Final Section 4(f) Evaluation
Final Environmental Impact Statement

Project F 1-2 (39) 138
Reconstruction of U.S. Highway 2 between Columbia Heights and Hungry Horse

Flathead County, Montana

State of Montana - Department of Transportation
and
U.S. Department of Transportation - Federal Highway Administration

APPENDICES

Appendix 1: General Design Controls and Cross-Section Elements of all Build Alternatives

1. GENERAL DESIGN CONTROLS

The following paragraphs describe the basic design controls used to develop reasonable alternatives for the proposed action. Guidance was obtained from the following sources:

- MDT's ***Road Design Manual* and *Geometric Design Standards* (1992),**
- **AASHTO's *A Policy on Geometric Design of Highways and Streets, 1990*,** and
- Transportation Research Board's *Highway Capacity Manual Special Report 209* (1985).

Develop Limited Access Control - Reconstruction in the corridor would include limited access control for safety and operational reasons. Existing approaches would be evaluated and recommendations for developing joint approaches and eliminating unnecessary ones would be made. Access would be perpetuated where necessary. An access control study would serve as the basis for identifying locations where access may be modified. **An Access Control Plan for the project area was initially prepared in June, 1990.**

Right-of-Way Corridor - Right-of-way needs, utility conflicts, and relocations would be identified through the preparation of preliminary designs for all build alternatives. The width of the right-of-way corridor for the proposed action would be based upon the limits of construction for each alternative. Cost estimates for additional right-of-way, relocations, and utility conflicts would be provided.

Speed and Geometrics - The speed of vehicles on a highway depends not only on the capabilities of drivers and their vehicles, but on the physical characteristics of the highway and its roadsides, the weather, the presence of other vehicles, and speed controls (legal or traffic control devices). The cumulative effect of these conditions determines the speed on a section of highway. Since only small percentages of drivers travel at excessively high or low speeds, it is not appropriate to design only for these users. The new highway should be designed for a speed that satisfies the demands of nearly all drivers. Drivers adjust their speeds based on the conditions presented by the physical features of the road and traffic on the facility.

Two measures of speed, the design speed and operating speed, are important considerations for highway designers. "Design speed" is the maximum safe speed maintainable over a specified section of highway when conditions permit design features to govern (1). "Operating speed" is the highest overall speed at which a driver can travel on a highway under favorable weather conditions and under prevailing traffic conditions without exceeding the safe speed as determined by the design speed for a section of highway (1). Note that design speed <u>does not equal</u> operating speed.

Geometric features, such as curvature, superelevation, and sight distance, are directly related to and vary substantially with design speed. Other features, like pavement and shoulder widths and clearances to roadside obstructions, are not directly related to design speed but they affect vehicle speeds. Highway designers strive to use as high a design speed as high as practicable for safety, mobility, and efficiency reasons.

The design speeds typically range from 20 to 70 mph and are usually expressed in 10 mph increments for speeds below 60 mph. Increments smaller than 10 mph show little difference in the design dimensions of features between any two design speeds. AASHTO indicates that rural arterials are normally designed with design speeds of 50 to 70 mph depending on terrain features (2). AASHTO states that a design speed of

70 mph is appropriate for level terrain, 60 mph for rolling terrain, and 50 mph for mountainous conditions (2). A 60 mph design speed is appropriate for the level to gently rolling terrain between Columbia Heights and Hungry Horse. Geometric standards for a 60 mph design are as follows:

- Maximum degree of Curvature = 4° 45'
- Maximum Gradient = 4%
- Minimum Passing Sight Distance = 2,100'
- Desirable Minimum Stopping Sight Distance = 650'
- **Absolute Minimum Stopping Sight Distance = 525'**
- Sight Distance at Intersections = AASHTO Guidelines

A lower design speed would be considered if it is necessary for geometric reasons, however, it would not be less than the posted speed limit for the project corridor.

The posted speeds would be set at the legally established speed limits for the corridor.

Level of Service (LOS) - Alternatives would be designed for LOS B in the design year as recommended in geometric design standards for rural arterials (3). AASHTO indicates that the design should strive to provide the highest LOS feasible and consistent with local conditions. Please see the Level of Service Comparison later in Part II for detailed discussions of this topic.

Traffic Data - Traffic data for this project was developed from information collected at an automatic traffic recorder located in the corridor, **periodic traffic** surveillance counts, turning movement counts, and vehicle classification studies. Part III of the EIS includes a detailed discussion of traffic characteristics for US 2.

Design Hourly Volume (DHV) - Traffic volume data collected at the permanent counter in the corridor serves as the basis for the design of this project. Current estimates of average daily traffic (ADT) at the permanent counter were identified and projected twenty years ahead to the design year (2010). The 30th highest hourly volume of the year (30HV) was determined and a corresponding value for the design year was calculated based on the percent of the ADT that the 30HV represents. The 30HV is commonly used as a design value for most rural roads because as a percentage of ADT, it varies little from year to year in spite of substantial changes in ADT.

The 30HV is a compromise between providing an adequate level of service for almost every hour of the year and economic efficiency. Providing a facility based on the highest peak hour of the year would result in a gross underutilization of capacity and an excessive design for all but a few hours of the year. Alternately, a design based on too low of an hourly volume could result in an unacceptable number of hours of congestion and delay for the facility. The use of the 30HV for the design of most rural highways is recommended by AASHTO (4).

2. CROSS-SECTION DESIGN ELEMENTS

The design elements that would be incorporated into the typical cross-sections for each alternative are discussed below.

Cut and Fill Slopes - Geometric design standards for cut and fill slopes on Primary roads would be used for the preliminary designs of the alternatives. Slopes would be designed as shown in the Typical Sections **(See FIGURE II-14 in Part II of the Final EIS)** for this project.

Shoulders - All shoulders would be usable and continuously surfaced. The minimum width of paved **usable** shoulders for **rural** two-lane arterials is **8 feet** (5). The width of outside shoulders on four-lane arterials should not be less than 8 feet (6). Shoulder widths for four-lane alternatives where curb and gutters are included would be 10 feet **in Columbia Heights and 9 feet in Hungry Horse.**

Narrow shoulders may be evaluated as measures to avoid impacts on the Section 4(f) properties in the corridor. However, shoulders less than 4-feet-wide will not be considered because they are unusable by emergency and bicyclist traffic.

Driving Lanes - All driving lanes evaluated in the EIS would be 12-feet-wide.

Medians/Left Turn Lanes - Median/left turn lanes considered for the proposed action would be 14 feet wide and flush with the road surface for ease of maintenance. A continuous, two-way left turn lane is proposed for Columbia Heights. **A flush median with left turn lanes would be included at major intersections and approaches in rural areas between Columbia Heights and Berne Road with some build alternatives. A median/left turn lane would not be included with the build alternatives in Badrock Canyon.**

Curbs - Curbs would be included in Columbia Heights and Hungry Horse where significant commercial and residential development exists. The use of curbs would minimize right-of-way requirements, help control access, and would help control drainage.

<u>Sidewalks</u> - **The build alternatives would include sidewalks in Columbia Heights where the density of roadside development is appropriate for this feature. Sidewalks to connect with those that were constructed with previous highway improvements would also be provided in Hungry Horse. The sidewalks would facilitate pedestrian access from Hungry Horse to the South Fork of the Flathead River. Sidewalks would typically be five feet wide.**

Minimum Taper for Lane Drops - The minimum length of tapers for four-lane to two-lane transitions is based on the design speed. The minimum tapers for lane drops would be 45:1 in Columbia Heights and 60:1 in rural areas. The minimum length of taper for dropping a 12-foot-wide lane would be 540' in the developed area and 720' in rural parts of the corridor.

3. OTHER DESIGN CONSIDERATIONS

In conjunction with the build alternatives, the existing weigh station in Columbia Heights **would be abandoned**. This decision was made because of the problems in siting the facility so that all truck traffic from US 2 and FAS 206 can safely enter the scale. The building and scale equipment would be used at another location as determined by the Gross Vehicle Weight Division. **A GVW "B" site, a widened area adjacent to the road where portable scales can be periodically stationed, is proposed for development within the limits of the proposed action. An exact location for the facility has not been identified but it would probably be constructed on the northside of the road adjacent to the westbound travel lanes of the new highway.**

A park-and-ride lot **near the intersection of US 2 and FAS 206 in Columbia Heights will also be incorporated** into the final design for the proposed action. **Developing such a facility was suggested by two cooperating agencies for the EIS.** The NPS estimates that as many as 100 full-time and seasonal employees living in the Flathead Valley commute to and from West Glacier each day during the summer.

Similarly, many USFS personnel and other private sector employees commute to work sites between Hungry Horse and West Glacier. Such a facility would provide a convenient location for employees to meet and form carpools. The use of a park-and-ride lot would translate into energy and cost savings for commuters and would help to reduce traffic on US 2.

References

1. Institute of Transportation Engineers, *Transportation and Traffic Engineering Handbook*, Second Edition, Prentice-Hall, Inc., Englewood Cliffs, N.J., 1982, page 587.

2. American Association of State Highway and Transportation Officials (AASHTO), *A Policy on Geometric Design of Highways and Streets, 1990*, Washington D.C., page **494**.

3. AASHTO, page **495**.

4. AASHTO, page **56**.

5. AASHTO, page **499**.

6. AASHTO, page **508**.

Appendix 2: Development of Cost Estimates for Build Alternatives

1. RIGHT-OF-WAY NEEDS AND COSTS

Identification of Right-of-Way Needs - The right-of-way requirements for each build alternative were based on the preliminary designs. The limits of construction (top of cut sections and toe of fill sections) were determined and used to develop preliminary right-of-way plans for each alternative. The area of existing right-of-way was subtracted from the total right-of-way area for each highway design to calculate the amount of new right-of-way needed for each design. The amount of new right-of-way needed for each build alternative is listed below:

ALTERNATIVE 1 = **48.76 Acres**
ALTERNATIVE 2 = **45.87 Acres**
ALTERNATIVE 3 = **41.78 Acres**
ALTERNATIVE 4 = **40.84 Acres**

Residential and commercial relocations were also identified from the preliminary construction plans. All build alternatives would affect the same properties to varying degrees.

Estimated Right-of-Way Costs by Alternative - The lands needed for new right-of-way were categorized by existing uses land to help identify appropriate land values for the corridor. These classifications included developed properties in Columbia Heights; land subdivided for commercial or residential uses; rural agricultural lands; unimproved rural land; and rural timbered land.

The estimated costs for new right-of-way ($/acre) for each land type were developed from an examination of recent real estate listings for the Flathead Valley (1). Typical relocation costs for affected residences and businesses were determined from real estate listings and consultations with the Right-of-Way Bureau.

TABLE A2-1 contains cost estimates for the right-of-way acquisitions and relocations necessary for each design alternative. The costs of easements for cut and fill slopes have not been included in the estimates presented below. Due to the preliminary status of the proposed action, a lump sum estimate for relocations is presented in the table. Easement requirements and associated costs would be identified during design activities for the proposed action. R/W damages shown below include impacts due to the proximity of highway to residential or commercial uses and loss of parking areas or yards.

TABLE A2-1
ESTIMATED RIGHT-OF-WAY COSTS BY ALTERNATIVE

ITEM	ALT. 1	ALT. 2	ALT. 3	ALT. 4
NEW R/W	$230,200	$211,350	$194,000	$186,600
RELOCATIONS	450,000	375,000	300,000	300,000
R/W DAMAGE	200,000	200,000	220,000	220,000
TOTAL	$880,200	$786,350	$714,000	$706,600

2. UTILITY RELOCATIONS

Affected Utilities - The proposed reconstruction would affect both public and private utilities located in the existing right- of-way for the US 2. A topographic survey of the corridor identified the following utilities that will be impacted by the proposed action.

- Montana Power Company natural gas lines.
- Northwestern Telephone Systems, Inc. service lines.
- Flathead Electric Co-op electrical lines and a substation.

Two support towers for electrical transmission lines to the Columbia Falls Aluminum Plant are located outside of the existing right-of-way but only 75 feet from the present centerline of US 2. Preliminary designs indicate that fill may encroach on these structures. Steepening the fill slopes and providing guardrail along the highway would minimize these impacts. Alternately, a retaining wall could be constructed to prevent fill slopes from impacting the towers.

The Bonneville Power Administration's 230 kV Hungry Horse-Hot Springs and 115 kV Hungry Horse-Kerr Dam transmission lines are located away from the highway and should not be affected by construction. Comments on possible utility conflicts are included in Part VI of the EIS.

Estimated Costs of Utility Relocations - Each affected utility company was contacted to help identify potential conflicts with highway reconstruction activities. Estimates of the costs for relocating utilities or other facilities were obtained from each company or the Utilities Section of the Right-of-Way Bureau. TABLE A2-2 summarizes estimated utility relocation costs for the proposed action. Relocation costs are similar for all build alternatives.

Please note that the estimates shown below are preliminary and were done without plans for utility relocations. **The costs for conflicts with Columbia Falls Aluminum's electrical transmission lines assume that support towers would not have to be moved. Impacts on the towers would be reduced by adjusting fill slopes or building a retaining wall.**

TABLE A2-2 ESTIMATED UTILITY RELOCATION COSTS	
Montana Power Company Gas Lines	$351,700
Northwest Telephone Systems	$134,400
Flathead Valley Electric Co-op	$ 84,800
Columbia Falls Aluminum Company Electrical Lines/Towers	$110,000
TOTAL	$680,900

A Utilities Agreement **with** each affected company will be prepared. The agreement will specify necessary adjustments, costs of relocating facilities, and plans for the new utility locations. Utilities within the existing right-of-way which must be relocated as a result of highway reconstruction are generally paid for as follows (2):

- 75% of the cost by Federal and State highway funds, and
- 25% of the cost by the owner of the utility.

If utilities are situated on private property and will be affected by the proposed action, all relocation costs **will be paid**. Exceptions to this general compensation policy exist for certain facilities not recognized as "utilities" (cable television lines, pipelines, telephone booths) and for companies which may or may not have prior property rights (easements) in the right-of-way. Appropriate adjustments to utilities and payments for relocations are subject to negotiations **with** affected companies.

