CHAPTER 1
PURPOSE AND NEED FOR ACTION

TABLE OF CONTENTS

1.1 OVERVIEW 1-2

1.2 PURPOSE OF PROPOSED ACTION 1-5

1.3 NEED FOR PROPOSED ACTION 1-6
- 1.3.1 Provide Safe and Reliable Rail Service 1-7
- 1.3.2 Further National Energy Policies 1-10
- 1.3.3 Increased Energy Demand 1-15
- 1.3.4 Increase Rail Capacity 1-18
- 1.3.5 Increase Rail Competition 1-19

1.4 PROPOSED ACTION 1-20
- 1.4.1 Construction 1-22
- 1.4.2 Operation 1-28
- 1.4.3 Maintenance 1-30

1.5 RESPONSIBLE OFFICIALS AND DECISIONS TO BE MADE 1-31

1.6 AGENCY RESPONSIBILITY 1-33
- 1.6.1 Lead Agency 1-34
- 1.6.2 Cooperating Agencies 1-34
- 1.6.3 Other Agencies 1-37

1.7 SCOPING AND PUBLIC INVOLVEMENT 1-39

1.8 ISSUES AND CONCERNS 1-42

1.9 EIS ORGANIZATION AND FORMAT 1-44

* * * * *

[THIS PAGE INTENTIONALLY LEFT BLANK]

LIST OF TABLES

Table Number		Page
1-1	DM&E Accidents/Incidents at Highway-Rail Crossings	1-7
1-2	DM&E Train Accidents	1-7
1-3	Accident Rate Comparison	1-8
1-4	Coal Mines to be Accessed by Powder River Basin Expansion Project	1-14
1-5	Projected Energy Generation, Sales, and Consumption	1-16

LIST OF FIGURES

Figure Number		Following Page
1-1	Project Overview	1-1
1-2	Minnesota Overview	1-1
1-3	South Dakota Overview	1-1
1-4	Wyoming Overview	1-1
1-5	Existing DM&E Rail System	1-2
1-6	Typical New Track Section	1-24
1-7	Typical Wetland Embankment Construction Water Depth Greater than 1 Foot	1-25
1-8	Typical Wetland Embankment Construction Water Depth Less than 1 Foot	1-25
1-9	Typical Precast Slab Bridge Details	1-25
1-10	Typical Precast Double Cell Bridge Details	1-25
1-11	Typical Large Box Culvert (Up to 12' x 12')	1-25
1-12	Typical Round Culvert	1-25
1-13	Typical Livestock Underpass	1-25
1-14	Channel Change Details	1-25
1-15	Typical Existing Track Rebuilt Section	1-27
1-16	Typical Double Drilled Shaft Structures for Replacing Existing Bridges	1-27
1-17	Typical New Track Section with North Siding	1-27
1-18	Typical New Track Section with South Siding	1-27
1-19	Typical Existing Track Rebuild Section with North Siding	1-27
1-20	Typical Existing Track Rebuild Section with South Siding	1-27

* * * * *

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER 1
PURPOSE AND NEED FOR ACTION

On February 20, 1998, the Dakota, Minnesota & Eastern Railroad (DM&E) filed an Application before the Surface Transportation Board (Board)[1] to extend its existing system westward into the Powder River Basin (PRB) region of Wyoming. In its Application, DM&E proposed the construction of approximately 281 miles of new rail line in South Dakota, Minnesota, and Wyoming and the rebuild of approximately 598 miles of existing rail line. Figures 1-1 to 1-4 provide an overview of the project area.

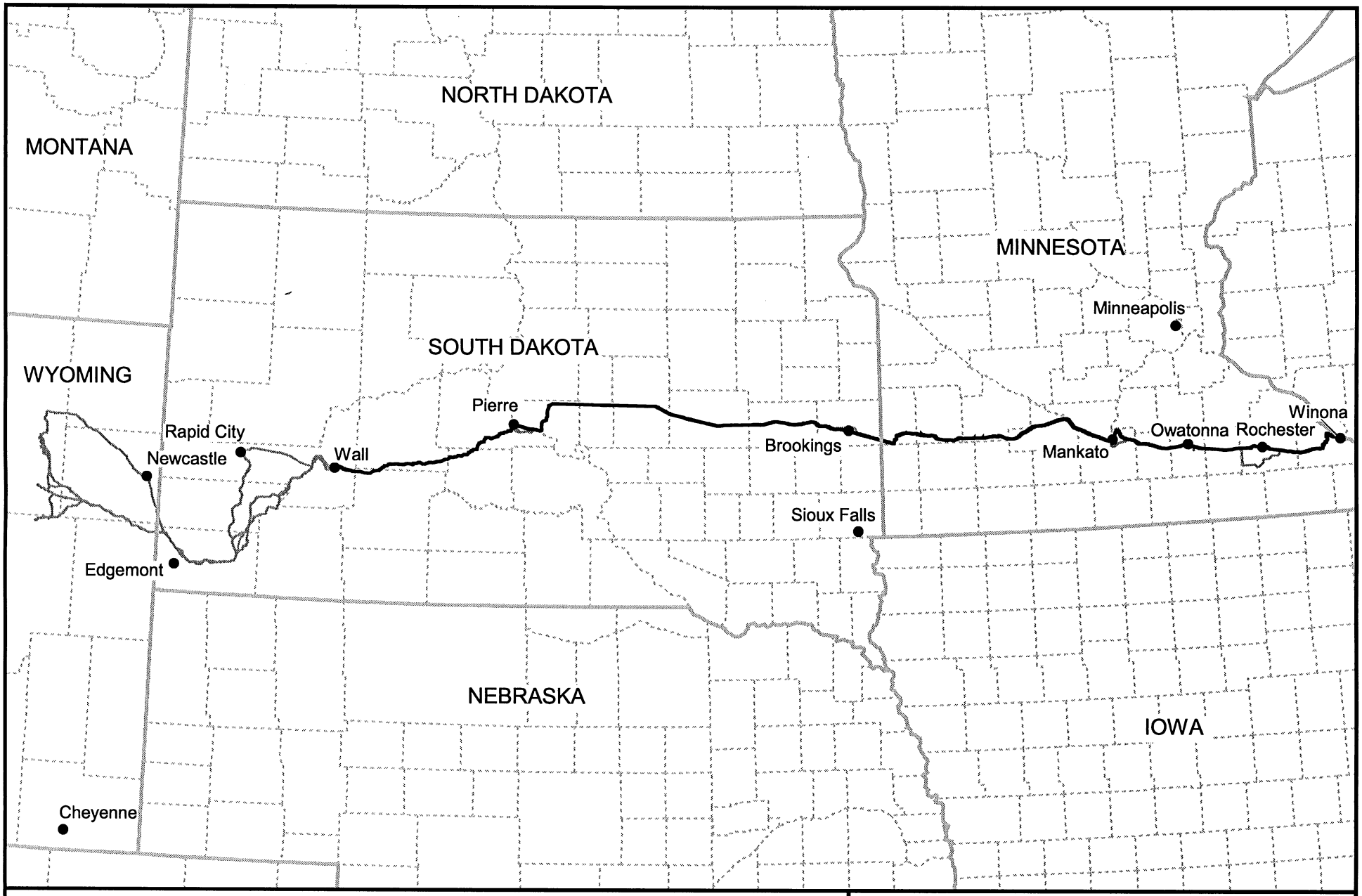
The Surface Transportation Board, Section of Environmental Analysis (SEA), prepared this Draft Environmental Impact Statement (EIS) to identify and evaluate the potential environmental impacts associated with DM&E's proposed expansion.[2] SEA prepared this Draft EIS according to the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ) guidelines, and the Board's environmental regulations to provide the Board, cooperating agencies, other Federal, state and local agencies, Native American Tribes, and the public with clear, concise information on the potential environmental effects associated with the proposed expansion and reasonable and feasible alternatives to DM&E's proposal, including the No-Action Alternative.

SEA is issuing this Draft EIS for public review and comment and will consider all comments it receives in preparing the Final EIS, which will include SEA's final recommended environmental mitigation conditions. The Board will consider the entire environmental record, the Draft and Final EIS, all public comments, and SEA's environmental recommendations in making its final decision on DM&E' s proposed expansion. The Board will decide whether to approve, deny, or approve with conditions (which would include conditions designed to mitigate impacts on the environment) the proposed project.

---

[1] The Surface Transportation Board is a bipartisan, decisionally independent adjudicatory body, organizationally housed within the U.S. Department of Transportation. The Surface Transportation Board was established by the Interstate Commerce Commission Termination Act of 1995 (49 U.S.C. 10101 et seq.; P.L. 104-88, December 29, 1995) to assume some of the regulatory functions that the Interstate Commerce Commission administered. The Surface Transportation Board has jurisdiction over rail rates, railroad acquisitions and consolidations, rail constructions, and abandonments of rail service. Other functions of the Interstate Commerce Commission were either eliminated or transferred to different agencies within the Department of Transportation.

[2] Specifically, this Draft EIS analyzes both DM&E's proposed construction of approximately 281 miles of new rail line and the rebuild of approximately 598 miles of existing rail line.



N
W E
S
90 0 90 Miles

Existing Rail Line
New Construction Alternatives
County Lines

Figure 1-1
POWDER RIVER BASIN EXPANSION PROJECT
Project Overview

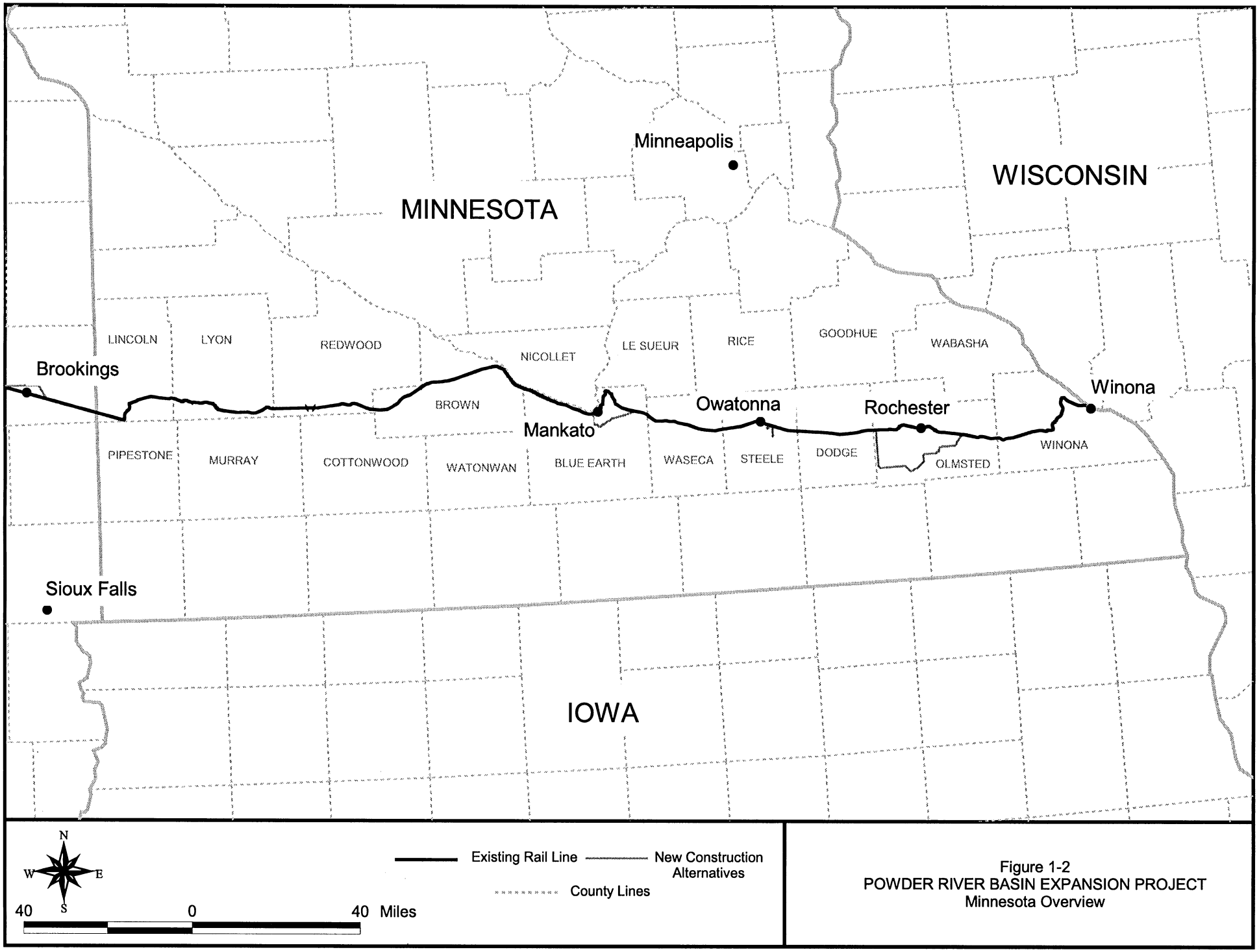


Figure 1-2
POWDER RIVER BASIN EXPANSION PROJECT
Minnesota Overview

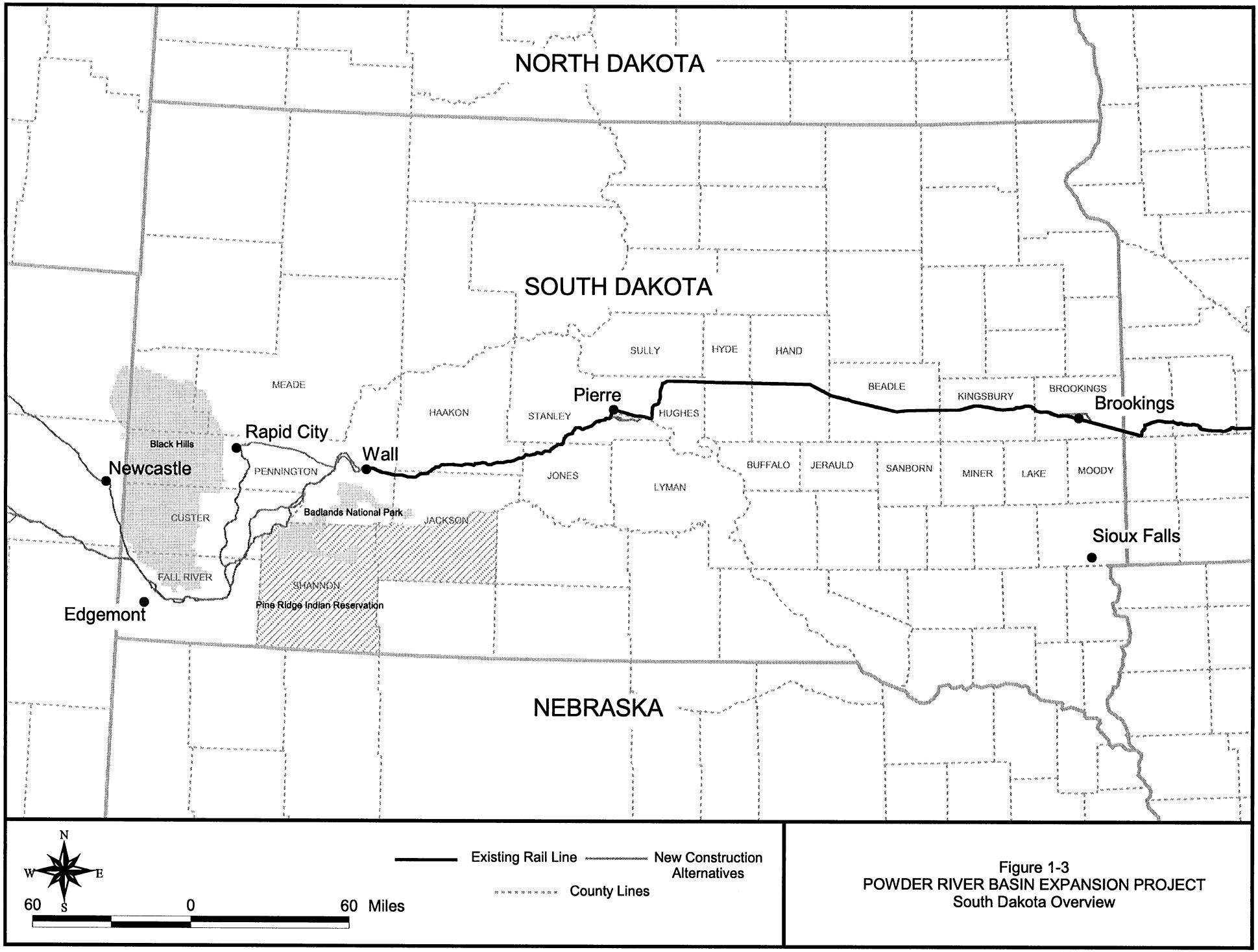


Figure 1-3
POWDER RIVER BASIN EXPANSION PROJECT
South Dakota Overview

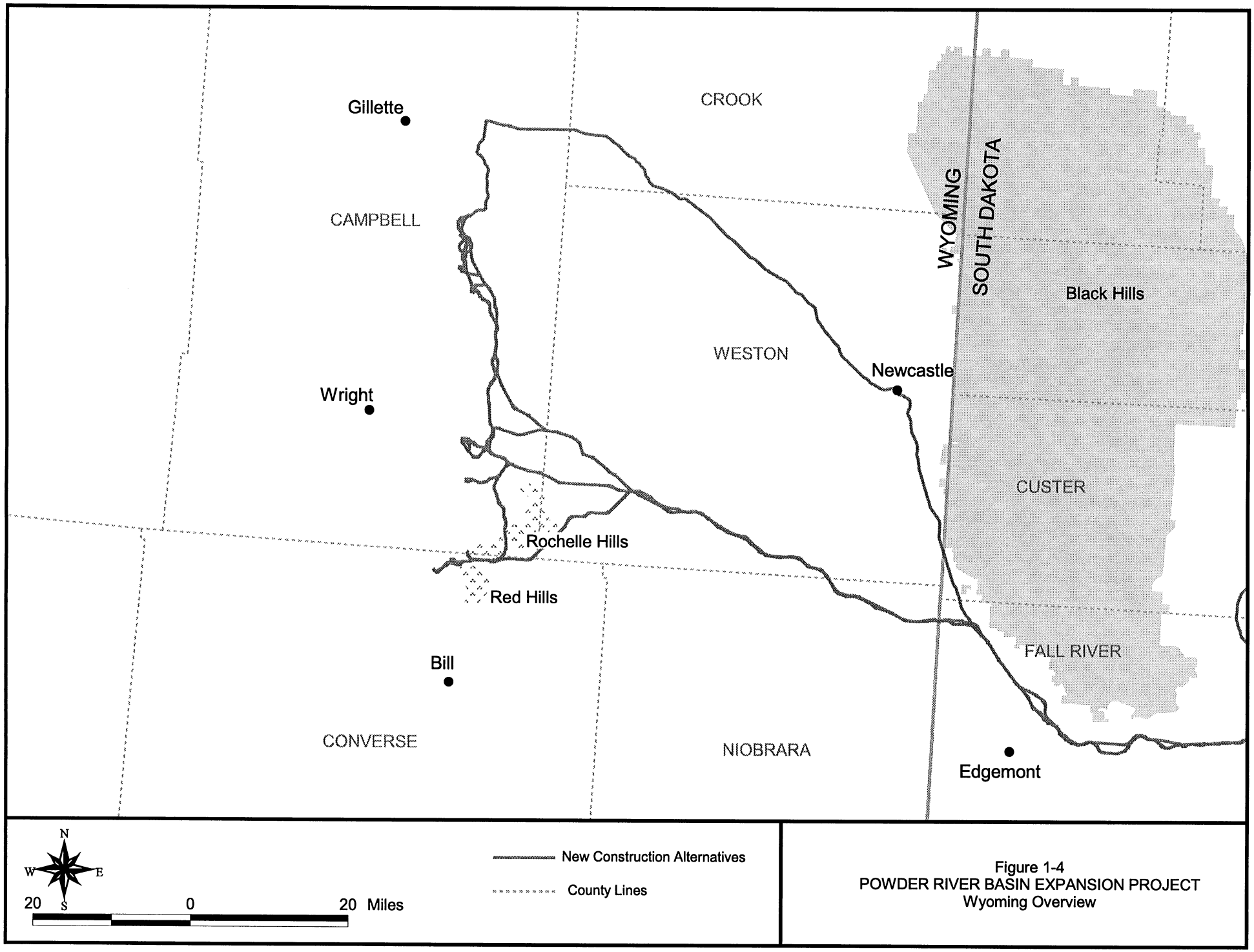


Figure 1-4
POWDER RIVER BASIN EXPANSION PROJECT
Wyoming Overview

1.1 OVERVIEW

The Dakota, Minnesota & Eastern Railroad Corporation, Brookings, South Dakota, was created in 1986. It was formed to assume ownership and operation of rail lines that the Chicago & North Western Railroad (C&NW) was attempting to abandon, in a proceeding filed before the Board's predecessor agency, the Interstate Commerce Commission (ICC). Additional rail lines owned by the C&NW that were not part of that abandonment proceeding were also included in the formation of DM&E. The current DM&E system includes approximately 700 miles of east-west rail line track across southern and central South Dakota and southern Minnesota. The rail line extends westward from near the Mississippi River at Winona, Minnesota, through Rochester, Owatonna, Waseca, and Mankato, Minnesota and into South Dakota. The rail line passes through Brookings, Huron, Pierre, and Rapid City, South Dakota then turns northwest through Sturgis and Belle Fourche, South Dakota and on to Colony, Wyoming. The system also consists of several hundred miles of secondary track extending off the rail line into northwestern Nebraska, northern Iowa, and other portions of South Dakota and Minnesota (Figure 1-5).

DM&E currently operates four to eight trains, including through trains and local service and switching, per day over various sections of its system, primarily transporting grain and other agricultural products. Other commodities it transports include bentonite, kaolin clays, cement, and wood products. DM&E is a Class II railroad and is the primary rail transportation provider for most of South Dakota and the only east-west railroad in southern Minnesota. DM&E links farm-based communities along its rail line to eastern and southern markets through its connections with other railroads and barge transportation on the Mississippi River. The rail service provided by DM&E to agricultural shippers in its service area is an important component of the rural agricultural economies of South Dakota and Minnesota.[3]

At the time DM&E was formed, its rail infrastructure was in poor condition. Speed and weight restrictions were required for rail operations on much of the system. DM&E originally assumed that after spending approximately $10 million in capital, DM&E's system would be economically viable. However, the poor condition of the system and lower than anticipated levels of service to customers required substantially greater expenditures for capital improvements. Since beginning operations in 1986, DM&E indicates it has spent approximately $110 million in capital expenditures for improvements. Even with this spending, DM&E asserts that many parts of its system are still in poor condition; are operated under speed and weight restrictions; and do not provide safe, reliable, or efficient rail service. The result has been lower than anticipated rail

[3] Filing before the Surface Transportation Board, received November, 1998, submitted by Michael V. Dunn, Under Secretary, Marketing and Regulatory Programs, U.S. Department of Agriculture.

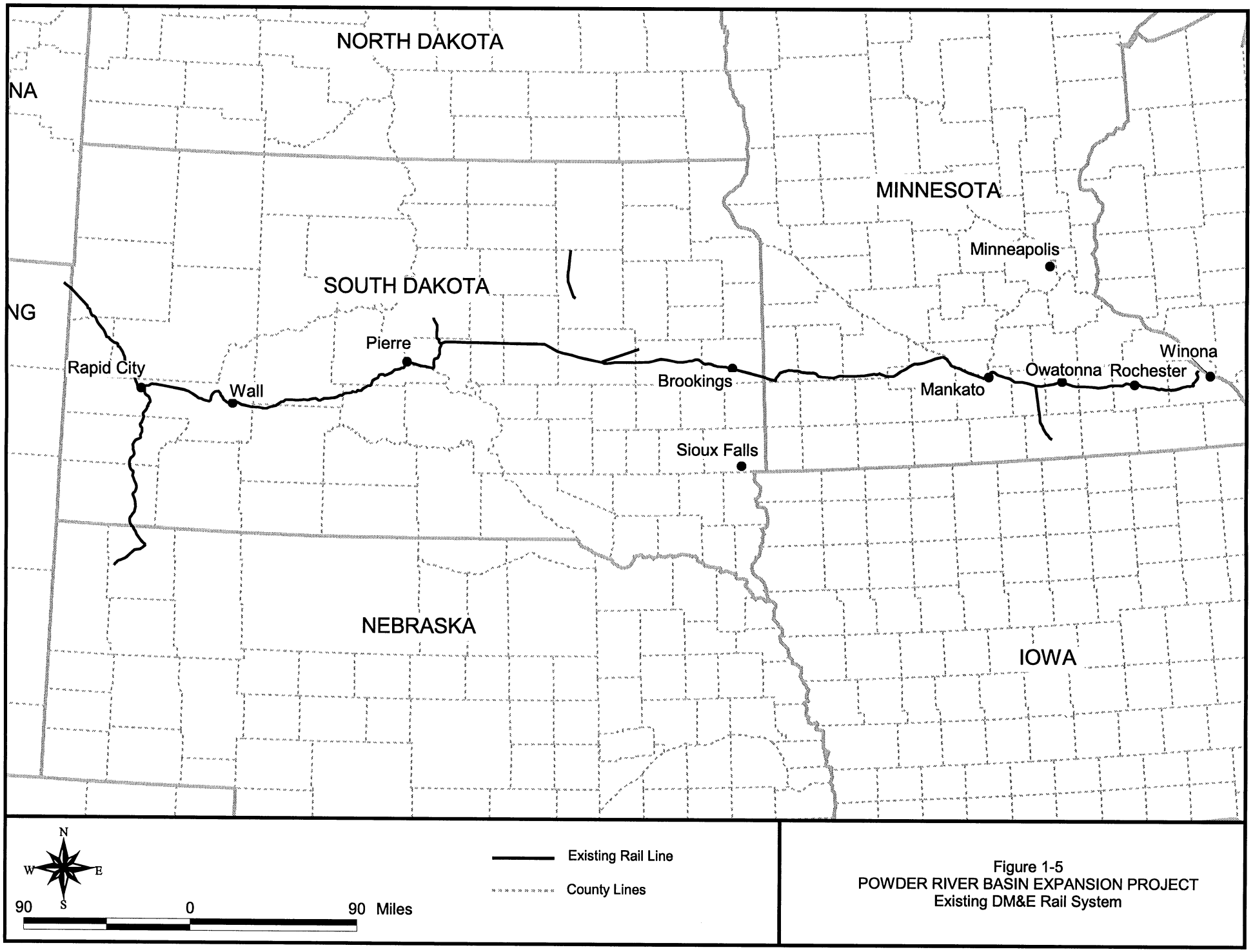


Figure 1-5
POWDER RIVER BASIN EXPANSION PROJECT
Existing DM&E Rail System

service to existing shippers and reduced ability to attract additional business, both from existing shippers and potentially new shippers.[4]

DM&E currently does not have the revenue base to provide the capital necessary to accomplish the system-wide rehabilitation required to provide safe, reliable, and efficient service to its existing shippers. However, DM&E believes that demand for the cleaner burning, lower cost, low sulfur coal available from western mines in the Powder River Basin (PRB) provides an opportunity for DM&E to expand its revenue base because of the location of the existing DM&E system in relation to both the PRB coal mines and potential coal markets. DM&E's system is located within a few hundred miles of the PRB coal fields on the west end of its system and within a few hundred miles of a number of upper Midwest power plants on the east end of its system. DM&E determined that expansion of its system into the PRB would enable it to expand its revenue base through the shipment of coal. This new revenue base would provide DM&E the capital necessary to rebuild its existing system. This rebuild would provide DM&E's existing shippers with improved service, increased safety, greater efficiency, and the potential to expand markets nationwide. These benefits, DM&E determined, would potentially lead to increased agricultural revenues and a stronger agricultural economy in the region.

In June of 1997, DM&E announced its proposal to build an extension from its existing system westward to mines in the PRB coal fields and rebuild its existing rail line to provide transportation of coal to a core market of Midwest energy-producing utilities. On February 20, 1998, DM&E filed an application before the Board. In its application, DM&E sought the Board's authority to construct and operate new rail line facilities in east-central Wyoming, southwest South Dakota, and south-central Minnesota. This proposed construction and operation would extend DM&E' s existing system westward into the PRB region of Wyoming, allowing DM&E to connect to coal-producing mines in the region. Construction and operation of this project would provide additional rail carrier access to the region and facilitate transport of coal eastward from the mines over DM&E's existing system.

The project, docketed as S.B. Finance Docket No.33407, *Construction and Operation -In Campbell, Converse, Niobrara, and Weston Counties, Wyoming, Custer, Fall River, Jackson, and Pennington Counties, South Dakota, and Blue Earth, Nicollet, and Steele Counties, Minnesota* (hereafter referred to as the Powder River Basin Expansion Project or the PRB Expansion Project), involves a total of 281 miles of new rail line construction. Additionally, as

[4] The Board acknowledged these service limitations in its decision on December 9, 1998, recognizing the widespread support for this project from existing DM&E rail shippers and the inability of a railroad with annual revenues of $50 to $60 million to rehabilitate over 1,000 miles of rail line.

part of the proposed project, DM&E would rebuild 598 miles of its existing rail line, generally along its current system, to standards acceptable for operation of unit coal trains.

Because the construction and operation of this project has the potential to result in significant environmental impact, SEA determined that the preparation of an EIS was appropriate. The Board announced on March 30, 1998, in the *Federal Register* and newspapers in the project area, its intent to prepare an EIS for this project and hold agency and public scoping meetings (Appendix C). SEA held 3 agency and 12 public scoping meetings in 14 cities as part of the EIS scoping process (Section 1.7). The initial scoping period concluded on July 10, 1998. On April 28, 1998, DM&E filed a Special Use Application with the U.S. Forest Service (USFS) for an easement to cross the Buffalo Gap National Grasslands in South Dakota and the Thunder Basin National Grasslands in Wyoming. Also on April 28, 1998, DM&E applied for a right-of-way grant across lands administered by the U.S. Department of the Interior, Bureau of Land Management (BLM) in South Dakota and Wyoming. These additional approval authorities would also require preparation of an EIS. The Board, with the concurrence of the cooperating agencies, determined that one EIS be prepared to satisfy each agency's requirements under NEPA. On August 7, 1998, the Board published a Revised Notice of Intent to Prepare an EIS, indicating that the USFS, BLM, and the U.S. Army Corps of Engineers (Corps) would be participating as cooperating agencies. The Revised Notice of Intent also extended the scoping period until September 8, 1998 to allow additional time for comments on the draft scope.

On December 10, 1998, the Board issued a decision (Appendix A) finding that the project satisfies the transportation-related requirements of 49 USC 10901. The Board also indicated in this decision that, following conclusion of the environmental review process, a further decision would be issued assessing the project's potential environmental impacts and the cost of environmental mitigation that might be imposed. This final decision on the project would consider the entire environmental record and reconsider the transportation-related merits of the project based on the environmental impacts and mitigation costs.

Rehabilitation or replacement of DM&E's existing rail bridge over the Missouri River would be required as part of the proposed rebuild of DM&E's existing rail line. If significant changes to the existing bridge are required, or the bridge is replaced, DM&E would be required to obtain a bridge permit from the U.S. Coast Guard (Coast Guard). During the scoping process, alternatives were developed that, if selected, would impact facilities administered by the U.S. Bureau of Reclamation (Reclamation). Reclamation would be required to issue a special use permit to DM&E should an alternative be selected that would affect Reclamation lands. Therefore, the Board, in a letter dated November 5, 1999, invited the Coast Guard and Reclamation to be cooperating agencies in this EIS. Each of these agencies has separate approval authorities for portions of the proposed construction and operation in addition to the Board's

approval authority. On January 12, 2000, the Board again published a revised Notice of Intent indicating the Coast Guard and Reclamation would also be cooperating agencies.

This EIS is intended to disclose the potential direct, indirect, off-site, and cumulative impact to the environment as a result of the proposed project and project alternatives. Potential impacts discussed reflect those issues and concerns identified by Federal, state, and local agencies, landowners, Native American Tribes, members of the public, and other interested parties determined to be relevant to this project.

1.2 PURPOSE OF PROPOSED ACTION

DM&E identified two primary purposes for this project in its Application (See Application p.22). The first is "to create a third major rail carrier with independent access to the eleven PRB coal mines" that would offer "competitive advantages and operational efficiencies not available on any railroad presently serving the PRB and providing new, more-efficient, lower-cost routings for many PRB coal movements to Midwestern utilities. A second and equally compelling purpose of the project is to transform DM&E's existing operations so that it can offer existing and prospective shippers of non-coal commodities vastly improved service, new marketing opportunities, and more-efficient and safer operations."

DM&E has indicated the PRB Expansion Project would enable them to satisfy the first project purpose by transporting coal in a more cost competitive and reliable manner to Midwestern utilities than exists today. DM&E believes the proposed project would develop a railroad system to efficiently serve a specified group of coal-producing mines in Wyoming's southern PRB[5] and competitively serve electricity-producing, coal-burning utilities in an identified target market[6] and the electricity-consuming public they serve. DM&E would

[5] The Application identifies 11 mines (Caballo, Belle Ayr, Caballo Rojo, Cordero, Coal Creek, Jacobs Ranch, Black Thunder, North Rochelle, North Antelope, Rochelle, and Antelope) to be served by the project listed at footnote 1. These southern PRB mines are distinguished by their coal's relatively low sulfur dioxide and sodium content relative to their British thermal unit content. The coal they produce is particularly suited to the electricity-producing utilities in the project's targeted market area in that the coal produced in these mines, when deliverable on cost competitive terms, has been proven to be an effective replacement energy source for high sulfur coal.

[6] The target markets for delivery of DM&E coal are (1) the Great Lakes utilities, (2) rail-based utility plants in Minnesota and Wisconsin, (3) the Chicago gateway, and (4) Mississippi River utilities. DM&E determined the primary criterion in its target market identification as being an area where the project would be able to introduce new transportation efficiencies and competitiveness sufficient to allow utilities to convert from high sulfur coal to the lower sulfur PRB coal.

accomplish this by constructing and operating the shortest, most energy efficient route and rail operation between the identified coal mines and the specified target market utilities. In its December 10, 1998 decision, the Board concurred that the proposed project would enable DM&E to provide shorter routes, and associated fuel saving, to various coal-burning electrical generating plants.

The second purpose of the proposed project would be accomplished by the proposed rebuild of the existing rail line. DM&E states that rebuild would enhance transportation safety and reliability throughout DM&E's service area because rehabilitating and rebuilding the existing infrastructure would reduce the high incidence of derailments caused by track failure and provide significant improvements to grade crossing protection for train and vehicular traffic. According to DM&E, operating speeds and car weights throughout the system could be increased if the existing rail line is rehabilitated. These efficiencies would enable DM&E and its customers to better compete in their existing markets and possibly expand into new markets.

DM&E states that the proposed project could also provide additional benefits. The increased competitiveness of and access to lower sulfur PRB coal would help facilitate the objectives of Phase II of the Clean Air Act Amendments of 1990 (CAAA), sulfur dioxide emission reductions, scheduled to take effect in the year 2000, by creating another economical means for utilities to replace high sulfur coal with lower sulfur PRB coal. The construction and operation of the proposed project would provide greater reliability in the national and regional rail transportation system by increasing rail capacity and converting DM&E to a Class I railroad.[7] Increased rail system safety, reliability, and efficiency could also provide rural economic benefits such as increased farm income, increased economic development, and less burden on the rural road network.

1.3 NEED FOR PROPOSED ACTION

The overall need for the proposed project is to develop viable, safe, and competitive rail service that provides a reliable fuel source to the Midwestern utility industry. This industry must meet the increased demands for more energy production and respond to a changing regulatory environment requiring cheaper, cleaner energy. Each component of the project need is discussed below.

[7] Railroad are classified by the Surface Transportation Board according to average annual operating revenues (AAOR). Class I railroads have AAOR of $256.4 million or more; Class II railroads have AAOR of between $256.4 million and $20.5 million; and Class III railroads have AAOR of less than $20.5 million.

1.3.1 Provide Safe and Reliable Rail Service

DM&E has indicated the dilapidated condition of their existing rail line currently poses safety and service reliability problems. DM&E's rail line today averages two to three major derailments and over a dozen smaller derailments per month because of the poor condition of its track. Two-thirds of its rail ties need to be replaced. The track steel is fatigued and consists of various weights, sizes, and age. Some of the existing track steel was rolled over 100 years ago. There is no train signaling system. Of its approximately 1,300 grade crossings, only 19 currently have gates and lights. Virtually no right-of-way protection, such as fencing for pedestrian traffic, exists. As shown in Tables 1-1, 1-2 and 1-3, DM&E's accident rate is high, and compared to the accident rate for all railroads, is among the highest in the rail industry.

Table 1-1
DM&E Accidents/Incidents at Highway-Rail Crossings (Public and Private)

YEAR	NUMBER
1992	23
1993	26
1994	17
1995	18
1996	11
1997	21
1998	14

Table 1-2
DM&E Train Accidents (Excluding Highway-Rail Crossings)

YEAR	NUMBER	RATE*
1992	31	46.50
1993	30	46.77
1994	34	53.05
1995	27	41.14

Table 1-2
DM&E Train Accidents (Excluding Highway-Rail Crossings)

YEAR	NUMBER	RATE*
1996	26	36.00
1997	27	38.39
1998	16	23.79

*Accident Rate per million train miles

Table 1-3
Accident Rate* Comparison

1995 Train Accident Rates for Class I, Class H, All Railroads and DM&E	
Train accident rate for Class I railroads	3.46
Train accident rate for Class II railroads	5.87
Train accident rate for all railroads	3.91
DM&E train accident rate	41.41
1996 Train Accident Rates for Class I, Class II All Railroads and DM&E	
Train accident rate for Class I railroads	3.40
Train accident rate for Class II railroads	5.72
Train accident rate for all railroads	3.85
DM&E train accident rate	36.00
1997 Train Accident Rates for Class I, Class II All Railroads and DM&E	
Train accident rate for Class I railroads	3.08
Train accident rate for Class II railroads	5.13
Train accident rate for all railroads	3.54
DM&E train accident rate	38.39

Table 1-3 Accident Rate* Comparison	
1998 Train Accident Rates for Class I, Class II All Railroads and DM&E	
Train accident rate for Class I railroads	3.42
Train accident rate for Class II railroads	4.22
Train accident rate for all railroads	3.77
DM&E train accident rate	23.79
*Accident Rate per million train miles	

DM&E has indicated that its existing revenue base and other critical capital needs preclude it from making meaningful improvements to its rail system. DM&E states that it is able to apply only a "Band-Aid" approach, fixing the most critical problems and deferring others until such time as they are critical to continued safe operation. Such an approach is inefficient and costly. Additionally, costs associated with derailments are also detrimental to the economic viability of the railroad. Any substantial improvement would require large scale replacement or rebuilding of the existing system. However, given the existing revenue base and the capital needs to keep the railroad operating, such funding is not available. Furthermore, under the current operational requirements and financial constraints, DM&E's present customers could lose service altogether without large-scale system-wide improvements. The Board evaluated DM&E's situation in December, 1998 and determined that "there appears to be the very real likelihood that, absent the funds generated by this project, DM&E could cease to exist as a viable railroad."[8]

Under the proposed project, with its projected increased revenue base, DM&E has indicted it would fund major grade crossing and right-of-way protection enhancements, provide an entirely new track infrastructure with new welded rail, and install a state-of-the-art signaling system for train control. DM&E believes these improvements would provide badly needed safety and service improvements for existing shippers served by DM&E as well as for future rail service needs. DM&E states that it could make these improvements only with the influx of capital made possible through the PRB Expansion Project.

[8] Surface Transportation Board Decision, dated December 10, 1998.

1.3.2 Further National Energy Policies

In the current electrical utility regulatory environment, two national policies, as well as a broad market increase in overall consumer demand for electrical energy, are prompting the utility industry to use lower sulfur, cheaper coal. One of these national policies is deregulation of the electrical utility industry.[9] This deregulation is occurring at the state, regional, and national levels.[10] Utility deregulation fosters competition for electrical customers in areas formerly served by only one utility.[11] Such competition is expected to be primarily in the area of lower electricity prices relative to other utilities offering service.[12] In order to compete and remain viable in such a marketplace, utilities will likely needed to lower their energy generation, transmission, and distribution costs. Fuel costs are a significant portion of the overall cost of electric generation.[13] Reducing fuel costs, either for the coal itself, the associated transportation, or both, would enable utilities to substantially lower their costs for electrical generation. These savings could then be passed on to the consumer. The Federal Energy Regulatory Commission (FERC) estimates competition in the electricity marketplace currently results in customer savings of between $3.5 and $5 billion annually.[14]

As deregulation progresses, those utilities most successful in lowering energy generation and delivery costs and then passing those savings on to the consumer will likely be the most successful. Converting to lower-cost PRB coal would enable utilities to reduce fuel costs and lower costs for electrical generation.

---

[9] Edison Electric Institute: Electric Utility Restructuring/Competition Issues - Promoting Competition in Electricity: Economic Report of the President. February, 1996.

[10] Edison Electric Institute: Electric Utility Restructuring/Competition Issues - Competition in the Electric Power Industry and Electric Utility Restructuring Competition Issues - State Activities on Electric Utility Restructuring/Retail Competition. October, 1998.

[11] Edison Electric Institute: Electric Utility Restructuring/Competition Issues - Competition in the Electric Power Industry - FERC and Wholesale Competition. October, 1998.

[12] Ibid.

[13] Beamon, J.A. and T.J. Leckey. 1999. Trends in Power Plant Operating Costs in Issues in Midterm Analysis and Forecasting 1999. Department of Energy, Energy Information Administration. Online at http://www.eia.doe.gov/oiaf/issues/power_plant.html. September 9, 1999.

[14] Edison Electric Institute at 11.

DM&E's Application identified a target market area that includes:

- Utility producers in Minnesota and Wisconsin.
- Utilities along the Great Lakes and Mississippi River.
- Utilities capable of receiving rail service through the Chicago rail gateway.

The proposed DM&E project would have the advantage of being a straighter, shorter, and more direct rail line between the PRB coal mines and DM&E's target utility market area than the systems of other rail carriers currently serving the PRB mines (Union Pacific Railroad Company [UP] and Burlington Northern Santa Fe Railway Company [BNSF). DM&E could offer utilities utilizing its system a 20 percent to 30 percent mileage reduction, resulting in lower fuel transportation cost. DM&E indicated in its Application that the proposed project would range from approximately 100 to nearly 400 miles shorter than existing rail routes to specific electrical generation facilities.[15] Additionally, DM&E could provide a slightly shorter route, approximately 30 miles one-way, to Chicago, a major rail interchange for traffic bound for the Ohio River area and the east. Lower transportation costs would further reduce utility energy generation costs.

Furthermore, PRB coal costs less than coal from other sources. The mine price of coal in Wyoming's PRB averaged $6 per ton in 1997, with the average for western coal (west of the Mississippi River) being $9.92 per ton.[16] This figure compares to coal from east of the Mississippi River that averaged $25.39 per ton in 1997. In the regulated utility market, utilities were provided a franchise area by state utility commissions (commission) for which they were responsible to provide electrical service, effectively creating a local monopoly territory.[17] Utilities were only allowed by the commission to charge a rate for electricity that provided the utility what the commission considered a fair return on their investments to generate electricity.[18] Profits were therefore based on rate-of-return on costs. Utilities had only to justify costs to the commission. Therefore, a 10 percent rate-of-return margin allowance on fuel costs of $20 per ton of coal provided a greater profit allowance than did a 10 percent margin on $3 per ton of coal. Thus, in the regulated, local monopoly environment, utilities may have had little incentive to find lower

---

[15] Approximately 115 miles shorter to Superior Midwest Energy Terminal, 220 miles shorter to Wisconsin Public Service Corporation's Pulliam Plant, and 375 miles shorter to Wisconsin Power & Light's Columbia Plant, based on an estimated total distance for the proposed project of 810 miles from the PRB to Winona, Minnesota.

[16] U.S. Department of Energy. Average Mine Price of Coal by State, 1988, 1993-1997. Online database: http://www.eia/doe.gov/cneaf/coal/cia/t80p0l .txt

[17] Edison Electric Institute at 9.

[18] Ibid.

cost energy sources in order to reduce the cost of electricity for the consumer because, if they could justify the higher cost, they would potentially make more profit.

Today, the United States utility industry is in the midst of deregulation, driven by a series of state and national policies, including the Energy Policy Act of 1992.[19] This deregulation initiative, designed to lower energy costs for the consumer, has placed an increased emphasis on the need to find lower cost sources of energy. It is expected that the American energy consumer will be the beneficiary of this energy deregulation policy initiative in the form of lower electric bills.[20]

The other national policy that, according to DM&E, creates a need for this project is the CAAA.[21] These amendments require, among other things, a phased-in overall reduction in sulfur dioxide (SO_2) emissions. Sulfur levels in coal found throughout the United States vary greatly.[22] Sulfur dioxide is a common pollutant emitted when sulfur-containing fossil fuel, most notably coal, is burned and is a key contributor to acid rain formation.[23]

The first phase of the CAAA has been implemented, resulting in reductions in overall SO_2 emissions by users of coal. Reductions have come in three forms - installation of scrubbers (devices designed to remove SO_2 from emissions), fuel switching to lower-sulfur coal, and a combination of both. Scrubbers are expensive to design and construct and require costly operation and maintenance as well as disposal of sulfur-containing sludge that often must be landfilled as a hazardous waste. Switching to lower sulfur fuels requires modifications to combustion facilities such as blast furnaces. However, these costs are minimal compared to expensive construction, operation, and maintenance costs required for scrubbers. Additionally,

---

[19] Edison Electric Institute at 9.

[20] Edison Electric Institute: U.S. Electricity Prices Are Among the World's Lowest -- And Are Getting Lower. Energy Issues/News. March, 1998.

[21] United States Environmental Protection Agency, National Environmental Policy Act of 1969. Energy Information Administration. The Effects of Title IV of the Clean Air Act Amendments of 1990 on Electric Utilities: An Update. Department of Energy. April 9, 1997. United States Environmental Protection Agency, Overview of the Clean Air Act Amendments of 1990.

[22] Oak Ridge National Laboratory, The Impact of Environmental Externality Requirements on Renewable Energy. Oak Ridge, TN. July, 1994.

[23] Environmental Protection Agency. The Plain English Guide to the Clean Air Act. Office of Air Quality Planning and Standards. January 15, 1996.

fuel switching does not require ongoing disposal costs. Use of lower sulfur fuels has provided the utility industry an effective means to reduce SO_2 emissions to levels compliant with the CAAA.[24]

PRB coal has an estimated SO_2 emission rate of 0.81 tons per Gigawatt hour compared to eastern coal that has an estimated SO_2 emission rate of 1.74 tons per Gigawatt hour.[25] The CAAA mandates a phased series of more stringent SO_2 and other air quality requirements. The next phase of the CAAA took effect in the year 2000, requiring further reductions in SO_2 emissions. Increased utilization of PRB coal is the most cost effective way for many utilities to come into compliance with these new requirements.[26]

[24] U.S. Department of Energy at 20.

[25] Oak Ridge National Laboratory at 21.

[26] United States Environmental Protection Agency at 20.

Table 1-4
Coal Mines to be Accessed by Powder River Basin Expansion Project

Mine Name	Recoverable Reserves	Annual Production (1996)	Annual Production (1997)	Annual Production (1998)	Permitted Annual Production Capacity 1996	Permitted Annual Production Capacity 1999	Coal Specifications		
							Btu/lb	% sulphur	% moisture
Caballo	585 mt	20.8 mt	19.9 mt	25.9 mt	24 mt	35 mt	8,500	0.38%	29.9
Belle Ayr	500 mt remaining	19.9 mt	22.7 mt	22.5 mt	23 mt	25[1] mt	8,549	0.30%	29.8
Caballo Rojo	355 mt	15.1 mt	*	*	30 mt	30 mt	8,450	0.32%	30.15
Cordero	350 mt	13.0 mt	*	*	24 mt	30 mt	8,350	0.37%	30.25
Coal Creek	NG	8.5 mt*	2.9 mt	7.1 mt	15 mt	18 mt	8,350	0.33%	30.0
Jacobs Ranch	250 mt	NG	27.1 mt	29.1 mt	35 mt	35 mt[1]	8,686	0.43%	27.93
Black Thunder	750 mt	NG	37.7 mt	42.7 mt	55 mt	55 mt[1]	8,800	0.34%	27.0
North Rochelle	189 mt	NG	0.0 mt	<0.1 mt	15 mt	20 mt	8,800-8,900	0.2%	26.0
North Antelope/ Rochelle Complex	1,375 mt	NG	59.9 mt	64.6 mt	70 mt	65 mt[1]	8,800	0.21-0.24%	27.2-28.0
Antelope	237 mt	12.0 mt	13.6 mt	19.4 mt	30 mt	30 mt	8,800	0.22%	26.5

* Reported as Cordero-Rojo Complex, total production of 28.1 mt (1997) and 37.0 mt (1998)
NG Information not given
MT Million tons
[1] Currently have permits on file with BLM to increase permitted production capacity to:

Belle Ayr -	45 mt	Black Thunder -	100 mt
Jacobs Ranch -	50 mt	North Antelope/ Rochelle -	75 mt
Black Thunder -	100 mt		

The lower cost of PRB coal and its environmental benefits have increased the demand for this coal source. Use of PRB coal provides an opportunity to help the utility industry meet the demands of the afore mentioned policies.[27] It provides a relatively inexpensive fuel that could help the utility industry meet its requirements under the CAAA.[28]

1.3.3 Increased Energy Demand

Consumption of energy in the United States has increased and is expected to continue to increase. Electric generation using coal is projected to increase from 1,796 billion Kilowatt-hours in 1997 to 2,298 billion Kilowatt-hours in 2020, a 1.1 percent annual increase (Table 1-5). Total electric generation is projected to increase from 3,192 billion Kilowatt-hours in 1997 to 4,450 billion Kilowatt-hours in 2020, a 1.5 percent annual increase. Electricity sales are projected to increase from 3,130 billion Kilowatt-hours in 1997 to 4,345 billion Kilowatt-hours in 2020, an annual increase of 1.4 percent, with sales in all sectors experiencing an increase. Additionally, national energy consumption is projected to increase from 69.0 quadrillion Btu[29] in 1997 to over 83.0 quadrillion Btu by 2020.

---

[27] Edison Electric Institute: Environmental Issues - Electric Utilities and Air Quality Issues. National Mining Association. Coal Production Continues to Grow. October 1998. Coal Statistics - National Mining Association - Salient Statistics of the Coal Mining Industry (1993-1998).

[28] U.S. Coal Supply & Demand: 1996 Review. B. D. Hong, Energy Information Administration, U.S. Department of Energy (Published in Mining Engineering, Vol.46, No.5, pp. 43-50. May 1994).

[29] British thermal units. Measure of heat where one Btu is equal to the amount of heat energy generated by the metabolism of approximately 252 calories in the human body.

Table 1-5
Projected Energy Generation, Sales, and Consumption

Electric Generation and Sales (Billion Kilowatt-hours)	Year							Annual Growth (%)
	1996	1997	2000	2005	2010	2015	2020	
Generation by Fuel								
Coal	1,745	1,796	1,931	1,976	2,046	2,151	2,298	1.1
Petroleum	72	82	101	36	28	26	24	-5.2
Natural Gas	278	299	338	649	919	1,213	1,349	6.8
Nuclear Power	675	629	659	630	554	419	359	-2.4
Pumped Storage	-2	-3	-1	-1	-1	-1	-1	-5.0
Renewable	379	389	375	381	388	401	420	0.3
Total	**3,147**	**3,192**	**3,403**	**3,672**	**3,934**	**4,208**	**4,450**	**1.5**
Sales by Sector								
Residential	1,082	1,072	1,175	1,262	1,341	1,446	1,557	1.6
Commercial	981	1,008	1,081	1,162	1,247	1,332	1,383	1.4
Industrial	1,030	1,033	1,059	1,130	1,211	1,280	1,339	1.1
Transportation	17	17	18	31	44	55	65	5.9
Total	**3,111**	**3,130**	**3,333**	**3,585**	**3,843**	**4,113**	**4,345**	**1.4**
Energy Consumption (Quadrillion Btu per year)								
Residential	19.25	18.99	20.04	20.47	21.11	21.91	22.85	0.8
Commercial	14.73	15.22	15.99	16.51	17.24	17.78	18.05	0.7
Industrial	34.85	34.79	36.03	37.51	39.41	40.84	42.14	0.8
Total	**68.83**	**69.00**	**72.06**	**74.49**	**77.76**	**80.53**	**83.04**	

Wyoming, with its extensive deposits of low cost, low-sulfur coal, is the nation's leading coal-producing state. From 1991 to 1995, Wyoming produced more coal each year than all interior coal states[30] combined, as well as more than all the other western coal states[31] combined.[32] Wyoming produced 193.9 million tons (mt) in 1991, increasing to 264.0 mt in 1995, slightly over 25 percent of the total U.S. coal production.[33] In 1996, Wyoming's coal production was 277.8 mt, approximately 26 percent of the U.S. total production[34] and in 1997, it increased to 282 mt, again approximately 26 percent of the U.S. total production.[35] The mines to which DM&E proposes to connect have a 1999 combined permitted capacity of 343 mt, with current applications for an additional 90 mt of capacity.[36] Growth in demand for Wyoming low-sulfur, low-ash coal has come from Midwestern markets, as well as eastern markets as far away as Alabama and Georgia.[37] The amount of coal actually consumed by electric utilities increased from 772.3 mt in 1991 to 829.2 mt in 1995.[38] When consumption for electrical power generation included independent power producers, the increase was from 777.2 mt in 1991 to 840.9 mt in 1995. Table 1-5 shows projected U.S. coal production through 2020.[39] Between 1996 and 2020, western coal production is projected to increase from 439 mt to 728 mt, an annual growth of 2.1

---

[30] Arkansas, Illinois, Indiana, Iowa, Kansas, western Kentucky, Louisiana, Missouri, Oklahoma, and Texas.

[31] Alaska, Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, Washington.

[32] Hong, B.D. 1996. Annual Review 1995: Coal Overview. Mining Engineering, Vol. 48, No. 5, pp 41-46. May, 1996.

[33] Ibid.

[34] Hong, B.D. 1997. Annual Review of 1996: Coal. Mining Engineering, Vol.49, No. 5, pp 43-50. May, 1997.

[35] Hong, B.D. 1998. Coal Industry Annual 1997. Executive Summary. Energy Information Administration, U.S. Department of Energy. Online at http://www.eia.doe.gov/cneaf/coal/cia/summary/cia_sum.html. November 18, 1998.

[36] U.S. Department of the Interior, Bureau of Land Management. Wyoming DEQ Permitted Production Capacities. Online at http://www.wy.blm.gov/minerals/coal/prb/pages/deq_aqd.html. March, 1999.

[37] Hong, B.D. at 32.

[38] Ibid.

[39] Department of Energy, Energy Information Administration. Annual Energy Outlook. Online at http://www.eia.doe.gov/cneaf/coal/quarterly. 1999.

percent. Consumption by electric generators is projected to lead other users, experiencing an annual growth of 1.0 percent and increasing from 897 mt in 1996 to 1,166 mt in 2020.

1.3.4 Increase Rail Capacity

Coal currently accounts for approximately 35 to 40 percent of the total rail commodity traffic in the United States.[40] Currently, the PRB is faced with the problem that transportation is not meeting existing production levels. The mines DM&E has identified to serve have a 1999 annual permitted production capacity of 343 million tons (Table 1-4), with applications to increase annual production by 90 million tons. The 1996 coal production at five of these mines (Caballo, Belle Ayr, Caballo Rojo, Cordero, and Antelope) was 131 million tons, yet only 80.8 million tons were shipped because of transportation problems.[41] In 1997, coal shipped from all these mines totaled 211 million tons, again well short (110 million tons) of even the 1996 total permitted capacity (321 million tons).

