirm completion of mitigation and verify the jurisdictional delineation.

5.5 PERMANENT PROTECTION MEASURES

To ensure long-term protection of wetland mitigation sites, TRRC would select sites currently under Conservation Easements or would pursue establishing Conservation Easements on mitigation sites. If a Conservation Easement is not feasible, TRRC would pursue a written agreement with the landowner providing for long-term protection and management of the site. A written long-term management plan would be prepared for each mitigation site designating the party responsible for management and citing restrictions binding on current and future owners.

6.0 REMEDIATION/CONTINGENCY PLAN

If results of annual monitoring indicate that success criteria may not be met for all or any portion of the mitigation project, TRRC would prepare an analysis of probable causes and, if determined necessary by the COE, propose remedial action. Remediation could include additional work at the existing mitigation site or developing mitigation at an alternative location.

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8.0 TABLES

Table 1. Waters of the U.S. types, number of sites and estimated acreage, TRRC Preferred Alignment

Type (code)	Number of Sites[1]	Average Size (acres)	Estimated Acreage[2]
Riverine			
Incised drainages - temporary flow (R4SBA)	183	0.02	3.7
Incised drainages - seasonal flow (R4SBC)	93	0.03	2.8
Lower perennial - open water (R2OW)	12	1.32	15.8
Lower perennial - beach/bar (R2BB)	1	0.20	0.2
Palustrine			
Open Water (POW)	7	0.60	4.2
Emergent (PEM)	24	0.22	5.4
Scrub/Shrub (PSS)	4	0.41	1.6
Forested (PFO)	9	0.48	4.3
Flat (PFL)	2	<0.01	<0.1
TOTALS	**335**		**38.1**

[1]The total number of sites by type exceeds the total number of WUS identified in the Initial Waters Report since 2 or 3 types are present at some sites.

[2]Acreage based on a standard 400-foot wide corridor.

Table 2. Waters of the U.S. within the analysis corridor of the Tongue River Railroad Preferred Alignment

Site					Classification				
Site #	Site Name	Legal Description	Cnty[1]	Owner-ship[2]	Cowardin[3]	WUS Class[4]	Function[5]	Acreage[6]	Comments
NE-1	Miles City Fish Hatchery	NE1/4 SE1/4 SEC 5 T7N R47E	C	S	POWHh	P, Manmade	Ft, WL	2.020	Half of pond crossed by corridor
NE-2	Unnamed channel	NW1/4 SW1/4 SEC 4 T7N R47E	C	S	PEM1Hx	ES, Drainage channel		0.294	Channel from fish hatchery to wetland on east side of centerline (C/L), crossed by C/L
NE-3	Wetland fringe of Spotted Eagle Lake	NW1/4 SW1/4 SEC 4 T7N R47E	C	C	POWHh/ PEM1C	P/R, Manipulated	Fp, WL, FLD	1.837	Wetland fringe is paralleled by C/L, receives discharge from NE-2
NE-4	Pond of Miles City Fish Hatchery	NW1/4 SW1/4 SEC 4 T7N R47E	C	S	POWHh	P, Manmade		0.808	120 feet west of C/L
NE-5	Unnamed channel	SE1/4 NW1/4 SEC 9 T7N R47E	C	L	R4SBA	ES, NWUS		0.007	Crossed by C/L, very steep slope
NE-6	Unnamed channel	NE1/4 SW1/4 SEC 9 T7N R47E	C	L	R4SBA	ES, NWUS		0.007	Crossed by C/L
NE-7	Unnamed channel	SW1/4 SE1/4 SEC 9 T7N R47E	C	L	R4SBC	ES, NWUS		0.028	Crossed by C/L
NE-8	Unnamed channel	NW1/4 SW1/4 SEC 15 T7N R47E	C	L	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-9	Unnamed channel	NE1/4 NW1/4 SEC 22 T7N R47E	C	L	R4SBA	ES, NWUS		0.020	Crossed by C/L
NE-10	Unnamed channel	NW1/4 NE1/4 SEC 22 T7N R47E	C	L	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-11	Stock pond	SW1/4 NE1/4 SEC 22 T7N R47E	C	L	PEM1Ch	P, in terraced field		0.367	Crossed by C/L
NE-12	Unnamed channel	SW1/4 SW1/4 SEC 23 T7N R47E	C	L	R4SBC	ES, NWUS		0.046	Crossed and paralleled by C/L
NE-13	Unnamed channel	SW1/4 NE1/4 SEC 26 T7N R47E	C	L	R4SBC	ES, NWUS		0.009	Crossed by C/L
NE-14	Unnamed channel	SW1/4 SW1/4 SEC 25 T7N R47E	C	L	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-15	Unnamed tributary to NE-14	SW1/4 SW1/4 SEC 25 T7N R47E	C	L	R4SBA	ES, NWUS		0.009	Crossed by C/L
NE-16	Unnamed tributary to NE-17	NW1/4 NW1/4 SEC 36 T7N R47E	C	L	R4SBA	ES, NWUS		0.007	Crossed by C/L
NE-17	Paddy Fay Creek	NW1/4 NW1/4 SEC 36 T7N R47E	C	L	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-18	Unnamed channel	NW1/4 NW1/4 SEC 36 T7N R47E	C	L	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-19	Stock pond	SE1/4 NW1/4 SEC 36 T7N R47E	C	L	PEM1A	P/WM	WL	0.918	Crossed by C/L on eastern edge
NE-20	Unnamed channel	SW1/4 SE1/4 SEC 36 T7N R47E	C	L	R4SBA	ES, NWUS		0.021	Crossed by C/L
NE-21	Unnamed channel	NE1/4 SE1/4 SEC 1 T6N R47E	C	L	R4SBC	ES, NWUS		0.026	Crossed by C/L
NE-22	Unnamed channel	NE1/4 NE1/4 SEC 12 T6N R47E	C	L	R4SBA	ES, NWUS		0.022	Crossed by C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-23	Unnamed channel	NE1/4 NE1/4 SEC 12 T6N R47E	C	L	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-24	Unnamed channel	SE1/4 NE1/4 SEC 12 T6N R47E	C	L	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-25	Unnamed channel	NE1/4 SE1/4 SEC 12 T6N R47E	C	L	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-26	Unnamed channel	NW1/4 NW1/4 SEC 18 T6N R48E	C	L	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-27	Unnamed channel	SW1/4 NW1/4 SEC 18 T6N R48E	C	L	R4SBC	ES, NWUS		0.026	Crossed by C/L
NE-28	Unnamed tributary to NE-27	SW1/4 NW1/4 SEC 18 T6N R48E	C	L	R4SBA	ES, NWUS		0.010	80 feet east of and parallel to C/L
NE-29	Tongue River	SE1/4 SW1/4 SEC 18 and NE1/4 NW1/4 SEC 19 T6N R48E	C	L	R2OWG	RWF	FLD, WL, Fp, DS?	2.893	180 feet east of C/L
NE-30	Unnamed channel	SW1/4 SE1/4 SEC 19 T6N R48E	C	P	R4SBC	ES, NWUS		0.008	140 feet east of C/L
NE-31	Unnamed channel	SW1/4 SE1/4 SEC 19 T6N R48E	C	P	R4SBC	ES, NWUS		0.034	Crossed by C/L
NE-32	Unnamed channel	SE1/4 NE1/4 SEC 30 T6N R48E	C	P	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-33	Unnamed channel	NE1/4 SE1/4 SEC 30 T6N R48E	C	P	R4SBA	ES, NWUS		0.006	60 feet east of C/L
NE-34	Unnamed channel	NE1/4 NE1/4 SEC 31 T6N R48E	C	P	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-35	Unnamed channel	NE1/4 NE1/4 SEC 31 T6N R48E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-36	Unnamed channel	NW1/4 SE1/4 SEC 31 T6N R48E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-37	Unnamed channel	SW1/4 NW1/4 and SE1/4 NW1/4 SEC 6 T5N R48E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-38	Unnamed channel	NW1/4 SW1/4 SEC 6 T5N R48E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-39	Wolf Creek	SW1/4 NW1/4 SEC 7 T5N R48E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.031	100 feet east of C/L
NE-40	Stock water reservoir, Wolf Creek	SW1/4 NW1/4 SEC 7 T5N R48E	C	P	R4SBC/ PFO1C	P, Manmade ES, NWUS		3.306	C/L bisects stock water reservoir
NE-41	Unnamed channel	NE1/4 SE1/4 SEC 12 T5N R47E	C	P	R4SBA	ES, NWUS		0.028	200 feet west of and parallel to C/L
NE-42	Unnamed channel	SW1/4 SE1/4 and SE1/4 SE1/4 SEC 12 T5N R47E	C	P	R4SBA	ES, NWUS		0.050	Crossed by C/L
NE-43	Unnamed tributary to NE-44	NE1/4 NW1/4 SEC 13 T5N R47E	C	P	R4SBA	ES, NWUS		0.010	West of C/L
NE-44	Unnamed channel	NE1/4 NW1/4 and NW1/4 NE1/4 SEC 13 T5N R47E	C	P	R4SBC	ES, NWUS		0.028	Crossed by C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-45	Circle L Creek	SE1/4 SE1/4 SEC 14 T5N R47E	C	P	R4SBC	ES, NWUS		0.021	Crossed by C/L
NE-46	Unnamed channel	SE1/4 NW1/4 SEC 23 T5N R47E	C	P	R4SBA	ES, NWUS		0.011	Crossed and paralleled by C/L
NE-47	Unnamed channel	SE1/4 NW1/4 SEC 23 T5N R47E	C	P	R4SBA	ES, NWUS		0.010	Crossed by C/L
NE-48	Unnamed channel	SE1/4 SE1/4 SEC 22 T5N R47E	C	P	R4SBA	ES, NWUS		0.055	Crossed (at low angle) and paralleled by C/L
NE-49	Unnamed channel	NE1/4 NE1/4 and SE1/4 NE1/4 SEC 27 T5N R47E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.035	Crossed and paralleled by C/L
NE-50	Thorpe Creek	SW1/4 NE1/4 and SE1/4 NE1/4 SEC 27 T5N R47E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.026	Crossed by C/L
NE-51	Unnamed channel	NW1/4 SE1/4 and SW1/4 SE1/4 SEC 27 T5N R47E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-52	Unnamed channel	SW1/4 SE1/4 SEC 27 T5N R47E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-53	Unnamed channel	NW1/4 NE1/4 SEC 34 T5N R47E	C	P	R4SBA	ES, NWUS		0.009	Crossed by C/L
NE-54	Unnamed channel	NW1/4 NE1/4 SEC 34 T5N R47E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-55	Unnamed channel	SW1/4 NE1/4 SEC 34 T5N R47E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-56	Unnamed channel	NW1/4 SE1/4 SEC 34 T5N R47E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-57	Kennedy Creek	NW1/4 NW1/4 and SW1/4 NW1/4 SEC 1 T4N R47E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-58	Plunkett Creek	NE1/4 NE1/4 SEC 10 T4N R47E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-59	Unnamed channel	SW1/4 NW1/4 SEC 10 T4N R47E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-60	Unnamed channel	SW1/4 NW1/4 SEC 10 T4N R47E	C	P	R4SBC	ES, NWUS		0.003	140 feet southeast of C/L
NE-61	Unnamed channel	NE1/4 SE1/4 SEC 9 T4N R47E	C	P	R4SBA	ES, NWUS		0.007	Terminates 40 feet north of C/L
NE-62	Unnamed channel	NW1/4 SE1/4 and NE1/4 SE1/4 SEC 9 T4N R47E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-63	Unnamed channel	SW1/4 SE1/4 SEC 9 T4N R47E	C	P	R4SBA	ES, NWUS		0.007	Terminates 40 feet north of C/L
NE-64	Unnamed channel	NW1/4 NE1/4 SEC 16 T4N R47E	C	P	R4SBA	ES, NWUS		0.028	Crossed by C/L
NE-65	Geddes Creek	NE1/4 NW1/4 and SE1/4 NW1/4 SEC 16 T4N R47E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-66	Unnamed channel	NW1/4 SE1/4 and SW1/4 SE1/4 SEC 17 T4N R47E	C	P	R4SBA	ES, NWUS		0.021	Crossed by C/L
NE-67	Yank Creek	SW1/4 SE1/4 SEC 17 T4N R47E	C	P	R4SBC	ES, NWUS		0.057	Crossed and paralleled by C/L

Table 2. (Continued)

Site					Classification				
Site #	Site Name	Legal Description	Cnty[1]	Owner-ship[2]	Cowardin[3]	WUS Class[4]	Function[5]	Acreage[6]	Comments
NE-68	Unnamed channel	NW1/4 NW1/4 SEC 20 T4N R47E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-69	Unnamed channel	SW1/4 NE1/4 SEC 19 T4N R47E	C	P	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-70	Miles Creek	SW1/4 SW1/4 and NW1/4 SW1/4 SEC 19 T4N R47E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.055	Crossed and paralleled by C/L
NE-71	Unnamed channel	SE1/4 SE1/4 SEC 24 and NE1/4 NE1/4 SEC 25 T4N R46E	C	P	R4SBC	ES, NWUS		0.024	Crossed by C/L
NE-73	Unnamed channel	NE1/4 SW1/4 SEC 25 T4N R46E	C	P	R4SBA	ES, NWUS		0.014	Crossed by C/L
NE-74	Unnamed channel	SE1/4 SW1/4 and NW1/4 SW1/4 SEC 25 T4N R46E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-75	Forest Creek	SE1/4 NE1/4 SEC 35 T4N R46E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.041	Crossed and paralleled by C/L
NE-76	Tributary to Forest Creek	NE1/4 SE1/4 SEC 35 T4N R46E	C	P	R4SBA	ES, NWUS		0.033	Crossed by C/L
NE-77	Unnamed channel	SE1/4 NW1/4 SEC 2 T3N R46E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-78	Horse Creek	NW1/4 SW1/4 SEC 2 T3N R46E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.018	Crossed by C/L
NE-79	Unnamed tributary to NE-80	NE1/4 NE1/4 SEC 10 T3N R46E	C	F	R4SBA	ES, NWUS		0.015	Crossed by C/L
NE-80	Unnamed channel	NW1/4 NE1/4 SEC 10 T3N R46E	C	F	R4SBA	ES, NWUS		0.016	Crossed by C/L
NE-81	Unnamed channel	SE1/4 NW1/4 SEC 10 T3N R46E	C	F	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-82	Unnamed channel	SE1/4 NW1/4 SEC 10 T3N R46E	C	F	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-83	Unnamed channel	NW1/4 SW1/4 SEC 10 T3N R46E	C	F	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-84	Side channel of Six Mile Creek	SW1/4 SE1/4 SEC 9 T3N R46E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.037	25 feet west of and paralleled by C/L
NE-85	Six Mile Creek	SW1/4 SE1/4 SEC 9 and NW1/4 NE1/4 SEC 16 T3N R46E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.018	Crossed by C/L
NE-86	Unnamed channel	SW1/4 NW1/4 SEC 16 T3N R46E	C	P	R4SBA	ES, NWUS		0.026	Crossed by C/L
NE-87	Unnamed channel	SE1/4 NE1/4 SEC 17 T3N R46E	C	P	R4SBA	ES, NWUS		0.020	140 feet west of C/L
NE-88	Unnamed channel	NW1/4 SE1/4 SEC 17 T3N R46E	C	P	R4SBA	ES, NWUS		0.005	100 feet west of C/L
NE-89	Unnamed channel	NW1/4 SE1/4 SEC17 T3N R46E	C	P	R4SBA	ES, NWUS		0.005	100 feet west of C/L
NE-90	Unnamed channel	NW1/4 SE1/4 SEC 17 T3N R46E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-91	Miller Creek	NW1/4 NW1/4 SEC 20 T3N R46E	C	P	R4SBC	ES, NWUS		0.033	Crossed by C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-92	Unnamed pond	SW1/4 NW1/4 SEC 20 T3N R46E	C	P	PEM1C	P	WL	0.147	40 feet east of C/L
NE-93	Unnamed channel	NE1/4 SE1/4 SEC 19 T3N R46E	C	P	R4SBA	ES, NWUS		0.011	Crossed by C/L
NE-94	Unnamed channel	NW1/4 SE1/4 and NE1/4 SE1/4 SEC 19 T3N R46E	C	P	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-95	Unnamed channel	SW1/4 SE1/4 SEC 19 T3N R46E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-96	Unnamed channel	NE1/4 NW1/4 SEC 30 T3N R46E	C	P	R4SBA	ES, NWUS		0.024	Crossed by C/L
NE-97	Unnamed channel	NE1/4 NW1/4 SEC 30 T3N R46E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-98	Unnamed channel	SW1/4 NW1/4 SEC 30 T3N R46E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-99	Unnamed channel	NE1/4 SE1/4 SEC 25 T3N R45E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-100	Pump Creek	SW1/4 SE1/4 SEC 25 T3N R45E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-101	Cow Creek	SE1/4 NE1/4 SEC 35 T3N R45E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.051	Crossed by C/L
NE-102	Unnamed channel	SW1/4 SE1/4 SEC 35 T3N R45E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-103	Ranch Creek	SW1/4 NW1/4 SEC 2 T2N R45E	C	P	R4SBC/ PFO1C	ES, NWUS, SWF		0.078	Crossed and paralleled by C/L
NE-104	Coal Creek	NE1/4 NW1/4 and NW1/4 NW1/4 SEC 9 T2N R45E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.018	Crossed by C/L
NE-105	Unnamed channel	SE1/4 NE1/4 SEC 8 T2N R45E	C	P	R4SBA	ES, NWUS		0.033	Crossed by C/L
NE-106	Unnamed channel	NE1/4 SW1/4 SEC 8 T2N R45E	C	F	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-107	Tributary to NE-106	NE1/4 SW1/4 SEC 8 T2N R45E	C	F	R4SBA	ES, NWUS		0.007	Conflues with NE-106 40 feet west of C/L
NE-108	Unnamed channel	SE1/4 SW1/4 SEC 8 T2N R45E	C	F	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-109	Unnamed channel	NE1/4 NW1/4 and NW1/4 NW1/4 SEC 17 T2N R45E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-110	Unnamed channel	SW1/4 NW1/4 SEC 17 T2N R45E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-111	Unnamed channel	SW1/4 NW1/4 SEC 17 and SE1/4 NE1/4 SEC 18 T2N R45E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-112	Unnamed channel	NE1/4 SE1/4 SEC 18 T2N R45E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-113	Unnamed channel	NE1/4 SE1/4 SEC 18 T2N R45E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-114	Unnamed channel	SE1/4 SE1/4 SEC 18 T2N R45E	C	P	R4SBA	ES, NWUS		0.005	190 feet east of C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-115	Cottonwood Creek	SW1/4 SE1/4 SEC18 T2N R45E	C	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.018	Crossed by C/L
NE-116	Unnamed channel	SW1/4 NE1/4 SEC 19 T2N R45E	C	P	R4SBA	ES, NWUS		0.005	100 feet east of C/L
NE-117	Tributary to NE-118	SE1/4 NW1/4 SEC 19 T2N R45E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-118	Unnamed channel	NE1/4 SW1/4 and SE1/4 NW1/4 SEC 19 T2N R45E	C	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-119	Unnamed channel	NE1/4 SW1/4 SEC 19 T2N R45E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-120	Unnamed channel	SW1/4 SW1/4 SEC 19 and NW1/4 NW1/4 SEC 30 T2N R45E	C	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-120A	Dry Creek	NW1/4 SE1/4 SEC 25 T2N R44E	R	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.068	Crossed by C/L
NE-120B	Unnamed channel	SW1/4 SE1/4 SEC 25 T2N R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-120C	Unnamed channel	NE1/4 NW1/4 SEC 36 T2N R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-120D	Unnamed channel	NW1/4 NW1/4 and SW1/4 NW1/4 SEC 36 T2N R44E	R	S	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-120E	Unnamed channel	SW1/4 NW1/4 SEC 36 T2N R44E	R	S	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-120F	Unnamed channel	NE1/4 SE1/4 SEC 35 T2N R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-121	Unnamed channel	SW1/4 SE1/4 SEC 35 T2N R44E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-122	Trail Creek	SW1/4 NW1/4 SEC 2 T1N R44E	R	P	R4SBC	ES, NWUS		0.028	Crossed by C/L
NE-123	Alfalfa Creek	NW1/4 SW1/4 SEC 2 T1N R44E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-124	Unnamed channel	SE1/4 SE1/4 SEC 3 T1N R44E	R	P	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-125	Unnamed tributary to Hart Creek	NW1/4 NE1/4 SEC 10 T1N R44E	R	P	R4SBA	ES, NWUS		0.026	Crossed by C/L
NE-126	Hart Creek	SW1/4 SE1/4 SEC 10 T1N R44E	R	P	R4SBC	ES, NWUS		0.022	Crossed by C/L
NE-127	Unnamed channel	NE1/4 SW1/4 SEC 22 T1N R44E	R	P	R4SBC	ES, NWUS		0.013	40 feet east of C/L
NE-128	Joe Leg Creek	NE1/4 SE1/4 SEC 28 and NW1/4 SW1/4 SEC 27 T1N R44E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-129	Unnamed channel and pond	SE1/4 NW1/4 SEC 33 T1N R44E	R	P	R4SBA/ POWAh	P, Manmade ES, NWUS		0.826	Crossed by C/L

Table 2. (Continued)