3. HIGHWAY CONSTRUCTION COSTS

Basis for Construction Cost Estimates - As mentioned previously, layouts of each highway design were prepared and used to quantify work items and design features. Work associated with each alternative was itemized to correspond with items contained in **agency** bid tabulations. Average bid prices from tabulations for construction projects during previous years were applied to the quantities to estimate the construction cost of each alternative. The estimates presented in this section include the costs of the materials plus all necessary labor.

Average bid prices for 1992 and for part of 1993 were reviewed during the preparation of the Final EIS to determine if substantial changes in unit prices occurred since the estimates contained in the Draft EIS were made. Construction costs have been revised to reflect changes in unit prices.

Estimated Construction Costs by Alternative - TABLE A2-3 shows the estimated construction costs for each build alternative examined in the EIS. Costs are identified for earthwork, paving, striping, and drainage facilities on US 2 and all approaches to the highway. Detailed quantities, unit prices, and total costs for each item considered are available for review in Helena.

Please note that the cost for "other items" presented in TABLE A2-3 includes activities like clearing and grubbing, guardrail, and the obliteration and removal of old pavement for US 2.

4. BRIDGE CONSTRUCTION COSTS

Basis for Bridge Cost Estimates - The Bridge Bureau provided information about the type of bridge and the design most appropriate for the new crossing at the South Fork. The new bridge would be complex to design and construct due to its location in a vertical curve and horizontal curves on both approaches to the structure. The bridge would be wide enough to accommodate four traffic lanes. The new structure would be some 65 feet longer than the existing bridge and would require four piers and two abutments to complete the crossing. Work bridges would be required between the existing and new structures.

The new bridge would probably have a cast-in-place concrete substructure and deck. The overall cost of construction for this type of bridge **is estimated to be** about **$90.00** per square foot. This estimate includes the cost of all required labor and materials for the new bridge.

The existing bridge would be fully removed at the completion of construction. Bridge removal costs would be about **$150.00** per lineal foot for the bridge deck and girders and around **$2,000** for removal of each bridge pier or abutment.

Estimated Cost of Bridge Construction - Based on the above assumptions, the estimated cost of the new bridge over the South Fork is **$4,020,300.** Note that the cost of the new bridge is the same for all build alternatives because the structure is located in an area where a transition from the 66-foot four-lane road that exists through Hungry Horse must occur.

The cost of the bridge shown above includes **$88,800** for fully removing the old structure plus the estimated construction cost for the new bridge for a total cost of **$3,919,500.**

TABLE A2-3 ESTIMATED CONSTRUCTION COSTS				
ITEM	**ALT. 1**	**ALT. 2**	**ALT. 3**	**ALT. 4**
EARTHWORK	$2,085,900	$2,005,100	$1,817,800	$1,994,900
PAVEMENT	2,341,200	2,200,000	1,969,900	1,834,900
DRAINAGE	376,600	373,200	366,900	363,600
APPROACHES	136,800	136,800	136,800	136,800
BRIDGE	4,020,300	4,020,300	4,020,300	4,020,300
OTHER ITEMS*	62,300	62,300	57,000	53,400
TOTAL	$9,023,100	$8,797,700	$8,368,700	$8,403,900

5. ANNUAL MAINTENANCE COSTS

Basis for Estimating Annual Road Maintenance Costs - Records kept by the **Maintenance Operations and Services Bureau** were reviewed to determine the costs various maintenance activities on the existing highway **during Fiscal Years 91, 92, and 93.** The records provided the actual costs for maintenance activities on US 2 **in and near** the project corridor. **Average costs for the state highway system were also reviewed.**

Based on these records, it was determined that the **average cost for the overall general maintenance of this Primary road segment was approximately $2,060 per lane-mile over the last three fiscal years.** These costs include general maintenance items such as minor road repairs, signing, reapplication of pavement markings, **winter maintenance activities,** and mowing shoulder slopes. **An amount equal to 40% of the average cost was added to account for salary additives and other indirect agency expenses. Therefore, the overall annual cost of general maintenance activities for the current road is estimated to be $2,880 per lane-mile.**

Due to the improved design of the build alternatives, a slight reduction in winter maintenance costs is predicted for the build alternatives. This decrease in winter annual maintenance is predicted to reduce the overall annual cost of road maintenance for the build alternatives to $2,515 per lane-mile.

Basis for Estimating Annual Winter Maintenance Costs - Actual costs for **winter roadway inspection, snow plowing**, sanding, and deicing on US 2 **in and near** the project over the past three fiscal years averaged **$1,040** per lane-mile (3). **A review of winter maintenance costs for Primary roads shows that this figure is substantially above the statewide average. The higher amounts of precipitation received by the area during the winter and the resulting periods of poor driving conditions are the likely reasons for higher winter maintenance expenditures on this segment of the Primary road system.**

It is assumed that winter maintenance costs would be reduced slightly by the improved alignment, right-of-way clearing, and new slope designs. For estimating purposes, a 25% reduction in winter maintenance costs was assumed for all build alternatives. This translates to an average cost of **$780** per lane-mile. **Adding an estimated overhead expense of 40% yields a winter maintenance cost of $1,095**

per lane-mile. Copies of the maintenance cost analysis for the proposed action are on file in Helena.

TABLE II-5 in Part II contains the estimated annual maintenance costs for each alternative.

6. LIFE-CYCLE PAVEMENT MAINTENANCE COSTS

Life-Cycle Pavement Maintenance - Decreasing appropriations for road maintenance combined with inflation and rising costs for pavement rehabilitation have resulted in conditions where pavements often wear out faster than they can be repaired. The age of the pavement and heavy traffic volumes often compound the problem, particularly on older roads nearing the end of their design life. Maintaining pavements to a high standard of serviceability not only maximizes public investments in transportation but facilitate the movement of people and goods.

Research indicates that roads deteriorate relatively slowly during the early years of their design life, but the rate of decline increases as they near the end of their design life. Proper maintenance and rehabilitation has been shown to significantly lengthen the life of pavements, however, reconstruction will eventually be needed.

A recent FHWA Federal-Aid Highway Program Manual (FHPM) established a policy calling for each state to "select, design, and manage Federal-Aid highway pavements in a cost effective manner and identify pavement work eligible for Federal-Aid funding" (4). Key to this policy is the implementation of a pavement management system that helps identify cost-effective strategies for providing , evaluating and maintaining pavements in a serviceable condition.

The FHPM defines pavement maintenance as "all routine actions, both responsive and preventative, which are taken by the State to preserve the pavement structure, including joints, drainage, surface, and shoulders, as necessary for its safe and efficient utilization" (5). A pavement management system can provide information to schedule the major maintenance or rehabilitation activities needed to preserve the condition of driving surfaces.

Pavement Management System - Data for a pavement management system based on software prepared by the California Department of Transportation **is being developed**. The result of this work will be life-condition curves for use in determining critical dates for maintenance activities on new and existing pavement surfaces. The system relies heavily upon non-destructive pavement distress ratings, traffic volumes, and soil and pavement design parameters to calculate a final pavement serviceability index (PSI). The PSI is considered with recommendations or requests from MDT District Engineers to prioritize rehabilitation projects.

No clearly defined policy toward rehabilitation and maintenance of pavement surfaces **has been established yet.** However, the following policies are well established and applicable to the proposed action.

- FHWA only pays for overlays designed for service lives greater than 8 years.
- Overlays are usually 0.3 feet (3 1/2 inches) thick.
- Crack sealing, seal and cover, and thin (0.1') overlays, which are considered maintenance items, are not funded by FHWA but are performed as needed. Funding for these activities is generally distributed to MDT Districts from the state Rehabilitation Trust Fund.

To evaluate the alternatives for the proposed action, the Program Development Division was contacted to help identify required pavement maintenance activities and a probable schedule for their implementation over the twenty year design life of the project (6). A project analysis engineer and a pavement management specialist were consulted to develop pavement maintenance assumptions for the build alternatives and for rehabilitating the existing pavement under the no-action alternative. These assumptions are discussed below.

Pavement Maintenance Assumptions for Build Alternatives - Future preventative maintenance for new construction **typically includes** a seal and cover at 7 and 20 years and a 0.30-foot overlay at 14 years. Crack sealing and digging out areas to repair surface failures would be completed with each major maintenance activity.

Pavement Rehabilitation for the No-Action Alternative - Estimating the costs of major maintenance activities for the existing highway under the no-action alternative is difficult. The highway was originally constructed in the late 1930's and was improved in 1965 and 1966. Considering the age and condition of the pavement, it is estimated that during the next 20 years the road would require a 0.30-foot asphaltic overlay immediately and at 14 years. Seal and cover courses would be required at 7 and 20 years. Crack sealing and digouts would be included with each major rehabilitation activity.

TABLE II-6 in Part II summarizes the estimated costs pavement maintenance and rehabilitation for the project alternatives.

References for Appendix 2

1. "Homes - Flathead Valley, MT", Harmon Publishing Company, Inc., Coeur d'Alene, ID, May 22 - June 18, 1990 and June 19 - July 16, 1990 issues; **"Homeseekers - Flathead Valley", October 6 - November 2, 1993 issue; RE/MAX of the Flathead Valley Real Estate Brochure, October, 1993.**

2. MDT, "Utility Policy and Procedures Manual, Part II", September 14, 1988, page 48.

3. MDT **Maintenance Operations & Services Section**, Management Information Subsystem Printouts, Fiscal Years **1987-93**.

4. US Department of Transportation, Federal Highway Administration, "Pavement Management and Design", Federal-Aid Highways Program Manual (FHPM), Volume 6, Chapter 2, Section 4, Subsection 1, March 6, 1989, page 1.

5. FHPM 6-2-4-1, page 1.

6. Anders, Jerry, Project Development Engineer and Wright, John, Pavement Management Section Supervisor, MDT, Project Analysis Bureau in personal communications May 18, 1990.

Appendix 3: Level of Service Definitions for Two-Lane and Multi-Lane Highways from the HCM

LOS A

TWO-LANE HIGHWAY - Without strict enforcement in rolling terrain, average speeds would approach 60 mph, the passing frequency required to maintain these speeds has not reached a demanding level, and almost no platoons (groups) of three or more vehicles are observed. Drivers would be delayed no more than 30% of the time by slow-moving vehicles.

MULTI-LANE HIGHWAY - Motorists can maneuver at will within the traffic stream. Minor disruptions in traffic flows are easily absorbed without causing significant delays or queuing (lines of cars). Average vehicle spacing is 440 feet (22 car-lengths) on highways with 60 mph design speeds.

LOS B

TWO-LANE HIGHWAY - Characterized by traffic flows of 55 mph or slightly higher on level terrain, however the passing demand to maintain such speeds increases. Drivers are delayed about 45% of the time on the average. The number of platoons in the traffic stream begins to increase.

MULTI-LANE HIGHWAY - The presence of other vehicles begins to be noticeable causing average travel speeds to diminish to 48 mph for highways with 60 mph design speeds. Vehicle spacing would be reduced to 264 feet (13 car-lengths). Minor disruptions in flow are still easily absorbed at this level but local deteriorations in LOS will be more obvious.

LOS C

TWO-LANE HIGHWAY - Characterized by noticeable increases in platoon formation, platoon size, and the frequency of impediments to passing. Average speed may still exceed 52 mph on level terrain but the demand for unrestricted passing exceeds the ability to pass. While traffic flow is stable, congestion caused by turning traffic and slow-moving vehicles becomes a problem. Drivers may be delayed up to 60% of the time.

MULTI-LANE HIGHWAY - The ability to maneuver within traffic and to select an operating speed is clearly affected by the presence of other vehicles. Average travel speeds are reduced to about 44 mph in sections with 60 mph design speeds. Average spacing is about 175 feet (9 car-lengths). Minor disruptions in flow may be expected to cause serious local deterioration in service, and lines of cars may form behind such disruptions. Severe or long- term disruptions could cause the facility to operate at LOS F.

LOS D

TWO-LANE HIGHWAYS - Characterized by conditions where traffic flow is approaching unstable flow. Passing becomes extremely difficult even though the demand to pass is high. Groups of 5 to 10 vehicles are common, although travel speeds of 50 mph can be maintained under ideal conditions. Turning vehicles and roadside distractions cause major disruptions in the traffic stream. Drivers may experience delays up to 75% of the time.

MULTI-LANE HIGHWAYS - Represents a condition in which speeds and the ability to maneuver are severely restricted due to traffic congestion. Average travel speeds are about 40 mph in sections with 60 mph design speeds. The average vehicle spacing is about 125 feet (6 car-lengths). Only minor disruptions can be absorbed without the formation of extensive lines of traffic and the deterioration of service to LOS F.

LOS E

TWO-LANE HIGHWAYS - defined as traffic flow conditions having a percent delay time exceeding 75%. Under ideal conditions, travel speeds will drop below 50 mph. On highways with less than ideal conditions, average travel speeds will be slower, as low as 25 mph on long upgrades. Passing is virtually impossible and massive platooning occurs when slower vehicles or other interruptions are encountered.

MULTI-LANE HIGHWAYS - describes operations at or near capacity and unstable flow. At capacity, vehicle spacing is 80 feet (4 car-lengths). Disruptions can not be accommodated because no usable gaps in traffic are available. Any disruption will cause lines of traffic to form and service to deteriorate to LOS F.

LOS F

TWO-LANE HIGHWAYS - Represents heavily congested flow with traffic demand exceeding the capacity of the facility. Volumes are lower than capacity, and speeds are below capacity speed. Stoppages may occur for short or long periods.

MULTI-LANE HIGHWAYS - This occurs at a point where vehicles arrive at a higher rate than at which they are discharged or when the forecasted demand exceeds the computed capacity. Vehicles experience short spurts of movement followed by stoppages. Average travel speeds within lines of traffic are less than 30 mph.