For the past five years, and despite continued capital spending, existing PRB coal carriers have consistently failed to meet guaranteed cycle times (the amount of time required to complete a full "cycle" from the mine to the utility and back to the mine for reloading). Existing PRB utility customers are today involved in litigation, alleging that their rail carriers have failed to meet their obligations to deliver coal.[42]

Rail capacity shortages and service failures have ripple effects on rail transportation throughout the country. Shortages in locomotive power to move grain and other goods can occur when railroad resources are diverted to transport coal and vice versa.[43] This results in problems for both coal and non-coal customers and further compounds capacity problems. DM&E believes that the additional rail capacity of a third PRB rail carrier would mitigate the impacts of both rail capacity shortages and rail service failures caused by shortages of rail resources during regional

---

[40] Railway Age. Published monthly by Simmons-Boardman Corporation. New York, New York. Monthly Industry Indicators Department. Weekly carload data by origin for major U.S. railroads.

[41] Hong, B.D. at 34.

[42] Empire District Electric Company v. Union Pacific Railroad, CV No. 197-1357CC (Circuit Court of Jasper County, Missouri). Energy Services, Inc. V. Union Pacific Railroad, No. 8:97CV00345,_F. Supp. 2d_, 1999 WL 51640 (D. Nebr. Jan. 28, 1999)

[43] U.S. Department of Agriculture. 1999. Grain Transportation Prospects. USDA/STB Grain Logistics Task Force. June, 1999.

catastrophes such as floods or snowstorms, which have halted rail traffic during periods of critical need, and during grain-hauling season, which is a market peak.

As a result of regulatory changes and an increasing demand for energy, the demand for PRB coal is projected to continue to increase (Table 1-5). To meet both current and projected demands, DM&E believes expansion of PRB rail capacity is needed.

1.3.5 Increase Rail Competition

Presently, only two railroads, UP and BNSF, serve the PRB. These railroads, either directly or through connections with other railroads, transport PRB coal to electric utility customers. However, the customer often has only single carrier access because 1) only one carrier serves a particular geographic market or 2) only one carrier offers a route direct enough to be economically competitive. That is, other carriers' routes from the PRB to the market are circuitous, resulting in increased mileage and transportation costs. In particular, utility customers on the east end of the movement have limited carrier choice because of circuitous routes. For example, while both BNSF and UP move coal out of the PRB, as a practical matter, only BNSF reaches the Great Lakes market because of the substantial additional mileage UP must transport coal, thus making it economically uncompetitive for UP in this market area.

Railroads charge customers according to the distance that goods are transported. For coal, the transportation charge is by the ton-mile (transporting one-ton of coal one mile).[44] The farther a ton of coal is transported, the greater the transportation cost. A coal-using utility must pay the mine for the coal and a railroad to transport it. Today, approximately two-thirds of the cost of PRB coal delivered to an electric generation plant is for transportation, with only one-third of its costs attributable to production.[45] When transportation routes are longer, the overall cost of the delivered coal increases. Thus, the advantages of PRB coal's low cost are offset by the transportation costs associated with increased transportation distance.

DM&E believes that the proposed project would increase rail competition by providing an additional rail carrier access to the PRB mines. DM&E's eastern connections with five other rail carriers could provide utilities access to a rail carrier with a shorter transportation route than their

---

[44] Surface Transportation Board at 8.

[45] Hong, B.D. Based on average mine price at U.S. Department of Energy. Average Mine Price of Coal by State, 1988, 1993-1997. Online Database: http://www.eia/doe.gov/cneaf/coal/cia/t80p01.txt as compared to average delivered cost of coal for utilities at U.S. Coal Supply & Demand: 1996 Review. B.D. Hong, Energy Information Administration, U.S. Department of Energy. (Published in Mining Engineering, Vol.46, No.5, pp.43-50. May, 1994).

current carriers. This additional access could change the competitive rail transportation dynamics for many utilities currently using PRB coal. Increased competition could result in reduced transportation costs, reducing total fuel costs for the generation of electricity. Reduced overall energy generation costs could then result in cheaper energy costs for the electrical consumer, including commercial, industrial, and residential users.

In addition to utilities within DM&E's target market areas, construction and operation of the proposed project may enable PRB coal producers to compete with the higher sulfur coal producers in the Appalachian and other eastern coal-producing regions. Because transportation costs for PRB coal are most of the delivered cost of the coal, in order for PRB coal to be competitive in Midwestern and eastern markets, transportation cost must be low enough so as not to offset the advantages gained by PRB coal's lower sulfur content.[46] Because much of the growth in demand for PRB coal has been from eastern utilities,[47] DM&E believes the shorter and more efficient routing and other efficiencies potentially provided by the proposed project, combined with the new CAAA requirements and utility deregulation, may enable eastern utilities relying on higher sulfur eastern coal to take advantage of the availability of cleaner PRB coal. Use of PRB coal by eastern utilities could help them comply with the CAAA[48] to meet the national policy of improved air quality through lower SO_2 emissions.

1.4 PROPOSED ACTION

The proposed PRB Expansion Project (Figure 1-1) would involve the construction and operation of approximately 300 miles of new rail line by DM&E and the rebuilding of approximately 600 miles of DM&E's existing main rail line.[49] The project would provide access for a third rail carrier to serve Wyoming's coal mines located south of Gillette and transport coal eastward from the PRB. New rail construction would include approximately 280 miles of rail line extending off DM&E's existing system near Wall, South Dakota, extending generally

---

[46] McDermott, David. 1997. Coal mining in the U.S. West: price and employment trends. Coal Mining Employment Trends. Monthly Labor Review. August 1997.

[47] Hong, B.D. at 31

[48] U.S. Department of Energy at 20.

[49] In its Application to the Board, DM&E identified a preferred alternative, which involved 280.9 miles of new construction and 597.8 miles of rebuild. Several alternatives to DM&E's preferred alternative exist. Since the Board has not yet approved an alternative for construction and operation, mileage figures for the proposed project have been rounded to include all possible alternatives and therefore reflect the approximate distances for the longest alternative. Thus, rounded mileage figures represent a maximum for the proposed project and may not total exactly.

southwesterly to Edgemont, South Dakota, and then westerly into Wyoming to connect with existing coal mines[50] located south of Gillette, Wyoming. These mines have an annual production capacity of 321 million tons (Table 1-4). The new rail line construction from the end of DM&E's existing rail line into the Powder River Basin would traverse portions of Custer, Fall River, and Pennington counties, South Dakota and Campbell, Converse, Niobrara, and Weston counties, Wyoming.

New rail construction would also include approximately 13.31 miles of rail line at Mankato, Minnesota, within Blue Earth and Nicollett Counties. DM&E currently has rail line on both sides of Mankato, accessed by trackage rights on rail line operated by UP. The proposed Mankato construction would provide DM&E direct access between its existing rail lines and avoid operational conflicts with UP.

The final proposed segment of new rail construction would involve a connection between the existing rail systems of DM&E and I&M Rail Link. The connection would include construction and operation of approximately three miles of new rail line near Owatonna, Steele County, Minnesota. The connection would allow interchange of rail traffic between the two carriers.

In order to transport coal over the existing system, DM&E proposes to rebuild approximately 600 miles of its existing rail line. The majority of this mileage would be along DM&E's rail line between Wall, South Dakota, and Winona, Minnesota. An additional approximately 5 miles of existing rail line near Smithwick, South Dakota, would also be rebuilt. Rail line reconstruction would include rail, tie, and ballast replacement, additional sidings, signals, grade crossing improvements, and other systems.

DM&E plans to transport coal over the new rail line extension as its principal commodity. However, shippers desiring rail access could ship other commodities in addition to coal over the new rail line. Existing shippers along the existing DM&E system would continue to receive rail service, with this service likely being improved over that currently available. Any new shippers along the existing DM&E rail line would also have reliable and efficient rail service available to them.

[50] The proposed project is intended to connect with the existing coal mines of Caballo, Belle Ayr, Caballo Rojo, Cordero, Coal Creek, Jacobs Ranch, Black Thunder, North Rochelle, North Antelope, Rochelle, and Antelope.

1.4.1 Construction

The proposed project would include construction of new rail line along a new rail right-of-way and the reconstruction or upgrade of existing rail line along existing rail right-of-way. All new construction and rebuild activities would follow methods approved by the American Railway Engineering and Maintenance of Way Association (AREMA).[51] Following is a discussion of how construction of new rail line would occur. The text primarily describes the new construction of the rail line extension in South Dakota and Wyoming. New construction in Minnesota would be similar in nature, but limited to the 13.31 mile new rail line proposed near Mankato, Minnesota. The procedure for rebuilding the existing rail line is also discussed.

New Construction[52]

New construction of the rail line extension in South Dakota and Wyoming would occur along new right-of-way. New rail line would be designed for 315,000-pound rail cars, operating in 135-car, with either three 6,000 horsepower locomotive or four 4,400 horsepower locomotives.[53] The trains will be approximately 7,400 feet (1.4 miles) in length. Locomotives would be distributed throughout the train, with two in series at the lead and the third located either at the end of the train or located approximately two-thirds of the way from the front of the train. If four locomotives are used, three would be in a series at the lead and the fourth either at the end or two-thirds of the way from the front of the two. Maximum operating speed on the new rail line would be 49 miles per hour (mph) for empty coal trains and other commodity trains and 45 miles per hour for loaded coal trains. The new rail line would consist of 136-pound, continuously welded rail. Ties would be wood spaced at 19.5 inches or concrete spaced at 24 inches. Maximum grade for the rail line would be 1.0 percent along tangent (straight) sections and 1.0 percent compensated (grade reduction to account for additional drag forces created when a train makes a turn) on curves.

---

[51] American Railway Engineering and Maintenance of Way Association. 1999. Manual for Railway Engineers. Volumes I and II. Published by Railway Engineering and Maintenance of Way Association; 8201 Corporate Drive, Suite 1125, Landover, Maryland 20785-2230.

[52] Based on information contained in DM&E's Application and in supplemental information provided by DM&E at the request of SEA.

[53] This would be the maximum operating capacity of the rail system. Because large portions of other rail carriers' existing systems could not currently accommodate such trains, initial trains operating on the system would use 115-cars (approximately 6,400 feet long) consisting of 286,000-pound cars. As other carriers' systems are upgraded, DM&E would be able to utilize the heavier capacity rail cars.

If construction is approved, the right-of-way would be acquired and fenced. The right-of-way width for new rail line would be a minimum of 200 feet, centered on the rail line in most areas. In areas requiring significant cut or fill, additional right-of-way may be required to maintain rail bed sideslopes. The construction area for the right-of-way would be restricted to the permanent right-of-way plus an additional 20 feet on either side of the permanent right-of-way's outer boundaries. Fence construction, drainage, firebreaks, and access, together with the grading footprint, would all be within the permanent right-of-way.

On lands administered by the USFS, an easement would be granted, and the easement would be fenced. On lands administered by the BLM, a right-of-way would be granted and fenced. The width of the easement and right-of-way would be approximately 200 feet, centered on the rail line in most areas. In areas requiring significant cut or fill, additional width of the easement or right-of-way may be required to maintain rail bed sideslopes. The construction area for the easement or right-of-way including fence construction, drainage, firebreaks, and access, together with the grading footprint, would all occur within the boundaries of the easement or right-of-way. Construction permits would be required for additional construction areas which would be located outside the easement or right-of-way boundaries.

Rail line construction would likely occur at several locations simultaneously, starting with bridge and crossing construction. Five to seven bridge construction crews, consisting of approximately 50 workers, could be working simultaneously, constructing bridges, culverts, cattle guards, and road, livestock, and wildlife crossings. Cranes, dozers, and front-end loaders would be typical equipment used. Much of the construction would involve placement of precast, concrete structures. The site would be prepared and the precast structures installed or cast structures formed and poured. Bridge and crossing construction would likely occur year-round. DM&E has indicated a precast concrete plant and staging yard could be established in Edgemont, South Dakota. Equipment and materials would be delivered by rail to this facility and construction crews would work east and west from Edgemont.

Construction and preparation of the rail bed would occur following bridge and crossing construction. As with bridges and crossings, five to seven crews of approximately 50 workers each would be working on the rail bed at different locations simultaneously, working east and west from Edgemont. Because of the variable nature of area topography, gently rolling to steeply sloped, and the need to maintain a grade slope of 1.0 percent or less, significant cut and fill would be necessary along some sections of the rail line. Cut and fill would be accomplished using heavy earthmoving equipment such as scrapers, dozers, power shovels, draglines, front-end loaders, and belly-dump trucks. Blasting in some areas could be necessary as part of cut activities. Cut material would be used for fill in other locations, where practical. Efforts would be made to supply fill requirements with excess material from adjacent cuts. However, haul distances

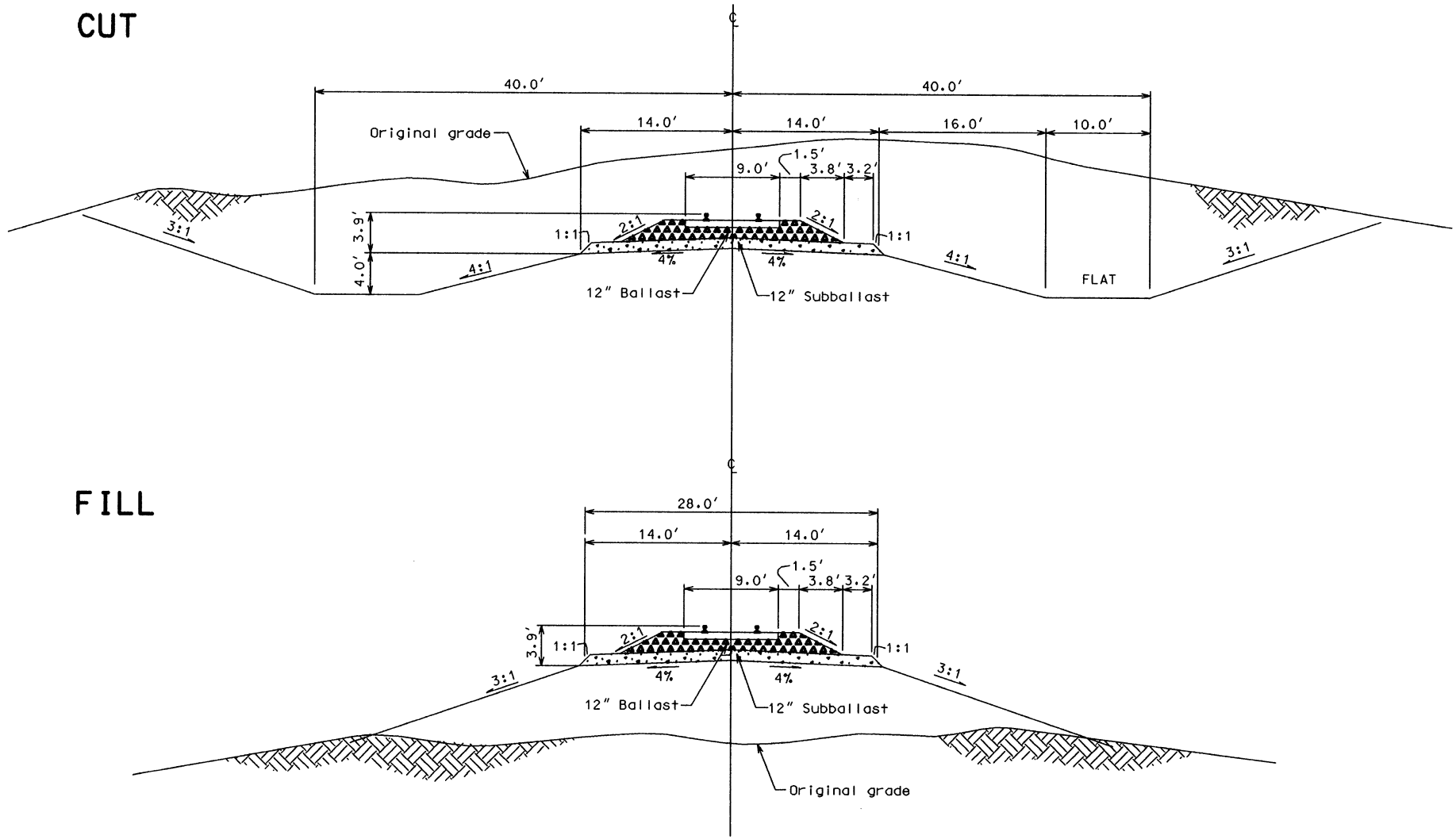
between cut and fill areas or additional fill requirements may require borrow areas to be found outside the rail right-of-way for access to fill material in closer proximity to fill areas. Additionally, extra right-of-way may be required to dispose of cut material if it is not usable in other areas because of its composition or haul distance. Borrow areas located on USFS lands would require establishment of need and acquisition of a mineral material sale permit.

New rail bed construction would be accomplished using earthmoving and grading equipment, including bulldozers, scrapers, and dump trucks. Existing vegetation would be cleared and disposed of according to landowner requests and appropriate Federal, state, and local requirements. The right-of-way would be grubbed and topsoil removed and stockpiled for later revegetation. Gravel and other materials required for the rail bed would be acquired from local sources to minimize haul distances. Subgrade material would be acquired within the permanent right-of-way or trucked from source areas. Subgrade material would be installed and compacted to provide a stable, raised bed 28 feet in width, composed of gravels and soils upon which ballast, ties, and rail would be laid (Figure 1-6).

During earthmoving activities, water trucks would be used to water the right-of-way and haul roads to help control dust. Water would also be applied to fill material to aid in compaction. Water would be moved along the right-of-way using irrigation piping and stored in pits along the right-of-way throughout the construction area. Water is anticipated to be obtained primarily from private stock ponds and wells, with the owners being compensated for the water used. Some water would be withdrawn from the Cheyenne River, if the water is available and appropriate regulatory approvals are obtained.

Areas adjacent to the rail bed which are disturbed during construction would be graded as necessary and stockpiled topsoil spread over the area. Disturbed areas would be reseeded and mulched as necessary to help maintain soil stability and protect the seed until the seed can germinate and vegetation becomes established. All seed mixes and mulch applied on USFS lands would be subject to USFS approval. Water trucks or the temporarily constructed water transport system could be used, if necessary, to water revegetated areas until sufficient ground cover is established.

Following preparation of the subgrade, subballast material would be placed on the subgrade and compacted to a depth of 6 to12 inches. Ties and continuous welded rail would be laid on the subgrade and welded in place. Signal and communication facilities would be installed. Ballast would be brought in by bottom-drop rail cars. The rail and tie sections would be lifted by rail-mounted tamping equipment and ballast dumped on the subgrade and around the ties. Ballast would be compacted into place using tamping equipment to a minimum depth of 8 to 12 inches below the tie. Additional ballast would be used in curves that would require super-elevation of



SOURCE: DM&E

Figure 1-6

POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL NEW TRACK SECTION

the track. Following ballast compaction, the alignment would be inspected and any flaws corrected. A typical cross section of the rail bed is shown in Figure 1-6. Figures 1-7 to 1-14 show typical wetland, bridge, culvert, and livestock crossing structures stream and channel change details for this project. All new materials would be used for subballast, ballast, ties, and rails.

It is likely that some roads and bridges in the project area would be inadequate to handle the traffic and equipment required for construction of this project. DM&E would coordinate with the agency responsible for maintenance of each specific road (anticipated to be the State Departments of Transportation, USFS, and BLM) to develop and implement bridge and roadway requirements suitable for continued and safe use of roads accessing the construction areas. DM&E would be responsible for any material damage to roads caused by excessive use and will be responsible for access to construction areas during construction periods.

Completion of construction is anticipated to take three construction seasons. Bridge and crossing construction would occur year-round. However, earthwork could not be done when the ground is frozen, generally limiting rail bed construction from April 1 to November 1. Construction crews would work double shifts, between 7 a.m. and midnight, six days a week. Equipment maintenance crews would work from midnight to 7 a.m.

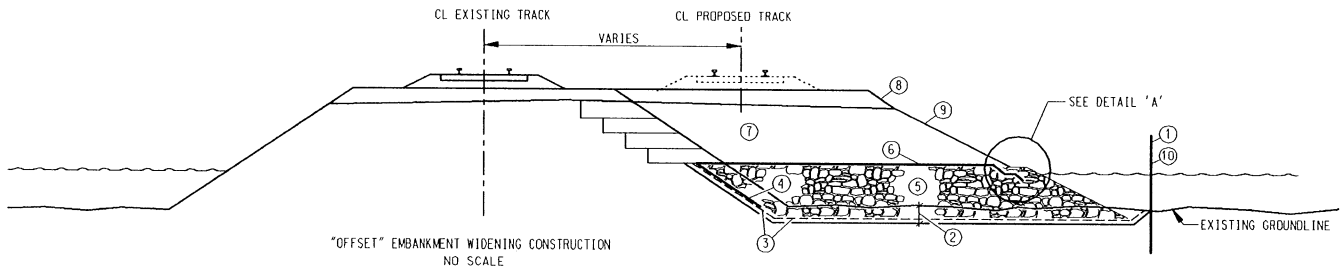
Rebuild Construction[54]

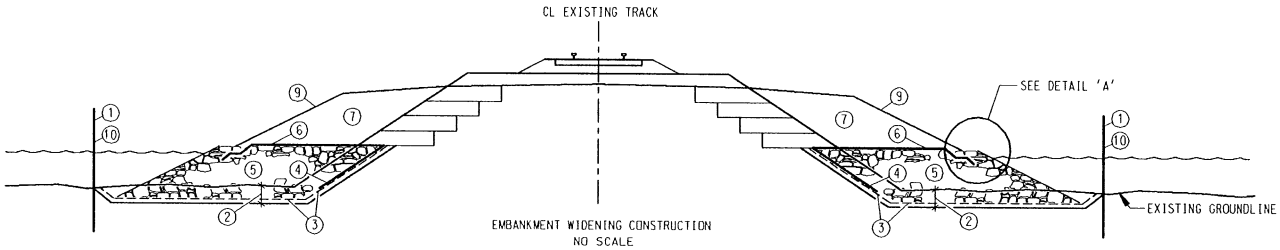
Because of years of deferred maintenance, much of DM&E's existing system is in poor condition.[55] DM&E has indicated in its Application that its existing system operates as either excepted track,[56] or under speed restrictions (some as slow as 5 miles per hour with 40 miles per hour being the maximum allowed on the system), and generally limited to 263,000-pound cars (286,000 pound cars are considered the industry standard). Existing rail generally ranges from 72

[54] Based on information contained in DM&E's Application and in supplemental information provided by DM&E at the request of SEA.

[55] Surface Transportation Board at 8.

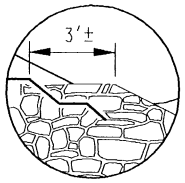
[56] Track lines designated by railroads as "excepted" are exempt from compliance with minumum requirements for roadbed, track geometry and track structure. The excepted track provision, which has been part of the track safety regulations for more than 15 years, permits railroads to conduct limited, slow-speed operations over substandard trackage on low density lines where it is unlikely that a derailment would endanger anyone along the right-of-way.





CONSTRUCTION SEQUENCE:

1. Install a turbidity cutoff wall, such as a tight sheeting (sheet pile) retainage wall, silt fence or acceptable alternative cutoff to prevent water that becomes turbid during construction operations from impacting wetland waters.
2. Excavate upper 6" ± of highly organic soil from base of area to receive rock stabilization material.
3. Install geogrid over the bottom and sides of the excavation and up to a level a minimum of 6" above the Existing static water level in the wetlands. Geogrid will be installed transverse to the track alignment with adjacent strips overlapping in accordance with recommendations provided by the manufacturer.
4. Filter fabric will be placed on the existing embankment slope overlapping the geogrid that extends above the toe of slope and covering the remainder of the embankment surface up to a level a minimum of 6" above the existing static water level in the wetlands.
5. Place subgrade stabilization rock over the geogrid and filter fabric in horizontal layers using techniques that provide optimum density and minimum voids. The height from which the rock is dropped into place should be less than that specified by the geogrid/filter fabric manufacturer to avoid damaging those materials.
6. Install filter fabric atop the stabiliization rock and key into the rock at the outside shoulder point as detailed.
7. Construct compacted cohesive embankment fill extending from the filter fabric capped rock suface to proposed embankment subgrade level.
8. Construct compacted subballast on subgrade ("OFFSET" widening only).
9. Revegetate exposed earthen embankment surfaces.
10. Remove turbidity cutoff wall.

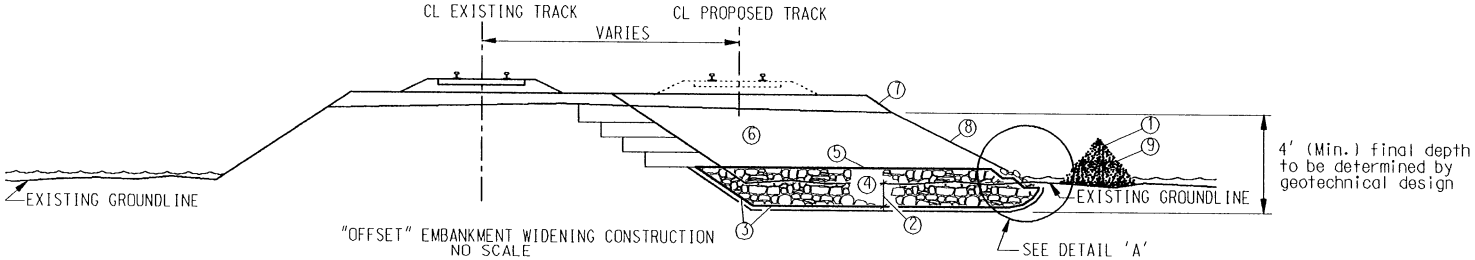


DETAIL A
NO SCALE

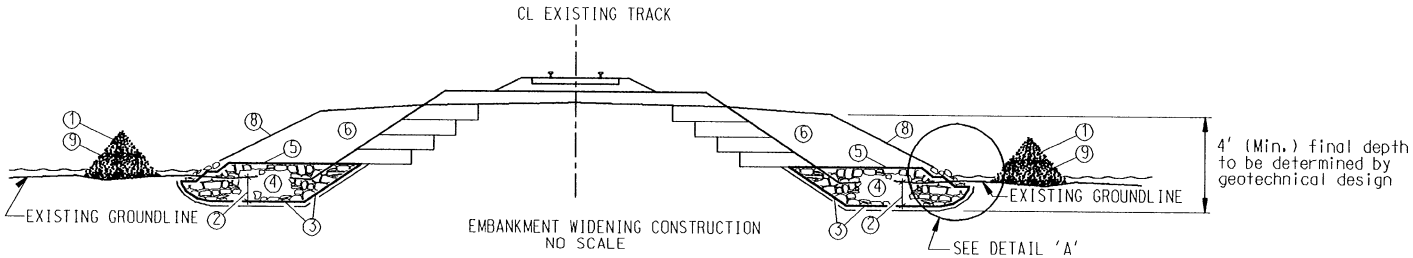
SOURCE: DM&E

Figure 1-7

POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL WETLAND EMBANKMENT CONSTRUCTION
WATER DEPTH GREATER THAN 1 FOOT



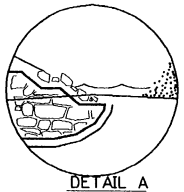
"OFFSET" EMBANKMENT WIDENING CONSTRUCTION
NO SCALE



EMBANKMENT WIDENING CONSTRUCTION
NO SCALE

CONSTRUCTION SEQUENCE:

1. Install a turbidity cutoff wall, such as a silt fence, a windrow of sand-gravel filter material, or a tight sheeting (sheet pile) retainage wall to prevent water that becomes turbid during construction operations from impacting the adjacent wetland waters.
2. Excavate subgrade soils to a depth required to attain firm natural foundations materials, or accomodate construction of an embankment section having a "minimum" 4 foot thickness/ depth (final depth to be determined by geotechnical design).
3. Install filter fabric over the bottom and sides of the excavation, and up to a level a minimum of 6" above the existing static water level in the wetlands. Filter fabric will be installed transverse to the track alignment with adjacent strips overlapping in accordance with recommendations provided by the manufacturer.
4. Place subgrade stabilization rock over the geogrid or filter fabric in horizontal layers using techniques that provide optimum density and minimum voids. The height from which the rock is dropped into place should be less than that specified by the filter fabric manufacturer to avoid damaging this material.
5. Install filter fabric atop the stabiliization rock and key into the rock at the outside shoulder point as detailed.
6. Construct compacted cohesive embankment fill extending from the filter fabric capped rock suface to proposed embankment subgrade level.
7. Construct compacted subballast ("OFFSET" widening only)
8. Revegetate exposed earthen embankment surfaces.
9. Remove turbidity cutoff wall. If windrow is used, grade back against embankment.

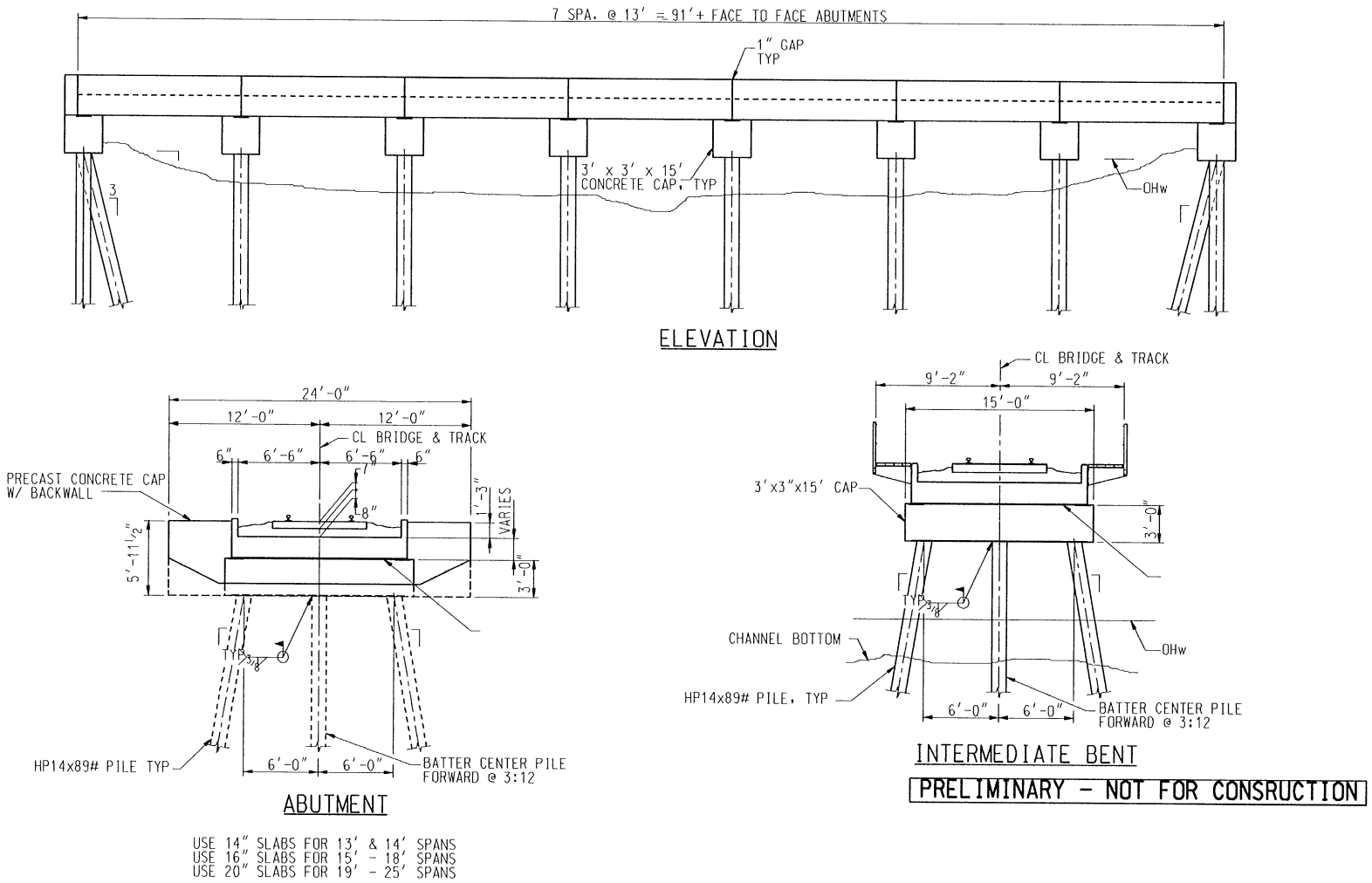


DETAIL A
NO SCALE

SOURCE: DM&E

Figure 1-8

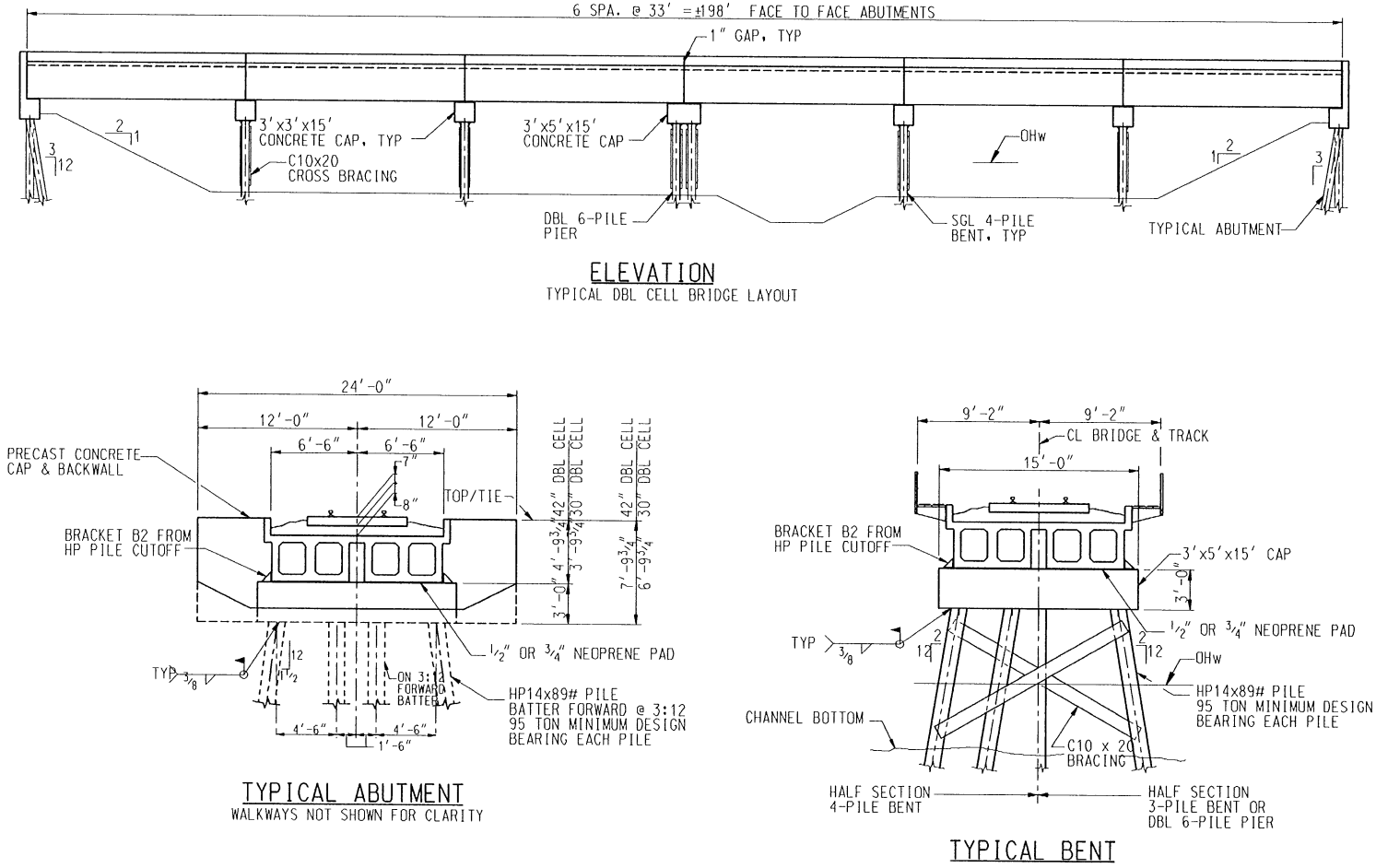
POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL WETLAND EMBANKMENT CONSTRUCTION
WATER DEPTH LESS THAN 1 FOOT



SOURCE: DM&E

Figure 1-9

POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL PRECAST SLAB BRIDGE DETAILS

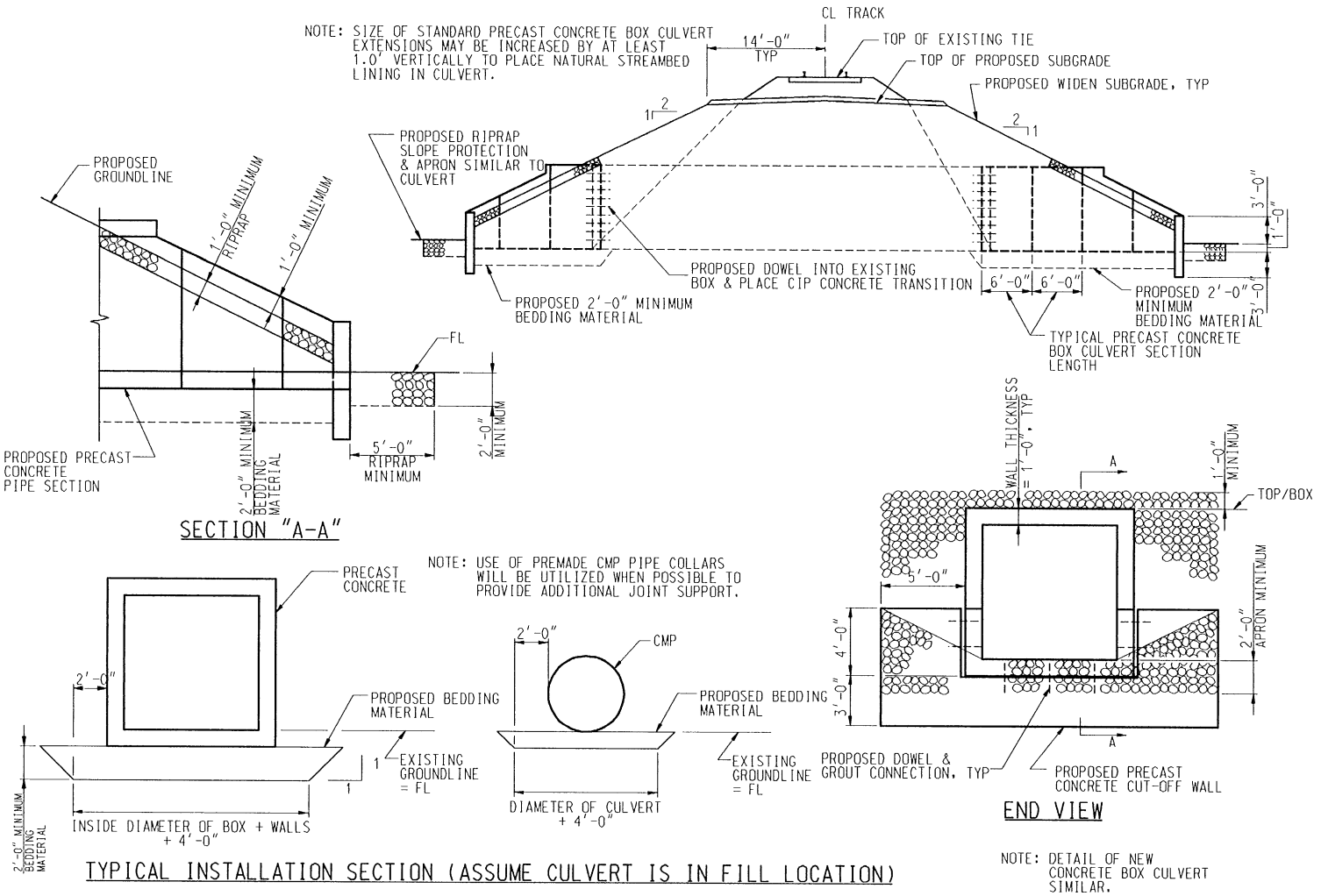


PRELIMINARY - NOT FOR CONSRUCTION

SOURCE: DM&E

Figure 1-10

POWDER RIVER BASIN EXPANSION PROJECT TYPICAL PRECAST DOUBLE CELL BRIDGE DETAILS

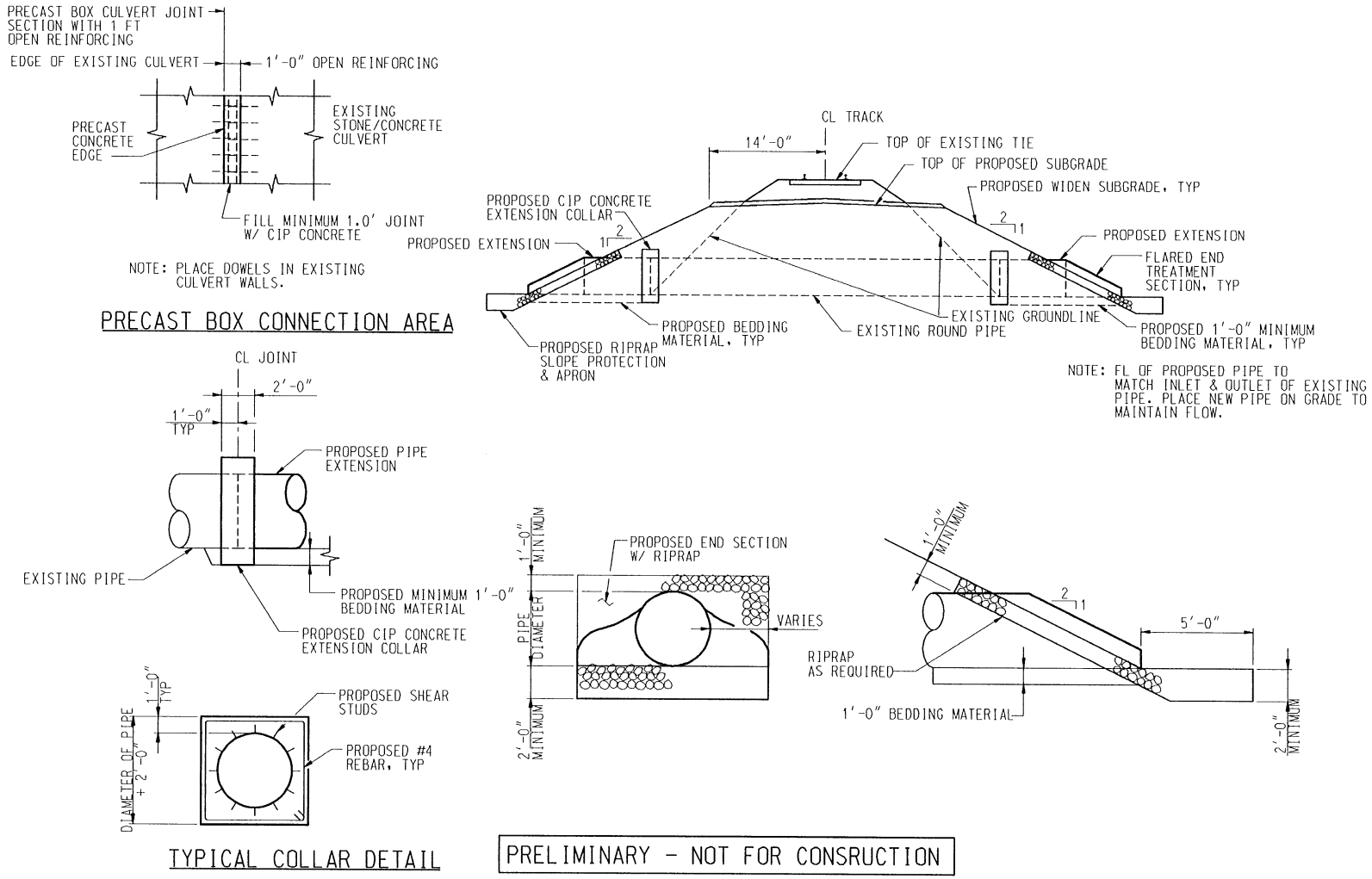


PRELIMINARY - NOT FOR CONSRUCTION

SOURCE: DM&E

Figure 1-11

POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL LARGE BOX CULVERT (UP TO 12' X 12')

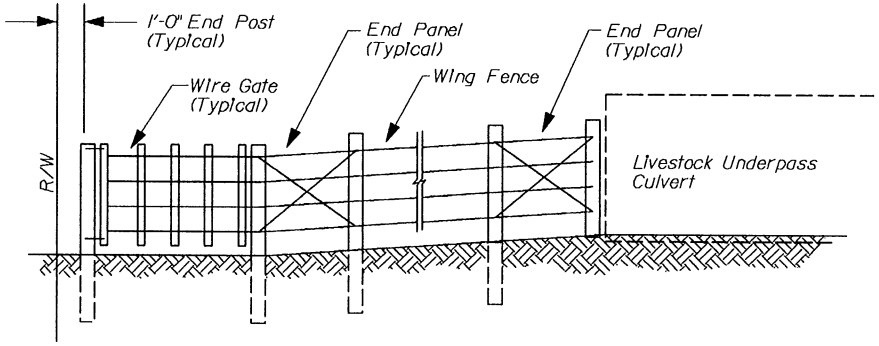


SOURCE: DM&E

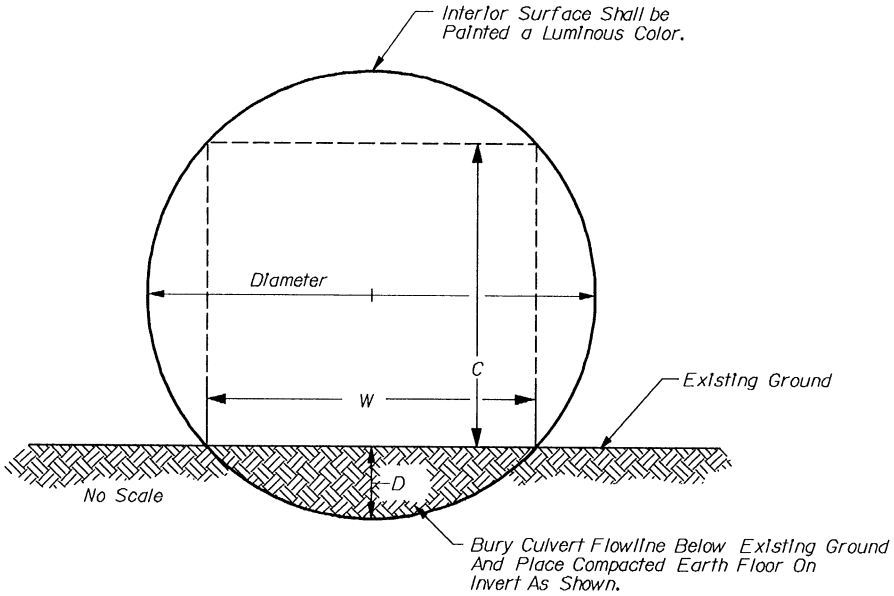
Figure 1-12

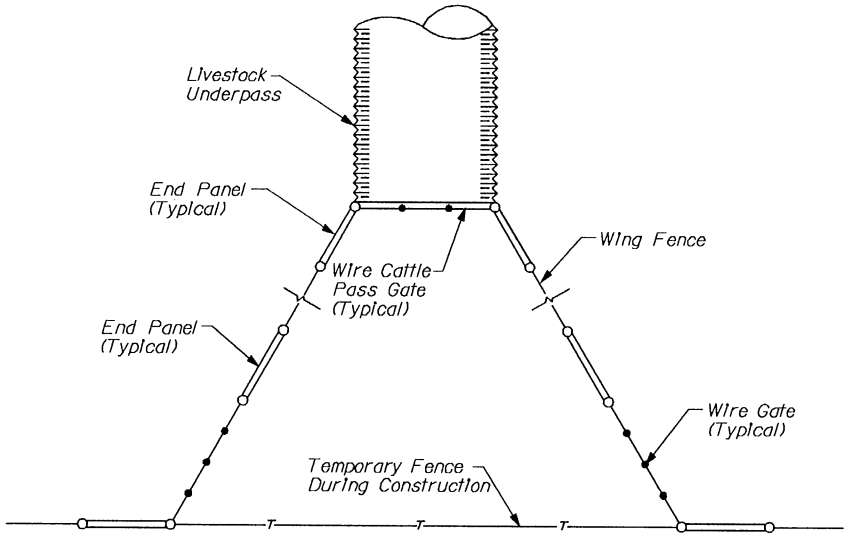
POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL ROUND CULVERT

Diameter	84"	90"	96"	102"	108"	120"
Depth, D	8"	8"	6"	6"	6"	12"
Width, W	4.1'	4.3'	3.9'	4.0'	4.1'	6.0'
Clearance, C	5.7'	6.2'	7.0'	7.5'	8.0'	8.0'



ELEVATION
No Scale





PLAN VIEW
No Scale

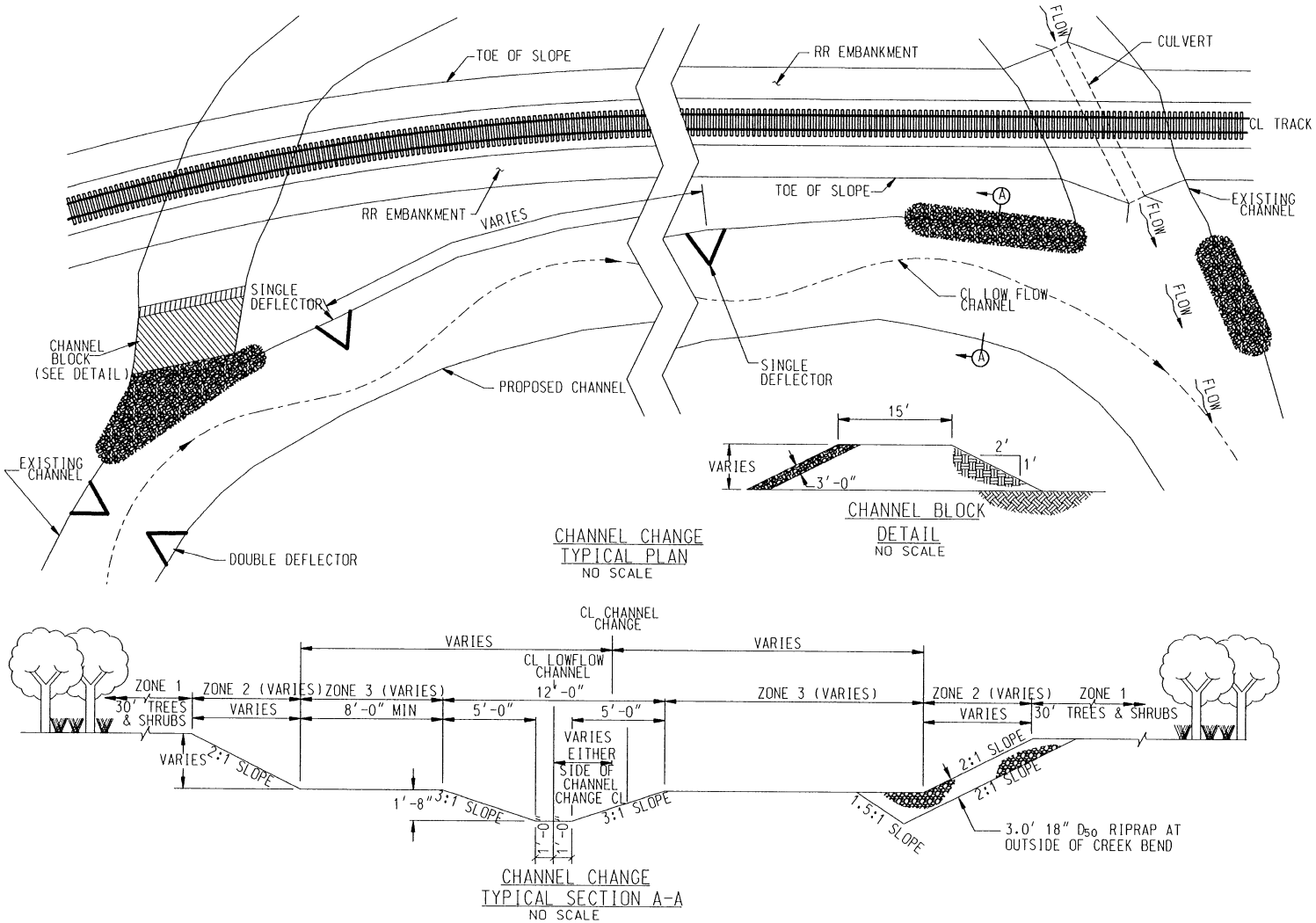
WING FENCE

SOURCE: DM&E

* STRUCTURE FOR THE SOLE PURPOSE OF MOVEMENT OF LIVESTOCK UNDER RAIL LINE. OTHER STRUCTURES SUCH AS CULVERTS OR BRIDGES CONSTRUCTED FOR OTHER PURPOSES MAY ALSO ALLOW FOR LIVESTOCK UNDERPASS.

Figure 1-13

POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL LIVESTOCK UNDERPASS*



SOURCE: DM&E

Figure 1-14

POWDER RIVER BASIN EXPANSION PROJECT
CHANNEL CHANGE DETAILS

to 100 pounds,[57] much of which is still jointed rail and as old as 100 years. DM&E also feels the existing system has limited sidings and other facilities such as maintenance yards, crew-change sites, and switching yards. Main line transit time averages approximately 150 hours (over 6 days), with rail car cycle times being approximately 12 days. DM&E believes reconstruction of the existing system is necessary to facilitate safe and efficient transport of existing train traffic as well as unit coal trains.

The reconstruction of the existing DM&E rail line from Wall, South Dakota eastward to Winona, Minnesota, would occur in such a way as to enable the rail line to be kept largely operational during the reconstruction period. Sections of the rail line would be taken out of service for 12 to 24 hours, as is standard industry practice for rail line construction and maintenance. Reconstruction of the existing rail line would occur at several locations simultaneously. Some portions of the rail line would be closed to train traffic for a short period, but closures could be scheduled around lower train traffic times, such as before crops are harvested.

The majority of the existing rail bed is suitable for rebuilding the existing rail line to standards acceptable for 315,000-pound rail cars. While all the rail line would have the rail, ties, and ballast replaced, it is currently estimated that approximately 20 percent (approximately 120 miles) of the existing rail bed subgrade[58] would require earthwork to improve its condition and suitability for the proposed project. In areas where subgrade or subballast work would be required, the rail line would be taken out of service; the ballast, ties, and rail removed; and suitable equipment brought in to repair the damaged or deteriorated sections of subgrade and/or subballast. Following reconstruction of the rail bed, new ballast, ties, and rail would be installed as discussed above under new construction.

For the majority of the rail line, no major rework of the subballast or subgrade would be necessary. Reconstruction of the existing rail line would be accomplished largely by rail-mounted equipment or equipment operating within the existing rail right-of-way. Sections of rail and ties would be removed by rubber-tired or rail-mounted equipment (such as boom trucks, cranes or rail change-out equipment) and loaded onto rail flat cars. Ballast would be removed by front-end

---

[57] Rail of a particular size is described by how much one yard (36 inches) of it weighs. Therefore, 100-pound rail indicates one yard of that size rail weighs 100 pounds. As rail car capacities have increased, the size of rail has also increased.