Site					Classification				
Site #	Site Name	Legal Description	Cnty[1]	Owner-ship[2]	Cowardin[3]	WUS Class[4]	Function[5]	Acreage[6]	Comments
NE-130	Unnamed channel	NE1/4 SE1/4 SEC 32 and NW1/4 SW1/4 SEC 33 T1N R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-131	Unnamed channel	SE1/4 NE1/4 SEC 3 T1S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-132	Unnamed channel	SE1/4 NE1/4 SEC 3 T1S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-133	Hammond Draw	NW1/4 SE1/4 SEC 3 T1S R44E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-134	Unnamed channel	SW1/4 SW1/4 SEC 10 T1S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-135	Unnamed channel	SE1/4 SE1/4 SEC 9 and NW1/4 NW1/4 SEC 15 T1S R44E	R	P	R4SBA	ES, NWUS		0.011	Crossed by C/L
NE-136	Unnamed channel	NE1/4 NE1/4 SEC 16 T1S R44E	R	S	R4SBA	ES, NWUS		0.015	Crossed by C/L
NE-137	Unnamed channel	NE1/4 NE1/4 SEC 16 T1S R44E	R	S	R4SBA	ES, NWUS		0.017	Crossed by C/L
NE-140	Roe and Cooper Creek	SW1/4 NE1/4 SEC 16 T1S R44E	R	S	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-141	Unnamed channel	NE1/4 SW1/4 SEC 16 T1S R44E	R	S	R4SBA	ES, NWUS		0.017	Crossed by C/L
NE-142	Unnamed channel	NE1/4 SW1/4 SEC 16 T1S R44E	R	S	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-143	Unnamed channel	SE1/4 SW1/4 SEC 16 T1S R44E	R	S	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-144	Unnamed channel	SE1/4 SW1/4 SEC 16 and NE1/4 NW1/4 SEC 21 T1S R44E	R	S/P	R4SBA	ES, NWUS		0.015	Crossed by C/L
NE-145	Unnamed channel	NE1/4 NW1/4 SEC 21 T1S R44E	R	P	R4SBA	ES, NWUS		0.008	Crossed by C/L
NE-146	Unnamed channel	NE1/4 NW1/4 SEC 21 T1S R44E	R	P	R4SBA	ES, NWUS		0.005	Terminates 20 feet east of C/L
NE-147	Unnamed channel	NE1/4 NW1/4 SEC 21 T1S R44E	R	P	R4SBA	ES, NWUS		0.013	Crossed by C/L
NE-148	Unnamed channel	SE1/4 SE1/4 SEC 21 T1S R44E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-149	Unnamed channel	NE1/4 NE1/4 SEC 28 T1S R44E	R	P	R4SBA	ES, NWUS		0.015	Crossed by C/L
NE-150	Unnamed channel	SW1/4 NW1/4 SEC 27 T1S R44E	R	P	R4SBA	ES, NWUS		0.013	Crossed by C/L
NE-151	Tongue River	NE1/4 SW1/4 and NW1/4 SW1/4 SEC 27 T1S R44E	R	P	R2OWG/ PFO1A	RWF	WL, Fp, FLD	2.204	crossed by C/L
NE-152	Unnamed channel	SW1/4 SE1/4 SEC 34 T1S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-153	Unnamed channel	NW1/4 NE1/4 SEC 3 T2S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-154	Unnamed channel	NW1/4 SE1/4 SEC 3 T2S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-155	Unnamed channel	SW1/4 NE1/4 SEC 10 T2S R44E	R	P	R4SBA	ES, NWUS		0.008	Crossed by C/L
NE-156	Unnamed channel	NW1/4 SE1/4 SEC 10 T2S R44E	R	P	R4SBA	ES, NWUS		0.009	Crossed by C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-157	Tongue River	NW1/4 SE1/4 SEC 10 T2S R44E	R	P	R2OWG	RWF	WL, Fp, FLD	5.785	80 feet west of C/L
NE-158	Unnamed channel	SW1/4 SE1/4 SEC 10 T2S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-159	Unnamed channel	NW1/4 NE1/4 SEC 15 T2S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-160	Unnamed channel	NE1/4 NW1/4 and NW1/4 NE1/4 SEC 15 T2S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-161	Tongue River	SE1/4 NW1/4 and NE1/4 SW1/4 SEC 15 T2S R44E	R	P	R2OWG	RWF	WL, Fp, FLD	0.882	120 feet west of C/L
NE-162	Unnamed channel	SW1/4 NE1/4 SEC 22 T2S R44E	R	P	R4SBA	ES, NWUS		0.007	40 feet east of C/L
NE-163	Tongue River	NE1/4 NE1/4 SEC 27 T2S R44E	R	P	R2OWG	RWF	WL, Fp, FLD	1.414	140 feet west of C/L
NE-164	Double E Coulee	SE1/4 NE1/4 and NE1/4 SE1/4 SEC 27 T2S R44E	R	P	R4SBC/ PFO1A	ES, NWUS, SWF		0.052	Crossed by C/L
NE-165	Tongue River	NE1/4 SE1/4 SEC 27 T2S R44E	R	P	R2OWG	RWF	WL, Fp, FLD	1.194	100 feet west of C/L
NE-166	Tongue River	NW1/4 SW1/4 and SW1/4 NW1/4 SEC 35 T2S R44E	R	P	R2OWG/ PFO1A	RWF	WL, Fp, FLD	2.314	60 feet west of C/L
NE-167	Cook Creek	NW1/4 SW1/4 SEC 35 T2S R44E	R	P	R4SBC/ PFO1A	ES, NWUS, SWF		0.018	Crossed by C/L
NE-168	Unnamed channel	NW1/4 SE1/4 and SW1/4 NE1/4 SEC 2 T3S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-169	Unnamed channel	SW1/4 SE1/4 SEC 2 T3S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-170	Otter Creek	NE1/4 NE1/4 SEC 11 T3S R44E	R	P	R2OWH/ PEM1Y	SWF	WL, Fs, FLD	1.019	190 feet west of C/L centerline
NE-171	Otter Creek meander	SE1/4 NE1/4 SEC 11 T3S R44E	R	P	PSS1Y	UM	WL, FLD, Fs	0.882	140 feet west of C/L
NE-172	Otter Creek meander	NE1/4 SW1/4 SEC 12 T3S R44E	R	P	POWF/ PFO1U	UM	WL, FLD, Ft?, DS	0.413	Meander cut off by road - 80 feet west of C/L
NE-173	Unnamed channel	NE1/4 SW1/4 SEC 12 T3S R44E	R	P	R4SBA	ES, NWUS		0.044	Crossed by C/L (3 times) and paralleled by C/L
NE-174	Otter Creek	SE1/4 SW1/4 SEC 12 T3S R44E	R	P	R2OWF/ PSS1Y	SWF	WL, FLD, Fp, DS	0.275	Crossed by C/L
NE-175	Otter Creek	SE1/4 SW1/4 SEC 12 and NE1/4 NW1/4 SEC 13 T3S R44E	R	P	R2OWF/ PSS1Y	SWF	WL, FLD, Fp, DS	0.161	150 feet east of C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-176	Unnamed channel	NW1/4 SW1/4 SEC 23 T3S R44E	R	P	R4SBC/ PSS1Y	ES, NWUS, SWF		0.018	Crossed by C/L
NE-178	Unnamed channel	SW1/4 SE1/4 SEC 22 T3S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-179	Spring Creek	NW1/4 NE1/4 SEC 27 T3S R44E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-180	Bridge Creek	NW1/4 SW1/4 SEC 27 T3S R44E	R	P	R4SBC	ES, NWUS		0.039	Crossed by C/L
NE-181	Unnamed channel	SE1/4 SE1/4 SEC 28 T3S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-182	Unnamed channel	SE1/4 SE1/4 SEC 28 T3S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-183	Unnamed channel	SE1/4 SE1/4 SEC 28 T3S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-184	Unnamed channel	SW1/4 NE1/4 SEC 33 T3S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-185	Unnamed channel	NE1/4 SW1/4 SEC 33 T3S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-186	Bowman Creek	NW1/4 NW1/4 SEC 4 T4S R44E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-187	Unnamed channel	SW1/4 NW1/4 SEC 4 T4S R44E	R	P	R4SBC	ES, NWUS		0.023	Crossed by C/L
NE-188	Unnamed channel	SE1/4 SE1/4 SEC 5 T4S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L, spring 550 ft. from edge of ROW
NE-189	Unnamed channel	SW1/4 SE1/4 SEC 5 T4S R44E	R	P	R4SBA	ES, NWUS		0.044	Crossed and paralleled by C/L
NE-190	King Creek	SW1/4 NE1/4 SEC 8 T4S R44E	R	P	R4SBC	ES, NWUS		0.046	Crossed and paralleled by C/L
NE-191	Cedar Creek	NE1/4 NE1/4 SEC 18 T4S R44E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-192	Unnamed channel	SE1/4 NE1/4 SEC 18 T4S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-193	Dry Creek	NW1/4 SE1/4 SEC 18 T4S R44E	R	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.035	Crossed by C/L
NE-194	Unnamed channel	NW1/4 SE1/4 SEC 18 T4S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-195	Unnamed channel	SE1/4 SW1/4 SEC 18 T4S R44E	R	P	R4SBC	ES, NWUS		0.023	Crossed by C/L
NE-196	Unnamed channel	SW1/4 NW1/4 SEC 19 T4S R44E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-197	Unnamed channel	SE1/4 SE1/4 SEC 24 T4S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-198	Unnamed channel	SW1/4 NE1/4 and NW1/4 NE1/4 SEC 25 T4S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-199	O'Dell Creek	NW1/4 SE1/4 SEC 25 T4S R43E	R	P	R4SBC/ PEM1C	ES, NWUS, SWF		0.064	Crossed and paralleled by C/L
NE-200	Unnamed channel	NW1/4 SW1/4 SEC 36 T4S R43E	R	S	R4SBA	ES, NWUS		0.024	Crossed by C/L
NE-201	Unnamed channel	NE1/4 SE1/4 SEC 35 T4S R43E	R	P	R4SBA	ES, NWUS		0.024	Crossed by C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-202	Unnamed channel	NE1/4 SE1/4 SEC 35 T4S R43E	R	P	R4SBA	ES, NWUS		0.015	Crossed by C/L
NE-203	Unnamed channel	NE1/4 SE1/4 SEC 35 T4S R43E	R	P	R4SBA	ES, NWUS		0.009	C/L bisects lower end of channel
NE-204	Unnamed channel	SW1/4 SE1/4 SEC 35 T4S R43E	R	P	R4SBC	ES, NWUS		0.026	Crossed by C/L
NE-205	Unnamed channel	SW1/4 SE1/4 SEC 35 T4S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-206	Gate Creek	NE1/4 NW1/4 SEC 2 T5S R43E	R	F	R4SBC	ES, NWUS		0.046	Crossed by C/L
NE-207	Unnamed channel	NW1/4 SE1/4 SEC 3 T5S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-208	Unnamed channel	NW1/4 SE1/4 and SW1/4 SE1/4 SEC 3 T5S R43E	R	P	R4SBC	ES, NWUS		0.028	Crossed and paralleled by C/L
NE-209	Unnamed channel	NW1/4 NW1/4 SEC 10 T5S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-210	Unnamed channel	NW1/4 SW1/4 SEC 10 T5S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-211	Unnamed channel and pond	NW1/4 SW1/4 SEC 10 T5S R43E	R	P	R4SBA/ PFL3Ch/ POWFh	ES, NWUS, P, SWF		0.018	Crossed by C/L
NE-212	Poker Teechee Creek	SE1/4 SE1/4 SEC 9 and NE1/4 NE1/4 SEC 16 T5S R43E	R	P/S	R4SBC	ES, NWUS		0.028	Crossed by C/L
NE-213	Unnamed channel	SW1/4 NE1/4 SEC 16 T5S R43E	R	S	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-214	Unnamed channel	NW1/4 SW1/4 SEC 16 T5S R43E	R	S	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-215	Poker Jim Creek	NE1/4 SE1/4 and SE1/4 SE1/4 SEC 17 T5S R43E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-216	Unnamed channel	SW1/4 SE1/4 SEC 17 T5S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-217	Unnamed channel	NE1/4 NW1/4 SEC 20 T5S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-218	Unnamed channel	NW1/4 NW1/4 and SW1/4 NW1/4 SEC 20 T5S R43E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-219	Unnamed channel	SW1/4 NW1/4 SEC 20 T5S R43E	R	P	R4SBA	ES, NWUS		0.022	Crossed by C/L
NE-220	Unnamed channel and pond	NW1/4 SE1/4 SEC 19 T5S R43E	R	P	R4SBC/ PFL3Ch	ES, NWUS, P		0.023	Crossed by C/L
NE-221	Unnamed channel	SE1/4 SW1/4 and SW1/4 SE1/4 SEC 19 T5S R43E	R	P	R4SBA/ PEM5A	ES, NWUS, SWF		0.018	Crossed by C/L
NE-223	Unnamed channel	SW1/4 NW1/4 SEC 30 T5S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-224	Unnamed channel	NE1/4 SE1/4 SEC 25 T5S R42E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-225	Black Eagle Creek	SE1/4 SE1/4 SEC 25 T5S R42E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-226	Tributary to NE-227	NE1/4 SW1/4 SEC 36 T5S R42E	R	S	R4SBA	ES, NWUS		0.018	Crossed by C/L,
NE-227	Unnamed channel	NE1/4 SW1/4 SEC 36 T5S R42E	R	S	R4SBC	ES, NWUS		0.007	Conflues with NE-226 100 feet east of C/L
NE-228	Unnamed channel	SE1/4 SW1/4 SEC 36 T5S R42E	R	S	R4SBC	ES, NWUS		0.027	Crossed by C/L
NE-229	Unnamed channel	NE1/4 SE1/4 SEC 6 T6S R43E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-230	Unnamed channel and pond	SE1/4 NE1/4 SEC 7 T6S R43E	R	P	R4SBC/ PEM5A	ES, NWUS, P		0.018	Crossed by C/L
NE-231	Unnamed channel	NE1/4 NE1/4 SEC 18 T6S R43E	R	P	R4SBA	ES, NWUS		0.030	Crossed by C/L
NE-232	Unnamed channel	NE1/4 NE1/4 SEC 18 T6S R43E	R	P	R4SBA	ES, NWUS		0.017	Crossed by C/L
NE-233	Unnamed channel	NE1/4 NE1/4 SEC 18 T6S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-234	Unnamed channel	SE1/4 NE1/4 SEC 18 T6S R43E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-235	Hackley Creek	NW1/4 SE1/4 SEC 18 T6S R43E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-236	Hanging Woman Creek	NW1/4 SE1/4 SEC 18 T6S R43E	R	P	R2OWF/ PFO1A	SWF	WL, FLD, Ft	0.230	Crossed by C/L
NE-237	Unnamed channel and pond	NW1/4 NE1/4 and NE1/4 NW1/4 SEC 24 T6S R42E	R	P	R4SBA/ POWFh	ES, NWUS, P		0.018	Crossed by C/L
NE-238	Unnamed channel	SE1/4 SW1/4 and SW1/4 SW1/4 SEC 23 T6S R42E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-239	Unnamed channel	NW1/4 NW1/4 SEC 26 T6S R42E	R	P	R4SBA	ES, NWUS		0.024	Crossed and paralleled by C/L
NE-240	Unnamed channel	NW1/4 NW1/4 SEC 26 T6S R42E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-241	Unnamed channel	SW1/4 NE1/4 and SE1/4 NE1/4 SEC 27 T6S R42E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-242	Battle Butte Creek	NW1/4 SW1/4 SEC 27 T6S R42E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-243	Unnamed channel	SW1/4 SE1/4 SEC 28 T6S R42E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-244	Ebaugh Creek	SE1/4 SW1/4 SEC 28 T6S R42E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-245	Unnamed channel	NE1/4 NE1/4 SEC 32 T6S R42E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-246	Unnamed channel	NE1/4 NE1/4 SEC 32 T6S R42E	R	P	R4SBA	ES, NWUS		0.014	Crossed by C/L
NE-246A	Tongue River	SW1/4 NW1/4 SEC 32 T6S R42E	R	P	R2OWG/ R2BB2C/ PFO1A	RWF	Fp, FLD, DS, WL	1.882	Crossed by C/L
NE-247	Prairie Dog Creek	NW1/4 SE1/4 SEC 31 T6S R42E	R	P	R4SBC	ES, NWUS		0.028	Crossed by C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-248	Bootlegger Draw	SW1/4 SW1/4 SEC 31 T6S R42E	R	P	R4SBA	ES, NWUS		0.021	Crossed by C/L
NE-249	School House Draw	NE1/4 NE1/4 SEC 1 T7S R41E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-250	Unnamed channel	SW1/4 NE1/4 and SE1/4 NE1/4 SEC 1 T7S R41E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-251	Spring Creek	NE1/4 SW1/4 and NW1/4 SE1/4 SEC 1 T7S R41E	R	P	R4SBC	ES, NWUS		0.041	Crossed and paralleled by C/L
NE-252	Unnamed channel	Center of SW1/4 SEC 1 T7S R41E	R	P	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-253	Unnamed channel	NE1/4 NE1/4 SEC 11 T7S R41E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-254	Unnamed channel	NE1/4 NE1/4 SEC 11 T7S R41E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-255	Unnamed channel	NE1/4 NE1/4 SEC 11 T7S R41E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-256	Unnamed channel	SW1/4 NE1/4 SEC 11 T7S R41E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-257	Canyon Creek	SE1/4 NW1/4 and NE1/4 SW1/4 SEC 11 T7S R41E	R	P	PEM5/9C/ R4SBC	ES, NWUS, SWF		0.018	Crossed by C/L
NE-258	Unnamed channel	NE1/4 SW1/4 SEC 11 T7S R41E	R	P	R4SBC	ES, NWUS		0.028	Crossed by C/L
NE-259	Unnamed channel	NW1/4 NW1/4 SEC 14 T7S R41E	R	F	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-260	Unnamed channel	SW1/4 NW1/4 SEC 14 T7S R41E	R	F	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-261	Dutch Hollow	SE1/4 SE1/4 SEC 15 T7S R41E	R	P	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-262	Unnamed channel	SW1/4 SE1/4 SEC 15 T7S R41E	R	P	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-263	Unnamed channel	NE1/4 NW1/4 SEC 22 T7S R41E	R	P	R4SBA	ES, NWUS		0.032	Crossed by C/L at acute angle
NE-264	Unnamed channel	NE1/4 SE1/4 SEC 21 T7S R41E	R	F	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-265	Unnamed channel	NE1/4 SE1/4 SEC 21 T7S R41E	R	F	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-266	Unnamed channel	NE1/4 NE1/4 SEC 28 T7S R41E	R	P	R4SBA	ES, NWUS		0.026	Crossed and paralleled by C/L
NE-267	Fourmile Creek	NE1/4 NE1/4 SEC 28 T7S R41E	R	P	R4SBC	ES, NWUS		0.055	Crossed by C/L
NE-268	Unnamed channel	NE1/4 SW1/4 and NW1/4 SE1/4 SEC 28 T7S R41E	R	P	R4SBA	ES, NWUS		0.046	Crossed and paralleled by C/L
NE-269	Unnamed channel	SE1/4 SW1/4 SEC 28 T7S R41E	R	P	R4SBA	ES, NWUS		0.051	Crossed by C/L (ROW≈800 feet wide at this point)
NE-270	Unnamed channel	SE1/4 SW1/4 SEC 28 T7S R41E	R	P	R4SBA	ES, NWUS		0.018	Crossed by C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-271	Unnamed channel	NW1/4 NW1/4 SEC 33 T7S R41E	R	P	R4SBA	ES, NWUS		0.031	Crossed by C/L at an angle (ROW up to 600 feet wide at this location)
NE-272	Unnamed channel	NE1/4 NE1/4 SEC 32 T7S R41E	R	P	R4SBA	ES, NWUS		0.023	Crossed by C/L
NE-273	Unnamed channel	SE1/4 NW1/4 SEC 32 T7S R41E	R	F	R4SBA	ES, NWUS		0.034	Crossed by C/L (ROW ≈700 feet wide)
NE-274	Unnamed channel	NW1/4 SW1/4 SEC 32 T7S R41E	R	P	R4SBC	ES, NWUS		0.036	Crossed by C/L (ROW ≈700 feet wide)
NE-275	Unnamed channel	SE1/4 SE1/4 SEC 31 T7S R41E	R	P	R4SBA	ES, NWUS		0.025	Crossed by C/L
NE-276	Unnamed channel	SW1/4 NE1/4 SEC 31 T7 ½ S R41E	B	P	R4SBA	ES, NWUS		0.051	Crossed and paralleled by C/L (ROW up to 650 feet wide)
NE-277	Post Creek	NW1/4 SE1/4 SEC 31 T7 ½ S R41E	B	P	R4SBC	ES, NWUS		0.057	Crossed by C/L (ROW ≈850 feet wide) and meanders
NE-278	Unnamed channel	SW1/4 NE1/4 and NW1/4 SE1/4 SEC 6 T8S R41E	B	P	R4SBA	ES, NWUS		0.021	Crossed by C/L
NE-279	Unnamed channel	NE1/4 SW1/4 SEC 6 T8S R41E	B	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-280	Unnamed channel	SW1/4 SW1/4 SEC 6 T8S R41E	B	P	R4SBA	ES, NWUS		0.022	Crossed by C/L
NE-281	Unnamed channel	NE1/4 NE1/4 SEC 12 T8S R40E	B	P	R4SBA	ES, NWUS		0.018	Crossed by C/L
NE-282	Unnamed channel	NE1/4 NE1/4 SEC 12 T8S R40E	B	P	R4SBC	ES, NWUS		0.030	Crossed by C/L (ROW ≈650 feet wide)
NE-283	Unnamed channel	SW1/4 NE1/4 SEC 12 T8S R40E	B	P	R4SBA	ES, NWUS		0.025	Crossed by C/L
NE-284	Unnamed channel	SW1/4 NE1/4 SEC 12 T8S R40E	B	P	R4SBA	ES, NWUS		0.021	Crossed by C/L
NE-285	Unnamed channel	NE1/4 SW1/4 SEC 12 T8S R40E	B	P	R4SBA	ES, NWUS		0.037	80 - 200 feet east of and parallel to C/L
NE-286	Leaf Rock Creek	SW1/4 SW1/4 SEC 12 T8S R40E	B	P/S	R4SBC	ES, NWUS		0.018	Crossed by C/L
NE-287	Unnamed channel	NE1/4 NE1/4 SEC 14 T8S R40E	B	P	R4SBA	ES, NWUS		0.028	Crossed by C/L
NE-288	Unnamed channel	SE1/4 NW1/4 SEC 14 T8S R40E	B	F	R4SBC	ES, NWUS		0.024	Crossed by C/L
NE-289	Monument Creek	NE1/4 SW1/4 SEC 14 T8S R40E	B	P	R4SBC	ES, NWUS		0.029	Crossed by C/L (ROW 600 feet wide)
NE-290	Unnamed channel	NW1/4 NW1/4 SEC 23 T8S R40E	B	P	R4SBA	ES, NWUS		0.030	Crossed by C/L at angle
NE-291	Unnamed channel	SE1/4 NE1/4 SEC 22 T8S R40E	B	P	R4SBC	ES, NWUS		0.018	Crossed by C/L

Table 2. (Continued)

Site		Legal Description	Cnty[1]	Owner-ship[2]	Classification		Function[5]	Acreage[6]	Comments
Site #	Site Name				Cowardin[3]	WUS Class[4]			
NE-292	Unnamed channel	NE1/4 NW1/4 SEC 27 T8S R40E	B	P	R4SBA	ES, NWUS		0.096	20 - 40 feet east of and parallel to C/L
NE-293	Tributary to NE-292	NW1/4 NW1/4 SEC 27 T8S R40E	B	P	R4SBA	ES, NWUS		0.016	Crossed by C/L
NE-294	Unnamed channel	SW1/4 NW1/4 SEC 27 T8S R40E	B	P	R4SBC/ PEM5Ah	ES, NWUS, SWF		0.022	Crossed by C/L
NE-295	Tributary to NE-294	SW1/4 NW1/4 SEC 27 T8S R40E	B	P	R4SBA	ES, NWUS		0.018	Cross

[1]County
- C = Custer
- R = Rosebud
- B = Big Horn

[2]Ownership:
- L = Livestock and Range Research Station
- C = Municipal
- S = State
- F = Federal
- P = Private

[3]See attached figure

[4]Waters of the U.S. classes:
- NWUS = Non-wetland waters of the U.S.
- ES = Ephemeral stream
- IS = Intermittent stream
- RWF = River with wetland fringe
- SWF = Stream with wetland fringe
- UM = Abandoned or unused meander of channel
- P = Natural or artificial pond
- R = Riparian area
- WM = Wet meadow/saline meadow

[5]Wetland function designations (adapted from Berglund 1996):
- WL = General wildlife habitat
- Ft = General Fish habitat, temporary
- Fs = General Fish habitat, seasonal
- Fp = General Fish habitat, perennial
- DS = Dynamic surface water storage
- FLD = Flood attenuation and storage

[6]Acreage is calculated based on a 400-foot-wide corridor unless otherwise noted.

Footnote 3 to Table 2

WETLANDS AND DEEPWATER HABITATS CLASSIFICATION

SYSTEM: P–PALUSTRINE

CLASS	Subclass
RB–ROCK BOTTOM	1 Bedrock 2 Boulder
UB–UNCONSOLIDATED BOTTOM	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic
AB–AQUATIC BED	1 Submergent Algal 2 Submergent Vascular 3 Submergent Moss 4 Floating–leaved 5 Floating 6 Unknown Submergent 7 Unknown Surface
FL FLAT	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated Pioneer 6 Vegetated Non–pioneer
ML–MOSS–LICHEN	1 Moss 2 Lichen
EM–EMERGENT	1 Persistent 2 Nonpersistent 3 Narrow–leaved Nonpersistent 4 Broad–leaved Nonpersistent 5 Narrow–leaved Persistent 6 Broad–leaved Persistent
SS–SCRUB–SHRUB	1 Broad–Leaved Deciduous 2 Needle–Leaved Deciduous 3 Broad–Leaved Evergreen 4 Needle–Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen
FO–FORESTED	1 Broad–Leaved Deciduous 2 Needle–Leaved Deciduous 3 Broad–Leaved Evergreen 4 Needle–Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen
OW–OPEN WATER/ Unknown Bottom	

SYSTEM: R–RIVERINE

SUBSYSTEM	1–TIDAL	2–LOWER PERENNIAL	3–UPPER PERENNIAL	4–INTERMITTENT	5–UNKNOWN PERENNIAL

CLASS	Subclass
RB–ROCK BOTTOM	1 Bedrock 2 Boulder
UB–UNCONSOLIDATED BOTTOM	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic
*SB–STREAMBED	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic
AB–AQUATIC BED	1 Submergent Algal 2 Submergent Vascular 3 Submergent Moss 4 Floating–leaved 5 Floating 6 Unknown Submergent 7 Unknown Surface
RS–ROCKY SHORE	1 Bedrock 2 Boulder
FL–FLAT	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated Pioneer 6 Vegetated Non–pioneer
**EM–EMERGENT	2 Nonpersistent 3 Narrow–leaved Nonpersistent 4 Broad–leaved Nonpersistent
BB–BEACH/BAR	1 Cobble–Gravel 2 Sand
OW–OPEN WATER/ Unknown Bottom	

SYSTEM: L–LACUSTRINE

SUBSYSTEM	1–LIMNETIC	2–LITTORAL

CLASS	Subclass
RB–ROCK BOTTOM	1 Bedrock 2 Boulder
UB–UNCONSOLIDATED BOTTOM	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic
AB–AQUATIC BED	1 Submergent Algal 2 Submergent Vascular 3 Submergent Moss 4 Floating–leaved 5 Floating 6 Unknown Submergent 7 Unknown Surface
OW–OPEN WATER/ Unknown Bottom	
RB–ROCK BOTTOM	1 Bedrock 2 Boulder
UB–UNCONSOLIDATED BOTTOM	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic
AB–AQUATIC BED	1 Submergent Algal 2 Submergent Vascular 3 Submergent Moss 4 Floating–leaved 5 Floating 6 Unknown Submergent 7 Unknown Surface
RS–ROCKY SHORE	1 Bedrock 2 Boulder
FL–FLAT	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated Pioneer 6 Vegetated Non–pioneer
BB–BEACH/BAR	1 Cobble–Gravel 2 Sand
**EM–EMERGENT	2 Nonpersistent 3 Narrow–leaved Nonpersistent 4 Broad–leaved Nonpersistent
OW–OPEN WATER/ Unknown Bottom	

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS, and comprises the only CLASS in the INTERMITTENT SUBSYSTEM.
**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS.

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The formed modifier may also be applied to the ecological system.

WATER REGIME

Non–Tidal

A Temporarily Flooded
B Saturated
C Seasonally Flooded
D Seasonally Flooded/ Well Drained
E Seasonally Flooded/ Saturated
F Semipermanently Flooded
G Intermittently Exposed
H Permanently Flooded
J Intermittently Flooded
K Artificially Flooded
W Intermittently Flooded/Temporary
Y Saturated/Semipermanent/ Seasonal
Z Intermittently Exposed/Permanent
U Unknown

Tidal

K Artificially Flooded
L Subtidal
M Irregularly Exposed
N Regularly Flooded
P Irregularly Flooded
*S Temporary–Tidal
*R Seasonal–Tidal
*T Semipermanent–Tidal
*V Permanent–Tidal
U Unknown

*These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity

1 Hyperhaline
2 Euhaline
3 Mixohaline (Brackish)
4 Polyhaline
5 Mesohaline
6 Oligohaline
0 Fresh

Inland Salinity

7 Hypersaline
8 Eusaline
9 Mixosaline
0 Fresh

pH Modifiers for all Fresh Water

a Acid
t Circumneutral
i Alkaline

SOIL

g Organic
n Mineral

SPECIAL MODIFIERS

b Beaver
d Partially Drained/Ditched
f Farmed
h Diked/Impounded
r Artificial Substrate
s Spoil
x Excavated

Source: Classification of Wetlands and Deepwater Habitats of the United States Cowardin ET. AL. 1979 as modified for National Wetland Inventory Mapping Convention

Table 3. Comparison of Waters of the U.S. along the Tongue River Railroad Proposed Alignment and four alternatives.
(Revised November 30, 1998)

Alternative	Approx. Length (Miles)	Total Number WUS	Total Acreage WUS	Acreage by WUS Type[1]						
				ES	ES, NWUS	IS	P	RWF	SWF	UM
TRRC Proposed Alignment	116	297	38.05	0.29	5.99	0.00	10.23	18.57	1.68	1.29
Tongue River Road Alternative[2]	117	309	94.36	0.29	5.67	3.09	5.95	42.31	1.95	35.10
Moon Creek Alternative[3]	124	294	46.92	0.00	7.08	0.01	0.97	35.51	2.06	1.29
Colstrip Alternative[4]	109	308	53.94	0.00	5.10	0.00	25.90	15.67	5.44	1.83
Four Mile Creek Alternative[5]	128	325	65.51	0.29	6.21	0.07	10.23	44.69	1.68	2.33

[1]Waters of the U.S. types:
NWUS = Non-wetland waters of the U.S.
ES = Ephemeral stream
IS = Intermittent stream
RWF = River with wetland fringe
SWF = Stream with wetland fringe
UM = Abandoned or unused meander of channel
P = Natural or artificial pond
R = Riparian area
WM = Wet meadow/saline meadow

[2]Incorporates TRRC Proposed Alignment from Miles City to approx. station 520+00, and from approx. station 3200+00 to Decker.
[3]Joins TRRC Proposed Alignment at approx. station 1100+00 then incorporates TRRC Proposed Alignment to Decker.
[4]Joins TRRC Proposed Alignment at approx. station 3040+00 then incorporates TRRC Proposed Alignment to Decker.
[5]Incorporates TRRC Proposed Alignment from Miles City to approx. station 5180+00.

REVISED
INITIAL ANALYSIS OF WATERS OF THE U.S., TONGUE RIVER RAILROAD ALTERNATIVES

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Project No. 3079712

October 1, 2003

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Table 5. Waters of the U.S. within the analysis corridor of the Tongue River Railroad Colstrip Alternative

Table 6. Waters of the U.S. within the analysis corridor of the Tongue River Railroad Four Mile Creek Alternative

FIGURES

Figure 1 Waters of the U.S. (8 sheets)

INTRODUCTION

In late August 1998, the U.S. Army Corps of Engineers (COE) notified the Surface Transportation Board (STB) that the COE would require wetland delineation and functional assessment for the Tongue River Railroad Project in its entirety, in order to comply with the COE's National Environmental Policy Act (NEPA) needs for Section 404 of the Clean Water Act (letter dated August 21, 1998 from Kathryn Schenk, chief, Regulatory Branch, Operations Division, U.S. Army Corps of Engineers to Dana White, Section of Environmental Analysis, Surface Transportation Board). The COE suggested that this delineation and assessment be included in the supplemental Environmental Impact Statement (EIS) for the Tongue River Railroad, now being prepared by the STB in cooperation with the COE and other agencies.

The COE indicated that an initial analysis of wetland and non-wetland Waters of the U.S. (WUS) be accomplished using aerial photography and National Wetlands Inventory (NWI) maps. For NEPA purposes, this analysis was to compare the proposed route of the Tongue River Railroad and alternatives to the proposed route, including alternatives to the portions of the alignment that were previously approved by the STB.

In September 1998 Tongue River Railroad Company (TRRC) asked WESTECH Environmental Services, Inc. (WESTECH) to compare the potential occurrence and relative size of wetland and non-wetland WUS along the proposed route of the Tongue River Railroad and four previously considered alternatives, and to the extent practicable, conduct the comparison at the same levels of effort and analysis for all alternatives. This initial analysis, using aerial photography and NWI maps, was conducted from late September through late October 1998. Data analysis and report preparation were conducted from mid-October through November.

On March 2, 2000, before SEA completed its Draft SEIS, TRRC requested that the Board’s Section of Environmental Analysis (SEA) suspend its environmental work. On December 19, 2002, TRRC advised SEA that it was now in a position to move forward and asked SEA to resume its environmental review of the application. On January 17, 2003, TRRC filed a request with the Board seeking to update its previously submitted evidence on the transportation merits. The Board served its decision allowing TRRC to file its supplemental evidence on the transportation merits on March 11, 2003. On March 26, 2003, SEA served an amended Notice of Intent to prepare a SEIS and requested comments on the adequacy of the final scope of the SEIS dated February 3, 1999.

This report provides an updated review of the information presented to the Board in WESTECH’s November 30, 1998 report (WESTECH 1998). No additional field work or aerial image analysis have been conducted.

METHODS

DESCRIPTION OF ROUTES

For the purposes of this analysis, the TRRC Preferred Alignment and four alternative routes, as shown on the maps attached to this report, were examined:

TRRC Preferred Alignment

The TRRC Preferred Alignment is the proposed Tongue River Railroad route approved by the STB and its predecessor, the Interstate Commerce Commission (ICC), in prior proceedings, together with the proposed Western Alignment for approximately the southernmost 17 miles of the route. The Western Alignment is being considered in an EIS now under preparation as an alternative to the previously approved Four Mile Creek Alignment.

The TRRC Preferred Alignment would begin in Miles City, where it would tie into the existing Burlington Northern-Santa Fe (BNSF) mainline. From Miles City, the route would bear south along the west side of the Tongue River to a point approximately 10 miles north of Ashland, Montana. The route would then cross the Tongue River and continue south along the east side of the river. Near Ashland, the route would divide, with one branch following approximately eight miles southeast along the Otter Creek drainage to Terminus Point 2 (this branch was not considered in this initial analysis of WUS), while the main branch would continue south along the east side of the Tongue River Valley about nine miles south of Ashland to Terminus Point 1. This portion of the TRRC Preferred Alignment was considered the "proposed action" in the ICC's 1985 Final Environmental Impact Statement (FEIS) for the Tongue River Railroad and is referred to as the 89-Mile segment (it would actually be about 78 miles long).

From Terminus Point 1, the TRRC Preferred Alignment would continue south along the east side of the Tongue River valley for about 21 miles. This portion of the route was considered part of the "proposed action" in the Surface Transportation Board's (STB) 1996 FEIS for the Tongue River Railroad Additional Rail Line from Ashland to Decker, Montana and is referred to as the 21-Mile segment.

From a point about 21 miles south of Terminus Point 1, the TRRC Preferred Alignment would follow the Western Alignment, which is a proposed action currently under NEPA consideration by the STB. The Western Alignment is about 17 miles long and would cross to the west side of the Tongue River, then gradually leave the Tongue River valley as it would proceed south to the final terminus near Decker, Montana.

In summary, the TRRC Preferred Alignment would be comprised of the previously permitted 89-Mile and 21-Mile segments, as well as the currently proposed Western Alignment. Total length of the TRRC Preferred Alignment would be about 116 miles.

Tongue River Road Alternative

The Tongue River Road alternative would follow the TRRC Preferred Alignment south from Miles City on the west side of the Tongue River for about eight miles, then depart from the proposed route and cross to the east side of the Tongue River near the mouth of Pumpkin Creek. It would then proceed south, roughly paralleling the Tongue River road, until it would rejoin the TRRC Preferred Alignment where the latter crosses to the east side of the Tongue River about 10 miles north of Ashland. From this point the Tongue River Road alternative would follow the TRRC Preferred Alignment south to the final terminus near Decker.

In summary, the Tongue River Road alternative would be comprised of about 34 miles of the previously approved 89-Mile segment and about 54 miles of new route on the east side of the Tongue River between Miles City and Ashland. It would then rejoin the previously approved 21-Mile segment, and the proposed Western Alignment. Total length of the Tongue River Road alternative would be about 117 miles.

Moon Creek Alternative

In 1985 the U.S. Department of Agriculture (USDA) suggested the Moon Creek alternative as a means of reducing impacts resulting from the 89-Mile segment on USDA's Livestock and Range Research Station (LARRS) near Miles City. (USDA has since agreed to grant the railroad an easement though LARRS). Consequently, from Miles City this alternative would cross the Yellowstone River and head west along an abandoned railroad right-of-way for about eight miles, then cross the Yellowstone River again and head southeast up the Moon Creek drainage, cross a ridge dividing the Yellowstone and Tongue Rivers, and descend to join the 89-Mile segment about 14 miles south of Miles City.

In summary, the Moon Creek alternative would be comprised of about 24 miles of new route from Miles City west along the Yellowstone River, then southeast to the Tongue River valley, about 62 miles of the previously approved 89-Mile segment, the entire previously approved 21-Mile segment, and the proposed Western Alignment. Total length of the Moon Creek alternative would be about 124 miles.

Colstrip Alternative

This alternative would begin west of the town of Forsyth, Montana, at a point about 50 miles west of Miles City. It would use the existing Colstrip Spur running about 30 miles south to the town of Colstrip. However, much of this old spur would have to be rebuilt as a result of current engineering and operational standards for the unit coal traffic that would utilize the Tongue River Railroad. The section of the route to be newly constructed would continue east from Colstrip, crossing Cow and Rosebud Creeks, and would then head southeast up the Greenleaf Creek drainage. It would cross the divide between the Rosebud Creek and Tongue River drainages, and then parallel Roe and

Cooper Creeks as it descended to the Tongue River valley. It would then join the 89-Mile segment at a point about 10 miles north of Ashland.

In summary, the Colstrip alternative would be comprised of about 30 miles of reconstructed route from Forsyth to Colstrip, about 22 miles of new route from Colstrip southeast to the Tongue River valley, about 19 miles of the previously approved 89-Mile segment, the entire previously approved 21-Mile segment, and the proposed Western Alignment. Total length of the Colstrip alternative would be about 109 miles.

Four Mile Creek Alternative

From Miles City, this alternative would follow the TRRC Preferred Alignment south to a point about 21 miles south of Terminus Point 1. At this point, instead of following the Western Alignment portion of the TRRC Preferred Alignment, this alternative would follow the Four Mile Creek Route south to the final terminus near Decker. The Four Mile Creek Route was previously approved by the STB in its 1996 decision on Finance Docket No. 30186 (Sub. No.2) as the southernmost part of the Ashland-Decker extension of the Tongue River Railroad considered in that proceeding.

In summary, the Four Mile Creek alternative would be comprised of the previously approved 89-Mile, 21-Mile and Four Mile Creek Routes. Total length of the Four Mile Creek alternative would be about 128 miles.

NATIONAL WETLANDS INVENTORY MAPS

AT the recommendation of the COE, WESTECH used National Wetlands Inventory (NWI) maps to compare/verify wetlands identified as a result of this aerial photographic interpretation. NWI maps were obtained from the U.S. Fish and Wildlife Service (USFWS). However, only the southern portion of the Tongue River valley from approximately the community of Birney south to Decker had been mapped by the NWI effort at that time. Thus less than one-third of the TRRC Preferred Alignment and the four alternatives were covered by NWI mapping at the time of the initial analysis. Most NWI wetlands were restricted to areas proximal to the river. Consequently NWI mapping was of limited use to the 1998 analysis. No additional NWI maps have been issued for the area to date.

INTERPRETATION OF AERIAL PHOTOGRAPHY

Aerial photographic coverage of the TRRC Preferred Alignment and four alternatives was obtained by WESTECH from TRRC and the U.S. Geological Survey's (USGS) EROS Data Center in Sioux Falls, South Dakota. Characteristics of the available photography were:

Route	Scale	Imagery	Dates of Photography
TRRC Preferred Alignment	1: 12,000	Black/white	November 1997
Tongue River Road	1 :40,000	Black/white	July/August 1996
Moon Creek	1:40,000	Black/white	July 1996, August 1997
Colstrip	1:40,000	Black/white	August/September 1996
Four Mile Creek	1:24,000	Color	August 1969, July 1973

Prior to beginning photographic interpretation, the analyst spent one day (accompanied by a trained wetlands delineator) driving public roads in the vicinity of the TRRC Preferred Alignment and all four alternatives. The purpose of this reconnaissance was to familiarize the analyst with field conditions depicted on the aerial photographs. Because access on privately owned lands was not equally available on all four alternatives, the analysis was conducted under the assumption that no access to privately owned lands was available on any alternative. Therefore the field reconnaissance was limited to examination of several wetland and non-wetland WUS that were visible from public roads. It was then assumed that field conditions and characteristics of WUS that were visible from public roads could be extrapolated to areas that were not visible from public roads. No field delineations (COE 1987 manual) were done.

In the office, the potential centerline for each route was superimposed on the aerial photographs. Centerlines provided by TRRC were used for the TRRC Preferred Alignment and Four Mile Creek alternative. For the remaining alternatives, centerlines were adapted from maps or figures contained in earlier NEP A documents and TRRC files from the early 1980s. These centerlines were sometimes modified slightly after comparison to topography presented on USGS 1:24,000 topographic maps.

Initially, WESTECH intended to also superimpose the potential right-of-way of each alternative on aerial photographs. When it became obvious that this approach would result in two sets of data (one set derived from a potential right-of-way reflecting the topography of the route, while the other relied on a standard right-of-way width) for each alternative that would not be comparable between routes, WESTECH eliminated this source of bias and dropped the mapping of the potential right-of-way width. A standard right-of-way width of 400 feet (200 feet on either side of the centerline) was used for all routes. This width was selected because it was wider than all but a few known locations of the potential right-of-way. In those few locations, the potential right-of-way width was used. In effect, then, the aerial photographic interpretation analyzed more area than would likely be affected by actual construction and operation of the railroad.