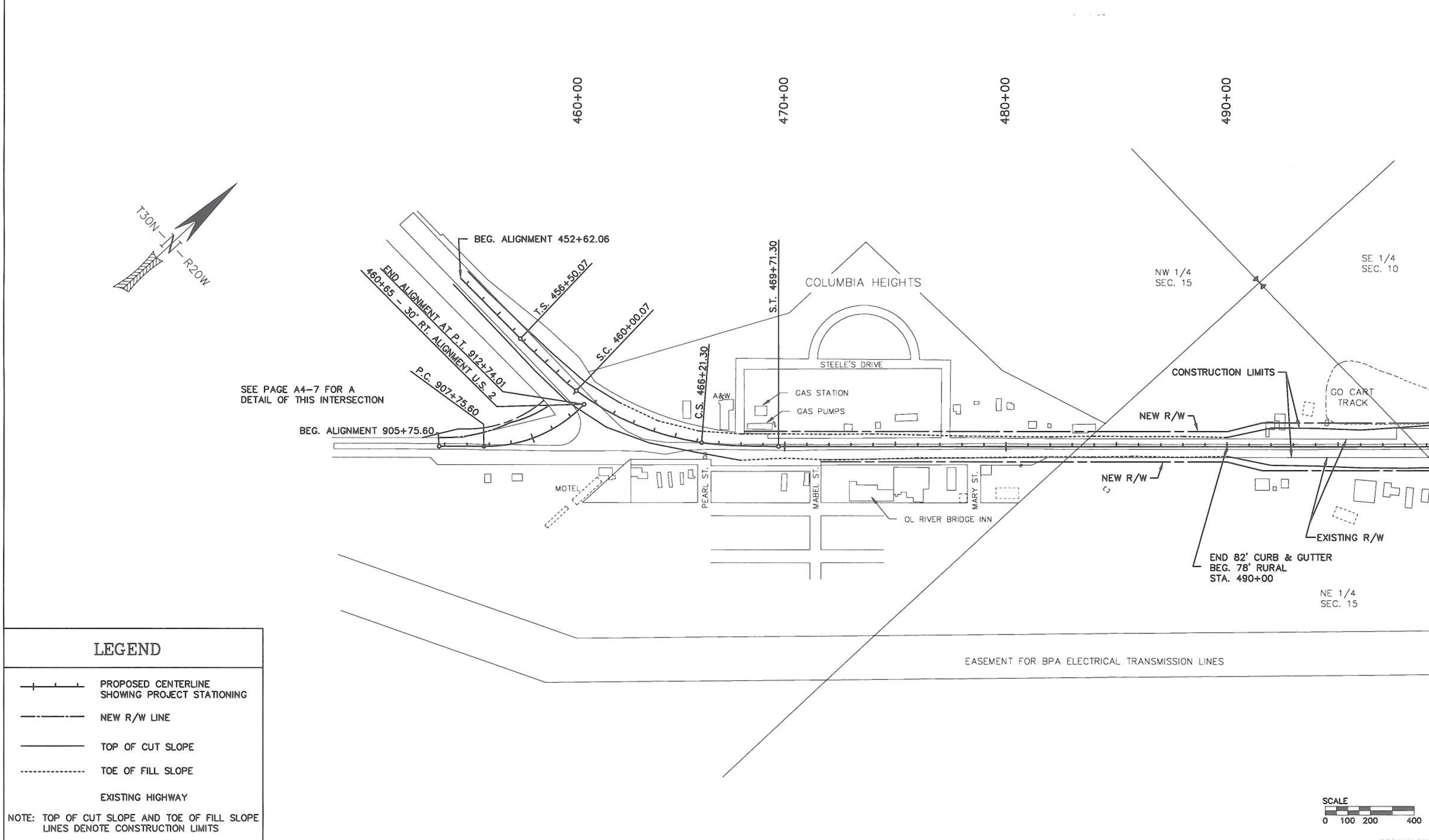
Appendix 4: Preliminary Layout of the Preferred Alternative

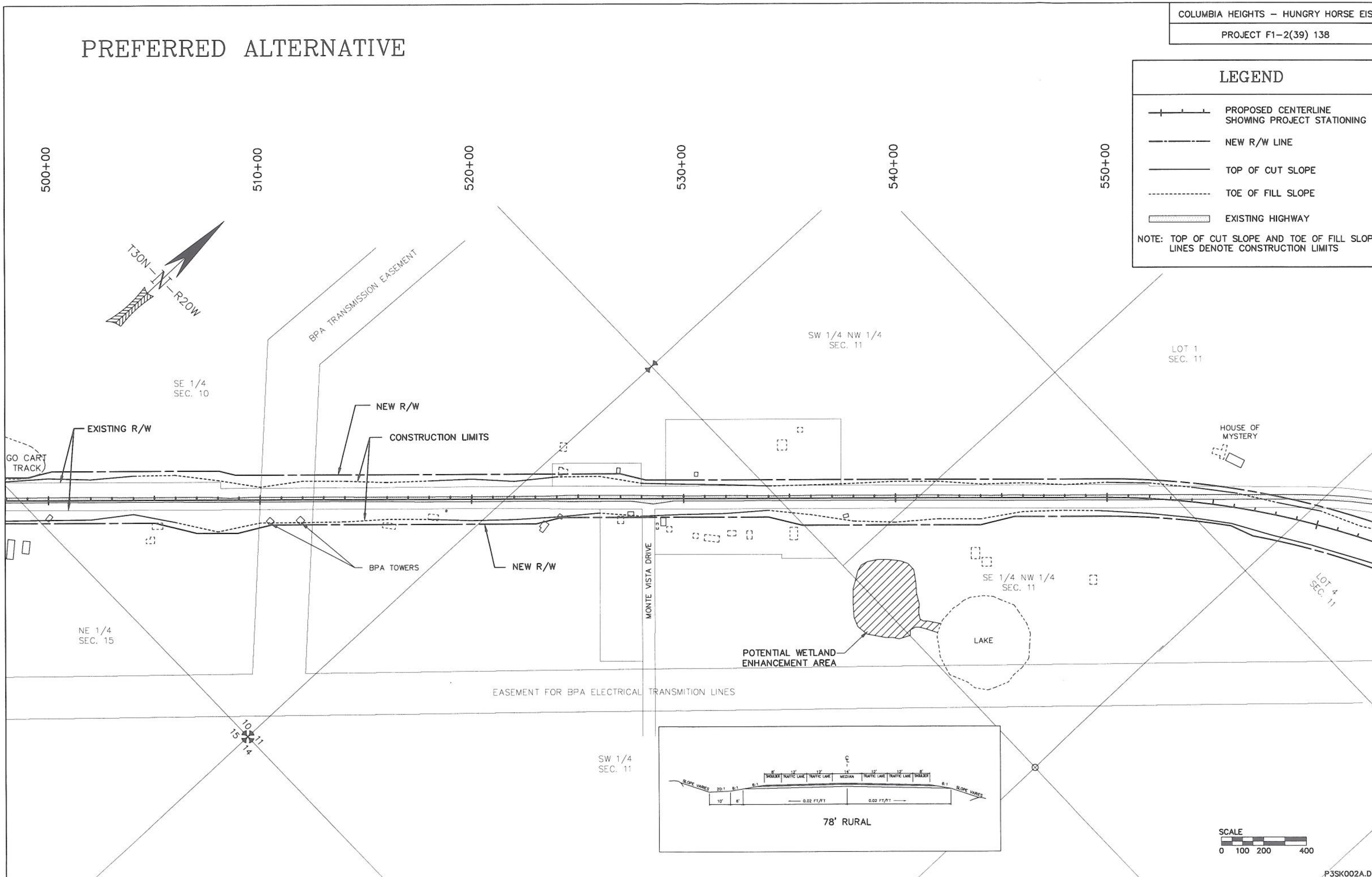
This appendix contains preliminary design and right-of-way drawings for Alternative 1, **the** preferred alternative for the proposed action. The preliminary designs were developed to this level of detail so that the costs and environmental impacts could be readily determined. Please note that these drawings were developed solely for the purposes of the EIS and are not intended to be the final design for the proposed action.

The following drawings are included in this appendix:

- **Plan drawings showing the land divisions, proposed centerline, project stationing, approximate construction limits, existing and proposed right-of-way lines, the current location of US 2, structures, and other project area features. These plan sheets are presented on pages A4-2 through A4-5.**
- **A drawing showing the proposed vertical alignment (centerline profile) of the new highway. This drawing, presented on page A4-6, shows the elevation of the proposed highway at its centerline location relative to the existing terrain.**
- **A detailed plan sheet showing the proposed layout of the US 2/FAS 206 intersection at Columbia Heights. This drawing is presented on page A4-7.**

PROPOSED LAYOUT OF PREFERRED ALTERNATIVE





COLUMBIA HEIGHTS – HUNGRY HORSE EIS
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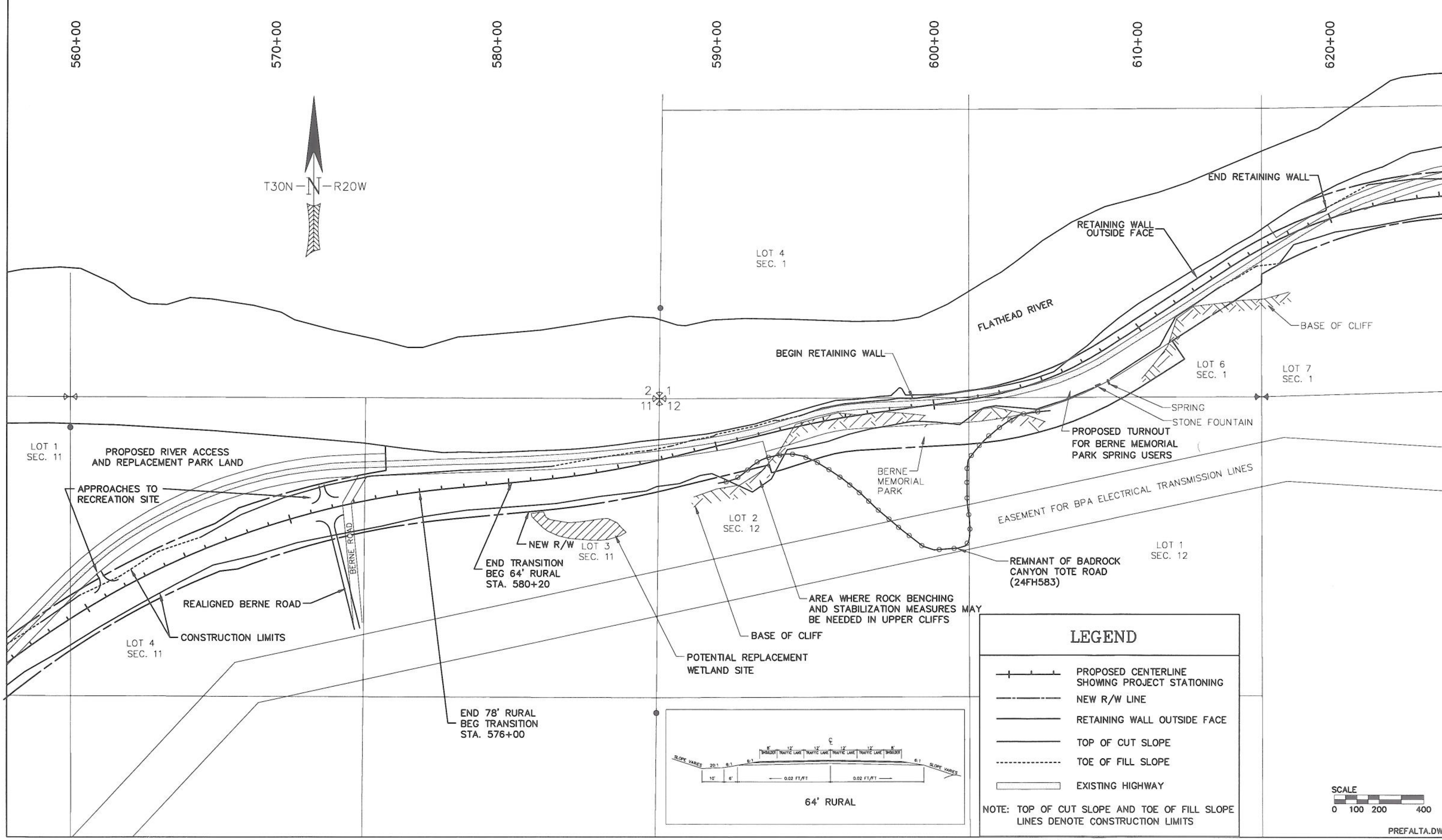
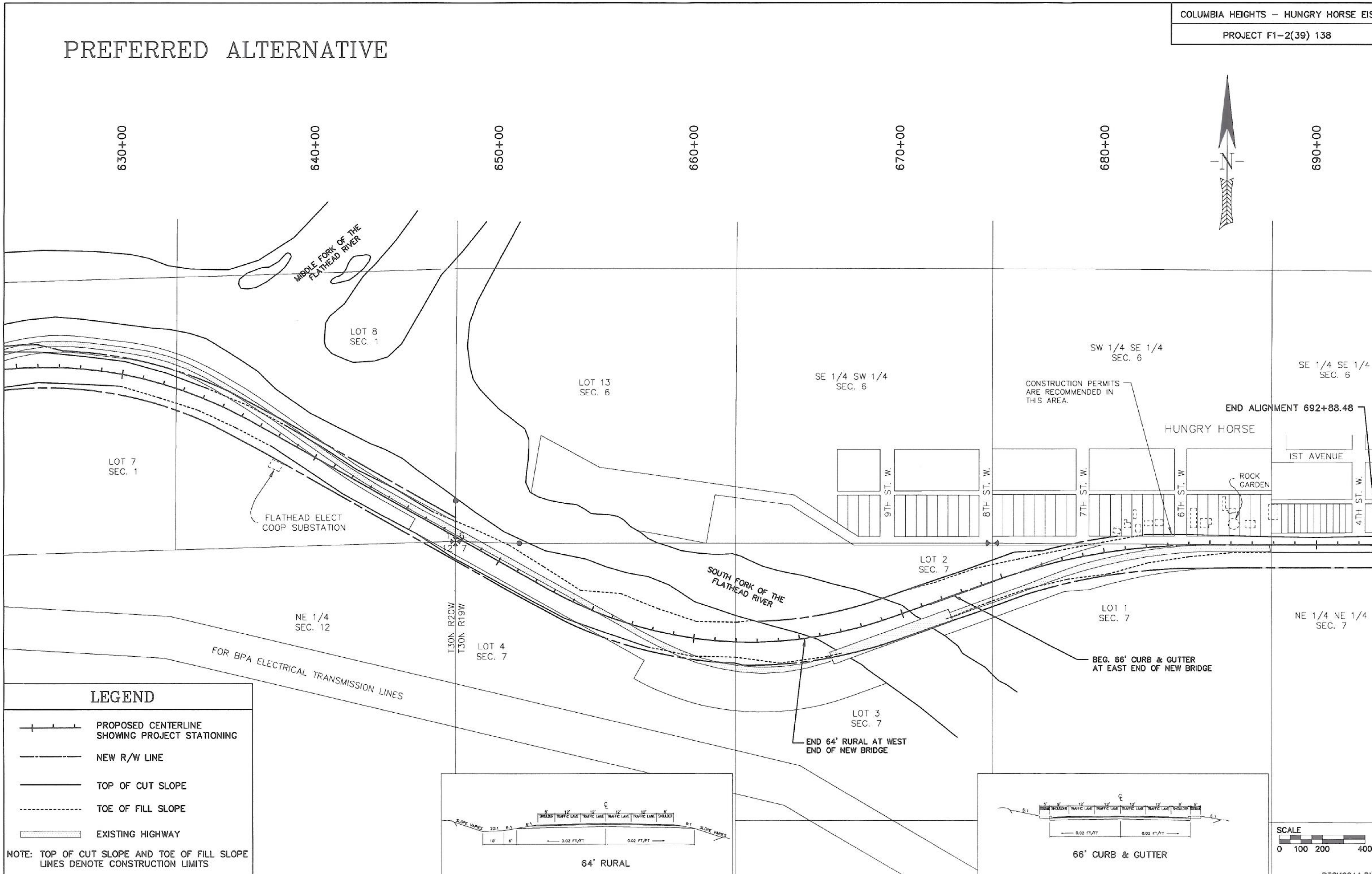
PREFERRED ALTERNATIVE
LEGEND
PROPOSED CENTERLINE SHOWING PROJECT STATIONING
NEW R/W LINE
TOP OF CUT SLOPE
TOE OF FILL SLOPE
EXISTING HIGHWAY
NOTE: TOP OF CUT SLOPE AND TOE OF FILL SLOPE LINES DENOTE CONSTRUCTION LIMITS
500+00
510+00
520+00
530+00
540+00
550+00
T30N
N
R20W
BPA TRANSMISSION EASEMENT
SW 1/4 NW 1/4 SEC. 11
LOT 1 SEC. 11
SE 1/4 SEC. 10
NEW R/W
EXISTING R/W
CONSTRUCTION LIMITS
GO CART TRACK
HOUSE OF MYSTERY
BPA TOWERS
NEW R/W
MONTE VISTA DRIVE
SE 1/4 NW 1/4 SEC. 11
LOT 4 SEC. 11
NE 1/4 SEC. 15
LAKE
POTENTIAL WETLAND ENHANCEMENT AREA
EASEMENT FOR BPA ELECTRICAL TRANSMITION LINES
10
11
15
14
SW 1/4 SEC. 11
78' RURAL
SCALE
0 100 200 400
P3SK002A.DWG