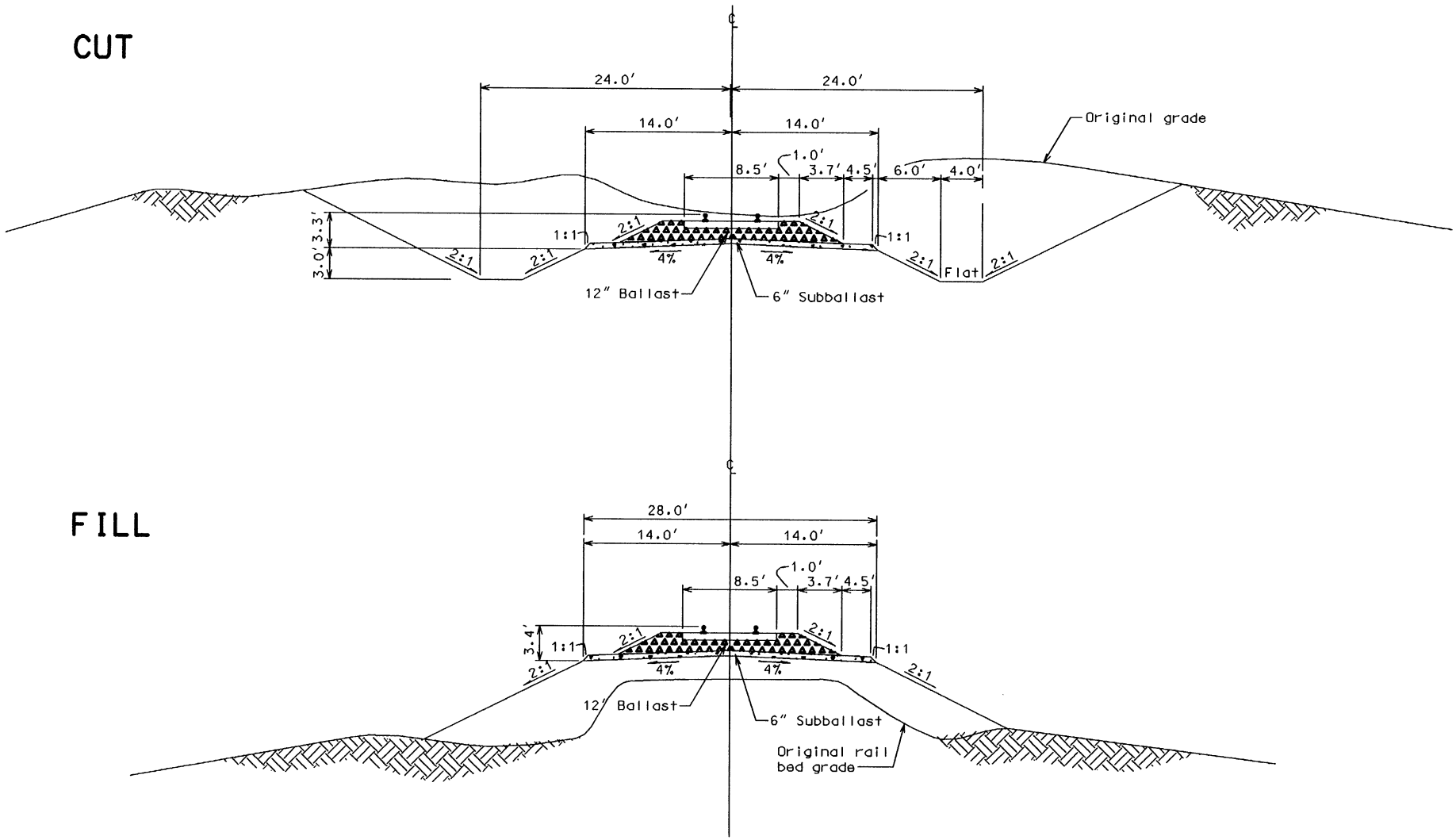
[58] The subgrade is the earthen or fill portion of the rail bed upon which the subballast material is placed. Ballast is placed over the subballast.

loaders and hauled off in dump trucks or rail cars, but more commonly would be incorporated into the existing subgrade. Because of the deteriorated condition of DM&E's system, it is unlikely much of the rail, ties, or ballast could be reused. Rail and ties of acceptable quality may be stockpiled for use along other sections of DM&E's system or in the construction of sidings. However, most of the material removed would be sold for scrap or disposed of consistent with environmental regulations.

Installation of new ballast, rail, and ties would be accomplished as described for the new construction. All new materials would be used, including 136-pound, continuously welded rail, wood or concrete ties, and special fasteners in curves. A typical cross section of the rebuilt rail bed is shown in Figure 1-15. Figure 1-16 provides a typical replacement bridge structure.

Numerous sidings (35 to 45) would be constructed along the existing rail line to accommodate the additional rail-mounted equipment necessary for rebuilding the existing rail line and providing for continued rail service along the rail line. Sidings would be located within existing rail right-of-way, to the fullest extent possible, thus their locations would generally be limited to those areas where a sufficient right-of-way width, approximately 150 to 200 total feet, is available. Sidings would be constructed in similar fashion to other track construction, with earthmoving equipment expanding the existing rail bed to accommodate a siding and rail line track laid as previously discussed. Typical cross sections of sidings are shown in Figures 1-17 to 1-20. Additional sidings that would be necessary for operation of the system following completion of the rebuild would be constructed during the rebuild process. Initially, the number of sidings and their locations would be established based on DM&E's existing train traffic and the addition of 40 million tons of coal annually. As coal transport increases to the projected 100 million tons annually, sidings would be lengthened or additional sidings would be added to accommodate traffic increases. Under the scenario of annual transport of 100 million tons of coal, sidings would be approximately 3 to 7 miles long and spaced approximately 12 to 25 miles apart to accommodate passing trains over the entire rail line, including the new rail line in South Dakota and Wyoming. Additionally, DM&E would upgrade many of its existing sidings and facilities serving its existing customers. Sidings would be designed to allow entry of trains from the rail line at 40 miles per hour.

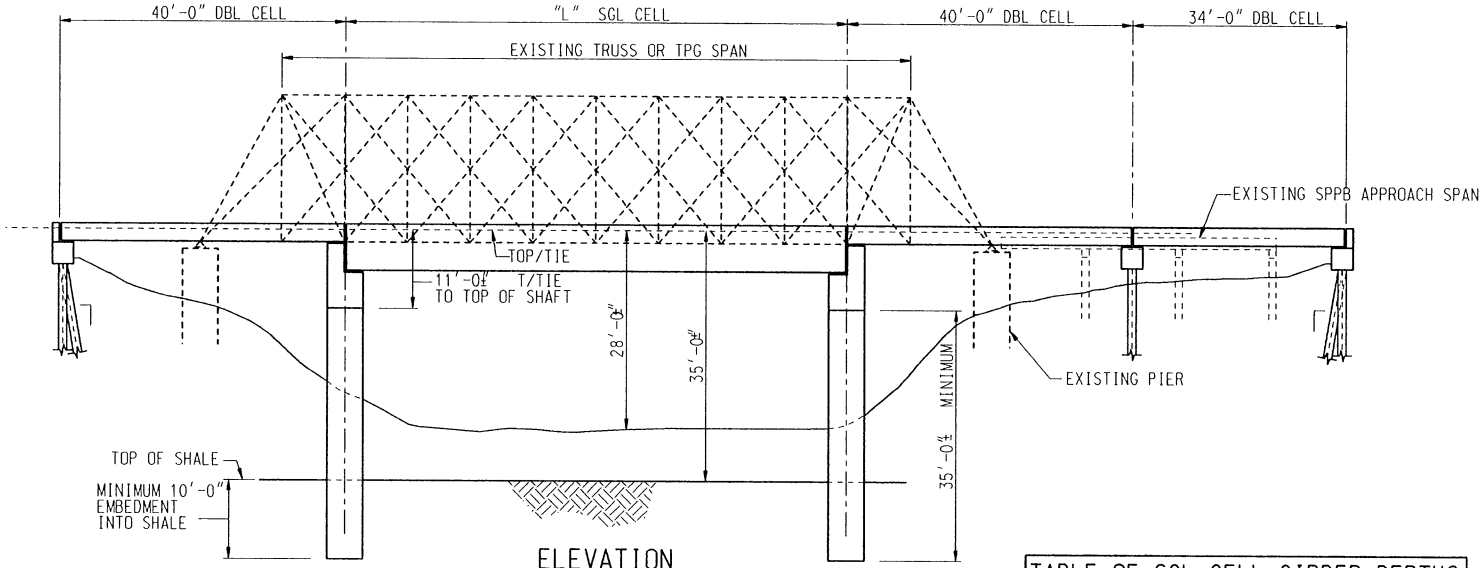
Installation of grade crossings and crossing protection would be the same as for new construction. Completion of the reconstruction of the existing rail line is anticipated to take two construction seasons, generally occurring during the period between April 1 and November 1.



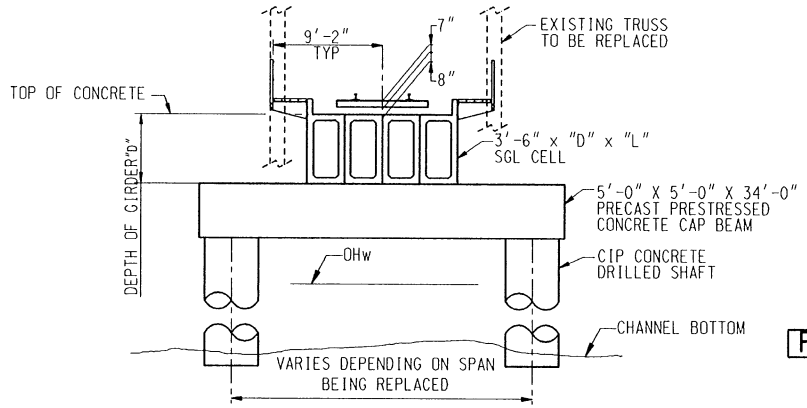
SOURCE: DM&E

Figure 1-15

POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL EXISTING TRACK REBUILT SECTION



ELEVATION
SCALE: 1"=20'-0"



TYPICAL INTERMEDIATE PIER
SCALE: 1"=10'-0"

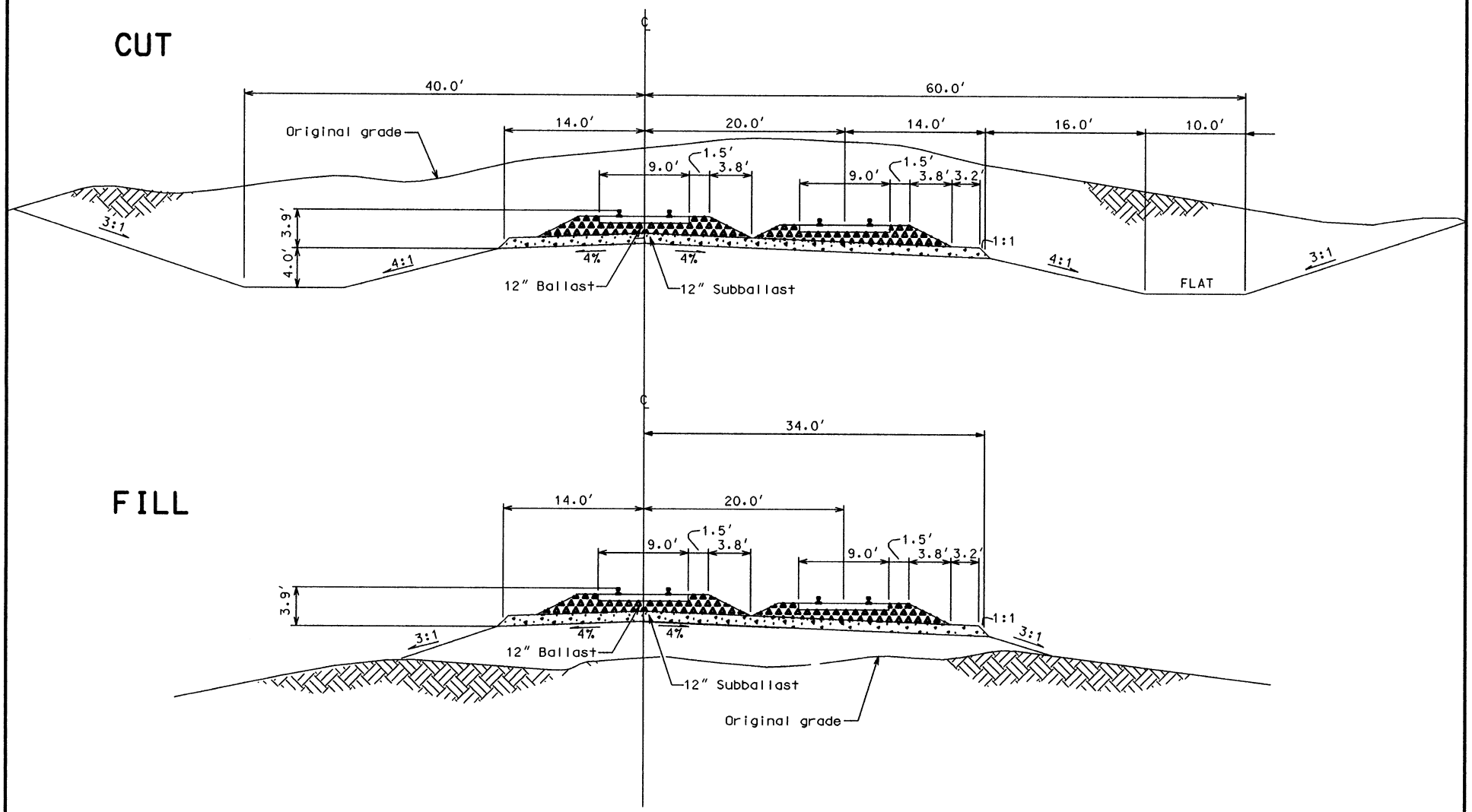
TABLE OF SGL CELL GIRDER DEPTHS	
"L" LENGTH OF GIRDER	"D" DEPTH OF GIRDER
45'-0"	48"
50'-0"	63"
60'-0"	72"
70'-0"	84"
80'-0"	90"

PRELIMINARY - NOT FOR CONSRUCTION

SOURCE: DM&E

Figure 1-16

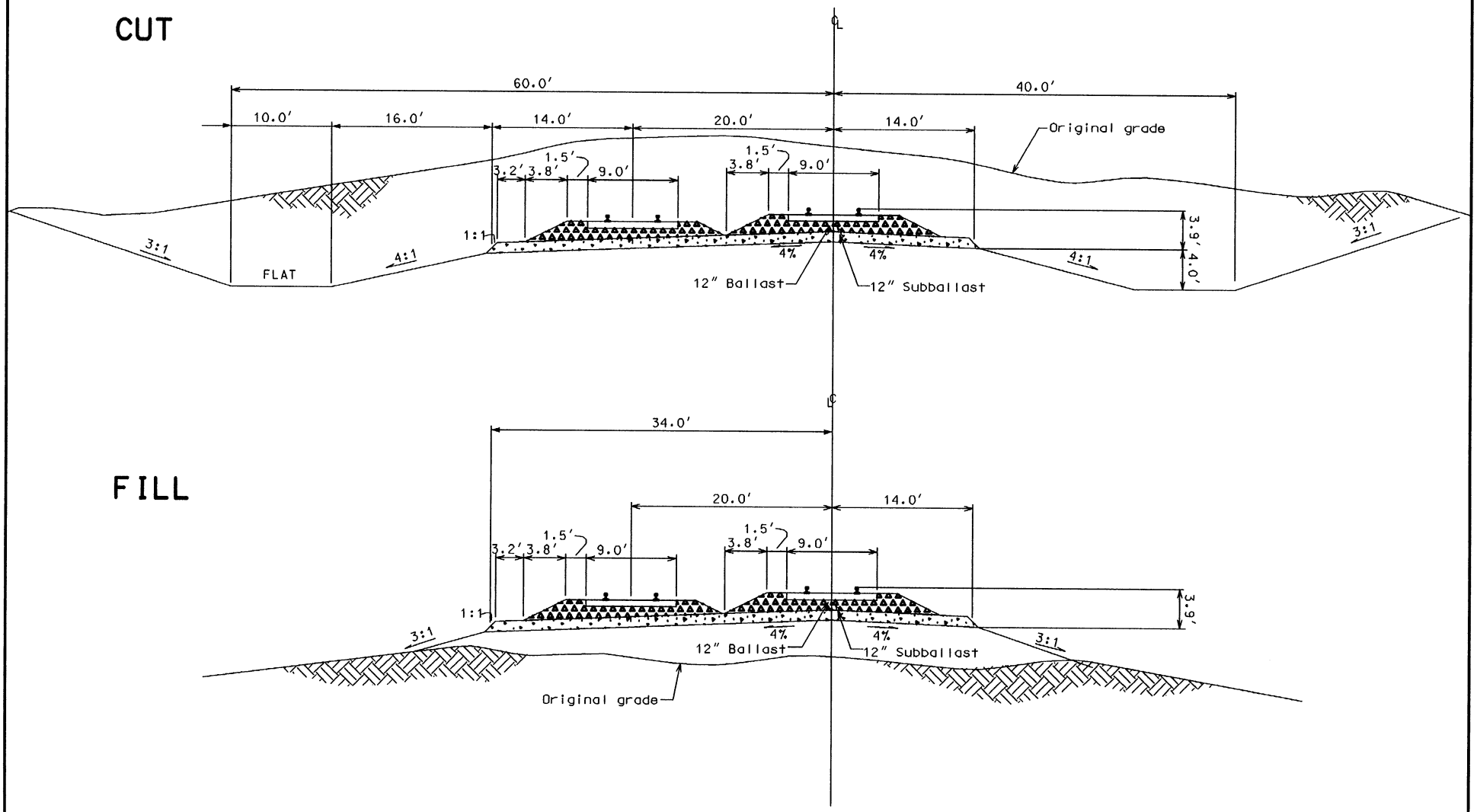
POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL DOUBLE DRILLED SHAFT
STRUCTURES FOR REPLACING EXISTING BRIDGES



SOURCE: DM&E

Figure 1-17

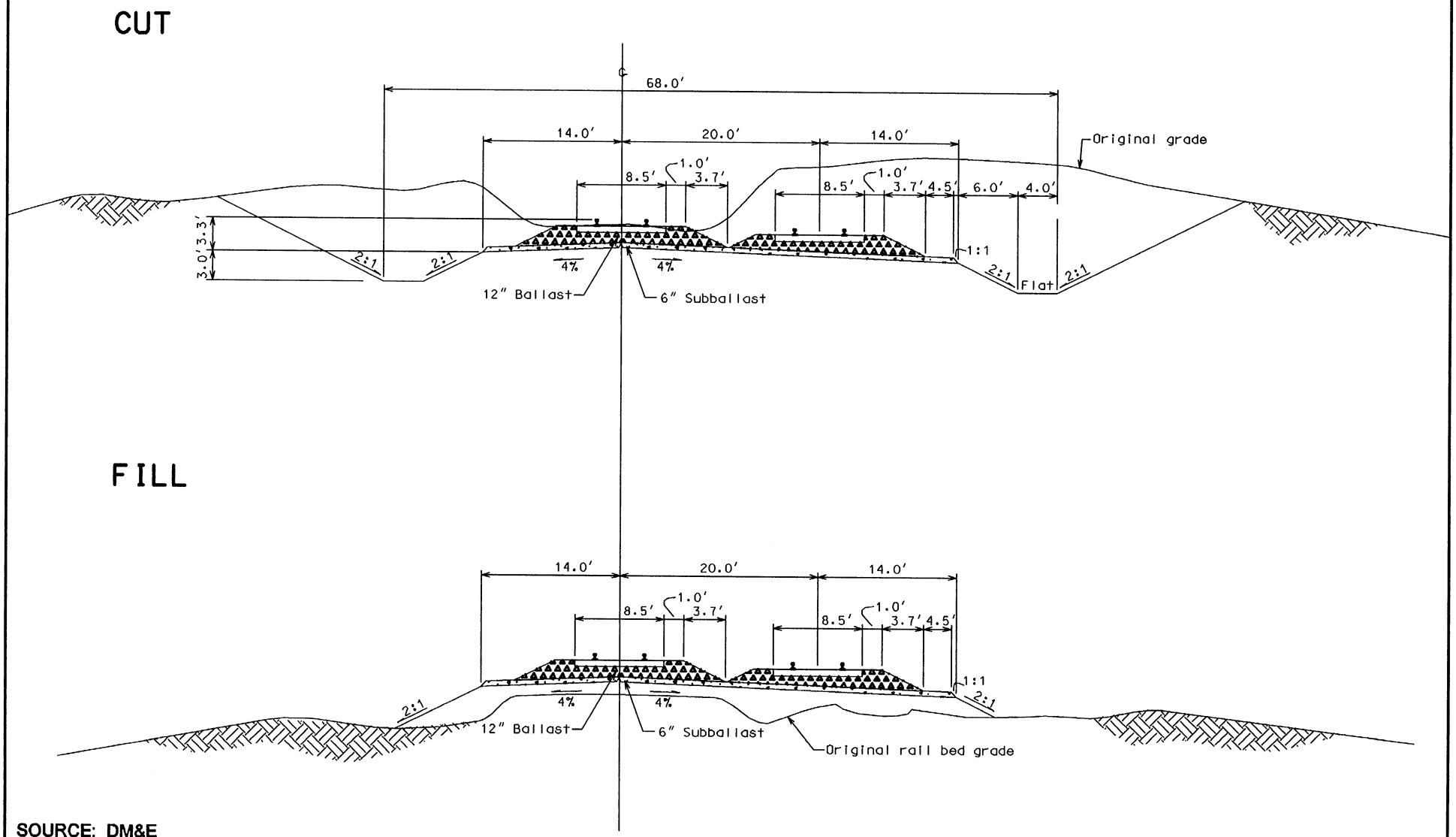
POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL NEW TRACK SECTION
WITH NORTH SIDING



SOURCE: DM&E

Figure 1-18

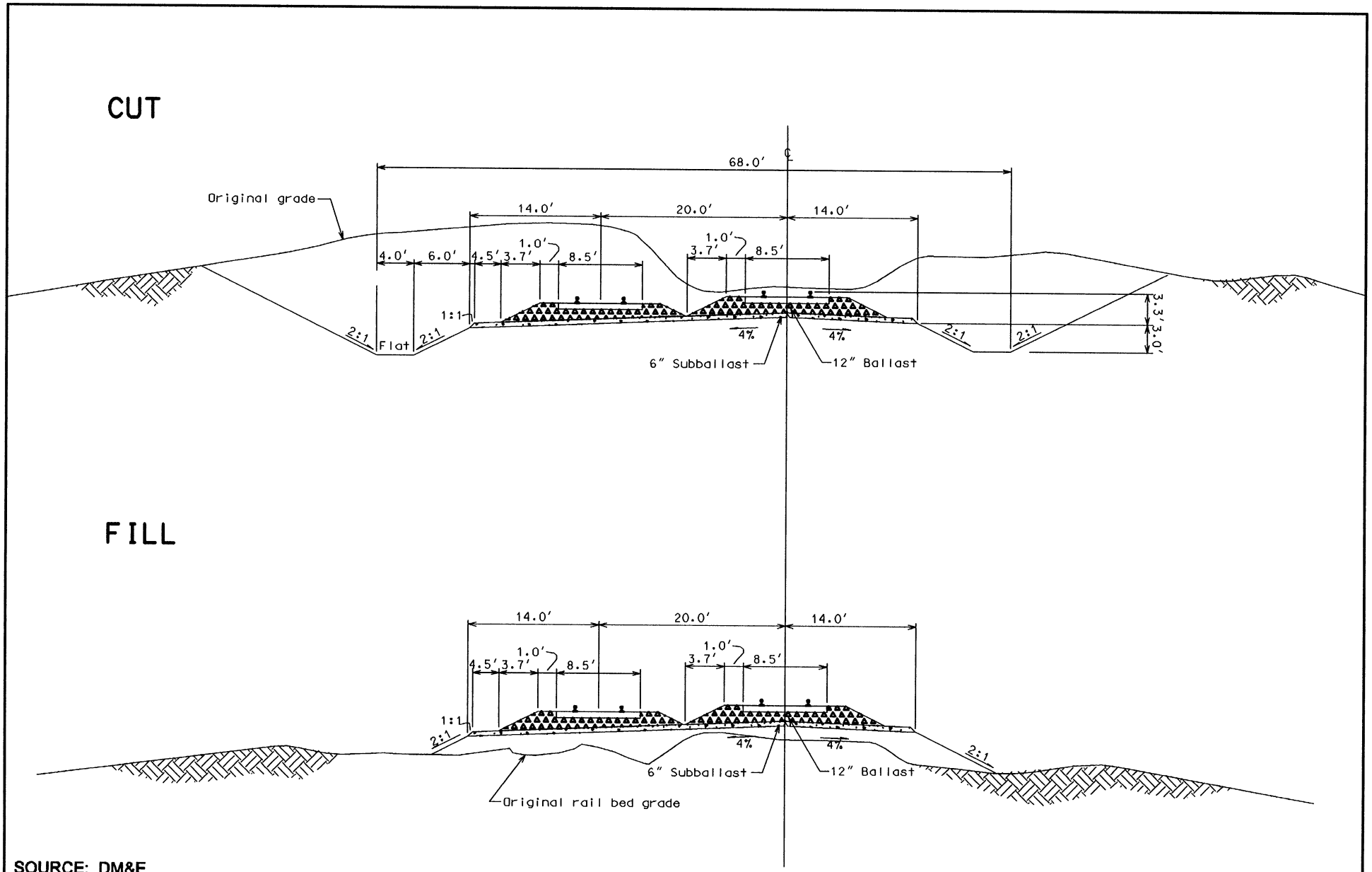
POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL NEW TRACK SECTION
WITH SOUTH SIDING



SOURCE: DM&E

Figure 1-19

POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL EXISTING TRACK REBUILD SECTION
WITH NORTH SIDING



SOURCE: DM&E

Figure 1-20

POWDER RIVER BASIN EXPANSION PROJECT
TYPICAL EXISTING TRACK REBUILD SECTION
WITH SOUTH SIDING

1.4.2 Operation[59]

Following completion of project construction and existing rail line reconstruction, the rail line DM&E system would consist of all new 136-pound, continuously welded rail. The system would be designed to accommodate 315,000-pound cars, although initially the largest cars would be the 286,000-pound variety. Up to 100 million tons of coal (approximately 750,000 cars) and approximately 66,000 freight cars of primarily corn, wheat, soybeans, bentonite and kaolin clays, cement, and wood products would be transported over the system annually. Through trains would be an average of 115 to 135 cars in length, using either four 4,400 horsepower or three 6,000 horsepower locomotives, distributed within the train. Maximum train speeds would be 49 miles per hour. Four track maintenance periods, up to 12 hours each, could be incorporated into the daily system operations.

Eastbound traffic would primarily consist of loaded coal and freight trains. Coal trains would travel at approximately 45 miles per hour, freight trains at a maximum of 49 miles per hour. Westbound traffic would consist of primarily empty trains traveling at approximately 49 miles per hour. Empty westbound trains would slow and switch onto passing sidings to allow loaded eastbound trains to pass without either needing to stop or slow. Empty westbound trains would generally not stop but would slow to 40 miles per hour or less on sidings. However, occasionally they could be required to stop for a short period. After the loaded train has cleared, the empty train would switch back onto the rail line and accelerate up to normal operating speed.

Trains would be dispatched into time slots from a central dispatching control center. The control center would be responsible for maintaining safe operating distances between trains heading in both the same direction and opposite directions. A system of positive train control would be employed whereby train location and speed would be continuously monitored through communication with the crew and by a global positioning system (GPS) with the full implementation of CBTC.[60] Safe braking distances would be continuously calculated for trains and the crew notified as to any potential problem and given the appropriate action to take. If warnings are not received or heeded, the train's brakes could be applied remotely.

---

[59] Based on information contained in DM&E's Application and in supplemental information provided by DM&E at the request of SEA.

[60] Communication Based Train Control - A system of train control currently under design and testing by FRA which, when approved for use on railroads, would provide for positive train separation.

In addition to control center monitoring, each locomotive would contain equipment for train monitoring and control. On-board equipment would tell the engineer what the allowable speed is for the portion of track over which the train is currently operating, speed on upcoming sections, limit of the train's operating authority, and location of other trains or equipment on the rail line nearby. Communication between the control center and the train would be by radio bases with geographically overlapping ranges and by cellular telephone.

DM&E proposes to construct five new rail yards and upgrade existing yards as part of this project. These yards would serve as crew change, maintenance, fueling, inspection, train assembly and disassembly, and dispatch locations. Only the western most yard would contain crew lodging and eating facilities. Personnel at all other yards would use local lodging and eating establishments. All rail yards would contain facilities and equipment necessary to service, repair, and operate trains. Trains would be loaded at the various mines and dispatched to a western staging yard. From this yard, trains would be dispatched eastward. The train would continue, non-stop to the next staging yard. Staging yards would be spaced, based on transit times of approximately 7 hours, between 225 and 275 miles apart. This spacing would enable staging yards to also function as crew change points. Crews would be on duty approximately eight hours (a 12-hour shift is the allowable industry maximum). New crews would take over and the train would be dispatched into an available time slot to the next staging yard.

Freight trains would be made up at staging and marshaling yards. Local trains, or wayfreights, would pick up cars from customers along the rail line and deliver them to marshaling yards. Marshaling yards would be spaced to provide wayfreights only short haul distances, minimizing use of the rail line. Freight cars would be put together in marshaling yards and groups of cars assembled into through trains in staging yards. Through freight trains would be dispatched similar to coal trains. Delivery of empty cars would be the same process in reverse.

In general, in its normal freight business, DM&E delivers primarily loaded cars to connecting carriers for movement to final destinations. Primarily empty cars are received from connecting carriers and delivered to DM&E shippers for loading. Coal trains, loaded at the mines in the PRB, would be delivered to connecting carriers for movement to their final destinations. Empty trains of coal cars would be returned from connecting carriers to DM&E for loading at the PRB mines. Interchange points for the coal trains would be at Mankato, Minnesota (UP), Owatonna, Minnesota (I&M) and at Minnesota City, Minnesota near Winona (CP). Interchange locations for DM&E's regular freight shipments would be at the West Staging Yard in Wyoming (UP and BNSF), Dudley, South Dakota near Edgemont (BNSF), Mankato, Minnesota (UP), Owatonna, Minnesota (I&M), Minnesota City, Minnesota (CP and UP) and Mason City, Iowa.

1.4.3 Maintenance[61]

Equipment

DM&E would construct a new locomotive and rail car maintenance and repair facility as part of this project to accommodate the additional rolling stock and associated maintenance needs. This would be a state-of-the-art facility for scheduled maintenance, overhaul, inspection, testing, fueling, and major repairs, capable of maintaining 300 or more locomotives. In addition, staging yards would contain maintenance capabilities to handle common maintenance problems. Trains would be stopped at staging yards for equipment inspection and crew changes. Following inspection of rail cars and locomotives, any identified maintenance problems could be addressed at the staging yard or more substantial problems identified and referred to the main maintenance facility. Trains traveling both directions would receive their 1,000-mile inspections and Inspection Certificates at the Middle Staging yard. Rail cars and locomotives would receive scheduled maintenance and overhaul based on industry standards and recommendations.

Track

DM&E would implement a track maintenance (maintenance-of-way) program to prevent deterioration of the rail line and provide for continuous safe and efficient rail service that is consistent with Federal Railroad Administration (FRA) requirements (49 CFR ϕ 213) for Class IV track.[62] The rail line would be inspected as required by FRA track standards. Additional inspections would be carried out, as necessary, when warranted by weather or other circumstances. DM&E personnel would carry out inspections focusing on:

- Runoff drainage.
- Track alignment.
- Track surface.
- Track gauge.
- Rail and turnouts.
- Cross ties.
- Switches.

[61] Based on information contained in DM&E's Application and in supplemental information provided by DM&E at the request of SEA.

[62] Federal Railroad Administration classification of rail line, based on maximum allowable train speed (49 CFR ϕ 213.9). Trains may operate at any speed but are not allowed to exceed the maximum for the classification of track. Class IV track has a maximum allowable speed for freight trains of 60 miles per hour.

- Highway grade crossings and warning devices.
- Fencing (subject to agreement with adjacent landowners).
- Cattle guards.

General maintenance-of-way activities would be performed by DM&E personnel. Seventeen maintenance-of-way section headquarters for crews and equipment would be established at intervals throughout the system. In addition, contractors would be used for rail flaw testing, rail grinding, tie changeout, vegetation control, and other specialized tasks. One 8-hour window and several smaller windows could be available each day to perform maintenance activities on the rail line.

Vegetation control activities would also be part of regular maintenance along the rail line. Vegetation control measures would be designed to control noxious weeds and reduce the potential for rail-related fires. Herbicides approved by the Environmental Protection Agency would be applied by licensed personnel to the railgrade, including the area of ballast, rail, and ties, and on USFS lands. Herbicide use would be consistent with the USFS Noxious Weed Implementation Plan. In addition, DM&E states that it would perform vegetation control activities as part of its fire prevention and suppression plan that would include one or more of the following:

- Plowing or sterilizing a fire guard at least 10 feet wide on both sides of the right-of-way, 50 feet from the centerline of the main track where practical and necessary.

- Burning the right-of-way on both sides of the track 50 feet from the centerline of the main track where practical and necessary.

- Sterilizing the right-of-way for 12 feet on both sides of the centerline.

- Applying an herbicide for 50 feet on both sides of the centerline where practical and necessary.

1.5 RESPONSIBLE OFFICIALS AND DECISIONS TO BE MADE

A decision on the proposed project will be required from the lead agency and each of the cooperating agencies. Those decisions and the officials responsible for issuing them include the following:

The Lead Agency:

- Authority from the Board, pursuant to 49 U.S.C. 10901, to construct and operate new rail facilities. The Board has overall responsibility to grant such authority with its jurisdiction under the Interstate Commerce Commission (ICC) Termination Act of 1995, Pub. L. No.104-88, 109 Stat. 803 (1995), and the members of the Board will be responsible for issuing a final decision on the proposed project following the completion of the environmental review process. DM&E cannot begin construction or rebuild unless and until the Board issues a final decision approving the railroad's application.

The Cooperating Agencies:

- An easement from the U.S. Department of Agriculture (USDA), USFS, under the Federal Land Policy Management Act of 1976, 43 USC 1737, to cross portions of the Thunder Basin and Buffalo Gap National Grasslands in Wyoming and South Dakota, respectively. The Region 2, Regional Forester will be responsible for issuing a decision on the granting of such an easement.

- A right-of-way grant from the U.S. Department of Interior, BLM under the Federal Land Policy Management Act of 1976, 43 USC 1737, across public lands administered by the BLM in Wyoming and South Dakota. The Wyoming State Director of the BLM will be responsible for issuing a decision on the required right-of-way.

- A permit from the U.S. Army Corps of Engineers under the Clean Water Act of 1977, Section 404, and the Rivers and Harbors Act of 1899, Section 10 for activities affecting waters of the United States, including wetlands and navigable waterways. The acting heads of the Omaha (South Dakota and Wyoming) and St. Paul (Minnesota) Districts will be responsible for issuing a decision on these permits.

- A permit from the Coast Guard, under the General Bridge Act of 1946, as amended (60 Stat. 847; 33 USC 525 et seq.) and the Department of Transportation Act (Public Law 89-670, 80 Stat. 931-950, 49 USC 1651-1659) for activities that may affect bridges across navigable waters. For this project, such a permit would be required if the existing bridge over the Missouri River is altered due to rebuild actions or if a new bridge is constructed. The Commander, 8th Coast Guard District, will be responsible for issuing a decision on any such permit.

- A permit from the U.S. Department of Interior, Bureau of Reclamation for any crossings or activities affecting structures and facilities associated with operation of the Angostura Irrigation Project. The Manager, Dakotas Area Office will be responsible for issuing a decision on any permit.

This Draft EIS will provide the responsible officials the environmental analysis necessary to render their decisions on the proposed project. In reaching a decision, the agencies will consider between the following set of alternatives. Specific alternatives within these categories are discussed in detail in Chapter 2:

- No-Action - denial of authority to construct and operate the proposed project by the Board, of an easement by the USFS, of a right-of-way by the BLM, and of permits by the Corps, Coast Guard, or Reclamation.

- The Proposed Project, including construction of new rail facilities along the alignments identified by DM&E as its preferred alternatives in Wyoming, South Dakota, and Minnesota and the rebuilding of that portion of DM&E's existing system in South Dakota and Minnesota necessary for project operation.

- Alternative alignments in Wyoming, South Dakota, and Minnesota for construction and operation of the proposed project in conjunction with the rebuilding of that portion of DM&E's existing system in South Dakota and Minnesota necessary for project operation.

- Some combination or modification of the above alternatives.

- Any decision issued may include environmental mitigation measures to be implemented as conditions of the decision.

1.6 AGENCY RESPONSIBILITY

Several Federal agencies will be issuing decisions for the proposed project using this Draft EIS as the disclosure and analysis of potential environmental impacts, as required by NEPA. Additional Federal agencies have review or oversight responsibilities related to the Draft EIS, other agency decisions, or other components of the environmental process. These agencies and the responsibilities of each are discussed below.

1.6.1 Lead Agency

Surface Transportation Board

The Board, pursuant to 49 USC 10901, is the agency responsible for granting authority for the construction of new rail line facilities and the subsequent operation and maintenance of those facilities. Accordingly, the Board is the lead agency responsible for supervising the preparation of the Draft EIS. On February 20, 1998, DM&E submitted an application to the Board requesting such authority. The Board published notice of its receipt of the application on March 11, 1998, indicating (1) it was requesting comments on the procedural schedule for determining the merits of the project, (2) establishment of a procedural schedule for the environmental review was premature, and (3) SEA was to begin preparation of a notice of intent to prepare an EIS and initiate the scoping process.

Consistent with its jurisdiction under the ICC Termination Act of 1995, Pub. L. No.104-88, 109 Stat. 803 (1995), the Board announced on March 30, 1998, its intent to prepare an EIS for this project and hold agency and public scoping. On August 7, 1998, the Board published a Revised Notice of Intent to Prepare an EIS, indicating that the USFS, BLM, and the Corps would be participating as cooperating agencies because these agencies have separate approval authorities necessary for construction and operation of the proposed project, as well as the rebuilding of DM&E's existing rail line, in addition to the Board's approval authority. The scoping period was extended until September 8, 1998. Also in that notice, the Board was designated as the lead agency, pursuant to 40 CFR 1501.5(c), and with responsibility to supervise the preparation of the EIS. In addition, the Board, on January 12, 2000, indicated the Coast Guard and the Bureau of Reclamation would also be participating as cooperating agencies due to these agencies also being determined to potentially have separate approval authority.

On December 10, 1998, the Board issued a decision finding that the project satisfies the transportation-related requirements of 49 USC 10901. Following completion of the environmental review process, the Board will issue a final decision on the authority of DM&E to construct and operate the desired rail facilities.

1.6.2 Cooperating Agencies

Several Federal agencies are participating with the Board on this analysis. These agencies will render separate decisions under their authority regarding the proposed project. As cooperating agencies under 40 CFR 1501.6, this Draft EIS is being prepared so that the agencies can participate in, and approve the analysis as the basis of their individual agency decision-making.

Forest Service

The USFS, under the Federal Land Policy Management Act of 1976 (FLPMA), 43 USC 1737, issues a Special Use Permit when construction on Forest Service lands occurs, in addition to issuing an easement. Activities such as cut and borrow materials, top soil piles, water use, and construction outside the easement on Forest Service land would also require special use permits. On April 28, 1998, DM&E submitted a Special Use Application to the USFS for an easement under the FLPMA to build new rail lines across portions of the Thunder Basin National Grassland in Wyoming, administered by the Medicine Bow-Routt National Forests, and across portions of the Buffalo Gap National Grassland in South Dakota, administered by the Nebraska National Forest. On August 7, 1998, the USFS indicated its intent to participate as a cooperating agency, pursuant to 40 CFR 1501.6, for the preparation of the EIS for the proposed project.

The National Forest Management Act (36 CFR 219.10(e)) requires consistency between any project being proposed and the national forest land and resource management plan (forest plan) for any forest or national grassland being affected. In this case, two existing forest plans were evaluated for consistency between the proposed project alternatives and forest plan standards and guidelines, as well as whether or not the new railroad alternatives would be consistent with the desired future condition of the national forest system lands affected. Those two forest plans, the *Medicine Bow National Forest Land and Resource Management Plan,* 1985, and the *Nebraska National Forest Plan,* 1984, were evaluated. It was determined that if an action alternative is selected, both of these forest plans will have to be amended because any action alternative will not be consistent with some management standards and guidelines of these forest plans in many cases. Therefore, a forest plan amendment for both the Medicine Bow National Forest Plan and the Nebraska Forest Plan will be included in this analysis for public comment and will become part of the Forest Service Record of Decision.

Additionally, a new plan which will replace the two existing forest plans for management of the National Grasslands including the Thunder Basin and Buffalo Gap National Grasslands *(The Northern Great Plains National Grassland Land and Resource Land and Resource Management Plans)* is being prepared at the same time as this DM&E Railroad analysis. The Draft EIS for the National Grasslands Plans was released to the public in July, 1999 and identified Alternative C as its preferred alternative. A Final EIS and Record of Decision for the National Grasslands Plans is expected in early 2001 and it is not known at this time if a Final EIS and Record of Decision will precede the National Grasslands Plan decision. However, the proposed DM&E Railroad project alternatives were evaluated against the draft preferred Alternative C of the draft National Grasslands plan for consistency to determine whether any of the proposed railroad alternatives would pre-dispose the desired future condition of the affected grasslands, if implemented. While this analysis recognized that the existing Medicine Bow and Nebraska National Forest Plans are the legal direction for the management of the lands potentially affected,

the likelihood of the amending the Northern Great Plains Forest Plans could be expected, if a final decision is made to permit the construction of a new railroad. If an amendment of the Northern Great Plains National Grassland Land and Resource Management Plan is required, then a separate amendment process will be initiated and the public will be notified through public scoping and provided an opportunity to comment.

Bureau of Land Management

The BLM, under FLPMA, must issue a right-of-way grant for construction of linear projects across public lands it administers. On April 28, 1998, DM&E submitted an application to the BLM for such a right-of-way as part of its proposed Powder River Basin Expansion Project. On August 7, 1998, as part of a notice filed by the Board, the BLM indicated its intent to participate as a cooperating agency for the preparation of the EIS for the proposed project.

Corps of Engineers

The Corps, under Section 404 of the Clean Water Act of 1977, has jurisdiction over activities that result in the discharge of dredge or fill material into waters of the U.S. including lakes, rivers, streams, oxbows, ponds, and wetlands such as prairie potholes, wet meadows, marshes, swamps, and bogs. Activities that affect these systems require a permit from the Corps. Construction of the proposed project would result in impacts to waters of the U.S. Therefore, DM&E would be required to submit an application to the Corps and obtain a permit prior to project construction in waters of the United States.

Additionally, the Corps is responsible for activities that may affect navigable waters, pursuant to Section 10 of the Rivers and Harbors Act. Construction of the proposed project and rebuilding of the existing DM&E rail line will require the crossing of navigable waters and has the potential to affect them. Therefore, DM&E will be required to submit a permit application under Section 10. The Corps will be responsible for review of the application and either issuance or denial of a permit.

Projects that have the potential to have significant impacts on wetlands and navigable waters may require an environmental assessment (EA) or EIS documenting the impacts of the proposed project on wetlands and other environmental resources. Because a project of this size and scope would likely require preparation of an environmental impact document, the Corps indicated, as part of a notice filed by the Board on August 7, 1998, its intent to participate as a cooperating agency for the preparation of the EIS for the proposed project.

Coast Guard

The Coast Guard, under authority provided in the General Bridge Act of 1946, as amended (60 Stat. 847; 33 USC 525 et seq.) and the Department of Transportation Act (Public Law 89-670, 80 Stat. 931-950,49 USC 1651-1659) is provided authority for approval of bridges over navigable waters of the United States. This approval authority includes construction of new bridges over navigable waters or modifications (repairs, improvements) to existing bridges that involve more than in-kind replacement of obsolete parts or alter the clearance characteristics of the bridge. If DM&E determines that a new bridge must be built across the Missouri River or the existing bridge extensively modified to accommodate coal trains, the crossing of the Missouri River would require authorization from the Coast Guard. Because a Coast Guard bridge permit may be required for this project, and an EIS document would likely be required as supporting information to the permit application, the Coast Guard, as part of a notice filed by the Board on January 12, 2000, indicated its intent to participate as a cooperating agency for the preparation of the EIS for the proposed project. The Coast Guard would be responsible for review of the application and either issuance or denial of a permit.

Bureau of Reclamation

The Bureau of Reclamation (BOR) is responsible for issuance of rights of use for projects that have the potential to affect lands it administers. Such lands occur within the project area and may be affected. If lands administered by BOR are affected, DM&E would be required to submit an application for rights of use, which would likely require documentation of the potential environmental affects of the project. Therefore, the Board has invited, and BOR has accepted the invitation as part of a notice filed by the Board on January 12, 2000, to participate as a cooperating agency on the preparation of this EIS.

1.6.3 Other Agencies

Environmental Protection Agency

U.S. Environmental Protection Agency (USEPA) has broad oversight and implementing responsibility for many Federal environmental laws including the Clean Air Act, Clean Water Act, Comprehensive Environmental Response Compensation and Liability Act, Superfund Amendment and Reauthorization Act, Toxic Substances Control Act, and Resource Conversation and Recovery Act. USEPA also provides guidance and advice in complying with appropriate Executive Orders, including Executive Order 12898 on Environmental Justice, Executive Order 11990 on Protection of Wetlands, and Executive Order 11988 on Floodplain Management. Under Section 309 of the Clean Air Act, 42 USC 7609, the U.S. Environmental Protection

Agency reviews and comments in writing on the environmental impact of major Federal actions for which an EIS is prepared in compliance with NEPA. The Office of Federal Activities within USEPA, which is responsible for reviewing EISs, evaluates both the extent of a proposal's impact on the environment and the quality of EIS analysis. USEPA also announces the availability of a Draft EIS in the *Federal Register*. SEA has consulted with USEPA in preparing this Draft EIS and will consider in the Final EIS any USEPA comments on the Draft EIS.

Advisory Council on Historic Preservation

The National Historic Preservation Act (NHPA) requires Federal agencies to consider the effects of its actions on historic and cultural resources. Under NHPA, the Board will consult with the appropriate State Historic Preservation Offices (SHPOs) and the Advisory Council on Historic Preservation (ACHP). The Advisory Council on Historic Preservation (Council) is an independent Federal agency created by the National Historic Preservation Act of 1966, 16 USC 470 (NHPA). It is responsible for advocating consideration of historic values in Federal decision making, issuing regulations to implement Section 106 of the NHPA, and reviewing Federal programs and policies to further historic preservation. SEA will provide the Draft EIS to ACHP and the appropriate SHPOs for their review.

ACHP is also responsible for ensuring projects are in compliance with other requirements directed toward cultural resources. These include the Archaeological Resource Protection Act (ARPA), Native American Graves Protection and Repatriation Act (NAGPRA), American Indian Religious Freedom Act (AIRFA), and Executive Orders requiring Native American Tribe consultation.

Fish and Wildlife Service

The U.S. Fish and Wildlife Service (USFWS) is the Federal agency with primary expertise for fish, wildlife, and natural resources issues. USFWS also is responsible for implementing the Endangered Species Act and, through its regional offices, for consulting with other Federal agencies on potential impacts to threatened and endangered species.

Under Section 7 of the Endangered Species Act, USFWS is responsible for review of potential project impacts and for issuing a determination, or biological opinion, on whether the project would jeopardize the continued existence of threatened or endangered species. The lead agency is responsible for formal Section 7 consultation with the USFWS, and must prepare and submit a Biological Assessment for those species Federally listed, or proposed for listing as either threatened or endangered, potentially impacted by the project.

1.7 SCOPING AND PUBLIC INVOLVEMENT

The NEPA process is intended to assist agencies and the public in identifying and assessing the potential environmental consequences of a proposed action before a final decision on the proposed action is made. Because the construction and operation of this project has the potential to result in significant environmental impact, the Board determined that the preparation of an EIS is appropriate. The first stage of the EIS process is scoping. Scoping is an open process for determining the scope of environmental issues to be addressed in an EIS and their potential for significance. The Board, acting through SEA, and the cooperating agencies have taken a number of steps to encourage broad participation in the EIS process. The Board published its Notice of Intent to Prepare an EIS and conduct Scoping Meetings on March 30, 1998. SEA conducted scoping meetings to provide opportunities for public involvement and input into the scoping process. Interested persons and agencies were invited to participate in the scoping phase by attending these meetings, reviewing the draft scopes of study for the EIS, and providing oral and written comments on the issues to be addressed in the EIS.

SEA conducted three scoping meetings specifically for agencies in order to provide an opportunity to focus on issues that may be of particular concern to local, state, and Federal governments. These agency scoping meetings were held in the following locations:

Agency Scoping Meetings

April 29, 1998	Cheyenne, Wyoming
May 14, 1998	St. Paul, Minnesota
June 17, 1998	Pierre, South Dakota

In addition, SEA held a number of meetings designed to focus on issues of concern to the general public. Public scoping meetings were held in the following locations:

Public Scoping Meetings

April 28, 1998	Newcastle, Wyoming
April 29, 1998	Wright, Wyoming
April 30, 1998	Edgemont, South Dakota
May 01, 1998	Hot Springs, South Dakota
May 12, 1998	Mankato, Minnesota
May 13, 1998	Rochester, Minnesota
June 16, 1998	Wall, South Dakota
June 17, 1998	Pierre, South Dakota

June 18, 1998	Huron, South Dakota
June 29, 1998	Brookings, South Dakota
June 30, 1998	Springfield, Minnesota
July 08, 1998	Winona, Minnesota

Information sheets on the project, the draft scope of study, and comment sheets were provided at the scoping meetings. Tape recorders were also available for those participants who wished to record their spoken remarks rather than submitting written comments. Comment sheets were collected at the meetings or could be mailed directly to the Board. Attendees were invited to take comment sheets to other family members, neighbors, or friends who were unable to attend the meetings. Interested parties were also invited to submit written comments along with or in lieu of prepared comment sheets. On June 10, 1998, the Board published the draft Scope of Study for the Draft EIS in the *Federal Register* and requested written comment by July 10, 1998.

During the scoping process, the USFS, BLM, and Corps of Engineers expressed interest in participating in the EIS process as cooperating agencies, because the project would either potentially affect lands they administered or require permits from their agencies. On August 7, 1998, the Board published a revised Notice of Intent indicating these agencies would be cooperating agencies for preparation of the EIS and requested comments. The scoping period was extended in this revised notice until September 8, 1998. SEA, as well as the cooperating agencies, have continued to receive and accept comments on the scope of the study after September 8, 1998, and throughout the environmental review process. These comments have been considered during the development of the draft and final scopes of study and the preparation of Draft EIS.

The final Scope of Study (final Scope) for the EIS was published by the Board on March 10, 1999. The final Scope provided an overview of the project and the environmental review process, the Board's responses to comments on the draft Scope, an outline of issues to be evaluated in the Draft EIS, and a description of the alternatives to be discussed in the Draft EIS. The alternatives included an additional alternative (Alternative C in the Draft EIS) for extension into the PRB and an alternative proposed by the City of Rochester, Minnesota, to bypass the portion of DM&E's existing system through Eyota, Byron, and Rochester. The Board indicated that it would accept comments on both Alternative C and on the feasibility of the Rochester bypass until April 10, 1999.

After publishing the final Scope, the Board received numerous requests to allow submittal of additional alternatives to bypass other communities. In response to these requests, the Board provided notice on April 14, 1999 to all interested parties that the comment period established in the final Scope would be extended for 60 days to allow interested communities the opportunity to

submit proposals for bypass alternatives. Any such proposals were to be submitted by June 10, 1999. An additional 30-day period was provided specifically to allow DM&E and persons potentially affected by a proposed bypass to submit comments on the proposal(s). The additional comment period was extended until July 12, 1999. The Board also indicated that it would continue to accept comments on other alternatives described in the final Scope.

During the scoping process, over 1,000 people and representatives of more than 30 Federal, state, and local agencies attended scoping meetings. Over 600 comment sheets were received, along with over 5,000 written comments. Materials provided at scoping meetings and a summary of issues identified are provided in Appendix C. Numerous issues and concerns were identified throughout the scoping process. Those appropriate to an EIS for a project of this type and scope are identified in Section 1.8 and are discussed in detail in Chapters 3 and 4 of this EIS.

In addition to scoping meetings, several resource agencies and Native American Tribes and organizations,[63] including the cooperating agencies, expressed an interest in meeting with the lead agency and representatives of DM&E to discuss the project in greater detail and the environmental resources potentially impacted. Therefore, additional meetings were held with one or more of the following groups:

- U.S. Forest Service
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- Wyoming State Historic Preservation Office
- Minnesota Department of Natural Resources
- Advisory Council on Historic Preservation
- Medicine Wheel Coalition
- Bureau of Indian Affairs
- Black Hills Sioux Nation Council
- Bureau of Reclamation
- Wyoming Game and Fish
- Bureau of Indian Affairs
- Minnesota Historical Society
  Minnesota State Archaeologist Office
- South Dakota Game, Fish & Parks
- South Dakota State Historical Society
- U.S. Coast Guard
- Cheyenne River Sioux Tribe
- Medicine Wheel Alliance
- Grey Eagles Society
- Oglala Sioux Tribe

Opportunities for public comment and participation in the environmental review process will continue throughout the EIS process. Interested parties and agencies are invited to submit comments on the scope and content of the Draft EIS. SEA and the cooperating agencies will consider these comments and incorporate them as appropriate along with any necessary further

[63] Government to government consultation between the lead and cooperating agencies and interested Tribes is discussed in greater detail in Appendices I and J.

analysis during the preparation of a Final EIS. In reaching a final decision in this case, the Board, as well as the cooperating agencies, will take into account the Draft EIS, the Final EIS, and all public and agency comments received.

1.8 ISSUES AND CONCERNS

As a result of scoping, numerous issues, both general and specific in nature, were identified. The draft and final scopes presented a broad overview of those topic areas to be discussed in the EIS. Broad impact categories were developed and presented in the draft and final scopes to allow the agencies the flexibility to address specific issues within these general categories as they were identified. Many of the issues raised during scoping fell within the broader impact analysis categories. Concerns regarding specific conditions, while not identified in detail, are addressed within the general impact categories evaluated in the EIS.

The general impact categories to be evaluated in the EIS include:

- Land Use
- Biological Resources
- Water Resources
- Geology and Soils
- Air Quality
- Noise
- Energy Resources
- Socioeconomics
- Safety
- Transportation Systems
- Cultural Resources
- Recreation
- Aesthetics
- Environmental Justice

Based on the definition of "significantly"[64] contained in 40 CFR 1508.27, the above listed impact categories will be analyzed in detail in this EIS as required by NEPA. In addition, the USFS and BLM developed a list of significant issues to determine the proposed project's potential impacts on Federal lands. The USFS and BLM list of significant issues consisted of general issues with more specific, associated subissues to be included in the analysis. These issues and subissues were the same or generally fell within one or more of the general impact categories identified by the Board. The significant issues identified by the USFS were:

- Grazing
- Native American Tribes
- Wildlife
- Ecology/Biodiversity
- Air Quality
- Noise and Light
- Wetlands
- Socioeconomics
- Archaeology/Paleontology
- Visual Quality
- Wilderness
- Night Lights
- Recreation
- Environmental Justice

[64] Significantly as used in NEPA requires consideration of both context and intensity. (a) Context. This means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. For instance, in the case of a site-specific action, significance would usually depend upon the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant. (b) Intensity. This refers to the severity of impact. Responsible officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity: (1) Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on balance the effect will be beneficial. (2) The degree to which the proposed action affects public health or safety. (3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas. (4) The degree to which the effects on the quality of the human environment are likely to be highly controversial. (5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks. (6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration. (7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small components. (8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources. (9) the degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973. (10) Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.