Wetland and non-wetland WUS were identified within this standard 400-feet-wide right-of-way for each route. Photographs were examined with the aid of a 4x stereoscope supplemented by a 7x measuring magnifier. Lengths and widths of WUS identified with this magnifier could be measured to the nearest 0.1 mm. Consequently the minimum measurable distance on a photograph with a scale of 1:12,000 (TRRC Preferred

Alignment) was four feet on a photograph with a scale of 1:24,000 (Four Mile Creek Alignment) was about eight feet, and on a photograph with a scale of 1:40,000 (the remaining alternatives) was 13 feet. Thus WUS on the TRRC Preferred Alignment and Four Mile Creek alternative may have been measured more accurately than those on other alternatives.

The field reconnaissance had revealed that many ephemeral drainages in this geographic area had defined channels that were only 1.5-3 feet wide. Therefore any channel on the aerial photographs that was measured to be less than 0.1 mm wide was assigned an arbitrary width of two feet. Due to the difficulty of measuring linear distance along a meandering channel at the scale of the available aerial photographs, some channel lengths may have been under or over estimated.

Each WUS was assigned an identification code, which was later transferred to maps of each route. Each WUS was also assigned to one or more of nine categories:

Category	**Identifying Characteristics on Aerial Photographs**
NWUS	Non-wetland WUS. Site may qualify as a jurisdictional WUS but may not meet the criteria defining a wetland (COE 1987 manual)
ES	Ephemeral stream. A drainage with a defined channel which carries water only during runoff or overland flow.
IS	Intermittent stream. A drainage with a defined channel that transports water seasonally or perennially over parts of its length. Parts of the channel may have hydric soils, support hydrophytic vegetation, or meet hydrological criteria to define a wetland in this region. Wetlands may be isolated or discontinuous along the channel length.
RWF	River with wetland fringe. A perennial stream that transports a "large" volume of water, (e.g., the Tongue River, Yellowstone River) with a shoreline fringe or floodplain supporting hydrophytic vegetation.
SWF	Stream with wetland fringe. A perennial stream with a shoreline fringe supporting hydrophytic vegetation.
UM	Unused meander. Isolated meander or oxbow lake within the floodplain of a river or stream. Supports hydrophytic vegetation and may be seasonally or intermittently inundated by water.
P	Pond. Natural or artificial impoundment of standing water. Usually found in ephemeral or intermittent stream courses or on floodplains of rivers and perennial streams.
R	Riparian habitat along river and stream channels, usually dominated by mesic trees and shrubs. May or may not meet criteria for a wetland (COE 1987 manual).
WM	Wet meadow/saline meadow. A grassy area that is moist throughout the growing season. Some sites may have high salt concentrations. This was a minor category that was primarily associated with ponds, and therefore was included with ponds when acreages of each category were calculated.

Apparent wetlands were assigned functions based on criteria defined in Berglund (1996). This methodology has been employed by the Montana Department of Transportation and other agencies and linear projects in Montana, such as the Express Pipeline and a tailings pipeline at the Stillwater Mine, that have been approved by the COE. The functions used in this initial analysis were:

WL	General wildlife habitat
Ft	General fish habitat, temporary
Fs	General fish habitat, seasonal
Fp	General fish habitat, perennial
DS	Dynamic surface water storage
FLD	Flood attenuation and storage
GD	Groundwater discharge or recharge

Because these functions were identified on the basis of aerial photograph interpretation only, they should be considered qualitative assessments, per the instructions given by the COE (letter dated August 21, 1998 from Kathryn Schenk, chief, Regulatory Branch, Operations Division, U.S. Army Corps of Engineers to Dana White, Section of Environmental Analysis, Surface Transportation Board).

WUS identified on the aerial photos were then compared to NWI maps, when available, as well as drainage classifications presented on USGS 1:24,000 topographic maps and Bureau of Land Management (BLM) 1:100,000 surface management maps. This comparison revealed that most drainages identified as intermittent streams on USGS and BLM maps were considered to be WUS by this initial analysis.

Locations of identified WUS were then transferred to route maps attached to this report. These route maps were based on BLM 1:100,000 surface management maps, with the scale increased to 1 inch = 1 mile.

RESULTS AND DISCUSSION

A total of 724 potential WUS were identified during the initial analysis. Locations of these sites by route are shown on the attached eight map sheets. Table 1 presents a comparison of the TRRC Preferred Alignment with the four alternatives in terms of total number of WUS by route, acreage of each WUS type by route, and total acreage of potential WUS by route. Data for individual WUS by route are provided in Tables 2 through 6.

LIMITATIONS OF THE ANALYSIS

All routes were analyzed identically. The same right-of-way width (400 feet) was used for each route. Potential WUS were identified using the same classifications for all routes. Length and width of potential WUS were measured consistently for all routes.

Functions of wetlands were interpreted identically among all routes. Consequently, any limitations of the analysis should apply equally to all routes. Some of these potential limitations are:

- Because the analysis was based on interpretation of aerial photographs, it is possible that some WUS were missed. It is reasonable to assume that any sites that were missed were so small that they could not be identified at this scale. Conversely, it is possible that some sites that were identified as WUS in this analysis may, upon field delineations, be deleted.

- Because the analysis was based on interpretation of aerial photographs, it is possible that acreage calculations were not exact. It is likely that acreages were overestimated, because measurements of length and width at the scales used are probably be greater than true field measurements. Field delineations would likely reduce the acreage of WUS on each route.

- Some potential WUS identified along each route were not actually crossed by the centerline for that route. It is possible that such sites could be avoided during construction. These sites are identified in Tables 2 through 6. Therefore total acreages of WUS for each route overestimate the total acreages that may be affected by that route.

- Acreage determinations for routes mapped on larger scale aerial photography (all routes except the TRRC Preferred Alignment and the Four Mile Creek alternative) probably underestimate acreages for smaller WUS compared to other routes, since many WUS on the larger scale photographs were assigned a standard width.

POTENTIAL CHANGES IN JURISDICTION OR PHYSICAL CONDITION OF WATERS SINCE ORIGINAL ANALYSIS

Subsequent to the initial analysis of WUS on the Tongue River Railroad alternatives, several legal rulings on the jurisdictional limits of the COE over waters in the U.S. have been made by federal courts. In 2001, the Supreme Court ruled in the SWANCC case that the COE could not assert jurisdiction over an isolated body of water solely on the basis that birds subject to the Migratory Bird Treaty Act use that water. On September 10, 2003, the Fourth Circuit federal appeals court ruled in the Newdunn case that the contested tributary eventually flows (intermittently) into traditional, navigable waters, and that the Corps may permissibly define the tributary as part of the "waters of the United States."

Omaha District issued no permits for work in jurisdictional wetlands or other waters of the U.S. within the analysis area between May 2000 and September 2003. No substantial changes in condition are likely to have occurred in the waters discussed here.

The analysis presented below is from the WESTECH's 1998 report. Based on the Newdunn ruling, the only waters previously considered to be WUS that might no longer be subject to jurisdiction are those in the wet meadow category. The Newdunn ruling lets

stand the COE's jurisdiction over adjacent wetlands (presumably including abandoned meanders) as currently defined by the COE. The wet meadows in this analysis were associated with ponds (e.g., adjacent to ponds) and were included in that category.

COMPARISON OF ROUTES

Evaluation of the information presented in Table 1 suggests that the TRRC Preferred Alignment and four alternative routes are not substantially different in terms of total numbers of potential WUS, despite the differences in length between routes. The TRRC Preferred Alignment and the Moon Creek alternative have approximately the same number of WUS. However, the Moon Creek alternative has a considerably larger acreage of total WUS, and particularly of RWF (river with wetland fringe) WUS, because it crosses the Tongue River one more time than the TRRC Preferred Alignment, and also crosses the Yellowstone River twice (the TRRC Preferred Alignment does not cross the Yellowstone River).

The Tongue River Road alternative, although approximately the same length as the TRRC Preferred Alignment; potentially affects more than twice as many WUS acres as the TRRC Preferred Alignment, and especially affects RWF (river with wetland fringe) and UM (abandoned meander) WUS. The large acreages in these two categories are due to the fact that the centerline of the Tongue River Road alternative passes within 200 feet of the Tongue River or its abandoned meanders at several locations.

The Colstrip alternative, although the shortest route, encounters more WUS (both numbers and acreage) than the TRRC Preferred Alignment because it follows the existing railroad from Forsyth to Colstrip along or in the floodplain of Armelis Creek, a perennial stream.

The Four Mile Creek alternative is the longest route and encounters the greatest number of potential WUS. In comparison to the TRRC Preferred Alignment, it encounters additional WUS as it follows the drainage of Four Mile Creek.

About 10 acres of the Pond category (P) were encountered by the TRRC Preferred Alignment. About half this acreage is due to the proximity of ponds at the Miles City Fish Hatchery (Table 2). It is not certain whether field delineations would find that some of these ponds meet the criteria for wetlands under the COE 1987 manual. This same acreage value was used in the analysis of the Tongue River Road and Four Mile Creek alternatives, which share this portion of route with the TRRC Preferred Alignment.

SUMMARY

An initial analysis of Waters of the U.S. (WUS) was conducted for the Tongue River Railroad's TRRC Preferred Alignment and four alternatives by WESTECH. This analysis has been reviewed in the light of subsequent legal rulings regarding the extent of COE jurisdiction over waters in the U.S. Although there were comparatively minor differences

in the total numbers of WUS encountered between the five routes (the smallest and largest total number of WUS varied by only about 10 percent), there were considerable differences in the acreages and categories of WUS encountered by certain routes (Table 1). The Tongue River Road, Moon Creek and Colstrip alternatives encountered the greatest acreages of probable wetlands, due to their proximity to and/or crossings of the Tongue River and its abandoned meanders, the Yellowstone River, or Armelis Creek. The crossings of the Tongue River and Yellowstone River by the Moon Creek alternative would likely be unavoidable, as would the proximity of the Colstrip alternative to Armelis Creek. T Tongue River Road alternative could be probably be designed to reduce its encounters with wetlands, although it would still impact more wetlands than the TRRC Preferred Alignment. The proximity of rugged terrain to the east of the Tongue River Road alternative makes it likely that the line would stay closer to the Tongue River and its abandoned meanders than would the comparable portion of the TRRC Preferred Alignment. The TRRC Preferred Alignment, because of its location away from the river to the extent practicable, encounters the lowest acreage of probable wetlands and the lowest total acreage of WUS of all routes examined by this analysis.

LITERATURE CITED

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Table 1. Comparison of Waters of the U.S. along the Tongue River Railroad TRRC Preferred Alignment and four alternatives. (Revised November 30,1998)

Alternative	Approx. Length (Miles)	Total Number WUS	Total Acreage WUS	Acreage by WUS Type[1]						
				ES	ES, NWUS	IS	P	RWF	SWF	UM
TRRC Preferred Alignment	116	297	38.05	0.29	5.99	0.00	10.23	18.57	1.68	1.29
Tongue River Road Alternative[2]	117	309	94.36	0.29	5.67	3.09	5.95	42.31	1.95	35.10
Moon Creek Alternative[3]	124	294	46.92	0.00	7.08	0.01	0.97	35.51	2.06	1.29
Colstrip Alternative[4]	109	308	53.94	0.00	5.10	0.00	25.90	15.67	5.44	1.83
Four Mile Creek Alternative[5]	128	325	65.51	0.29	6.21	0.07	10.23	44.69	1.68	2.33

[1]Waters of the U.S. classes:

NWUS = Non-wetland waters of the U.S.
ES = Ephemeral stream
IS = Intermittent stream
RWF = River with wetland fringe
SWF = Stream with wetland fringe
UM = Abandoned or unused meander of channel
P = Natural or artificial pond
R = Riparian area
WM = Wet meadow/saline meadow

[2]Incorporates TRRC Preferred Alignment from Miles City to approx. station 520 + 00, and from approx. station 3200 + 00 to Decker.
[3]Joins TRRC Preferred Alignment at approx. station 1100 + 00 then incorporates TRRC Preferred Alignment to Decker.
[4]Joins TRRC Preferred Alignment at approx. station 3040 + 00 then incorporates TRRC Preferred Alignment to Decker.
[5]Incorporates TRRC Preferred Alignment from Miles City to approx. station 5180+00.

Tab1e 2. Waters of the U.S. within the analysis corridor of the Tongue River Railroad Preferred Alignment (Revised November 30, 1998)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
Photo # 3742 - 007	NE-1	220 x 400	2.020	P, Manmade	Ft, WL	Miles City Fish Hatchery, half of pond crossed by corridor
	NE-2	20 x 640	0.294	ES, Drainage channel		Channel from fish hatchery to wetland on east side of centerline (C/L), crossed by C/L
	NE-3	200 x 400	1.837	P/R, Manipulated	Fp, WL, FLD	Wetland fringe is paralleled by C/L, receives discharge from NE-2
	NE-4	220 x 160	0.808	P, Manmade		Pond for Miles City Fish Hatchery, 120 feet west of C/L
	NE-5	3 x 100	0.007	ES, NWUS		Crossed by C/L, very steep s10pe
	NE-6	3 x 100	0.007	ES, NWUS		Crossed by C/L
Photo # 3742 - 009	NE-7	3 x 400	0.028	ES, NWUS		Crossed by C/L
	NE-8	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 011	NE-9	2 x 440	0.020	ES, NWUS		Crossed by C/L
	NE-10	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-11	160 x 100	0.367	P, in terraced fie1d		Crossed by C/L
Photo # 3742 - 013	NE-12	2 x 1000	0.046	ES, NWUS		Crossed and paralleled by C/L
	NE-13	2 x 200	0.009	ES, NWUS		Crossed by C/L
	NE-14	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-15	2 x 200	0.009	ES, NWUS		Tributary to NE-14, crossed by C/L
	NE-16	2 x 150	0.007	ES, NWUS		Tributary to NE-17, crossed by C/L
	NE-17	2 x 400	0.018	ES, NWUS		Paddy Fay Creek, crossed by C/L
Photo # 3742 - 015	NE-18	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-19	100 x 400	0.918	PIWM	WL	Crossed by C/L on eastern edge
	NE-20	2 x 450	0.021	ES, NWUS		Crossed by C/L
Photo # 3742 - 021	NE-21	2 x 560	0.026	ES, NWUS		Crossed by C/L
	NE-22	2 x 480	0.022	ES, NWUS		Crossed by C/L
Photo # 3742 - 021	NE-23	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-24	2 x 400	0.018	ES, NWUS		Crossed by C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
Photo # 3742 - 023	NE-25	2 x 500	0.023	ES, NWUS		Crossed by C/L
At approximate1y station 520+00 – Tongue River Road A1ternative begins						
Photo # 3742 - 023	NE-26	2 x 500	0.023	ES, NWUS		Crossed by C/L
	NE-27	2 x 560	0.026	ES, NWUS		Crossed by C/L
	NE-28	2 x 220	0.010	ES, NWUS		80 feet east of and parallel to C/L, tributary to NE-27
	NE-29	140 x 900	2.893	RWF	FLD, WL, Fp, DS?	Tongue River, 180 feet east of C/L
Photo # 3742 - 025	NE-30	3 x 120	0.008	ES, NWUS		140 feet east of C/L
	NE-31	3 x 500	0.034	ES, NWUS		Crossed by C/L
Photo # 3742 - 027	NE-32	2 x 500	0.023	ES, NWUS		Crossed by C/L
	NE-33	2 x 140	0.006	ES, NWUS		60 feet east of C/L
.	NE-34	2 x 500	0.023	ES, NWUS		Crossed by C/L
	NE-35	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-36	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 034	NE-37	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-38	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 036	NE-39	3 x 450	0.031	ES, NWUS		Wolf Creek, 100 feet east of G1
	NE-40	360 x 400	3.306	P, Manmade ES, NWUS		C/L bisects stock water reservoir, Wolf Creek
	NE-41	3 x 400	0.028	ES, NWUS		200 feet west of and parallel to C/L
	NE-42	3 x 720	0.050	ES, NWUS		Crossed by C/L
	NE-43	3 x 140	0.010	ES, NWUS		Tributary to NE-43, west of C/L
	NE-44	3 x 400	0.028	ES, NWUS		Crossed by C/L
Photo # 3742 - 043	NE-45	2 x 460	0.021	ES, NWUS		Circ1e L Creek, crossed by C/L
	NE-46	2 x 240	0.011	ES, NWUS		Crossed and paralleled by C/L
Photo # 3742 - 043	NE-47	2 x 220	0.010	ES, NWUS		Crossed by C/L
Photo # 3742 - 045	NE-48	2 x 1200	0.055	ES, NWUS		Crossed (at low ang1e) and paralleled by C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
	N.E-49	2 x 760	0.035	ES, NWUS		Crossed and paralleled by C/L
	NE-50	2 x 560	0.026	ES, NWUS		Thorpe Creek, crossed by C/L
Photo # 3742 - 045	NE-51	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 050	NE-52	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-53	2 x 200	0.009	ES, NWUS		Crossed by C/L
	NE-54	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-55	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-56	2 x 400	0.018	ES, NWUS		Crossed by C/L
At approximately station 1100+00 – Moon Creek Alternative joins TRRC Preferred Alignment						
Photo # 3742 - 056	NE-57	2 x 400	0.018	ES, NWUS		Kennedy Creek, crossed by C/L
Photo # 3742 - 058	NE-58	2 x 400	0.018	ES, NWUS		Plunkett Creek, crossed by C/L
	NE-59	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-60	2 x 60	0.003	ES, NWUS		140 feet southeast of C/L
Photo # 3742 - 060	NE-61	2 x 150	0.007	ES, NWUS		Terminates 40 feet north of C/L
	NE-62	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-63	2 x 150	0.007	ES, NWUS		Terminates 40 feet north of C/L
	NE-64	2 x 600	0.Q28	ES, NWUS		Crossed by C/L
	NE-65	2 x 400	0.018	ES, NWUS		Geddes Creek, crossed by C/L
Photo # 3742 - 062	NE-66	2 x 450	0.021	ES, NWUS		Crossed by C/L
	NE-67	2 x 1240	0.057	ES, NWUS		Yank Creek, crossed and paralleled by C/L
	NE-68	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 068	NE-69	2 x 500	0.023	ES, NWUS		Crossed by C/L
	NE-70	2 x 1200	0.055	ES, NWUS		Miles Creek, crossed and paralleled by C/L
	NE-71	2 x 520	0.024	ES, NWUS		Crossed by C/L
Photo # 3742 - 070	NE-72	De1eted				

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
	NE-73	2 x 300	0.014	ES, NWUS		Crossed by C/L
	NE-74	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 072	NE-75	2 x 900	0.041	ES, NWUS		Forest Creek, crossed and paralleled by C/L
	NE-76	2 x 720	0.033	ES, NWUS		Crossed by C/L
Photo # 3742 - 077	NE-77	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-78	2 x 400	0.018	ES, NWUS		Horse Creek, crossed by C/L
Photo # 3742 - 079	NE-79	2 x 320	0.015	ES, NWUS		Crossed by C/L
	NE-80	2 x 350	0.016	ES, NWUS		Tributary to NE-79, crossed by C/L
	NE-81	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-82	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-83	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 081	NE-84	2 x 800	0.037	ES, NWUS		Side channel of Six Mile Creek, 25 feet west of and paralleled by C/L
	NE-85	2 x 400	0.018	ES, NWUS .		Six Mile Creek, crossed by C/L
	NE-86	2 x 560	0.026	ES, NWUS		Crossed by C/L
	NE-87	2 x 440	0.020	ES, NWUS		140 feet west of C/L
	NE-88	2 x 100	0.005	ES, NWUS		100 feet west of C/L
	NE-89	2 x 100	0.005	ES, NWUS		100 feet west of C/L
	NE-90	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 083	NE-91	2 x 720	0.033	ES, NWUS		Miller Creek, crossed by C/L
	NE-92	160 x 40	0.147	P	WL	40 feet east of C/L
	NE-93	2 x 240	0.011	ES, NWUS		Crossed by C/L
	NE-94	2 x 500	0.023	ES, NWUS		Crossed by C/L
	NE-95	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 085	NE-96	2 x 520	0.024	ES, NWUS		Crossed by C/L
	NE-97	2 x 400	0.018	ES, NWUS		Crossed by C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
	NE-98	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-99	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 087	NE-100	2 x 400	0.018	ES, NWUS		Pump Creek, crossed by C/L
	NE-101	2 x 1100	0.051	ES, NWUS		Cow Creek, crossed by C/L
Photo # 3742 - 089	NE-102	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-103	2 x 1700	0.078	ES, NWUS		Ranch Creek, crossed and paralleled by C/L
Photo # 3742 - 093	NE-104	2 x 400	0.018	ES, NWUS		Coal Creek, crossed by C/L
	NE-105	2 x 720	0.033	ES, NWUS		Crossed by C/L
	NE-106	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-107	2 x 160	0.007	ES, NWUS		Tributary to NE-1 06, conflues 40 feet west of C/L
	NE-108	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 095	NE-109	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-110	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-111	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-112	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-113	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-114	2 x 100	0.005	ES, NWUS		190 feet east of C/L
	NE-115	2 x 400	0.018	ES, NWUS		Cottonwood Creek, crossed by C/L
Photo # 3742 - 097	NE-116	2 x 100	0.005	ES, NWUS		100 feet east of C/L
	NE-117	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-118	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-119	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-120	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 -103	NE-120A	2 x 1480	0.068	ES, NWUS		Dry Creek, crossed by C/L
Photo # 3742 - 105	NE-120B	2 x 400	0.018	ES, NWUS		Crossed by C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
	NE-120C	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-120D	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-120E	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-120F	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 106	NE-121	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 106	NE-121	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 -108	NE-122	2 x 600	0.028	ES, NWUS		Trail Creek, crossed by C/L
	NE-123	2 x 400	0.018	ES, NWUS		A1falfa Creek, crossed by C/L
	NE-124	2 x 500	0.023	ES, NWUS		Crossed by C/L
Photo # 3742 -108	NE-125	2 x 560	0.026	ES, NWUS		Crossed by C/L
Photo # 3742 -113	NE-126	2 x 480	0.022	ES, NWUS		Hart Creek, crossed by C/L
Photo # 3742 -115	NE-127	2 x 280	0.013	ES, NWUS		40 feet east of C/L
Photo # 3742 - 117	NE-128	2 x 400	0.018	ES, NWUS		Joe Leg Creek, crossed by C/L
	NE-129	120 x 300	0.826	P, Manmade, ES, NWUS		Stream and pond crossed by C/L
Photo # 3742 -119	NE-130	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-131	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-132	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 121	NE-133	2 x 400	0.018	ES, NWUS		Hammond Draw, crossed by C/L
	NE-134	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 123	NE-135	2 x 240	0.011	ES, NWUS		Crossed by C/L
	NE-136	2 x 320	0.015	ES, NWUS		Crossed by C/L
	NE-137	2 x 360	0.017	ES, NWUS		Crossed by C/L
	NE-138	De1eted				
At approximately station 3040+00 – Colstrip Alternative joins TRRC Preferred Alignment						
	NE-139	De1eted				

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
Photo # 3742 - 244	NE-140	2 x 400	0.018	ES, NWUS		Roe and Cooper Creek, crossed by C/L
	NE-141	2 x 360	0.017	ES, NWUS		Crossed by C/L
	NE-142	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-143	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-144	2 x 320	0.015	ES, NWUS		Crossed by C/L
	NE-145	2 x 180	0.008	ES, NWUS		Crossed by C/L
	N E- 146	2 x 100	0.005	ES, NWUS		Terminates 20 feet east of C/L
Photo # 3742 - 244	NE-147	2 x 280	0.013	ES, NWUS		Crossed by C/L
Photo # 3742 - 242	NE-148	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-149	2 x 320	0.015	ES, NWUS		Crossed by C/L
	NE-150	2 x 280	0.013	ES, NWUS		Crossed by C/L
Photo # 3742 - 242	NE-151	240 x 400	2.204	RWF	WL, Fp, FLD	Tongue River, crossed by C/L
At approximate1y station 320+000 – Tongue River Road A1ternative rejoins TRRC Preferred A1ignment						
Photo # 3742 - 240	NE-152	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-153	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 236	NE-154	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-153	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 236	NE-154	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 234	NE-155	2 x 165	0.008	ES, NWUS		Crossed by C/L
	NE-156	2 x 200	0.009	ES, NWUS		Crossed by C/L
	NE-157	180 x 1400	5.785	RWF	WL, Fp, FLD	Tongue River, 80 feet west of C/L
	NE-158	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-159	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-160	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-161	320 x 120	0.882	RWF	WL, Fp, FLD	Tongue River, 120 feet west of C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
Photo # 3742 - 232	NE-162	2 x 160	0.007	ES, NWUS		40 feet east of C/L
	NE-163	140 x 440	1.414	RWF	WL, Fp, FLD	Tongue River, 140 feet west of C/L
Photo # 3742 - 230	NE-164	3 x 760	0.052	ES, NWUS		Doub1e E Cou1ee, crossed by C/L
	NE-165	100 x 520	1.194	RWF	WL, Fp, FLD	Tongue River, 100 feet west of C/L
Photo # 3742 - 224	NE-166	120 x 840	2.314	RWF	WL, Fp, FLD	Tongue River, 60 feet west of C/L
	NE-167	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 222	NE-168	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-169	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-170	60 x 740	1.019	SWF	WL, Fs, FLD	Otter Creek, 190 feet west of C/L centerline
	NE-171	60 x 640	0.882	UM	WL, FLD, Fs	Otter Creek meander, 140 feet west of C/L
Photo # 3742 - 220	NE-172	25 x 720	0.413	UM	WL, FLD, Ft?, DS	Otter Creek meander cut off by road - 80 feet west of C/L
	NE-173	2 x 960	0.044	ES, NWUS		Crossed by C/L (3 times) and paralleled by C/L
	NE-174	25 x 480	0.275	SWF	WL, FLD, Fp, DS	Otter Creek, crossed by C/L
	NE-175	25 x 280	0.161	SWF	WL, FLD, Fp, DS	Otter Creek,150 feet east of C/L
Photo # 3742 - 213	NE-176	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-177	De1eted				
	NE-1 78	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-179	2 x 400	0.018	ES, NWUS		Spring Creek, crossed by C/L
Photo # 3742 - 211	NE-180	3 x 560	0.039	ES, NWUS		Bridge Creek, crossed by C/L
	NE-181	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-182	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-183	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-184	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 209	NE-185	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-186	2 x 400	0.018	ES, NWUS		Bowman Creek, crossed by C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
	NE-187	2 x 500	0.023	ES, NWUS		Crossed by C/L
Photo # 3742 - 207	NE-188	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-189	2 x 960	0.044	ES, NWUS		Crossed and paralleled by C/L
	NE-190	2 x 1000	0.046	ES, NWUS		King Creek, crossed and paralleled by C/L
Photo # 3742 - 205	NE-191	2 x 400	0.018	ES, NWUS		Cedar Creek, crossed by C/L
	NE-192	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-193	2 x 760	0.035	ES, NWUS		Dry Creek, crossed by C/L
89 mile corridor ends – 20.8 mile extension begins						
	NE-1904	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 203	NE-195	2 x 500	0.023	ES, NWUS		Crossed by C/L
	NE-196	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-197	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 201	NE-198	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 201	NE-199	2 x 1400	0.064	ES, NWUS		O'De11 Creek, crossed and paralleled by C/L
Photo # 3742 - 199	NE-200	2 x 520	0.024	ES, NWUS		Crossed by C/L
	NE-201	2 x 520	0.024	ES, NWUS		Crossed by C/L
	NE-202	2 x 320	0.015	ES, NWUS		Crossed by C/L
Photo # 3742 -199	NE-203	2 x 200	0.009	ES, NWUS		C/L bisects lower end of channel
	NE-204	2 x 560	0.026	ES, NWUS		Crossed by C/L
	NE-205	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-206	2 x 1000	0.046	ES, NWUS		Gate Creek, crossed by C/L
Photo # 3742 - 191	NE-207	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-208	2 x 600	0.028	ES, NWUS		Crossed and paralleled by C/L
	NE-209	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 189	NE-210	2 x 400	0.018	ES, NWUS		Crossed by C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
	NE-211	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-212	2 x 600	0.028	ES, NWUS		Poker Teechee Creek, crossed by C/L
	NE-213	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 187	NE-214	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-215	2 x 400	0.018	ES, NWUS		Poker Jim Creek, crossed by C/L
	NE-216	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-217	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-218	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 185	NE-219	2 x 480	0.022	ES, NWUS		Crossed by C/L
	NE-220	2 x 500	0.023	ES, NWUS		Crossed by C/L
	NE-221	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 183	NE-223	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-224	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-225	2 x 400	0.018	ES, NWUS		Black Eagle Creek, crossed by C/L
Photo # 3742 - 178	NE-226	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-227	2 x 160	0.007	ES, NWUS		Tributary to NE-226, conflues 100 feet east of C/L
	NE-228	2 x 580	0.027	ES, NWUS		Crossed by C/L
Photo # 3742 - 176	NE-229	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 176	NE-230	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 174	NE-231	2 x 650	0.030	ES, NWUS		Crossed by C/L
	NE-232	2 x 360	0.017	ES, NWUS		Crossed by C/L
	NE-233	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-234	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-235	2 x 400	0.018	ES, NWUS		Hackley Creek, crossed by C/L
	NE-236	20 x 500	0.230	SWF	WL, FLD, Ft	Hanging Woman Creek, crossed by C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
Photo # 3742 - 168	NE-237	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 166	NE-238	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-239	2 x 520	0.024	ES, NWUS		Crossed and paralleled by C/L
	NE-240	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 162	NE-241	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 161	NE-242	2 x 400	0.018	ES, NWUS		Battle Butte Creek, crossed by C/L
	NE-243	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-244	2 x 400	0.018	ES, NWUS		Ebaugh Creek, crossed by C/L
20.8 mile extension ends – Western Alignment begins						
Photo # 3742 - 159	NE-245	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-246	2 x 300	0.014	ES, NWUS		Crossed by C/L
Four Mile Creek Alternative begins at approximately station 5180+00						
	NE-246A	200 x 410	1.882	RWF	Fp, FLD, DS, WL	Tongue River, crossed by C/L
Photo # 3742 - 157	NE-247	2 x 600	0.028	ES, NWUS		Prairie Dog Creek, crossed by C/L
	NE-248	2 x 450	0.021	ES, NWUS		Bootlegger Draw, crossed by C/L
Photo # 3742 - 155	NE-249	2 x 400	0.018	ES, NWUS		School House Draw, crossed by C/L
	NE-250	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-251	3 x 600	0.041	ES, NWUS		Spring Creek, crossed and paralleled by C/L
	NE-252	2 x 500	0.023	ES, NWUS		Crossed by C/L
Photo # 3742 - 153	NE-253	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-254	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 153	NE-255	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-256	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-257	2 x 400	0.018	ES, NWUS		Canyon Creek, crossed by C/L
	NE-258	3 x 400	0.028	ES, NWUS		Crossed by C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
Photo # 3742 - 145	NE-259	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-260	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-261	2 x 400	0.018	ES, NWUS		Dutch Hollow, crossed by C/L
Photo # 3742 - 143	NE-262	2 x 500	0.023	ES, NWUS		Crossed by C/L
	NE-263	2 x 700	0.032	ES, NWUS		Crossed by C/L at acute ang1e
	NE-264	2 x 500	0.023	ES, NWUS		Crossed by C/L
	NE-265	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 -141	NE-266	2 x 560	0.026	ES, NWUS		Crossed and paralleled by C/L
	NE-267	3 x 800	0.055	ES, NWUS		Fourmile Creek, crossed by C/L
	NE-268	2 x 1000	0.046	ES, NWUS		Crossed and paralleled by C/L
Photo # 3742 - 140	NE-269	2 x 1100	0.051	ES, NWUS		Crossed by C/L (ROW"800 feet wide at this point)
	NE-270	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-271	2 x 680	0.031	ES, NWUS		Crossed by C/L at an ang1e (ROW up to 600 feet wide at this location)
	NE-272	2 x 500	0.023	ES, NWUS		Crossed by C/L
Photo # 3742 - 138	NE-273	2 x 750	0.034	ES, NWUS		Crossed by C/L (ROW" 700 feet wide)
	NE-274	2 x 780	0.036	ES, NWUS		Crossed by C/L (ROW" 700 feet wide)
	NE-275	2 x 550	0.025	ES, NWUS		Crossed by C/L
	NE-276	2 x 1100	0.051	ES, NWUS		Crossed and paralleled by C/L (ROW up to 650 feet wide)
	NE-277	2 x 1250	0.057	ES, NWUS		Post Creek, crossed by C/L (ROW =850 feet wide) and meanders
Photo # 3742 - 136	NE-278	2 x 450	0.021	ES, NWUS		Crossed by C/L
	NE-279	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-280	2 x 480	0.022	ES, NWUS		Crossed by C/L
Photo # 3742 – 136	NE-281	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 - 134	NE-282	2 x 650	0.030	ES, NWUS		Crossed by C/L (ROW = 650 feet wide)
	NE-283	2 x 550	0.025	ES, NWUS		Crossed by C/L