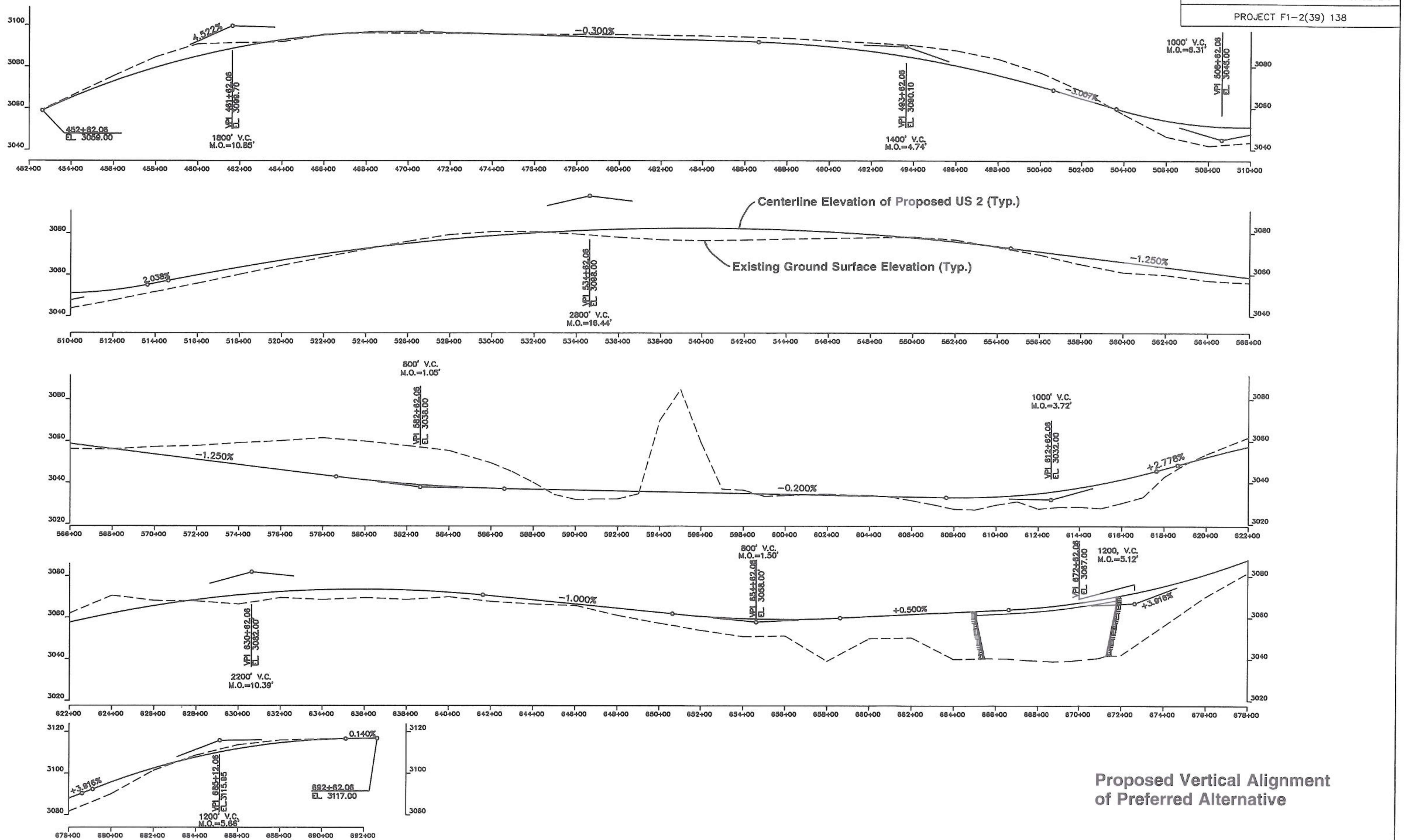
PREFERRED ALTERNATIVE

COLUMBIA HEIGHTS – HUNGRY HORSE EIS
PROJECT F1-2(39) 138

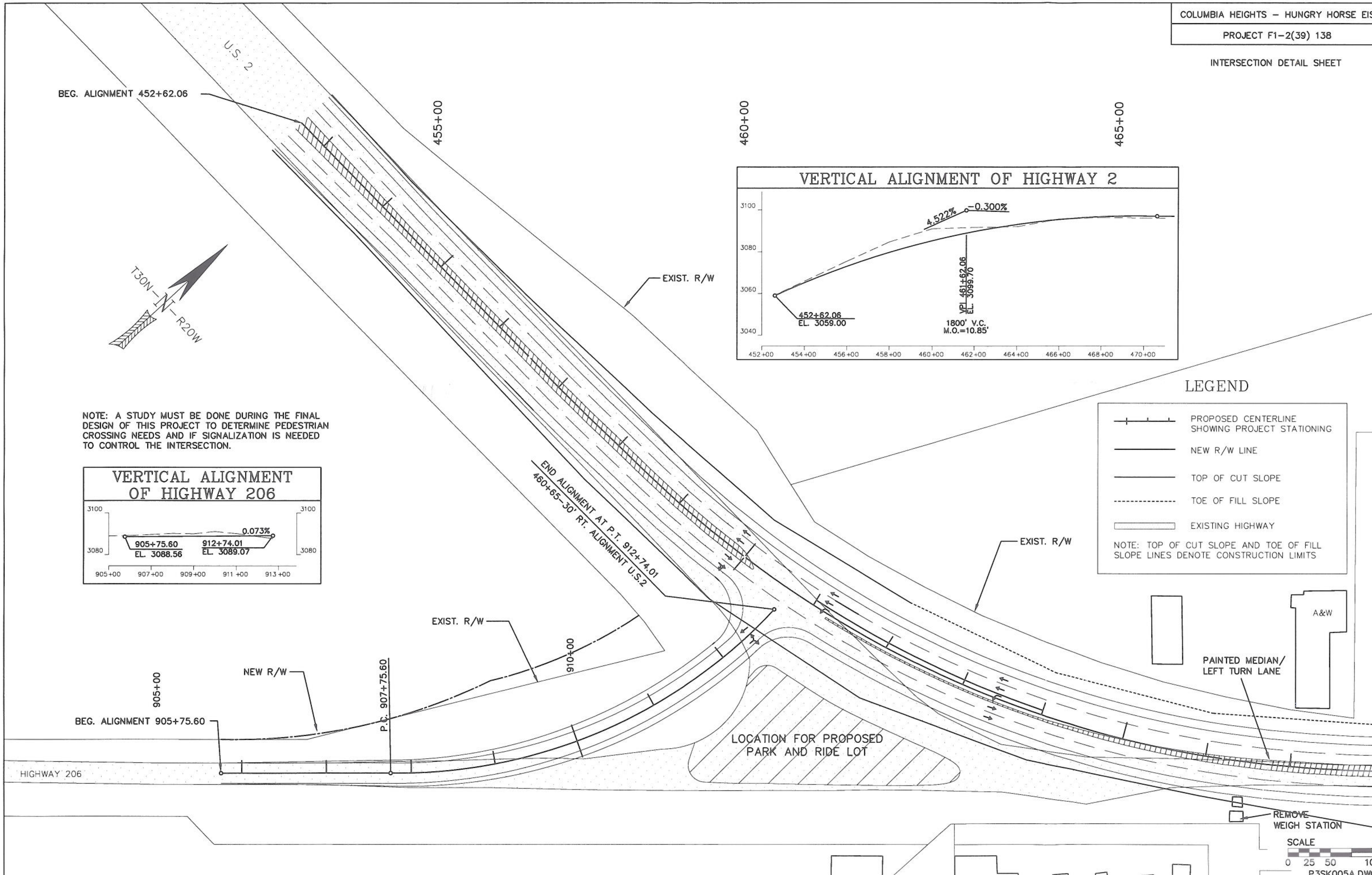




COLUMBIA HEIGHTS – HUNGRY HORSE EIS
PROJECT F1-2(39) 138
PREFERRED ALTERNATIVE
630+00
640+00
650+00
660+00
670+00
680+00
690+00
N
MIDDLE FORK OF THE FLATHEAD RIVER
LOT 8 SEC. 1
LOT 7 SEC. 1
LOT 13 SEC. 6
SE 1/4 SW 1/4 SEC. 6
SW 1/4 SE 1/4 SEC. 6
SE 1/4 SE 1/4 SEC. 6
CONSTRUCTION PERMITS ARE RECOMMENDED IN THIS AREA.
END ALIGNMENT 692+88.48
HUNGRY HORSE
IST AVENUE
ROCK GARDEN
9TH ST. W.
8TH ST. W.
7TH ST. W.
6TH ST. W.
4TH ST. W.
FLATHEAD ELECT COOP SUBSTATION
SOUTH FORK OF THE FLATHEAD RIVER
LOT 2 SEC. 7
LOT 1 SEC. 7
NE 1/4 NE 1/4 SEC. 7
NE 1/4 SEC. 12
T30N R20W
T30N R19W
LOT 4 SEC. 7
LOT 3 SEC. 7
FOR BPA ELECTRICAL TRANSMISSION LINES
BEG. 66' CURB & GUTTER AT EAST END OF NEW BRIDGE
END 64' RURAL AT WEST END OF NEW BRIDGE
LEGEND
PROPOSED CENTERLINE SHOWING PROJECT STATIONING
NEW R/W LINE
TOP OF CUT SLOPE
TOE OF FILL SLOPE
EXISTING HIGHWAY
NOTE: TOP OF CUT SLOPE AND TOE OF FILL SLOPE LINES DENOTE CONSTRUCTION LIMITS
64' RURAL
66' CURB & GUTTER
SCALE
0 100 200 400
P3SK004A.DWG



Proposed Vertical Alignment of Preferred Alternative


COLUMBIA HEIGHTS – HUNGRY HORSE EIS
PROJECT F1–2(39) 138
INTERSECTION DETAIL SHEET
U.S. 2
BEG. ALIGNMENT 452+62.06
455+00
460+00
465+00
T30N
N
R20W
VERTICAL ALIGNMENT OF HIGHWAY 2
3100
3080
3060
3040
4.522%
–0.300%
VPI 461+62.06
EL. 3099.70
452+62.06
EL. 3059.00
1800' V.C.
M.O.=10.85'
452+00
454+00
456+00
458+00
460+00
462+00
464+00
466+00
468+00
470+00
EXIST. R/W
LEGEND
PROPOSED CENTERLINE SHOWING PROJECT STATIONING
NEW R/W LINE
TOP OF CUT SLOPE
TOE OF FILL SLOPE
EXISTING HIGHWAY
NOTE: TOP OF CUT SLOPE AND TOE OF FILL SLOPE LINES DENOTE CONSTRUCTION LIMITS
NOTE: A STUDY MUST BE DONE DURING THE FINAL DESIGN OF THIS PROJECT TO DETERMINE PEDESTRIAN CROSSING NEEDS AND IF SIGNALIZATION IS NEEDED TO CONTROL THE INTERSECTION.
VERTICAL ALIGNMENT OF HIGHWAY 206
3100
3080
0.073%
905+75.60
EL. 3088.56
912+74.01
EL. 3089.07
905+00
907+00
909+00
911+00
913+00
END ALIGNMENT AT P.T. 912+74.01
460+65–30' RT. ALIGNMENT U.S.2
EXIST. R/W
A&W
PAINTED MEDIAN/
LEFT TURN LANE
910+00
NEW R/W
905+00
P.C. 907+75.60
BEG. ALIGNMENT 905+75.60
HIGHWAY 206
LOCATION FOR PROPOSED
PARK AND RIDE LOT
REMOVE
WEIGH STATION
SCALE
0 25 50 100
P3SK005A.DWG

Appendix 5: Existing Water Quality and Aquatic Ecosystem Information for the Flathead River

A. CHARACTERISTICS OF WATER QUALITY IN THE PROJECT AREA

Much of the information presented in this appendix was compiled from the *Water Quality and Quantity Committee Technical Report* (Flathead River International Study Board, 1987) and from the *Flathead River Basin Environmental Impact Study Final Report* prepared for the Flathead Basin Environmental Impact Study Steering Committee in 1983.