1.9 EIS ORGANIZATION AND FORMAT

This EIS has been organized consistent with NEPA and Council on Environmental Quality (CEQ) guidelines at 40 CFR 1502.10. It is intended to provide clear and concise information to the public and agency decision makers on the proposed project. This EIS describes the proposed project, alternatives, existing environment of the proposed project, and the potential environmental impacts associated with the proposed project. Chapters and specific topics within each chapter are outlined in the Table of Contents and numerically coded to aid the reader in locating individual areas of interest. Tables and figures are listed numerically by the chapter in which they occur. Appendices are denoted with alphabetic characters and included at the end of the EIS.

Following is a list of the components of the EIS and a brief description of each:

- Executive Summary — The Executive Summary provides a brief description of the purpose and need for the project, the alternatives developed and evaluated, and the potential environmental impacts anticipated to result from each alternative. The Executive Summary also contains the conclusion and recommendations concerning preferred alternatives and the mitigation developed to reduce the potential environmental impacts.

- Chapter 1 — Purpose of and Need for Action - This Chapter describes the reason for the EIS, the purpose and need the proposed action is intended to serve, the proposed action, the various agencies involved in the EIS process and their responsibilities, the process of developing the scope of the EIS analysis and the issues to be evaluated, and the EIS organization.

- Chapter 2 — Alternatives - This chapter describes the No-Action alternative, the proposed action, and feasible alternatives in detail, identifies the alternatives considered but eliminated from consideration and discusses why they were eliminated.

- Chapter 3 — Minnesota - This chapter describes the existing natural and human resources within the proposed project area of Minnesota and the potential impacts of the project on these resources. The proposed rail line rebuild and new rail construction projects and alternatives are included.

- Chapter 4 — South Dakota and Wyoming - This chapter describes the existing natural and human resources within the proposed project area of South Dakota

and Wyoming and the potential impacts of the project on these resources. The proposed rail line rebuild in South Dakota and new rail construction projects and alternatives in South Dakota and Wyoming are included.

- Chapter 5 — Cumulative Impacts - This chapter summarizes the impacts of each of the alternatives for each of the project components. It also provides a discussion of the other reasonably foreseeable activities in the project area contributing to the overall impacts on the environment.

- Chapter 6 — Conclusions and Recommendations - This chapter compares the potential environmental impacts of the reasonable and feasible alternative, and provides the rationale for selection of the preferred alternative for each of the project components.

- Chapter 7 — Mitigation - This chapter contains descriptions, by resource category, of the mitigation to be implemented as part of the proposed project to minimize impacts.

- Appendices — The appendices provide methodologies for conducting the analysis, relevant background information, and analytical data in support of the information, processes, analyses, and conclusions presented in the EIS.

- Glossary — The glossary provides the definitions of technical, NEPA, or agency-related terms potentially unfamiliar to the reader.

- Acronyms — The acronyms list defines all acronyms used in the EIS.

- Literature Cited — The literature cited lists all published and unpublished sources of information and personal contacts used in preparing the EIS.

* * * * *

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER 2

ALTERNATIVES

[THIS PAGE INTENTIONALLY LEFT BLANK]

CHAPTER 2
ALTERNATIVES

TABLE OF CONTENTS

2.1 PRE-APPLICATION ALTERNATIVES DEVELOPMENT 2-2
2.1.1 CORRIDOR IDENTIFICATION AND SELECTION 2-3
2.1.2 PRE-APPLICATION ALTERNATIVES FOR CONNECTION AT MANKATO, MINNESOTA 2-6
2.1.3 PRE-APPLICATION ALTERNATIVES FOR CONNECTION AT OWATONNA, MINNESOTA 2-7

2.2 ALTERNATIVES CONSIDERED IN SEA'S ENVIRONMENTAL REVIEW. 2-7
2.2.1 RAIL LINE EXTENSION ALTERNATIVES 2-9
2.2.1.1 Alternative A: No-Action Alternative 2-10
2.2.1.2 Alternative B: Proposed Route 2-11
2.2.1.3 Modified Proposed Route - Alternative C 2-30

2.2.2 EXISTING TRANSPORTATION CORRIDOR ALTERNATIVES .. 2-43
2.2.2.1 Proposed Existing Transportation Corridor Alternative Selection 2-44
2.2.2.2 Alternative D: Existing Corridor Alternative 2-50

2.2.3 NON-CONSTRUCTION ALTERNATIVES 2-54

2.2.4 MANKATO, MINNESOTA NEW CONSTRUCTION 2-54
2.2.4.1 No-Action, M-1 2-55
2.2.4.2 Southern Route - Alternative M-2 2-55
2.2.4.3 Existing Corridor Route - Alternative M-3 2-56

2.2.5 OWATONNA, MINNESOTA NEW CONSTRUCTION 2-57
2.2.5.1 No Action-Project Denial, Alternative O-1 2-57
2.2.5.2 No-Action - Rail Line Reconstruction Only, Alternative O-2 2-57
2.2.5.3 Proposed Action, Alternative O-3 2-57
2.2.5.4 Alternative Action, Alternative O-4 2-58
2.2.5.5 Alternative Action, Alternative O-5 2-58

2.2.6 BYPASS ALTERNATIVES 2-59
2.2.6.1 Description of Bypass Proposals 2-59
2.2.6.1.1 Bypass Construction - Rochester, Minnesota 2-59
2.2.6.1.2 Bypass Construction - Owatonna, Minnesota 2-61
2.2.6.1.3 Bypass Construction - Brookings, South Dakota 2-61
2.2.6.1.4 Bypass Construction - Pierre/Fort Pierre, South Dakota 2-62
2.2.6.2 Evaluation of Bypasses 2-63

2.2.7 RAIL YARDS 2-65
2.2.8 SIDINGS 2-67
2.2.9 MISSOURI RIVER BRIDGE 2-81

2.3 SUMMARY

* * * * *

LIST OF TABLES

Table Number		Page
2-1	Comparison of Principal Characteristics of Alternative Routes for Extension Into the PRB	2-12
2-2	Alternative B Segments	2-13
2-3	Alternative C Segments	2-31
2-4	Alternative D Segments	2-50
2-5	Proposed Rail Yards for Alternatives B, C and D	2-69
2-6	Sidings Locations - Extension Alternative B	2-72
2-7	Sidings Locations - Extension Alternative C	2-75
2-8	Sidings Locations - Extension Alternative D	2-78
2-9	Summary of Alternatives	2-84

* * * * *

LIST OF FIGURES

Figure Number		Following Page
2-1	Pre-Application Corridor Locations South Dakota and Wyoming	2-5
2-2	Existing Rail Lines Mankato, Minnesota	2-6
2-3	Pre-application Alternatives Mankato, Minnesota	2-6
2-4	Pre-application Alternatives Owatonna, Minnesota	2-7
2-5	Alternative B	2-9
2-6	Alternative C	2-9
2-7	Alternative D	2-9
2-8	Alternatives B, C, and D	2-10
2-9	Spring Creek Alternatives	2-10
2-10	Hay Canyon Alternatives	2-10
2-11	Key to Route Description Terminology	2-11
2-12	Alternatives B, C, and D, Including Phiney Flat Alternative and WG Divide Alternative	2-34
2-13	Existing Transportation Corridors Western South Dakota and Eastern Wyoming	2-43
2-14	D Alternatives South Dakota and Wyoming	2-44
2-15	Landscape Profile Alternative C Black Thunder Creek Wyoming	2-47
2-16	Landscape Profile State Highway 450 Wyoming	2-47
2-17	Mankato Alternatives Mankato, Minnesota	2-55
2-18	Owatonna Alternatives Owatonna, Minnesota	2-58
2-19	Existing Rail Lines Owatonna, Minnesota	2-58
2-20	Rochester Bypass Alternative Route Rochester, Minnesota	2-59
2-21	Owatonna Bypass Alternative Owatonna, Minnesota	2-61
2-22	Brookings Bypass Alternative Route Brookings, South Dakota	2-61
2-23	Pierre/Fort Pierre Bypass Alternative Routes Pierre, South Dakota	2-62
2-24	Proposed Missouri River Crossing Alternatives Pierre, South Dakota	2-81
2-25	Cross Section Proposed New Missouri River Bridge - Pierre, South Dakota	2-82

* * * * *

CHAPTER 2
ALTERNATIVES

The Dakota, Minnesota & Eastern Railroad Corporation's (DM&E's) proposed construction of new rail facilities to coal mines in the Powder River Basin (PRB) resulted in the development of a complex project with a number of components. Each of these components presented opportunities for different alternatives to balance DM&E's identified purpose and need (Chapter 1) with the engineering, environmental, and economic constraints presented by the project. DM&E reviewed its existing system and identified areas where construction of new facilities would be required. DM&E also developed an operating plan that allowed it to further identify the required new facilities. DM&E also identified locations where it would not be reasonable to operate over what is essentially a competitor's rail line. Prior to submitting its Application to the Surface Transportation Board (Board), DM&E identified the major physical components it would have to construct in order to provide the new rail service. These components included:

- New rail line
- A bypass around a competitor's facilities
- New rail connections

Within each of these categories, DM&E analyzed many options. These options revolved around developing a route that would provide efficient and reliable rail transportation between the mines and Midwestern coal users. Section 2.1, "Pre-Application Alternatives," briefly describes the studies DM&E performed to evaluate these routes. Based on the results of these studies, DM&E was able to identify the construction projects it submitted in its February 20, 1998 Application to the Board.

A period of intense public and agency scrutiny followed DM&E's submission of its Application to the Board. The Board's Section of Environmental Analysis (SEA) notified the public of its intent to prepare an environmental impact statement (EIS) on March 30, 1998. From that date until the close of the formal scoping period (as outlined by the National Environmental Policy Act) on July 12, 1999, many individuals, communities, and agencies requested that DM&E modify the alternatives proposed in its Application. Most requests for modification could be grouped into the following categories:

- Provide alternatives or modifications to the original route DM&E proposed in its Application to bypass communities where DM&E currently operates (albeit at a low level of service and frequency) or to avoid environmentally sensitive areas.

- Provide an alternative that would minimize the amount of new track, specifically by taking advantage of existing transportation infrastructure, such as rail lines and highways.

- Provide non-construction alternatives that would focus on the development of alternative energy sources, such as solar, wind, or nuclear power, rather than develop a project that would promote continued reliance on coal.

SEA reviewed these requests to identify those additional alternatives that appeared to hold potential to reduce environmental impacts while still providing a competitive project. This Draft EIS summarizes the many options the public and agencies proposed and SEA's analysis of these proposals. SEA's initial analysis considered whether the options were feasible from an engineering standpoint, would meet DM&E's purpose and need, and the potential environmental issues associated with each option. SEA determined that some of the proposed options were reasonable and feasible and warranted a detailed review in this Draft EIS. Section 2.2 provides a complete and detailed description of the alternatives proposed by DM&E in its Application and these proposed options.

2.1 PRE-APPLICATION ALTERNATIVES DEVELOPMENT

As described in Chapter 1, the previous owner of the DM&E rail line, the Chicago & North Western Transportation Company (C&NW), considered extending its system westward into the PRB as early as the 1980s.[1] DM&E continued to explore the concept by conducting a market analysis, developing preliminary construction costs and considering post-construction operating plans for the railroad. In 1996, DM&E determined that extending its existing system into the PRB would be both technically feasible and economically viable in the current market.

With its decision to pursue the expansion, DM&E began to formulate more specific plans for alternatives that it could present in its Application to the Board. DM&E determined that the project would need to consist of three components, with each component having the potential for several alternatives. These components were:

- Developing a new rail corridor into the PRB through the construction of approximately 262 miles of new mainline track to extend DM&E's existing system westward.

- Providing a connection between the two ends of DM&E's existing rail line, to bypass trackage owned and operated by DM&E, at Mankato, Minnesota. DM&E determined that this connection was essential to the project. Currently, DM&E operates on Union Pacific Railroad Company (UP) track in this area under a trackage rights agreement.

[1] Verified Statement of Richard H. McDonald. Filed on behalf of the Western Coal Traffic League in response to August 31, 1998, filing by the Mid-States Coalition for Progress. Subscribed and sworn on September 25, 1998.

Because UP is a potential competitor for the rail service into the PRB that DM&E's proposed project would provide, DM&E believed that UP would have little incentive to minimize operational conflicts that inevitably occur when two competing shippers share the same track. The new construction at Mankato would eliminate the potential for these operational conflicts.

- Providing a connection at Owatonna, Minnesota between the I&M Rail Link (another rail line) and the existing DM&E track. DM&E determined that this connection was desirable because it would allow DM&E to interchange rail traffic with an additional rail carrier. The additional rail routes would enhance the project's potential to ship goods efficiently and competitively.

DM&E determined that each component was a separate and distinct element of the entire project, thus, the selection of a construction alternative for one portion of the project would not predetermine the use of a construction alternative for another portion. As such, DM&E evaluated several alternatives for each component.

2.1.1 CORRIDOR IDENTIFICATION AND SELECTION

DM&E's challenges in identifying the locations for an extension track and the nature and extent of required improvements to its existing rail line, are the physical requirements for a modern, heavy haul railroad. Today's freight trains are heavier and faster than those of the early 1900's when much of DM&E's rail line was constructed. Because they are heavier and faster, they require gentle grades (slope up and down) and wide, open curves to operate safely and efficiently.

The location of DM&E's existing system (Figure 1-5) provides numerous opportunities and possible routes for westward expansion. Prior to beginning the formal Application process with the Board, DM&E first identified the engineering and operational considerations associated with how it could best extend its existing rail line into the PRB and still provide efficient and reliable rail service. DM&E determined a key element of this efficiency and reliability was train speed. According to DM&E, train speeds over the proposed system would need to be high enough to provide reasonable transit times between the coal mines and Midwestern utilities. Reducing the transit time of individual trains would also reduce the number of locomotives and rail cars required to fulfill delivery requirements. Under DM&E's plan, one set of cars and locomotives would be able to make more trips, instead of the more costly use of more train sets for fewer trips to achieve delivery of the same quantity of goods. Speeds of 49 miles per hour for empty unit coal trains and 45 miles per hour for loaded unit coal trains were determined by DM&E to be acceptable for the project. As DM&E indicated in its Application, although these

speeds would be slower than the maximum speeds of unit coal trains on portions of other rail carriers' systems, the average speed would be slightly greater than these other carriers when considering the entire distance the trains would travel.

DM&E then set out to develop a rail alignment that would allow for safe rail transport at the desired speeds while minimizing the total mileage between the coal mines and Midwestern utilities. Numerous factors pertaining to safe rail operations were considered. These factors included:

- The weight of a train being pulled uphill can be greater than the strength of the rail car couplers holding the cars together, causing the cars to pull apart.
- The weight of a train going downhill, pushing forward on the rail cars closer to the front of the train, can exceed the strength of the rail car couplers, causing couplers to buckle or fail, resulting in the rail cars piling up on each other and derailing.
- The steeper the hill, the greater the pulling and pushing forces.
- Sharper curves require reduced train speed to reduce the pull of rail cars against each other as they round the curve, to prevent derailments.
- Trains operating uphill, downhill, and through curves consume greater amounts of fuel and cause greater rail wear than trains operating over level and straight track.

These physical requirements of gentle grade and wide curves, however, can result in the need for more cut and fill to smooth and lower the topography. This increased cut and fill generally results in greater land disturbance and subsequently, greater environmental impact. Based on the factors for safe rail transportation, DM&E looked for conditions it believed would be necessary to construct a safe and efficient rail line that would still enable it to provide competitive rail service for transport of unit coal trains while minimizing the environmental impacts associated with cut and fill activities. The challenge of balancing railroad efficiency and safety against probable environmental impacts drove much of DM&E's route development process for its Application to the Board.[2] DM&E's considerations included:

[2] During the scoping process when the public and government agencies suggested various alternative alignments, SEA considered similar safety, efficiency, and environmental concerns as DM&E in determining whether any post-Application options were reasonable and feasible, and therefore warranted analysis in this Draft EIS.

- Identification of topographic conditions that would allow construction and operation of a rail line with a maximum track grade of 1.0 percent and minimum curvature to accommodate safe operating speeds of 49 miles per hour (mph) for unit coal trains.

- Identification of routes that would provide a reasonably direct path between the end of the existing system and the PRB to minimize travel time between the coal mines and the market.

DM&E's engineers also consulted with various regulatory agencies that would be interested in the project (including SEA), landowners that could be affected, and members of the public. DM&E consulted with these groups to identify a reasonable and feasible corridor for westward expansion of its existing rail system. As shown in Figure 2-1, "Pre-Application Corridor Locations," DM&E identified three potential corridors that would meet these initial objectives:

- The Northern Corridor, which would extend from the end of DM&E's existing rail line near Colony, Wyoming to reach the PRB.
- The Middle Corridor, which would depart from DM&E's existing rail line south of Belle Fourche, South Dakota to reach the PRB.
- The Southern Corridor, which would depart DM&E's existing rail line at Wall, South Dakota, and generally follow the Cheyenne River into the PRB.

The width of each of these corridors varied from less than 1 mile to nearly 10 miles. DM&E recognized many potential options for the new rail line existed within each corridor. To evaluate the feasibility of actually constructing and operating a rail line, DM&E investigated several alignments within each corridor.

DM&E conducted numerous public meetings, visited potential alignment areas with potentially affected landowners, and conducted field investigations to understand the engineering and environmental issues and concerns associated with each corridor. These activities also provided information to the public about the project while facilitating discussions about potential alignments. Based on these discussions and studies, DM&E identified the advantages and disadvantages each corridor offered, as discussed below.

DM&E determined that all the corridors posed significant environmental concerns such as cultural resources, wetlands, the Cheyenne River, and public lands. However, the Southern Corridor would provide greater flexibility than the other corridors for constructing new track. This flexibility results from the topographic features of the Southern Corridor. It is wider than the

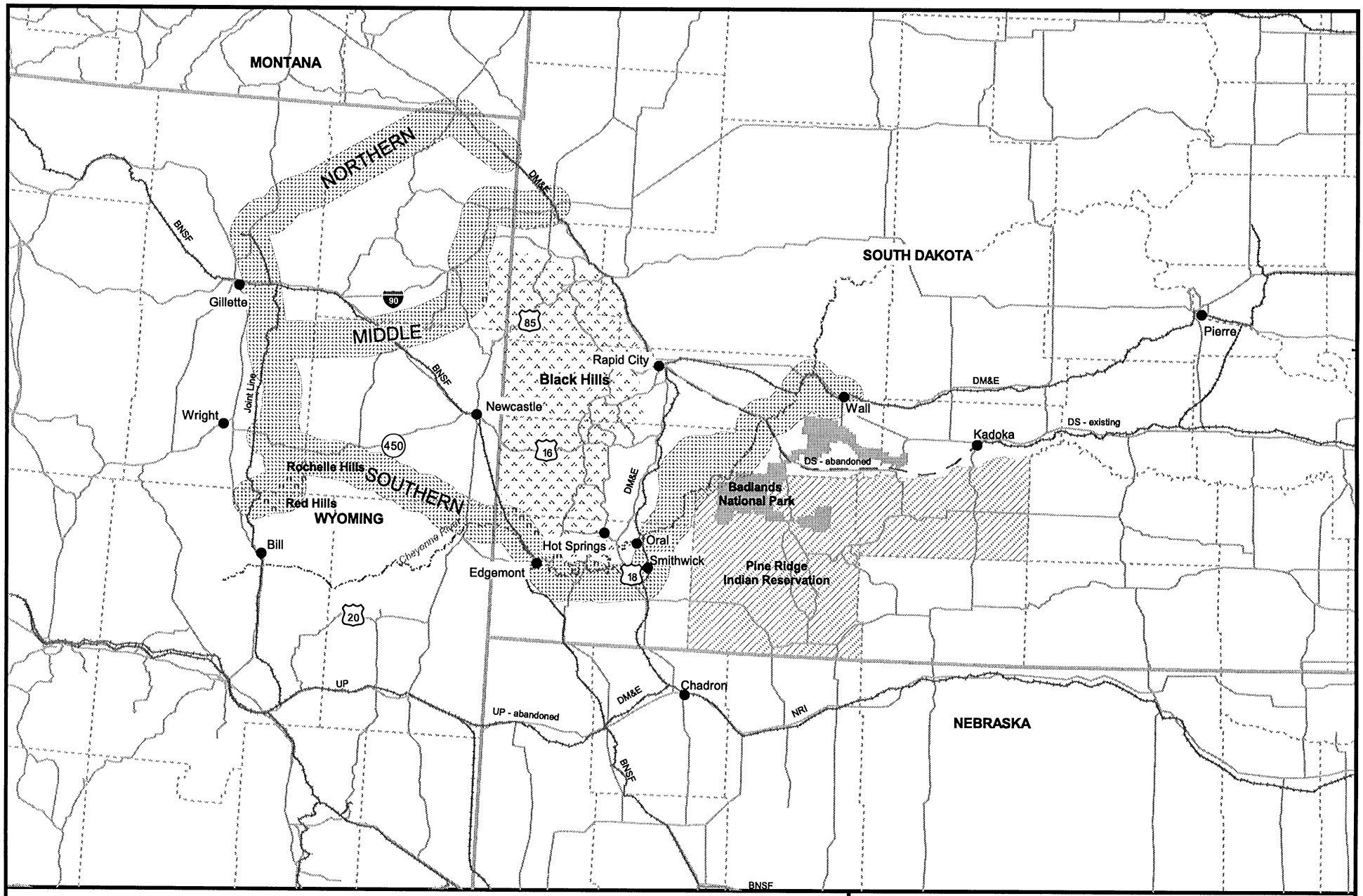


Figure 2-1
POWDER RIVER BASIN EXPANSION PROJECT
Pre-Application Corridor Locations
South Dakota and Wyoming

Northern Corridor and parallels the Cheyenne River for much of its length. The drainage ways and flats associated with the river generally run in an east-west direction, and would provide DM&E with the opportunity to design a gentle grade for the track without significant cutting and filling that the Middle Corridor would require. Although DM&E determined construction within the Southern Corridor would be more expensive, its analysis showed that the lower grades possible along this corridor and shorter distance between the mines and coal-users would provide greater operational efficiency for accessing the southern mines than the other two corridors. According to DM&E, this operational efficiency would minimize long-term operating costs in reaching the more marketable coal of the southern PRB and allow DM&E to create a system that would offer competitive advantages to shippers. Neither the Northern Corridor nor the Middle Corridor would meet this project purpose and need.

After identifying the Southern Corridor (Figure 2-1) as the corridor with the most potential to meet the project purpose and need, DM&E continued to meet with landowners and interested parties to identify potential construction alignments within the corridor. Engineers consulted with landowners to identify alignment locations that would avoid or minimize impacts such as crossing or dividing cultivated lands, particularly irrigated land, or causing potential operational impacts to ranching. Through this consultation process, DM&E developed a network of alternatives within the Southern Corridor. DM&E's February 20, 1998, Application to the Board described DM&E's preferred route alignment,[3] various alternatives to portions of this alignment, and alternatives DM&E initially considered but dropped from further consideration because DM&E had found them infeasible.

2.1.2 PRE-APPLICATION ALTERNATIVES FOR CONNECTION AT MANKATO, MINNESOTA

DM&E currently operates over existing UP rail line through Mankato, Minnesota subject to a trackage rights agreement with UP (Figure 2-2). There is an approximately 5.8-mile gap in DM&E's existing rail line through Mankato. DM&E's existing rail line ends approximately 1.2 miles north east of Mankato, near Benning, where it joins the existing UP rail line. DM&E's rail rail line does not begin again until approximately 1.0 mile west of Mankato, in LeHillier, where it branches from the UP rail line. The UP rail line bridges the gap in the DM&E rail line through Mankato. Before submitting its Application to the Board, DM&E developed a series of alternatives for constructing a rail connection at Mankato to connect its system and bypass the use of UP's rail line (Figure 2-3). The alternatives are listed below:

[3] DM&E's preferred alignment is identified as Alternative B, Proposed Action, in this Draft EIS.

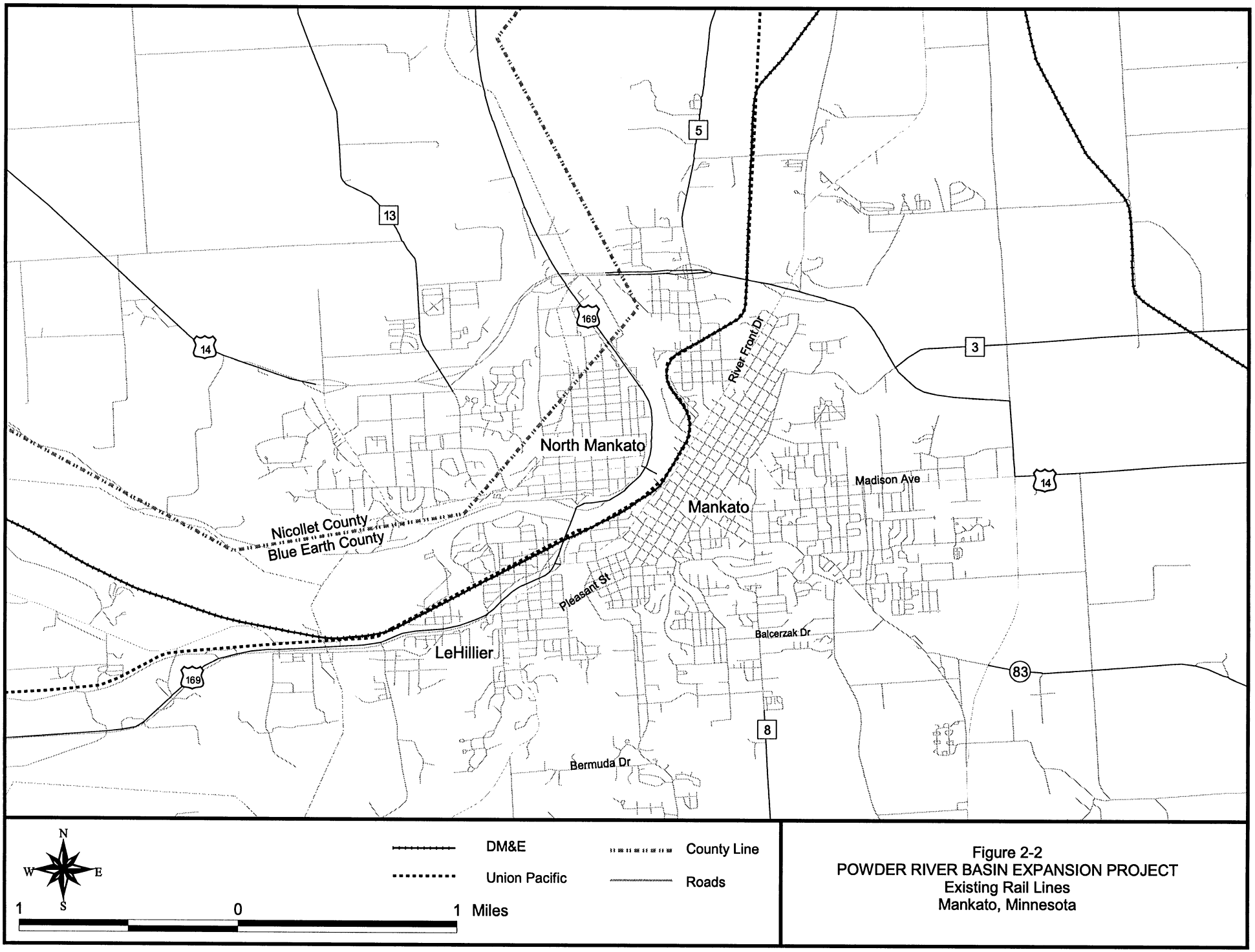
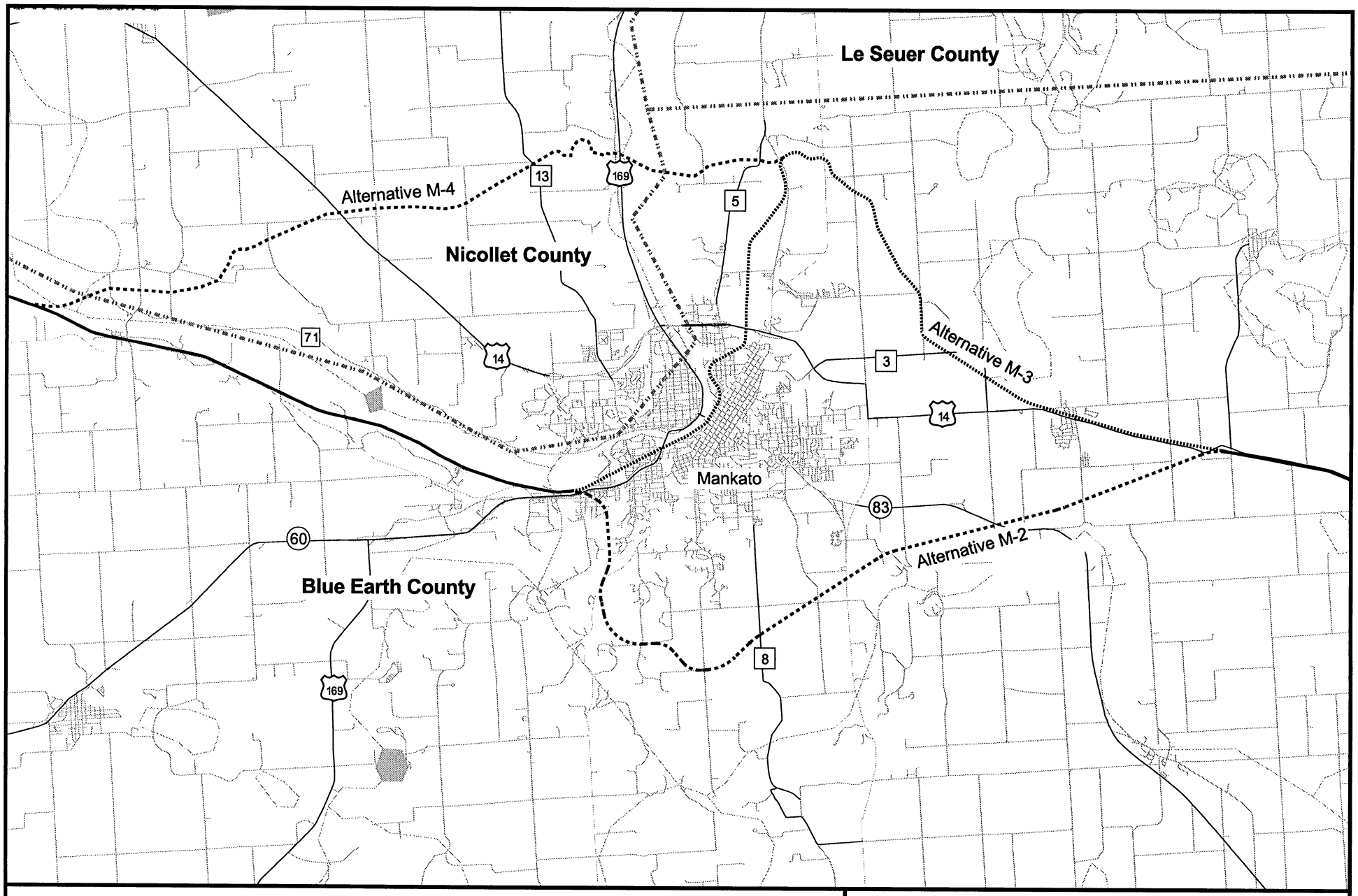


Figure 2-2
POWDER RIVER BASIN EXPANSION PROJECT
Existing Rail Lines
Mankato, Minnesota



N
W E
S
3 0 3 Miles

Existing Rail Line
New Construction
Streams
Roads
County Line
Existing Rail Line Alternative

Figure 2-3
POWDER RIVER BASIN EXPANSION PROJECT
Pre-Application Alternatives
Mankato, Minnesota

- Alternative M-1, which DM&E identified as the No-Build Alternative. This alternative, DM&E stated, would serve as a baseline against which SEA could compare other alternatives during its environmental analysis.
- Alternative M-2, the Southern Route, which would provide a connection route south of Mankato.
- Alternative M-3, the Existing Corridor Route, which would require the construction of a DM&E rail line within UP's existing rail corridor.
- Alternative M-4, the Northern Route, which would provide a connection route north of Mankato.

In its February 20, 1998, Application to the Board, DM&E discussed all these alternatives. DM&E recognized that extensive negotiation with UP and detailed engineering studies would be required to determine the ultimate feasibility of constructing Alternative M-3 within UP's existing corridor. DM&E also determined that Alternative M-4 would require extensive cuts and fills and cross major river floodplains.

2.1.3 PRE-APPLICATION ALTERNATIVES FOR CONNECTION AT OWATONNA, MINNESOTA

DM&E developed alternatives for constructing a connecting rail line between the existing DM&E rail line and the I&M Rail Link (I&M) system at Owatonna (Figure 2-4) are listed below:

- Alternative O-1, which DM&E identified as the No-Build Alternative. This alternative would serve as a baseline against which SEA could compare other alternatives during its environmental analysis.
- Alternative O-2, a 2.94-mile link that would depart from DM&E's existing track approximately 2 miles east of Owatonna to meet the I&M Rail Link line in a "Y" configuration just south of Owatonna.

DM&E presented both alternatives in its February 20, 1998 Application as options for the Board's consideration.

2.2 ALTERNATIVES CONSIDERED IN SEA'S ENVIRONMENTAL REVIEW

After the Board accepted DM&E's Application and SEA determined that an EIS was warranted, SEA began a formal scoping process to comply with National Environmental Policy Act (NEPA) requirements (see Chapter 1, "Introduction"). During the scoping process, which included numerous meetings with agencies, the public and landowners, and opportunities for

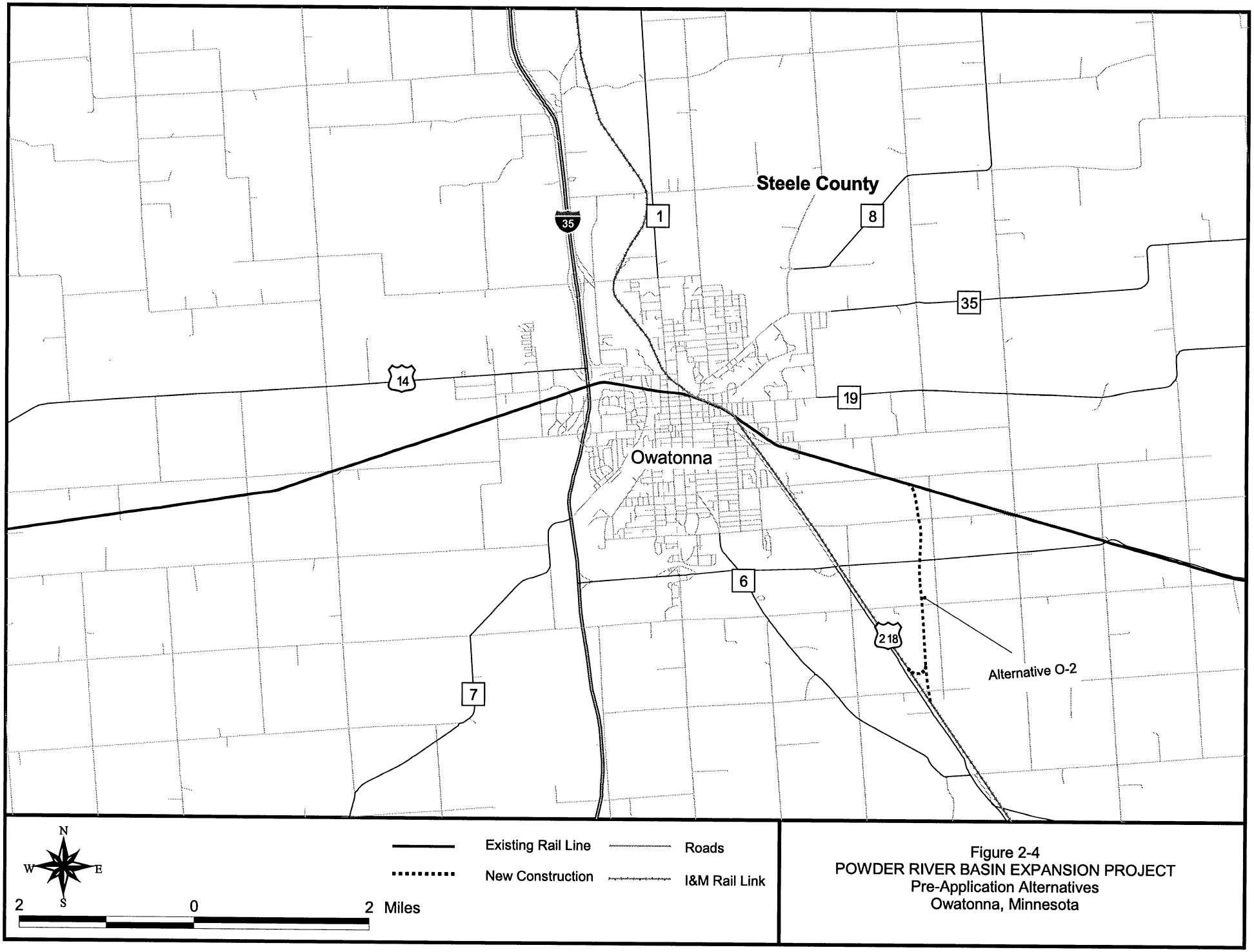


Figure 2-4
POWDER RIVER BASIN EXPANSION PROJECT
Pre-Application Alternatives
Owatonna, Minnesota

public review and comment, the Board received many requests to evaluate alternatives that DM&E did not include in its original Application.

Section 2.2 provides information on these additional alternatives. The section includes the rationale for SEA's elimination of certain alternatives from detailed study early in the environmental review process because SEA determined the alternatives were not reasonable and feasible alternative that would meet DM&E's purpose and need. This section also provides a detailed description of each alternative that SEA determined to be reasonable, feasible, and met the project's purpose and need.

Section 2.2 is organized as follows:

- Section 2.2.1, "Rail Line Extension Alternatives," describes alternatives for constructing new rail line between DM&E's existing track and the PRB.
- Section 2.2.2, "Alternatives Using Existing Transportation Corridors," describes alternatives that rely primarily on use of existing track rather than new construction to reach the PRB.
- Section 2.2.3, "Non-Construction Alternatives," describes options the public suggested as a means to reduce the need for coal and the need for the proposed project.
- Section 2.2.4, "Mankato, Minnesota Construction Alternatives," describes the alternatives for connecting two segments of DM&E's existing rail line in the vicinity of Mankato.
- Section 2.2.5, "Owatonna, Minnesota Construction Alternatives," describes the alternatives for connecting DM&E's existing rail lines the I&M Rail Link system in the vicinity of Owatonna. This section also includes a description of the bypass submitted by the community of Owatonna that suggested ways to avoid routing coal traffic through town while still enabling a connection between DM&E and I&M Rail Link in this area.
- Section 2.2.6, "Bypass Alternatives," describes additional bypass options the public suggested during the formal scoping process. The suggestions included bypasses at Rochester, Minnesota; Pierre/Fort Pierre, South Dakota; and Brookings, South Dakota.

2.2.1 RAIL LINE EXTENSION ALTERNATIVES

The Southern Corridor originates approximately 75 miles east of Rapid City and approximately 1 mile north of Wall, South Dakota (Figure 2-1). The corridor extends from the existing DM&E rail line and generally follows the Cheyenne River south and west to near Oral, South Dakota using the section of DM&E's existing rail line between Oral and Smithwick. It follows the Cheyenne River drainage into Wyoming, just north of Edgemont, South Dakota. In Wyoming, the Southern Corridor extends northwest to enter the PRB west of Wright, Wyoming. DM&E developed an alignment, Alternative B (which DM&E identified as its Preferred Alternative), within this southern corridor for extending its existing system (Figure 2-5). This alignment, along with several alignment modifications, was submitted by DM&E in its Application to the Board.

During the formal scoping process, SEA, in the draft scope published two alternatives for public and agency comment:

- Alternative A, the No-Action Alternative, which was the no-build alternative.
- Alternative B, the Proposed Action, which was based primarily on the preferred alternative DM&E presented in its Application to the Board.[4]

As a result of scoping meetings and consultation with Federal and State agencies, DM&E modified various portions of Alternative B, the Proposed Action, to create an additional alternative route, Alternative C, Modified Proposed Action (Figure 2-6). DM&E continued to refine Alternative C during the scoping process to respond to environmental concerns that the public and agencies raised. In March of 1999, the Board and cooperating agencies presented Alternative C to interested parties, landowners and agencies along with the Final Scope of Study for the Draft EIS.

As a result of the scoping meetings and consultation with Federal and state agencies, SEA identified an extension alternative that would utilize existing transportation corridors within the project area. Alternative D (Figure 2-7) was developed by SEA and the cooperating agencies in response to comments raised by the public during the scoping process.

[4] DM&E has presented minor alignment modifications to its preferred alternative, Alternative B, to respond to operational, environmental and engineering concerns raised with regard to the original Alternative B.

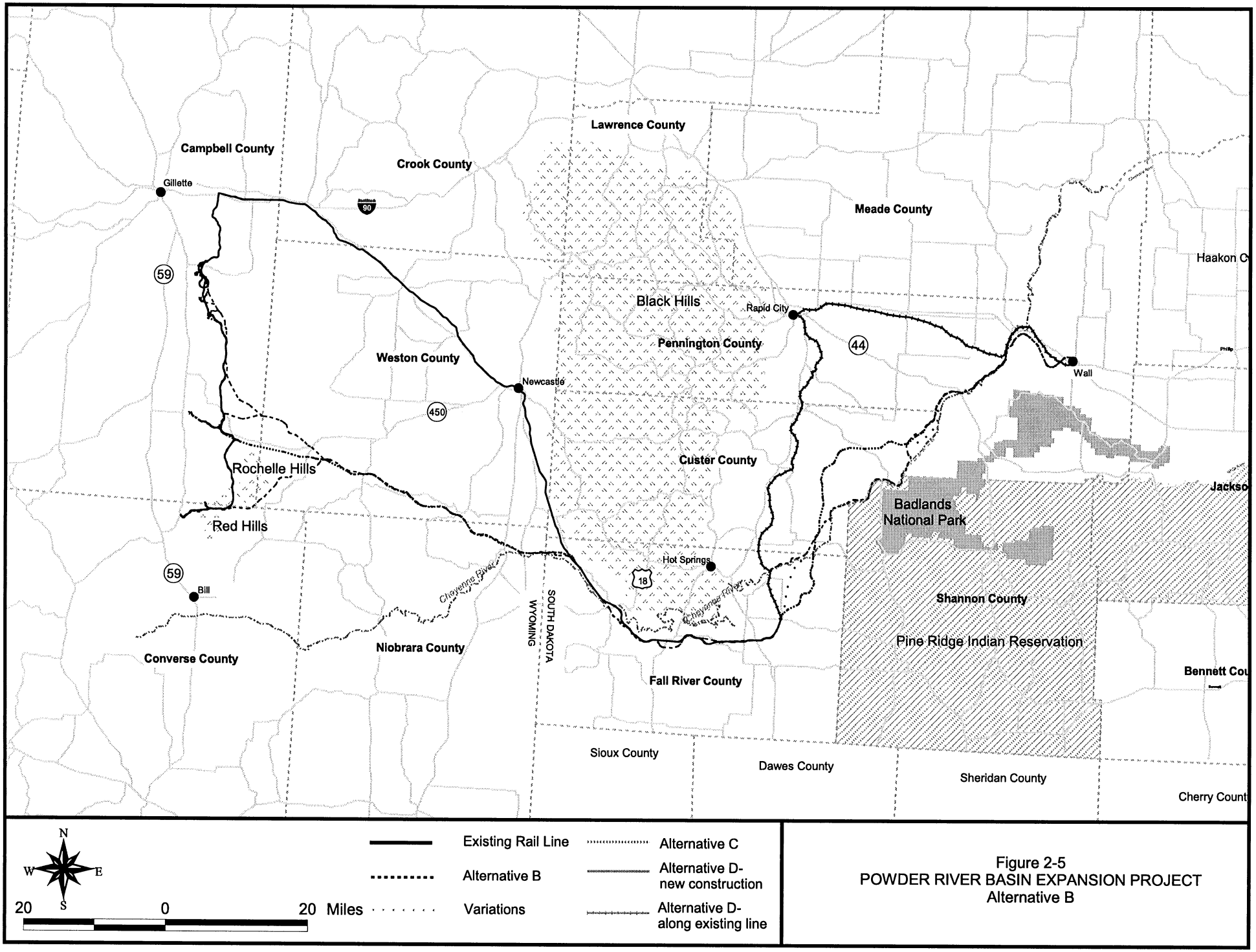


Figure 2-5
POWDER RIVER BASIN EXPANSION PROJECT
Alternative B

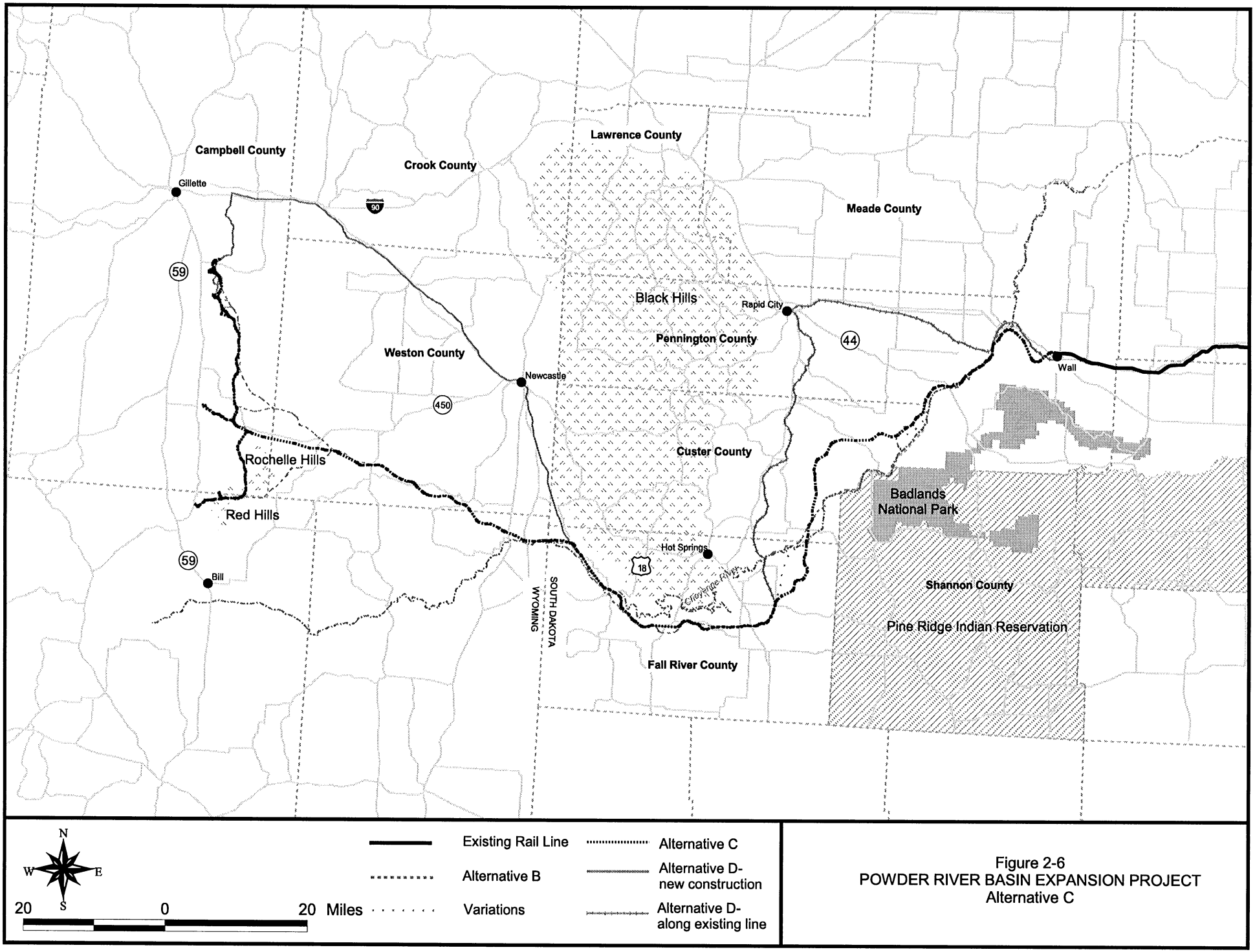
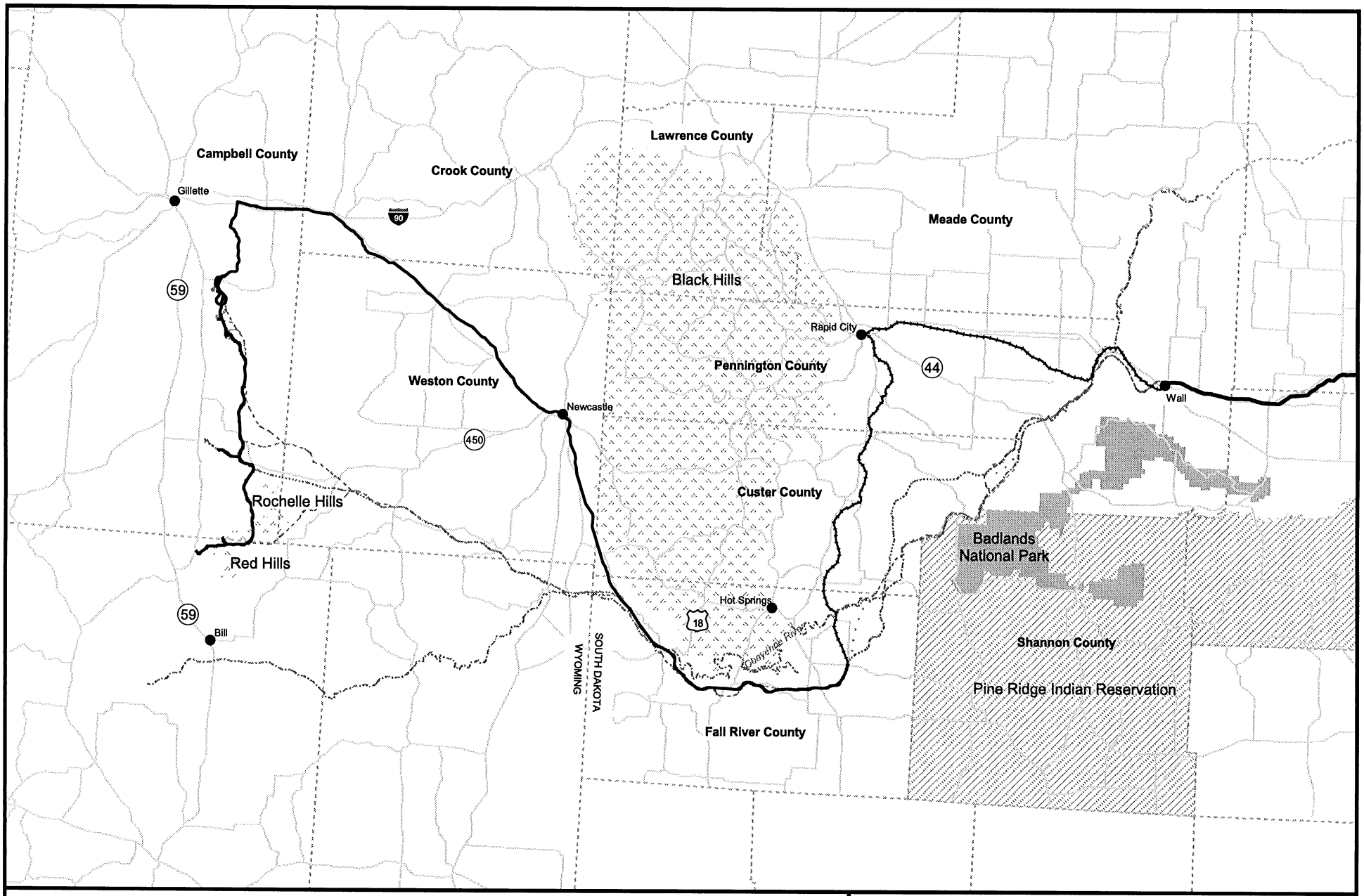


Figure 2-6
POWDER RIVER BASIN EXPANSION PROJECT
Alternative C



N
W E
S

20 0 20 Miles

Existing Rail Line

Alternative B

Variations

Alternative C

Alternative D-
new construction

Alternative D-
along existing line

Figure 2-7
POWDER RIVER BASIN EXPANSION PROJECT
Alternative D

Sections 2.2.1.1 through 2.2.1.3 and 2.2.2.2 provide a detailed description of the No-Action Alternative (Alternative A) and alternative alignments (Alternatives B, C, and D) for extending the existing DM&E rail line into the PRB. These alignments are shown in Figures 2-5 through 2-8. Alternatives B, C and D follow the same alignment for some portions of their total alignment. Therefore, the new Extension Alternatives are divided into segments. Each segment is described in detail. Segments are combined with other segments to create entire alternatives. When a segment is used by more than one alternative, it is only described once. When discussed later for a different alternative, the reader is referred to the earlier description. Each segment is described according to the Section (Sec.), Township (T) and Range (R) in which it appears on U.S. Geological Survey (USGS) 7.5-minute topographic maps. Figures 2-5 through 2-8 provide an overview of the alignments for the Extension Alternative. In addition, Volume V of this Draft EIS provides detailed maps of the locations of the project alternatives.

Although the Extension Alternatives share numerous segments in common, each Extension Alternative would generally be required to follow the alignment of the segments described for it. Topography and engineering considerations such as slope, grade and curve may not allow one extension alternative to follow the alignment of a particular segment described for another alternative. Exceptions to this include the Spring Creek (Figure 2-9) and Hay Canyon (Figure 2-10) areas where any of the alternative segments through these areas could be followed by the Extension Alternative.[5] These alternative alignments are described in Sections 2.2.1.2 and 2.2.1.3.

2.2.1.1 Alternative A: No-Action Alternative

Under the No-Action Alternative, Alternative A, DM&E would not construct or operate new rail line in South Dakota and Wyoming extending its existing system into the PRB.[6] The Application before the Board for the authority to construct, operate, and maintain a new rail line accessing PRB coal mines would not be approved. The Special Use Application submitted by DM&E for an easement under the Federal Land Management Policy Act of 1976 (FLPMA) to cross portions of the Buffalo Gap National Grassland (BGNG) in South Dakota and Thunder Basin National Grassland (TBNG) in Wyoming would not be granted by the U.S. Forest Service (USFS). The Application for a right-of-way crossing portions of land administered by the U.S. Department of the Interior, Bureau of Land Management (BLM) in Sections of South Dakota and

[5] Applies to Extension Alternatives B and C only as Alternative D avoids both the Spring Creek and Hay Canyon areas.

[6] It is likely that DM&E would also not rebuild its existing system in Minnesota and South Dakota under the No-Action Alternative due to lack of available revenue sources.