Tab1e 2. (continued)

Photo Number	Site #	Width x 1ength (within 400' corridor) (feet)	Acreage	WUS C1ass[1]	Function & Value[2]	Comments
	NE-284	2 x 450	0.021	ES, NWUS		Crossed by C/L
	NE-285	2 x 800	0.037	ES, NWUS		80 - 200 feet east of and parallel to C/L
	NE-286	2 x 400	0.018	ES, NWUS		Leaf Rock Creek, crossed by C/L
Photo # 3742 - 132	NE-287	2 x 600	0.028	ES, NWUS		Crossed by C/L
	NE-288	2 x 520	0.024	ES, NWUS		Crossed by C/L
	NE-289	2 x 640	0.029	ES, NWUS		Monument Creek, crossed by C/L (ROW 600 feet wide)
	NE-290	2 x 650	0.030	ES, NWUS		Crossed by C/L at ang1e
Photo # 3742 - 130	NE-291	2 x 400	0.018	ES, NWUS		Crossed by C/L
	NE-292	2 x 2100	0.096	ES, NWUS		20 - 40 feet east of and parallel to C/L
	NE-293	2 x 350	0.016	ES, NWUS		Tributary to NE-292, crossed by C/L
Photo # 3742 - 128	NE-294	2 x 480	0.022	ES, NWUS		Crossed by C/L
	NE-295	2 x 400	0.018	ES, NWUS		Tributary to NE-294, crossed by C/L
At approximate1y station 6100+00 – Joins pre-existing railroad and Four Mile A1ternative						

[1]Waters of the U.S. c1asses:

NWUS	_	Non-wetland waters of the U.S.
ES	=	Ephemeral stream
IS	_	Intermittent stream
RWF	_	River with wetland fringe
SWF	=	Stream with wetland fringe
UM	=	Abandoned or unused meander of channel
P	-	Natural or artificial pond
R	_	Riparian area
WL	=	Wet meadow/saline meadow

[2]Wetland functions and values designations (adapted from Berg1und 1996):

WL	=	General wildlife habitat
Ft	_	General fish habitat, temporary
Fs	_	General fish habitat, seasonal
Fp	_	General fish habitat, perennial
DS	_	Dynamic surface water storage
FLD	_	Flood attenuation and storage

Table 3. Waters of the U.S. within the analysis corridor of the Tongue River Railroad Tongue River Road Alternative (identifies WUS not shared in common with the TRRC Preferred Alignment - see description of routes in text) (Revised November 30,1998)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 911 7 - 180	TRD-l	145 x 400	1.332	RWF	FLD, WL, Fp	Tongue River crossing
	TRD-2	3 x 600	0.041	ES, NWUS		190 feet north of centerline (C/L) and parallel to C/L
	TRD-3	2 x 900	0.041	ES, NWUS		Crossed by C/L
	TRD-4	25 x 2500	1.435	ES (Not WUS)		Tongue and Yellowstone River irrigation district canal, paralleled by ROW, 150 feet west of C/L
Photo # 9117 - 179	TRD-5	13 x 400	0.119	SWF	WL, Fp, DS, FLD	Pumpkin Creek, crossed by C/L
	TRD-6	2 x 200	0.009	ES, NWUS		Flow west from C/L
	TRD-7	2 x 450	0.021	ES, NWUS		Crossed by C/L
	TRD-8	Deleted				
	TRD-9	Deleted				
	TRD-lO	Deleted				
	TRD-ll	Deleted				
	TRD-12	Deleted				
	TRD-13	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-14	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-15	4 x 400	0.037	ES, NWUS		Crossed by C/L
Photo # 10722 - 53	TRD-16	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-17	2 x 450	0.021	ES, NWUS		Crossed by C/L
	TRD-18	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-19	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-20	18 x 400	0.165	IS	WL, FLD	Prat Creek, crossed by C/L
	TRD-21	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-22	2 x 450	0.021	ES, NWUS		Nelson Creek, crossed by C/L
c	TRD-23	2 x 1900	0.087	ES, NWUS		Crossed by C/L then is channelized and paralleled by C/L for 1300 feet

Table 3. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
	TRD-24	2 x 400		ES, NWUS		Crossed by C/L
	TRD-25	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-26	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-27	150 x 528	1.818	RWF	WL, Fp, FLD	Tongue River, 80 feet west of C/L
	TRD-28	150 x 528	1.818	RWF	WL, Fp, FLD	Tongue River, 80 feet west of C/L
	TRD-29	150 x 400	1.377	IS	WL, Ft, FLD	Ash Creek, crossed by C/L
	TRD-30	264 x 450	2.727	UM	WL, FLD	Abandoned meander of Tongue River, crossed by C/L
	TRD-31	90 x 400	0.826	IS	GD,WL?	Spring at roadside, crossed by C/L
	TRD-32	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-33	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-34	2 x 300	0.014	ES, NWUS		160 feet east of and parallel to C/L
	TRD-35	2 x 320	0.015	ES, NWUS		Crossed by C/L
	TRD-36	2 x 450	0.021	ES, NWUS		jack Creek, crossed by C/L
	TRD-37	3 x 1100	0.076	IS	Ft, FLD, WL	Crossed by C/L at a low angle
	TRD-38	2 x 400	0.018			Crossed by C/L
	TRD-39	2 x 175	0.008			Paralleled by C/L, 150 feet southeast of C/L
	TRD-40	2 x 650	0.030			Crossed by C/L
	TRD-41	2 x 700	0.032			Crossed by C/L
	TRD-42	2 x 400	0.018		FLD,WL	Brown Creek, crossed by C/L
Photo # 9088 - 44	TRD-43	2 x 450	0.021	ES, NWUS		Crossed by C/L
	TRD-44	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-45	2 x 1000	0.046	IS	WL	Haddow Creek, crossed and paralleled by C/L
	TRD-46	2 x 250	0.011	ES, NWUS		Crossed by C/L
	TRD-47	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-48	2 x 200	0.009	ES, NWUS		Bisected by C/L where channel terminates

Table 3. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9088 - 44	TRD-49	150 x 300	1.033	RWF	WL, Fp, FLD	Tongue River, paralleled by C/L
	TRD-50	2 x 400	0.018	ES, NWUS		Cheever Creek, crossed by C/L
Photo # 9088 - 219	TRD-51	2 x 430	0.020	ES, NWUS		Sand Creek, crossed by C/L
	TRD-52	6 x 860	0.118	IS	WL	Foster Creek, crossed by C/L
	TRD-53	200 x 1300	5.969	UM	WL, FLD, Ft?	Abandoned Tongue River meander 75 feet west of C/L
Photo # 9088 - 22	TRD-54	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-55	3 x 250	0.017	ES, NWUS		Crossed by C/L
	TRD-56	2 x 4000	0.184	ES, NWUS		Stony Creek, paralleled by C/L
	TRD-57	2 x 320	0.015	ES, NWUS		Crossed by C/L
	TRD-58	2 x 500	0.023	ES, NWUS		Crossed and paralleled by C/L
	TRD-59	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-60	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-61	3 x 400	0.028	ES, NWUS		Crossed by C/L
	TRD-62	2 x 400	0.018	IS	WL, FLD	Elk Creek, crossed by C/L
Photo # 9089 - 34	TRD-63	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-64	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-65	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-66	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-67	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-68	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-69	2 x 600	0.028	ES, NWUS		Crossed by C/L
	TRD-70	2 x 450	0.021	ES, NWUS		Crossed by C/L
Photo # 10722 - 40	TRD-71	6 x 400	0.055	IS	WL, FLD	Lay Creek, crossed by C/L
	TRD-72	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-73	2 x 300	0.014	ES, NWUS		Crossed by C/L

Table 3. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 10722 - 40	TRD-74	2 x 200	0.009	ES, NWUS		Bisected by C/L where channel terminates
	TRD75	2 x 600	0.028	ES, NWUS		Crossed by C/L at 45° angle
	TRD-76	5 x 400	0.046	ES, NWUS		Crossed by CIL
	TRD-77	3 x 50	0.003	ES, NWUS		180 feet west of C/L
	TRD-78	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-79	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-80	2 x 450	0.021	IS	WL	Coon Creek, crossed by C/L
	TRD-81	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 9090 - 142	TRD-82	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-83	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-84	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-85	2 x 550	0.025	ES, NWUS		Crossed by C/L at angle
	TRD-86	2 x 450	0.021	ES, NWUS		Garden Creek, crossed by C/L
	TRD-87	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-88	30 x 500	0.344	IS	FLD, DS, WL	Broad floodplain wetland along Liscom Creek, crossed by C/L
Photo # 9090 - 14	TRD-89	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-90	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-91	300 x 1300	8.953	UM	WL	Abandoned meander, 150 feet west of C/L
	TRD-92	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-93	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-94	2 x 132	0.006	ES, NWUS		50 feet west of C/L
	TRD-95	2 x 200	0.009	ES, NWUS		West of C/L
	TRD-96	2 x 200	0.009	ES, NWUS		West of C/L
	TRD-97	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-98	200 x 1300	5.969	RWF	WL, FLD, Fp	Tongue River, 190 feet west of C/L

Table 3. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9090 - 141	TRD-99	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-l00	130 x 600	1.791	RWF	WL, FLD, Fp	Tongue River, 80 feet west of C/L
	TRD-l01	200 x 500	2.296	UM	WL, FLD, Ft	50 feet west of C/L
	TRD-l02	2 x 400	0.018	ES, NWUS		Big John Creek, crossed by C/L
	TRD-l03	2 x 400	0.018	ES, NWUS		Freda Creek, crossed by C/L
	TRD-l04	2 x 200	0.009	ES, NWUS		West of C/L, C/L crosses near upper end of channel
	TRD-l05	2 x 400	0.018	ES, NWUS		Goodale Creek, crossed by *C/L*
Photo # 9090 - 152	TRD-l06	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-l07	2 x 500	0.023	ES, NWUS		Crossed by C/L
	TRD-1O8	2 x 200	0.009	ES, NWUS		Perpendicular to and mainly east of C/L, crossed by C/L at lower end
	TRD-l09	2 x 200	0.009	ES, NWUS		Paralleled and crossed by C/L
	TRD-ll0	200 x 1320	6.061	UM	WL, FLD, GD?	Abandoned meander, crossed by *C/L* on eastern edge
	TRD-111	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-112	2 x 300	0.014	ES, NWUS		Crossed by C/L at lower end of channel
	TRD-113	200 x 400	1.837	UM	WL, FLD	Crossed by C/L
	TRD-114	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-115	3 x 1200	0.083	SWF?	WL, FLD	Crossed by C/L, channelized stream feeding TRD-116
	TRD-116	200 x 1300	5.969	UM	WL, FLD	Crossed by C/L twice
	TRD-l1 7	2 x 400	0.002	ES, NWUS		Straight Creek, 180 feet east of C/L, feeds into TRD-116
	TRD-118	2 x 400	0.018	ES, NWUS		Diamond Creek, crossed by C/L
	TRD-119	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-120	130 x 2100	6.267	RWF	WL, Fp, FLD	Tongue River, 40 feet west of C/L
Photo # 9090 - 153	TRD-121	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-122	6 x 400	0.055	SWF	WL, FLD	Beaver Creek, crossed by C/L
	TRD-123	2 x 80	0.004	ES, NWUS		Terminates 180 feet east of C/L

Table 3. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9090 - 153	TRD-124	2 x 40	0.002	ES, NWUS		Terminates 150 feet east of C/L
	TRD-125	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-126	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-127	2 x 900	0.041	ES, NWUS		Houston Draw, crossed by C/L
	TRD-128	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-129	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 9097 - 29	TRD-130	2 x 200	0.009	ES, NWUS		Crossed by C/L, mainly on east side of C/L
	TRD-131	176 x 800	3.232	RWF	WL, FLD, Fp	Tongue River, paralleled by C/L, C/L within 30 feet of bank
	TRD-132	2 x 400	0.018	ES, NWUS		Crossed by C/L, partly channelized
	TRD-133	2 x 550	0.025	ES, NWUS		Crossed by *C/L*
	TRD-134	130 x 600	1.791	RWF	WL, FLD, Fp	Tongue River, paralleled by C/L, C/L within 30 feet of bank
	TRD-135	2 x 260	0.012	ES, NWUS		Crossed by C/L
	TRD-136	3 x 400	0.028	IS	WL, FLD	Bringoff Creek, crossed by C/L
Photo # 9097 - 28'	TRD-137	2 x 425	0.020	ES, NWUS		Crossed by C/L
	TRD-138	2 x 60	0.003	ES, NWUS		Tributary to TRD-137, 180 feet east of C/L
	TRD-139	2 x 350	0.016	ES, NWUS		Crossed by C/L
	TRD-140	2 x 325	0.015	ES, NWUS		Crossed by *C/L*
	TRD-141	165 x 1000	3.788	RWF	WL, DS, Fp, FLD	Tongue River, 130 feet west of C/L
	TRD-142	2 x 600	0.028	ES, NWUS		Crossed by C/L
	TRD-143	2 x 1000	0.046	ES, NWUS		Crossed by C/L
	TRD-144	2 x 400	0.018	ES, NWUS		Crossed by C/L
	TRD-145	2 x 200	0.009	ES, NWUS		Tributary to TRD-146, conflues 60 feet east of C/L
	TRD-146	2 x 600	0.028	ES, NWUS		Crossed by C/L
At approximately station 3200+00 – Tongue River Road Alternative rejoins TRRC Preferred Alignment						

Table 3. (continued)

[1]Waters of the U.S. classes:

NWUS	_	Non-wetland waters of the U.S.
ES	=	Ephemeral stream
IS	_	Intermittent stream
RWF	_	River with wetland fringe
SWF	=	Stream with wetland fringe
UM	=	Abandoned or unused meander of channel
P	-	Natural or artificial pond
R	_	Riparian area
WL	=	Wet meadow/saline meadow

[2]Wetland functions and values designations (adapted from Berglund 1996):

WL	=	General wildlife habitat
Ft	_	General Fish habitat, temporary
Fs	_	General Fish habitat, seasonal
Fp	_	General Fish habitat, perennial
DS	_	Dynamic surface water storage
FLD	_	Flood attenuation and storage

Table 4. Waters of the U.S. within the analysis corridor of the Tongue River Railroad Moon Creek Alternative (identifies WUS not shared in common with the TRRC Preferred Alignment - see description of routes in text) (Revised November 30,1998)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9088 - 54	M-1	160 x 400	1.469	RWF	Fp, WL	Tongue River crossing
	M-2	3 x 200	0.014	IS	WL FLD	70 feet north of and parallel to centerline (C/L)
	M-3	6 x 400	0.055	ES, NWUS		Crossed by C/L
	M-4	6 x 600	0.083	ES, NWUS		Crossed and paralleled by C/L
	M-5	1100 x 400	10.101	RWF	WL FLD, Fp	Yellowstone River crossing
Photo # 9088 - 54 and #9088 - 208	M-6	3 x 6600	0.455	ES, NWUS		20 feet north of and parallel to C/L, crossed by C/L
Photo # 9088 - 208	M-7	3 x 400	0.028	ES, NWUS		Crossed by C/L
	M-8	3 x 575	0.040	ES, NWUS		Crossed and paralleled by C/L
C/L leaves Old Milwaukee Road ROW here						
	M-9	3 x 750	0.052	ES, NWUS		Crossed by C/L
	M-10	900 x 400	8.264	RWF	WL Fp, FLD	Yellowstone River crossing
	M-11	5 x 425	0.049	SWF	WL Fs, FLD	Moon Creek, crossed by C/L
Photo # 9088 - 210	M-12	6 x 500	0.069	SWF	WL Fs, FLD	Moon Creek, 75 feet east of and parallel to C/L
	M-13	6 x 200	0.028	SWF	WL Fs, FLD	Moon Creek, 75 feet east of and parallel to C/L
	M-14	2 x 400	0.018	ES, NWUS		Crossed by C/L
	M-15	2 x 150	0.007	ES, NWUS		65 feet east of C/L
	M-16	5 x 800	0.092	SWF	WL Fs, FLD	Moon Creek, crossed and paralleled by C/L
	M-17	5 x 500	0.057	SWF	WL Fs, FLD	50 feet west of and parallel to C/L
	M-18	2 x 1200	0.055	ES, NWUS		Crossed and paralleled by C/L
	M-19	2 x 400	0.018	SWF	WL Fs, FLD	Moon Creek, 100 feet west of and parallel to C/L
	M-20	5 x 150	0.017	SWF	WL Fs, FLD	Moon Creek,150 feet west of and parallel to C/L
	M-21	5 x 200	0.023	SWF	WL Fs, FLD	Moon Creek, 100 feet west of and parallel to C/L
Photo # 9088 - 212	M-22	2 x 450	0.021	ES, NWUS		Crossed by C/L

Table 4. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9088 - 212	M-23	3 x 450	0.031	ES, NWUS		Crossed by C/L
	M-24	3 x 400	0.028	ES, NWUS		Crossed by C/L
	M-25	3 x 250	0.017	ES, NWUS		Channel conflues with M-24 50 feet east of C/L
	M-26	3 x 528	0.036	ES, NWUS		Crossed by C/L
	M-27	3 x 660	0.045	ES, NWUS		Crossed by C/L
	M-28	3 x 600	0.041	ES, NWUS		Crossed and paralleled by C/L
	M-29	5 x 250	0.029	SWF	WL FLD, Ft	Moon Creek, 50 feet west of C/L
	M-30	3 x 400	0.028	ES, NWUS		Crossed by C/L
	M-31	3 x 1000	0.069	ES, NWUS		Crossed by C/L
	M-32	3 x 132	0.009	ES, NWUS		100 feet east of C/L
	M-33	3 x 250	0.017	ES, NWUS		200 feet west of C/L
	M-34	3 x 1100	0.076	ES, NWUS		Crossed and paralleled by C/L
	M-35	3 x 400	0.028	ES, NWUS		Crossed by C/L
Photo # 9088 - 49	M-36	3 x 200	0.014	ES, NWUS		East Fork Moon Creek, 66 feet west of C/L
	M-37	3 x 450	0.031	ES, NWUS		Crossed by C/L
	M-38	3 x 400	0.028	ES, NWUS		East Fork Moon Creek, 30 feet west of C/L
	M-39	3 x 200	0.014	ES, NWUS		Crossed by C/L
	M-40	3 x 800	0.055	ES, NWUS		East Fork Moon Creek, crossed and paralleled by C/L
	M-41	3 x 1320	0.091	ES, NWUS		East Fork Moon Creek, crossed and paralleled by C/L
	M-42	3 x 400	0.028	ES, NWUS		Crossed by C/L
	M-43	2 x 400	0.018	ES, NWUS		Crossed by C/L
	M-44	2 x 1500	0.069	ES, NWUS		Crossed and paralleled by C/L
	M-45	2 x 1200	0.055	ES, NWUS		Paralleled by C/L
	M-46	2 x 400	0.018	ES, NWUS		Crossed by C/L, with stock pond
	M-47	2 x 2600	0.119	ES, NWUS		50 feet west and parallel to C/L, stock pond at east end

Table 4. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9088 - 49	M-48	2 x 5000	0.230	0.230	ES, NWUS	Crossed and paralleled by C/L, stock pond in mid portion
Photo # 10722 - 53	M-49	2 x 250	0.011	0.011	ES, NWUS	66 feet south of C/L
	M-50	2 x 450	0.021	0.021	ES, NWUS	Crossed by C/L
	M-51	2 x 520	0.024	0.024	ES, NWUS	Crossed by C/L, stock pond on south end
	M-52	2 x 600	0.028	0.028	ES, NWUS	Crossed by C/L
	M-53	2 x 400	0.018	0.018	ES, NWUS	Crossed by C/L
At approximately station 1100+00 – Moon Creek Alternative joins TRRC Preferred Alignment						

[1]Waters of the U.S. classes:

NWUS	_	Non-wetland waters of the U.S.
ES	=	Ephemeral stream
IS	_	Intermittent stream
RWF	_	River with wetland fringe
SWF	=	Stream with wetland fringe
UM	=	Abandoned or unused meander of channel
P	-	Natural or artificial pond
R	_	Riparian area
WL	=	Wet meadow/saline meadow

[2]Wetland functions and values designations (adapted from Berglund 1996):

WL	=	General wildlife habitat
Ft	_	General Fish habitat, temporary
Fs	_	General Fish habitat, seasonal
Fp	_	General Fish habitat, perennial
DS	_	Dynamic surface water storage
FLD	_	Flood attenuation and storage

Table 5. Waters of the U.S. within the analysis corridor of the Tongue River Railroad Colstrip Alternative (identifies WUS not shared in common with the TRRC Preferred Alignment - see description of routes in text) (Revised November 30,1998)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9109 - 7	C-l	6 x 300	0.041	UM/WM	WL, FLD	Located between branches of RR by junction with BN mainline, crossed by centerline (C/L)
	C-2	6 x 200	0.028	UMIWM	WL, FLD	Crossed by C/L, located just south of C-l
	C-3	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-4	6 x 400	0.055	SWF	WL, FLD, Ft	Armells Creek, 200 feet west of and parallel to C/L
	C-5	2 x 200	0.009	ES, NWUS		Crossed by C/L
	C-6	6 x 1300	0.179	SWF	WL, FLD, Ft	Armells Creek, 30 feet west of and parallel to C/L
	C-7	2 x 200	0.009	ES, NWUS		Crossed by C/L
	C-8	6 x 320	0.044	SWF	WL, FLD, Ft	Armells Creek, 150 feet west of and parallel to C/L
	C-9	2 x 450	0.021	ES, NWUS		Crossed by C/L
	C-10	2 x 300	0.014	ES, NWUS		Crossed by C/L
	C-11	6 x 1200	0.165	SWF	WL, FLD, Ft	Armells Creek, 80 feet west of and parallel to C/L
	C-12	2 x 400	0.018.	ES, NWUS		Crossed by C/L
	C-13	2 x 330	0.015	ES, NWUS		Crossed by C/L
	C-14	6 x 500	0.069	SWF	WL, FLD, Ft	Armells Creek, 160 feet west of and parallel to C/L
	C-15	2 x 250	0.011	ES, NWUS		Crossed by C/L
	C-16	6 x 450	0.062	SWF	WL, FLD, Ft	Armells Creek, 80 feet west of and parallel to C/L
	C-17	6 x 800	0.110	SWF	WL, FLD, Ft	Armells Creek, 150 feet west of and parallel to C/L
	C-18	2 x 320	0.015	ES, NWUS		Crossed by C/L
	C-19	2 x 425	0.020	ES, NWUS		Crossed by C/L
	C-20	5 x 420	0.048	SWF	WL, FLD, Ft	Armells Creek, 130 feet west of and parallel to C/L
Photo # 9109 - 5	C-21	2 x 200	0.009	ES, NWUS		Crossed by C/L
	C-22	2 x 200	0.009	ES, NWUS		Crossed by C/L
	C-23	6 x 330	0.045	SWF	WL, FLD, Ft	Armells Creek, 180 feet west of and parallel to C/L
	C-24	6 x 450	0.062	SWF	WL, FLD, Ft	Armells Creek, 50 feet west of and parallel to C/L

Table 5. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9109 - 5	C-25	6 x 550	0.076	SWF	WL, FLD, Ft	Armells Creek, 100 feet west of and parallel to C/L
	C-26	2 x 250	0.011	ES, NWUS		Crossed by C/L
	C-27	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-28	150 x 100	0.344	P, Manmade		140 feet west of C/L
	C-29	2 x 400	0.018	ES, NWUS	.	Crossed by C/L
	C-30	2 x 750	0.034	ES, NWUS		Crossed by C/L
	C-31	2 x 200	0.009	ES, NWUS		Crossed by C/L
	C-32	2 x 100	0.005	SWF	WL, FLD, Ft	Armells Creek, 175 feet west of and parallel to C/L
	C-33	6 x 1000	0.138	SWF	WL, FLD, Ft	Armells Creek, 80 feet west of and parallel to C/L
	C-34	2 x 320	0.015	ES, NWUS		Crossed by C/L
	C-35	4 x 1100	0.101	UM	WL, FLD?	Crossed and paralleled by C/L, meander cut off by RR construction
	C-36	6 x 2200	0.303	SWF	WL, Ft, FLD	Armells Creek, partially channelized on west side of C/L
	C-37	2 x 500	0.023	ES, NWUS		Crossed by C/L
	C-38	6 x 528	0.073	SWF	WL, Ft, FLD	Armells Creek, 130 feet west of and parallel to C/L
	C-39	2 x 325	0.015	ES, NWUS		Crossed by C/L
	C-40	6 x 1400	0.193	SWF	WL, Ft, FLD	Armells Creek, 80 feet west of and parallel to C/L
	C-41	2 x 300	0.014	ES, NWUS		Crossed by C/L
	C-42	6 x 1200	0.165	SWF	WL, Ft, FLD	Armells Creek, 130 feet west of and parallel to C/L
	C-43	2 x 300	0.014	ES, NWUS		Crossed by C/L
Photo # 9109 - 3	C-44	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-45	2 x 520	0.024	ES, NWUS		Crossed by C/L
	C-46	6 x 150	. 0.021	SWF	WL, FLD, Ft	Armells Creek, 175 feet west of and parallel to C/L
	C-47	6 x 900	0.124	SWF	WL, FLD, Ft	Channelized section of Armells Creek adjacent to C/L on west side

Table 5. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9109 - 3	C-48	6 1000	0.138	UM	WL, FLD?	Meander of Armells Creek cut off by RR tracks, crossed by C/L
	C-49	6 x 150	0.021	SWF	WL, FLD, Ft	Armells Creek, 150 feet west of and parallel to C/L
	C-50	2 x 300	0.014	ES, NWUS		Crossed by C/L
	C-51	6 x 400	0.055	SWF	WL, Ft, FLD	Armells Creek, 60 feet west of RR tracks, parallel to C/L
	C-52	2 x 500	0.023	ES, NWUS		Crossed by C/L
	C-53	6 x 300	0.041	SWF	WL, Ft, FLD	Armells Creek, 70 feet west of and parallel to C/L
	C-54	2 x 1100	0.051	ES, NWUS		Crossed and paralleled by C/L
	C-55	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-56	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-57	6 x 620	0.085	SWF	WL, FLD, Ft	Armells Creek, 175 feet west of C/L
	C-58	2 x 450	0.021	Es., NWUS		Crossed by C/L
Photo # 9115 - 138	C-59	2 x 1300	0.060	ES, NWUS		Crossed and paralleled by C/L
	C-60	6 x 320	0.044	SWF	WL, FLD, Ft	Armells Creek, 40 feet west of and parallel to C/L
	C-61	6 x 260	0.036	SWF	WL, FLD, Ft	Armells Creek, 130 feet west of and parallel to C/L
	C-62	6 x 1320	0.182	SWF	WL, FLD, Ft	Armells Creek (channelized) paralleled and crossed by C/L
	C-63	6 x 600	0.083	UM	WL, FLD?	Old meander of Armells Creek, RR tracks cut off meander of stream
	C-64	2 x 925	0.042	ES, NWUS		Crossed and paralleled by C/L
	C-65	6 x 660	0.091	UM	WL, FLD?	Old meander of Armells Creek (cut *off* by RR), crossed and paralleled by C/L
	C-66	6 x 400	0.055	UM	WL, FLD?	Crossed by C/L, meander cut off by RR
	C-67	6 x 1200	0.165	SWF	WL, FLD, Ft	Armells Creek, partially channelized, paralleled by C/L
Photo # 9115 - 136	C-68	6 x 790	0.109	SWF	WL, FLD, Ft	Armells Creek, 80 feet east of and parallel to C/L
	C-69	2 x 525	0.024	ES, NWUS		Crossed by C/L
	C-70	6 x 700	0.096	SWF	WL, FLD, Ft	Armells Creek, 70 feet east of and parallel to C/L

Table 5. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9115 - 136	C-71	6 x 600	0.083	SWF	WL, FLD, Ft	Armells Creek, 100 feet east of and parallel to C/L
	C-72	2 x 400	0.018	ES, NWUS		Sevenmile Creek, crossed by C/L
	C-73	6 x 180	0.025	SWF	WL, FLD, Ft	Armells Creek, 132 feet east of RR tracks, paralleled by C/L
Photo #9111-61	C-74	2 x 400	0.018	ES,NWUS		Crossed by C/L
	C-75	6 x 925	0.127	SWF	WL, FLD, Ft	Armells Creek, 60 feet east of and parallel to C/L
	C-76	2 x 325	0.015	ES, NWUS		Crossed by C/L
	C-77	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-78	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-79	6 x 200	0.028	SWF	FLD, WL, Ft	Armells Creek, 180 feet east of and parallel to C/L
	C-80	6 x 780	0.107	SWF	FLD, WL, Ft	Armells Creek, 150 feet east of and parallel to C/L
	C-81	2 x 450	0.021	ES, NWUS		Crossed by C/L
	C-82	2 x 1100	0.051	ES, NWUS		McGelvrey Creek, crossed and paralleled by C/L
Photo # 9111 - 59	C-83	6 x 200	0.028	SWF	WL, FLD, Ft	Armells Creek, 165 feet east of and parallel to C/L
	C-84	2 x 325	0.015	ES, NWUS		Crossed by C/L
	C-85	2 x 800	0.037	ES, NWUS		Crossed by C/L
	C-86	2 x 600	0.028	ES, NWUS		Corral Creek, crossed by C/L
	C-87	2 x 396	0.018	ES, NWUS		Crossed by C/L
	C-88	6 x 450	0.062	SWF	WL, FLD, Ft	Armells Creek, 132 feet east of and parallel to C/L
	C-89	2 x 528	0.024	ES, NWUS		Crossed by C/L
	C-90	6 x 132	0.018	SWF	WL, FLD, Ft	Armells Creek, 160 feet east of and parallel to C/L
	C-91	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-92	2 x 200	0.009	ES, NWUS		Crossed by C/L
	C-93	6 x 320	0.044	SWF	WL, FLD, Ft	Armells Creek, 90 feet east of and parallel to C/L
	C-94	2 x 425	0.020	ES, NWUS		Crossed by C/L
	C-95	2 x 500	0.023	ES, NWUS		Crossed by C/L

Table 5. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9111 - 57	C-96	6 x 200		SWF	WL, FLD, Ft	East Fork Armells Creek, 200 feet east of and parallel to C/L
	C-97	2 x 460	0.021	ES, NWUS		Stocker Creek, crossed by C/L
	C-98	6 x 250	0.034	SWF	WL, FLD, Ft	East Fork Armells Creek, 200 feet east of and parallel to *C/L*
	C-99	2 x 550	0.025	ES, NWUS		Crossed by C/L
	C-l00	6 x 70	0.010	SWF	WL, FLD, Ft	East Fork Armells Creek, 180 feet east of and parallel to C/L
	C-l01	6 x 600	0.083	SWF	WL, FLD, Ft	East Fork Armells Creek, 25 feet east of *C/L*
	C-l02	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-l03	200 x 300	1.377	P, Manmade		200 feet east of C/L
	C-l04	6 x 100	0.014	SWF	WL, FLD, Ft	East Fork Armells Creek, 200 feet east of and parallel to C/L
	C-l 05	80 x 90	0.165	P, Manmade		100 feet east of C/L
	C-l 06	2 x 400	0.018	ES, NWUS		Crossed by *C/L*
	C-l 07	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-l08	800 x 900	16.529	P, Manmade		100 feet east of C/L
	C-l 09	6 x 100	0.014	SWF	WL, FLD, Ft	East Fork Armells Creek, 200 feet east of and parallel to C/L
	C-l10	6 x 900	0.124	SWF	WL, FLD, Ft	Partially channelized East Fork Armells Creek, crossed and paralleled by C/L
	C-l11	260 x 650		P, Manmade		350 feet south of C/L
	C-112	400 x 130		P, Manmade		200 feet north of CIL
Photo # 9110 - 241	C-113	132 x 264		P, Manmade		200 feet north of CIL
	C-114	60 x 400		P, Manmade		80 feet north of C/L
	C-115	100 x 200	0.459	P, Manmade		80 feet south of CIL
	C-116	130 x 200	0.597	P, Manmade		150 feet north of *C/L*
ROW leaves BNSF pre-existing tracks						