1. Existing Water Quality Parameters

TABLE A5-1 summarizes a variety of water quality parameters for the mainstem of the Flathead River at Columbia Falls. The text that follows provides more detailed explanations of these and other parameters that are commonly used to evaluate the quality of surface waters.

a. Salinity

Waters in the project area generally contain levels of total dissolved solids are generally less than 100 milligrams per liter (mg/L). Water with measured levels of total dissolved solids below 1,000 mg/L are considered to be fresh.

b. Water Chemistry

Major Dissolved Constituents - The mineral constituents of soils and rocks enter solution in the form of electrically charged atoms or groups of atoms called ions. Major dissolved constituents with positively charged ions consist of calcium, magnesium, sodium, and potassium. Negatively charged ions include bicarbonate, carbonate, sulfates, and chlorides. Silica is another major dissolved constituent found in Flathead waters. Collectively, these constituents are referred to as total dissolved solids (TDS).

The chemical composition of waters in the Flathead River system is generally dictated by the geology of the drainage basins that various segments of the system flow through. The watersheds of the main stem and the South Fork of the Flathead River located in the vicinity of the proposed project are underlain by Precambrian Belt series formations of argillites, dolomites, quartzites, and limestones more than 600 million years old. These formations are resistant to weathering and erosion and add very low concentrations of dissolved solids to the river system.

Calcium represents about 70% of the positively charged ions in Flathead waters, reflecting the dominance of limestone formations in the region. Magnesium ions from dolomitic limestones, make up the remainder of positive ions. Only small amounts of dissolved sodium and potassium are present. The dominant negative ion in solution is bicarbonate, which is produced by chemical reactions between carbonate ions dissolved from limestones and carbon dioxide gas and water.

Concentrations of dissolved solids, including calcium, bicarbonate, and other common ions, decrease during runoff periods because rainwater or snowmelt have little time to dissolve minerals from soils and rocks before entering the river system.

Information for the Flathead River near Columbia Falls shows that water is low in dissolved minerals.

TABLE A5-1
SUMMARY OF SELECTED WATER QUALITY PARAMETERS FOR THE FLATHEAD RIVER

Parameters (Units)	Mainstem Flathead at Columbia Falls
1. Suspended Sediment (tons/yr) Sediment Distribution: Clay (10-25%) Silt (63-70%) Sand (12-30%)	1,275,840 tons/yr
2. Turbidity (Nephelometric Turbidity Units)	Min = 1.0-10.0 NTU Max = 170 NTU
3. Temperature (°F) Mean Monthly (Oct.-May) Minimum Maximum	 Less than 45°F 32°F 64°F
4. Hydrogen Ion Concentration (pH)	7.5-7.9 (Slightly Basic)
5. Dissolved Oxygen (milligrams/litre)	8.4-13.4 mg/l
6. Alkalinity and Hardness (milligrams/litre)	72(June)-91(Mar.)mg/L (Moderately Hard)
7. Total Dissolved Solids (milligrams/litre)	Less than 100 mg/L (Avg.)
8. Conductivity (micromhos/centimeter)	150-200 µmho/cm (mean Monthly)
9. Metals (Selected-micrograms/litre) Aluminum Arsenic Cadmium Chromium Iron (milligrams/litre) Lead (dissolved) Mercury Silver Zinc	 <400 µg/L 1.1 µg/L (Avg.) 1.1 µg/L (Mean) 5.0 µg/L (Mean) 0.18 MG/L (Avg.) 2.1 µg/L (Mean) 0.1 µg/L (Mean) 0.68 µg/L (Mean) 11.2 µg/L

Source: Flathead River International Study Board, *Water Quality and Quantity Committee Technical Report*, 1987.

Limited information shows that TDS is generally less that 100 mg/L. Bicarbonate is the dominant negatively charged ion and calcium and magnesium are the major positively charged ions found in the water at this location. Other ions are present in concentrations of 10 mg/L or less, with sulfates concentrations being somewhat higher than chloride and sodium. Dissolved silica is typically in the 4 to 8 mg/L range.

Hydrogen Ion Concentration (pH) - The pH of water is a measure of its reactive characteristics. Low pH values (below 4), indicate a corrosive water that tends to dissolve metals and other substances it contacts. High values of pH (above 8.5) indicate an alkaline water that upon heating will tend to form scale. A pH value of 7 is considered neutral. Below this point, water would be considered acidic. Water would be considered basic at levels above a pH of 7.

Monthly means of field-measured pH ranged from 7.5 in December to 7.9 in August. Sampling extremes of 6.9 and 8.5 have been recorded on the Flathead River at Columbia Falls. A comparison of similar data indicates that the Flathead River at Columbia Falls is less basic than at upstream locations. Studies of waters in the Flathead River system do not indicate any seasonal or geographical trends in pH levels.

Alkalinity and Hardness - As indicated above, bicarbonate is the predominant negative ion in solution found in the Flathead River near Columbia Falls. Bicarbonate solutions have the ability to neutralize acids and serve as a natural "buffer" system for the aquatic ecosystem. They provide temporary protection for the ecosystem from some forms of pollution like acid precipitation or acid mine drainage. This buffering capacity is measured as alkalinity.

Hardness is caused by calcium and magnesium dissolved in the water. Standard classifications of hardness indicate water with $CaCO_3$ levels ranging from 0 to 60 is considered to be soft; from 61 to 120 is considered to be moderately hard; from 121 to 180 is considered to be hard; and above 180 is considered very hard. Hardness is often nearly the same magnitude as alkalinity.

Data for the Flathead River at Columbia Falls shows that the monthly mean values of alkalinity range from 72 mg/L in June to 91 mg/L in March. Minimum values of about 60 mg/L have been recorded during high precipitation events or snowmelt periods when river levels may increase notably. Mean monthly values for hardness are between 89 and 98 mg/L from August through March suggesting that the water is almost always moderately hard.

c. Suspended Sediments

Sediments in a waterbody come from three major sources including sediments from overland flow, sediments from eroded streambeds, and sediments from eroded streambanks. Streams transport sediments by rolling materials along the streambed, by bouncing particles causing others to be released into the flow, by mechanical suspension, and through chemical solution. The first three methods of sediment transport are dependent upon the velocity of flow.

Data on the concentrations and size distribution of sediments in the Flathead River at Columbia Falls has been collected by the U.S. Geological Survey. This data shows that during low flows, sediment concentrations range from 1.0 mg/L to 15.0 mg/L. During high flows, concentrations to 980 mg/L (equivalent to about one pound of sediment per 100 gallons of water) have been measured at this location. Sampling during June in two different calendar years (presumably when stream flows were quite high) showed that silts accounted for between 53 and 71% of the suspended sediment in the river at this location. The clay and sand fraction of suspended sediments accounted for 23 to 28% and 6 to 19%, respectively.

The average total suspended sediment load in the Flathead River at Columbia Falls is estimated to be about 1.3 million tons per year.

d. Clarity (Turbidity)

The clarity of water is related to the amount of particulate matter suspended in the water. Clarity. Turbidity is an indicator of the extent to which the penetration of light is inhibited by particulates in the water. Because light penetration depends on the scattering properties of suspended matter, turbidity relates to the concentration and size of particles in the water. Measurements of turbidity are expressed in terms of

Nephelometric Turbidity Units (NTU).

Turbidity, thus water clarity, varies by season depending suspended sediment concentrations. Water clarity would be expected to be highest during periods of base flow conditions from late summer and through the fall and winter months. Water clarity is lowest during snowmelt periods and spring runoff and for short periods following high precipitation events in the summer or fall.

The mean turbidity values for the Flathead River near Columbia Falls are generally higher than those for upstream locations. The minimum values for all months range between 1.0 and 10.0 NTU. The maximum recorded value for this location is 170 NTU. For reference, a turbidity rating of 8 to 10 NTU means there is a visible muddiness or that the water is slightly milky in color.

e. Color

Many of the colors associated with water are not true color but the result of the suspension of particles. Most true colors result from dissolved materials, primarily organics. Most colors in natural waters result from dissolved tannins extracted from decaying plant materials which imparts a slightly brownish tint.

The color of the water in the Flathead River system is generally dependent upon the level of suspended sediments present. During base flow conditions, the amount of sediment in the river system is typically low (between 1 and 2 mg/L). This concentration is indicative of extremely clear water. The most notable change in the color of waters in the large segments of the Flathead River system occurs during spring runoff when these waters turn a milky color. This change in color occurs because upstream erosion of tertiary sediments along the North and Middle Forks and their tributaries increases sediment loads to about 10 mg/L.

f. Odor

Odors associated with water usually result from the presence of decaying organic matter or the reduction of sulfates by bacteria to hydrogen sulfide gas. Water in the Flathead River near the project area is not known to have a distinctive odor. Some odors may be associated with the contained waters of some project area wetlands where higher amounts of organic material exists.

g. Taste

No specific assessments of the taste of water from the Flathead River within the project area was available. In the absence of subjective information on taste, measured levels of chemical constituents like iron, manganese, sulfates, chlorides, nitrates, and total dissolved solids were reviewed and compared against drinking water standards because high concentrations of these constituents can adversely influence the taste of water. This review did not indicate high concentrations of constituents that can affect the taste of water in the Flathead River system.

h. Dissolved Gas Levels

Data reviewed for this analysis indicates that waters of the Flathead River system are all well oxygenated throughout most of the year. This can be attributed to the limited amounts of decomposing plant materials, cool water temperatures, and stream turbulence. Measurements of dissolved oxygen in the Flathead River at Columbia Falls are within 7 percent of saturation, with concentrations ranging from 8.4 mg/l in July to 13.4 mg/l in March.

i. Nutrients

Nutrients are elements or compounds essential as raw materials for organism growth and development. Nutrients that may be found in water include phosphorus, nitrogen, organic carbon, sulfur, magnesium, calcium, potassium, and sodium. Waters of the Flathead River system generally contain very low amounts of the major plant growth nutrients, nitrogen and phosphorus.

Nitrogen and phosphorus concentrations are of concern because these elements are usually considered the nutrients that limit the growth of plants. Because low amounts of these nutrients are generally present in the waters of the Flathead River system, abnormal inputs of nitrogen and phosphorus could stimulate algae growth and cause secondary impacts to the aquatic food web through the process of eutrophication.

When phosphorus or nitrogen levels increase (with all other factors remaining constant), more plant growth usually occurs. In addition to large crops of plants, these highly productive waters may also contain large amounts of decaying matter, large numbers of bacteria, and low dissolved oxygen. Increased plant growth may also result in decreases water clarity, a condition indicative of a decrease in water quality. As water clarity decreases, noxious plants may flourish, and fish tolerant of warmer water with less oxygen may become the predominant species. As levels of suspended sediments in the water increase, additional nutrients are also present in the water. This situation "naturally" occurs during periods of high runoff in the Flathead River basin.

In waters of the Flathead River system, dissolved forms of inorganic nitrogen (NH_3, NO_2, and NO_3) and soluble reactive phosphorus (SRP) are readily used by living species. Measures of total nitrogen (TN) and total phosphorus (TP) include organic and inorganic particles suspended in the water and soluble forms. Organic nitrogen in both particulate and dissolved phases is measured as total Kjeldahl nitrogen (TKN).

The Environmental Protection Agency recommends that total phosphate as phosphorus not exceed 0.025 mg/L (25 µg/L) to prevent eutrophication of lakes and reservoirs. The also recommend an upper limit of 0.050 mg/L (50 µg/L) total phosphate as phosphorus for all streams entering lakes or reservoirs. Researchers also recommend nitrate concentrations of less than 0.30 mg/L (300 µg/L) to prevent eutrophication of lakes and reservoirs. These recommended values can be compared to the monitored values for selected locations on the Flathead River system nearest to the project area and for Flathead Lake presented in TABLE A5-2. The table provides information on the existing concentrations of phosphorus and nitrogen forms.

Phosphorus - Significant amounts of phosphorus are contained in the sedimentary bedrock that underlies the Flathead region. Although phosphorus is prevalent in these base rocks, most is found in complex mineral constituents and does not readily dissolve into the river system. Research has shown that the primary sources of phosphorus are decomposed organic matter (sewage), phosphorus compounds stored on sediments, and phosphorus that falls from the air combined with dust and precipitation.

Phosphorus concentrations may increase sharply during spring runoff when unconsolidated materials bordering the rivers are eroded and carried downstream. Phosphorus levels in the Flathead River system show a correlation with water discharge and suspended sediments. Generally, as more water flows in the system, levels of suspended sediments and phosphorus (which is attached to sediment particles) increases.

As TABLE A5-2 shows, the mean level of TP for the Flathead River near Columbia Falls was found to be 17.31 µg/L, considerably below the recommended level of 50 µg/L for streams supplying lakes and reservoirs. The maximum values of TP and TKN generally reflect periods of high volume flows in the river while the lowest values are indicative of low flow conditions.

Nitrogen - Concentrations of nitrogen, also an important nutrient for plants, are generally low in the

Flathead River system. Nitrogen compounds enter the water from decomposing plants and animal materials in the stream and on adjacent lands. Inputs of nitrogen generally originate from the same sources as phosphorus. There is also a variety of forms of nitrogen ranging from that incorporated into organic particles, compounds of ammonia that are in the process of being degraded, and nitrates, the fully oxidized and stable nitrogen compounds found in most water. Nitrates are easily leached to the groundwater. Streams in forested drainage basins typically have nitrate concentrations of about 0.1 mg/L (100 µg/L).

According to the *Flathead Basin Commission 1991-1992 Biennial Report* (1993), researchers have found that nitrogen concentrations do not vary in a consistent manner when either discharge volumes or suspended sediment yields increase or decrease. Researchers contend that the lack of correlation is due to the high solubility of nitrogen.