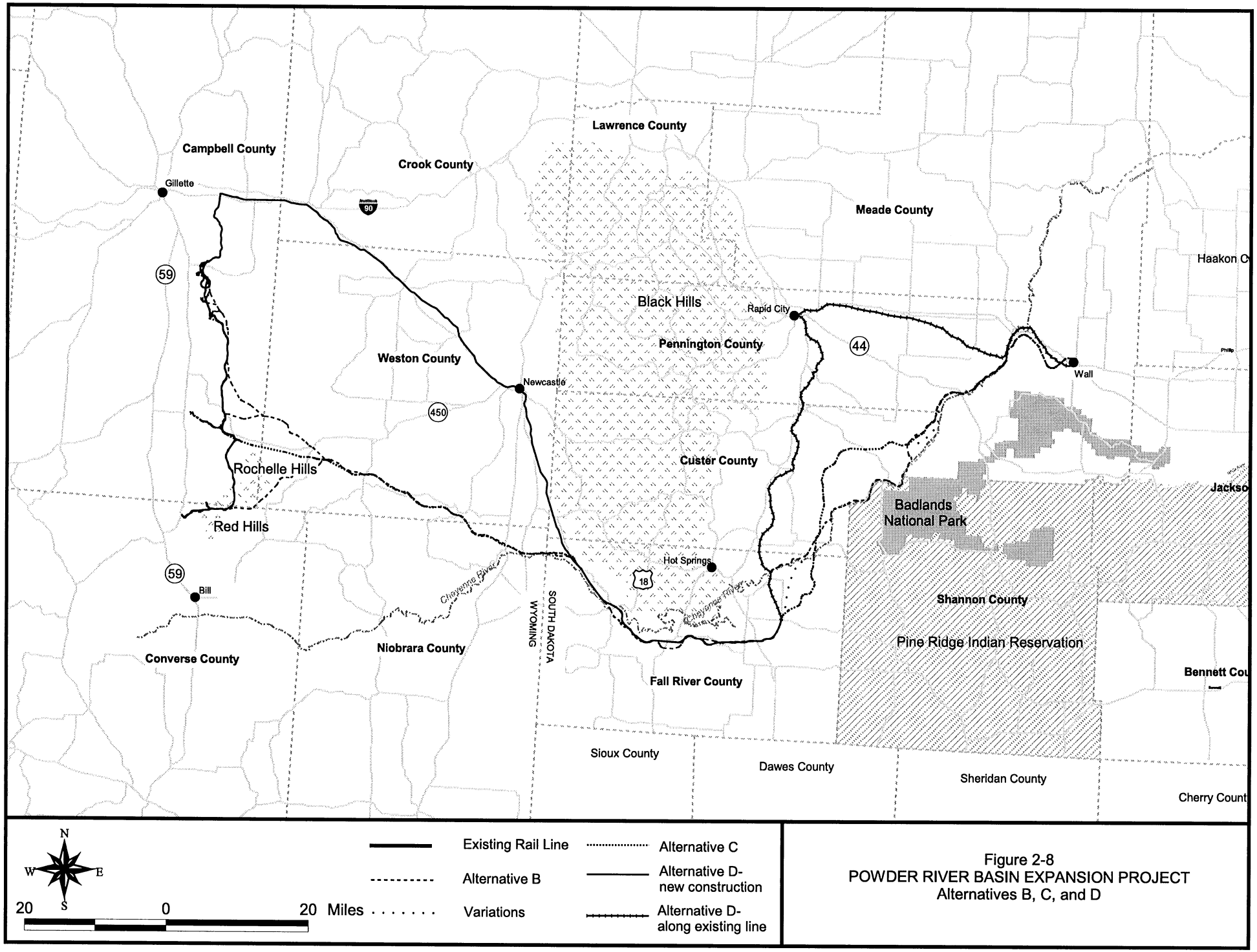
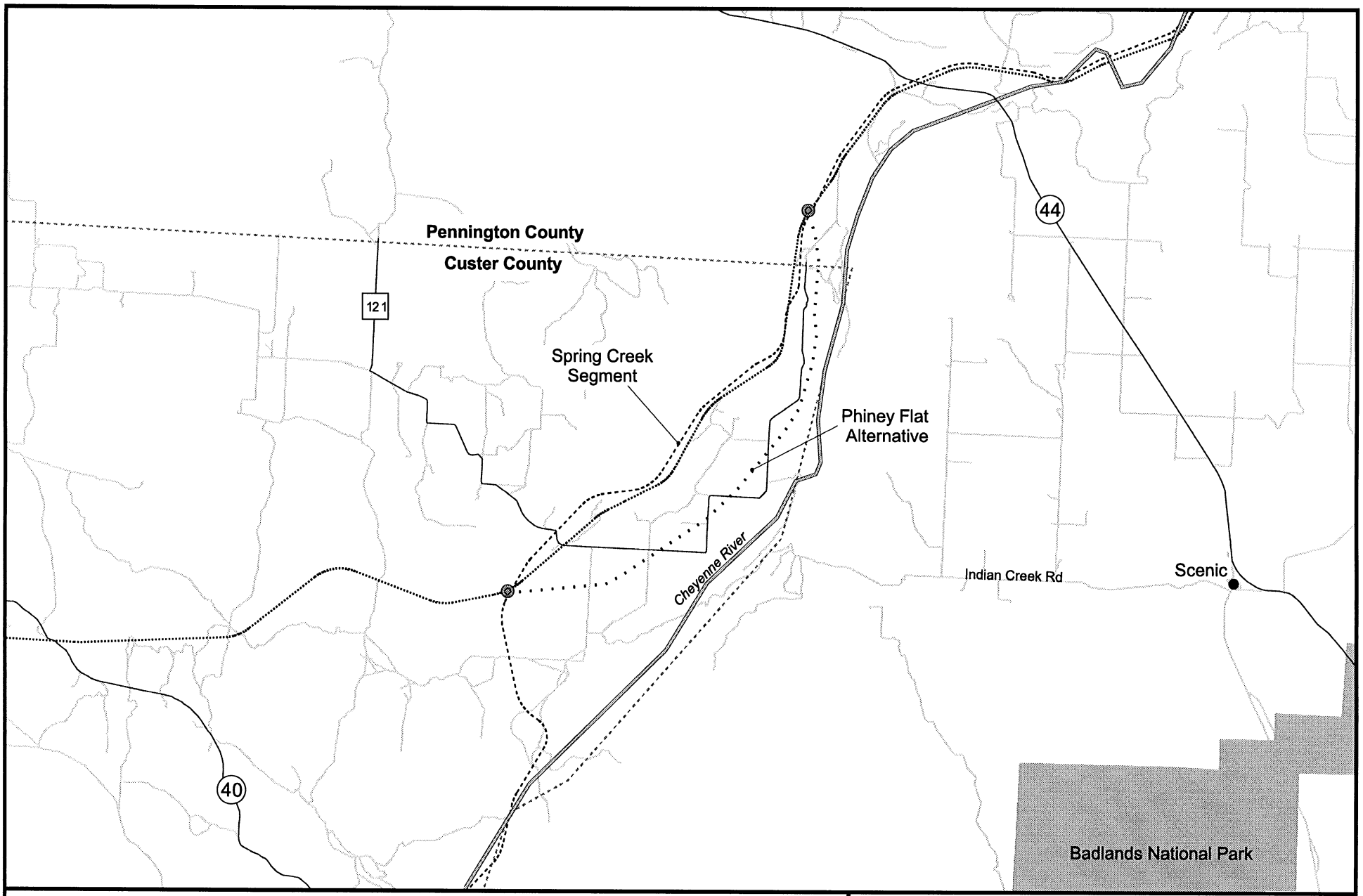


Figure 2-8
POWDER RIVER BASIN EXPANSION PROJECT
Alternatives B, C, and D



N
W E
S

2 0 2 4 Miles

Alternative B

Alternative C

Variations

Marks Beginning and End of Spring Creek Alternatives

Figure 2-9
POWDER RIVER BASIN EXPANSION PROJECT
Spring Creek Alternatives

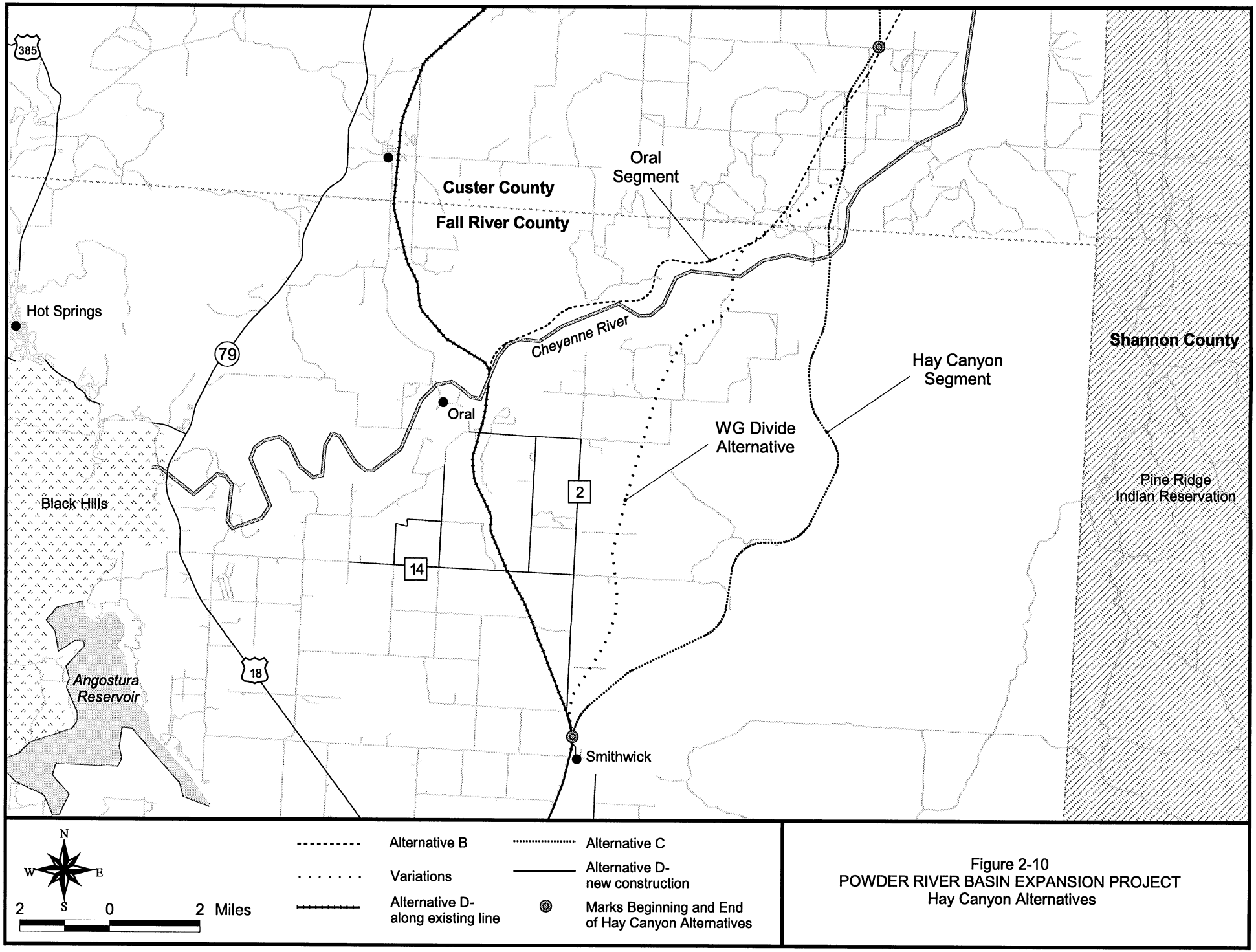


Figure 2-10
POWDER RIVER BASIN EXPANSION PROJECT
Hay Canyon Alternatives

Wyoming would not be granted. The U.S. Army Corps of Engineers (COE) would not issue a permit for impacting waters of the United States or wetlands. The Coast Guard (USCG) would not issue a permit for construction of rail bridge facilities over the Missouri River. The U.S. Department of the Interior, Bureau of Reclamation (Reclamation) would not issue a permit for project impacts to lands and facilities that are part of the Angostura Reservoir and Irrigation Project. No state or local permits would be issued. Under the No-Action Alternative, coal would continue to be mined in the PRB and transported by UP and BNSF railroads. Coal mines would continue to open and increase production as discussed in Chapter 1, potentially increasing rail service problems both in the PRB at the mines and for coal customers. As coal production increased, rail traffic on the existing rail line routes between the mines and users would also increase. Upgrades to the existing rail lines operated by UP and BNSF (Joint Line) accessing PRB coal mines would be likely. Communities through which the existing coal traffic is currently transported, such as Gillette, Newcastle, Torrington, and Cheyenne in Wyoming, Edgemont in South Dakota, and numerous towns throughout Nebraska, North Dakota, and Montana, would likely experience increases in rail traffic and associated impacts related to noise, traffic delay, safety, and air emissions.

2.2.1.2 Alternative B: Proposed Route

DM&E presented Alternative B, Proposed Route, in its February 20, 1998, Application to the Board. As shown in Table 2-1, "Comparison of Principal Characteristics of Alternative Routes for Extension into the PRB," Alternative B would be 281.4 miles long. This alternative runs generally east-west from Wall, South Dakota to the southwestern portion of Weston County, Wyoming (Figure 2-5). From that point, Alternative B would split into a "Y" that would provide shippers access to various locations within the PRB. The Southern Fork of the "Y" would have a spur that would provide access to the Antelope, North Antelope and Rochelle coal mines. The Northern Fork of the "Y" would have several spurs that would provide access to the Jacobs Ranch, North Rochelle, Black Thunder, Coal Creek, Cordero, Caballo Rojo, Caballo and Belle Ayr coal mines. Table 2-1 also summarizes information regarding other features of this alternative, such as requirements for new right-of-way, sidings, locomotives, etc. Alternative B consists of the segments presented in Table 2-2. A detailed description of each segment follows the table. Figure 2-11 provides a guide to SEA's descriptions of the segments' location within a section. Volume V provides detailed maps for Alternative B.

North Side

Northwest Corner	North Center	Northeast Corner
West Center	Center 6	East Center
Southwest Corner	South Center	Southeast Corner

West Side

East Side

South Side

6 Section Number

Section Boundary

Figure 2-11
POWDER RIVER BASIN EXPANSION PROJECT
Key to Route Description Terminology

Table 2-1
Comparison of Principal Characteristics of Alternative Routes for Extension Into the PRB

Alternative	Total Project Length	Length of New Construction		Length of existing rail line rebuild	Total round trip distance*	Train cycle time (hours)	Max. grade against loads	Locomotives per train	Number of train crews required	Number of sidings required	Miles of sidings required	Annual locomotive fuel (million gallons)
		New right-of-way	Parallel existing right-of way									
Alternative B	281.4	260.6	8.0	12.8	1,638	80.0	1.00%	3	9	43	187.3	46.4
Alternative C	268.7	256.3	8.0	4.4	1,620	70.2	1.00%	3	9	43	181.2	45.9
Alternative D-1	439.0	0.0	260.9	178.1	1,988	89.2	1.68%	5	12	55	223.2	75.2
Alternative D-2	412.0	0.0	234.0	178.1	1,932	86.7	1.68%	5	12	54	219.7	73.7
Alternative D-3	395.0	63.3	153.6	178.1	1,876	85.3	3.79%	9	12	52	212.7	90.6
Alternative D-4	294.4	191.9	98.8	3.7	1,676	73.7	3.79%	9	11	45	188.2	82.0
Alternative D-5**	399.8	286.1	29.5	83.7	1,630	70.6	1.00%	3	9	43	171.2	46.1
Alternative D-6	311.4	177.8	8.0	125.6	1,682	75.9	1.68%	5	11	45	182.2	67.0
Alternative D-7	353.4	102.1	125.7	125.6	1,840	82.7	1.68%	5	11	50	205.7	71.2

Information partially obtained from DM&E June 9, 1999 filing to STB, Applicants Comments On Alternative Routes Analysis
* Round trip distance based on transport of coal from center of PRB region south of Wyoming, approximately Black Thunder Mine.
** Characteristic information for Alternative D-5 includes use of Alternative C to extend the rail line into the PRB.

Table 2-2
Alternative B Segments

Segment (Approximate Length)	Start	End
Wall Segment (33.5 miles)	Section 31, T1N, R16E, approximately 0.5 mile north of Wall	North-center of Section 20, T2S, R12E, approximately 0.5 mile west of Creston Road and north of Spring Creek
Spring Creek Segment (8.5 miles)	North-center of Section 20, T2S, R12E, approximately 0.5 mile west of Creston Road and north of Spring Creek	South-center of Section 21, T3S, R11E
Phiney Flat Alternative (10.3 miles)	North-center of Section 20, T2S, R12E, approximately 0.5 mile west of Creston Road and north of Spring Creek	South-center of Section 21, T3S, R11E
Cheyenne River Segment (27.2 miles)	South end of Section 12, T3S, R11E, near Spring Creek	Northeast corner of Section 18, T6S, R9E, near Cottonwood Cutoff Road
Oral Segment (20.5 miles)	Northeast corner of Section 18, T6S, R9E, near Cottonwood Cutoff Road	Section 31, T8S, R8E, just north of the town of Smithwick
WG Divide Alternative (14.7 miles)	Northeast corner of Section 18, T6S, R9E, near Cottonwood Cutoff Road	Section 31, T8S, R8E, just north of the town of Smithwick
Hay Canyon Segment (18.5 miles)	Northeast corner of Section 18, T6S, R9E, near Cottonwood Cutoff Road	Section 31, T8S, R8E, just north of the town of Smithwick
Smithwick Segment (13.1 miles)	Section 31, T8S, R8E, just north of the town of Smithwick	Section 29, T9S, R6E west of Dry Creek
Tepee Creek North Segment (3.4 miles)	Section 29, T9S, R6E west of Dry Creek	Southwest corner of Section 23, T9S, R5E

Table 2-2
Alternative B Segments

Segment (Approximate Length)	Start	End
Heppner Segment (3.1 miles)	Southwest corner of Section 23, T9S, R5E	Section 29, T9S, R5E, southwest of Heppner
Hat Creek South (7.7 miles)	Section 29, T9S, R5E, southwest of Heppner	Section 25, T9S, R3E at Plum Creek
Edgemont Segment (3.8 miles)	Section 25, T9S, R3E at Plum Creek	Southwest corner of Section 15, T9S, R3E
Edgemont South Segment (4.7 miles)	Southwest corner of Section 15, T9S, R3E	Center of Section 26, T8S, R2E, near Existing BNSF rail line
BNSF Segment (8.0 miles)	Center of Section 26, T8S, R2E, near Existing BNSF rail line	Northwest corner of Section 25, T7S, R1E
Beaver Creek Segment (5.7 miles)	Northwest corner of Section 25, T7S, R1E	Section 15, T40N, R60W, south of Twenty One Divide at WY/SD border
Wyoming Segment (43.9 miles)	Section 15, T40N, R60W, south of Twenty One Divide at WY/SD border	North-center of Section 12, T42N, R67W at Lion Creek
Southern Fork (29.2 miles)	Section 12, T42N, R67W, at Lion Creek	Section 1, T40N, R71W, at Antelope coal mine
North Antelope East Mine Loop Alternative (4.1 miles)	Northeast corner of Section 34, T41N, R70W	Northwest corner of Section 27, T41N, R70W west of Porcupine Reservoir upon joining existing spur to North Antelope/Rochelle coal mine.
North Antelope West Mine Loop Alternative (2.4 miles)	Center of Section 32, T41N, R70W, north of Antelope Creek	Border between Section 33 and 34, T41N, R70W, north of Antelope Creek upon joining with existing North Antelope/Rochelle mine spur.

Table 2-2
Alternative B Segments

Segment (Approximate Length)	Start	End
Northern Fork (13.7 miles)	Section 12, T42N, R67W, at Lion Creek	Section 1, T43N, R69W, at approximately Keeline Road
North Fork-South Spur (11.6 miles)	Section 1, T43N, R69W, at approximately Keeline Road	Southeast corner of Section 14, T43N, R70W
Black Thunder North Mine Loop Alternative (4.5 miles)	Southeast corner of Section 14, T43N, R70W	Section 17, T43N, R70W at Black Thunder coal mine. Includes spur to serve Jacobs Ranch coal mine.
Black Thunder South Mine Loop Alternative (7.1 miles)	Southeast corner of Section 14, T43N, R70W	Section 14, T43N, R70W at Jacobs Ranch coal mine and second spur in Section 17, T43N, R70W at Black Thunder coal mine.
North Rochelle Mine Spur - Highway 450 Alternative (6.5 miles)	Southeast corner of Section 14, TH3N, R70W	Section 5, T42N, R70W at North Rochelle coal mine.
North Fork North Spur (41.0 miles)	Section 1, T43N, R69W, at approximately Keeline Road	Section 24, T48N, R71W at Caballo mine; includes spurs to serve Cordero, Caballo Rojo and Belle Ayr mines

Wall Segment

This 33.5-mile segment of Alternative B would leave the existing DM&E rail line approximately 0.5 mile north of Wall at the point where the existing rail line turns south.[7] The rail line would bend northwest from the existing rail line, cross the northern portion of Sec. 36, T1N, R15E, and turn south. The Wall Segment would have a grade-separated crossing over Interstate 90 (I-90) approximately 1.5 miles northwest of DM&E's existing grade-separated crossing of I-90 and approximately 1.8 miles west of the Wall, State Route 240 exit. It would extend southwest approximately 2.0 miles, cross Baseline Road at grade approximately 0.4 mile southwest of I-90 and the existing DM&E rail line, and cross Bull Creek approximately 1,000 feet west of the northeast corner of Sec. 2, T1S, R15E. The segment would continue southwest across this section, turning back northwest across the bottom of Sec. 3, T1S, R15E, and crossing Sec. 4, T1S, R15E from the southeast corner to the northwest corner. The Wall Segment would continue for approximately 3.0 miles, generally between 0.5 and 1.0 mile southwest of the existing rail line and Bull Creek, into the center of Sec. 19, T1N, R15E, where it would turn more westerly and leave this section at the northwest corner. The Wall Segment would cross Sec. 13, T1N, R14E from the southeast corner to the northwest corner, enter the southwest corner of Sec. 11, T1N, R14E. It would enter the east side of Sec. 10, T1N, R14E approximately 0.5 mile south of I-90 and turn to the southwest through the middle of this section. This segment would continue southwest across the northwest corner of Sec. 16, T1N, R14E, cross Crooked Creek approximately 0.3 mile from its confluence with the Cheyenne River, pass within approximately 1,000 feet of the Cheyenne River in Sec. 17, T1N, R14E, and enter Sec. 20 approximately 500 feet west of its northeast corner. The Wall Segment would curve westward through the center of Sec. 20, cross the Cheyenne River in the northeast corner of the southwest quarter section of Sec. 20, and exit this section at its southwest corner. It would cross Baseline Road at grade upon entering Sec. 19, T1N, R14E approximately 3.2 miles south of Wasta. The Wall Segment would turn south and join the existing DM&E rail line in the center of Sec. 30, T1N, R14E.

---

[7] DM&E indicated in its Application that there were operational issues for the proposed project along its existing system near Wall. It noted that actions would likely be required at Wall to reduce grade and straighten the track. However, no plan was presented by DM&E in its Application. Subsequent to filing its Application, DM&E developed a proposal to eliminate these problems. This proposal included approximately 30 miles of new construciton from approximately 4 miles south of Wasta, near the point the new rail line would branch from DM&E's existing system, in roughly a backwards, horizontal "S" shape eastwards (see portion of Alternatives B and C just west of Wall in Figures 2-5 and 2-6), eventually connecting to the existing system north of Wall. This realignment of the exisiting system was determined the only practical and feasible solution to the operational problems at Wall, considering the Cheyenne River, engineering requirements to cross Interstate 90, and straighten the overall alignment. It was, therefore, included as part of Extension Alternatives B and C, which were originally proposed to extend from the existing DM&E rail line south of Wasta.

Approximately 4.0 miles south of Wasta where the existing DM&E rail line turns westward, the Wall Segment would branch from the existing rail line, cross Boxelder Creek approximately 0.5 mile from its confluence with the Cheyenne River, and extend southward for approximately 1.5 miles into Sec. 6, T1S, R14E, before curving to the southwest. The Wall Segment would generally run along the north or west sideslope of the Cheyenne River floodplain for approximately 11 miles. Approximately 0.6 mile north of where State Highway 44 crosses the Cheyenne River, the Wall Segment would curve to the south. It would cross Rapid Creek approximately 1.5 miles from its confluence with the Cheyenne River, cross State Highway 44 at grade approximately 1.5 miles east of Creston and 1.6 miles west of where the highway crosses the Cheyenne River, and cross Creston Road at grade approximately 0.5 mile southeast of its intersection with State Highway 44. The Wall Segment would parallel Creston Road, which is located on the old Chicago, Milwaukee and St. Paul Railroad grade, for approximately 0.8 mile. The railroad grade turns sharply to the southeast in the center of Sec. 9, T2S, R12E. However, Creston Road continues to the southwest and the Wall Segment would continue to parallel the road for nearly 1.0 mile.

In the northeast corner of Sec. 17, T2S, R12E, Creston Road turns due south and the Wall Segment would extend southwest, away from the road. The Wall Segment would cross Cole Draw approximately 0.9 miles from its confluence with the Cheyenne River. The Wall Segment would end in the south-center of Section 17, approximately 0.5 mile north of Spring Creek.

Spring Creek Segment

The 8.5-mile Spring Creek Segment of Alternative B would continue south into Sec. 20, T2S, R12E, crossing Spring Creek just west of where Spring Creek Road crosses the creek. The Spring Creek Segment would follow the sideslope of the Spring Creek floodplain through Sec. 29, T2S, R12E. After entering Sec. 32, T2S, R12E, it would curve westward and cross Spring Creek in the middle of the section, just east of the rail line between Sections 32 and 31. After crossing to the west side of Spring Creek, it would again follow the sideslope of the floodplain in the southwest corner of Sec. 12, T3S, R11E. The Spring Creek Segment would cross Spring Creek nine times along this stretch. The Spring Creek Segment[8] would extend from Sec. 12, T3S, R11E across the southeast corner of Sec. 11, and into Sec. 14, T3S, R11E. From the

[8] From this point to the end of the segment, the Spring Creek Segment alignment would differ between Alternatives B and C. However, it is considered one segment because this portion is relatively short and if this segment were divided into additional segments it would be difficult to compare the alternative alignments for the Spring Creek area. Different alignments for this section of the Spring Creek Segment are therefore described for Alternatives B and C.

northeast corner of Sec.14, T3S, R11E it would continue southwesterly to cross Spring Creek in the center of Sec.15, T3S, R11E and Spring Creek Road in the southwest corner of this section. The Spring Creek Segment would turn to the south in Sec. 21, T3S, R11E approximately 1.5 miles south of the crossing of Spring Creek Road.

Phiney Flat Alternative

The 10.3-mile Phiney Flat Alternative would provide an alternate alignment for the Spring Creek Segment of Alternative B. It would move the Spring Creek portion of Alternative B out of the Spring Creek drainage, upslope and southeast onto Phiney Flat. The Phiney Flat Alternative would extend from the Wall Segment, curving to the south. It would cross Spring Creek Road southeast of the center of Sec. 20 and Spring Creek in the southeast corner of the section. The Phiney Flat Alternative would enter Custer County and ascend the slope at the north end of Phiney Flat, between the Cheyenne River and Spring Creek, extending south along the eastern third of Sections 29 and 32. It would curve to the southwest entering Sec. 5, T3S, R12E, crossing the northwest tip of Sec. 8, southeast corner of Sec. 7, and northwest corner of Sec. 18. It would cross the southeast corner of Sec. 13, T3S, R11E, northwest tip of Sec. 24, and southwest into the center of Sec. 23. The Phiney Flat Alternative would curve to a more westerly direction, crossing the southern third of Sec. 22. It would end in the south-center of Sec. 21.

Cheyenne River Segment

The 27.2-mile Cheyenne River Segment of Alternative B would begin in the south-center of Sec. 21 and continue south through the center of Sections 28 and 33 (across Phiney Flat). It would enter the northwest corner of Sec. 3, T4S, R11E, turn southwest and leave the section's southwest corner, cross the northwest corner of Sec. 10, and turn south to enter the Cheyenne River floodplain on the east side of Sec. 9. Alternative B would follow the west floodplain of the Cheyenne River in a southerly direction through Sections 9, 16, and 21 of T4S, R11E, Sections 20, 21 and 29, of T43N, R11E and Sections 28 and 29 of T43N, R46W, staying within 0.5 mile of the Cheyenne River. Alternative B would cross Battle Creek in Sec. 21, just east of the Sec. 20 (T4S, R11) boundary. In the southeast corner of Sec. 29, T4S, R11E Alternative B would turn to the west and follow the north floodplain of the Cheyenne River through Sections 32, 31 and 30, T43N, R11E and Sections 25, 26 and 27, T4S, R10E. Alternative B would have a grade separated crossing of State Highway 40 in Sec. 25, T4S, R10E approximately 0.5 mile north of the Cheyenne River. In the center of Sec. 27, Alternative B would turn south and continue to parallel the west floodplain slope of the Cheyenne River through Sections 27, 28, and 33, T4N, R10E and Sections 4, 9, 8, 18, 13, 14, 23, 22, 21, 28, and 33, T5S, R9E. Alternative B would cross Red Shirt Creek in Sec. 27, T4S, R10E, and French Creek in Sec. 4, T5S, R10E. In the southwest corner of Sec. 33 Alternative B would turn in a southwesterly direction and leave the

Cheyenne River floodplain. It would generally follow the west side of Cottonwood Creek for approximately 3.5 miles through Sec. 32, T5S, R9E and Sections 5, 6, 7, and into Sec. 18, T6S, R9E.

Oral Segment[9]

The 20.5-mile Oral Segment of Alternative B would extend from the Cheyenne River Segment, continuing southwest along Cottonwood Creek. It would cross Cottonwood Creek twice. The Oral Segment would cross the southern portion of Harrison Flat, a gravel county road at grade at the bottom of Sec. 24, T6S, R8E, and continue southwest. The Oral Segment would again cross Cottonwood Creek at the point where the creek flows into Sec. 18 and twice more before leaving Sec. 13, T6S, R8E. It would cross the southwest corner of Harrison Flat (through Sec. 35, T6S, R8E) and Lame Johnny Creek. The Oral Segment would enter Fall River County in the northwest corner of Sec. 2, T7S, R8E and turn southwest into Cheyenne River floodplain in the southwest corner of Sec. 3. The Oral Segment would continue in a southwesterly direction along the base of the north floodplain slope of the Cheyenne River for approximately 6.0 miles (through Sections 4, 5, 8, 7, 18, 13, 14 and 23). It would cross Beaver Creek approximately 1,000 feet from its confluence with the Cheyenne River. The Oral Segment would join the existing DM&E rail line 1.5 miles north of Oral, South Dakota and 0.5 mile north of the Cheyenne River in the southeast corner of Sec. 22, T7S, R7E. It would continue south using the existing DM&E rail line for approximately 8.6 miles. The existing rail line crosses the Cheyenne River in the northeast corner of Sec. 27, T7S, R7E. Once across the Cheyenne River, the existing alignment generally follows Sand Creek south to where it would end, approximately 0.5 mile north of Smithwick. It would cross the Sand Creek several times. The Oral Segment would cross County Road 2 at grade in the southeast corner of Sec. 27 directly east of Oral, SD.

Hay Canyon Segment[10]

The 18.5-mile Hay Canyon Segment, which is an alternative route for the Oral Segment of Alternative B, would begin in the northeast corner of Sec. 18, T6S, R9E, and extend southwest across the southeast corner of Sec. 13, T6S, R8E, crossing Cottonwood Creek in the west-center of the section. The Hay Canyon Segment would curve back south through the center of Sections

[9] The Oral Segment was the original alignment proposed for Alternative B by DM&E in its Application to the Board. However, it would be possible to use either the Hay Canyon Segment or WG Divide Alternative as alternative alignments to the Oral Segment for Alternative B.

[10] The Hay Canyon Segment is the original alignment developed as part of Alternative C. As noted above, it could also be used as an alternative to the Oral Segment of Alternative B.

24, 25 and 36, T6S, R8E, and Sec. 1, T7S, R8E. Upon entering Sec. 1, it would leave Custer County, entering Fall River County, and cross Lame Johnny Creek just inside Sec. 1. The Hay Canyon Segment would cross the Cheyenne River where it runs between Sections 1 and 12, just west of the confluence of the river and Hay Canyon Creek.

After crossing the Cheyenne River, the Hay Canyon Segment would extend south, up Hay Canyon. It would pass through Sections 12, 13, 24, 25 and 36, T7S, R8E and Sec. 1, T8S, R8E. It would cross from one side of the canyon to the other several times along this stretch. It would continue to follow Hay Canyon, curving west across the south east tip of Sec. 2, the northern boundary of Sec. 11, turning south through the center of Sections 10 and 15, the northwest corner of Sec. 22, the center of Sec. 21, southeast corner of Sec. 20, northwest corner of Sec. 29 and the southeast corner of Sec. 30. The Hay Canyon Segment would curve to the south, cross Sand Creek approximately 0.6 mile north of Smithwick, and join with the existing DM&E rail line approximately 0.5 mile north of the town.

WG Divide Alternative

The U.S. Fish & Wildlife Service (USFWS), COE, and the South Dakota Department of Game, Fish and Parks (SDDGFP) expressed concerns during the scoping process regarding the loss of wetlands and riparian habitat along the Cheyenne River and Hay Canyon. The USFWS expressed concern that should these habitats be lost, efforts to mitigate their loss could be unsuccessful. In a letter submitted to the COE on June 11, 1999, the USFWS indicated that because of the amount of potential impact to wetland and riparian areas in Hay Canyon and the "nearly irreplacability of riverine habitat in western South Dakota," efforts should be taken to avoid this area rather than develop mitigation strategies that would likely be unsuccessful. Conversations with the cooperating agencies indicated a likelihood that the USFWS would recommend to the COE that the Section 404 Permit be denied should the Hay Canyon Segment be selected for construction. As a result of these developments, SEA and the cooperating agencies coordinated with DM&E in the development of an alternate alignment to avoid or minimize impacts to Hay Canyon under Alternative B. The WG Divide Alternative was developed as an alternative to the Hay Canyon Segment.

The 14.7-mile WG Divide Alternative would follow the same alignment as the Hay Canyon Segment for the first several miles. It would begin in the northwest corner of Sec. 18, T6S, R9E. The WG Divide Alternative would extend southwest across the southeast corner of Sec. 13, T6S, R8E, crossing Cottonwood Creek twice. It would turn south in Sec. 24, crossing Harrison Flat, into the middle of Sec. 25. In the center of Sec. 25 at the top of the Cheyenne River floodplain, the WG Divide alternative would turn westward, leaving the alignment of the Hay Canyon Segment. The WG Divide Alternative would cross the northwest corner of Sec. 36

and southeast corner of Sec. 35 at the south end of Harrison Flat. It would enter Fall River County, South Dakota, in the southeast corner of Sec. 35. It would cross the northwest tip of Sec. 2, T7S, R8E, curving to the south in the center of Sec. 3. It would cross the Cheyenne River approximately 2.7 stream miles upstream of the confluence of the river and Hay Canyon in the northwest corner of Sec. 10. The WG Divide Alternative would turn westward, crossing the northwest tip of Sec. 15, into the middle of Sec. 16. It would turn south, leaving the southwest corner of the section, extending across the southeast side of Sec. 20, the center of Sec. 29, and the west third of Sec. 32. It would cross the northwest corner of Sec. 5, T8S, R8E, the southeast tip of Sec. 6 and along the eastern boundaries of Sections 7 and 18. It would enter Sec. 19 in the northeast corner, curving to the west to leave the section at the center of the southern boundary. Upon entering Sec. 30, the WG Divide Alternative would curve back to the south, crossing Sand Creek in the southwest corner of the section. It would join with the existing DM&E rail line in Sec. 31, approximately 0.5 mile north of Smithwick. This segment would cross the Angostura Irrigation District, which is under jurisdiction of the U.S. Bureau of Reclamation.

Smithwick Segment

The 13.1-mile Smithwick Segment of Alternative B would originate in the western portion of Sec. 31, T8S, R8E, 0.5 mile north of the town of Smithwick, SD on existing DM&E rail line. The segment would continue south through the town of Smithwick. This segment would follow the existing DM&E rai line for approximately 3.0 miles, extending south of Smithwick in the center of Sec. 23, T9S, R7E where the existing rail line makes a sharp curve around to the southeast. The segment would extend across the central portion of Sec. 23, enter Sec. 22 and curve to the south, leaving the southwest corner of Sec. 22, approximately 300 feet north of Horsehead Creek. It would enter Sec. 21 and cross Horsehead Creek approximately 0.3 miles east of U. S. Highway 18 and 3.8 miles south of its entry into to Angostura Reservoir in the southwest corner of Sec. 21, T9S, R7E. The Smithwick Segment would have a grade-separated crossing of U.S. Highway 18 approximately 0.5 mile south of where the highway crosses Horsehead Creek. The Smithwick Segment would proceed west, crossing the southern portion of Sections 20 and 19, T9S, R7E and Sec. 24, T9S, R6E, passing south of Angostura Reservoir. The Smithwick Segment would cross County Road 79 at grade, approximately 2.1 miles west of U.S. Highway 18 and 1.7 miles south of where the county road crosses Horsehead Creek. It would continue west across the northern portion of Sec. 25, and central portions of Sections 26, 27 and 28, T9S, R6E. This segment would cross Dry Creek at the east central portion of Sec. 29, T9S, R6E, approximately 500 feet after entering the section. At this point the Smithwick Segment ends.

Tepee Creek North Segment

The 3.5-mile Tepee Creek North Segment of Alternative B would continue west across the northern third of Sec. 29, and the northern boundary of Sec. 30, T9S, R6E and Sec. 25, T9S, R5E and the southern boundary of Sec. 23. Alternative B would cross County Road 6 at grade in the north-central portion of Sec. 30, T9S, R6E.

Heppner Segment

The Heppner Segment of Alternative B is approximately 3.0 miles long. It begins in the south west corner of Sec. 23, T9S, R5E and extends westward along the southern boundary of Sec. 22, for approximately 0.5 mile. It would cross Tepee Creek where the creek enters Sec. 22 from the south. The segment would turn northwest and cross County Road 6 where it would turn due south between Sections 22 and 21, T9S, R5E. The Heppner Segment would curve to the west through the center of Sec. 21, turning south to enter Sec. 20. It would pass immediately west of Heppner, South Dakota and cross County Road 6 at grade just west of the town. The segment would continue southwest and into Sec. 29. The Heppner Segment would end approximately 0.25 mile south of County Road 6.

Hat Creek South Segment

The Hat Creek South Segment would continue southwest through Sec. 29, on the 7.7-mile segment, crossing County Road 6 at grade at a "Y" in the road in the west central area of Sec. 29. It would leave the southwest corner of Sec. 29 and extend into the center of Sec. 31. It would then curve to the west, crossing Ash Creek in Sec. 36, approximately 0.5 mile upstream of the confluence of Ash Creek and Hat Creek. The Hat Creek South Segment would continue west, crossing Hat Creek where it enters Sec. 36 from the south, approximately 1.5 miles upstream of the confluence of Hat Creek and Ash Creek. The Hat Creek South Segment would continue west 1.0 mile from the creek crossing along the southern boundary of Sec. 35 and would cross State Highway 71 at grade in Sections 34/35 T9S, R4E. Once across the highway, The Hat Creek South Segment would turn to the northwest from the southeast corner of Sec. 34, T9S, R4E, and proceed northwesterly through Sec. 34, the northeast corner of 33, turning westerly in Sec. 28, T9S, R4E. Upon entering Sec. 29, The Hat Creek South Segment would continue to curve to the southwest, enter Sec. 32, then turn west across the northern portion of Sec. 31. The Hat Creek South Segment would curve to the northwest from Sec. 31, cross the northeast corner of Sec. 36, T9S, R3E and enter Sec. 25. It would cross Plum Creek in the south-center of Sec. 25.

Edgemont Segment

The 3.8-mile Edgemont Segment of The Edgemont Segment would begin in the southwest corner of Sec. 25, T9S, R3E, after The Edgemont Segment crosses Plum Creek. It would extend northwest along the east side of an intermittent, unnamed tributary to Plum Creek through Sections 26 and 23. In Sec. 23, The Edgemont Segment would curve more northerly away from the tributary and across the northeast quarter section of Sec. 22. It would cross the southwest corner of Sec. 15, approximately 1,000 feet north of an unnamed intermittent drainage. The Edgemont Segment would end at this point.

Edgemont South Segment

The 4.7-mile Edgemont South Segment of The Edgemont South Segment would extend through the center of Sec. 16, the northeast corner of Sec. 17 and along the south side of an unnamed intermittent tributary across Sec. 8, T9S, R3E. It would cross the northeast corner of Sec. 7 and enter Sec. 6 at approximately the middle of the southern boundary of the section. The Edgemont South Segment would cross County Highway 6E at grade as it extends into Sec. 6. The Edgemont South Segment would continue northwest, cross a county road between Sec. 1, T9S, R2E and Sec. 6, T9S, R3E, at grade, Cottonwood Creek (approximately 1,500 feet upstream of its confluence with the Cheyenne River), a second county road and Old Highway 18, and the Cheyenne River at the road bridge over the river. The Edgemont South Segment would cross under U.S. Highway 18 on the east side of the existing Burlington Northern-Santa Fe Railroad (BNSF) track, also under the highway. The Edgemont South Segment would extend northwest along the BNSF rail line for approximately 1.5 miles at which point the BNSF Segment would begin.

BNSF Segment

The 8.0-mile BNSF Segment of Alternative B would extend northwesterly from the center of Sec. 26, T8S, R2E, adjacent to the east side of the existing BNSF rail line for approximately 8.0 miles. The BNSF Segment would be built adjacent to the existing BNSF rail line on the eastern edge of the Cheyenne River floodplain. The BNSF Segment would continue to follow the existing BNSF rail line into the northwest corner of Sec. 25, T7S, R1E. County Road 6463 currently runs along portions of the existing BNSF rail line. In some areas, the road would require relocation to accommodate a second rail line parallel to the existing BNSF rail line.

Beaver Creek Segment

The 5.7-mile Beaver Creek Segment of Alternative B would curve away from the existing BNSF rail line, cross the southwest corner of Sec. 24, and into Sec. 23. It would curve to the west, with the rail bed rising in elevation, and cross over the existing BNSF rail line and County Road 6463, approximately 1.8 miles southeast of Burdock in Sec.23, T7S, R1E. Alternative B would continue westward along the northern boundaries of Sections 22 and 23 for 1.8 miles, where it would cross Beaver Creek. It would continue westerly along the northern slope of the Cheyenne River floodplain, through Sections 21, 20, 17, 18 and 15, T40N, R60W, 700 to 2,000 feet north of the Cheyenne River. The Beaver Creek Segment would leave South Dakota and enter Niobrara County, Wyoming, upon entering Sec. 15, south of Twenty One Divide, approximately 4.2 miles west of the BNSF crossing,

Wyoming Segment

The 43.9-mile Wyoming Segment of Alternative B would extend westward from the South Dakota-Wyoming border, following the north slope of the Cheyenne River floodplain valley through Sections 15, 16, 17, 20 and 19, T40N, R60W and 24, T40N, R61W. The Wyoming Segment would cross old U.S. Highway 85 at grade in the extreme northwest corner of Sec. 24, approximately 1.1 miles north of where the highway crosses the Cheyenne River. The Wyoming Segment would curve to a northwesterly direction, cross Sec. 14 and Robbers Roost Creek where this intermittent tributary flows out of Sec. 14. It would continue across the center of Sec. 15, the northeast corner of Sec. 16, and the southwest corner of Sec. 19, crossing Bobcat Creek where it flows along the boundary between Sections 9 and 8. The Wyoming Segment would cross U.S. Highway 85 (at grade) approximately 2.0 miles north of the Cheyenne River bridge. After crossing U.S. Highway 85, the segment would extend northwest up the Bobcat Creek drainage for approximately 3.8 miles. It would extend through Sections 8 and 7, T40N, R61W and Sec. 1, T40N, R62W. Along this stretch, it would cross several tributaries to Bobcat Creek.

In Sec. 2, T40N, R62W, the Wyoming Segment would curve to a more westerly direction, away from Bobcat Creek, crossing through the middle of Sections 2 and 3. It would curve to the northwest in Sec. 4 and follow the northeast side of the Alkali Creek drainage northwest through Sec. 2, T41N, R62W and Sections 29, 30 and 19, T41N, R62W and 24, T41N, R63W. The Wyoming Segment would enter Weston County, Wyoming upon entering Sec. 30. Approximately 0.5 miles northwest of the Niobrara/Weston county rail line, the Wyoming Segment would cross Morrisey Road (at grade).

The Wyoming Segment would cross Alkali Creek in the center of Sec. 24, T41N, R63W. It would continue west into Sec. 23 where it would cross Roxson Road, approximately 300 feet south of its intersection with the Cheyenne River Road and the community of Morrisey, and begin to follow an unnamed tributary of Alkali Creek in a northwesterly direction. It would follow this drainage through Sections 23, 15 and 16, curving to a due west direction in Sec. 16. The Wyoming Segment would continue westward approximately 600 feet south of the north section lines of Sections 17 and 18, T41N, R63W and 13, T41N, R64W. The Wyoming Segment would cross Coyote Creek in the north half of Sec. 13. Upon entering Sec. 14, this segment would curve to the north, crossing the southeast corner of Sec. 11, northeast corner of Sec. 10, southwest corner of Sec. 3, generally through the middle of Sec. 4 and northeast corner of Sec. 5. Along this stretch it would generally be following the Lodgepole Creek drainage, but more than 1.0 mile away at some points.

The Wyoming Segment would cross Grieves Road (at grade) in the northeast corner of Sec.5, T41N, R64W, approximately 500 feet south of where the Cheyenne River Road extends eastward from Grieves Road. It would cross Lodgepole Creek just south of where the creek enters Sec. 5. The Wyoming Segment would continue northwesterly, generally following the south side of Wildcat Creek through Sec. 31, T42N, R64W and Sections 36, 35, 26, 27 and 22, T42N, R65W. In Sec. 22, this segment would curve to the west away from Wildcat Creek, crossing through the center of Sec. 21, then curving from a northwest to a southwest direction across the northern third of Sec. 21. The Wyoming Segment would flatten out to a west direction in across the upper half of Sec. 19, crossing Dull Center Road (at grade) approximately 1.4 miles north of where the road crosses Black Thunder Creek. The Wyoming Segment would continue northwest through Sec. 24, T42N, R66W, before turning west to extend along the north boundary of Sec. 23. Upon entering the northeast corner of Sec. 22, it would again turn to a northwest direction, generally following the north sideslope of the Black Thunder Creek floodplain through Sections 15, 16, 17 and 8, at some points over one mile away from the creek itself. The Wyoming Segment would cross Black Thunder Creek just north of its confluence with Horse Creek in Sec. 7. It would follow the south slope of the creek floodplain through Sec. 7, entering Sec. 12, T42N, R67W just south of Black Thunder Creek. The Wyoming segment would continue westward, crossing Lion Creek, ending in the north-center of Sec. 12. At this location, this alignment would split into a "Y". The "Y" has southern and northern "forks" that are described below.

Southern Fork Segment

The 29.2-mile Southern Fork Segment (South Fork) of Alternative B would generally follow the east side of Lion Creek, for approximately 3.0 miles in a southwesterly direction. It would cross Lion Creek after entering Sec. 11, T42N, R67W, and curve south along the east side

of the creek. The South Fork Segment would pass through the northwest corner of Sec. 14, southeast corner of Sec. 15, northwest corner of Sec. 22 and enter Sec. 21 approximately 450 feet south of Lion Creek. It would cross Lynch Road at grade in the southeast corner of Sec. 21, T42N, R67W, approximately 0.6 mile south of Sec. 16. It would continue southwest, turning due west in the northwest corner of Sec.28 and extend west for two miles across the northern quarter of Sections 29 and 30. It would cross Lion Creek in the center of Sec. 29 and remain north of the creek until it would turn south on the west side of Sec. 30. The South Fork Segment would turn west in the southern half of Sec. 25, T42N, R68W, and continue west through Sec. 26. Upon entering Sec. 27, the The South Fork Segment would turn south and cross Frog Creek where it leaves Sec. 27. The South Fork Segment would continue south, curving slightly west through Sec. 34, T42N, R68W, the northwest corner of Sec. 3, T41N, R68W, southeast corner of Sec. 4, northwest corner of Sec. 9, southeast corner of Sec. 8, northwest corner of Sec. 17, southeast corner of Sec. 18, and the northwest corner of Sec. 19. The South Fork Segment would cross Keyton Creek approximately 600 feet northwest of Rochelle Hills Road, cross Rochelle Hills Road at grade in Sec.26, T42N, R68W, approximately 0.3 mile from where the road enters Sec. 18. The South Fork Segment would generally be running along the east side of the Rochelle Hills escarpment.

The South Fork Segment would enter Campbell County, Wyoming at approximately the middle of Sec. 24, T41N, R69W. It would cross the southeast corner of the section and curve to the west upon entering Sec. 25. It would enter Converse County, Wyoming and cross the middle of Sections 26, 27, 28, running approximately 500 feet south of the Converse-Campbell county rail line. It would cross Wildcat Creek just south of the county rail line in Sec. 26. The South Fork Segment would turn slightly south in Sec. 28, crossing the southeast corner of Sec. 29 and Gibson Draw where it leaves Sec.29. It would continue southwest across Sec. 31 along the sideslope of Antelope Creek. It would continue along the north side of the creek, crossing Sunny Draw in the northeast corner of Sec. 36, T41N, R70W. The South Fork Segment would continue west along the northern boundary of Sections 36 and 35, turning south at the crossing of Porcupine Creek in the northwest corner of Sec. 35, approximately 0.6 miles from Antelope Creek. The South Fork Segment would parallel the south side of the existing joint BNSF/UP rail line in the western half of Sec. 34 and for approximately 0.25 mile in Sec. 33. It would then curve south away from the rail line, cross Antelope Creek in the south-center of Sec. 33. The South Fork Segment would follow the south side of the creek westward and cross over the existing joint rail line just south of where the existing rail line crosses Antelope Creek in Sec. 31. The South Fork Segment would turn south and cross the northwest corner of Sec. 6, T40N, R70W. It would curve back to the northwest in Sec. 1, T40N, R71W, to join with the existing mine rail loop at Antelope coal mine in the southwest corner of Sec. 1.

North Antelope East Mine Loop Alternative

DM&E proposed two alternatives to access the North Antelope and Rochelle coal mines. An additional 1.5-mile spur, the North Antelope East Mine Loop Alternative, would extend north in Sec. 34, T41N, R70W, from the South Fork Segment under Alternative B. This spur would extend along the east side of Porcupine Reservoir, to join with the existing rail line. This spur would provide access to the North Antelope and Rochelle mines.

North Antelope West Mine Loop Alternative

The 2.4 mile North Antelope West Mine Loop Alternative would provide a second alternative for DM&E to access the North Antelope and Rochelle coal mines. This alternative would extend from the South Fork Segment in the center of Section 32, T41N, R70W, just north of Antelope Creek. It would extend westward from the South Fork Segment but curve northward and back to the east, all in Section 32. It would continue west paralleling the north side of Antelope Creek for approximately 1.0 mile. The North Antelope West Alternative would join with the existing North Antelope and Rochelle mine spur north of Antelope Creek at the section rail line between Sections 33 and 34, T41N, R70W.

Northern Fork Segment

The 13.7-mile Northern Fork of the "Y" (North Fork) would begin in Sec. 12, T42N, R67W, just west of where Alternative B would cross Lion Creek. The North Fork would proceed northwest, leaving Sec. 12 through the northwest corner of the section, extending from the southeast to the northwest corners of Sec. 2, T42N, R67W, across the southwest corner of Sec. 34, T43N, R67W, and the northwest corner of Sec. 33, generally remaining on the south edge of the Black Thunder Creek floodplain. The North Fork would cross over State Highway 450 approximately 0.5 mile southwest of where the highway crosses Black Thunder Creek. The North Fork would continue to follow Black Thunder Creek from the southeast to the northwest corner of Sec. 29 and the southwest corner of Sec. 19. The North Fork would curve more westerly, extending across the northern quarter of Sec. 24, before turning to the north. It would cross the northeast corner of Sec. 23 and extend in a slightly southeast to northwest direction, south to north, through Sec. 14. It would cross Buzzard Creek in the south center of Sec. 14.

The North Fork would cross the southwest corner of Sec. 11, turning west across the northeast corner of Sec. 10, cross the southwest tip of Sec. 3, and the southern portion of Sec. 4. The North Fork would cross Little Mike Creek approximately 0.7 mile from its confluence with Black Thunder Creek. It would extend west across the center of Sections 5 and 6, entering Sec. 1, T43N, R69W, in Campbell County, Wyoming, approximately 0.3 miles south of the northern

boundary of the section. At approximately Keeline Road, the North Fork would split, with one spur turning north and one turning south.

North Fork - South Spur Segment

The 11.6-mile North Fork-South Spur Segment of Alternative B (South Spur) would provide service to Jacobs Ranch, North Rochelle, and Black Thunder Mines. The South Spur would cross the center of Sec. 2, Ha Creek, and the southeast corner of Sec. 3. The South Spur would turn west in the southwest corner of Sec. 3 to extend along the north section boundary of Sec. 9, following the north side of Ha Creek. The South Spur would continue to follow Ha Creek, entering the southeast corner of Sec. 5, remaining along an intermittent tributary across Sections 5 and 6. The South Spur would enter Sec. 1, T43N, R70W, turning south in the center of the section and cross Little Thunder Road at grade. The South Spur would continue south along the east side of an intermittent tributary of Burning Coal Draw in the northwest corner of Sec. 12, curve to the southwest and extend across the southeast corner of Sec. 11, and follow the east side of Burning Coal Draw the southeast corner of Sec. 14.

Black Thunder North Mine Loop Alternative

DM&E proposed two alternatives, the Black Thunder North Loop and South Loop, to access the Jacobs Ranch and Black Thunder coal mines. The Black Thunder North Loop Alternative, a 4.5-mile rail spur, would curve west from the North Fork-South Spur in the southeast corner of Sec. 14. It would cross Burning Coal Draw in Sec. 14. The North Loop Alternative would extend west along the north side of the North Prong of Little Thunder Creek, north of State Highway 450, through Sections 14, 15 and 16. In Sec. 14, a small spur would curve north from this alternative to connect to the Jacobs Ranch Mine Loop. The Black Thunder North Alternative would enter the northeast corner of Sec. 17, curving south in the north-center of the section, crossing Shipley Draw, to join the existing Black Thunder Mine Loop. The Black Thunder North Alternative would use the existing rail crossing of State Highway 450.

Black Thunder South Mine Loop Alternative

The 7.1-mile Black Thunder South Loop Alternative provides a second alignment to access the Jacobs Ranch and Black Thunder mines. This alternative would involve two spurs, one accessing each mine. A short, approximately 0.75 mile spur would curve from the North Fork-South Spur in Sec. 14, cross Burning Coal Draw, and connect to the existing Jacobs Ranch Mine Loop. The second spur would continue south from the North Fork-South spur into Sec. 23. It would turn west, cross Burning Coal Draw, then turn south, crossing State Highway 450 and the North Prong of Little Thunder Creek. It would cross the southeast corner of Sec. 22, curving

through the northwest corner of Sec. 27 and north west corner of Sec. 28. The Black Thunder South Loop Alternative would cross the southwest side of Sec. 21 and northeast corner of Sec. 20, entering the southeast corner of Sec. 17. In Sec. 17, this alternative would join with the existing Black Thunder Mine Loop. However, in the center of Sec. 17, it would branch from the existing mine loop, curving to the east, along the south side of State Highway 450. In the center of Sec. 16, the South Loop Alternative would turn south to connect to the portion of the South Loop Alternative in Sec. 21, effectively creating a second mine loop east of the existing mine loop.