Table 5. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9110 - 241	C-117	2 x 250	0.011	ES, NWUS		Crossed by C/L
	C-118	2 x 300	0.014	ES, NWUS		Crossed by C/L
	C-119	2 x 3300	0.152	ES, NWUS		Cow Creek, crossed and paralleled by C/L
	C-120	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-121	2 x 260	0.012	ES, NWUS		Crossed by C/L
	C-122	2 x 150	0.007	ES, NWUS		Cow Creek,80 feet north of and parallel to C/L
	C-123	2 x 200	0.009	ES, NWUS		Cow Creek, 20 feet north of and parallel to C/L
	C-124	2 x 250	0.011	ES, NWUS		Cow Creek, 80 feet north of and parallel to C/L
Photo # 9110 - 38	C-125	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-126	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-127	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-128	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-129	3 x 200	0.014	ES, NWUS		Cow Creek, 200 feet south of and parallel to C/L
	C-130	3 x 260	0.018	ES, NWUS		Cow Creek, 200 feet south of and parallel to C/L
	C-131	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-132	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo#9115-157	C-133	2 x 460	0.021	ES, NWUS		South Fork Cow Creek, crossed by C/L
	C-134	2 x 550	0.025	ES, NWUS		Crossed by C/L
	C-135	2 x 400	0.018	ES, NWUS		Crossed. by C/L
Photo # 9122 - 34	C-136	6 x 600	0.083	SWF	WL, FLD, Ft	Rosebud Creek, crossed by C/L
	C-137	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-138	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-139	2 x 700	0.032	ES, NWUS		Crossed by C/L
	C-140	4 x 200	0.018	SWF	WL, FLD	Greenleaf Creek, 150 feet east of and parallel to C/L
	C-141	2 x 400	0.018	ES, NWUS		Crossed by C/L

Table 5. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 9122 - 34	C-142	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-143	4 x 600	0.055	SWF	WL, FLD	Greenleaf Creek, crossed by C/L
Photo # 9097 - 76	C-144	2 x 600	0.028	ES, NWUS		Conflues with C-145 80 feet south of C/L
	C-145	2 x 1200	0.055	ES, NWUS		Roe and Cooper Creek, crossed and paralleled by C/L
	C-146	2 x 400	0.018	ES, NWUS		Roe and Cooper Creek, 180 feet north of C/L
	C-147	2 x 650	0.030	ES, NWUS		Crossed by C/L
	C-148	2 x 200	0.009	ES, NWUS		Terminates on north edge of C/L
	C-149	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-150	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-151	2 x 200	0.009	ES, NWUS		Crossed by C/L at acute angle
	C-152	2 x 400	0.018	ES, NWUS		Crossed by C/L
	C-153	2 x 400	0.018	ES, NWUS		Crossed by C/L
At approximately Station 3040+00 – joins TRRC Preferred Alignment						

[1]Waters of the U.S. classes:

NWUS	_	Non-wetland waters of the U.S.
ES	=	Ephemeral stream
IS	_	Intermittent stream
RWF	_	River with wetland fringe
SWF	=	Stream with wetland fringe
UM	=	Abandoned or unused meander of channel
P	-	Natural or artificial pond
R	_	Riparian area
WL	=	Wet meadow/saline meadow

[2]Wetland functions and values designations (adapted from Berglund 1996):

WL	=	General wildlife habitat
Ft	_	General Fish habitat, temporary
Fs	_	General Fish habitat, seasonal
Fp	_	General Fish habitat, perennial
DS	_	Dynamic surface water storage
FLD	_	Flood attenuation and storage

Table 6. Waters of the U.S. within the analysis corridor of the Tongue River Railroad Four Mile Creek Alternative (identifies WUS not shared in common with the TRRC Preferred Alignment - see description of routes in text) (Revised November 30,1998)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 3742 – 159	FM-62	2 x 500	0.023	ES, NWUS		Crossed by centerline (C/L)
	FM-63	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 3742 – 157	FM-64	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-65	200 x 1700	7.805	RWF	WL, Fp, FLD	Tongue River, 60 feet west of C/L and paralleled by C/L
	FM-66	2 x 240	0.011	ES, NWUS		Crossed by C/L, conflues with FM-65
	FM-67	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-68	200 x 1800	8.264	RWF	WL, Fp, FLD	Tongue River, 60 feet west of C/L, paralleled by C/L
Photo # 2729 – 69	FM-69	2 x 400	0.018	ES, NWUS		Deadman Gulch, crossed by C/L
	FM-70	2 x 50	0.002	£5, NWUS		Conflues with FM-69, 150 feet east of C/L
	FM-71	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-72	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-73	200 x 1750	8.035	RWF	WL, Fp, FLD	Tongue River, paralleled by C/L and 150 feet west of C/L
	FM-74	2 x 800	0.037	ES, NWUS		Crossed and paralleled by C/L
	FM-75	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-76	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-77	200 x 250	1.148	RWF	WL, Fp, FLD	Tongue River, 170 feet west of and paralleled by C/L
Photo # 2749 - 49	FM-78	4 x 800	0.073	IS	WL, Ft, FLD	Harris Creek, crossed and paralleled by C/L, conflues with FM-77

Table 6. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
Photo # 2729-49	FM-l	225 x 200	1.033	UM	Ft?, WL, FLD	Unused meander of Tongue River, crossed by C/L
	FM-2	300 x 400	2.755	RWF	Fp, WL, FLD, DS	Tongue River crossing
	FM-3	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-4	2 x 450	0.021	ES, NWUS		Crossed by C/L
	FM-5	2 x 430	0.020	ES, NWUS		Crossed by C/L
	FM-6	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-7	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-8	2 x 500	0.023	ES, NWUS		Four Mile Creek, crossed by C/L
	FM-9	2 x 528	0.024	ES, NWUS		Four Mile Creek, crossed by C/L
	FM-10	2 x 200	0.009	ES, NWUS		Crossed by C/L
Photo # 2729-51	FM-11	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-12	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-H	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-14	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-15	2 x 750	0.034	ES, NWUS		Crossed and paralleled by C/L
	FM-16	2 x 520	0.024	ES, NWUS		Crossed by C/L
	FM-17	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-18	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-19	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 2729-64	FM-20	2 x 660	0.030	ES, NWUS		Crossed by C/L
	FM-21	2 x 550	0.025	ES, NWUS		Crossed by C/L
	FM-22	2 x 910	0.042	ES, NWUS		100 feet north of and parallel to C/L
Photo # 2729-62	FM-23	2 x 450	0.021	ES, NWUS		Crossed by C/L
	FM-24	2 x 500	0.023	ES, NWUS		Crossed by C/L

Table 6. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
	FM-25	2 x 500	0.023	ES, NWUS		Crossed by C/L
Photo # 2729-62	FM-26	2 x 450	0.021	ES, NWUS		Crossed by C/L
Photo # 2729-61	FM-27	2 x 520	0.024	ES, NWUS		Crossed and paralleled by C/L
	FM-28	2 x 500	0.023	ES, NWUS		Crossed by C/L
	FM-29	2 x 700	0.032	ES, NWUS		Tributary to FM-28, crossed and paralleled by C/L
	FM-30	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-31	2 x 780	0.036	ES, NWUS		Crossed and paralleled by C/L
	FM-32	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 2729-57	FM-33	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-34	2 x 500	0.023	ES, NWUS		leaf Rock Creek, crossed by C/L
	FM-35	2 x 120	0.006	ES, NWUS		Crossed by C/L
	FM-36	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-37	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-38	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-39	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-40	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-41	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-42	2 x 400	0.018	ES, NWUS		South Fork leaf Rock Creek, crossed by C/L
	FM-43	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-44	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 2513-69	FM-45	2 x 1200	0.055	ES, NWUS		Crossed and paralleled by C/L
	FM-46	2 x 450	0.021	ES, NWUS		Crossed by C/L
Photo # 2513-70	FM-47	2 x 700	0.032	ES, NWUS		Crossed and paralleled by C/L
	FM-48	2 x 500	0.023	ES, NWUS		Crossed by C/L

Table 6. (continued)

Photo Number	Site #	Width x Length (within 400' corridor) (feet)	Acreage	WUS Class[1]	Function & Value[2]	Comments
	FM-49	2 x 400	0.018	ES, NWUS		Crossed by C/L
Photo # 2513-6	FM-51	2 x 1000	0.046	ES, NWUS		100 feet north of and parallel to C/L
Photo # 2513-7	FM-52	2 x 720	0.033	ES, NWUS		Crossed and paralleled by C/L
Photo # 2513-38	FM-53	2 x 650	0.030	ES, NWUS		Crossed and paralleled by C/L
	FM-54	2 x 800	0.037	ES, NWUS		Crossed and paralleled by C/L
	FM-55	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-56	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-57	2 x 450	0.021	ES, NWUS		Crossed by C/L
	FM-58	2 x 480	0.022	ES, NWUS		Crossed by C/L
	FM-59	2 x 100	0.005	ES, NWUS		50 feet northeast of C/L
	FM-60	2 x 400	0.018	ES, NWUS		Crossed by C/L
	FM-61	2 x 1400	0.064	ES, NWUS		100 feet west of and parallel to C/L

[1]Waters of the U.S. classes:

NWUS	_	Non-wetland waters of the U.S.
ES	=	Ephemeral stream
IS	_	Intermittent stream
RWF	_	River with wetland fringe
SWF	=	Stream with wetland fringe
UM	=	Abandoned or unused meander of channel
P	-	Natural or artificial pond
R	_	Riparian area
WL	=	Wet meadow/saline meadow

[2]Wetland functions and values designations (adapted from Berglund 1996):

WL	=	General wildlife habitat
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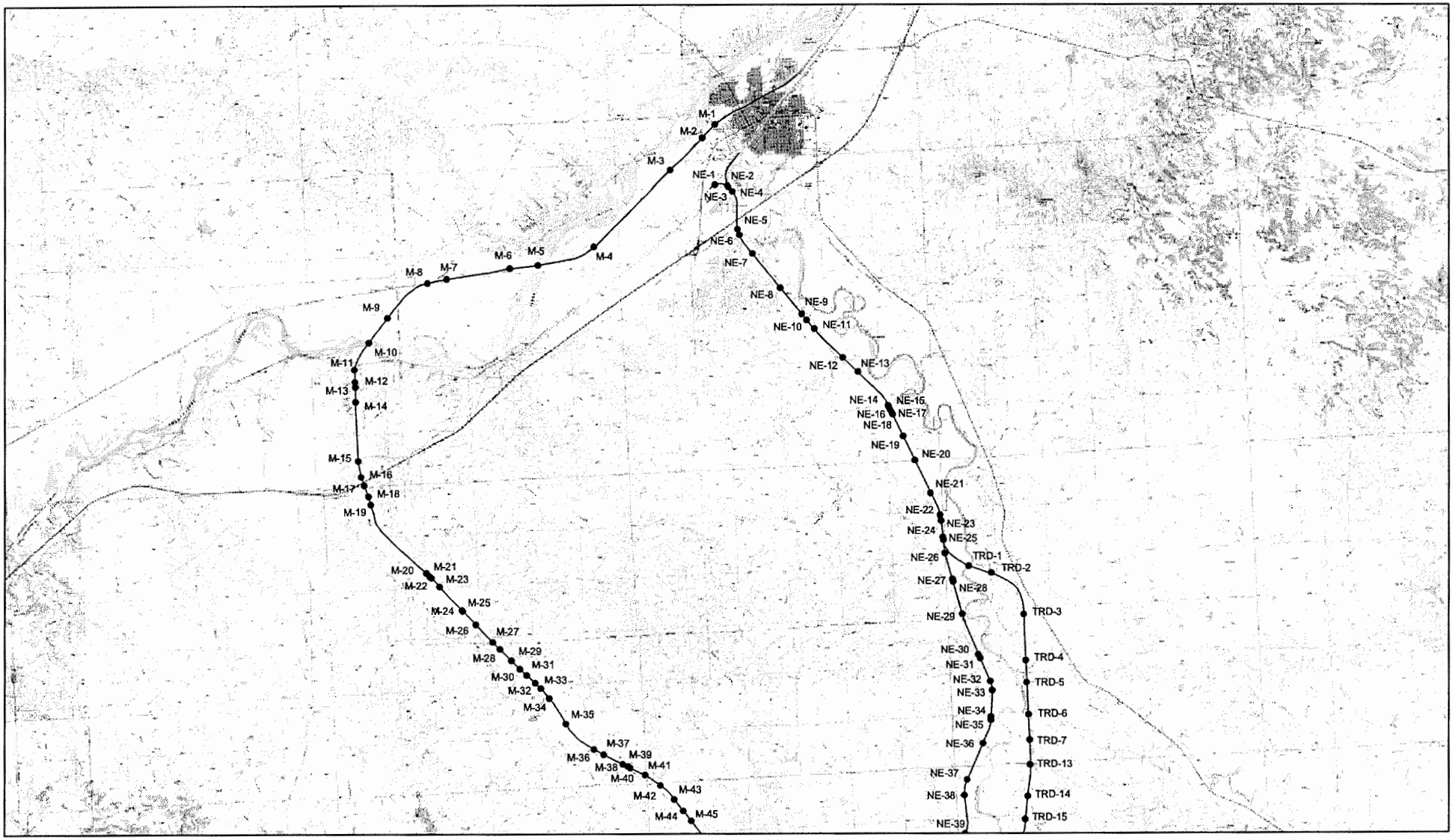
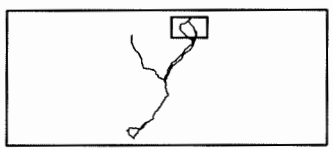
Fs	_	General Fish habitat, seasonal
Fp	_	General Fish habitat, perennial
DS	_	Dynamic surface water storage
FLD	_	Flood attenuation and storage





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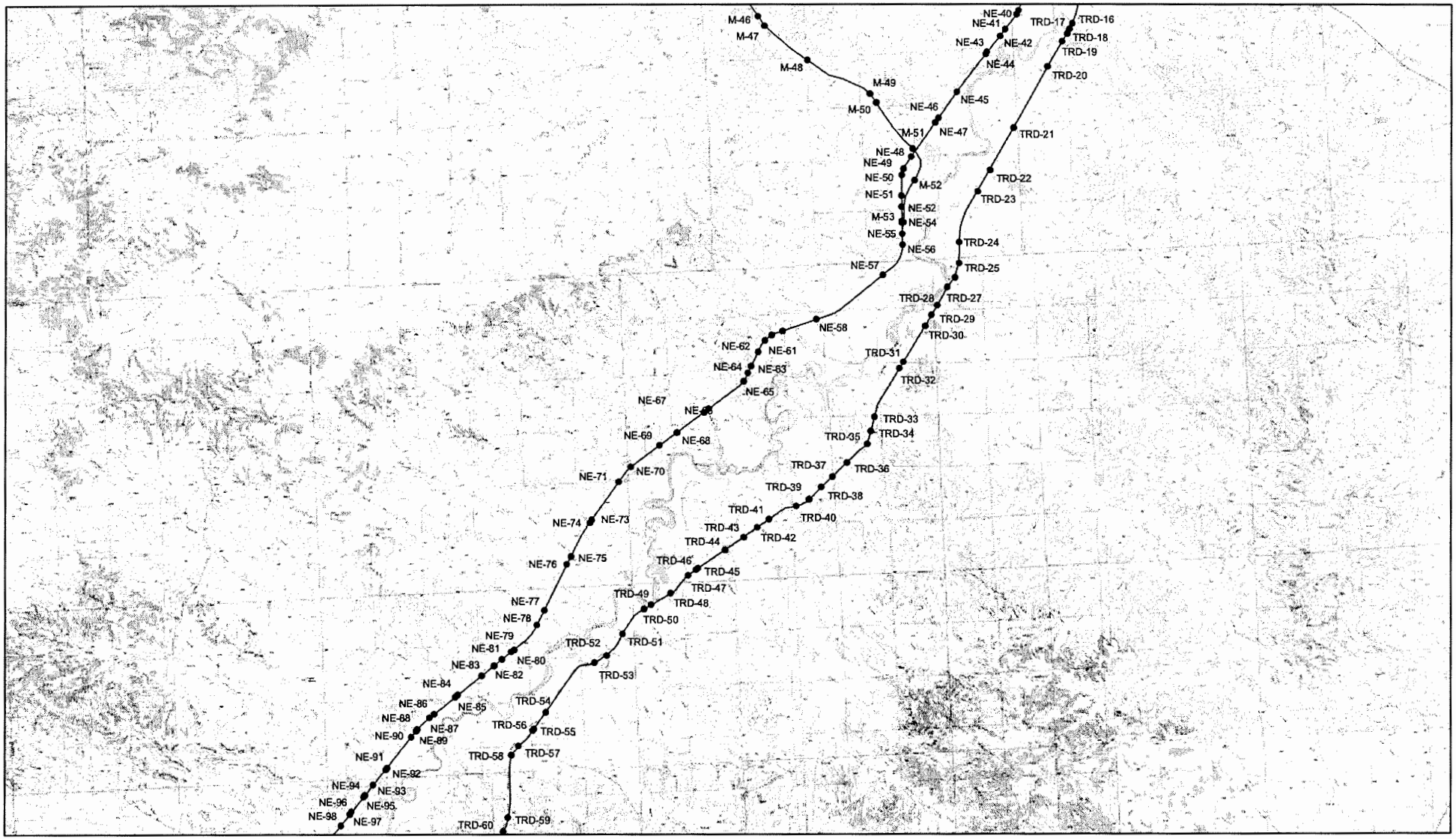
Waters of The U.S.
Sheet 1 of 8
Tongue River Railroad

Proj. 3079712 Date: 10/2003



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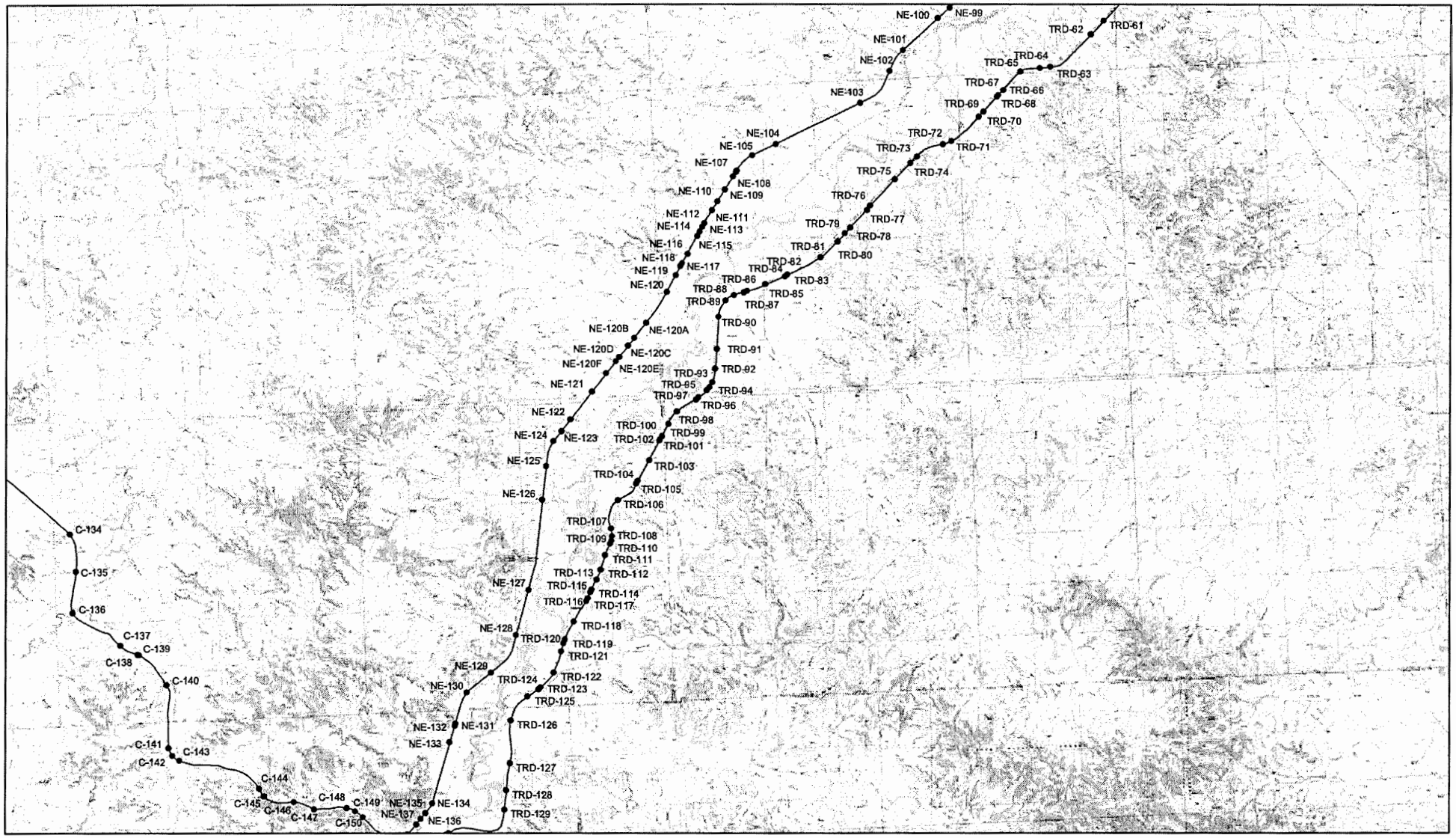
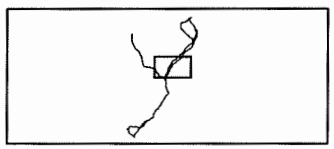
Waters of The U.S.
Sheet 2 of 8
Tongue River Railroad

Proj. 3079712 Date: 10/2003





0 1.25 2.5 5 Miles

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Waters of The U.S.
Sheet 3 of 8
Tongue River Railroad

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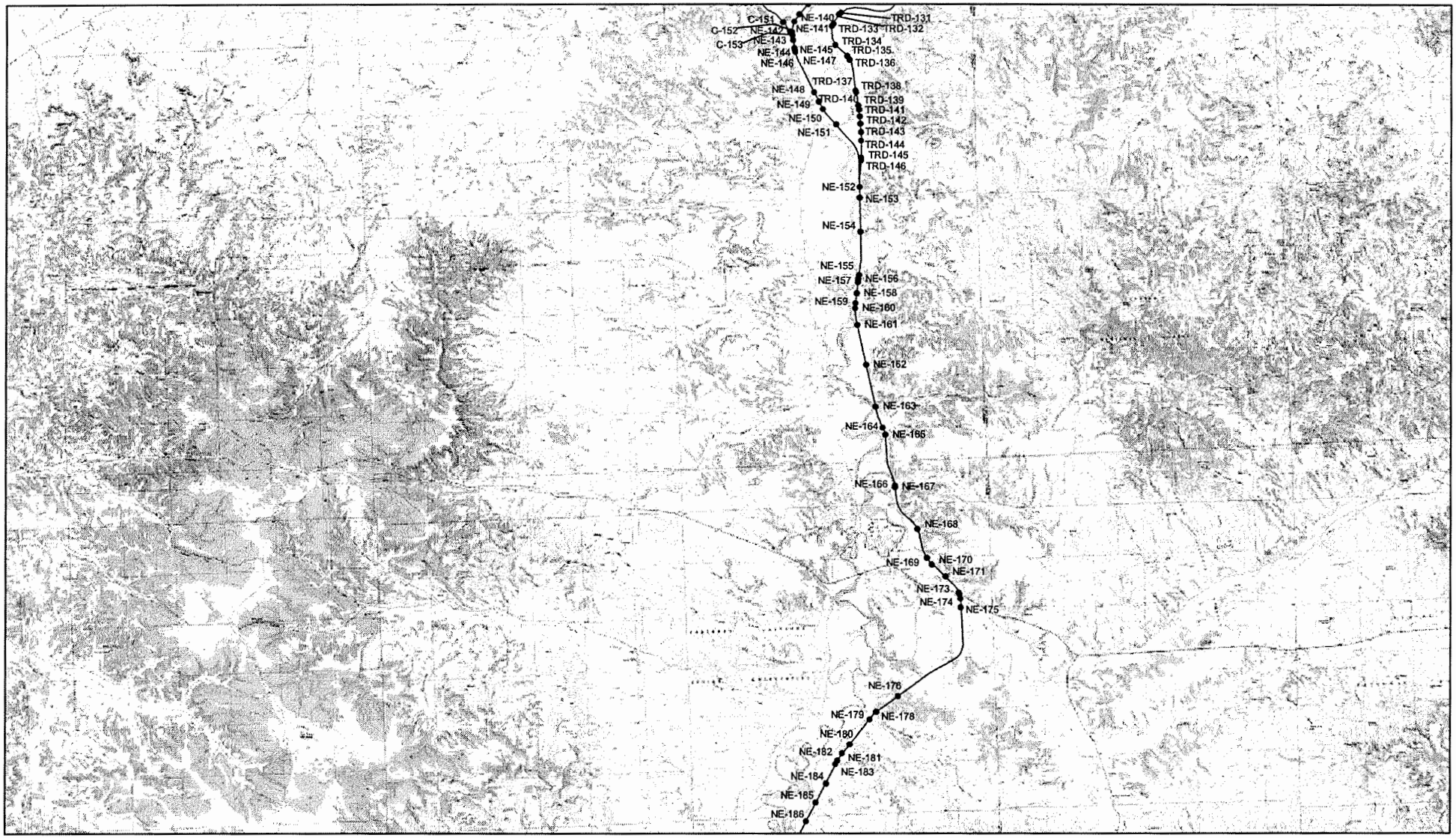

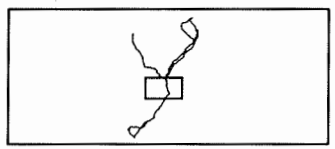

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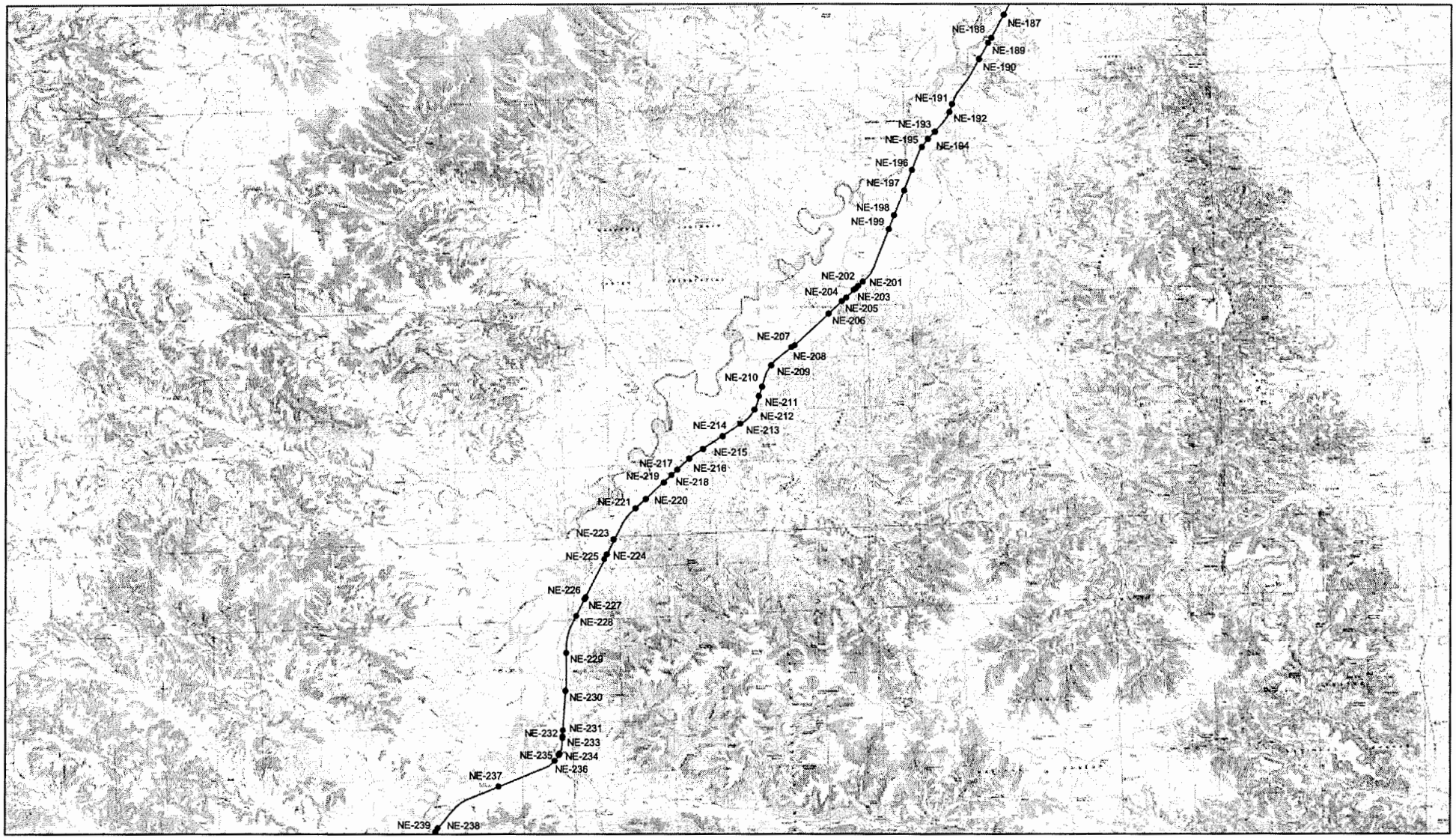

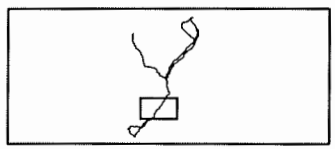

0 1.25 2.5 5 Miles

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Waters of The U.S.
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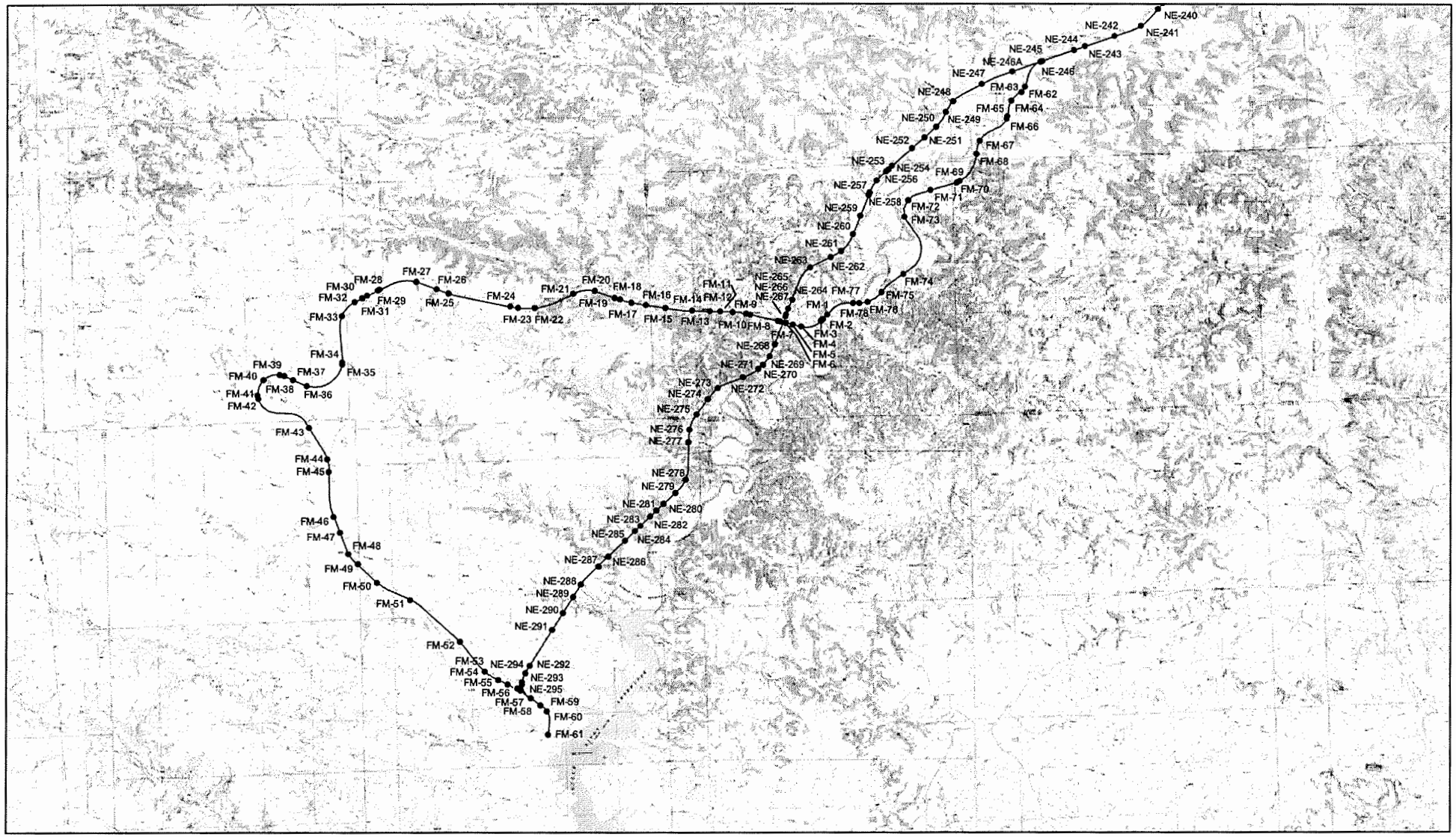