A slightly different observation on the variability of nitrate level was made in the *Water Quality and Quantity Committee Technical Report* published by the Flathead River International Study Board in 1987. This report indicates that nitrate concentrations at some monitoring sites in the Flathead River Basin fluctuated slightly by flow or season and noted that nitrates in rivers may be 3 to 5 times more concentrated at some monitoring locations following periods of heavy rain or rapid snowmelt. Research incorporated into the report suggests that this variation may be related to flushing of groundwater reservoirs or to increased erosion.

As shown in TABLE A5-2, recorded levels of nitrate in the Flathead River near Columbia Falls have not historically approached the 300 µg/L level which may contribute to the eutrophication of lakes and reservoirs.

Organic Carbon - This substance is derived from plant and animal materials and occurs in both particle and dissolved form in the river system. Particulate organic carbon, which is indicative of instream plant productivity, generally occurs in low concentrations in the Flathead River system. This material also serves as the primary food for many species of aquatic insects.

Dissolved organic carbon comprises about 80% of the organic carbon load in the Flathead River system and enters surface waters through the flow of groundwater. Because organic compounds dissolve rapidly through contact with water, concentrations of dissolved organic carbon increase during the periods of snowmelt or during high runoff conditions.

j. Eutrophication

Eutrophication is a process by which a contained water body becomes enriched with nutrients. The term usually refers to the process of maturation of a lake from nutrient-poor to a nutrient-rich body of water. The process of eutrophication occurs naturally over long periods (geologic time) or may occur as a result of man-caused changes over relatively short periods (decades).

Natural eutrophication is initiated by rivers transporting sediments eroded from the drainage basin into a lake. As the lake fills over a period of up to several thousand years, it becomes shallower, warmer, and more productive for plant growth which increases the organic content. Eventually, the continued inflow of sediments transforms the lake into a pond and ultimately a marsh. The process concludes when combination of organic materials and sediments completely fill in the lake. Man-caused eutrophication typically begins when nutrients derived from sewage, detergents, fertilizers, or other discharges enter the water and stimulate the growth of aquatic plants and algae. Levels of total phosphorus and nitrates that may stimulate the rate of eutrophication were described previously.

According to the *Flathead River Basin Environmental Impact Study Final Report* (1983), Flathead Lake is classified as an oligo-mesotrophic lake meaning the water body is relatively unproductive. Oligotrophic lakes

TABLE A5-2
CONCENTRATIONS OF PHOSPHORUS AND NITROGEN FORMS
SELECTED LOCATIONS IN THE FLATHEAD RIVER BASIN (µg/L as N or P)

Variable	Flathead River Near Columbia Falls			Flathead River Near Holt (Near North Shore of Lake)			Flathead Lake at Midlake		
	Mean	Minimum	Maximum	Mean	Minimum	Maximum	Mean	Minimum	Maximum
Total Phosphorus (TP)	17.31	2.00	151.00	19.44	3.00	276.00	5.43	2.90	14.08
Soluble Phosphorus (SP)	3.38	1.25	9.30	4.21	1.00	10.80	2.29	1.00	4.65
Soluble Reactive Phosphorus (SRP)	1.48	1.00	7.60	2.29	1.00	18.90	1.01	1.00	1.23
Nitrate (NO_3)	29.00	10.00	81.00	69.06	10.00	142.00	35.37	5.33	106.90
Nitrite (NO_2)	0.39	0.20	1.00	0.88	0.20	5.40	0.63	0.20	1.90
Ammonium (NH_3)	6.14	5.00	13.00	6.78	5.00	14.00	5.61	5.00	7.33
Total Kjeldahl Nitrogen (TKN)	131.17	43.00	494.00	88.25	20.00	236.00	74.76	24.00	200.09

Source: *Water Quality and Quantity Committee Technical Report* (Flathead River International Study Board, 1987).

are typically low in nutrients and productivity and have clear cold waters with high concentrations of dissolved oxygen. Mesotrophic lakes have characteristics that range between those of oligotrophic lakes and eutrophic lakes. The intermediate classification indicates that Flathead Lake is more productive than typical oligotrophic lakes. Research has shown that man's activities in and around Flathead Lake have contributed nutrients and increased its productivity.

k. Water Temperature

Streams in the Flathead River system have a predictable annual temperature regime that generally corresponds to seasonal patterns of flow volumes and air temperatures.

Average monthly temperature for the Flathead River at Columbia Falls are less than 45° F from October through May, reaching an annual low of about 36° F in February. The maximum monthly average of 54° F occurs in July. Extremes in river temperature at this location range from near 32° F in winter to 64° F in August.

Water discharged into the South Fork by Hungry Horse Dam is drawn from as deep as 250 feet below the reservoir surface at full pool. This water is generally insulated from the effects of solar heating and radiational cooling and remains at between 37-45° F throughout the year. The annual average temperatures on the South Fork are cooler than on unregulated waters of the Flathead River system, although the South Fork does experience higher winter temperatures and its surface does not freeze.

l. Metals

Most metals measured are present in very low concentrations in the Flathead River Basin. Levels of metals of possible concern in the Flathead River at Columbia Falls are shown in TABLE A5-1.

m. Microbiology

According to the *Flathead Basin Commission 1991-1992 Biennial Report*, researchers found low fecal coliform and fecal strep bacteria counts in the major tributaries of the Flathead River system. The recorded counts were within permitted standards for swimming and floating. However, the water in the river system must be purified to be suitable for drinking.

2. Current Patterns and Circulation

a. Current Patterns, Drainage Patterns, Normal and Low Flows

Current patterns and drainage patterns relate to the physical movement of water through the aquatic ecosystem. These patterns correspond to natural forces such as the drainage basin shape and land cover, the geologic character of the area, and energy dissipating features and obstructions within the water course. Water flow provides an indication of the amount of water transported within the stream.

> **Current Patterns** - Specific information on current patterns in the Flathead River in Badrock Canyon and in the South Fork near Hungry Horse is not available.
>
> Fisherman's Rock, located near Berne Memorial Park in Badrock Canyon, is a prominent outcrop along the banks of the main stem of the Flathead River. This natural feature obstructs river flows and substantially reduces the width of the river channel at this location. River cross-sections taken at Fisherman's Rock show a notable increase in water depth this location suggestive of a deep pool and a localized change in current patterns.

Current patterns in the South Fork vary depending upon the power production cycle at Hungry Horse Dam. Currents in the South Fork are more turbulent during periods of power generation when flows are highest.

Drainage Patterns - The overall drainage pattern of the Flathead River system can be classified as dendritic having many consequent streams. Dendritic drainage patterns can be likened to the trunk and limbs of a tree. The geologic structure of the area influences the drainage pattern of area streams. The large tributaries of the Flathead River (North, Middle and South Forks) are 5th order streams and the main stem of the Flathead River system is the only 6th order stream in the Flathead River Basin.

The waters of the South Fork and main stem of the Flathead River have meandered considerably within valley bottoms over recent geologic time. The river segments within the area of the proposed action presently flow within relatively well defined channels and have not been subject to recent major changes in channel location.

Normal and Low Flows - Based on data collected since the completion of Hungry Horse Dam in the early 1950's, the average discharge for the Flathead River recording station at Columbia Falls is 10,200 cubic feet per second (cfs). The highest instantaneous flow on record for this station is 176,000 cfs which occurred on June 9, 1964. The lowest instantaneous flow on record for the station is 798 cfs which occurred in December, 1929. Since the completion of Hungry Horse Dam, peak flows at the Columbia Falls recording station have been reduced and low flows (September through March) have been increased.

Power production at Hungry Horse Dam on the South Fork reaches its peak when flow releases of 11,500 cfs occur. During periods when water is stored and no electricity is generated, flow releases into the South Fork are about 150 cfs.

b. Velocity

Specific information on the velocity of flows in the Flathead River in Badrock Canyon and in the South Fork near Hungry Horse is not available. Calculations based on hydraulic modeling for the section of the Flathead River in the project area show that velocities of about 9 feet per second may occur during high water conditions.

c. Stratification

Specific information on the stratification of waters in the Flathead River in Badrock Canyon and in the South Fork near Hungry Horse is not available.

d. Hydrologic Regime

Streamflows in the Flathead River system are at their lowest level at the beginning of the year when cold weather halts snowmelt and freezes some surface waters. Groundwater flows feed the river system during this period. The relatively stable groundwater discharge constitutes the base flow volume of Flathead River system.

Moderating temperatures during the spring melt accumulations of winter snow and cause streamflows to increase. Most meltwater seeps into the groundwater before being discharged into surface streams. The overland flow of snowmelt runoff generally contributes only a minor share of stream volumes in the Flathead drainage.

The advent of warm weather coupled with periods of rain is responsible for rapid increases in stream levels from April through mid-May. Peak flows may be more than ten times the average flow in some tributaries of the Flathead River system. High flow periods usually persist for four to six weeks and have usually tapered off by mid-June.

Streamflows decrease steadily throughout the summer as snowpack at higher elevations shrinks and groundwater flows in to Flathead River tributaries is reduced. Periodic late-summer and autumn rains cause temporary increases in stream flows, but base flow conditions are usually re-established by October and persist through the winter months.

e. Aquifer Recharge

The primary aquifer tapped for water within the Flathead Valley from Columbia Falls to Flathead Lake is the large floodplain aquifer that exists beneath the Flathead River valley floor. This deep bed of gravel and sand supplies many wells and has a storage capacity estimated at 55 billion gallons. The primary source of recharge for this aquifer is annual precipitation, infiltration from the flow of surface waters, and a percolation of unused irrigation waters.

Deep artesian aquifers also underlie much of the Flathead Valley and consist of unconsolidated sand and gravel beds beneath impermeable glacial deposits. Recharge of these aquifers occurs primarily by precipitation and snowmelt runoff. The recharge areas for the artesian aquifers is located on the east side of the valley along the mountain fronts where aquifers are closer to the surface.

Bedrock aquifers are also important groundwater sources in many mountainous or hilly portions of the Flathead Valley. These aquifers consist of water trapped within the faults and fractures of Precambrian rocks. The storage volume of these aquifers is small and yields generally meet only domestic needs.

3. Normal Water Level Fluctuations

Normal water fluctuations in the Flathead River aquatic system in the vicinity of the proposed action include daily and seasonal fluctuations in water levels.

Seasonally, water levels are highest in the Flathead River system when rapid snowmelt and spring runoff occurs from April through mid-June. Water levels are lowest during base flow conditions which generally occur from October through the winter months.

The water levels of the main stem and South Fork of the Flathead River in the project area also undergo daily fluctuations due to power generation at Hungry Horse Dam. The peaking regime associated with power production may result in water levels fluctuations of up to eight feet in the stretch of the South Fork below the dam and up to five feet in the main stem of the Flathead downstream from the confluence of the South Fork.

4. Salinity Gradients

Salinity gradients form where salt water from the ocean meets and mixes with fresh water from the land. This situation does not occur within the project area.

B. FLATHEAD RIVER SUBSTRATE NEAR THE PROJECT AREA

The substrate of the aquatic ecosystem underlies open waters in the project area and consists of organic and inorganic solid materials including water and other liquids that fill the spaces between solid particles. Stream substrates in the Flathead River system generally consist of an aggregation of fine sediments, sand, gravel, cobbles, and boulders. Tributary streams to the major rivers of the system have steep gradients and have a substrate comprised of boulders and cobbles since most fine sediments are transported downstream. Streams with more gentle gradients show higher percentages of gravel, sand, and fine sediments.

The materials contained in the substrate of project area streams are dependent upon the velocity of flows. Fine sediments are usually deposited in pools and along calm riverbank areas while gravel and cobbles are likely to be encountered beneath smooth flowing sections of river.

1. Substrate Characteristics

The substrate of the Flathead River below the confluence with the South Fork is influenced by both natural riverine cycles and regulated flow releases from Hungry Horse Dam. A substantial amount of suspended sediments and organic particulates during spring runoff and maintains a mix of substrate types characteristic of free-flowing waters in other sections of the Flathead River system.

The substrate of the South Fork of the Flathead River is markedly different than that of the main stem due to the effects of flows from Hungry Horse Dam. Since the operation of the dam, high flows have washed sediments and gravel from the stream bottom and the inflow of replacement materials from upstream sites has been isolated above Hungry Horse Reservoir. As a result, large cobbles and boulders now comprise the streambed of the South Fork and substrate materials have been compacted by the force of high water flows.

2. Substrate Elevation and Slope

The slope of the main stem of the Flathead River from its source to Columbia Falls is quite steep. The section of the main stem of the Flathead River between Badrock Canyon and Columbia Falls has a slope that averages 9.5 feet per mile. The reach between Columbia Falls and Kalispell has a slope that varies from 5 to 7 feet per mile. The streambed of the South Fork of the Flathead River near Hungry Horse is expected to similar or slightly steeper than that of the main stem between Badrock Canyon and Columbia Falls.

3. Erosion and Accretion Patterns

Erosion is the process in which land along a stream is gradually lost to river action and transported downstream. Accretion is the gradual addition of new land to old by the deposition of sediment carried by the water of a stream. The process of erosion and accretion is ongoing in the Flathead River system. The lands that exist in the project area immediately west of Badrock Canyon are old river terraces consisting of various depths of topsoil underlain by gravel deposits.

C. AQUATIC ECOSYSTEM IN THE PROJECT AREA

The aquatic ecosystem can be defined as an interdependent complex of physical elements, plants and animals which interact in an aquatic environment. The ecosystem includes both living and non-living elements. Where the previous text focused on non-living aspects of the aquatic ecosystem, the following sections address living elements of the aquatic ecosystem.

1. Plankton

Plankton are the organisms suspended in a body of water that because of their size or physical character are incapable of sustained mobility in directions opposing water currents. Plankton include phytoplankton (consisting mostly of algae) and zooplankton, which utilize phytoplankton for food and in turn are consumed by higher organisms like macroinvertebrate and fish species. According to materials compiled by the Biological Resources Committee of the Flathead River International Study, the rivers of the Flathead Basin above Flathead Lake are generally too small to develop a true plankton community. As a result, most baseline information compiled about plankton, focus on the associations of algae that live on stream bottoms (periphyton) rather than on suspended forms of phytoplankton. The amount of periphyton growth on stream bottoms is often used as a measure of river productivity.