North Rochelle Mine Loop - Highway 450 Alternative

The North Rochelle Mine Spur - Highway 450 Alternative, is a 6.5-mile spur that would be necessary for Alternative B to access the North Rochelle coal mine. Generally, this spur option would extend south from the North Fork-South spur in the southeast corner of Sec. 14. It would cross State Highway 450 and turn west into Sec. 21. The alternative would turn south, passing just west of Reno Reservoir, and following the east side of Trussler Creek. The North Rochelle-Highway 450 Alternative would join with the existing North Rochelle Mine Loop in the southeast corner of Sec. 5, T42N, R70W.

North Fork - North Spur Segment

Finally, the 41.0-mile North Fork- North Spur Segment of Alternative B (North Spur) would curve north from the North Fork Segment in Sec. 1, as noted above. It would leave the northwest corner of the section, cross Sec. 35, T44, R69W from the southeast to the northwest corners, cross the southwest corner of Sec. 27 and northern portion of Sec. 28, following the south side of Black Thunder Creek. The North Spur would curve to the north, cross the northeast corner of Sec. 29, and southwest side of Sec. 20. It would cross Black Thunder Creek and leave the northwest corner of the section. It would cross Sec. 18 from southeast to northwest corner, following the east side of Cottonwood Creek, continuing across the southwest corner of Sec. 7 and into Sec. 12, T44N and R70W. It would cross Cottonwood Creek in the northeast corner of Sec. 12. The North Spur would follow the west side of Cottonwood Creek and then an unnamed tributary through Sec. 1, crossing the tributary where it enters the section. The North Spur would extend along the west third of Sections 36 and 25, T45, R70W. It would turn and pass between Smith Reservoir and Hay Lakes, in the southwest corner of Sec. 24 and northeast corner of Sec. 23. The North Spur would continue north along the east third of Sections 14, 11 and 2, T45N, R70W. It would curve slightly west, then continue north through the center of Sections 35 and 26, T46N, R70W. It would cross the southwest corners of Sections 23 and 14 and the northeast tip of Sec. 15 and Sec. 10 from the southeast to the northwest corner. The North Spur would enter Sec. 4 and curve north, crossing the T7 Road approximately

500 feet east of where the road crosses a tributary of Dry Creek. It would cross this tributary and continue north through Sec. 4.

Just prior to crossing the T7 Road, a mine access spur would branch from the North Spur. The access spur would extend west across Sec. 4, south of the T7 Road, into Sec. 5. It would turn due south in the center of Sec. 5, continuing south into Sec. 8 to connect with the Coal Creek Mine Loop.

The North Spur would continue northwest, crossing the southwest corner of Sec. 33, T47N, R70W, the northeast corner of Sec. 32 and diagonally across Sec. 29. It would cross Dry Creek just north of the south boundary of Sec. 29 and the Belle Fourche River in the northwest corner of the section. After crossing the river, another access spur would branch from the North Spur to the west, extending across the north portion of Sec. 30. It would cross the T7 Road approximately 0.5 mile north of where the road crosses the Belle Fourche River, continue southwest across the river in the east-center of Sec. 25. After crossing to the south side of the river, this access spur would curve to the northwest, cross over the joint BNSF/UP rail line and the river again in the north-center of Sec. 25 before turning north and connecting to the existing rail loop at the Cordero coal mine.

The North Spur would continue northwest, cross the southwest tip of Sec. 20, the northeast corner of 19, and extend north to south through the center of Section 18. It would continue north into Sec. 7, turning to the west in the northern portion of the section. It would cross the southwest tip of Sec. 6 and parallel the existing joint rail line into Sec. 1, T47N, R71W. It would cross over the existing joint rail line in the center of the section and continue northwest out of the northwest corner of the section. The North Spur would continue north along the east side of Sections 35 and 26, T48N, R71W, entering Sec. 24 from the southwest corner. It would cross Caballo Creek in the northeast corner of Sec. 35, Bishop Road approximately 1.0 mile east of the entrance to the Caballo Rojo coal mine, and Tisdale Creek in the northeast corner of Sec. 26. A mine access spur to Caballo Rojo coal mine would branch off in Sec. 1, T47N, R71W, to Belle Ayr coal mine in Sec. 35, T48N, R71W. The North Spur would terminate in Sec. 24 after connecting to the rail loop at the Caballo coal mine.

2.2.1.3 Modified Proposed Route - Alternative C

Alternative C, The Modified Proposed Route, follows much of the same alignment as Alternative B, the Proposed Route. During the scoping process, DM&E proposed modifications to Alternative B by realigning it to avoid certain environmentally sensitive areas, such as USFS roadless and wilderness areas and along the Cheyenne River. As shown in Table 2-2, "Comparison of Principal Characteristics of Alternative Routes for Extension into the PRB,"

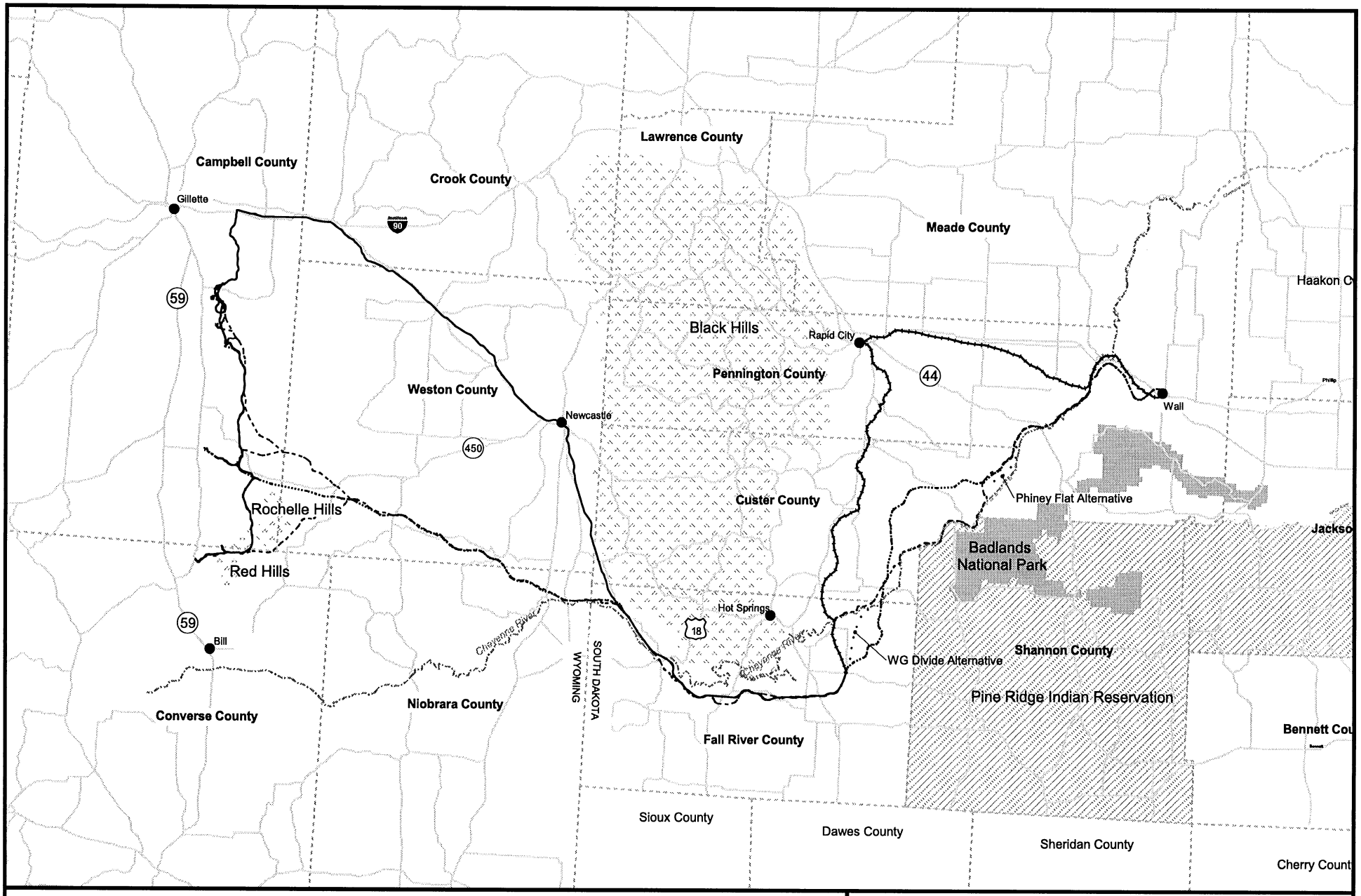
Alternative C would be 268.7 miles long. The main portion of this alternative generally runs east-west from Wall, South Dakota to the southeastern portion of Campbell County, Wyoming (Figure 2-6). Within this main portion of Alternative C, DM&E developed two alternatives. One, an 11.3-mile segment, known as the Phiney Flat Alternative,[11] would avoid use of the Spring Creek floodplain for a rail alignment (Figure 2-9). The other, a 14.7-mile segment known as the WG Divide Alternative, would avoid the use of Hay Canyon (Figure 2-10). Figure 2-12 shows each of the Extension Alternatives (B, C, and D) along with the Phiney Flat and WG Divide Alternatives. However, for engineering reasons, in many areas Alternative C follows much the same alignment as Alternative B, and would include the use of the Oral Segment of Alternative B as an option for Alternative C to avoid Hay Canyon. SEA evaluated these options in this Draft EIS.

After entering Campbell County, Wyoming, Alternative C would split into a "T" that would provide shippers access to various locations within the PRB as discussed in detail below. The South Arm of the "T" has a spur that would provide access to the North Antelope, Rochelle and Antelope coal mines. The North Arm of the "T" has several spurs that would provide access to the Jacobs Ranch, and the Black Thunder, North Rochelle, Coal Creek, Cordero, Caballo Rojo, Caballo and Belle Ayr coal mines. Table 2-1 also presents summary information regarding other features of this alternative, such as requirements for new right-of-way, sidings, locomotives, etc. As shown in Table 2-3, Alternative C consists of the following segments. A detailed description of each segment that has not been previously described in the discussion of Alternative B follows. Figure 2-9 provides a guide to SEA's descriptions of the segments' location with a section. Volume V provides detailed maps for Alternative C.

Table 2-3
Alternative C Segments

Segment	Between	And
Wall Segment (33.5 miles)	Section 31, T1N, R16E, approximately 0.5 mile north of Wall	North-center of Section 20, T2S, R12E, approximately 0.5 mile west of Creston Road and north of Spring Creek
Spring Creek Segment (8.5 miles)	North-center of Section 20, T2S, R12E, approximately 0.5 mile west of Creston Road and north of Spring Creek	South-center of Section 21, T3S, R11E

[11] The Phiney Flat Alternative is part of the Wall Segment. Because this segment is common to both Alternative B and C, the Phiney Flat Alternative could be used with either alternative and was previously described under Alternative B.



N
W E
S
20 0 20 Miles

Existing Rail Line
Alternative B
Variations
Alternative C
Alternative D- new construction
Alternative D- along existing line

Figure 2-12
POWDER RIVER BASIN EXPANSION PROJECT
Alternatives B, C, and D,
Including Phiney Flat Alternative and WG Divide Alternative

Table 2-3
Alternative C Segments

Segment	Between	And
Phiney Flat Alternative (10.3 miles)	North-center of Section 20, T2S, R12E, approximately 0.5 mile west of Creston Road and north of Spring Creek	South-center of Section 21, T3S, R11E
Battle Creek Segment (27.4 miles)	South end of Section 12, T3S, R11E, near Spring Creek	Northeast corner of Section 18, T6S, R9E, near Cottonwood Cutoff Road
Hay Canyon Segment (18.5 miles)	Northeast corner of Section 18, T6S, R9E, near Cottonwood Cutoff Road	Section 31, T8S, R8E, just north of the town of Smithwick
WG Divide Alternative (14.7 miles)	Northeast corner of Section 18, T6S, R9E, near Cottonwood Cutoff Road	Section 31, T8S, R8E, just north of the town of Smithwick
Oral Segment (20.5 miles)	Northeast corner of Section 18, T6S, R9E, near Cottonwood Cutoff Road	Section 31, T8S, R8E, just north of the town of Smithwick
Smithwick Segment (13.1 miles)	Section 31, T8S, R8E, just north of the town of Smithwick	Section 29, T9S, R6E west of Dry Creek
Tepee Creek South Segment (3.7 miles)	Section 29, T9S, R6E west of Dry Creek	Southwest corner of Section 23, T9S, R6E
Heppner Segment (3.1 miles)	Southwest corner of Section 23, T9S, R6E	Section 29, T9S, R5E, southwest of Heppner
Hat Creek North Segment (7.3 miles)	Section 29, T9S, R5E, Southwest of Heppner	Section 25, T9S, R3E at Plum Creek
Edgemont Segment (3.8 miles)	Section 25, T9S, R3E at Plum Creek	Southwest corner of Section 15, T9S, R3E
Edgemont North Segment (6.9 miles)	Southwest corner of Section 15, T9S, R3E	Center of Section 26, T8S, R2E, near Existing BNSF rail line

Table 2-3
Alternative C Segments

Segment	Between	And
BNSF Segment (8.0 miles)	Section 26, T8S, R2E, near Existing BNSF rail line	Northwest corner of Section 25, T7S, R1E
Burdock School Segment (6.0 miles)	Northwest corner of Section 25, T7S, R1E	Section 15, T40N, R60W, south of Twenty One Divide, at the WY/SD border
Wyoming Segment (43.9 miles)	Section 15, T40N, R60W, south of Twenty One Divide, at the WY/SD border	North-center of Section 12, T42N, R67W, at Lion Creek
450 Segment (16.0 miles)	North-center of Section 12, T42N, R67W, at Lion Creek	Southeast corner of Section 29, T43N, R69W, south of Little Thunder Creek
South Arm (22.2 miles)	Southeast corner of Section 29, T43N, R69W, south of Little Thunder Creek	Section 2, T40N, R71W at Antelope coal mine
North Antelope East Mine Loop Alternative (1.5 miles)	Northeast corner of Section 34, T41N, R70W	Northeast corner of Section 27, T41N, R70W west of Porcupine Reservoir upon joing existing spor to North Antelope/Rochelle coal mine.
North Antelope West Mine Loop Alternative (2.4 miles)	Center of Seciton 32, T41N, R70W, north of Antelope Creek.	Border between Secitons 33 and 34, T41N, R70W, north of Antelope Creek upon joining with existing North Antelope/Rochelle mine spur.
Black Thunder North Mine Loop Alternative (4.5 miles)	Southeast Corner of Section 14, T43N, R70W	Section 17, T43N, R70W at Black Thunder coal mine. Includes spur to serve Jacobs Ranch coal mine.
Black Thunder South Mine Loop Alternative (7.1 miles)	Southeast corner of Section 14, T43N, R70W	Section 14, T43N, R70Wat Jacobs Ranch coal mine and second spur in Section 17, T43N, R70W at Black Thunder coal mine.
North Rochelle Mine Spur - School Creek Option (4.1 miles)	Northeast corner of Section 6, T42N, R69W at School Creek Road.	Section 9, T42N, R70W at North Rochelle coal mine.

Table 2-3
Alternative C Segments

Segment	Between	And
North Arm (40.6 miles)	Southeast corner of Section 29, T43N, R69W, south of Little Thunder Creek	Section 25, T48N, R71W at Caballo coal mine; includes spurs to Coal Creek, Cordero, Caballo Rojo, and Belle Ayr coal mines.

Alternative C would begin with the realignment of the existing DM&E rail line north of Wall, South Dakota and would follow the alignment described in Section 3.4.2 as the Wall Segment.

Wall Segment

This 33.5-mile segment would follow the Wall Segment described for Alternative B.

Spring Creek Segment

This 8.5-mile segment of Alternative C would follow the Spring Creek Segment described for Alternative B until it reaches Sec. 12, T3S, R11E. At this point the Spring Creek Segment[12] for Alternative C would leave the section's southwest corner. It would cross the northwest corner of Sec. 14, including three crossings of Spring Creek. It would cross the southeast corner of Sec. 15, staying on the south slope of the Spring Creek floodplain. The Spring Creek Segment would cross the northwest corner of Sec. 22, and end in the south-center of Sec. 21.

Phiney Flat Alternative

An alternative to the Spring Creek Segment of Alternative C would be the 10.3-mile Phiney Flat Alternative. This alternative would follow the same alignment for the Phiney Flat Alternative described for Alternative B.

[12] From this point to the end of the segment, the Spring Creek Segment alignment would differ between Alternatives B and C. However, it is considered one segment because this portion is relatively short and if this segment were divided into additional segments it would be difficult to compare the alternative alignments for the Spring Creek area. Different alignments for this section of the Spring Creek Segment are therefore described for Alternatives B and C.

Battle Creek Segment

The 27.4-mile Battle Creek Segment of Alternative C would begin in the south-center of Sec. 21, curve to the southwest extending across the north boundary of Sec. 29, continuing to curve around to the northwest, entering Sec. 19 through the southeast corner of the section. It would extend across the southwest corner of Sec. 19, entering Sec. 24, T3S, R10E just south of the center of the section. The Battle Creek Segment would curve around to a southwesterly direction through the center of Sec. 24, leaving the section through the southwest corner. It would cross Sec. 26 diagonally from the northeast to the southwest corners, curving westward, just north of the southern boundary of Sec. 27, dropping down into Sec. 33 about 0.5 mile across Sec. 28. The Battle Creek Segment would continue west across the northern boundaries of Sections 32 and 31, T3S, R10E, crossing State Highway 40 (grade separated) and Battle Creek in the northwest corner of Sec. 31, and Sections 36 and 35, T3S, R9E.

In Sec. 35, the Battle Creek Segment would curve southwesterly, crossing through the center of Sec. 34 and the southeast corner of Sec. 33. The Battle Creek Segment would enter Sec. 4, T4S, R9E, crossing the Sec. north to south through the center of the section. It would cross the northwest corner of Sec. 9, southeast corner of Sec. 8, and curve more westerly to cross the northwest corner of Sec. 17 and southeast corner of Sec. 18. The Battle Creek Segment would cross Dry Creek in the south-center of Sec. 18. It would then curve south, extending along the west side of Sec. 19. It would leave the southwest corner of Sec. 19, continuing south along the east side of Sections 25 and 36, T4S, R8E. It would curve back to the southeast in Sec. 36 along the west side of an unnamed intermittent drainage of French Creek. The Battle Creek Segment would cross the southwest corner of Sec. 31, T4S, R9E, turning south into Sec. 6, T5S, R9E. It would cross French Creek Road (grade separated) in the northeast corner of Sec. 6 and French Creek approximately 0.25 mile east of the western boundary of Sec. 6, continue south into Sec. 7 and cross the South Fork of French Creek in the center of Sec. 7.

The Battle Creek Segment would continue south, generally through the center of Sections 18, 19, and 30. It would cross Sec. 31, north to south from the center of the section to the southwest corner. It would continue to extend south along the west side of Sections 6 and 7, T6S, R9E, curving west into the northwest corner of Sec. 18 where it would end.

Hay Canyon Segment

The 18.5-mile Hay Canyon Segment of Alternative C would follow the alignment described for Alternative B. As part of the original alignment of Alternative C, the Hay Canyon Segment provides one alternative for the Hay Canyon, WG Divide, and Oral areas of the project area.

WG Divide Alternative Segment

The 14.7-mile WG Divide Segment of Alternative C would follow the same alignment as described for Alternative B. It would provide a second alternative alignment for Alternative C in the Hay Canyon area.

Oral Segment

During the scoping process, SEA and the cooperating agencies identified concerns with the Hay Canyon Segment of Alternative C. Because of these concerns, SEA and the cooperating agencies[13] coordinated with DM&E for the development of an alternative to avoid or minimize impacts in Hay Canyon. The 14.7-mile WG Divide Alternative was developed as a result of this coordination. Upon review of the WG Divide Alternative, however, SEA became concerned that this alternative had the potential to impact lands associated with the Angostura Irrigation District (District).

The District receives water from and is responsible for repayment of construction, operation and maintenance costs for the Angostura Dam, Angostura Reservoir, and irrigation facilities, which are under the jurisdiction of the U.S. Bureau of Reclamation (Reclamation). SEA determined that the WG Divide Alternative would potentially impact irrigation facilities and irrigated lands, affecting the ability of the District to meet its committments to Reclamation for repayment of facility costs. Because of this potential effect, Reclamation expressed concerns regarding the impacts of the WG Divide Alternative and requested an alternative that would avoid or minimize impacts to the District. In evaluating potential alternatives, SEA concluded that both the 18.5-mile Hay Canyon Segment and the 20.5-mile Oral Segment could address the concerns of Reclamation. The Hay Canyon Segment was part of the original alignment of Alternative C. Additionally, SEA determined that use of the Oral Segment, originally proposed as part of the alignment for Alternative B, appeared to also be feasible for use with Alternative C and would avoid both the Hay Canyon area and lands within the District. Therefore, the Oral Segment was retained as a third alternative alignment for this portion of Alternative C. The Oral Segment would follow the alignment described in Alternative B.

[13] At this point in the scoping process, the cooperating agencies included the U.S. Forest Service, U.S. Army Corps of Engineers and the U.S. Department of the Interior - Bureau of Land Management, as these agencies would be required to render a decision on the project as discussed in Chapter 1. As a result of the development of the WG Divide Alternative, the U.S Bureau of Reclamation was invited to also participate as a cooperating agency.

Smithwick Segment

This 13.1-mile segment or Alternative C would follow the Smithwick Segment described for Alternative B.

Tepee Creek South Segment

At the western end of the Smithwick Segment, the 3.7-mile Tepee Creek South Segment of Alternative C would curve southwest, crossing County Highway 6 in the southeast corner of Sec. 30. The Tepee Creek South Segment would curve around to a northwesterly direction, leaving Sec. 30 in the southwest corner, extending along the south and southwest corner of Sec. 25, T9S, R5E. It would leave the west center of Sec. 25, crossing the northeast corner of Sec. 26, into Sec. 23 and along the southern boundary of Sec. 22. From this point, Alternative C would follow the Heppner Segment alignment.

Heppner Segment

This 3.1-mile Heppner segment of Alternative C would follow the Heppner Segment described for Alternative B.

Hat Creek North Segment

In Sec. 29, T9S, R5E at the western end of the Heppner Segment, the 7.3-mile Hat Creek North Segment of Alternative C (Hat Creek North) would continue southwest, crossing County Highway 6, approximately 0.4 mile south of the northern boundary of Sec. 29. The Hat Creek North Segment would curve to a westerly direction, extending westward across Sec. 30, T9S, R5E, and Sections 25, 25, 27, and 28, approximately 1,000 feet north of the southern boundaries of these Sections. In Sec. 25, the Hat Creek North Segment would cross Hat Creek and State Highway 71 at grade in the southwest corner of Sec. 26. The Hat Creek North Segment would enter Sec. 29, curve southwest, crossing the southeast corner of the section and the northwest tip of Sec. 32 before curving back to the northwest across the northern quarter of Sec. 31. It would leave the northwest corner of Sec. 31, entering Sec. 25, T9S, R3E. It would cross Plum Creek and begin to follow the Edgemont Segment alignment.

Edgemont Segment

This 3.8-mile Edgemont Segment of Alternative C would follow the Edgemont Segment described for Alternative B.

Edgemont North Segment

In the northwest corner of Sec. 16, T9S, R3E, the 6.9-mile Edgemont North Segement of The Edgemont North Segment would extend from the Edgemont Segment, turning to the north along the western boundaries of Sections 9 and 4, T9S, R3E. It would cross County Highways 6N and 6E where they intersect. The Edgemont North Segment would curve west across the northeast corner of Sec. 5, T9S, R3E and the southeast corner of Sec. 32, T8S, R3E. It would cross the Cheyenne River in Sec. 31, immediately upstream of where the river enters Sec. 32. It would cross Old State Highway 18 at grade in the northeast corner of Sec. 31. It would continue northwest, having a grade separated crossings of a BNSF siding track and State Highway 18 in the northwest corner of the section. The Edgemont North Segment would leave the northwest corner of Sec. 31, continuing northwest, across the southwest portion of Sec. 25, T8S, R2E and into the central portion of Sec. 26. At this point, The Edgemont North Segment would parallel the north and east side of the existing BNSF rail line and would follow the BNSF Segment alignment.

BNSF Segment

The 8.0-mile BNSF Segment of Alternative C would follow the BNSF Segment described for Alternative B.

Burdock School Segment

The 6.0-mile Burdock School Segment of Alternative C would continue to follow the existing BNSF rail line into the northwest corner of Sec. 25, T7S, R1E. In the northwest corner of the section, it would deviate from the BNSF rail line, crossing the southwest corner of Sec. 24, curving westward across the northeast corner of Sec. 23 and southwest corner of Sec. 14. Alternative C would cross County Road 6463 were the road enters Sec. 14 from Sec. 15. It would cross the lower third of Sec. 15, curving slightly north to cross through the center of Sections 16 and 17. The Burdock School Segment would cross the county road between Sections 15 and 16 and Beaver Creek in the west center of Sec. 16. After entering Sec. 18, The Burdock School Segment would curve slightly south, then west, entering Niobrara County, Wyoming in the southeast corner of Sec. 15, T40N, R60W. Upon entering Wyoming, Alternative C would follow the alignment described for the Wyoming Segment.

Wyoming Segment

This 43.9-mile segment of Alternative C would follow the Wyoming Segment described for Alternative B.

450 Segment

In Sec. 12, T42N, R67W, the 16.0-mile 450 Segment of The 450 Segment would continue west across Lion Creek in the northwest corner of the section. It would continue across the northern third of Sec. 11, curving north in Sec. 10 to leave the northwest corner of the section. It would enter Sec. 4 and curve back to the west. The 450 Segment would extend across the bottom third of Sections 5 and 6. It would cross Lynch Road at grade in the southeast corner of Sec. 5. The 450 Segment would continue across the southern third of Sections 1, 2, 3, and 4, T42N, R68W. It would cross Piney Creek in the south-center of Sec. 2. It would curve to the northwest through Sec. 5, across the northwest corner of Sec. 6 and the southwest corner of Sec. 31, T43N, R68W. The 450 Segment would extend Campbell County in Sec. 36, T43N, R69W. The 450 Segment would continue westerly, generally across the center of Sections 36 and 35 and cross Hansen Draw in the center of Sec. 35. It would gently curve northwest across the northern portion of Sec. 34, the northeast corner of Sec. 33, the southwest corner of Sec. 28. Upon entering Sec. 29, Alternative C would split into a "T", with one arm of the "T" continuing south, the other north. The following describes each arm.

South Arm Segment

The 22.2-mile South Arm Segment of Alternative C (south arm), would curve south, leaving the southwest corner of Sec. 23, crossing the northwest corner of Sec. 32 and School Creek. It would cross the southeast corner of Sec. 31, running parallel to School Creek Road, into Sec. 6, T42N, R69W. It would cross School Creek Road at grade twice in Sec. 6. The South Arm Segment would continue south along the west side of the School Creek drainage. It would cross the northwest corner of Sec. 7, T42N, R69W, the southeast and northeast tips of Sections 12 and 13, T42N, R70W, respectively. Continuing along School Creek, the South Arm Segment would cross the southwest corner of Sec. 18, T42N, R69W, diagonally through the center of Sec.19, entering Sec. 29 through the northwest corner. In the center of Sec. 29, it would curve south away from School Creek, extending south into the center of Sec. 32. In the center of Sec. 32, the South Arm Segment would follow an unnamed tributary east of West Fork of Beckwith Creek. It would follow this drainage into Sec. 5, T41N, R69W, where it would begin to follow West Fork of Beckwith Creek. It would continue to follow this drainage south through Sec. 8, continuing south away from the drainage in the southeast corner of Sec. 8. The South Arm Segment would cross the east side of Sections 17 and 20. After entering Sec. 29, it would curve westward, entering Converse County, Wyoming in the center of Sec. 29. The South Arm Segment would cross the northwest corner of Sec. 29, the southeast corner of Sec.30, and across the northern boundary of Sec. 31.

The South Arm Segment would extend into Sec. 36, T41N, R70W, crossing Sunny Draw in the northwest corner of the section. It would continue across the northern boundary of Sections 36 and 35, following the north side of the Porcupine Creek floodplain. The South Arm Segment would cross Porcupine Creek in the northwest corner of Sec. 35. The South Arm Segment would continue across the floodplain at the confluence of Porcupine and Antelope Creeks, crossing through the center of Sections 34, 33 and 32, extending along the north sideslope of the Antelope Creek floodplain. The South Arm Segment would cross Antelope Creek and the joint line in Sec. 31 where the joint line crosses the creek. The South Arm Segment would cross the southeast corner of Sec. 31, trending southwest across the northwest corner of Sec. 6, T40N, R70W, following Logan Draw. It would cross the southeast corner of Sec. 1, T40N, R71W. After entering Sec. 12, the South Arm Segment would turn northwest, cross Logan Draw, parallel the joint line access spur into Antelope coal mine, joining with the mine's rail loop in Sec. 2.

North Antelope East Mine Loop Alternative

The 1.5-mile North Antelope East Mine Loop Alternative would follow the same alignment as described for Alternative A. It provides one alternative to access the North Antelope and Rochelle mines.

North Antelope West Mine Loop Alternative

The 2.4-mile North Antelope West Mine Loop Alternative would follow the same alignment as described for Alternative B. This Alternative would provide a second alternative alignment to access the North Antelope and Rochelle mines.

North Arm Segment

The 45.0-mile North Arm Segment of Alternative C would curve north in Sec. 29, T43N, R69W and have a grade separated crossing of State Highway 450 approximately 0.25 mile east of Sec. 30. The North Arm Segment would curve westward across the northeast corner of Sec. 30 and the southwest corner of Sec. 19. It would parallel the north side of State Highway 450, generally within the Little Thunder Creek drainage, through Sec. 24, T43N, R70W, turning north along the west side of the section.

The North Arm Segment would continue north along the east side of Sec. 14, curving slightly west to continue north along the west side of Sec. 12. It would cross the southwest corner of Sec. 1 and the northeast corner of Sec. 2. The North Arm Segment would cross Little Thunder Road (at grade) in the southeast corner of Sec. 35, T44N, R70W and continue north

through the centers of Sections 35, 26 and 23. It would continue north along the west side of Sec. 14, crossing Black Thunder Creek in the northwest tip of the section, and Sec. 11, where it would cross Keeline Road in the southwest tip of the section. The North Arm Segment would continue north along the east side of Sec. 2. The North Arm Segment would continue north along the east side of Sec. 35, T45N, R70W, crossing Cottonwood Creek on the east-central side of the section, and continue through the center of Sec. 26. It would curve slightly eastward and continue north along the east sides of Sec. 23 (just east of Hay Lake), 14, 11 (crossing East Fork of Coal Creek in the east-central area of the section), and 2. The North Arm Segment would continue north, curving to the northwest through the center of Sec. 35, T46N, R70W, across the southwest corner of Sec. 26, northeast corner of Sec. 27, and curve north through the center of Sec. 22. The North Arm Segment would curve westward across the southwest corner of Sec. 15 and through the northeast center of Sec. 16, where it would cross the T7 road. The North Arm Segment would cross the southwest tip of Sec. 9, curving westward into Sec. 8. In Sec. 8, a spur would extend from the North Arm Segment. The spur would curve back around to the southeast in the west central area of the section and connect to the rail loop at the Coal Creek coal mine.

The North Arm Segment would continue north from the Coal Creek coal mine, leaving the northwest corner of Sec. 8. It would cross the southwest tip of Sec. 5 and the northeast tip of Sec. 6. The North Arm Segment would enter Sec. 31, T47N, R70W, extending northwest through the section. It would cross the Belle Fourche River in the northwest corner of Sec. 31. Also in the northwest corner, a spur line would extend westward into the northeast corner of Sec. 36, T47N, R71W to connect with the Cordero coal mine rail loop.

The North Arm Segment would extend north across the southwest tip of Sec. 19, T47N, R70W, the northeast corner of Sec. 24, T47N, R71W, and continue north along the east sides of Sections 13 and 12. It would cross Kicken Draw in the southeast corner of Sec. 13. In the northeast corner of Sec. 12, the North Arm Segment would curve westward, into Sec. 1 where a spur would extend further west to connect with the Caballo Rojo coal mine rail loop. The North Arm Segment itself would continue northwest through Sec. 1, the southwest tip of Sec. 36, T48N, R71W, curve north and extend along the east side of Sec. 35. It would cross Caballo Creek in the northwest corner of Sec. 35 and continue north into Sec. 26. Upon entering Sec. 26, a North Arm Segment spur would curve to the east and back around on itself to the west, connecting with the Belle Ayr coal mine spur along the northern boundary of Sec. 35. The North Arm Segment would curve eastward into the center of Sec. 25, crossing Tisdale Creek and connecting to the rail loop at Caballo coal mine in the northeast corner of the section.

Black Thunder North Mine Loop Alternative

The 4.5-mile Black Thunder North Mine Loop Alternative would follow generally the same alignment as for Alternative B. However, because this alternative would extend from the North Arm Segment, it would start in the northeast corner of Sec. 23, T43N, R70W, slightly south of where this alternative would start for Alternative B. It would extend north into Sec. 14, curving to the west. The Black Thunder North Alternative would cross Burning Coal Draw and follow the same alignment as for Alternative B to access the Jacobs Ranch and Black Thunder mines.

Black Thunder South Mine Loop Alternative

The two spurs of the 7.1-mile Black Thunder South Loop Alternative would extend from the North Arm Segment in the northeast corner of Sec. 23. The spur to access the Jacobs Ranch mine would extend north into Sec. 14. It would curve west, cross Burning Coal Draw and connect to the Jacobs Ranch Mine Loop in the south-central portion of of Sec. 14. The spur to access Black Thunder Mine would extend westward from the North Arm Segment slightly south of the spur to Jacobs Ranch. It would curve south, crossing Burning Coal Draw and State Highway 450. The Black Thunder South Alternative would cross the North Prong of Little Thunder Creek in the northwest corner of Sec. 23. From this point, it would follow the same alignment as for Alternative B, resulting in a second mine loop east of the existing mine loop at Black Thunder mine.

North Rochelle Mine Spur - School Creek Option

Alternative C would access the North Rochelle coal mine using the 4.1-mile North Rochelle Mine Spur - School Creek Option. This spur option would extend from the South Arm Segment in north-centeral Sec. 6, T42N, R69W. The School Creek Option would curve to the west, crossing School Creek Road and extending into the center of Sec. 1, T42N, R70W. In the center of Sec. 1, the School Creek Option would curve to the southwest, exiting Sec. 1 through its southwest corner, and entering the northeast corner of Sec. 11. It would curve west and cross the northern portion of Sections 11 and 10. In the northwest corner of Sec. 10, the School Creek Option would split into two lines, one connecting to the north portion of the existing North Rochelle Mine Loop and the other connecting to the south portion of the existing mine loop, both in the north center of Sec. 9.

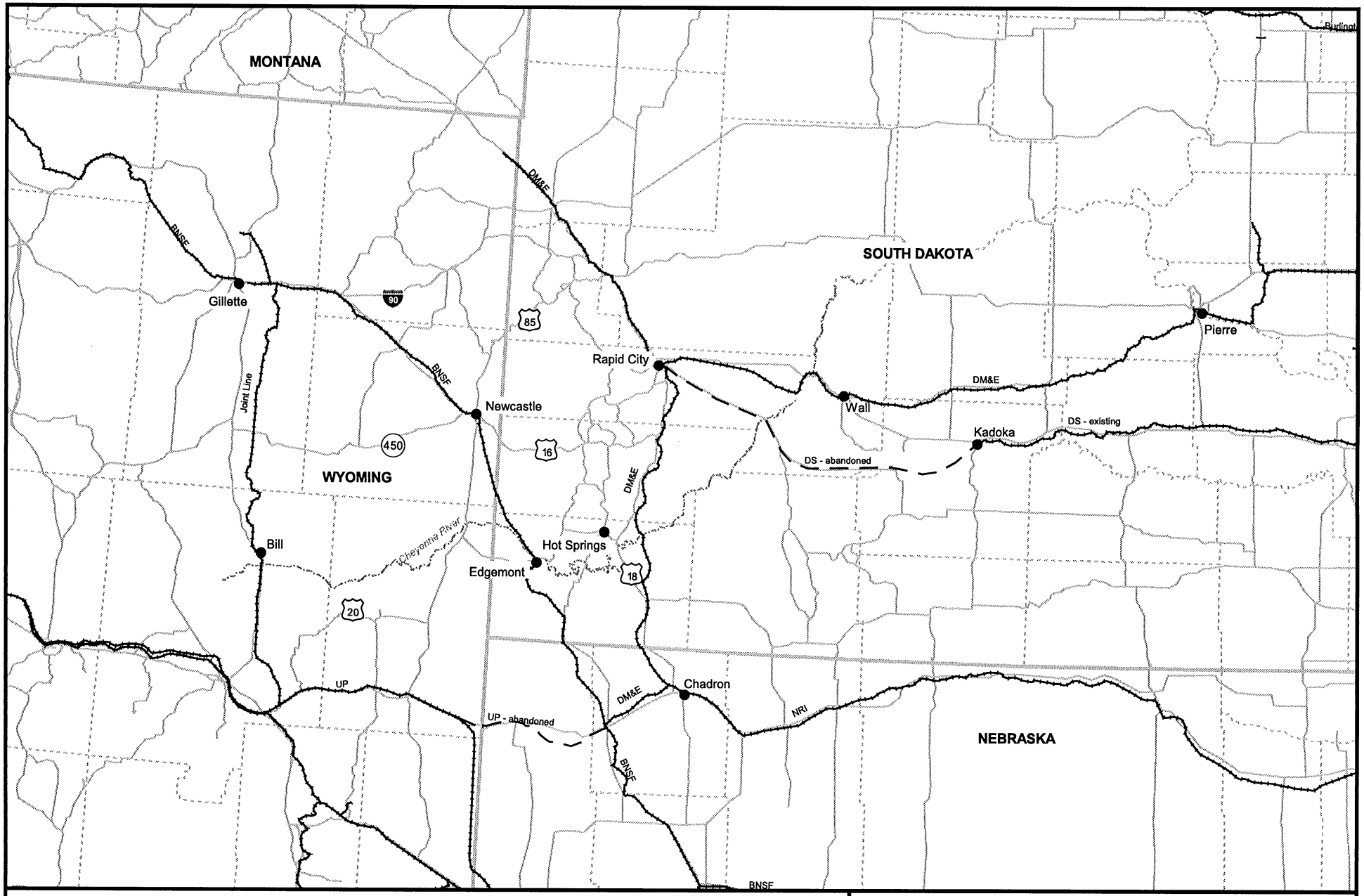
2.2.2 EXISTING TRANSPORTATION CORRIDOR ALTERNATIVES

A network of existing transportation corridors, including rail lines and highways, currently exist in western South Dakota and eastern Wyoming (Figure 2-13). Rail service is currently provided to the PRB by rail lines owned and operated by BNSF and jointly by BNSF and UP. These rail lines provide rail access to the PRB from the north and south, with existing rail lines extending from the PRB north into Montana and south into Colorado and Nebraska (passing through southwest South Dakota). Additionally, DM&E has existing rail lines in southwestern and west-central South Dakota. These lines extend south into Nebraska and northwest into east-central Wyoming. Interstate 90 (I-90) extends westward across South Dakota and across northeast Wyoming. Other east-west highways include U.S. Highway 18 near Edgemont, South Dakota, U.S. Highway 16 near Newcastle, Wyoming, and State Highway 450 extending westward from Newcastle.

During DM&E's pre-Application public and agency coordination efforts, the public and agencies suggested repeatedly that DM&E make more use of existing transportation corridors for this project. The public and agencies identified several opportunities including:

- Rail lines owned by DM&E,
- Rail lines owned by other railroads,
- Abandoned rail beds, and
- Highway corridors.

As discussed below, SEA using design information provided by Applicant evaluated the feasibility of these corridors for the proposed project. DM&E reconsidered these opportunities and determined that use of existing transportation corridors would not meet its project's primary objective of providing a shorter, more competitive route into the PRB. SEA considered DM&E's evaluation and based on SEA's further evaluation, determined that overall the use of existing transportation corridors would not meet the objectives of the project, as described in Chapter 1. However, SEA concluded that one existing corridor alternative, Alternative D, would be retained for analysis in the Draft EIS. SEA recognized that this alternative may not meet the project purpose. However, Alternative D seemed to make efficient use of the existing transportation corridors available in the area and inclusion of it in the Draft EIS would provide a comparison of the potential impacts of new rail construction and operation with the impacts of constructing, and operating a rail line along existing transportation corridors in the project area.



N
W E
S
40 0 40 Miles

BNSF - Burlington Northern & Santa Fe
DM&E - Dakota, Minnesota & Eastern
UP - Union Pacific
DS - Dakota Southern
NRI - Nebkota
Joint Line - Union Pacific and Burlington Northern & Santa Fe

Figure 2-13
POWDER RIVER BASIN EXPANSION PROJECT
Existing Transportation Corridors
Western South Dakota and Eastern Wyoming

2.2.2.1 Proposed Existing Transportation Corridor Alternative Selection

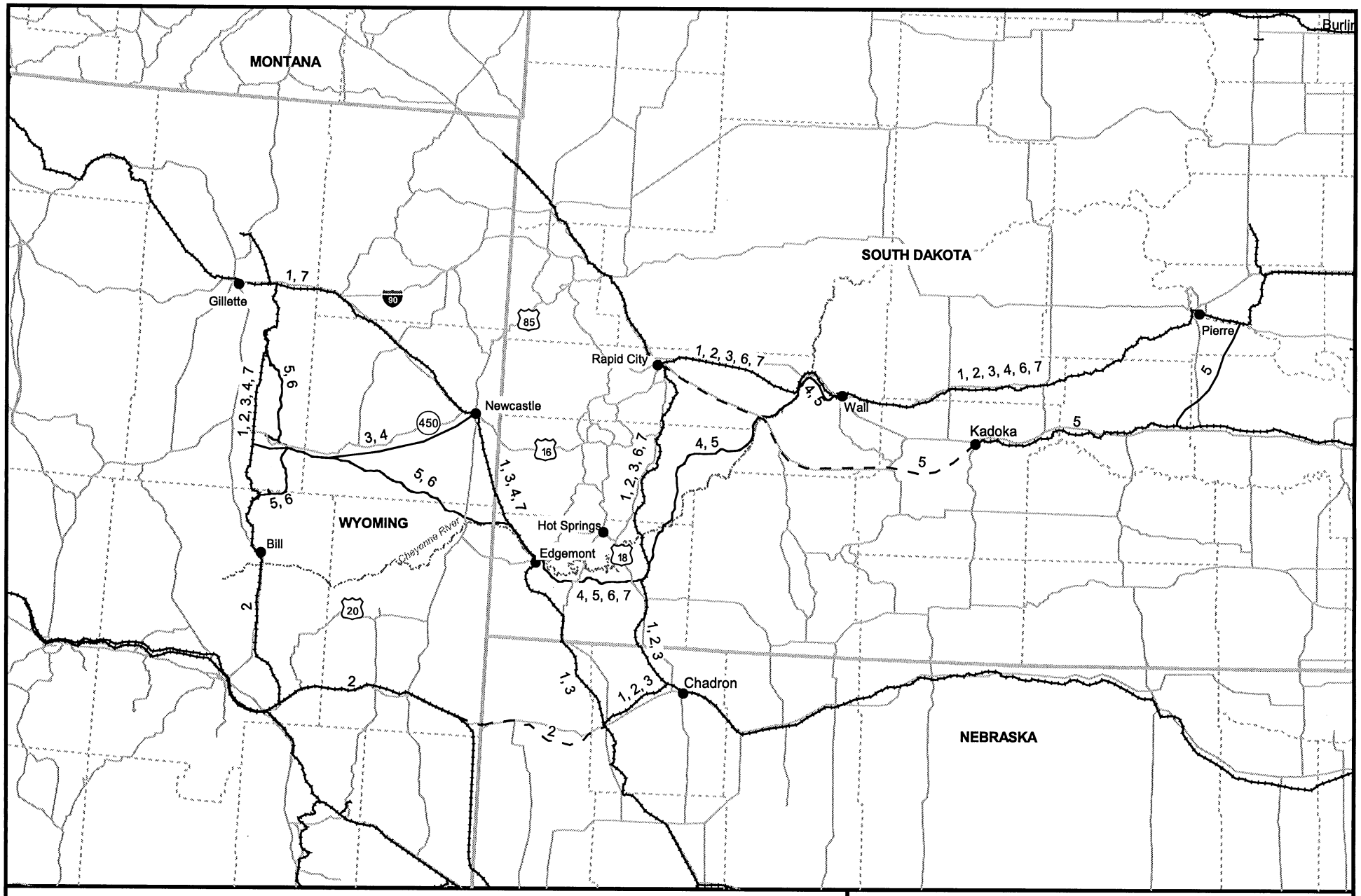
SEA has received numerous comments regarding the use of existing DM&E rail lines and other rail lines within the Southern Corridor to achieve DM&E's transportation objectives. Many commenters noted that DM&E's existing system includes an operational rail line which extends off the rail line southward from Rapid City to Crawford, Nebraska as well as other linear corridors. These commentors believe that by using existing corridors DM&E could avoid disruptions, reserve the large tracts of land that would be divided under Alternatives B or C, and cause fewer construction impacts. Additionally, the USFS requested the evaluation of an alternative that would use existing transportation corridors (Figure 2-13) to the extent practical to minimize impact to the National Grasslands in South Dakota and Wyoming.

SEA recognizes that use of existing rail lines and transportation corridors is generally preferable to construction of new corridors, provided using existing corridors and facilities does not increase the overall impacts of the project, require questionable engineering techniques to cope with existing facilities, or cause the project to become impractical as a result of following indirect routes between shippers and users. Therefore, SEA and the cooperating agencies developed numerous alternatives using existing linear corridors. SEA also encouraged DM&E to develop alternatives that would use the existing DM&E rail line and other rail lines. DM&E responded by developing and conducting a preliminary screening of seven alternatives. These "D" Alternatives, shown in Figure 2-14, included:

- Alternative D-1, which would involve reconstructing the existing DM&E rail line to Crawford, Nebraska and constructing new rail line immediately adjacent to the existing BNSF rail line from Crawford and along the joint BNSF/UP rail line (Joint line).

- Alternative D-2, which would require reconstructing the existing DM&E rail line to Crawford, Nebraska; rebuilding previous Chicago & Northwestern rail line to Crandall, Wyoming; and constructing new rail line adjacent to the existing UP and Joint lines.

- Alternative D-3, which would follow the same alignment as Alternative D-1 to south of Newcastle, Wyoming, where new rail line would be constructed parallel to State Highway 450 and north and south to access the coal mines.



N
W E
S
40 0 40 Miles

1 - D Alternative Number
Existing Rail Line
Abandoned Rail Line
Proposed Rail Line

Figure 2-14
POWDER RIVER BASIN EXPANSION PROJECT
D Alternatives
South Dakota and Wyoming

- Alternative D-4, which would require construction along the Alternative C alignment from Wall to Edgemont, reconstruction of a short section of the existing DM&E rail line between Oral and Smithwick, and construction parallel to the BNSF rail line to just south of Newcastle, where it would involve new construction parallel to State Highway 450 as discussed for Alternative D-3.

- Alternative D-5, which would involve reconstructing an abandoned rail bed right-of-way formerly owned by the Chicago, Milwaukee, and St. Paul Railroad (Old Milwaukee route), between Kadoka and Creston, South Dakota, reconstructing an operating portion of this rail line between Kadoka and Draper and new rail line between Draper and Alto. This alternative would also utilize part of another alternative, either Alterative B or C, to complete the route into the PRB.

- Alternative D-6, which would be a combination of Alternative D-1 between Wall and Smithwick and Alternative C west of Smithwick. Alternative D-6 would require reconstruction of the existing DM&E system from Wall to Smithwick and new construction westward from Smithwick to the mines.

- Alternative D-7, would be a combination of Alternative D-1 between Wall and Smithwick, Alternative C between Smithwick and Edgemont, and Alternative D-2 between Edgemont and the coal mines. This alternative would involve rebuilding the existing DM&E rail line to Smithwick, new construction along the alignment of Alternative C between Smithwick and Edgemont, and new construction parallel to the existing BNSF rail line north from Edgemont to the coal mines. This alternative would not access the mines paralleling the joint line, but it would involve new rail construction following the alignment of Alternative C north-south within the basin to connect to the coal mines.

After consulting with DM&E regarding certain operational issues, SEA conducted its own review of these alternatives to determine whether they were reasonable and feasible and warranted a detailed analysis in this Draft EIS. To evaluate these alternatives, SEA posed the following questions:

- Would the existing rail right-of-way or linear corridor be of similar use as the proposed new construction routes?[14] Certain linear rights-of-way, such as pipelines or electric line corridors, may be very similar to natural conditions and receive only minimal management from its owners; railroad operations would vary dramatically from these existing uses.

- Would DM&E's plan to transport up to 100 million tons of coal annually using 115- to 135-car trains significantly disrupt existing rail operations or create conflicts with road travel at grade crossings on the existing routes or existing railroad rights-of-way?
- Would the railroad's use of the linear right-of-way offer significant environmental or social advantages over new construction or create significant social or environmental impacts?[15]

- Would the shared right-of-way offer an appropriate grade and curve to accommodate unit coal trains in a safe and efficient manner, or would portions of the existing rail line require reconstruction to achieve safety and efficiency?

- Would the existing route or existing right-of-way serve the specific geographic areas (i.e., markets) DM&E identified in its Application?

- Would the overall route be shorter than using existing routes? A shorter route is critical to determining whether the alternative would offer economic or competitive advantages to shippers.

SEA and the cooperating agencies also evaluated all of the existing corridor alternatives to determine whether they would meet the environmental objective of minimizing intrusion to the National Grasslands while still fulfilling DM&E's operational and project objectives (see Table 2-1).

---

[14] A wide variety of facilities require linear corridors. However, the impact of corridors for rail and highway transport vary greatly in use from corridors for pipelines and high voltage electrical lines. While all of these are linear corridors, rail and highway corridors are generally highly intrusive and the land use and differs from the surrounding environment. The land use within pipeline and electrical line corridors, in contrast, may be very similar to those areas adjacent to the rights-of-way. Therefore, the impacts created by these different linear corridors may be significantly different. Locating one linear corridor within or alongside another may be infeasible or result in a greater level of impact than constructing a new corridor at another location.

[15] The use of parallel or existing linear rights-of-way can reduce social and environmental impact because it limits disturbance to additional land or facilities located in previously disturbed areas. However, the use of parallel or existing rights-of-way can cause greater impacts if the railroad is incompatible with adjacent land uses or if adjacent land uses have encroached on the existing right-of-way.

Alternatives D-1 and D-2

SEA determined that Alternatives D-1 and D-2 were not feasible alternatives for two reasons: First, each of these alternatives would require the construction of more than 230 miles of new rail line (with accompanying miles of sidings) and reconstruction of over 175 miles of existing rail line. This amount exceeds the amount of construction required for Alternatives B&C located entirely on new alignment. Second, the additional length of Alternatives D-1 and D-2 would result in increased fuel consumption and train crews and could increase DM&E's operating costs to the point where they would not provide a competitive advantage in terms of either time or cost savings for the major utilities associated with DM&E's intended market (Chapter 1, Section 1.3.2). Therefore, SEA eliminated these alternatives from further consideration in the Draft EIS.

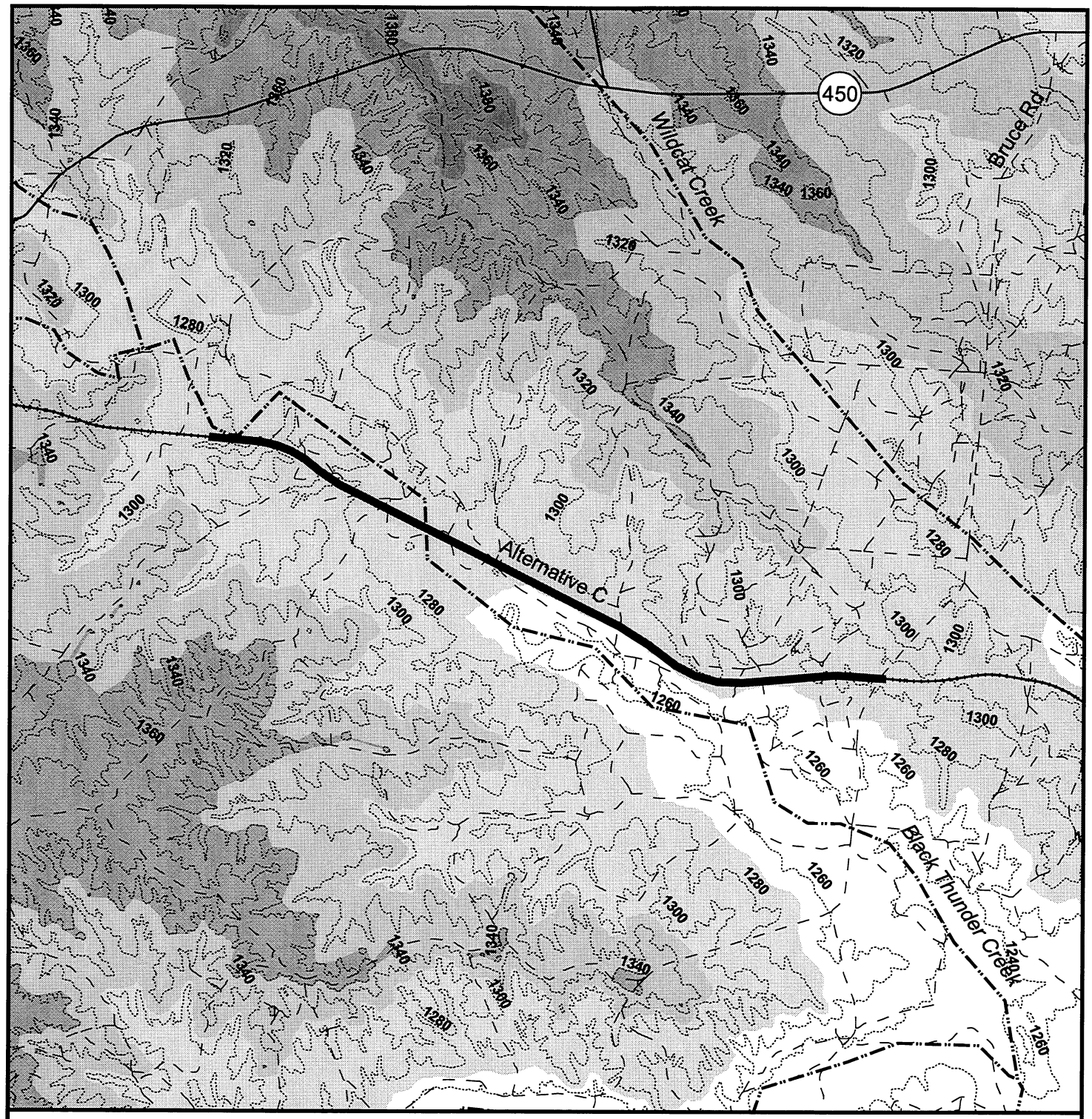
Alternatives D-3 and D-4

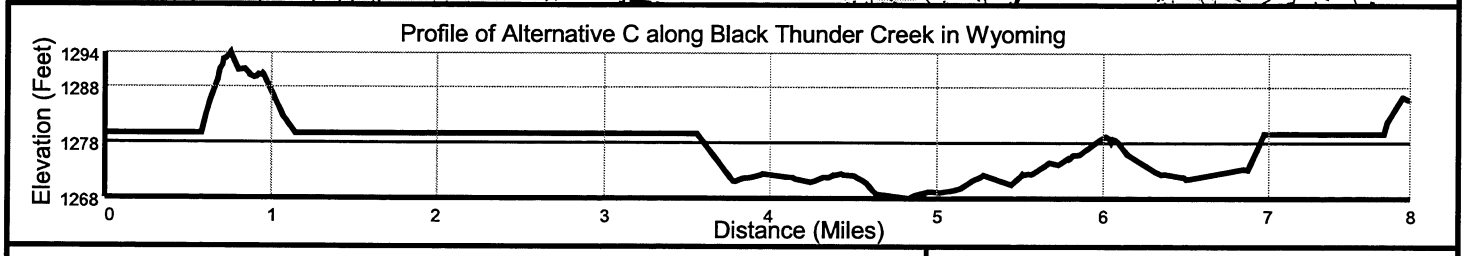
SEA eliminated Alternatives D-3 and D-4 from further consideration because they would pose unreasonable operational constraints. Much of the proposed route for these alternatives would parallel State Highway 450, and would cross numerous drainageways. The perpendicular drainage crossings, that would be required for these alternatives, would require substantial cutting and filling to cross deep, steep-sided drainage banks, and would create a track with a nearly 4 percent grade at some locations. Figures 2-15 and 2-16 provide a comparison of the ground surface elevations along a portion of Alternative C south of Highway 450 with those of a portion of Highway 450. The reader should recognize that the overall range of elevations shown in the profile of Figure 2-15 is only 26 feet, while the range in the profile of Figure 2-16 is 100 feet. The nearly 4 percent grade would present concerns for the safe operation of unit coal trains. To accommodate this grade, each fully loaded coal train would require nine locomotives distributed throughout the train to reduce in-train push and pull forces and prevent derailments. Because so many locomotives would be required, trains using a route along Highway 450 would consume significantly more fuel than the other alternatives (Table 2-1).