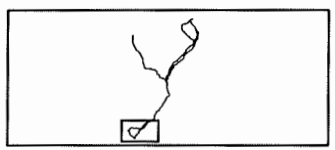

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Waters of The U.S.
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Tongue River Railroad

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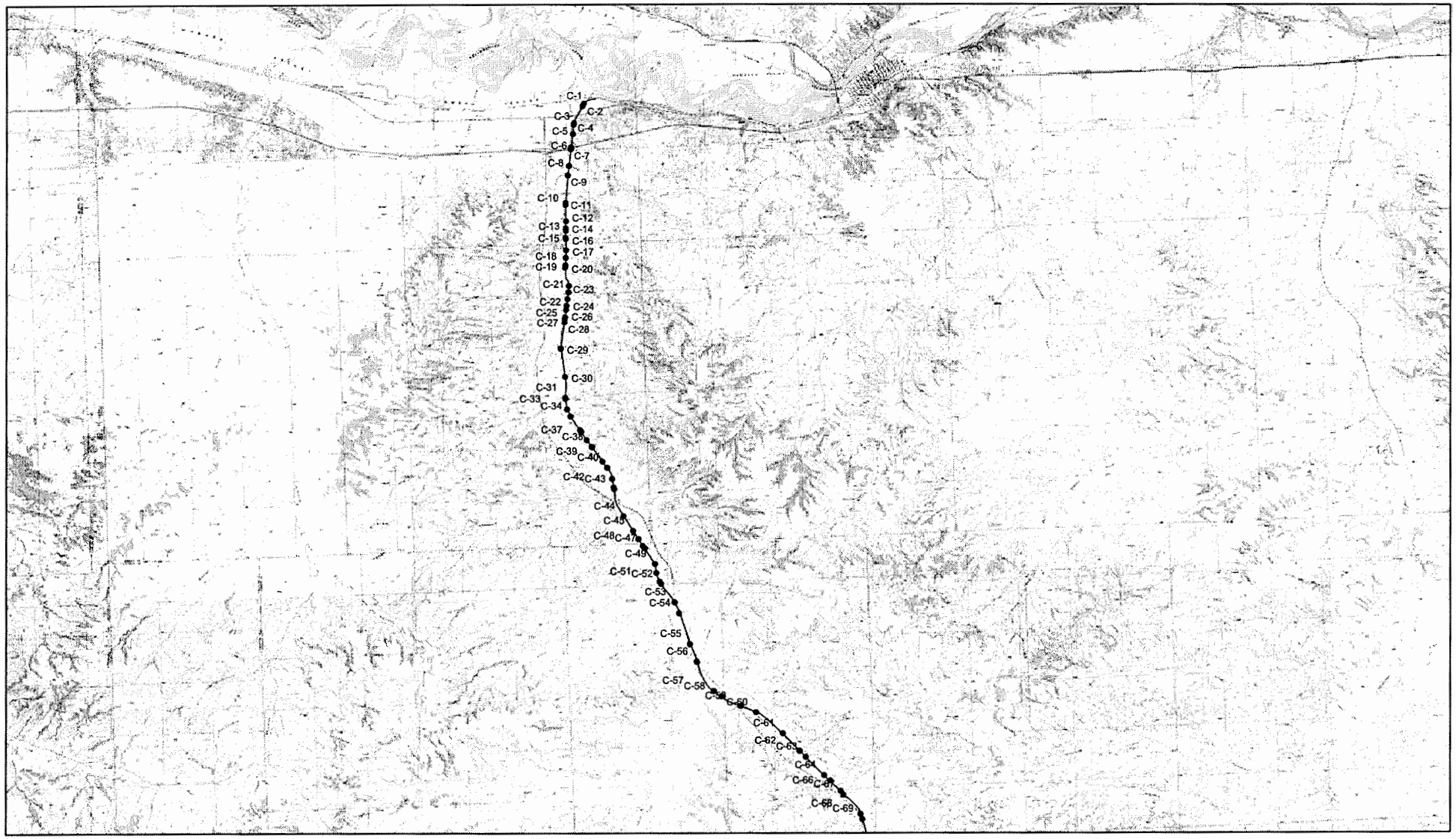

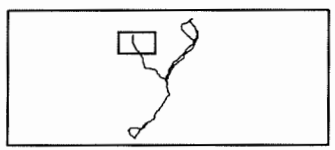

0 1.25 2.5 5 Miles

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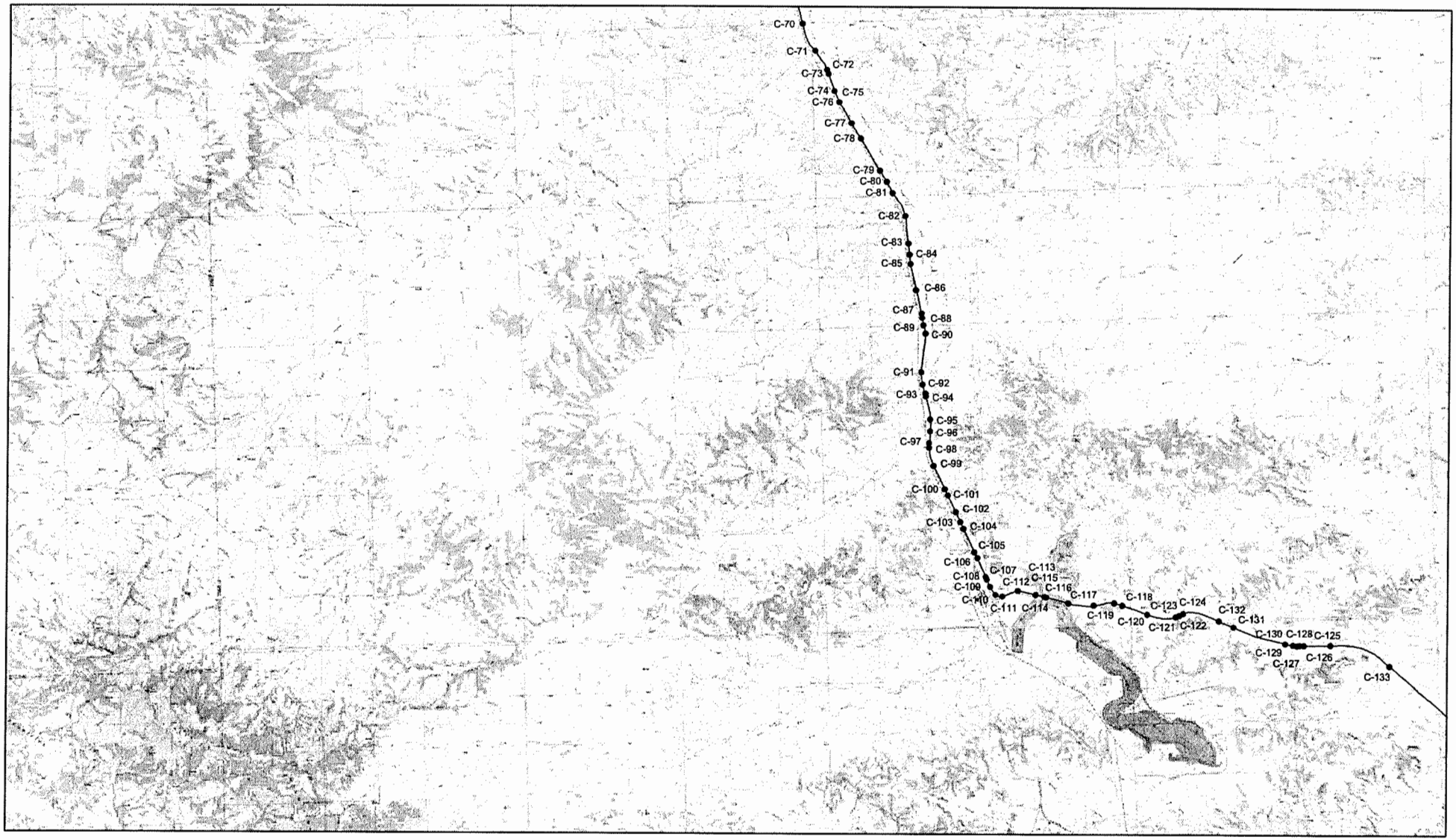

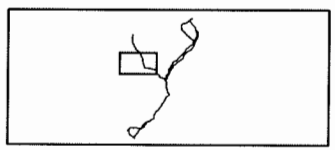

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Waters of The U.S.
Sheet 8 of 8
Tongue River Railroad

Proj. 3079712 Date: 10/2003

FISH AND WILDLIFE SPECIES OCCURRENCE BY HABITAT, TONGUE RIVER RAILROAD PROJECT AREA

For:

Tongue River Railroad Company
P.O. Box 1181
Billings, MT 59103

By:

ENTRIX, Inc
Walnut Creek, CA and Houston, TX

Revised

2004

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2. Habitat Map of Tongue River Railroad Project Area

INTRODUCTION

The attached fish and wildlife species/habitat matrix was prepared to document both the species that have been recorded or may potentially occur in the vicinity of the Tongue River Railroad project, and the habitats within which they have been recorded, or may potentially occur. Additionally, the matrix (and attached figures) provides information on the percentage of each habitat type along the Tongue River Railroad and 200-foot project area.

METHODS

The 10 habitats used to form this matrix were first identified in the 1983 Draft Environmental Impact Statement (hereafter 1983 DEIS) and 1985 Final Environmental Impact Statement (hereafter 1985 FEIS) for Finance Docket No. 30186, which encompassed the Tongue River Railroad from Miles City to Terminus Point No. 1 about nine miles south of Ashland, Montana. These habitats were retained for the analysis of an additional rail line from Terminus Point No. 1 to Decker, Montana in the 1992 Draft Environmental Impact Statement (hereafter 1992 DEIS) and 1996 Final Environmental Impact Statement (hereafter 1996 FEIS) for Finance Docket No. 30186 (Sub. No. 2). The 10 habitats were again considered in the Environmental Report for the Western Alignment (hereafter 1998 Environmental Report) for Finance Docket No. 30186 (Sub-No. 3).

These habitats are:

- Pine/juniper comprised of forested areas dominated by ponderosa pine (*Pinus ponderosa*) and/or Rocky Mountain juniper (*Juniperus scopulorum*). Stands may vary from open savannahs to dense thickets. Usually occurs on rolling hills or steep ridges, often on north or east-facing slopes, and generally increases to the south along the route of Tongue River Railroad.

- Prairie. Areas that are largely dominated by a mixture of native grasses, forbs and/or sub-shrubs. Shrubs or trees may be present but are generally a minor component. May occur in a variety of areas from rolling uplands to riverine terraces and drainages.

- Silver sagebrush/grassland, dominated by silver sagebrush (*Artemisia cana*). Usually occurs in drainages throughout the region or on river terraces in the Tongue River valley.

- Big sagebrush/grassland, dominated by big sagebrush (*Artemisia tridentata*). Usually found on rolling upland hills and benches.

- Skunkbush sumac/grassland, dominated by skunkbush sumac (*Rhus trilobata*). Generally occurs on south or west slopes of ridges but may also occur on upland benches.

- Greasewood/grassland. This habitat generally occurs over somewhat saline or sodic soils, usually in drainages or on terraces along the Tongue River, and is dominated by black greasewood (*Sarcobatus vermiculatus*).

- Breaks. This habitat is generally characterized by very steep, sometimes highly eroded slopes often intermixed with sandstone or scoria outcrops. The vegetation on these sites may be highly variable, from grassland to ponderosa pine and juniper to sparsely vegetated. Due to the topography of this habitat, the route of the Tongue River Railroad has been located to minimize, to the extent practicable, contact with this habitat type.

- Deciduous tree/shrub. Usually occurring in drainages or along the banks of rivers and streams, this habitat is dominated by trees such as cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*) and boxelder (*Acer negundo*). The mesic shrub component may be highly variable, but common shrubs in the area are serviceberry (*Amelanchier alnifolia*), black hawthorn (*Crataegus douglasii*), chokecherry (*Prunus virginiana*), currant (*Ribes* spp.), rose (*Rosa* spp.) and snowberry (*Symphoricarpos albus*).

- Agriculture/disturbed sites/pasture. For the purposes of this analysis, this habitat complex is comprised of sites where the natural vegetation component has been dramatically altered by human activity. Agricultural fields may be composed of dryland crops such as wheat or barley, or irrigated hay fields. Disturbed sites include building sites, gravel pits and roads. Pasture is defined as fields where native vegetation has been disturbed and largely replaced by non-native grass species, such as crested wheatgrass (*Agropyron cristata*).

- Aquatic. In the 1983 DEIS, 1985 FEIS, 1992 DEIS and 1996 FEIS, this habitat was generally defined as cattail (*Typha* spp.)/sedge (*Carex* spp.) stands bordering open water. For the purposes of this report, however, the definition of this habitat has been expanded to include the open water of the Tongue River and its perennial tributaries, which may support fish, as well as the open water of stock ponds or small reservoirs which may provide habitat for a variety of wildlife species.

The habitats were then preliminary mapped on aerial images. Of the ten types, however, only seven of the habitats were delineated. The Silver sagebrush/grassland, Big sagebrush/grassland, Greasewood/grassland and the Skunkbush sumac/grassland habitats are grouped together into a habitat named Prairie/Shrub. The habitat types were then ground-truthed in the spring of 2004 during an aerial and ground survey. During this survey, observations were made for

the specific Prairie/Shrub habitats and approximate percentages are calculated. Additionally, the habitat mapping was compared to other vegetation mapping done by Olson-Elliott and Associates (1980c) for environmental baseline study report for the proposed Montco mine project.

The potential occurrence of fish and wildlife species in the region encompassing the Tongue River Railroad was determined from several published sources, including Holton and Johnson (1996) for fish, Reichel and Flath (1995) for amphibians and reptiles, Thompson (1982) and Hart et al. (1998) for mammals, and the Montana Bird Distribution Committee (1996) for birds. Additionally, in 2003, Redmond et al (1988), MFISH (2002), and Montana Bird Distribution Online Database (2001) were used to update the species occurrences in the list of species. Habitat preference for each species was determined from a variety of sources, listed in the LITERATURE CITED below.

Actual occurrence of these species in the vicinity of the Tongue River Railroad project was determined from a review of published and unpublished reports from the area, which are listed in the LITERATURE CITED and in the footnotes to Table 1. In addition, the wildlife annual monitoring reports from the Montco Mine and from the Decker and Spring Creek Mines were reviewed in the offices of the Montana Department of Environmental Quality, Industrial and Energy Minerals Bureau in Helena, Montana. These reports provided the greatest amount of documentation of wildlife species in the region. The above listed references were then used to update the species in 2003.

It should be noted that the potential and documented occurrences of fish and wildlife species were determined from a large region surrounding the Tongue River Railroad project. For example, the potential occurrence of mammals and birds was determined from two geographic units called a latilongs that encompass the railroad route from Miles City to Decker. Each latilong is defined as the area delineated by one degree of latitude and one degree of longitude, and is about 3,000 square miles in size. Thus, the potential species lists in Table 1 were determined on the basis of a regional area of about 6,000 square miles. For the Montana Bird Distribution Online Database (2001), potential occurrences were also queried for the two latilongs and additional two other quarter latilongs (approximate total of 7,500 square miles) from 1996 to 2003 occurrences. Redmond et al. (1988) was queried for potential occurrence by examining the potential distribution maps from this reference and comparing it to the 116 miles of the entire proposed railroad. The MFISH (2002) potential occurrences were queried for fish species by waterbody. Montana Natural Heritage Program Database (2003) was queried to determine the occurrences of species of concern and threatened and endangered species of Montana. The occurrences noted for Rosebud, Bighorn, and Custer Counties were included. Montana Natural Heritage Program Spatial Distribution Maps (2003) were queried to determine which mammal species had been known to occur in the project area.

The railroad will disturb small acreages of any given habitat. The complete railroad will be about 116 miles long via the Western Alignment, and it was estimated that the entire railroad would require about 3,000 right-of-way acres.

RESULTS AND DISCUSSION

Table 1 presents the matrix of potential fish and wildlife species in the region encompassing the Tongue River Railroad in 10 major habitats potentially crossed by the railroad. Figure 1 shows the fisheries zones of the Tongue River referenced in Table 1. Figures 2 show the 7 habitat types used in Table 1.

Wildlife habitat use reported in Table 1 primarily represents breeding and foraging habitats commonly used by each species. Even though a given species may not be listed for a certain habitat type, it is possible that this species could be found in microsite conditions within that habitat type. In addition, many species may travel through or temporarily use many habitat types, even though these habitats are not commonly used for breeding or foraging.

A total of 49 fish, 7 amphibians, 14 reptiles, 64 mammals and 245 birds potentially occur in the two latilongs and the additional two quarter latilongs encompassing the Tongue River Railroad through 2003 (Table 1).

The U.S. Fish and Wildlife Service (USFWS) had determined (letter dated January 19, 1999 from Kemper M. McMaster, field supervisor of the Montana Field Office of the USFWS to Dana White, Section of Environmental Analysis of the Surface Transportation Board) that only six fish or wildlife species protected by the Endangered Species Act (ESA) of 1973, as amended, are of potential relevance to the Tongue River Railroad project: black-footed ferret (*Mustela nigripes*)), bald eagle *(Haliaeetus leucocephalus),* peregrine falcon (*Falco peregrinus*), mountain plover (*Charadrius montanus*), swift fox (*Vulpes velox*), and sturgeon chub (*Macrhybopsis gelida*). Using the June, 2003, USFWS endangered and threatened species list and Hanebury, personal comm. (2003), there are six threatened or endangered species and one species of federal conservation concern in the three counties that the Tongue River Railroad crosses. The black-footed ferret, pallid sturgeon (*Scaphirhynchus albus),* whooping crane (*Grus americana*) and interior least tern (*Sterna antillarum athalassos*) are listed as endangered, the bald eagle is listed as threatened, the black-tailed prairie dog (*Cynomys ludovicianus*) is a candidate species, and the mountain plover is species of conservation concern that could occur in the three counties in which the Tongue River Railroad crosses (USFWS 2003a, Nordstrom, personal comm, 2003; Hanebury, personal comm. 2003).

Fish and wildlife species diversity by habitat, in descending order, are deciduous tree/shrub (177 species), aquatic (164 species), pine/juniper (147 species), agriculture/disturbed sites/pasture (124 species), prairie (115 species), big

sagebrush/grassland (106 species), silver sagebrush/grassland (98 species), greasewood/grassland (90 species), breaks (79 species) and skunkbush sumac/grassland (76 species). As might be expected, riparian and forested habitats support the greatest diversity of wildlife, while non-forested upland habitats generally support fewer species.

The Tongue River Railroad primarily will affect non-forested upland habitats and will affect limited riparian (deciduous tree/shrub) and aquatic habitat (1983 DEIS, 1992 DEIS, 1998 Environmental Report). Relative percentages for habitat types were determined by delineating habitat polygons on aerial images and field-verifying these polygons. Within the the 200-ft ROW, **Aquatic** habitat consists of less than 1% of acreage affected; the **Breaks** habitat consists of approximately 16% of acreage affected; **Deciduous Tree/Shrub** habitat consists of approximately 1% of acreage affected; **Pine/ Juniper** habitat consists of approximately 6% of acreage; **Prairie / Shrub** habitat consists of approximately 47% of acreage affected; **Prairie** consists of approximately 25% of acreage affected; and **Agricultural/Disturbed Sites/Pasture** habitat consists of approximately 5% of acreage (urban / developed habitat is also less than 1% of acreage affected). Of the Prairie / Shrub habitat, Silver sagebrush/grassland comprised approximately 65% of the Prairie/Shrub habitat; Big sagebrush/grassland comprised approximately 7% of the Prairie/Shrub habitat; Greasewood/grassland comprised approximately 2% of the Prairie/Shrub habitat; and approximately 25% was undetermined.

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Table 1. Potential Fish and Wildlife Species Occurrence by Habitat, Tongue River Railroad Project Area.[a]

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
FISH										
ACIPENSERIDAE Shovelnose Sturgeon (*Scaphirhynchus platorynchus*)[f]										I
POLYODONTIDAE Paddlefish (*Polyodon spathula*)[f,l,i]										I
ESOCIDAE Northern Pike (*Esox lucius*)[f]										I-V
HIODONTIDAE Goldeye (*Hiodon alosoides*)[f]										I-V
CATOSTOMIDAE Shorthead Redhorse (*Moxostoma macrolepidotum*)[f]										I-V
White Sucker (*Catostomus commersoni*)[f]										I-V
Longnose Sucker (*Catostomus catostomus*)[f]										I-V
Mountain Sucker (*Catostomus playtrhynchus*)[f]										I-V
Blue Sucker (*Cycleptus elongatus*)[f,l,i]										I
Smallmouth Buffalo (*Ictiobus bubalus*)[f]										I
Bigmouth Buffalo (*Ictiobus cyprnellus*)[f (only)]										I
River Carpsucker (*Carpiodes carpio*)[f]										I-V
CYPRINIDAE Common Carp (*Cyprinus carpio*)[f]										I-V
Goldfish (*Carassius auratus*)[f]										I-V
Golden Shiner (*Notemigonus crysoleucas*)										V
Lake Chub (*Couesius plumbeus*)										I-V
Creek Chub (*Semotilus atromaculatus*)[f]										I-V
Flathead Chub (*Playgobio gracilis*)[f]										I-V
Sturgeon Chub (*Macrhybopsis gelida*)[f,l]										I
Longnose Dace (*Rhinichthys cataractae*)[f]										I-V

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Fathead Minnow (*Pimephales promelas*) [f]										I-V
Brassy Minnow (*Hybognathus hankinsoni*) [f]										I-V
Western Silvery Minnow (*Hybognathus argyritis*) [f]										I-V
Plains Minnow (*Hybognathus placitus*) [f]										I-V
Emerald Shiner (*Notropis atherinoides*) [f]										I-V
Sand Shiner (*Notropis stramineus*) [f]										I-V
Spottail Shiner (*Notropis hudsonius*) [f (only)]										V
SALMONIDAE Rainbow Trout (*Oncorhynchus mykiss*) [f]										I-V
Yellowstone Cutthroat Trout (*Oncorhynchus clarki bouvieri*) [(only)]										I-V
Brown Trout (*Salmo trutta*) [f]										I-V
Mountain Whitefish (*Prosopium williamsoni*) [f]										V
ICTALURIDAE Channel Catfish (*Ictalurus punctatus*) [f]										I-V
Black Bullhead (*Ameiurus melas*) [f]										I-V
Yellow Bullhead (*Ameiurus natalis*) [f]										I-V
Stonecat (*Noturus flavus*) [f]										I-V
GADIDAE Burbot (*Lota lota*) [f]										I-II
CENTRARCHIDAE Black Crappie (*Pomoxis nigromaculatus*) [f]										I-V
White Crappie (*Pomoxis annularis*) [f]										I-V
Pumpkinseed (*Lepomis gibbosus*) [f]										I-V
Bluegill (*Lepomis macrochirus*)										I-V
Green Sunfish (*Lepomis cyanellus*) [f]										I-V
Rock Bass (*Ambloplites rupestris*) [f]										I-V

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Smallmouth Bass (*Micropterus dolomieu*)[f]										I-V
Largemouth Bass (*Micropterus salmoides*)[f]										I-V
PERCIDAE Yellow Perch (*Perca flavescens*)[f]										I-V
Walleye (*Stizostedion vitreum*)[f]										I-V
Sauger (*Stizostedion canadense*)[f]										I-V
AMPHIBIANS										
CAUDATA Tiger Salamander (*Ambystoma tigrinum*)[d,e,g,k,j]		x	x					x	x	x
SALIENTIA Plains Spadefoot (*Spea bombifrons*)[g,k]		x	x	x		x				x
Woodhouses[illegible]s Toad (*Bufo woodhousii*)[d,e,g,k]	x	x	x	x	x	x		x	x	x
Great Plains Toad (*Bufo cognatus*)[e,g,k]		x		x						x
Western Chorus Frog (*Pseudacris maculata*)[d,e,g,k]	x	x	x			x		x	x	x
Northern Leopard Frog (*Rana pipiens*)[d,e, g,k]										x
REPTILES										
TESTUDINES Snapping Turtle (*Chelydra serpentina*)[d,e,g,k,l]										x
Painted Turtle (*Chrysemys picta*)[d,e,g,k]										x
Spiny Softshell (*Apalone spinifera*)[d,g,i,k]										x
SQUAMATA Sagebrush Lizard (*Sceloporus graciosus*)[d,e,g,k]	x	x	x	x	x	x	x			
Greater Short-horned Lizard (*Phrynosoma hernandesi*)[e,g,k]	x	x	x	x	x	x	x			
Western Hognose Snake(*Heterodon nasicus*)[e,g,k,l]		x	x	x	x	x			x	
Racer (*Coluber constrictor*)[d,e,g,k]	x	x	x	x	x	x			x	
Gopher Snake (*Pituophis catenifer*)[d,e,g,k]	x	x	x	x	x	x	x	x	x	
Common Garter Snake (*Thamnophis sirtalis*)[e,g,k]	x	x	x	x	x	x		x	x	x

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Western terrestrial garter snake (*Thamnophis elegans*)[e,g,k]	x	x	x	x	x	x		x	x	x
Plains Garter Snake (*Thamnophis radix*)[d,e,g,k]	x	x	x	x	x	x		x	x	x
Western Prairie Rattlesnake (*Crotalus viridis*)[d,e,g,k]	x	x	x	x	x	x	x	x	x	
Milk Snake (*Lampropeltis triangulum*)[e,g,i,k]							x			
MAMMALS										
INSECTIVORA Hayden Shrew (*Sorex haydeni*)[d,e,g,j]	x	x	x	x	x	x	x	x	x	
Masked Shrew (*Sorex cinereus*)[g,j(only)]		x						x		
Vagrant Shrew (*Sorex vagrans*)[g(only)]	x							x		
Dusky (Montane) Shrew (*Sorex monticolus*)[g(only)]								x		
Dwarf Shrew (*Sorex nanusij*)[j(only)]	x									
Preble's Shrew (*Sorex preblei*)[j(only)]		x	x	x						
Merriam's Shrew (*Sorex merriami*)[g,j,l(only)]		x	x	x				x		
CHIROPTERA Western Small-footed Myotis (*Myotis ciliolabrum*)[g,j]	x	x	x	x	x	x	x	x	x	x
Long-eared Myotis (*Myotis evotis*)[g,j]	x						x	x		x
Little Brown Myotis (*Myotis lucifugus*)[d,g,j]	x							x		x
Long-legged Myotis (*Myotis volans*)[g,j]	x									x
Silver-haired Bat (*Lasionyctaris noctivagans*)[g,j]	x	x	x	x		x		x	x	x
Spotted Bat (*Euderma maculatum*)[g,j,i]	x	x	x	x	x	x	x			x
Big Brown Bat (*Eptesicus fuscus*)[g,j]	x	x	x	x	x	x	x	x	x	x
Hoary Bat (*Lasiurus cinereus*)[g,j]	x							x		x
Townsend's Big-eared Bat (*Plecotus townsendii*)[g,j]	X	x	x	x	x	x	x	x	x	x
Pallid Bat (*Antrozous pallidus*)[g,j(only)]							x			
LAGOMORPHA Desert Cottontail (*Sylvilagus audubonii*)[d,e,g,j]	X		x	x	x	x	x	x		x

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Mountain Cottontail (*Sylvilagus nuttallii*)[g,j (only)]	x		x	x				x		
White-tailed Jackrabbit (*Lepus townsendii*)[d,e,g,j]		x	x	x	x	x			x	
RODENTIA Least Chipmunk (*Tamias minimus*)[d,e,g,j]	X				x		x	x		
Yellow-bellied Marmot (*Marmota flaviventris*)[e,g,j]	x	x	x	x	x	x	x	x		
Thirteen-lined Ground Squirrel (*Spermophilus tridecemlineatus*)[d,e,g,j]		x							x	
Black-tailed Prairie Dog (*Cynomys ludovicianus*)[d,e,g,i,j]		x								
Fox Squirrel (*Sciurus niger*)[d,j]								x		
Red Squirrel (*Tamiasciurus hudsonicus*)[d,e,g,j]	x							x		
Northern Pocket Gopher (*Thomomys talpoides*)[d,e,g,j]	x	x	x	x	x	x		x	x	
Olive-backed Pocket Mouse (*Perognathus fasciatus*)[d,e,g,j]		x	x	x	x				x	
Ord□s Kangaroo Rat (*Dipodomys ordii*)[d,e,g,j]	x	x	x	x	x	x	x		x	
Beaver (*Castor canadensis*)[d,e,g,j]								x		x
Western Harvest Mouse (*Reithrodontomys megalotis*)[d,e,g,j]		x	x	x	x	x	x	x	x	
Deer Mouse (*Peromyscus maniculatus*)[d,e,g,j]	x	x	x	x	x	x	x	x	x	
White-footed Mouse (*Peromyscus leucopus*)[d,g,j]								x		
Northern Grasshopper Mouse (*Onychomys leucogaster*)[e,g,j]		x	x	x					x	
Bushy-tailed woodrat (*Neotoma cinerea*)[d,g,j]	x				x		x	x	x	
Meadow Vole (*Microtus pennsylvanicus*)[d,e,g,j]		x						x	x	
Prairie Vole (*Microtus ochrogaster*)[d,e,g,j]		x	x	x	x	x		x	x	
Long-tailed Vole (*Microtus longicaudus*)[g,j(only)]		x	x	x						
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Southern Red-backed Vole (*Clethrionomys gapperi*)[g(only)]								x		
Muskrat (*Ondatra zibethicus*)[d,e,g,j]										x

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
House Mouse (*Mus musculus*)[d,j]									x	
Meadow Jumping Mouse (*Zapus princeps*)[d,g,l,j,i]		x							x	
Porcupine (*Erethizon dorsatum*)[g,j]	x	x	x	x	x	x	x	x	x	
CARNIVORA Coyote (*Canis latrans*)[d,e,g,j]	x	x	x	x	x	x	x	x	x	
Red Fox (*Vulpes vulpes*)[d,e,g,j]		x	x			x		x	x	
Swift Fox (*Vulpes velox*)[g]		x	x	x	x	x				
Black Bear (*Ursus americanus*)[d,e,g,j]	x						x			
Raccoon (*Procyon lotor*)[d,e,g,j]								x	x	x
Ermine (*Mustela erminea*)[g]	x	x	x	x	x	x	x	x	x	
Long-tailed Weasel (*Mustela frenata*)[d,e,g,j]	x	x	x	x	x	x	x	x	x	
Least Weasel (*Mustela nivalis*)[g,j(only)]		x	x	x						
Mink (*Mustela vison*)[d,e,g,j]								x		x
Badger (*Taxidea taxus*)[d,e,g,j]	x	x	x	x	x	x	x	x	x	
Striped Skunk (*Mephitis mephitis*)[d,e,g,j]	x	x	x	x	x	x	x	x	x	
River Otter (*Lutra canadensis*)[d,g,j]										x
Mountain Lion (*Felis concolor*)[d,g,j]	x	x	x	x	x	x	x	x	x	
Bobcat (*Felix rufus*)[d,e,g,j]	x	x	x	x	x	x	x	x	x	
ARTIODACTYLA Elk (*Cervus elaphus*)[e,g,l,j]	x	x	x	x	x	x	x	x	x	
Mule Deer (*Odocoileus hemionus*)[d,e,g,l,j]	x	x	x	x	x	x	x	x	x	
White-tailed Deer (*Odocoileus virginianus*)[d,e,g,l,j]	x	x	x	x	x	x	x	x	x	
Moose (*Alces alces*)								x		x
Pronghorn (*Antilocapra americana*)[d,e,g,l,j]	x	x	x	x	x	x			x	
BIRDS										