2. Aquatic Invertebrates

Aquatic insects are the predominant form of invertebrates found in the Flathead River system. The system generally supports a diverse number of aquatic insects because of its wide variety and high quality of habitats for such species. Aquatic invertebrates constitute the bulk of the diet of many fish species in the Flathead River Basin. Research has identified more than one hundred species of aquatic insects in the North Fork, Middle Fork, and main stem of the Flathead River. The invertebrates found in the Flathead River system are characteristic of a clean, coldwater environment and consist primarily of caddisflies (*Trichoptera*), mayflies (*Ephemeroptera*), stoneflies (*Plecoptera*), and true flies (*Diptera*). Of the aquatic invertebrates found in project area waters, mayflies are the predominant species.

It is notable that the aquatic insect community in the lower South Fork of the Flathead is much less diverse than in other tributaries. Only seven species of stoneflies, five species of mayflies, and one species of caddisfly are believed to complete their lifecycles in South Fork below Hungry Horse Dam. The primary factor limiting insect diversity in the lower South Fork is the perennially cold water temperature due to releases from Hungry Horse Reservoir. The absence of fine sediments, an important habitat component, need for many invertebrates, also plays a role in limiting the number of species that exist in this river section. Midges and non-insect aquatic invertebrates like nematodes (roundworms), flatworms, and water mites are more abundant in the South Fork than in the main stem of the Flathead River.

3. Aquatic Vertebrates

Aquatic vertebrates are animals that have a spinal column and include mammals, birds, reptiles, amphibians, and fish. Bald eagles and fish in the Flathead River system are the vertebrate species of primary concern for this highway reconstruction project. The bald eagle, fish, and other vertebrates that exist within the project area discussed in Parts III and Part IV of the EIS.

4. Aquatic Food Web

The aquatic food web refers to a series of plant and animal species in a community, each of which is related to the next as a source of food in complex interactions. The aquatic food web of the Flathead River system originates with algae and fallen plant materials consumed by insects which in turn are consumed by fish.

The production of energy-containing compounds through photosynthesis by plants is called primary productivity. This process represents the initial means through which energy is incorporated into living tissue. Organisms lacking photosynthetic abilities consume plant materials or eat animals dependent upon plant production. The sequential transfer of energy between organisms forms a food web.

Measurements taken at locations throughout the Flathead River system indicates very low levels of primary productivity as compared to other river systems in temperate climates. Researchers attribute this low productivity to the natural shortage of phosphorus, a nutrient critical to plant growth. Natural disturbance of the stream bottom also keeps the amount of plant materials low in most streams of the Flathead River system. Sediments carried by runoff scours algae from exposed rock surfaces preventing the buildup of large amounts of plant material.

References Reviewed for Appendix 5

Flathead Basin Commission, *Flathead Basin Commission 1989-1990 Biennial Report*, 1991.

Flathead Basin Commission, *Flathead Basin Commission 1991-1992 Biennial Report*, February, 1993.

Flathead River International Study Board, *Biological Resources Committee Technical Report*, 1987.

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Appendix 6: Descriptions of Vegetation and Wetlands Communities in the Project Area

A field reconnaissance of the project corridor was conducted OEA Research, an ecological consulting firm from Helena, during June, 1989. A vegetation and soils specialist from the firm visited the project area and identified representative vegetative communities. Nineteen landtypes including ten wetland communities, five upland communities, and four other landtypes were initially identified in the project corridor. **Comments on the Draft EIS indicated that wetlands in the corridor be redelineated based on the 1987 Corps of Engineers Wetlands Delineation Manual and that jurisdictional wetlands be assessed for functions and values using the Wetlands Evaluation Technique (WET). Based on the reevaluation of wetlands, a total of twenty landtypes including six wetland types, five riparian communities, five upland communities, and four other landtypes were identified in the project corridor. These landtypes are shown in FIGURE III-6 in Part III of the Final EIS.**

1. UPLAND COMMUNITIES

The upland community types (CT), with subclasses A, B, E, and G are dominated by coniferous overstories. CT-A, which accounts for about 4.1% of the acreage in the project corridor, is comprised of dry Douglas-fir habitat types (1). This unit occurs on the steep south-facing slopes of Teakettle Mountain and west-facing slopes of Columbia Mountain. Douglas-fir dominates the overstory and shrubs such as snowberry, chokecherry, and ninebark dominate the understory. **CT-B** is comprised of moist Douglas-fir habitat types and is found on a similar amount of acreage in the project corridor. Western larch is common in the overstory and twinflower is an abundant groundcover. Shrubs such as snowberry and Rocky Mountain maple are also common.

Community types E and G are cool, moist types found on toe-slope positions and north and east aspects. **CT-E** is comprised of the subalpine fir/queencup beadlily habitat type and occurs on steeper slopes or lowest terraces that accumulate cold air. Spruce, larch, and lodgepole pine dominate the overstory. Subalpine fir occupies the mid-canopy or is present only as seedlings. Queencup beadlily, bunchberry dogwood, twinflower and blue huckleberry are well represented in the understory. This type comprises about 9.1% of the vegetation in the corridor.

CT-G is comprised of the Engelmann spruce/twinflower habitat found on the well drained benches and slopes and accounts for some 4% of the acres examined in the project area. Spruce, lodgepole pine, and Douglas-fir dominate the overstory. Twinflower, mountain alder, and blue huckleberry are common in the understory. The strong climatic influence of the Pacific Northwest is reflected by the presence of western yew and western red cedar in this type.

Community Type **C** represents rock outcrops which occur above Berne Memorial Park and is associated with the steep fluvial breaklands. This community type (about 1.1% of the acreage evaluated) is dominated by mosses, grasses, and forbs. Rough and Idaho fescue are the dominant graminoids. Forbs such as stonecrop, penstemon, wild onion, alumroot, pussytoes, wild buckwheat, and prairie smoke are common. Stunted shrubs such as wild rose, white spirea, and ninebark have taken hold in crevices.

2. WETLAND COMMUNITIES

All areas delineated as wetlands in the initial survey were revisited in September, 1992. Particular attention was focused in riparian areas where it was noted in the 1990 report that jurisdictional wetlands may possibly be confined to narrow topographic lows within the larger riparian vegetative units (original Map Unit 7 in the Draft EIS) delineated. Additional areas between the House of

*Changes since the Draft EIS are shown in **bold-faced** text.*

Mystery and the Flathead River were also inventoried.

In the initial Wetlands Evaluation, all riparian areas with a predominance of hydrophytic vegetation and apparent wetland soils and hydrology were mapped as wetlands. The reevaluation showed differences in wetland/riparian delineations based primarily on the presence or absence of hydric soil indicators. As a result, the areas originally delineated as 'riparian wetlands' have been further segregated into riparian community types and riparian wetlands. The latter meets COE jurisdictional wetland definitions.

FIGURE III-6 shows all vegetative map units within the study corridor including the remapping of jurisdictional wetlands and riparian habitats. Six wetland community types were identified and are designated by the capital letter 'W' followed by a number (i.e. W-1). These areas are shaded on the figure. Wetlands which meet jurisdictional wetlands definition (types W-0, W-1, W-2, W-3, W-4, W-7) comprise a total of 29.2 acres in the study corridor. Five riparian habitats were identified and are designated by the capital letter "R" followed by a number. Riparian communities total 80.21 acres in the study corridor.

The substantive changes between old and new mapping involved delineating jurisdictional riparian wetlands within larger riparian non-wetland communities. Also, the WT-8 (old map unit label) delineation was changed to R-8 and covered less acreage. For those who wish to compare the findings of the initial evaluation with the 1992 reevaluation, TABLE A6-1 contains a comparison of the old map labels (shown on FIGURE 17 of the Draft EIS) and new map unit label designations shown on FIGURE III-6 of the Final EIS. Map unit descriptions did not change with the exception of WT-7 (old) which was refined to distinguish between jurisdictional riparian wetlands (W-7) and other riparian communities (R-7).

TABLE A6-1
COMPARISON OF OLD AND NEW MAP UNIT DESIGNATIONS FOR WETLANDS

Old Map Unit Label		New Map Unit Label
	Permanent Shallow Water	
0	⇒	W–0
1	⇒	W-1
2	⇒	W-2
	Seasonal or Permanent High WaterTable	
3	⇒	W-3
4	⇒	W-4
7	⇒	W-7
	Riparian Community Types	
6	⇒	R-6
7	⇒	R-7
8	⇒	R-8
9	⇒	R-9
10	⇒	R-10

The following paragraphs describe the wetland types present in the project area. **Wetland Types 0 and 1 have permanent (≥9 months) standing water to a depth of less than 6.6 feet. Wetland types 2, 3, 4, and 7 have permanent or seasonally high water tables, but do not have permanent standing water. The discussion below references Wetland Sites evaluated within the corridor.**

<u>Wetland Type 0 (Open, Shallow Water)</u> - This wetland includes permanent open water up to a depth of less than 6.6 feet. This type was found at Site 1 where it is associated with Wetland Type 4,

forested cottonwood/aspen. Site 2 has a shallow water component. At Site 3, the shallow water type is associated with Wetland Type 2, herbaceous vegetation (W-2) and Wetland Type 3, scrub-shrub (W-3). There is also some deep water (>6.6 feet) habitat at Site 3. No aquatic macrophytes were observed.

Wetland Type 1 (Rooted Emergent Vegetation) - Wetland Type 1 (W-1) which accounts for 1.24 acres within the study corridor is flooded for more than 9 months in a normal year. Only one extensive area of this type (Site 2) was located within the study area. Rooted emergent species such as common cattail (*Typha latifolia*) and bulrush (*Scirpus* spp.) occupy this site. Other species include water smartweed (*Polygonum amphibium*) and spearmint (*Mentha spicata*).

Wetland Type 2 (Graminoid and Herbaceous Cover) - This wetland type (W-2) which accounts for 4.49 acres within the study corridor is subject to seasonal flooding. This type is found at Site 2, Site 3, and at Site 4. Wet site graminoids, such as redtop (*Agrostis stolonifera*), reed canarygrass (*Phalaris arundinaceae*), bluejoint (*Calamagrostis canadensis*), and beaked sedge (*Carex rostrata*) dominate. Bulrush and cattail are also present.

Wetland Type 3 (Scrub-Shrub Cover) - This Wetland Type (W-3) is represented at Site 4, Site 3, and Site 5. Shrubs form a moderately heavy to dense cover, three to five feet tall. Species include red-osier dogwood (*Cornus stolonifera*), alder (*Alnus tenuiflia)*, willow (*Salix drummondiana*), and to a lesser extent water birch (*Betula occidentalis*). Horsetail and reed canary grass also occur. This type accounts for 7.27 acres in the study area.

Wetland Type 4 (Forested Cottonwood and Aspen) - Wetland Type 4 (W-4), represented at Site 1, is dominated by narrowleaf cottonwood (*Populus angustifolius*), aspen (*Populus tremula*), and water birch in the overstory. This type accounts for 3.9 acres within the study corridor. Rough horsetail (*Equisetum hymale*) is a common understory species.

Wetland Type 7 (Forested Cottonwood and Conifer) - Wetland Type 7 (W-7), represented by Site 5 is similar to Wetland Type 4 (W-4) but aspen is replaced by spruce and other conifers as co-dominant overstory species. This type occurs intermingled within the riparian type (R-7) in the topographic lows that occur between overbank/dike deposits. High water table influenced by high spring run-off flows in the Flathead River, and runoff impoundment are the primary source of water. Flooding of the Flathead occurs less frequently now than before Hungry Horse Dam was constructed on the South Fork (Clark 1992).

Narrowleaf cottonwood, balsam (black) cottonwood (*Populus balsamifera*), Rydberg's cottonwood (*Populus X acuminata*), and Engelman spruce (*Picea engelmannii*) dominate the overstory. Dense shrub cover is also typical but species present vary by specific site. Common species found include sapling-sized narrowleaf cottonwood, dogwood, alder, willow (*Salix exigua*), Rocky Mountain maple and water birch. Rough horsetail (*Equisetum hymale*), water sedge (*Carex aqualilis*), bluejoint, redtop, and occasionally bulrush are understory species. This type accounts for 9.15 acres within the study corridor.

The primary distinction between jurisdictional Wetland Types 4 and 7 and riparian areas with similar vegetative cover appears to be the percent occurrence of facultative and facultative upland species. Both kinds of sites have a similar complement of these species such as quaking aspen, Rocky Mountain maple (*Acer glabrum*), wood's rose (*Rosa woodsii*), snowberry (*Symphoricarpos albus*), and thimbleberry (*Rubus parviflora*). The presence of faculative and wetter species in the shrub and herbaceous layers in both situations usually exceeds 50%, but hydric soil and wetland hydrology indicators tend to be lacking if facultative and drier species exceed 30% of the total cover.

3. OTHER LANDTYPES

Other landtypes identified were associated with human activities that have altered or eliminated native community types. Pasture and haylands **(F)** comprised about 20% of the vegetation communities identified in the study corridor between Columbia Heights and Badrock Canyon. A variety of tame grasses, such as smooth brome, Kentucky bluegrass, and timothy occur in this area. A variety of native and introduced forbs and low-growing shrubs such as snowberry and wild rose are present.

Rural residential **(R)** and Urban **(U)** development and disturbed areas **(D)** were also delineated during the mapping of vegetative communities. These community types accounted for 27.1%, 24.5%, and 6%, respectively of the acreage examined in the project corridor.

4. SUMMARY OF VEGETATION AND WETLANDS ACREAGES IN PROJECT CORRIDOR

TABLE A6-2 summarizes the acreage of various vegetation communities that occur in the study area. The table includes all vegetative map units which were identified in the 1990 survey and verified during the 1992 wetlands reevaluation.