Alternative D-5

SEA determined that Alternative D-5 was not feasible because it would pose the following construction and operational constraints:

- The need to construct approximately 315.6 miles of new track. Part of this mileage includes portions of Alternative C to extend the rail line into the PRB.



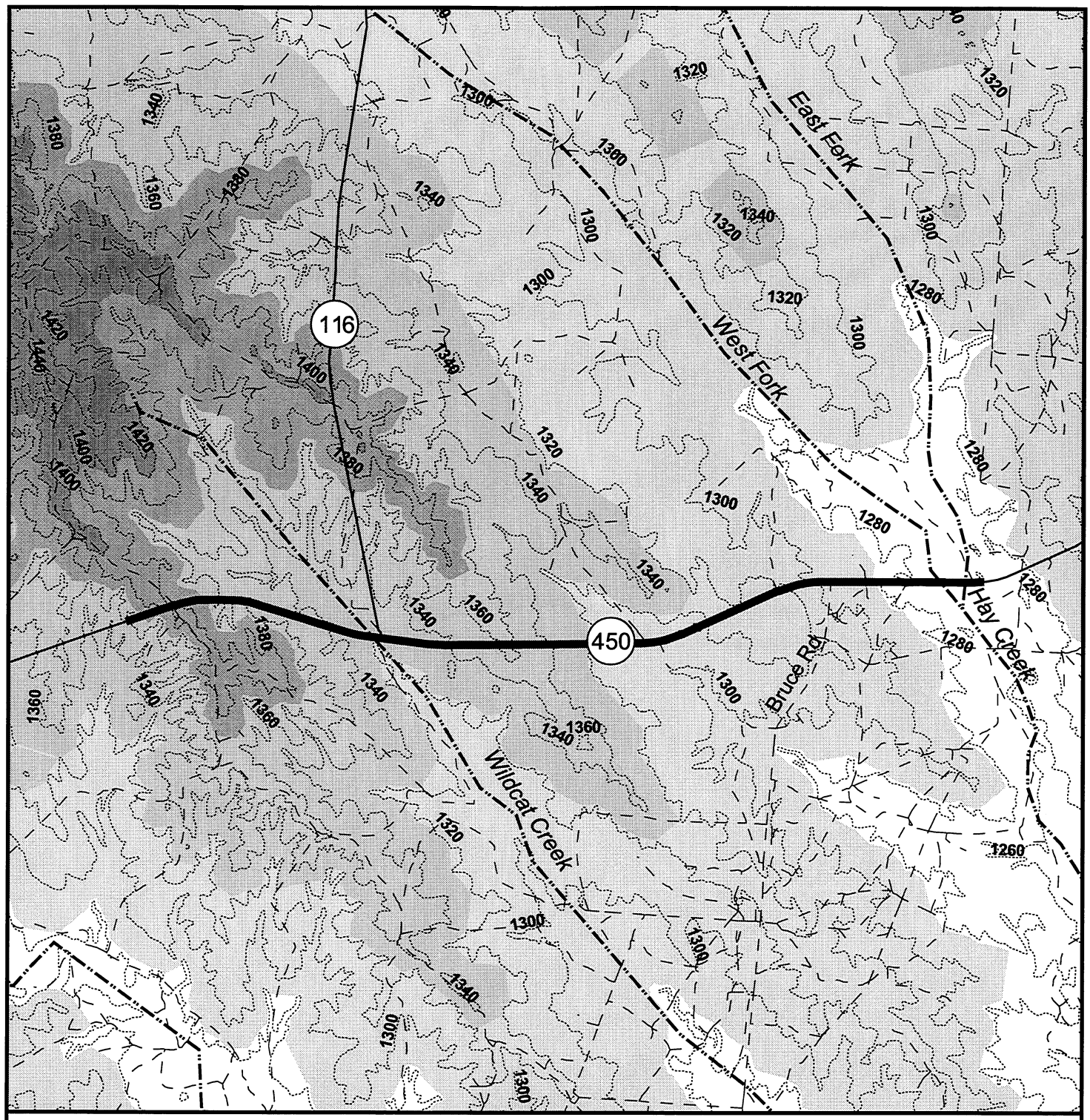


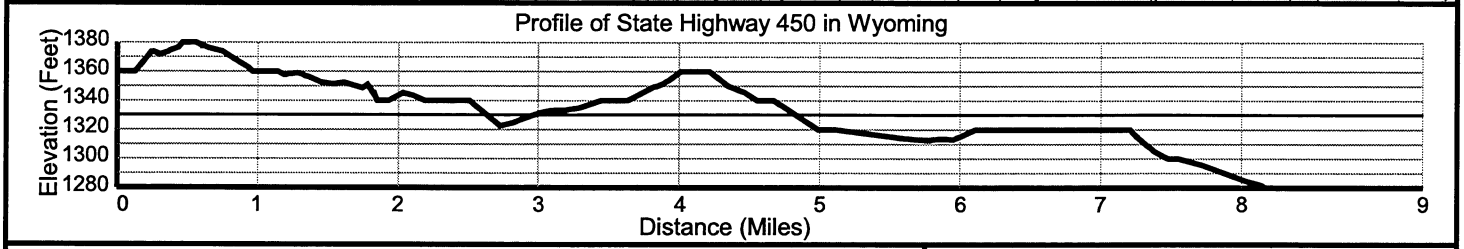
N

Profiled Line

8000 0 8000 Feet

Figure 2-15
LANDSCAPE PROFILE
ALTERNATIVE C
BLACK THUNDER CREEK
WYOMING





N

Profiled Line

8000 0 8000 Feet

Figure 2-16
LANDSCAPE PROFILE
STATE HIGHWAY 450
WYOMING

- Reuse of the Old Milwaukee route could result in DM&E abandoning its existing rail line and eliminating service to these shippers along this rail line. SEA has determined that both DM&E's existing track and the Old Milwaukee track, which generally parallels the existing DM&E rail line from east of Pierre to Wasta, South Dakota, are in poor condition and would require substantial reconstruction to continue operation. For example, trains traveling on some portions of these tracks currently operate under an FRA-mandated maximum speed of 10 miles per hour because of the poor track condition. Based on market projections and current traffic patterns on DM&E's existing rail line, SEA determined that DM&E might be unable to support both projects simultaneously, which would result in the abandonment of DM&E's existing rail line and loss of service to existing rail shippers.

- The need to construct a rail line connection from Draper to Alto, South Dakota. This construction would include approximately 40 miles of new rail line and a new bridge crossing at Lake Sharpe, a mainstem impoundment of the Missouri River. Such a crossing would pose potential environmental and navigational concerns.

Alternative D-6

SEA determined that Alternative D-6 would not meet the environmental objective of using an existing transportation corridor to avoid new rail construction in National Grasslands. Alternative D-6 would follow the Alternative C alignment through the State of Wyoming, crossing approximately 30.3 miles of TBNG to reach the PRB. In addition, Alternative D-6 would not offer a shorter, more competitive route into the PRB nor would it provide construction or operational advantages over Alternatives B and C. Therefore, SEA eliminated Alternative D-6 from further consideration in the Draft EIS.

Alternative D-7

SEA determined that Alternative D-7 warranted further detailed analysis in this Draft EIS because it would achieve the environmental objectives of using existing transportation corridors and avoiding new rail line construction across National Grasslands, particularly through the TBNG area. Alternative D-7 also offered the advantage of requiring only 44 miles of new rail construction along new right-of-way in South Dakota, all of which avoided National Grasslands.

As part of its evaluation of Alternative D-7, SEA conducted an engineering feasibility study of this alternative and identified significant adverse operational constraints associated with the existing DM&E rail line between Rapid City and Smithwick, South Dakota. SEA's analysis showed that the rail track configuration in this area would pose safety and operational concerns to

unit coal trains, which can be up to 1 mile in length.[16] To enable safe rail operations along this section of rail line, SEA determined DM&E would be required to perform one of the following:

- Build rail yards where the unit trains could be disassembled and reassembled before and after traveling over the existing track. Under this option, DM&E would upgrade the rail bed, ties and rail along the existing rail line. Operation over this rail line would require unit trains of up to 135 cars be broken into smaller trains of approximately 30 cars to operate over this deteriorating rail line. DM&E would also have to maintain a fleet of locomotives that would remain on standby to move these smaller trains through this area or develop a system of shuttling car sets using the available locomotives. Operating speeds along this rail line would also be significantly below those desired by DM&E for this project. These activities would significantly delay train movement in the area and be very inefficient.

- Reconstruct the existing rail line so that it could safely operate unit coal trains. SEA determined DM&E could straighten curves and level steep grades on the rail line. This reconstruction could result in relocation of the existing rail line into areas outside the existing DM&E right-of-way. However, even with this type of reconstruction, SEA determined that it might not be possible for DM&E to operate the unit coal trains at its desired speeds (49 mph for empty trains and 45 mph for loaded trains).

SEA has determined that breaking up unit trains, which would cause delays, would be an unreasonable and unacceptable operational constraint. Therefore, while Alternative D-7 is one of the alternatives being fully considered in the Draft EIS, SEA assumes that if Alternative D-7 ultimately is approved for construction by the Board the portion of the existing DM&E rail line between Rapid City and Smithwick would require major reconstruction to allow for safe and efficient rail operations. Section 2.2.2.2 describes Alternative D-7, which for the remainder of this Draft EIS is referred to as Alternative D, Existing Corridor Alternative.

[16] SEA's analysis concluded that the line's many reverse curves and up and down grades in proximity to each other would subject a unit coal train over one mile in length to numberous opposing forces. A single train would be turning east, while another portion of the train was turning west, at the same time going both upgrade and downgrade. These physical forces could be significant to pul the train off the track or apart. SEA further concluded in its analysis that in order to operate a unit coal train at any speed over this section of track, trains would need to be broken into as many as four or five smaller trains.

2.2.2.2 Alternative D: Existing Corridor Alternative

Alternative D would run between Wall, South Dakota, and the PRB. Much of its alignment follows existing DM&E and BNSF rail corridors. At its western terminus, Alternative D would utilize new right-of-way along the same alignment as Alternative C to access different portions of the PRB. Table 2-4 presents Alternative D segments; Figure 2-7 provides an overview of this alternative. A detailed description of the segments follows the table. Figure 2-9 provides a guide to SEA's descriptions of the segments' locations within a section. Volume V provides detailed maps for Alternative D.

Table 2-4
Alternative D Segments

Segment	Start	End
Rapid City East Segment (58.7 miles)	Approximately 0.5 mile north of Wall	Rapid City at junction of existing DM&E mainline and south spur to Crawford, Nebraska
Rapid City South Segment (63.2 miles)	Rapid City at junction of existing DM&E mainline and south spur of Crawford, Nebraska	Section 31, T8S, R8E, just north of the town of Smithwick
Smithwick Segment (13.1 miles)	Section 31, T8S, R8E, just north of the town of Smithwick	Section 29, T9S, R6E west of Dry Creek
Tepee Creek South Segment (3.7 miles)	Section 29, T9S, R6E west of Dry Creek	Southwest corner of Section 23, T9S, R6E
Heppner Segment (3.1 miles)	Southwest corner of Section 23, T9S, R6E	Section 9, T9S, R5E, Southwest of Heppner
Hat Creek North Segment (7.3 miles)	Section 9, T9S, R5E, Southwest of Heppner	Section 25, T9S, R3E at Plum Creek
Edgemont Segment (3.8 miles)	Section 25, T9S, R3E at Plum Creek	Southwest corner of Seciton 15, T9S, R3E

Table 2-4
Alternative D Segments

Segment	Start	End
Edgemont North Segment (6.9 miles)	Southwest corner of Section 15, T9S, R3E	Center of Section 26, T8S, R2E, near the existing BNSF rail line
BNSF Segment (8.0 miles)	Center of Section 26, T8S, R2E, near the existing BNSF rail line	Northwest corner of Section 25, T7S, R1E
Newcastle Segment (116.2 miles)	Northwest corner of Section 25, T7S, R1E	
North Arm Segment* (45.0 miles)	Section 25, T48N, R71W at Caballo coal mine	Southeast corner of Section 29, T43N, R69W, south of Little Thunder Creek
South Arm Segment (22.2 miles)	Southeast corner of Section 29, T43N, R69W, south of Little Thunder Creek	Section 2, T40N, R71W at Antelope coal mine
South Arm Spur (2.3 miles)	Northeast corner of Section 34, T41N, R70W, south of Porcupine Reservoir	Section 21, T41N, R70W, at North Antelope/Rochelle coal mine complex

* Because Alternative D would enter the PRB from the north end rather than the center as do alternatives B and C, the start and end points for this segment are reversed in order to provide a continuous sequence of segments from the east to the coal mines.

Rapid City East Segment

Alternative D would begin approximately 1.0 mile north of Wall, South Dakota, at the point where the existing rail line turns south and passes through the town. Rather than extend westward, the 58.7 mile Rapid City East segment of Alternative D would continue on the existing DM&E rail line south, through the town of Wall and under I-90 southwest of town. It would continue on the existing rail line, winding westward along Bull Creek on the south side of I-90. It would cross under I-90 approximately 1.0 mile east of the interchange with Jensen Road. It would cross Jensen Road at grade and continue west, crossing the Cheyenne River approximately 0.9 mile north of I-90. Alternative D would turn south, passing through the town of Wasta and under I-90. It would continue south along the west side of the Cheyenne River. At Boxelder

Creek, Alternative D would turn west away from the river and follow the Boxelder Creek drainage.

A potential Alternative to this portion of Alternative D would be the portion of the Wall Segment described for Alternative B between Wall and where the Wall Segment would join the existing rail line in Sec. 30, T1N, R14E, north of Boxelder Creek. This segment would avoid the operational problems caused by the sharp uphill turn north of Wall.

Alternative D would follow the Boxelder Creek drainage west to Rapid City. It would pass through the towns and communities of Owanka, New Underwood, and Box Elder. Along this section of rail line, it would cross Box Elder Creek several times. Alternative D would enter Rapid City from the northeast. It would pass through residential areas and into the downtown, central business district.

Rapid City South Segment

At the crossing of Rapid Creek, the 63.2 mile Rapid City South segment of Alternative D would switch off the mainline onto a secondary rail line that extends south from town. This secondary rail line would extend southeast through a commercial and light industrial section of Rapid City. It would pass through a small rail yard operated by DM&E and turn south.

Alternative D would extend south, generally between 2 and 3 miles east of State Route 79. Although extending south, Alternative D would wind east and west using the gentler slopes of drainageways whenever possible. It would pass through the towns of Hermosa, Fairburn, Buffalo Ga,p and Oral. It would cross numerous drainages including the Cheyenne River, Dry Creek, Spring Creek, Battle Creek, French Creek, Lame Johnny Creek, Beaver Creek, and Sand Creek.

Smithwick Segment

This 13.1-mile segment of Alternative D would follow the Smithwick Segment described for Alternative B.

Tepee Creek South Segment

This 3.7-mile segment of Alternative D would follow the Tepee Creek South Segment described for Alternative C.

Heppner Segment

This 3.1-mile segment of Alternative D would follow the Heppner Segment described for Alternative B.

Hat Creek North Segment

This 7.3-mile segment of Alternative D would follow the Hat Creek North Segment described for Alternative C.

Edgemont Segment

This 3.8-mile segment of Alternative D would follow the Edgemont Segment described for Alternative B.

Edgemont North Segment

This 6.9-mile segment of Alternative D would follow the Edgemont North Segment described for Alternative C.

BNSF Segment

This 8.0-mile segment of Alternative D would follow the BNSF Segment described for Alternative B.

Newcastle Segment

The 116.2-mile segment of Alternative D would continue to parallel the BNSF rail line after Alternatives B and C curve away from and cross over it. It would parallel the east side of the BNSF rail line north through Dewey and into Wyoming. This alignment generally follows the Stockade Beaver Creek drainage and numerous crossings of this creek would likely be required.

Alternative D would parallel the BNSF rail line through the west side of Newcastle, Wyoming. Alternative D would parallel the east side of the BNSF rail line northwest from Newcastle, where the BNSF rail line currently parallels the east side of U.S. Highway 16. Southeast of Osage, Wyoming, Alternative D would be required to pass between the existing BNSF rail line and an electrical generation plant. This plant currently has a rail siding. Alternative D would need to be configured so as not to interfere with current rail service at this facility.

Northwest of Osage, Alternative D would cross several tracts of the TBNG. While it would still be parallel to the BNSF rail line, new right-of-way, including lands part of the TBNG would have to be acquired. Alternative D would pass through Upton and Moorcroft, Wyoming. Northwest of Moorcroft, Alternative D would be located between I-90 and the BNSF rail line. At the boundary between Sections 26 and 27, T50N, R70W, Campbell County, Wyoming, Alternative D would bridge over the BNSF rail line and U.S. Highway 14/16 and continue northwest, paralleling the south side of the BNSF rail line.

After crossing Donkey Creek in Campbell County, Wyoming (Sec. 29, T50N, R70W), Alternative D would turn south, paralleling the existing BNSF rail line the that extends south along Donkey Creek to access the southern coal mines.

North Arm Segment

This 45.0-mile segment of Alternative D would follow the North Arm Segment described for Alternative C.

South Arm and South Arm Spur Segment

These 22.2 and 2.3 mile segments of Alternative D would follow the South Arm and South Arm Spur alignments described for Alternative C.

2.2.3 NON-CONSTRUCTION ALTERNATIVES

During scoping, the public suggested that SEA evaluate alternative energy sources, such as nuclear, hydroelectric and wind, in the Draft EIS as alternatives to burning coal to generate electricity. SEA determined that these alternatives, while offering legitimate means of generating energy, would not advance the Applicant's goals of efficiently transporting coal and upgrading its current rail system. Therefore, these alternatives are not evaluated in the Draft EIS.

2.2.4 MANKATO, MINNESOTA NEW CONSTRUCTION

DM&E identified the need to construct a new rail line to bypass the section of rail line owned and operated by UP overwhich DM&E operates via trackage rights, as discussed in Section 2.1.2. In its Application, DM&E identified three bypass options (Figure 2-3). However, one option, Alternative M-4 (Northern Route) was subsequently determined to be infeasible, as explained earlier in this Chapter. The following text describes the remaining alternatives to bypass the UP rail line at Mankato that SEA analyzed in this Draft EIS.

Prior to submitting its Application to the Board, DM&E considered several options for providing a connection between two Sections of its existing rail line. As explained in greater detail in Chapter 3, Section 3.3.1, DM&E's rail line contains a gap of approximately 5.5 miles through Mankato (Figure 2-2). The DM&E rail line ends east of Mankato and begins again at LeHillier on the west side of Mankato. The UP rail line bridges the gap in the DM&E rail line through Mankato. In order to transport shipments through Mankato, DM&E currently relies on a trackage right agreement with UP. Eventually, two configurations, Alternative M-2 and M-3, were identified as feasible and supportive of DM&E's project goals. SEA analyzed these options along with the No-Build Alternative in this Draft EIS.

2.2.4.1 No-Action, M-1

The No-Action Alternative, M-1, would result in continuation of DM&E operating over the existing UP rail line through Mankato under a trackage rights agreement. It would not include construction of a bypass. UP, as the owner of the track, would be responsible for granting DM&E permission to operate over its segment of rail line through the town. The operational conflicts between the two railroads on this segment of rail line would continue to occur. If the Board gives final approval to DM&E's Application to construct a rail line into the PRB following completion of environmental review, the resultant increase of DM&E rail traffic would likely aggravate these conflicts, resulting in delays for both east and west bound trains requiring passage through Mankato. These delays would affect DM&E's ability to meet shippers schedules for delivery of goods, both coal and other materials. Additionally, delays at Mankato would result in system-wide delays of trains. Such delays and other operational conflicts could render DM&E non-competitive with other rail carriers, preventing DM&E from attracting coal shippers, and cause the entire project to become unviable due to insufficient revenues from coal transporation to finance the project.

2.2.4.2 Southern Route - Alternative M-2

As shown in Figure 2-17, "Mankato Alternative Routes", the southern Mankato route, Alternative M-2, would extend from DM&E's existing rail line approximately 1.25 miles east of Eagle Lake on the east side of Sec. 17, T108N, R25W in Blue Earth County. It would curve to the south and cross U.S. Highway 14/State Route 60. Alternative M-2 would extend across the northwest corner of Sec. 20 and parallel a pipeline right-of-way southwest, passing approximately 200 feet north of the Le Sueur River. It would continue southwest, crossing State Route 22 in the northern portion of Sec. 33, T108N, R26W. Alternative M-2 would turn west through the middle of Sections 32 and 31. It would curve south in Sec. 36, T108N, R27W and parallel the south side the U.S. Highway 14 south bypass of Mankato. Alternative M-2 would parallel the highway north along State Route 66. Alternative M-2 would cross U.S. Highway 14 Bypass and

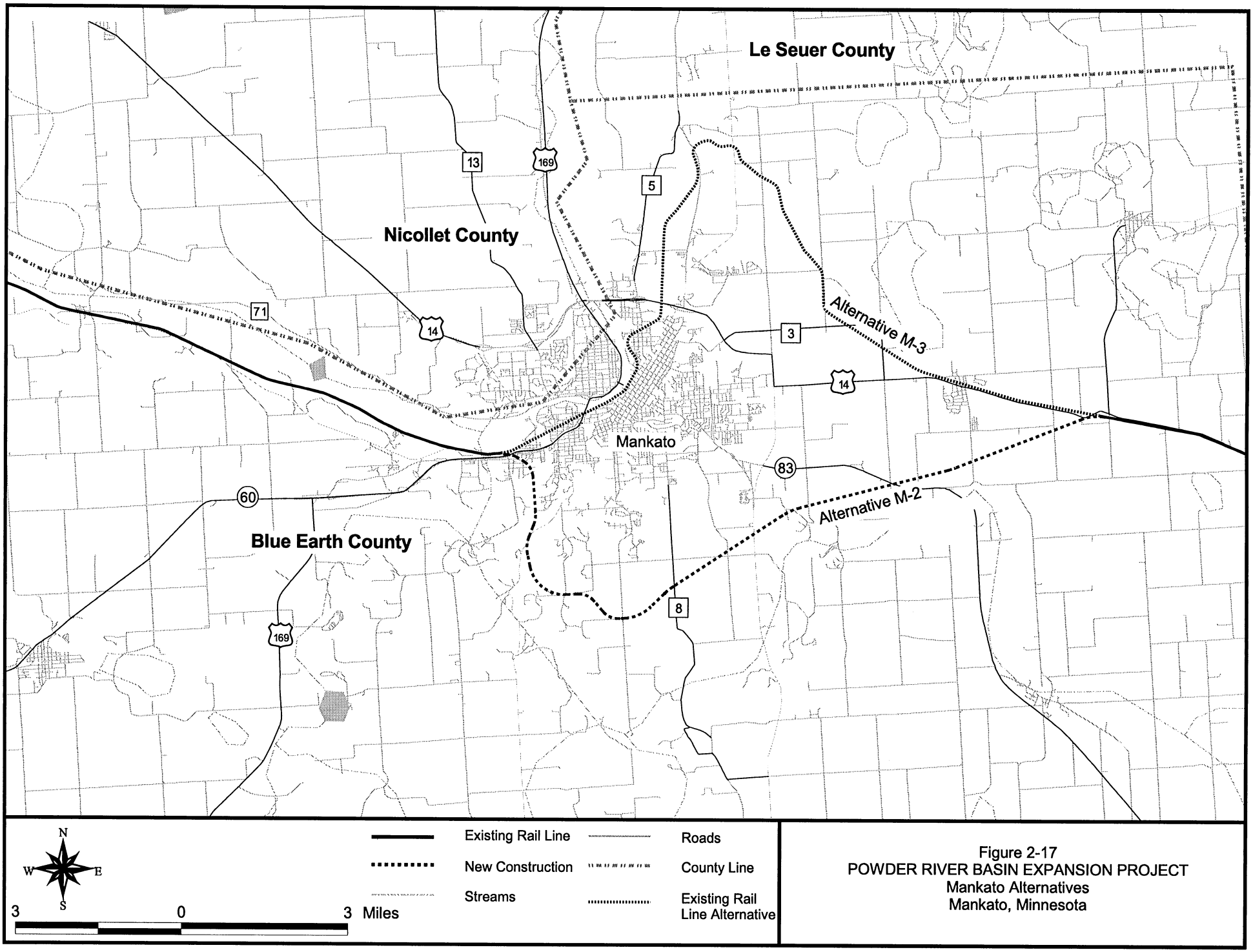


Figure 2-17
POWDER RIVER BASIN EXPANSION PROJECT
Mankato Alternatives
Mankato, Minnesota

the Blue Earth River, passing over the highway bridge at the river crossing. It would extend north, along the west slope of the river, approximately half-way up the slope, above several homes and County Road 33 at the base of the slope. This alternative would continue north across a draw west of the river and through a small residential area in western LeHillier. It would follow the east slope of the draw, turning slightly westward. Alternative M-2 would pass under the frontage road and State Route 60, and the existing UP rail line north of State Route 60. Alternative M-2 would join with the existing DM&E rail line approximately 0.6 mile west of where the existing DM&E and UP rail lines merge.

2.2.4.3 Existing Corridor Route - Alternative M-3

This alternative (Figure 2-17) would bypass the UP rail line through Mankato by using the existing DM&E rail line until it merges with the UP rail line, and then DM&E would construct a new rail line within the existing UP rail corridor.

Alternative M-3 would diverge from the existing DM&E rail line in Sec. 17, T108N, R25W, in Blue Earth County and would include rebuilding the existing rail line westward, through the town of Eagle Lake. The existing rail line would be rebuilt westward to where it currently joins the UP rail line northeast of Benning, just outside the northern corporate boundary of Mankato. Alternative M-3 would involve construction of a new rail line that would run parallel to the UP rail line. Alternative M-3 would extend south and pass along the east side of the UP rail yard. South of the rail yard, it would cross under U.S. Highway 14 Bypass and continue to parallel the UP rail line to Pine Street. Just east of Pine Street, Alternative M-3 would curve slightly away from the UP rail line and generally continue parallel to the inside of a curve in the UP rail line. Alternative M-3 would pass through a quarry and under the UP rail line. Alternative M-3 would continue westward between several commercial and industrial buildings, along the alignment of several rail siding tracks. It would extend along the Minnesota River, between the river and the industrial buildings north of Front Street, parallel to the north side of an existing UP siding. It would pass under U.S. Highway 14 and along the Minnesota River between the floodwall and the UP rail lines. Alternative M-3 would continue to parallel the north side of the UP rail line westward through Mankato and LeHillier. It would connect to the existing DM&E rail line where it currently merges with the UP rail line.

Alternative M-3 would require rebuilding approximately 0.5 mile of existing DM&E track westward from the point where the existing DM&E rail line joins with the UP rail line. Alternative M-3 would require the construction of a bridge across the Blue Earth River and reconstruction of several existing grade separated road crossings sufficient to accommodate two rail lines.

2.2.5 OWATONNA, MINNESOTA NEW CONSTRUCTION

DM&E identified the need for a new rail line to connect the existing DM&E rail line to the I&M Rail Link system in the Owatonna area, as discussed in Section 2.1.3. In its Application, DM&E identified a potential option, Alternative O-3. Subsequently, DM&E identified two additional Alternative Actions, Alternatives O-4 and O-5. In this Draft EIS, SEA analyzed these alternatives and compared them to the No-Build Alternatives, Alternative O-1 and O-2.

In addition, during the scoping process, the community of Owatonna asked SEA to consider a bypass around the community that it had developed. The Owatonna Bypass is described below in Section 2.2.6.1.2.

2.2.5.1 No Action-Project Denial, Alternative O-1

Alternative O-1, the No-Action Alternative, would result from the Board denying DM&E the authority to construct and operate a rail line extension into the PRB. Therefore, DM&E would not reconstruct its existing rail line through Owatonna, nor would it construct a new connecting track between DM&E and I&M Rail Link. No permits would be issued for the necessary construction. DM&E and I&M would remain unable to interchange traffic at Owatonna, despite the close proximity of their existing rail lines. Both railroads would only be able to interchange traffic at Winona, through trackage rights over Canadian Pacific Railway Company (CP). This alternative provides a less efficient routing of rail traffic to various markets in central Minnesota, Iowa and Missouri because goods must be transporated east to Winona, Minnesota, then south and back west to reach their destinations. An interchange at Owatonna would eliminate this backtracking and unnecessary mileage. The O-1 Alternative would not provide either DM&E or I&M the opportunity to attract additional rail traffic with a more efficient rail system.

2.2.5.2 No-Action - Rail Line Reconstruction Only, Alternative O-2

Alternative O-2 would involve the Board granting DM&E authority to construct and operate a rail line extension into the PRB. However, under this alternative, the Board would deny DM&E the authority to construct a connecting track to the I&M. The existing rail line would be reconstructed, without an option for the two railroads to interchange rail traffic, at Owatonna. DM&E and I&M would only be able to interchange traffic at Winona, Minnesota, through trackage rights over Canadian Pacific Railway Company (CP). This routing provides a less efficient routing of traffic to various markets in central Minnesota, Iowa, and Missouri because goods must be transporated east to Winona, then south and back west to reach their destinations. An interchange at Owatonna would eliminate this backtracking and unnecessary mileage. The O-

2 Alternative would not provide either DM&E or I&M the opportunity to attract additional rail traffic with a more efficient rail system.

2.2.5.3 Proposed Action, Alternative O-3

Alternative O-3, the Proposed Action (Figure 2-18), would include construction and operation of an approximately 2.94-mile connecting track to interchange rail traffic between DM&E and I&M. This rail connection would provide an efficient north-south connection with access to Chicago, the Twin Cities, and various Mississippi River ports.

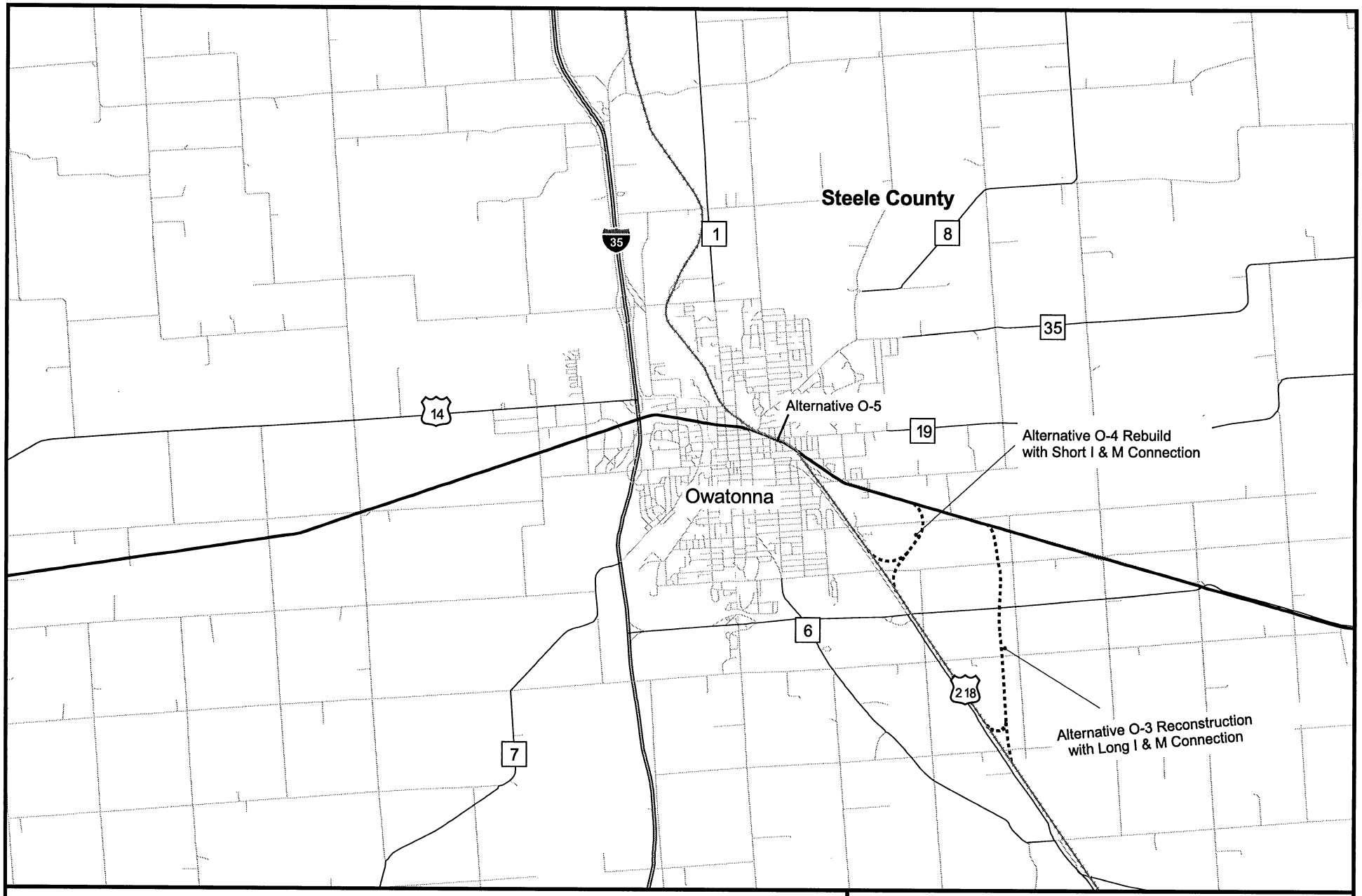
Alternative O-3 would curve south approximately 2.0 miles east of Owatonna, Minnesota, in the southeast corner of Sec. 13, T107, R20W (Steele County). The rail line would proceed south, parallel to the west side of County Ditch No.1. It would cross U.S. Highway 14 Bypass then continue south into Sec. 25, T107N, R20W. In Sec. 25, it would curve westward to join with the existing I&M rail line the center of Sec. 25, T107N, R20W. The connection would form a "Y" to allow rail traffic to move northbound through Owatonna or southbound on the I&M rail line.

2.2.5.4 Alternative Action, Alternative O-4

Alternative O-4 would also provide a connection to the I&M rail line by an approximately 1.25-miles of new rail line construction. Alternative O-4 would begin approximately 1.0 mile southeast of Owatonna, Minnesota, in the northeast corner of Sec.14, T107N, R20W. The alternative would extend southeast from the existing DM&E rail line, into Sec. 13. Alternative O-4 would continue to curve to the southwest and back into Sec. 14. The alternative would split to form a "Y" in the southwest corner of Sec. 14 and the southern spur would curve south into the northeast corner of Sec.23, T107N, R20W. Each spur would connect to the I&M rail line, creating northbound and southbound connections.

2.2.5.5 Alternative Action, Alternative O-5

Alternative O-5 would include restoration of an existing connection between the current UP rail line (overwhich DM&E currently operates through Owatonna) and the I&M (Figure 2-18 and 2-19). This connection is located within the community of Owatonna. Although it is an existing connection, use of the connection is not currently feasible due to both the condition of the



N
W E
S

2 0 2 Miles

Existing Rail Line
New Construction
Roads
I&M Rail Link

Figure 2-18
POWDER RIVER BASIN EXPANSION PROJECT
Owatonna Alternatives
Owatonna, Minnesota

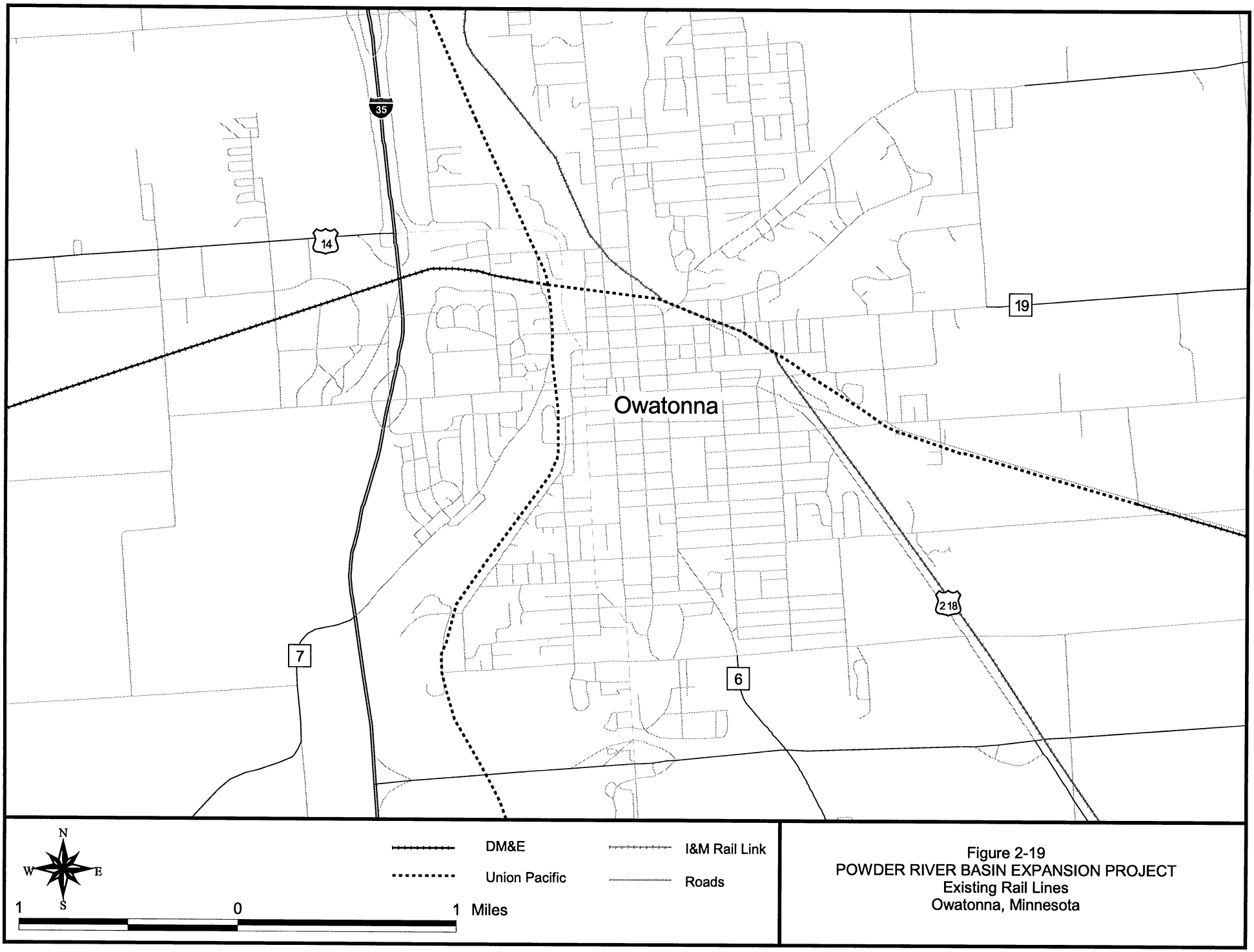


Figure 2-19
POWDER RIVER BASIN EXPANSION PROJECT
Existing Rail Lines
Owatonna, Minnesota

track and the trackage rights agreement that DM&E has with UP.[17] Alternative O-5 would include reconstruction of the existing UP rail line and the existing connection between the two rail lines.

2.2.6 BYPASS ALTERNATIVES

During the scoping process, the community of Rochester, Minnesota submitted a proposal for a rail line bypass around the city. The Board indicated in its March 10, 1999 Notice of Availability of the Final Scope of Study that preliminarily determined that the proposed bypass may be a feasible alternative to reconstructing the existing DM&E rail line through Rochester and provided the opportunity for public comments on the proposal. Due to request from other communities, on April 20, 1999, in a Notice to the Parties, the Board provided the opportunity for other communities to submit proposals for rail lines bypass. The Board indicated that any proposals would be evaluated to determine if they were feasible, would merely shift impacts from one community to others, and would facilitate DM&E's goal to create an efficient route to transport coal. Additional bypass proposals were submitted by Owatonna, Minnesota, Brookings and Pierre/Fort Pierre, South Dakota. A description of each proposed bypass and the results of SEA's evaluation is provided in this section.

2.2.6.1 Description of Bypass Proposals

Bypass proposals were submitted by Rochester and Owatonna, Minnesota and by Brookings and Pierre, South Dakota. The following text provides a detailed description of each of these bypass proposals.

2.2.6.1.1 Bypass Construction - Rochester, Minnesota

The Rochester bypass (Figure 2-20) would be approximately 34.1 miles in length. From its western end at the existing DM&E rail line in Dodge County, Minnesota approximately 0.8 miles west of the Olmsted County line, the bypass route would curve south, entering Olmsted County approximately 250 feet south of the existing rail line. It would cross U.S. Highway 14 in the center of Sec. 31 T107N, R15W and Cascade Creek in the south-center of the section. The bypass would continue south, paralleling an existing high voltage electrical line, through the center of Sec. 31, T107N, R15W and Sections 6, 7, 18, 19, 30 and 31, T106, R15W, and

[17] The trackage rights agreement between DM&E and UP allows DM&E unlimited access to this portion of rail line. However, it prohibits DM&E from interchanging rail traffic along this portion of rail line, including via the existing connection.

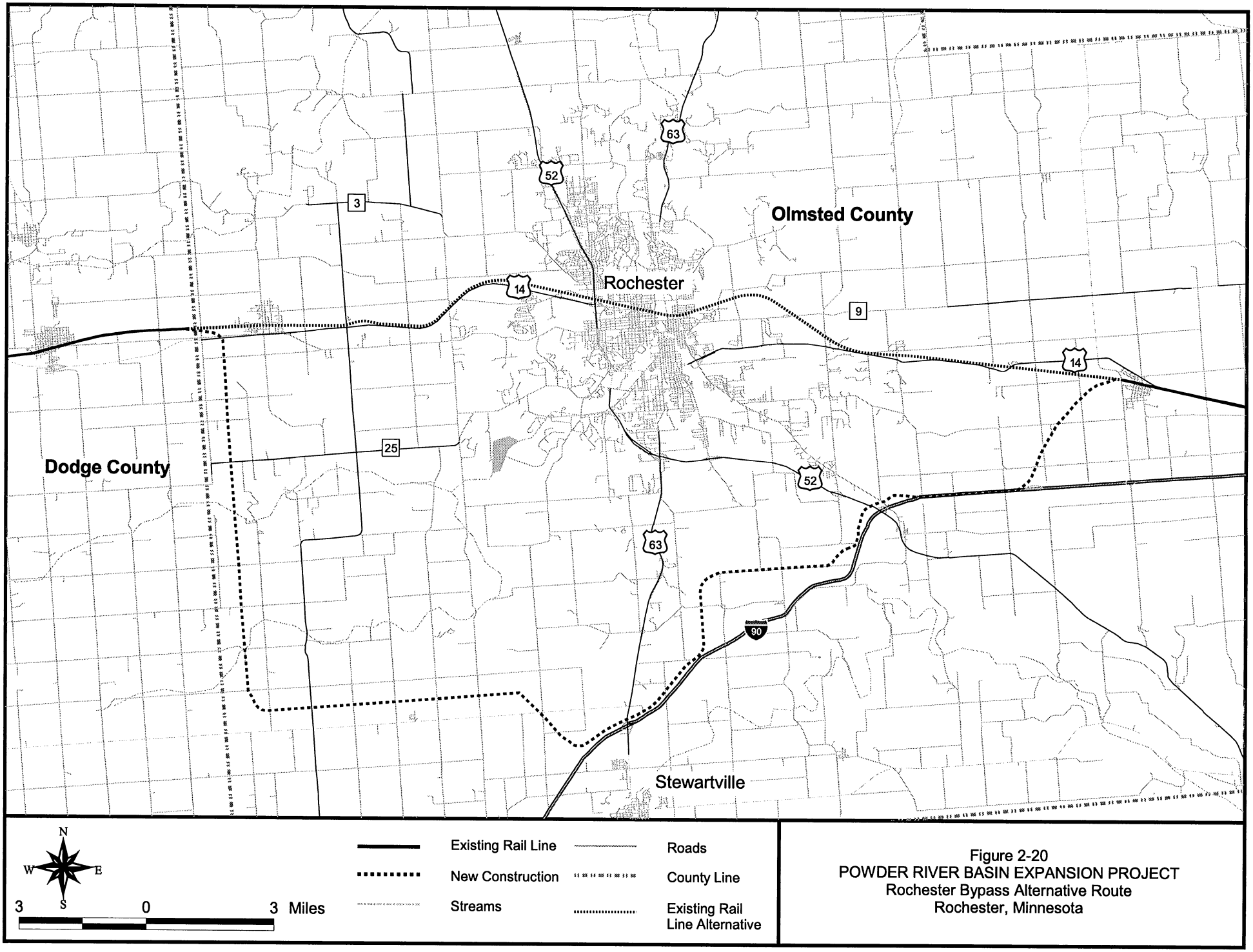


Figure 2-20
POWDER RIVER BASIN EXPANSION PROJECT
Rochester Bypass Alternative Route
Rochester, Minnesota

Sections 6 and 7, T105, R15W. It would cross Salem Creek in Sec. 19, and the South Fork of the Zumbro River in Sec. 6.

The bypass would continue due south into Sec. 18, however, the high voltage line turns southwesterly upon entering Sec. 6. The bypass would turn eastward across the northeast corner of Sec. 18, crossing through the middle of Sec. 17. It would continue east through the centers of Sections 16, 15, 14, 13, T105N, R15W, and Sec. 18, T105N, R14W. It would cross (from east to west) 110th Avenue SW, County Road 3, 90th Avenue SW, 80 Avenue SW, County Road 15, and 60 Avenue SW. The bypass would generally be located approximately 0.5 mile north of State Highway 30 to accommodate potential expansion of this roadway. In Sec. 18, however, the bypass would turn southeast, crossing County Road 8 and the southwest corner of Sec. 17. It would cross State Highway 30, and curve back to the east. It would cross 31st Avenue SW and turn north, crossing State Highway 30 approximately 0.3 mile west of its intersection with U.S. Highway 63. This dip to the south would be southwest of the Rochester Municipal Airport to allow for planned runway expansion. The bypass would turn east and cross U.S. 63 approximately 0.25 mile north of its intersection with State Route 30. It would continue east across Sec. 14, T105N, R14, to I-90.

The Rochester bypass would turn northeast and parallel I-90 for approximately 1.0 mile into the center of Sec. 12. It would turn north through the center of Sec. 12, crossing County Road 16/20, and continue north into the center of Sec. 1, T106, R14W. In Sec. 1, the bypass would curve west across the northeast corner of Sec. 1, extending east along the northern boundaries of Sections 6, 5, and 4, T105N, R13W. Approximately 0.5 mile across the northern portion of Sec. 4, the bypass would turn north, pass under a high voltage electrical line, and cross 56 Street-SE at grade. It would continue north, paralleling an unnamed intermittent tributary of Badger Run. The bypass would curve east, crossing U.S. Highway 52, Badger Run Creek, and both State Route 36 and County Road 123 just north of where they intersect.

The bypass would continue east, paralleling the northside of I-90 for approximately 2.5 miles. Approximately 0.3 mile west of the rest area along I-90 in Sec. 29, T106N, R12W, the bypass would curve northeast, away from I-90. It would cross the southeast corner of Sec. 20, northwest corner of Sec. 21. The bypass would extend into Sec. 16, curving from the south center of the section to the northeast corner. It would cross 110 Avenue-SE, approximately 0.5 mile south of its existing highway/rail grade crossing with the existing DM&E rail line. The bypass would continue northeast across Sec. 15, across the 20 Street SE, joining with the existing DM&E rail line in the northeast corner of the section, approximately 2,000 feet west of Eyota, Minnesota.

2.2.6.1.2 Bypass Construction - Owatonna, Minnesota

The Owatonna bypass (Figure 2-21) would include approximately 13 miles of new rail line. At its eastern end, approximately 1.4 miles southeast of Havana, Minnesota, in the center of Sec. 21, T107N, R19W, the bypass would leave the existing DM&E rail line and extend westward. It would follow the center lines of Sections 20 and 19 to a point in the center of Sec. 24, T107N, R20W. It would turn southwest for 1.7 miles and make a grade separated crossing (bridge) of the I&M rail line and Highway 218 between Sections 24 and 23. The alignment would pass through the southeast corner of Sec. 23, crossing both Austin Road and SE 14th Avenue at grade in the northwest corner of Sec. 26. It would turn westward in the northeast corner of Sec. 27 and run westerly, south of and parallel to County Road 18 for approximately 3.5 miles. The bypass route would include a grade separated crossing of County Road 45, an existing UP rail line, 22nd Avenue and Interstate Highway 35. The bypass route would cross the Straight River in the north central portion of Sec. 29, approximately 0.25 mile north of Somerset State Wildlife Area. It would turn north and cross County Roads 7 and 18 at grade near their intersection. The bypass route would extend north through the center of Sec. 19, T107N, R20W, and into Sec. 18. In the center of Sec. 18, it would curve to the northwest and cross 8th Street at grade. It would continue northwest across the southwest corner of Sec. 7, T107N, R20W, and into Sec. 12, T107N, R21W, connecting to the existing DM&E rail line in the southeast corner of this section.