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
GAVIIFORMES Common Loon (*Gavia immer*)[e]										x
PODICIPEDIFORMES Pied-billed Grebe (*Podilymbus podiceps*)[e,g,h]										x
Horned Grebe (*Podiceps auritus*)[e,g]										x
Eared Grebe (*Podiceps nigricollis*)[d,e,g]										x
Western Grebe (*Aechmophorus occidentalis*)[e]										x
PELECANIFORMES American White Pelican (*Pelecanus erythrorhynchos*)[e,h]										x
Double-crested Cormorant (*Phalacrocorax auritus*)[d,e,g,h]								x		x
CICONIIFORMES Great Blue Heron (*Ardea herodias*)[d,e,g,h]								x		x
Snowy Egret (*Egretta thula*)[d]								x	x	x
Cattle Egret (*Bubulcus ibis*)								x	x	x
Black-crowned Night-Heron (*Nycticorax nycticorax*)[d,e,g]								x		x
ANSERIFORMES Tundra Swan (*Cygnus columbianus*)[g]										x
Trumpeter Swan (*Cygnus buccinator*)[e]										x
Greater White-fronted Goose (*Anser albifrons*)[e,g]									x	x
Snow Goose (*Chen caerulescens*)[e,g]									x	x
Ross's Goose (*Chen rossii*)[g (only)]										x
Canada Goose (*Branta canadensis*)[d,e,g,h]								x	x	x
Wood Duck (*Aix sponsa*)[d,e,g,h]								x		x
Green-winged Teal (*Anas crecca*)[d,e,g]										x
American Black Duck (*Anas rubripes*)									x	x
Mallard (*Anas platyrhynchos*)[d,e,g,h]									x	x
Northern Pintail (*Anas acuta*)[d,e,g,h]									x	x

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Blue-winged Teal (*Anas discors*)[d,e,g,h]										x
Cinnamon Teal (*Anas cyanoptera*)[e,g]										x
Northern Shoveler (*Anas clypeata*)[d,e,g,h]										x
Gadwall (*Anas strepera*)[d,e,g,h]										x
American Wigeon (*Anas americana*)[d,e,g]										x
Canvasback (*Aythya valisineria*)[e]										x
Redhead (*Aythya americana*)[d,e,g]										x
Ring-necked Duck (*Aythya collaris*)[d,e]										x
Lesser Scaup (*Aythya affinis*)[d,e]										x
Surf Scoter (*Melanitta perspicillata*)[e]										x
Common Goldeneye (*Bucephala clangula*)[d,e]										x
Barrow's Goldeneye (*Bucephala islandica*)										x
Bufflehead (*Bucephala albeola*)[d,e,g]										x
Hooded Merganser (*Lophodytes cucullatus*)[d,e,g]								x		x
Common Merganser (*Mergus merganser*)[d,e,g]										x
Red-breasted Merganser (*Mergus serrator*)[g]										x
Ruddy Duck (*Oxyura jamaicensis*)[d,e,g]										x
FALCONIFORMES Turkey Vulture (*Cathartes aura*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Osprey (*Pandion haliaetus*)[d,e,g,h]										x
Bald Eagle (*Haliaeetus leucocephalus*)[d,e,g,l]	x		x			x	x	x	x	x
Northern Harrier (*Circus cyaneus*)[d,e,g,h]		x	x	x		x			x	
Broad-winged Hawk (*Buteo platypteus*)[e,g]								x		
Swainson's Hawk (*Buteo swainsoni*)[d,e,g]	x	x	x	x	x	x	x	x	x	

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Red-tailed Hawk (*Buteo jamaicensis*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Sharp-shinned Hawk (*Accipiter striatus*)[d,e,g]	x							x		
Ferruginous Hawk (*Buteo regalis*)[d,e,g,h,i]	x	x	x	x	x	x	x	x	x	
Rough-legged Hawk (*Buteo lagopus*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Northern Goshawk (*Accipiter gentilis*)[d,e,g,i]	x							x		
Cooper■s Hawk (*Accipiter cooperii*)[d,e,g]	x							x		
Golden Eagle (*Aquila chrysaetos*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
American Kestrel (*Falco sparverius*)[d,e,g,h]	x							x		
Merlin (*Falco columbarius*)[d,e,g]	x							x		
Peregrine Falcon (*Falco peregrinus*)[d,e,i]	x	x	x	x	x	x	x	x	x	x
Gyrfalcon (*Falco rusticolus*)[d,e,g]	x	x	x	x	x	x	x	x	x	x
Prairie Falcon (*Falco mexicanus*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
GALLIFORMES Gray Partridge (*Perdix perdix*)[d,e,g,h]		x	x			x			x	
Ring-necked Pheasant (*Phasianus colchicus*)[d,e,g,h]			x			x		x	x	
Ruffed Grouse (*Bonasa umbellus*)[d,e,g]	x							x		
Sage Grouse (*Centrocercus urophasianus*)[d,e,g]		x	x	x		x			x	
Sharp-tailed Grouse (*Tympanuchus phasianellus*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Wild Turkey (*Meleagris gallopavo*)[d,e,g,h]	x						x	x	x	
Chukar (*Alectoris chukar*)[g(only)]	x							x		
GRUIFORMES Virginia Rail (*Rallus limicola*)[g]										x
Sora (*Porzana carolina*)[d,g,h]										x
American Coot (*Fulica americana*)[d,e,g,h]										x
Sandhill Crane (*Grus canadensis*)[d,e,g,h]									x	x

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Whooping Crane (*Grus americana*)[g]									x	x
CHARADRIIFORMES Black-bellied Plover (*Pluvialis squatarola*)[g]										x
Semipalmated Plover (*Charadrius semipalmatus*)[e,g]										x
Mountain Plover (*Charadrius montanus*)[i(only)]		x							x	
Killdeer (*Charadrius vociferus*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	x
American Avocet (*Recurvirostra americana*)[d,e,g]										x
Greater Yellowlegs (*Tringa melanoleuca*)[d,e,g]										x
Lesser Yellowlegs (*Tringa flavipes*)[e,g]										x
Solitary Sandpiper (*Tringa solitaria*)[d,e,g,h]										x
Willet (*Catoptrophorus semipalmatus*)[d,e,g]		x								x
Spotted Sandpiper (*Actitis macularia*)[d,e,g,h]										x
Upland Sandpiper (*Bartramia longicauda*)[d,e,g,h]		x	x	x					x	
Long-billed Curlew (*Numenius americanus*)[d,e,g,h]		x	x	x					x	x
Marbled Godwit (*Limosa fedoa*)[e,g]										x
Western Sandpiper (*Caldris mausi*)[e,g]										x
Semipalmated Sandpiper (*Calidris pusilla*)[g]										x
Least Sandpiper (*Calidris minutilla*)[d,g]										x
Stilt Sandpiper (*Calidris himantopus*)[g]										x
White-rumped Sandpiper (*Calidris fuscicollis*)[g (only)]		x								
Pectoral Sandpiper (*Calidris melanotos*)[g (only)]		x								
Baird's Sandpiper (*Calidris bairdii*)[g (only)]		x								
Long-billed Dowitcher (*Limnodromus scolopaceus*)[d,e,g]										x
Common Snipe (*Gallinago gallinago*)[d,e,g]										x

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Wilson's Phalarope (*Phalaropus tricolor*)[d,e,g,h]										x
Red-necked Phalarope (*Phalaropus lobatus*)[g]										x
Franklin's Gull (*Larus pipixcan*)[d,e]									x	x
Bonaparte's Gull (*Larus philadelphia*)[g]									x	x
Ring-billed Gull (*Larus delawarensis*)[d,e]									x	x
California Gull (*Larus californicus*)[e]									x	x
Herring Gull (*Larus argentatus*)									x	x
Caspian Tern (*Sterna caspia*)[e]										x
Common Tern (*Sterna hirundo*)										x
Forster's Tern (*Sterna forsteri*)										x
Least Tern (*Sterna antillarum*)[g,h,i]										x
Black Tern (*Chlidonias niger*)[e,g,h]										x
COLUMBIFORMES Rock Dove (*Columba livia*)[d,e,g,h]	x						x	x	x	
Mourning Dove (*Zenaida macroura*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Black-billed Cuckoo (*Coccyzus erythropthalmus*)[d,e,g]		x						x	x	
Yellow-billed Cuckoo (*Coccyzus americanus*)[g]		x						x	x	
STRIGIFORMES Barn Owl (*Tyto alba*)[g]								x	x	
Eastern Screech-Owl (*Otus asio*)[d,e,g]	x							x		
Great Horned Owl (*Bubo virginianus*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Burrowing Owl (*Speotyto cunicularia*)[d,e,g,h,i]		x	x	x		x	x		x	
Long-eared Owl (*Asio otus*)[d,g]	x						x	x		
Short-eared Owl (*Asio flammeus*)[d,e,g,h]		x	x	x	x	x			x	
Northern Saw-whet Owl (*Aegolius acadicus*)[d,e,g]	x								x	

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Snowy Owl (*Nyctea scandiaca*)[g(only)]		x								
CAPRIMULGIFORMES Common Nighthawk (*Chordeiles minor*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Common Poorwill (*Phalaenoptilus nuttallii*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
APODIFORMES Chimney Swift (*Chaetura pelagica*)[d,g,h]							x			x
White-throated Swift (*Aeronautes saxatalis*)[d,e]							x			x
CORACIIFORMES Belted Kingfisher (*Ceryle alcyon*)[d,e,g]										x
PICIFORMES Lewis' Woodpecker (*Melanerpes lewis*)[e,g]	x							x		
Red-headed Woodpecker (*Melanerpes erythrocephalus*)[d,e,g,h]	x							x		
Red-naped Sapsucker (*Sphyrapicus nuchalis*)[d,g]	x							x		
Downy Woodpecker (*Picoides pubescens*)[d,e,g,h]	x							x		
Hairy Woodpecker (*Picoides villosus*)[d,e,g]	x							x		
Black-backed Woodpecker (*Picoides arcticus*)[g,h]	x							x		
Northern Flicker (*Colaptes auratus*)[d,e,g,h]	x							x		
PASSERIFORMES Western Wood-Pewee (*Contopus sordidulus*)[d,e,g,h]	x							x		
Olive-sided Flycatcher (*Contopus coopeni*)[h(only)]								x		
Willow Flycatcher (*Empidonax traillii*)[g]	x							x		
Least Flycatcher (*Empidonax minimus*)[d,e,g,h]	x							x		
Dusky Flycatcher (*Empidonax oberholseri*)[g,h]	x							x		
Say's Phoebe (*Sayornis saya*)[d,e,g,h]	x		x	x	x	x	x	x	x	
Cassin's Kingbird (*Tyrannus vociferans*)[e,g,h]		x	x	x	x	x	x	x	x	
Western Kingbird (*Tyrannus verticalis*)[d,e,g,h]		x	x	x	x	x	x	x	x	
Eastern Kingbird (*Tyrannus tyrannus*)[d,e,g,h]		x	x	x	x	x	x	x	x	

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Horned Lark (*Eremophila alpestris*)[d,e,g,h]		x							x	
Tree Swallow (*Tachycineta bicolor*)[d,e,g,h]	x							x	x	x
Violet-green Swallow (*Tachycineta thalassina*)[d,e,g,h]	x						x	x	x	x
Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)[d,g,h]	x						x	x	x	x
Bank Swallow (*Riparia riparia*)[d,e,g,h]									x	x
Cliff Swallow (*Hirundo pyrrhonota*)[d,e,g,h]							x		x	x
Barn Swallow (*Hirundo rustica*)[d,e,g,h]								x	x	x
Gray Jay (*Perisoreus canadensis*)[g]	x							x		
Blue Jay (*Cyanocitta cristata*)[g(only)]	x							x		
Pinyon Jay (*Gymnorhinus cyanocephalus*)[d,e,g,h]	x						x	x		
Clark's Nutcracker (*Nucifraga columbiana*)[d,e,g,h]	x						x	x		
Black-billed Magpie (*Pica pica*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
American Crow (*Corvus brachyrhynchos*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Common Raven (*Corvus corax*)[e,g]	x							x		
Black-capped Chickadee (*Parus atricapillus*)[d,e,g,h]	x							x		
Mountain Chickadee (*Poecile gambeli*)[g(only)]	x									
Red-breasted Nuthatch (*Sitta canadensis*)[d,e,g,h]	x							x		
White-breasted Nuthatch (*Sitta carolinensis*)[d,e,g,h]	x							x		
Pygmy Nuthatch (*Sitta pygmaea*)[g(only)]	x									
Brown Creeper (*Certhia americana*)[d,g]	x							x		
Rock Wren (*Salpinctes obsoletus*)[d,e,g,h]							x			
Canyon Wren (*Catherpes mexicanus*)[d,g]							x			
House Wren (*Troglodytes aedon*)[d,e,g,h]								x	x	
Winter Wren (*Troglodytes troglodytes*)								x		

Table 1. (Continued)

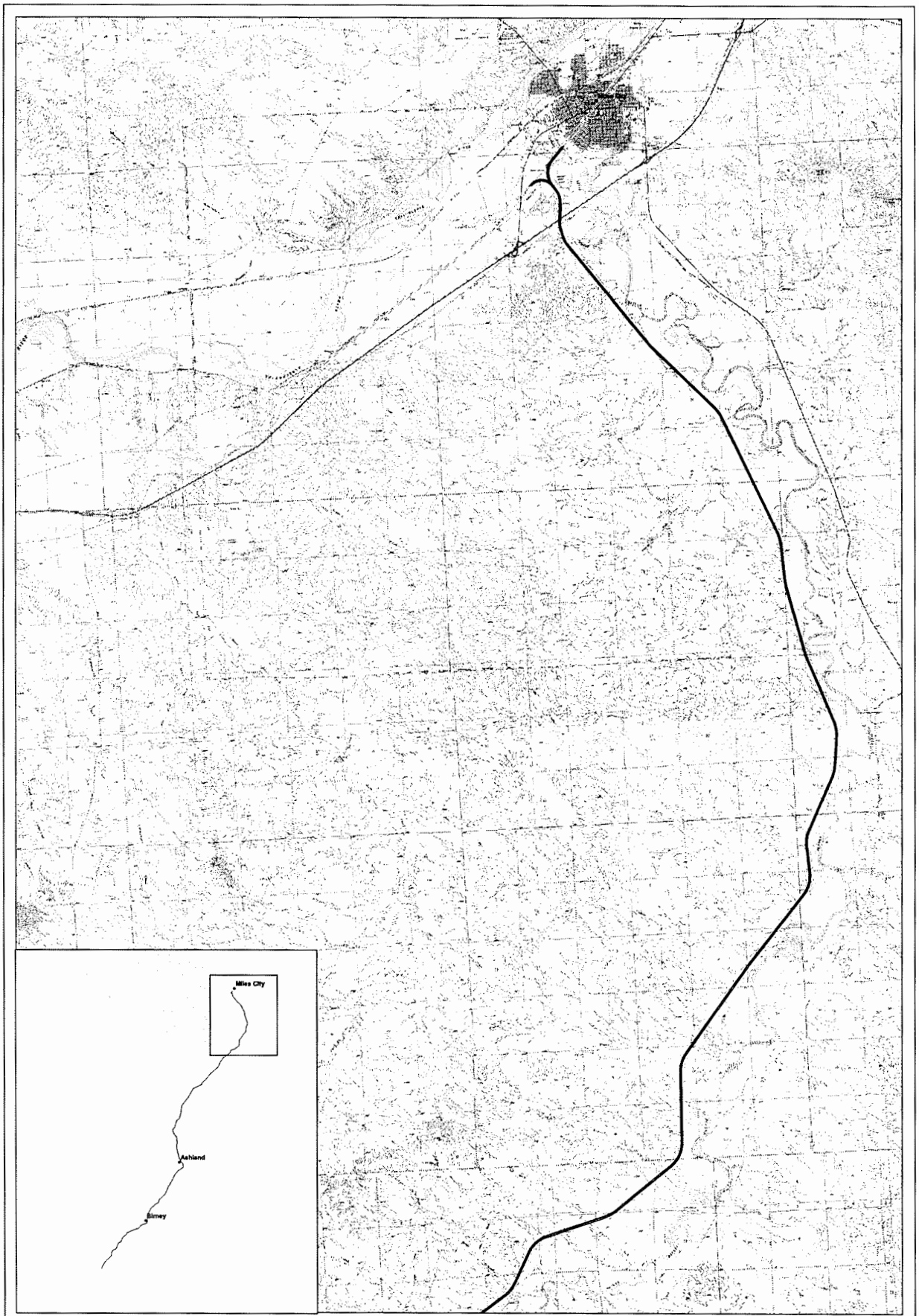
SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Marsh Wren (*Cistothorus palustris*)[d,g]										x
Golden-crowned Kinglet (*Regulus satrapa*)[d,g]	x							x		
Eastern Bluebird (*Sialia sialis*)[d,g]								x		
Mountain Bluebird (*Sialia currucoides*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Townsend's Solitaire (*Myadestes townsendi*)[d,e,g]	x							x		
Veery (*Catharus fuscescens*)[d,g,h]	x							x		
Swainson's Thrush (*Catharus ustulatus*)[d,g]	x							x		
Wood Thrush (*Hylocichla mustelina*)	x							x		
Gray-cheeked Thrush (*Catharus minimus*)[g(only)]	x							x		
American Robin (*Turdus migratorius*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Gray Catbird (*Dumetella carolinensis*)[d,e,g,h]	x							x		
Sage Thrasher (*Oreoscoptes montanus*)[d,e,g,h]			x	x	x	x	x			
Brown Thrasher (*Toxostoma rufum*)[d,e,g,h]								x		
American Pipit (*Anthus rubescens*)[d]		x							x	
Sprague's Pipit (*Anthus spragueii*)[g,h]		x							x	
Bohemian Waxwing (*Bombycilla garrulus*)[d,e,g,h]	x							x		
Cedar Waxwing (*Bombycilla cedrorum*)[d,e,g,h]	x							x		
Northern Shrike (*Lanius excubitor*)[d,e,g]	x	x	x	x	x	x	x	x	x	
Loggerhead Shrike (*Lanius ludovicianus*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
European Starling (*Sturnus vulgaris*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Solitary Vireo (*Vireo solitarius*)[d,e,g]								x		
Warbling Vireo (*Vireo gilvus*)[d,e,g,h]	x							x		
Plumbeous Vireo (*Vireo plumbeus*)[h(only)]								x		
Red-eyed Vireo (*Vireo olivaceus*)[d,e,g]								x		

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Tennessee Warbler (*Vermivora peregrina*)								x		
Orange-crowned Warbler (*Vermivora celata*)[e,g]	x									
Yellow Warbler (*Dendroica petechia*)[d,e,g,h]								x		
Magnolia Warbler (*Dendroica magnolia*)[e]								x		
Yellow-rumped Warbler (*Dendroica coronata*)[d,e,g,h]	x							x		
Blackpoll Warbler (*Dendroica striata*)[g(only)]	x									
Black-and-White Warbler (*Mniotilta varia*)[g]								x		
American Redstart (*Setophaga ruticilla*)[d,g,h]	x							x		
Ovenbird (*Seiurus aurocapillus*)[d,g,h]	x							x		
Common Yellowthroat (*Geothlypis trichas*)[d,e,g,h]								x		
Yellow-breasted Chat (*Icteria virens*)[d,e,g,h]								x		
Western Tanager (*Piranga ludoviciana*)[d,e,g,h]	x							x		
Black-headed Grosbeak (*Pheucticus melanocephalus*)[d,e,g,h]	x							x		
Lazuli Bunting (*Passerina amoena*)[d,e,g,h]								x		
Indigo Bunting (*Passerina cyanea*)[g,h]								x		
Green-tailed Towhee (*Pipilo chlorurus*)[e,g]					x		x			
Spotted Towhee (*Pipilo maculatus*)[d,e,g,h]	x				x		x	x		
American Tree Sparrow (*Spizella arborea*)[d,g,h]	x							x		
Chipping Sparrow (*Spizella passerina*)[d,e,g,h]	x							x		
Clay-colored Sparrow (*Spizella pallida*)[d,g,h]		x	x	x						
Brewer's Sparrow (*Spizella breweri*)[d,e,g,h]		x	x	x						
Field Sparrow (*Spizella pusilla*)[d,g,h]									x	
Vesper Sparrow (*Pooecetes gramineus*)[d,e,g,h]		x	x	x	x	x	x		x	
Lark Sparrow (*Chondestes grammacus*)[d,e,g,h]	x	x	x	x	x	x	x		x	

Table 1. (Continued)

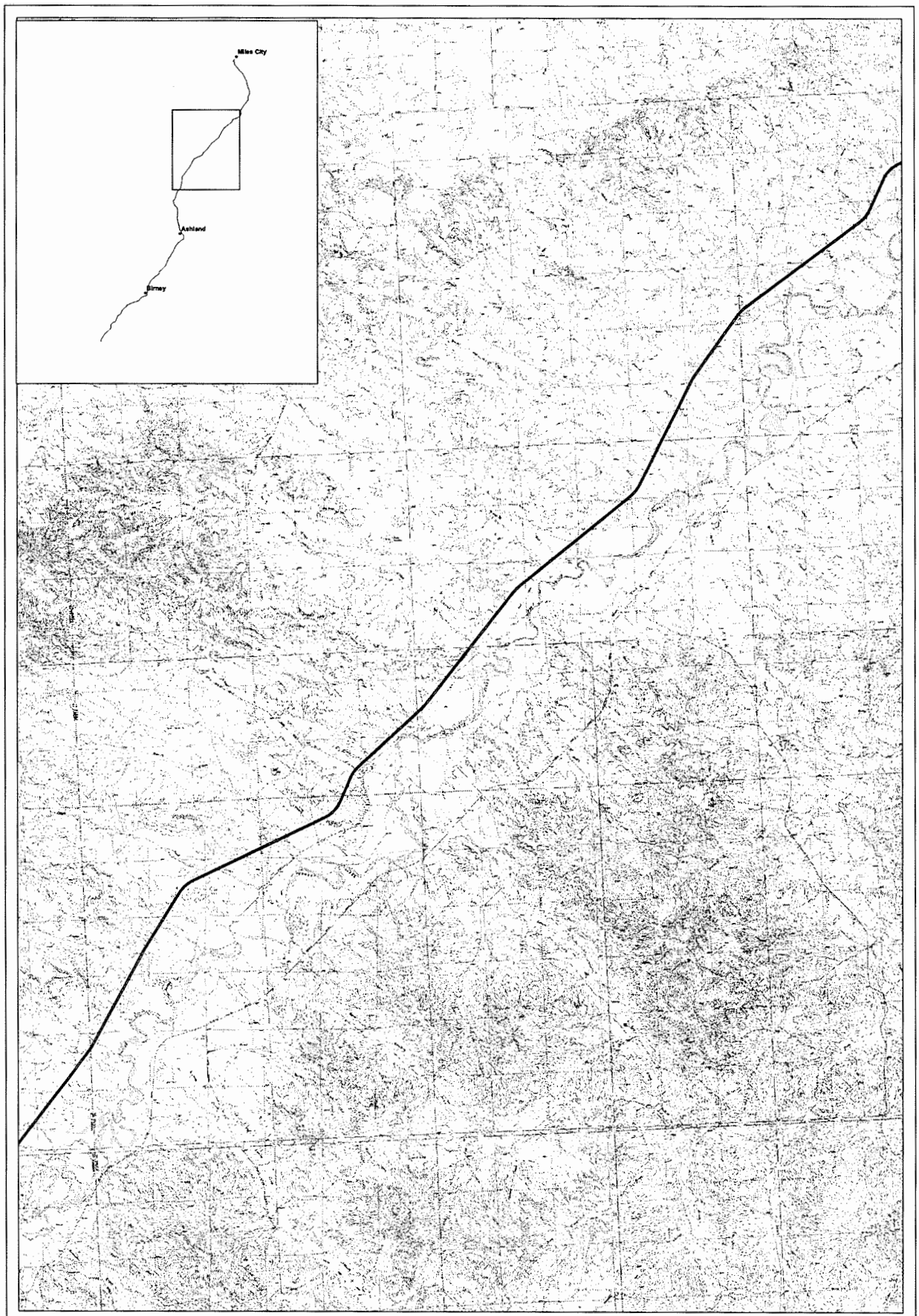
SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Lark Bunting (*Calamospiza melanocorys*)[d,e,g,h]		x	x	x						
Savannah Sparrow (*Passerculus sandwichensis*)[d,e,g,h]		x	x	x						
Baird's Sparrow (*Ammodramus bairdii*)[g]		x							x	
Grasshopper Sparrow (*Ammodramus savannarum*)[d,e,g,h]		x	x	x					x	
Fox Sparrow (*Passerella iliaca*)[d]								x		
Song Sparrow (*Melospiza melodia*)[d,e,g,h]	x	x	x	x				x	x	
White-crowned Sparrow (*Zonotrichia leucophrys*)[d,e]	x							x		
Harris's Sparrow (*Zonotrichia querula*)[g(only)]	x							x		
White-throated Sparrow (*Zonotrichia albicollis*)[g(only)]	X							x		
Dark-eyed Junco (*Junco hyemalis*)[d,e,g,h]	x							x		
McCown's Longspur (*Calcarius mccownii*)[g]		x								
Lapland Longspur(*Calcarius lapponicus*)[g]		x								
Chestnut-collared Longspur (*Calcarius ornatus*)[g,h]		x								
Snow Bunting (*Plectrophenax nivalis*)[d,g]		x	x	x	x	x			x	
Bobolink (*Dolichonyx oryzivorus*)[g]		x	x	x						
Red-winged Blackbird (*Agelaius phoeniceus*)[d,e,g,h]								x		x
Western Meadowlark (*Sturnella neglecta*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*)[d,e,g,h]										x
Brewer's Blackbird (*Euphagus cyanocephalus*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Common Grackle (*Quiscalus quiscula*)[d,e,g,h]	x							x		
Brown-headed Cowbird (*Molothrus ater*)[d,e,g,h]	x	x	x	x	x	x	x	x	x	
Bullock's Oriole (*Icterus bullockii*)[d,e,g,h]	x							x		
Orchard Oriole (*Icterus spurius*)[g,h(only)]			x	x						
Black Rosy-Finch (*Leucosticte atrata*)	x									



ENTRIX

Figure 2
Habitat Map
Tongue River Railroad

Proj 3079712 Date: 9/2003



Legend

Proposed Rail

Habitat Type:

- Deciduous Tree / Shrub
- Agric./Grass/Pasture
- Barren
- Pine/Juniper
- Prairie
- Prairie / Shrub
- Aquatic
- Urban / Developed

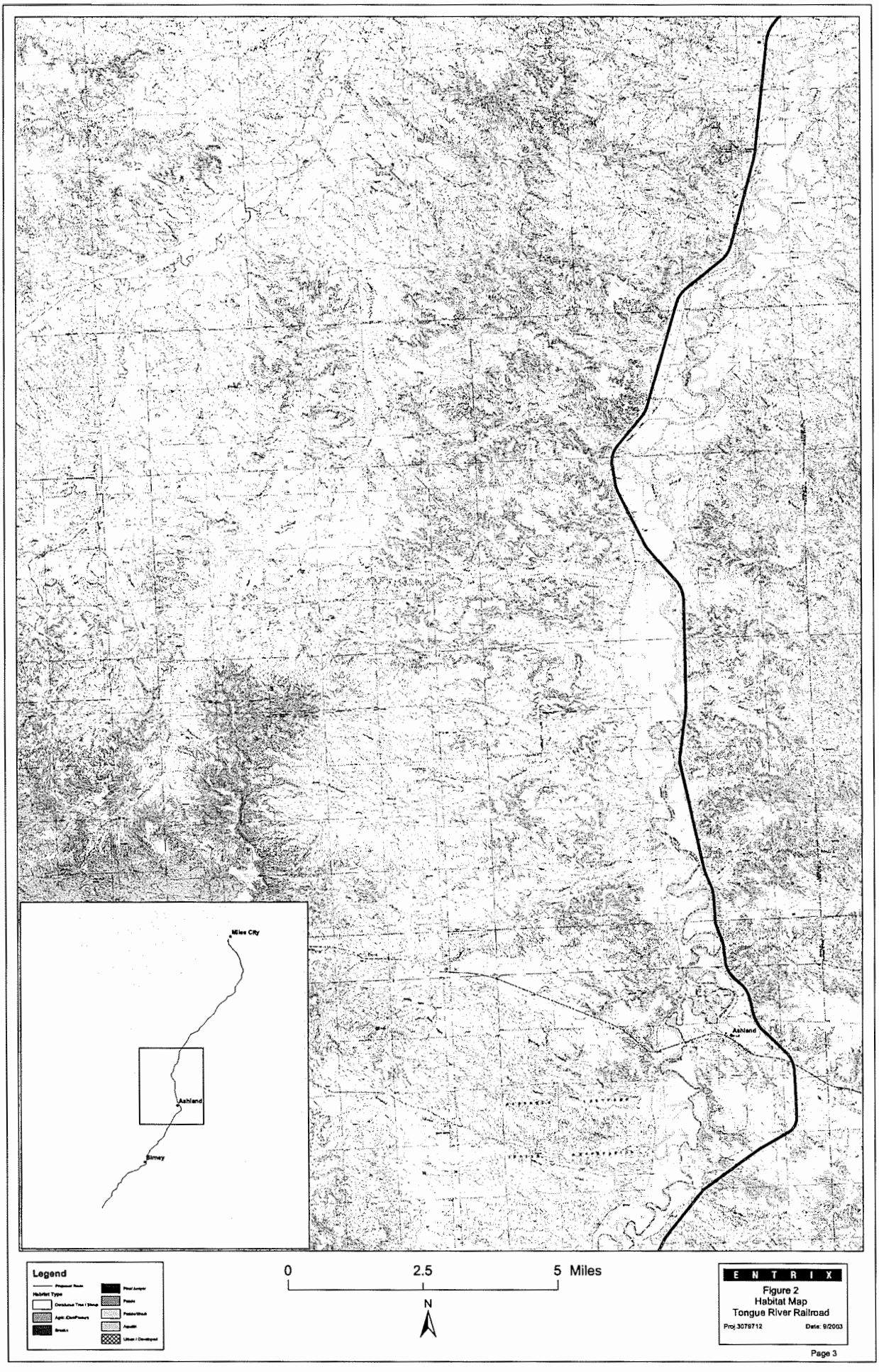
0 2.5 5 Miles

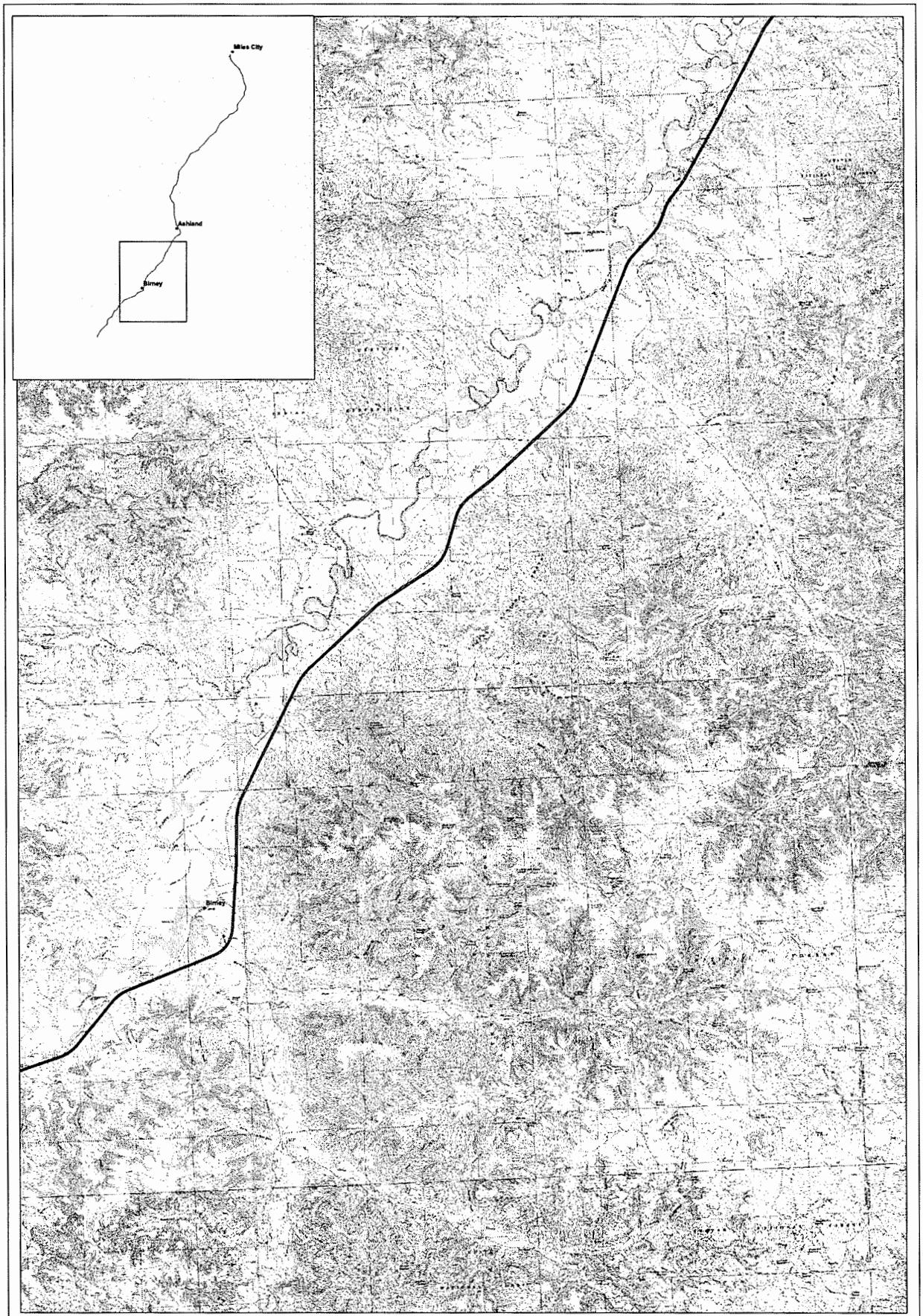
N

E N T R I X

Figure 2
Habitat Map
Tongue River Railroad

Proj.3079712 Date: 9/2003


Miles City
Ashland
Birney
Ashland
Legend
Habitat Type
0
2.5
5 Miles
N
ENTRIX
Figure 2
Habitat Map
Tongue River Railroad
Proj:3079712
Date: 9/2003



Legend

Habitat Type

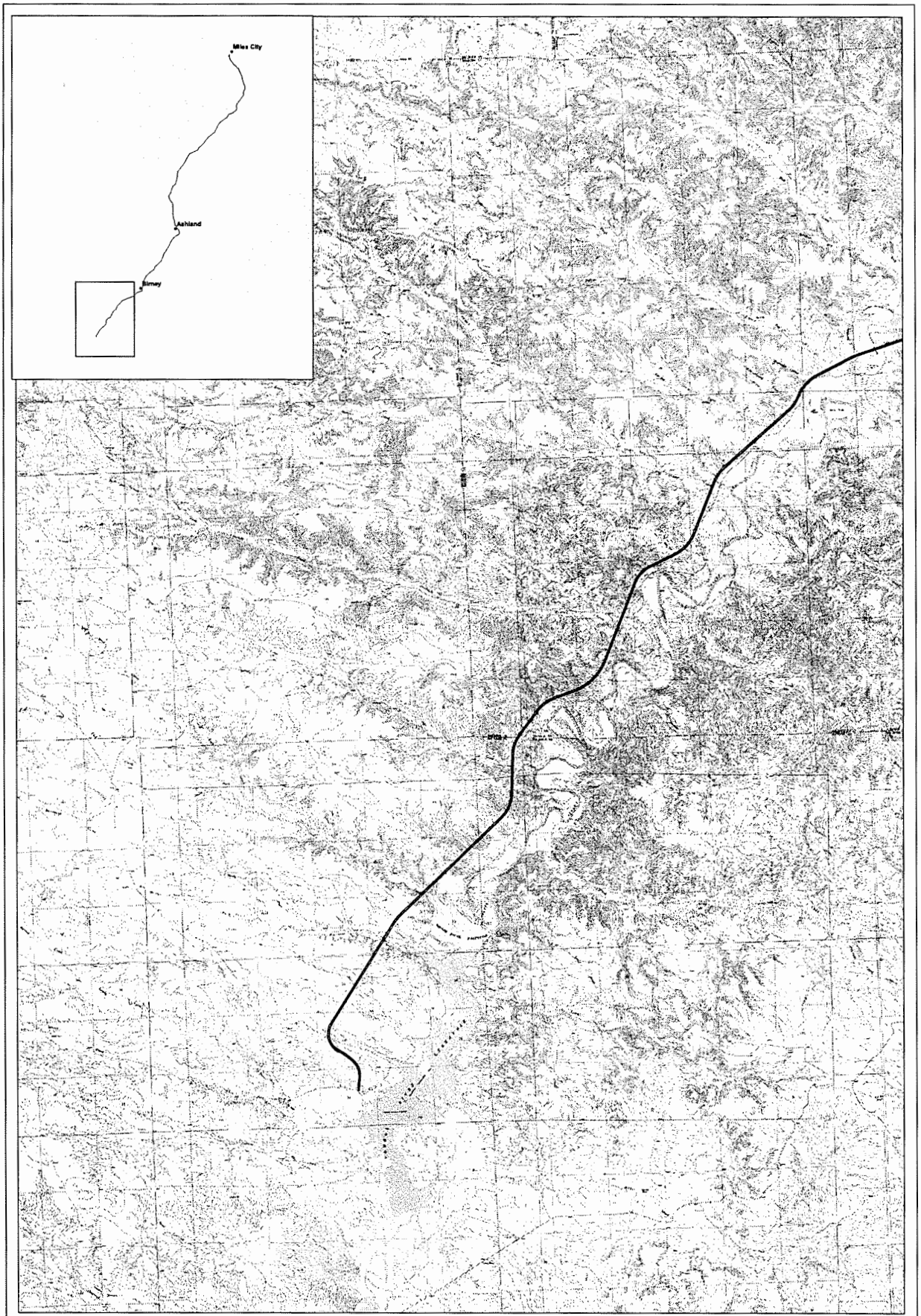
0 2.5 5 Miles

N

E N T R I X

Figure 2
Habitat Map
Tongue River Railroad

Proj.3079712 Date: 9/2003



ENTRIX

Figure 2
Habitat Map
Tongue River Railroad

Proj.3079712 Date: 9/2003

Table 1. (Continued)

SPECIES[b]	PINE/JUNIPER	PRAIRIE	SILVER SAGE	BIG SAGE	SUMAC	GREASE-WOOD	BREAKS	DECIDUOUS, TREE/SHRUB	AGRICULTURAL/ DISTURBED PASTURE	AQUATIC[c]
Grey-crowned Rosy Finch (*Leucosticte tephrocotis*)[d]	x									
Cassin's Finch (*Carpodacus cassinii*)[g]	x							x		
House Finch (*Carpodacus mexicanus*)[g,h]	x							x	x	
Purple Finch (*Carpodacus purpureus*)[g(only)]	x							x		
Pine Grosbeak (*Pinicola enucleator*)[d]	x									
Dickcissel (*Spiza americana*)[g(only)]		x							x	
Red Crossbill (*Loxia curvirostra*)[d,e,g,h]	x									
Common Redpoll (*Carduelis flammea*)[d,g]	x							x		
Hoary Redpoll (*Carduelis hornemanni*)[g]	x							x		
Pine Siskin (*Carduelis pinus*)[d,e,g,h]	x							x		
American Goldfinch (*Carduelis tristis*)[d,e,g,h]		x							x	
Evening Grosbeak (*Coccothraustes vespertinus*)[d,g]	x							x	x	
House Sparrow (*Passer domesticus*)[d,e,g,h]									x	

[a]Habitat use determined from DeGraaf et al. (1991) and Ehrlich et al. (1988) (birds), Genter and Jurist (1995) (bats), Holton and Johnson (1996) (fish), Reichel and Flath (1995) (amphibians and reptiles), Montana Bird Distribution Committee (1996) (birds), Montana Fisheries Information System (2002), Montana Natural Heritage Program (1997) (mammals)., Thompson (1982) (mammals), various wildlife monitoring reports from the Monteco Mine, Decker Mines and Spring Creek Mine, and Whitaker, J.O. (1988) (mammals).

[c] Fisheries zones I-V adapted from Elser et al. (1977) as shown in Figure 1.

[d] Reported in various monitoring reports (1978-1989) for the Montco Mine.

[e] Reported in various monitoring reports from the Decker Mines (1976-1977) and Spring Creek Mine (1994-1997), and the Tongue River Basin Project DEIS (1995).

[f] Montana Fisheries Information System 2002.

[g] Reported as predicted occurrence in Redmond, et al. 1998.

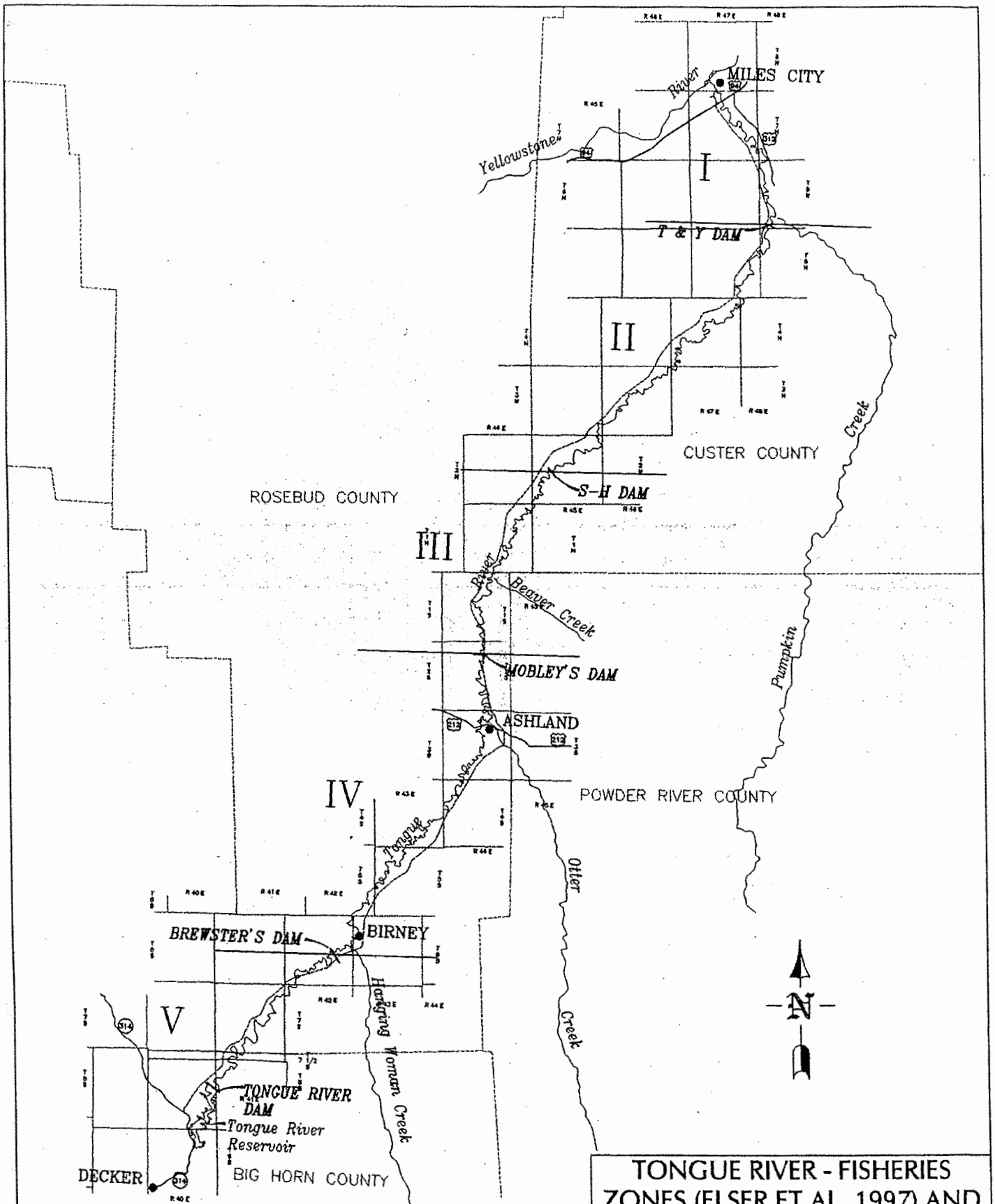
[h] Montana Bird Distribution Online Database 2001.

[i] Montana Natural Heritage Program (MTNHP) 2003a.

[j] Montana Natural Heritage Program (MTNHP) 2003b.

[k] Maxell et. al. 2003.

[l] Sasse, D. 2003, personal comm.



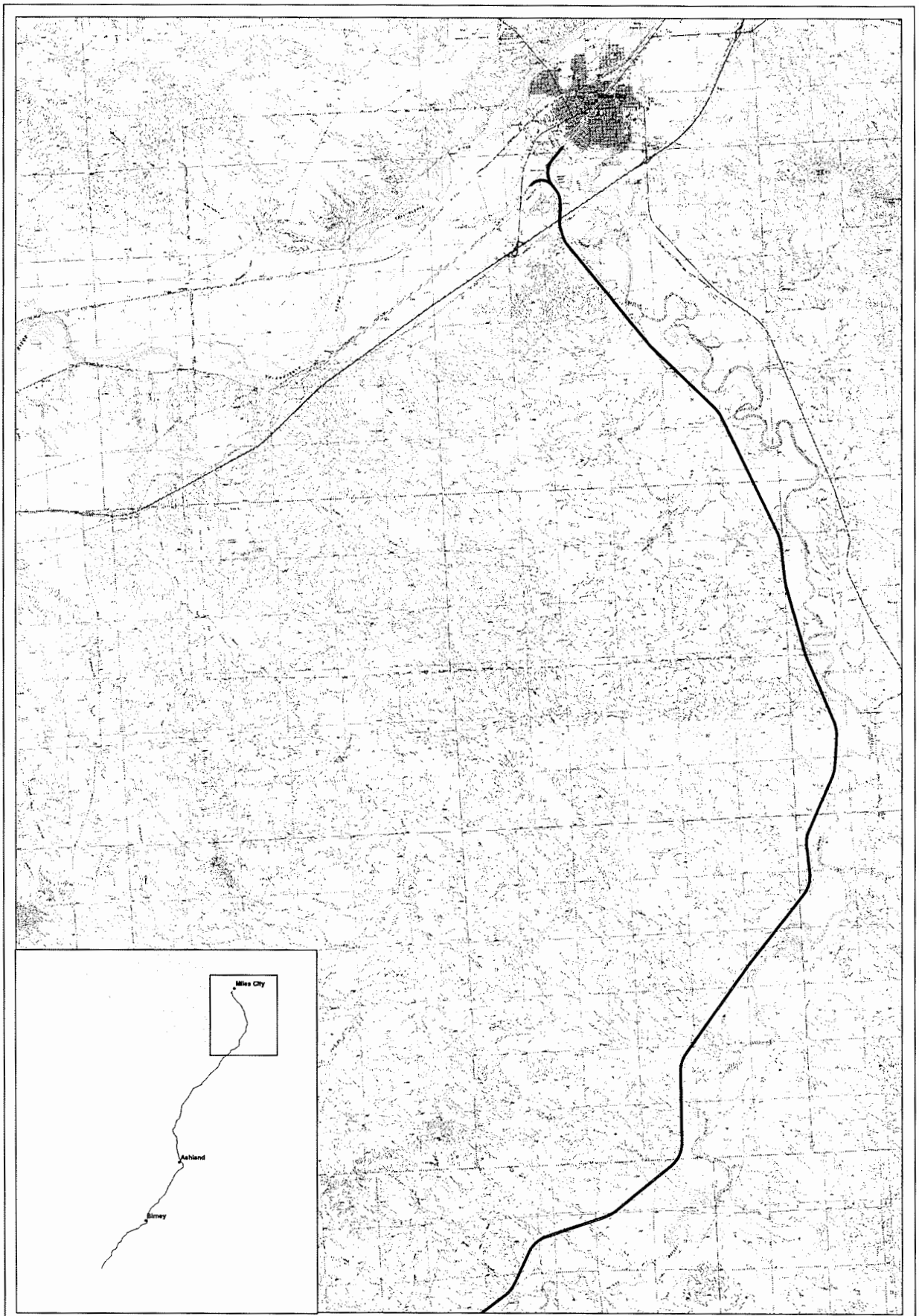
WESTECH
Environmental Services, Inc.
P.O. Box 6045
Helena, Montana 59604

SCALE: NTS
DATE: FEBRUARY 1999
DRAWN BY: DC
CHECKED BY:
FILE: TRRR99A08.DWG

TONGUE RIVER - FISHERIES ZONES (ELSER ET AL. 1997) AND MAJOR DIVERSIONS

TONGUE RIVER RAILROAD

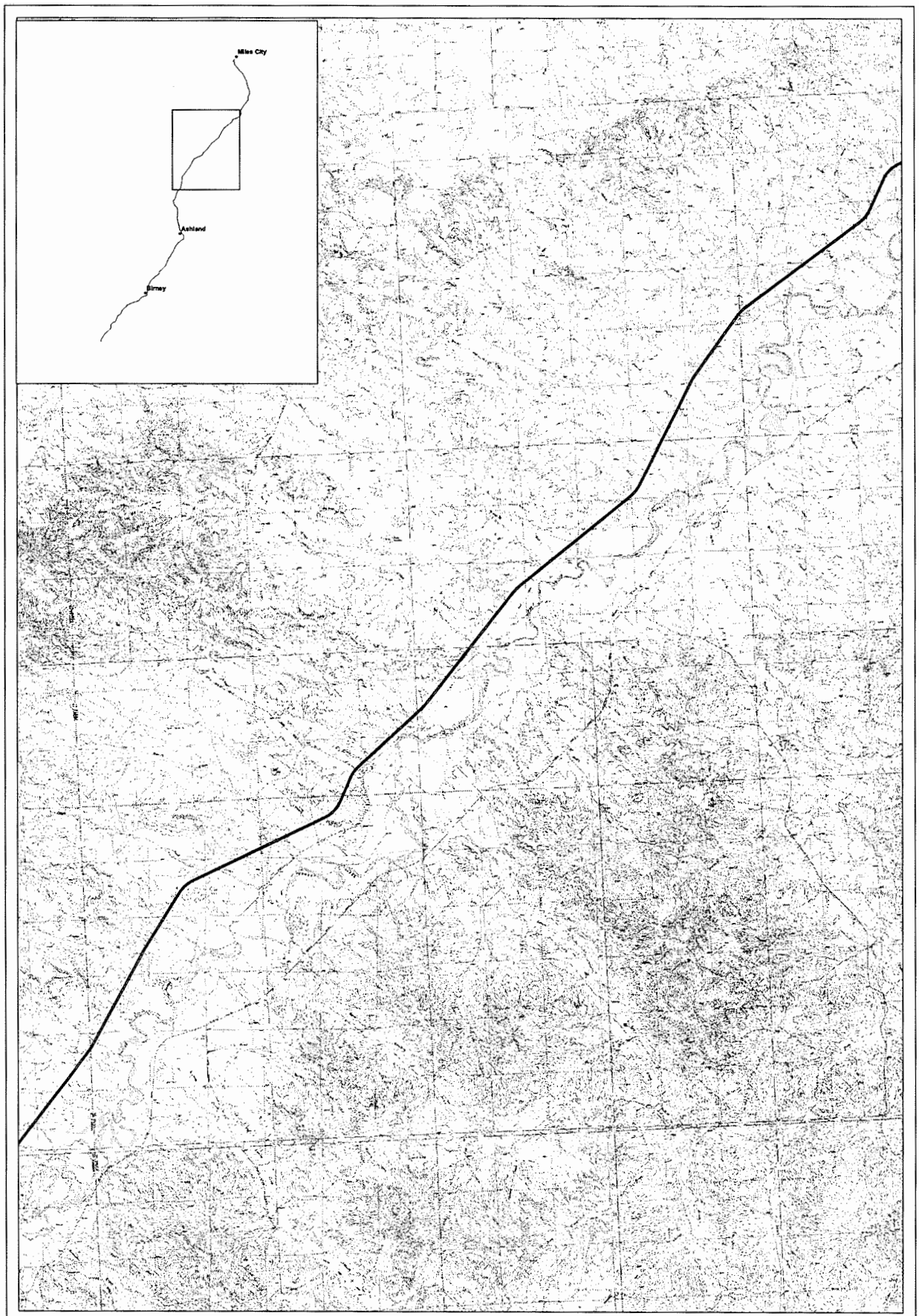
FIGURE 1



ENTRIX

Figure 2
Habitat Map
Tongue River Railroad

Proj 3079712 Date: 9/2003



Legend

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0 2.5 5 Miles

N

E N T R I X

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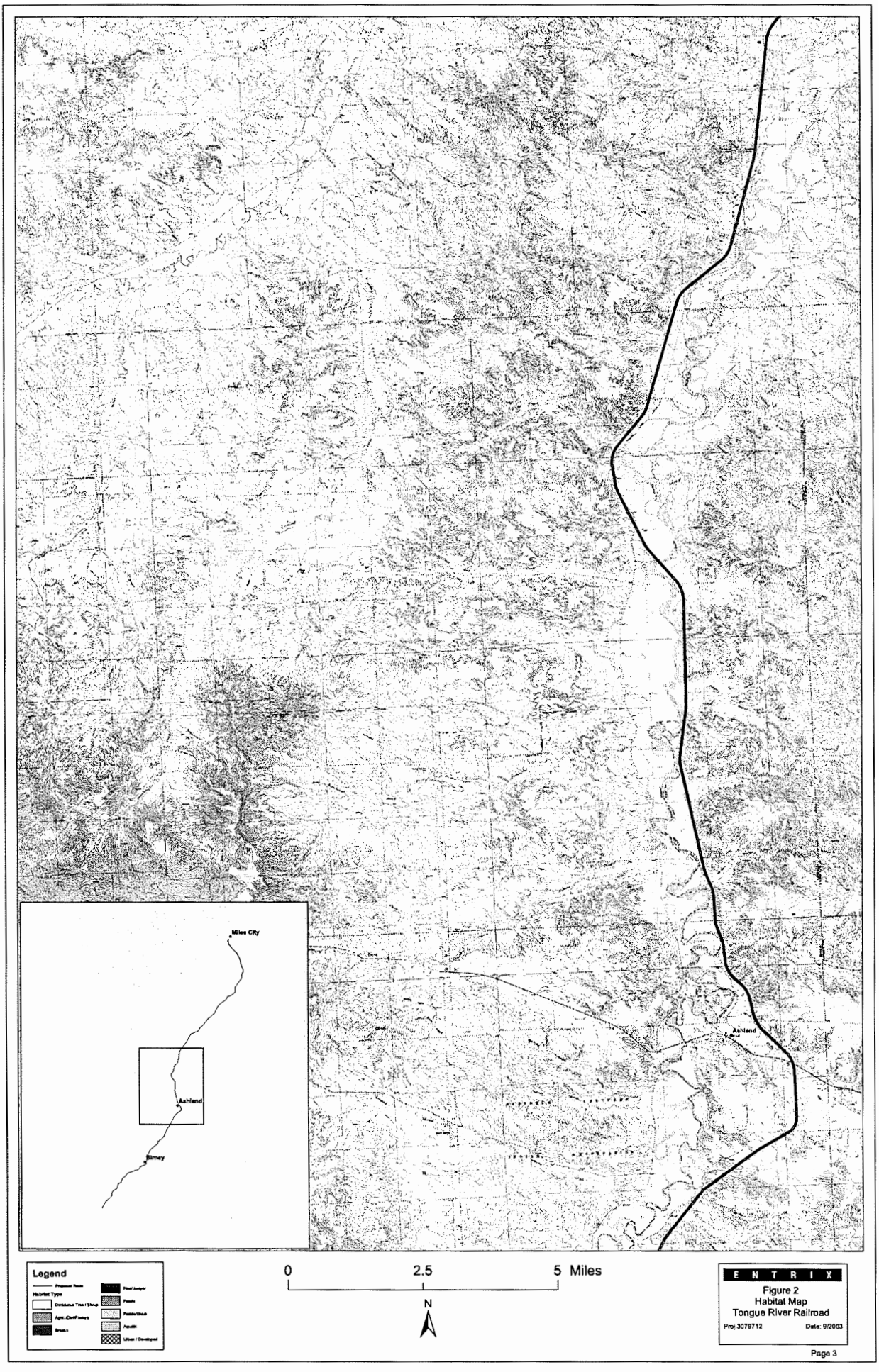
Habitat Map
Tongue River Railroad

Proj.3079712 Date: 9/2003


Miles City
Ashland
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Habitat Type
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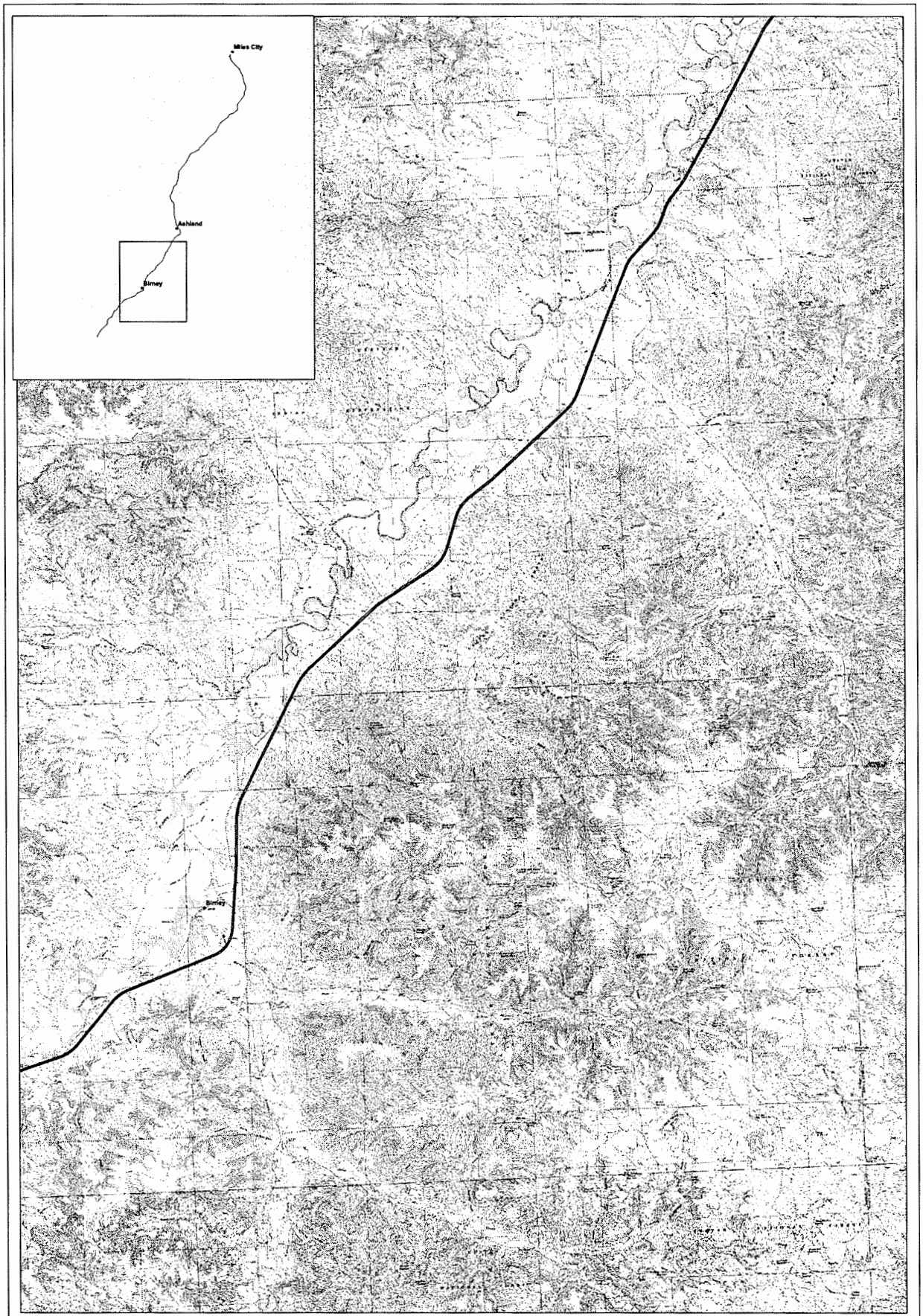

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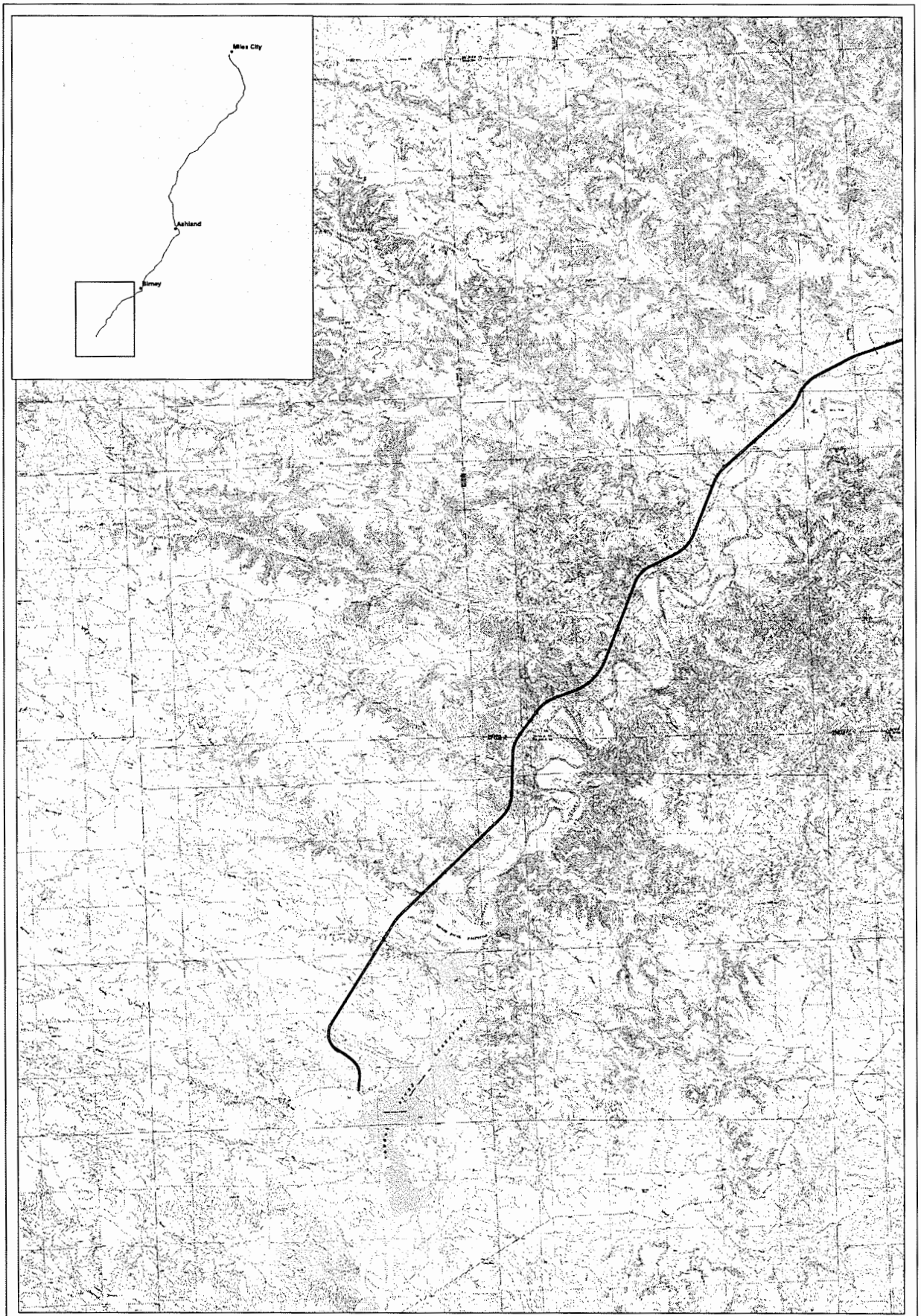

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Figure 2
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Tongue River Railroad

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