2.2.6.1.3 Bypass Construction - Brookings, South Dakota

The total length of the Brookings bypass (Figure 2-22) would be approximately 15.2 miles. From its western end, the proposed bypass route would branch from the existing DM&E rail line 1.5 miles west of the town of Volga, South Dakota and 0.4 mile northwest of the point where the existing track crosses U.S. Highway 14 in the southwest corner of Sec.16, T110N, R51W. The bypass would extend northeast across Sec. 15, crossing County Road 5 at grade between Sections 15 and 14, approximately 0.5 mile north of U.S. Highway 14. The bypass would continue east through the center of Sections 14, 13 and 12, T110N, R51W, Sections 18, 17, 16, 15, 14, and 13, T110N, R50W, and Sec. 18, T110N, R50W. The bypass would cross Sections 14 and 13 and County Road 7 at grade between Sec. 13, T110N, R51W, and Sec. 18, T110N, R50W. The bypass would cross the Big Sioux River on the east side of Sec. 13, T110N, R51W. In the eastern half of Sec. 18 the bypass would connect and cross an existing DM&E rail spur which serves a cement plant to the northwest of Brookings. The bypass would form a "Y" in the track to allow access to and from the plant as well as to permit the flow of east-west traffic. The bypass would cross North Deer Creek in the center of Sec. 17, T110, R50W. It would cross section roads between Sections 18 and 17, 17 and 16, 16 and 15, 15 and 14, and County Road 77

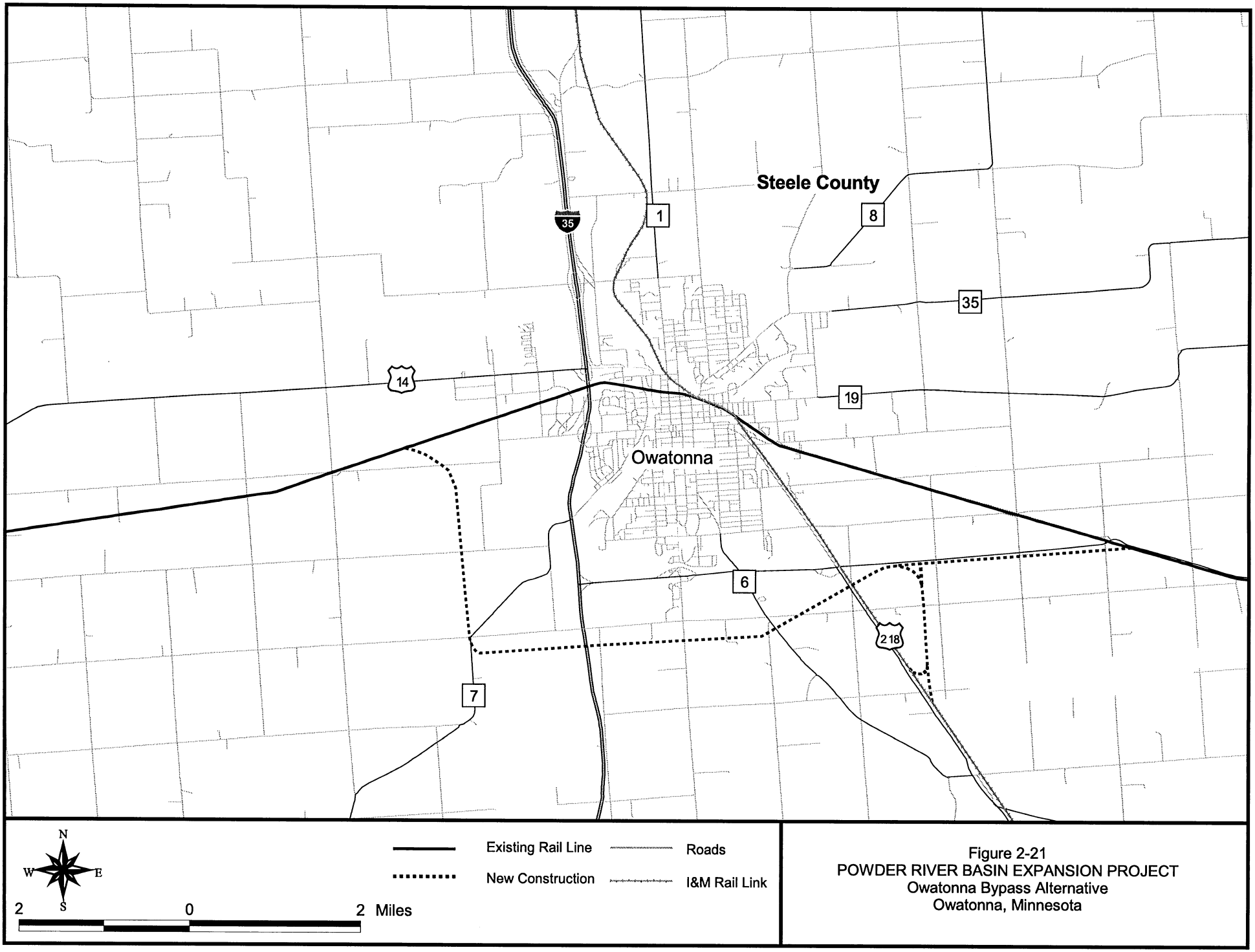


Figure 2-21
POWDER RIVER BASIN EXPANSION PROJECT
Owatonna Bypass Alternative
Owatonna, Minnesota

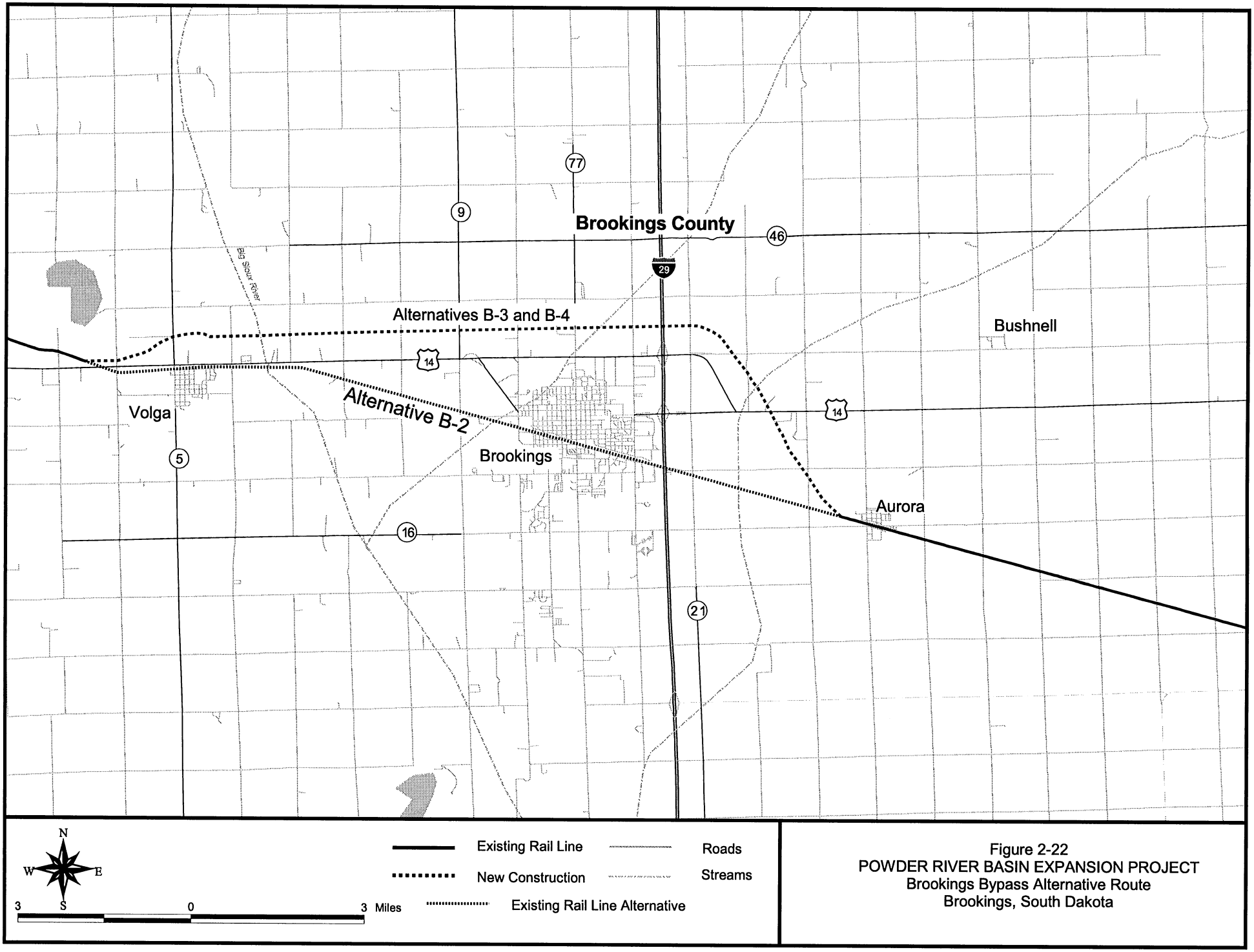


Figure 2-22
POWDER RIVER BASIN EXPANSION PROJECT
Brookings Bypass Alternative Route
Brookings, South Dakota

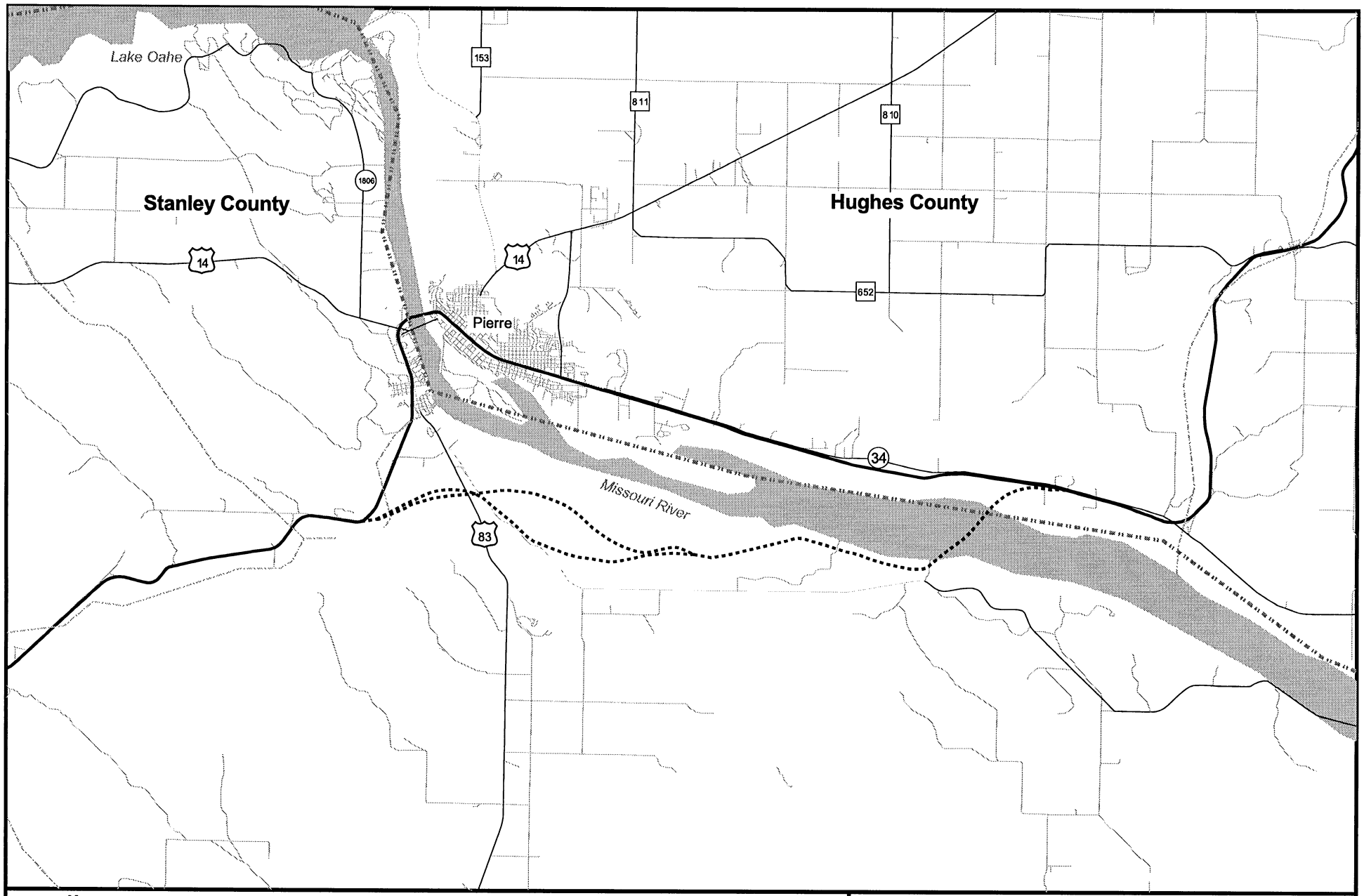
between Sections 14 and 13, approximately 1.5 miles north of the town of Brookings, SD. All these crossings would be at grade. The bypass would cross Six Mile Creek in the western half of Sec.13.

The Brookings bypass would make a grade separated crossing of Interstate Highway 29 (I-29) in the center of Sec. 18, T110N, R49W. After crossing I-29, the bypass would extend through the center of Sec. 18 and into Sec. 17, crossing the section road between the two Sections. In Sec. 17, the bypass would curve southeasterly through the southeast corner of the section. It would cross Deer Creek and U.S. Highway 14 at the highway bridge over the creek. The bypass would continue southeast across Sec. 28, leaving the southeast corner of the section. It would cross the northeast tip of Sec. 33, and the section roads between Sections 28 and 33 and 33 and 34. The bypass would curve more easterly, joining with the existing DM&E rail line in the southern half of Sec. 34, approximately 0.5 mile west of Aurora, South Dakota.

2.2.6.1.4 Bypass Construction - Pierre/Fort Pierre, South Dakota

The Pierre/Fort Pierre bypass (Figure 2-23) would consist of 14.6-miles of new rail line. The proposed bypass would extend from the existing DM&E rail line in the southwest corner of Sec. 17 T110N, R77W, approximately 10.4 miles east of Pierre in Hughes County, South Dakota. The bypass would curve to the south in Sec. 18 and cross Lake Sharpe approximately 1,000 feet east (downstream) of Antelope Island. The bridge span over the lake would be approximately 1.25 miles long. After crossing the lake, the bypass would enter Stanley County. The bypass would cross the northwest tip of Sec. 16, T4N, R33E, east of the Antelope Creek Recreation Area. The bypass would extend in to Sec. 17, crossing the access road to the recreation area, Antelope Creek Road (County Highway 1806) (grade separated) and Sand and Antelope Creeks in the center of the section. It would turn northwest, crossing Sec. 18 slightly north of the center of the section.

The Pierre/Fort Pierre bypass would extend across the north portion of Sections 13 and 14, T4N, R32E. It would curve south in to the center of Sec. 15. On the west side of Sec. 15, the communities proposed two potential alignment options. One option would continue generally west across sections 16, 17, and 18, then turn northwest following an unnamed tributary of the Bad River through Sec. 12, T4N, R31E, curving west into Sec. 11 and cross U.S. Highway 83 with a grade separation. The other potential alignment would curve northward, pass through the north portion of Sec. 16, the northeast corner of Sec. 17, and follow an intermittent, unnamed tributary of the Missouri River through the southwest corner of Sec. 8 and into Sec. 7. In Sec. 7, the alignment would curve west across the northern portion of Sec. 12, T4N, R31E, into Sec. 11, across U.S. Highway 83 with a grade separation.



N
W E
S

3 0 3 Miles

Existing Rail Line
New Construction
Streams
Roads
County Line

Figure 2-23
POWDER RIVER BASIN EXPANSION PROJECT
Pierre/Fort Pierre Bypass Alternative Routes
Pierre, South Dakota

After crossing the highway, both alignment options would follow generally the same path southwest through Sec. 10. They would cross the Bad River in the southwest corner of Sec. 10 then turn west to join with the existing DM&E rail line in Sec. 9, approximately 300 feet north of the river.

2.2.6.2 Evaluation of Bypasses

SEA carefully evaluated all the information regarding the four bypass proposals. SEA first determined whether, from an engineering and environmental standpoint, the proposals were reasonable and feasible alternatives to DM&E's proposal to reconstruct and operate its existing rail line. If determined to be reasonable and feasible, SEA then determined whether the proposal would reduce the environmental impact of DM&E's proposal, or simply shift the impacts to other locations. Those proposals determined to reduce environmental impacts were then evaluated taking into account DM&E's project goal of creating an efficient route for PRB coal. Those bypass proposals determined to meet these criteria were retained for evaluation in the Draft EIS. The results of SEA's analysis and evaluation of each bypass is discussed below.

Rochester Bypass

SEA evaluated the Rochester Bypass and determined it should be retained for analysis in the Draft EIS. Although the bypass would be approximately 10.8 miles longer than DM&E's existing rail line, SEA determined it would have substantial environmental impacts. Additionally, SEA determined that no engineering or environmental issues would make the bypass unreasonable or infeasible. SEA recognized that both the construction and operation of the bypass and reconstruction and increased operation of the existing rail line through Rochester would result in substantial environmental impacts. However, these impacts would generally differ in nature. Reconstruction and operation of the existing rail line would primarily impact noise levels, traffic flow, and safety, including emergency access, in Rochester. Construction of the bypass would primarily impact natural resources, such as land use, wetlands, and wildlife. SEA therefore determined that the proposal would not simply shift one type and level of environmental impact from one area to another. Rather, it would result in new and different environmental impacts that warranted evaluation and comparison to the impacts associated with the reconstruction and increased operation of the existing rail line.

The Draft EIS evaluated several alternatives associated with the proposed Rochester Bypass. These alternatives include:

- Alternative R-1, No-Action. This alternative would involve denial of final authority for DM&E to construct and operate the entire project.

- Alternative R-2, Existing Rail Line. This alternative would involve the reconstruction and operation of the existing DM&E rail line through Rochester. All existing rail traffic and any future coal traffic would operate along the existing reconstructed rail line.

- Alternative R-3, Bypass for Future Coal Traffic. This alternative would involve DM&E constructing a bypass around the community of Rochester for transport of unit coal trains. Existing rail traffic would continue to operate along the existing rail line, which would not be reconstructed.

- Alternative R-4, Bypass for all Rail Traffic. This alternative would be the same as Alternative R-3, except that existing rail traffic would operate over the bypass in addition to any future coal trains.

Owatonna Bypass

SEA accepted the submittal, dated June 10, 1999, of a proposed bypass from the City of Owatonna. However, in a letter submitted to the Board dated March 13, 2000, the City indicated it had reached a mitigation agreement with DM&E that addressed many of the community's concerns. As a result, the City of Owatonna indicated it was withdrawing its bypass proposal from consideration. Therefore, SEA has not included an analysis of the Owatonna bypass in this Draft EIS.

Brookings, Bypass

The bypass proposed by the community of Brookings would be approximately 1.8 miles longer than operating over the existing reconstructed rail line. The bypass would primarily impact agricultural land use, wildlife, vegetation, wetlands and rail service to one local shipper. SEA's evaluation concluded that none of these impacts would cause this bypass to be unreasonable or infeasible. SEA also concluded that the Brookings bypass would not shift similar impacts to a new area. Rather, like Rochester, it would result in new and different impacts along the bypass alignment than currently or would exist along the existing rail line. As a result, the Brookings bypass has been evaluated in this Draft EIS.

The Draft EIS evaluated several alternatives associated with the proposed Brookings bypass. These alternatives include:

- Alternative B-1, No-Action. This alternative would involve denial of final authority for DM&E to construct and operate the entire project.

- Alternative B-2, Existing Rail Line. This alternative would involve DM&E reconstructing and operating its existing rail line. All existing DM&E rail traffic and any future coal traffic would use the existing rail line.

- Alternative B-3, Bypass for Future Coal Traffic. This alternative would involve DM&E constructing a bypass around the community of Brookings for transport of unit coal trains. Existing rail traffic would continue to operate along the existing rail line, which would not be reconstructed.

- Alternative B-4, Bypass for all Rail Traffic. This alternative would be the same as Alternative B-3, except that existing rail traffic would operate over the bypass in addition to any future coal trains.

Pierre/Fort Pierre Bypass

SEA evaluated the proposed bypass around the communities of Pierre and Fort Pierre, South Dakota and determined it to be unreasonable. The alternatives proposed for the bypass would have significant environmental and engineering constraints. The topography along the bypass route would require extensive cuts and fills to establish a safe and suitable grade for operation of unit coal trains. The bypass would also require construction of a new bridge, at a new location, over the Missouri River/Lake Sharpe. The bridge would be required to cross approximately 1.0 mile of the lake and would be approximately 1.5 miles long or longer, including the approaches. A new bridge would create an additional navigational hazard to watercraft. The bypass would likely have severe impacts on a substantial amount of significant cultural resources. These impacts were determined to be unreasonable, and the Pierre/Fort Pierre bypass was removed from further consideration.

2.2.7 RAIL YARDS

DM&E indicated in its Application to the Board that construction and operation of the proposed project would also require construction of several new rail yards and improvements to some existing rail yards. These yards would be designed to serve multiple purposes, such as crew change locations, inspections, maintenance, fueling, and staging and marshalling for both existing trains and future unit coal trains. While some flexibility would exist, rail yards would generally be

spaced to provide for crew changes,[18] mandatory 1,000-mile inspections, and fueling.[19] One rail yard, the middle or central yard, would also be the location of the primary maintenance, repair, inspection, and fueling facilities.

DM&E determined in its operating plan that rail yards needed to be located based on transit times of approximately 7 hours between yards in order to enable the rail yards to serve the numerous functions DM&E desires for each individual rail yard. Therefore, rail yards would need to be placed approximately 225 to 275 miles apart, as discussed in Chapter 1. DM&E then examined its system, the proposed Extension Alternatives, and its operating plan to determine the optimum location for each rail yard considering the desired functions and transit times. DM&E reviewed each potential site to determine if it would provide a feasible and suitable location for rail yard placement. In conducting this review, DM&E considered:

- the rail yard's location relative to communities and towns,
- land use, wetlands, road crossing, stream crossing, and other environmental considerations,
- location of existing rail yards, and
- topography with a wide, level area being preferred due to less earthwork being necessary to provide a suitable grade for a rail yard.

Based on its site review of preliminary rail yard locations, DM&E adjusted the proposed locations of rail yards, as necessary, to avoid environmental impacts and take advantage of existing yards and suitable topography. However, adjusting a rail yard made it closer to the next rail yard in one direction and further from the next rail yard in the opposite direction. Relocating

[18] The maximum time for a train crew to be on duty is 12 hours. DM&E has indicated its proposed yard layout would provide for train crews to operate on 8-hour shifts. Yard spacing would be such that a train crew would normally leave a yard, pass throught the next yard, and arrive at the following yard in time to be off-duty before exceeding the 12-hour period. Activities such as inspections, unscheduled maintenance, and fueling would periodically lead to delays that would require train crews to work longer shifts. However, several hours of delay could be accomodated under this operating plan without the crews exceeding the 12-hour on-duty period.

[19] Under DM&E's proposed operating plan, locomotives would require fueling approximately every 1,000 miles. DM&E has designed a yard layout that would combine the fueling and 1,000 mile inspection in the same location. This location would be at the primary maintenance facility. Trains stopped for inspection could be fueled at the same time and any maintenance problems identified could be corrected. This facility is designed to be located at approximately the mid-point of the route such that it would be approximately 500 miles between the yard and the east or west end of the rail line, or 1,000 miles round trip from the yard. Other yard locations would be determined by the location of this central yard and the transit time and distance east and west from this yard.

one rail yard often required DM&E to relocate other rail yards in order to maintain the necessary spacing for efficient operation of its system.

Additionally, because the alternatives for extending DM&E's existing rail line into the PRB differ in length, thereby affecting transit times, the number and location of rail yards also differs depending upon the chosen Extension Alternatives. While some yard locations may be suitable for two or more of the Extension Alternatives, others only work for one alternative. Because of the functions each rail yard is required to perform under the operating scenario as dictated by the specific extension alternative, yard locations that are different for the same rail yard under the different alternatives can not be used in place of any of the rail yards for another alternative. Therefore, Extension Alternatives require a specific layout for rail yards. Because of the numerous considerations for yard locations, few alternative sites for individual rail yards are available. Alternatives were only determined by DM&E to be available for two rail yards, the Middle East Staging and Marshalling Yard under Extension Alternatives B and C, and the West Yard under Extension Alternative C. Two alternative sites were identified for each of these rail yards.

SEA evaluated the environmental impacts of rail yard construction and operation based on the location of the rail yards proposed under each extension alternative. The rail yards evaluated and their locations are provided in Table 2-5. Volume V provides detailed maps with the locations of each rail yard under each extension alternative.

2.2.8 SIDINGS

DM&E determined the locations of sidings to be highly dependent on the distance and transit times between rail yards. In order to allow DM&E to implement its proposed operating plan, sidings need to be spaced to allow trains traveling in opposite directions, at different speeds to pass safely, without having to reduce speed or stop. As discussed in Chapter 1, DM&E determined sidings would range from 3 to 7 miles in length and be spaced 12 to 25 miles apart. Differences in rail yard locations and total transit times and lengths associated with the various Extension Alternatives required some differences in where sidings could be located for each Extension Alternative.

In determining siding locations, DM&E used a process similar to that used for determining rail yard locations. Optimum siding locations and lengths were first determined and then field reviewed. As a result of field reviews, DM&E adjusted siding lengths to avoid environmental impacts such as wetlands, towns, and road crossings. While it was not possible to avoid all environmental impacts, sidings were located to minimize as many impacts as possible while still providing for efficient and safe rail operations. Adjustments in sidings in one direction or another

may also have required adjustment of sidings along the entire system. Such adjustments could include moving a siding to a new location, extending the length of a siding, or both.

Because siding construction would occur within DM&E's existing right-of-way or the right-of-way acquired for any new construction, and SEA considered all this area potentially impacted by this project, SEA did not generally consider the location of specific sidings under each extension alternative. SEA conservatively projected impacts based on the entire right-of-way for both any new rail line and the reconstructed rail line considered to be affected by construction and reconstruction activities. This accounted for any disturbance that would potentially occur as a result of any siding construction within the right-of-way. However, the presence of a siding at a road crossing would result in two tracks to be crossed by vehicles instead of one set. As the additional tracks affect the level of safety at a road crossing, SEA did consider siding locations for each extension alternative as part of its safety analysis. The locations of sidings over the entire DM&E system contemplated as part of this project for each extension alternative are included in Tables 2-6 to 2-8.

Table 2-5
Proposed Rail Yards for Alternatives B, C and D

Yard	Functions	Dimensions	Alternative Locations	
			Mile Post	Geographic Location (approximate mileage)
East	Staging yard for empty and loaded trains and marshaling yard for grain, manifest, and way freights. UP and CP interchange. Mechanical facilities for emergency repairs. Locomotive refueling. Maintenance of way equipment. Crew base for all train crews starting and finishing work between Utica and Winona.			
Alternative B		600 Ft. x 2.1 miles	19.7 - 21.8	1.0 mi west of Lewiston to 0.5 mi east of Utica
Alternative C		same as Alt. B	same as Alt. B	same as Alt. B
Far East				
Alternative D		same as Alt. B	same as Alt. B	same as Alt. B
Waseca	Marshaling yard for grain, manifest, and way freights. Base for way freights. Set out and pickup of cars. May contain mechanical equipment for emergency repairs. Locomotive refueling. Maintenance of way equipment.			
Alternative B		300 Ft. x 2.2 miles	105.3 - 107.5	0.25 mi west of Waseca to 5.0 mi east of Janesville
Alternative C		300 Ft. x 2.6 miles	104.3 - 107.0	western edge of Waseca to 5.5 mi east of Janesville
Alternative D		same as Alt. B	same as Alt. B	same as Alt. B
Middle East	Staging yard for empty and loaded trains and marshaling yard for grain, manifest, and way freights. UP interchange at Mankato. Base for way freights. Small amount of maintenance of way equipment. Potential for mechanical facilities in the future.			
Alternative B				
Option A		400 Ft. x 2.4 miles	147.0 - 149.4	4.0 mi west of Mankato to 1.0 mi east of Judson
Option B		400 Ft. x 2.3 miles	160.5 - 162.8	4.5 mi northwest of Cambria to 0.25 mi southeast of New Ulm
Alternative C				
Option A		400 Ft. x 2.5 miles	146.9 - 149.4	
Option B		same as Alt. B	same as Alt. B	4.0 mi west of Mankato to eastern edge of Judson
East				same as Alt. B
Alternative D		400 Ft. x 3.6 miles	123.0 - 126.6	0.25 mi west of Eagle Lake to 2.0 mi northeast of Mankato

Table 2-5
Proposed Rail Yards for Alternatives B, C and D

Yard	Functions	Dimensions	Alternative Locations	
			Mile Post	Geographic Location (approximate mileage)
Central	Center of DM&E operations. Principle inspection and maintenance facility for all coal equipment. Refueling. Central yard for receiving, classification, dispatch, and storage of freight cars. Locomotive repair and maintenance. Pollution control facilities. Extensive maintenance of way facilities. Change of crews on all trains. Interchange with BNSF.			
Alternative B		1,000 Ft. x 5.4 miles	354.3 - 359.7	0.3 mi west of Cavour to 1.0 mi east of Huron
Alternative C		1,000 Ft. x 5.0 miles	367.1 - 371.9	2.0 mi west of Huron to 4.0 mi east of Wolsey
Middle East				
Alternative D		1,000 Ft. x 3.0 miles	316.0 - 319.0	2.0 mi west of Hetland to 1.5 mi east of Lake Preston
Middle West	Staging yard for empty and loaded trains. Two marshaling tracks for manifest, grain, and way freight trains. Crew changes. Potential for future maintenance of way track.			
Alternative B		300 Ft. x 2.1 miles	567.5 - 569.6	6.0 mi west of Philip to 3.0 mi east of Cottonwood
Alternative C		same as Alt. B	590.4 - 592.5	0.6 mi north of Wall to 1.5 mi northwest of Wall
Middle				
Alternative D		same as Alt. B	527.0 - 531.0	2.0 mi southwest of Capa to 1.0 mi east of Midland

Table 2-5
Proposed Rail Yards for Alternatives B, C and D

Yard	Functions	Dimensions	Alternative Locations	
			Mile Post	Geographic Location (approximate mileage)
West	Base of operations for coal trains. Staging yard for empty trains, and for all trains in the event of a maintenance of way work window. Interchange for BNSF, UP, and DM&E. Coordination of operations. Small maintenance facilities for emergency repairs. Refueling of locomotives and maintenance work trains. Small facility for maintenance of way equipment. Potential for crew lodging and eating facilities due to rural location and potentially severe winter weather.			
Alternative B		1,300 Ft. x 3.1 miles	760.0 - 764.0	27.0 mi west of Highway 85 to 5.0 mi east of The Nose, 3.5 mi north of the Niobrara/Weston County Rail Line
Alternative C				
Option A		1,300 Ft. x 6.0 miles	787.0 - 793.0	1.0 mi west of Campbell/Weston County Rail Line to 5.0 mi east of County Rail Line, 5.5 mi north of Converse County Rail Line
Option B		same as Option A	787.0 - 791.3	1.9 mi east of Campbell/Weston County Rail Line to 5.0 mi east of County Rail Line, 5.5 mi north of Converse County Rail Line
Alternative D		1,300 Ft. x 5.0 miles	568.0 - 563.0	10.0 mi northwest of Upton to 6.3 mi south of Moorcroft

Table 2-6
Siding Locations - Extension Alternative B

Siding Number	State	County	Mile Post
1	MN	Winona	4.4 - 10.0
2	MN	Winona/Olmsted	29.0 - 32.0
3	MN	Olmsted	37.0 - 40.0
4	MN	Olmsted	45.0 - 48.0
5	MN	Olmsted	52.0 - 55.0
6	MN	Olmsted/Dodge	60.4 - 67.0
7	MN	Dodge/Steele	74.0 - 79.0
8	MN	Steele	84.0 - 87.0
9	MN	Steele	92.0 - 98.0
10	MN	Waseca	103.2 - 108.0
11	MN	Waseca/Blue Earth	115.0 - 118.0
12	MN	Blue Earth	123.0 - 131.0
13	MN	Blue Earth	143.0 - 152.0
14	MN	Brown	159.8 -166.0
15	MN	Brown	171.0 - 175.0
16	MN	Brown	180.0 - 189.3
17	MN	Brown	195.0- 198.0
18	MN	Redwood	204.0 -209.0
19	MN	Redwood	214.0 - 217.0
20	MN	Lyon	227.0 - 232.0
21	MN	Lyon	241.0 - 246.0
22	MN	Lincoln	254.0 - 258.0

Table 2-6
Siding Locations - Extension Alternative B

Siding Number	State	County	Mile Post
23	MN	Lincoln	263.0 - 268.0
24	SD	Brookings	275.0 - 278.0
25	SD	Brookings	282.0 - 287.0
26	SD	Brookings	291.5 - 297.0
27	SD	Kingsbury	309.0 - 315.0
28	SD	Kingsbury	322.0 - 326.0
29	SD	Kingsbury	332.0- 343.0
30	SD	Beadle	351.9 - 354.3
31	SD	Beadle	365.6 - 376.2
32	SD	Beadle	382.0 - 385.5
33	SD	Hand	391.0 - 394.0
34	SD	Hand	400.0 - 404.0
35	SD	Hand	410.0 - 413.0
36	SD	Hyde	420.0 - 423.0
37	SD	Hyde	431.0 - 435.0
38	SD	Hughes	441.8 - 445.0
39	SD	Hughes	450.3 - 454.5
40	SD	Hughes	459.0 - 462.0
41	SD	Hughes	468.0 - 472.0
42	SD	Hughes	477.0 - 480.0
43	SD	Stanley	488.0 - 492.2
44	SD	Stanley	503.0 - 506.0

Table 2-6
Siding Locations - Extension Alternative B

Siding Number	State	County	Mile Post
45	SD	Stanley/Jones	511.3 - 515.0
46	SD	Jones	522.0 - 526.0
47	SD	Haakon	534.0 - 537.5
48	SD	Haakon	544.0 - 548.0
49	SD	Haakon	556.0 - 559.5
50	SD	Jackson	569.6 - 571.8
51	SD	Jackson/Pennington	578.0 - 583.0
52	SD	Pennington	590.5 - 605.8
53	SD	Pennington	616.0 - 620.2
54	SD	Custer	635.0 - 640.0
55	SD	Custer	652.0 - 655.5
56	SD	Custer	658.0 - 665.0
57	SD	Fall River	679.0 - 683.5
58	SD	Fall River	695 - 702.0
59	SD	Fall River	720.0 - 726.0
60	WY	Niobrara	738.0 - 744.0
61	WY	Weston	757.0 - 760.0
62	WY	Weston	764.0 - 767.0
63	WY	Weston	777.0 - 781.0
64	WY	Weston/Campbell	791.0 - 795.0
65	WY	Campbell	813.0 - 817.0
66	WY	Campbell	M3.0 - M6.0

Table 2-6
Siding Locations - Extension Alternative B

Siding Number	State	County	Mile Post
67	WY	Campbell	S0.3 - S5.0
68	WY	Campbell/Converse	S16.0 - S21.0

Table 2-7
Siding Locations - Extension Alternative C

Siding Number	State	County	Mile Post
1	MN	Winona	4.4 - 7.0
2	MN	Winona	19.7 - 21.8
3	MN	Olmsted	38.2 - 39.7
4	MN	Olmsted/Dodge	60.4 - 62.0
5	MN	Dodge	65.6 - 67.1
6	MN	Dodge	79.7 - 81.4
7	MN	Steele	90.9 - 93.3
8	MN	Waseca	102.8 - 107.0
9	MN	Blue Earth	124.8 - 131.0
10	MN	Blue Earth	142.4 - 149.4
11	MN	Brown	159.8 - 163.3
12	MN	Brown	181.2 - 185.3
13	MN	Brown	204.2 - 207.7
14	MN	Lyon	227.3 - 230.9
15	MN	Lyon/Lincoln	248.6 - 252.1
16	MN/SD	Lincoln/Brookings	270.7 - 274.2

Table 2-7
Siding Locations - Extension Alternative C

Siding Number	State	County	Mile Post
17	SD	Brookings	291.2 - 296.8
18	SD	Kingsbury	314.9 - 318.4
19	SD	Kingsbury	330.8 - 338.5
20	SD	Beadle	355.4 - 358.9
21	SD.	Beadle	365.6 - 367.1
22	SD	Beadle	371.9 - 376.3
23	SD	Beadle	382.0 - 385.5
24	SD	Hand	403.5 - 407.0
25	SD	Hyde	426.0 - 429.5
26	SD	Hughes	440.2 - 443.7
27	SD	Hughes	450.0 - 454.5
28	SD	Hughes	467.9 - 471.4
29	SD	Stanley	488.0 - 492.2
30	SD	Jones	511.3 - 515.0
31	SD	Haakon	534.0 - 537.5
32	SD	Haakon	556.0 - 559.5
33	SD	Stanley	579.4 - 583.0
34	SD	Pennington	590.5 - 605.8
35	SD	Pennington	616.0 - 620.2
36*	SD	Custer	638.1 - 642. 9
36	SD	Custer	637.5 - 642.3
37*	SD	Custer	656.1 - 662.6

Table 2-7
Siding Locations - Extension Alternative C

Siding Number	State	County	Mile Post
37	SD	Custer	655.6 - 662.1
38*	SD	Fall River	677.4 - 681.9
38	SD	Fall River	676.8 - 681.3
39*	SD	Fall River	697.5 - 702.2
39	SD	Fall River	698.1 - 702.7
40*	SD	Fall River	719.4 - 724.9
40	SD	Fall River	720.0 - 725.5
41*	WY	Niobrara	741.9 - 747.2
41	WY	Niobrara	742.5 - 747.8
42*	WY	Weston	762.5 - 768.1
42	WY	Weston	763.1 - 768.7
43*	WY	Weston	777.2 - 789.9
43	WY	Weston	777.8 - 783.5
44	WY	Campbell	807.4 - 810.9
45	WY	Campbell/Converse	S12.9 - S16.2

* Sidings on the the Phiney Flats/WG Divide Alternative

Table 2-8
Siding Locations - Extension Alternative D

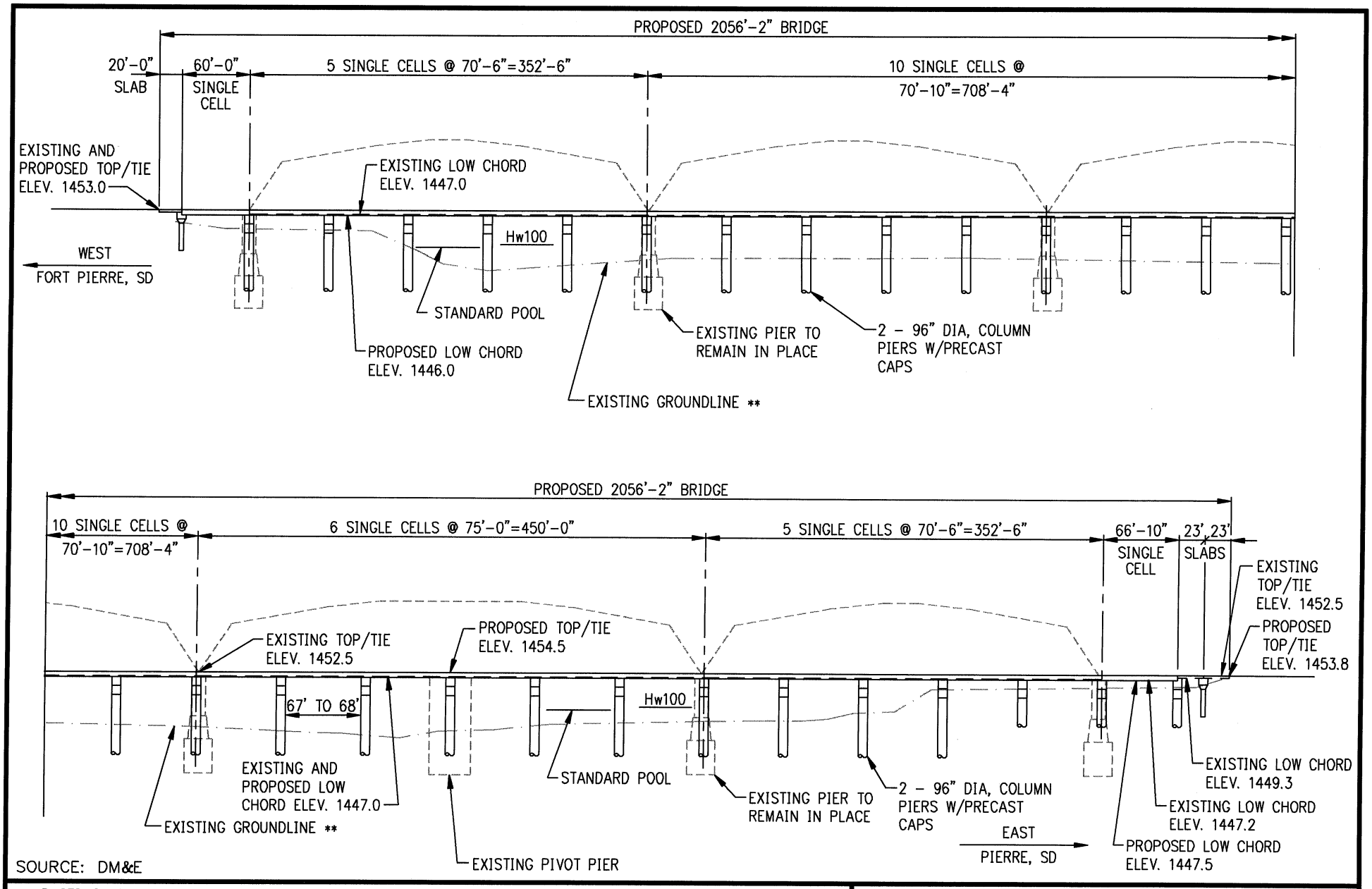
Siding Number	State	County	Mile Post
1	MN	Winona	4.4 - 11.58
2	MN	Winona	21.8 - 26.0
3	MN	Olmsted	30.0 - 33.0
4	MN	Olmsted	39.72 - 45.28
5	MN	Olmsted	52.0 - 55.0
6	MN	Olmsted/Dodge	60.0 - 64.0
7	MN	Dodge/Steele	74.0 - 79.0
8	MN	Steele	92.0 - 97.0
9	MN	Waseca	103.2 - 108.0
10	MN	Blue Earth	120.0 - 130.0
11	MN	Blue Earth	143.0 - 157.0
12	MN	Brown	166.0 - 172.0
13	MN	Brown	180.0 - 189.0
14	MN	Redwood	203.0 - 209.0
15	MN	Redwood	213.0 - 217.0
16	MN	Redwood	221.0 - 225.0
17	MN	Lyon	229.0 - 235.0
18	MN	Lyon	241.0 -246.0
19	MN	Lincoln	254.0 - 258.0
20	MN/ SD	Lincoln/Brookings	268.0 - 276.0
21	SD	Brookings	284.0 - 288.0
22	SD	Brookings	291.5 - 297.0

Table 2-8
Siding Locations - Extension Alternative D

Siding Number	State	County	Mile Post
23	SD	Brookings/Kingsbury	309.0 - 316.0
24	SD	Kingsbury	319.0 - 323.0
25	SD	Kingsbury	332.0 - 343.0
26	SD	Beadle	353.0 - 359.0
27	SD	Beadle	366.0 - 376.3
28	SD	Beadle/Hand	385.79 - 392.15
29	SD	Hand	408.6 - 415.45
30	SD	Hyde	428.0 - 436.7
31	SD	Hughes	448.28 - 454.73
32	SD	Hughes	468.0 - 475.0
33	SD	Stanley	487.0 - 491.4
34	SD	Stanley/Jones	510.5 - 517.5
35	SD	Jones/Haakon	523.0 - 527.0
36	SD	Haakon	531.0 - 532.9
37	SD	Haakon	548.0 - 552.0
38	SD	Jackson	567.0 - 570.0
39	SD	Pennington	584.0 - 587.0
40	SD	Pennington	590.0 - 605.0
41	SD	Pennington	611.5 - 615.5
42	SD	Pennington	627.0 - 633.0
43	SD	Pennington	640.0 - 643.0
44	SD	Pennington	96.1 - 94.0

Table 2-8
Siding Locations - Extension Alternative D

Siding Number	State	County	Mile Post
45	SD	Pennington/Custer	80.0 - 77.0
46	SD	Custer	72.0 - 68.9
47	SD	Custer	65.8 - 62.0
48	SD	Custer	57.0 - 53.0
49	SD	Fall River	39.0 - 36.0
50	SD	Fall River	675.84 - 682.85
51	SD	Fall River	694.57 - 701.0
52	SD	Fall River	717.15 - 722.0
53	SD	Fall River/Custer	487.3 - 492.8
54	WY	Weston	516.0 - 509.0
55	WY	Weston	528.8 - 520.2
56	WY	Weston	556.3 - 547.2
57	WY	Crook	563.0 - 560.0
58	WY	Crook	572.0 - 568.0
59	WY	Campbell	0.0 - 17.0
60	WY	Campbell	27.0 - 32.0
61	WY	Campbell	40.0 - 43.0
62	WY	Campbell	44.0 - 47.0
63	WY	Converse	57.0 - 62.0



SOURCE: DM&E

** BASED ON THE CORPS OF ENGINEERS SOUNDINGS IN AUGUST, 1997.

Hw100 = ELEV. 1422.7

STANDARD POOL = ELEV. 1420.0

LEGEND

- - - - - - - - - - EXISTING BRIDGE

———————— NEW BRIDGE

Figure 2-24

POWDER RIVER BASIN EXPANSION PROJECT
PROPOSED MISSOURI RIVER CROSSING ALTERNATIVES
PIERRE, SOUTH DAKOTA

2.2.9 MISSOURI RIVER BRIDGE

The existing DM&E rail line currently crosses the Missouri River at Lake Sharpe between Pierre and Fort Pierre, South Dakota. The existing Missouri River Bridge is approximately 2,056 feet in length. It is located in Hughes and Stanley counties, at river mile 1066.5, T111N, R79W, Section 32, and T5N, R31E, Section 21. In its current condition, unit trains would be unable to operate over the existing bridge. DM&E has indicated to SEA that it has conducted preliminary studies regarding the feasibility of using the existing bridge for movement of unit coal trains. DM&E believes it may be possible to reinforce and rehabilitate the existing bridge to allow for safe operation of unit coal trains. However, additional studies are necessary before a final determination can be reached. Due to this uncertainty, DM&E has developed a proposal that would include construction of a new bridge across the Missouri River, just upstream of the location of the existing bridge. SEA considered each of these alternatives as reasonable and subject to the findings of additional investigation, feasible. Both the reinforcement of the existing bridge and construction of a new bridge were retained by SEA for evaluation. The alternatives for the Missouri River Bridge are discussed below.

Rehabilitation of the Existing Bridge

The existing Missouri River Bridge, at MP 482.8, was constructed in 1907 and now consists of 5 truss spans with steel deck girder approach spans supported on seven stone masonry river pier stems (Figure 2-24). The bridge was originally constructed to operate as a swing bridge where one span could be swung open to allow passage of river vessels too tall to pass under the bridge. The swing mechanism is currently in-operable. The bridge is a single-track structure with an open deck on tangent track with a flat grade across the river. The east approach embankment is on a 6°00' curve and the west approach embankment is on a 3°00' curve. A speed restriction exists at the bridge due to the east approach alignment. The bridge also has weight and clearance restrictions.

The existing spans and substructures are not be capable of supporting unit coal train operations. A final determination has not been made on whether the existing bridge could be reinforced sufficiently for heavy haul traffic. However, reinforcement of the existing bridge would likely require the following actions:

- reinforcement of existing river piers with cast-in-place concrete collars on H-pile supports,
- replacement of the floor system and its verticle support members,
- additional truss members, depending on more detailed inspection and analysis, and
- replacement of the entire timber tie deck and rail.

Rehabilitation of the existing bridge would not be expected to include any new or additional piers within the ordinary high water channel. Horizontal span distances would remain the same, ranging from approximately 350 to 450 feet. Vertical clearances would also remain the same, approximately 27 feet above the standard pool water level. Reinforcement and rehabilitation of the existing bridge is estimated to take one to two years.

Construction of a New Bridge with Ownership Transfer

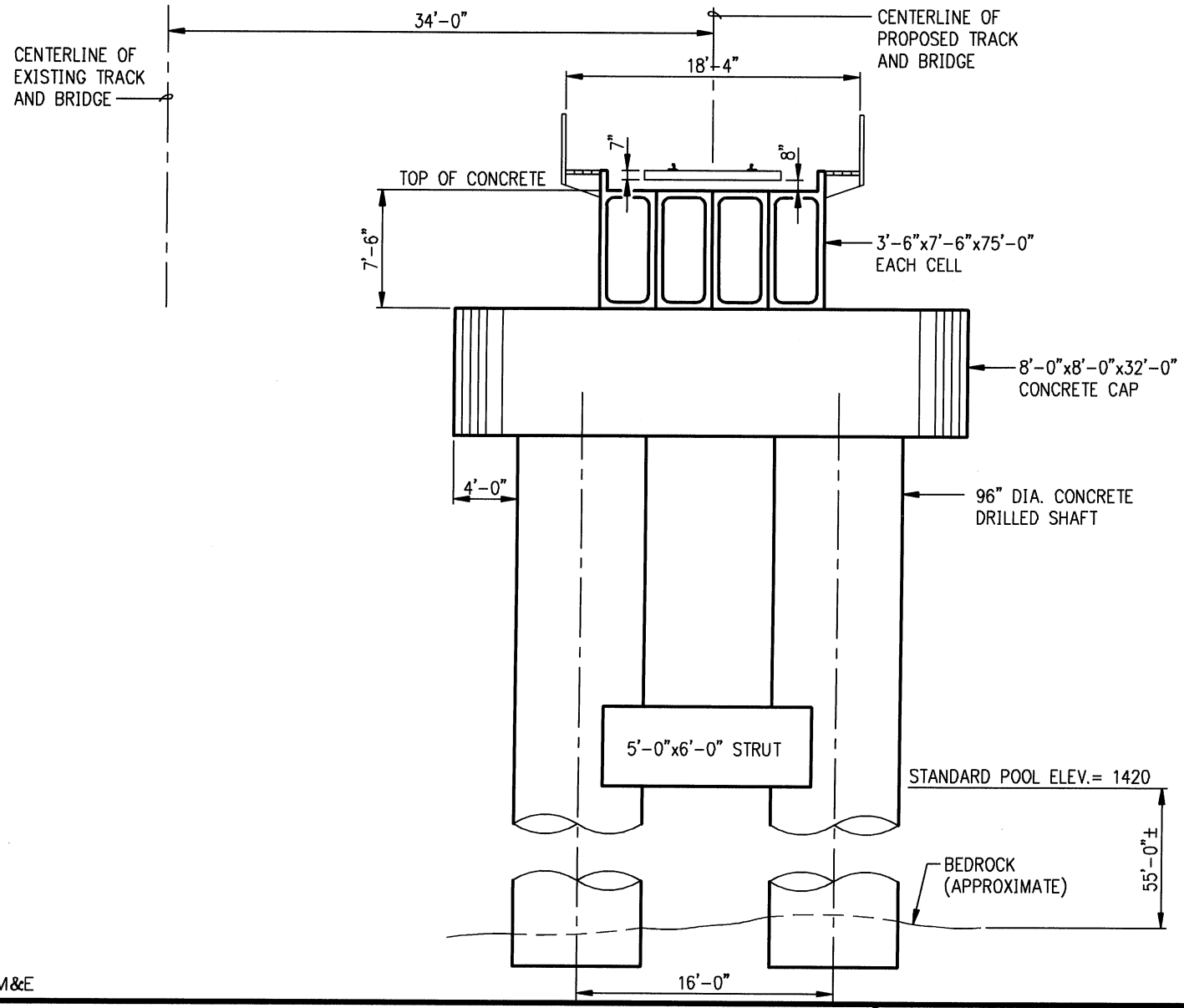
Should DM&E determine that the existing bridge could not be reinforced or the construction of a new bridge is ultimately approved by the Board, the new bridge would require changes in the existing rail alignment. The new bridge would be of similar length to the existing bridge, approximately 2,056 feet (Figure 2-24). The new bridge would be built on an offset alignment 34 feet upstream of the existing structure centerline to maintain integrity of the existing bridge foundations. New piers would be located close to the existing piers with several new piers aligned directly upstream of the existing piers (Figure 2-25). Steel casing around the new piers would extend up above the high pool elevation of Lake Sharpe to protect the piers from ice. The verticle clearance of the new bridge would be similar to that of the existing bridge at approximately 26 feet above the standard water level. However, horizontal span distances would be reduced to between approximately 60 and 75 feet. Construction is estimated to take up to 2 years to complete, during which time the existing bridge would remain in service for existing rail traffic. Trains would continue to move unimpeded over the existing bridge until the new bridge is placed in service.

The realignment necessary for construction of a new bridge would allow for some reduction in the existing bridge approach curves. This reduction would allow DM&E to safely operate trains at increased speeds.

Following completion of construction of a new bridge, DM&E could transfer ownership of the existing bridge to another party. The bridge would no longer be used for rail traffic but would be converted to other uses. These could include a pedestrian and bike trail or support for utilities such as pipelines, phone lines, or fiber optic lines. DM&E has indicated it would work with the local community to leave the existing bridge in place for use as a bicycle/pedestrian crossing over the Missouri River connecting existing trails on both sides of the river.

Construction of a New Bridge with Removal of Existing Bridge

The new bridge would be constructed as described above. However, if ownership of the bridge could not be transferred, the existing bridge would be removed according to Coast Guard



SOURCE: DM&E

Figure 2-25

POWDER RIVER BASIN EXPANSION PROJECT CROSS SECTION PROPOSED NEW MISSOURI RIVER BRIDGE - PIERRE, SOUTH DAKOTA

regulations. Salvage activities would likely include removal of all bridge superstructure and removal of piers to at least the elevation of the bottom of Lake Sharpe.

2.3 SUMMARY

DM&E identified several project components it believes necessary to provide safe and efficient rail access between coal mines in the PRB and Midwestern utilities over its system. These components included extending its existing rail system westward, reconstructing its existing rail line, and bypassing a section of track owned by another railroad. It also proposed constructing a connection to another railroad to help provide efficient routing for rail traffic. DM&E conducted an extensive route development process which included identifying the necessary design criteria to construct a project that would serve its purpose of providing safe and efficient access for an additional rail carrier to the PRB. During this process, DM&E met with landowners and agencies. Initially, three rail corridors were investigated. DM&E selected the southern-most corridor because, according to DM&E, this corridor provided DM&E the flexibility to avoid a number of potential environmental impacts as well as a more efficient route to the central and southern portions of the PRB. DM&E also proposed several alternative routes in its Application to the Board.

SEA reviewed DM&E's proposed alternatives and presented them to other agencies and the public during the EIS scoping process. Numerous other alternatives were proposed during the scoping process. These other alternatives involved modification of DM&E's proposed alternatives to avoid sensitive environmental areas and use of additional portions of DM&E's existing rail line and other transportation corridors, including both rail and highway, in the project area. Four communities along the existing DM&E rail line proposed bypasses as an alternative to reconstructing and increasing rail traffic over the existing rail line through their communities. DM&E continued to evaluate its proposed alternatives and other potential alternatives. DM&E found some of its original alternatives to be infeasible based on additional engineering analysis and found others (such as Alternative C, Phiney Flat Alternative, and WG Divide Alternative) to be feasible and proposed these to the Board. SEA evaluated alternatives proposed by DM&E, the public, communities, and other agencies. Some of these alternatives were found not to meet the project purpose, others were found to be infeasible for reasons detailed earlier in this chapter. These alternatives have been eliminated from detailed evaluation in this Draft EIS. The alternatives found to be reasonable and feasible have been retained for detailed analysis in this Draft EIS. Table 2-9 provides a summary of the alternatives proposed and their status in this Draft EIS.

Table 2-9
Summary of Alternatives

Project	Alternative	Evaluated by DM&E			Proposed during Scoping Process	Evaluated By SEA	
		Before Submitting Application	Included in Application	Submitted After Filing Application		Eliminated from Detailed Analysis in Draft EIS	Retained for Detailed Analysis in Draft EIS
Rail Line Extension	Northern Corridor	yes	no	no	no	yes	no
	Middle Corridor	yes	no	no	no	yes	no
	Southern Corridor	yes	yes	no	no	no	yes
	No-Action - Alternative A	yes	yes	no	no	no	yes
	Proposed Alternative - Alternative B	yes	yes	no	no	no	yes
	Modified Proposed Alternative - Alternative C	no	no	yes	yes	no	yes
	Alternative D-1	yes	no	no	yes	yes	no
	Alternative D-2	yes	no	no	yes	yes	no

Table 2-9
Summary of Alternatives

Project	Alternative	Evaluated by DM&E			Proposed during Scoping Process	Evaluated By SEA	
		Before Submitting Application	Included in Application	Submitted After Filing Application		Eliminated from Detailed Analysis in Draft EIS	Retained for Detailed Analysis in Draft EIS
Rail Line Extension (Continued)	Alternative D-3	no	no	no	yes	yes	no
	Alternative D-4	no	no	no	yes	yes	no
	Alternative D-5	yes	no	no	yes	yes	no
	Alternative D-6	no	no	no	yes	yes	no
	Alternative D-7	no	no	no	yes	no	yes
	Phiney Flat Alternative	no	no	yes	yes	no	yes
	WG Divide Alternative	no	no	yes	yes	no	yes
	Mine Loop Alternative	no	no	yes	no	no	yes
Mankato	No-Action - Alternative M-1	yes	yes	no	no	no	yes
	Alternative M-2 - Southern Route	yes	yes	no	no	no	yes
	Alternative M-3 - Existing Rail Corridor	yes	yes	no	no	no	yes
	Alternative M-4 - Northern Route	yes	yes	no	no	yes	no

Table 2-9
Summary of Alternatives

Project	Alternative	Evaluated by DM&E			Proposed during Scoping Process	Evaluated By SEA	
		Before Submitting Application	Included in Application	Submitted After Filing Application		Eliminated from Detailed Analysis in Draft EIS	Retained for Detailed Analysis in Draft EIS
Owatonna	No-Action - Alternative O-1	yes	yes	no	no	no	yes
	Alternative O-2	yes	yes	no	no	no	yes
	Alternative O-3	yes	yes	no	no	no	yes
	Alternative O-4	no	no	yes	no	no	yes
	Alternative O-5	no	no	yes	no	no	yes
	Bypass	no	no	no	yes	yes	no
Rochester	No-Action - Alternative R-1	no	no	no	no	no	yes
	Alternative R-2	no	no	no	no	no	yes
	Alternative R-3	no	no	no	yes	no	yes
	Alternative R-4	no	no	no	yes	no	yes

Table 2-9
Summary of Alternatives

Project	Alternative	Evaluated by DM&E			Proposed during Scoping Process	Evaluated By SEA	
		Before Submitting Application	Included in Application	Submitted After Filing Application		Eliminated from Detailed Analysis in Draft EIS	Retained for Detailed Analysis in Draft EIS
Brookings	No-Action - Alternative B-1	no	no	no	no	no	yes
	Alternative B-2	no	no	no	no	no	yes
	Alternative B-3	no	no	no	yes	no	yes
	Alternative B-4	no	no	no	yes	no	yes
Pierre	Bypass	no	no	no	yes	yes	no
Missouri River	Existing Bridge Rehabilitation	no	no	no	yes	no	yes
	New Bridge Construction/Existing Bridge Reuse	no	no	no	yes	no	yes
	New Bridge Construction/Existing Bridge Removal	no	no	no	yes	no	yes
Other	Alternative Energy Sources	no	no	no	yes	yes	no

* * * * *