TABLE A6-2
SUMMARY OF VEGETATIVE COMMUNITY ACREAGES WITHIN THE STUDY CORRIDOR

Wetland Types		
Permanent Standing Water		
W-0	Open Water (<6.6 ft. deep)	0.25
W-1	Rooted Emergent Vegetation	1.24
Seasonal or Permanent High Water Table		
W-2	Herbaceous	4.49
W-3	Scrub-Shrub	7.27
W-4	Forested Cottonwood/Aspen	3.90
W-7	Forested Cottonwood/Conifer	9.15
W-0/W-3		2.90
Riparian Community Types		
R-6	Scrub-Shrub	7.04
R-7	Forested Cottonwood/Conifer	20.40
R-8	Seeps and Springs	7.84
Other Riparian Areas		
R-9	Disturbed	36.83
R-10	Unvegetated	8.10
Upland Community Types		
A	Dry Douglas-fir Habitat	37.23
B	Moist Douglas-fir Habitat	34.76
C	Rock Outcrop community	7.58
E	Subalpine fir/Queen Cup Beadlily Habitat	64.29
G	Spruce/Twinflower Habitat	26.24
Other Landtypes		
F	Irrigated Pasture/Hayland	140.63
R	Rural Residential Development	188.64
U	Urban Development	173.23
D	Disturbed lands	45.41

References for Vegetation and Wetlands Identification

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Appendix 7: Noise Abatement Criteria and Assessment Methodology

General - Although all forms of transportation produce noise, highway traffic is the most common and readily apparent source. Highway noise is composed of engine noise, exhaust noise, and tire noise. These components of noise are dependent on:

- the numbers and travel speeds of vehicles,
- local terrain and road grades,
- the types of vehicles using the road, and
- the distance between the road and the noise receptor.

The decibel (dB), a logarithmic measure of sound pressure, is the most widely accepted unit of noise measurement. Traffic noise levels are commonly expressed in units of dBA, decibels measured with a frequency weighting corresponding to the A-scale on the standard sound level meter. The A-weighting scale has been found to closely simulate the hearing characteristics of the human ear by de-emphasizing the low noise frequencies.

Zero dBA represents the threshold of hearing and 140 dBA is the threshold of pain on the A-weighting scale. A sound level change of 3 dBA is barely noticeable, a 6 dBA change isperceived as significantly louder, and a 10 dBA change is perceived as twice as loud.

Methodology - Five noise sensitive receptors were selected as sites for noise measurements to determine representative existing noise levels for the project corridor. These monitoring sites included four residences at various distances from the highway and Berne Memorial Park in Badrock Canyon. Measurements were taken at the selected locations on November 30, 1989. The measurements were made over 15-minute periods throughout the day at various distances from the highway centerline using a Metrosonics dB-308 sound level dosimeter/analyzer.

Values for ambient noise levels, based on actual traffic volumes and vehicle classification data collected during the field measurements, were made for each sensitive location to verify the accuracy of the FHWA noise prediction model used for this analysis. Measured and calculated ambient noise levels were nearly the same indicating that the model provides valid noise level projections. Future highway traffic noise levels for each of the alternatives under consideration in the EIS were determined by the STAMINA 2.0 noise prediction model. The primary inputs for the model were traffic volumes, vehicle classifications, travel speed, terrain characteristics, and distance from the noise source to the receptor.

Basis for Assessing Noise Impacts - The traffic noise impacts resulting from the reconstruction of US 2 may be determined by comparing existing and projected noise levels at sensitive areas with the FHWA Noise Abatement Criteria (NAC). A noise impact occurs when either the projected noise levels approach or exceed the NAC, or when projected noise levels substantially increase over the existing levels for a selected location.

A "substantial increase" in traffic noise levels **is defined** as an increase of more than 10 dBA over existing levels. A 10 dBA increase in noise levels is a doubling of the perceived loudness. The NAC are shown below. Each of the noise sensitive receptors are Activity Category B according to the NAC.

TABLE A7-1 FHWA NOISE ABATEMENT CRITERIA (NAC) HOURLY A-WEIGHTED SOUND LEVEL - DECIBELS (dBA)		
Activity Category	**$L_{eq}(h)$**	**Description of Activity Category**
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.
Source: FHWA Federal-Aid Highway Program Development Manual, Volume 7, Chapter 7, Section 3 (FHPM 7-7-3)		

The NAC represent the upper limits of acceptable highway traffic noise for different types of land uses and human activities. When these levels are approached of exceeded, mitigation for noise impacts must be examined.

Appendix 8: Documents Pertinent to the Section 4(f) Evaluation

This appendix contains the following documents for relating to the acquisition, development, and operation of Berne Memorial Park in Badrock Canyon.

- **A graphic developed for the EIS that shows the area considered to be Section 4(f) property at Berne Memorial Park and the locations of park features.**

- Bargain and Sale Deed with John P. and Hazel M. Simpson dated December 22, 1953. This document references a correction deeddated August 4, 1959 which changed the name of the park from "Berne Roadside Park" to Berne Memorial Park.

- Flathead County Deed Book References for Bargain and Sale Deeds with John P. and Hazel M.Simpson. Original Deed recorded on February 24, 1954. Correction Deed recorded on August 12, 1959.

- A reduced copy of the MDOH right-of-way plan sheet for Project FAP 257 A showing Berne Roadside Park. These plans were referenced by project stationing in the Bargain and Sale Deed with the Simpsons.

- January 4, 1954 document from A.G. Swaney, Land Agent that describes conditions of the original deed for the roadside park.

- A 1954 article from the *Hungry Horse News* from Columbia Falls containing a description of early use of the roadside park.

- An application from the Martin City, Whitefish, and Kalispell Lions Clubs dated May 21, 1949 requesting permission from the State Highway Commission to build a public drinking fountain at the spring located in Berne Memorial Park. Note that this application was filed prior to acquisition of the property by the MDOH for Project FAP 257 A.

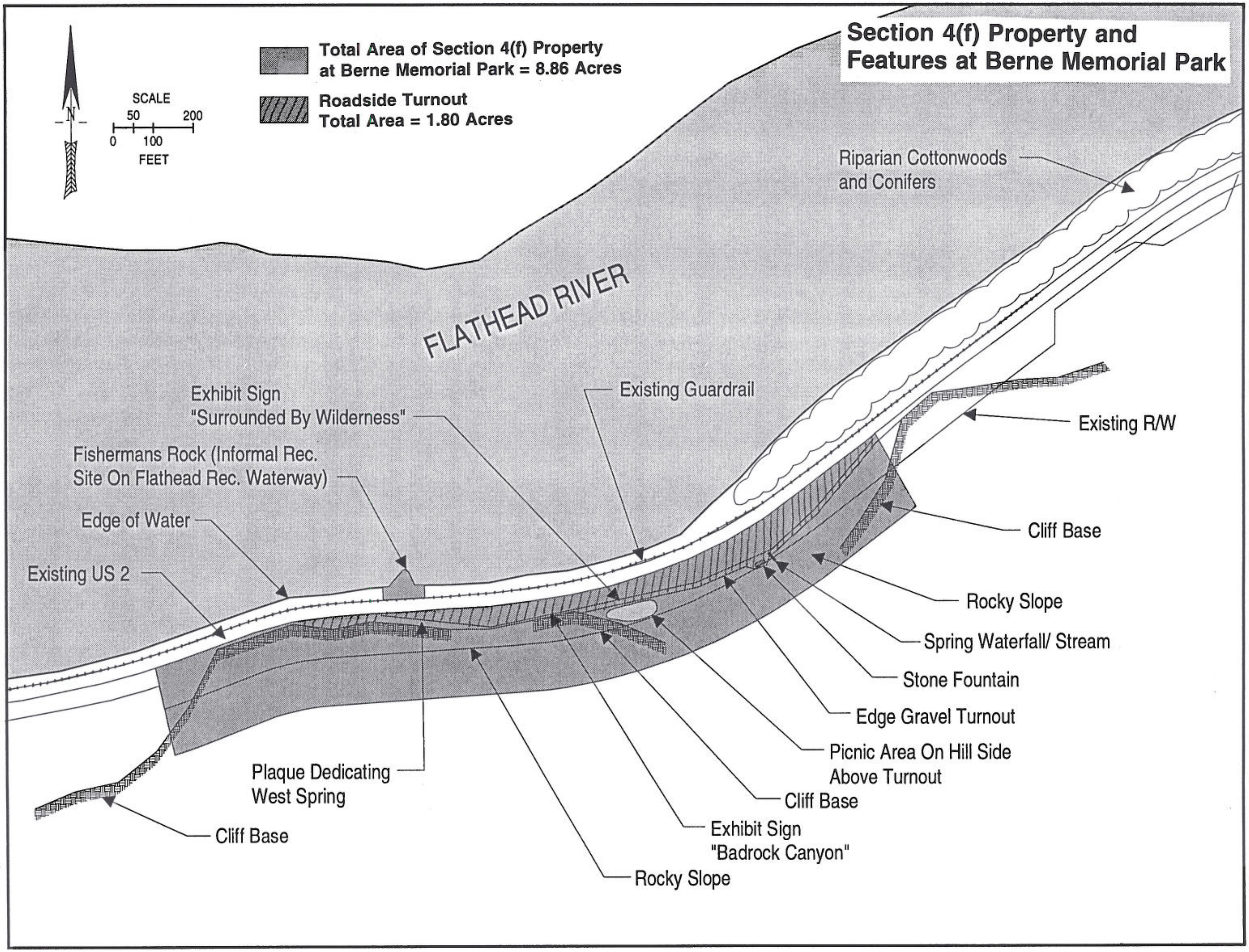
- **Memorandum of Understanding (MOU) between MDT and the USFS concerning the development and maintenance of the proposed replacement parkland and river access site.**

- **May 28, 1994 correspondence from SHPO to MDT regarding eligibility of the Badrock Canyon "tote" road (24FH583) for inclusion in National Register of Historic Places.**

- **August 28, 1994 correspondence from SHPO to MDT indicating the agency's concurrence with initial determination that the proposed action would have "No Adverse Effect" on the Badrock Canyon "tote" road (24FH583).**

- **October 6, 1994 correspondence from MDT to SHPO transmitting a revised Determination of Effect for the Badrock Canyon "tote" road (24FH583) with SHPO's stamp of concurrence dated October 30, 1994.**

- **January 6, 1995 correspondence from FHWA to the Advisory Council on Historic Preservation transmitting the Determination of Effect for the Badrock Canyon Tote Road (24FH583). The letter also indicates the Advisory Council's concurrence with a determination that the proposed project would have No Adverse Effect on the Tote Road.**


Section 4(f) Property and
Features at Berne Memorial Park
Total Area of Section 4(f) Property
at Berne Memorial Park = 8.86 Acres
Roadside Turnout
Total Area = 1.80 Acres
N
SCALE
0
50
100
200
FEET
FLATHEAD RIVER
Riparian Cottonwoods
and Conifers
Existing Guardrail
Existing R/W
Exhibit Sign
"Surrounded By Wilderness"
Fishermans Rock (Informal Rec.
Site On Flathead Rec. Waterway)
Edge of Water
Existing US 2
Cliff Base
Rocky Slope
Spring Waterfall/ Stream
Stone Fountain
Edge Gravel Turnout
Picnic Area On Hill Side
Above Turnout
Cliff Base
Exhibit Sign
"Badrock Canyon"
Rocky Slope
Plaque Dedicating
West Spring
Cliff Base

STATE HIGHWAY COMMISSION OF MONTANA
Right of Way Division

Project: FAP 257 A FLATHEAD COUNTY

BARGAIN AND SALE DEED

THIS INDENTURE, made this 22 day of December, 1953 ; IN CONSIDERATION of the sum of ONE HUNDRED AND FIFTY DOLLARS ($150.00), lawful money of the United States to them in hand paid by the STATE OF MONTANA, the receipt whereof is hereby acknowledged, WITNESSETH THAT,

JOHN P. SIMPSON and HAZEL M. SIMPSON, husband and wife,
of Tacoma, Washington

do hereby GRANT, BARGAIN, SELL and CONVEY unto the STATE OF MONTANA for the benefit and use of its State Highway Commission, the following described real property, to-wit:

On Right 18+00.0 to 37+00.0

A tract of land in N½NW¼ Section 12 and S½SE¼SW¼ Section 1, Township 30 North, Range 20 West, M.P.M., Flathead County, Montana, more particularly described as follows:

A strip of land 100 feet wide, lying between two parallel lines which are parallel to and respectively 100 feet and 200 feet distant southeasterly when measured at right angles from the following described center line: Beginning at a point on the center line of State Highway Project No. FAP 257-A, which said point is north 1281.0 feet, and east 468.7 feet, more or less, from the witness corner on west line of Section 12; thence from the said point of beginning northeasterly along a curve to the left of 1910.0 feet radius, 103.8 feet; thence North 72° 11' East, 140.6 feet; thence along a curve to the right of 818.6 feet radius, 190.2 feet; thence North 85° 30' East, 518.4 feet; thence along a curve to the left of 1432.5 feet radius, 745.4 feet; thence North 55° 41' East, 201.6 feet, more or less, to a point on the center line of said State Highway Project No. FAP 257-A, which said point is north 1789.1 feet, and east 2266.2 feet, more or less, from the witness corner on west line of Section 12, and containing in all 4.36 acres, more or less.

EXCEPTING AND RESERVING, however, all ores and minerals, including gas and oil, beneath the surface of the above-described and conveyed premises, together with the right to mine for and extract the same, provided that in the exercise of such mining right the surface thereof shall not be disturbed, interfered with, or in anywise damaged.

TO HAVE AND TO HOLD the above described and conveyed premises, with all the reversions, remainders, tenements, hereditaments and appurtenances thereto, unto the STATE OF MONTANA, and to its successors and assigns forever.

The State of Montana, by acceptance of this deed, and as part consideration for the grant hereby made, covenants to and with the above named grantors, their heirs, executors, administrators and assigns, that this conveyance is subject to the following restrictions and limitations as to the use of said premises; that said property be used solely as a roadside park (including use of a part thereof as a Port of Entry station) and for a highway right of way, and that neither said property nor any part thereof shall ever be used by the grantee above named or by its successors or assigns for any commercial enterprise; any breach of the foregoing conditions, or any of them, occurring after the delivery of this deed, shall have the effect of forfeiting the title of the grantee and thereupon the title to said real property shall revert to the grantors, their heirs and assigns, each of whom respectively shall have the right of immediate re-entry upon said premises in the event of any such breach; said restrictions and conditions contained in this deed shall be covenants running with the land.

The State of Montana further covenants and agrees, as a part of the consideration for this conveyance, that the park to be created upon the above described property shall be named and known as "Berne Roadside Park" X

IN WITNESS WHEREOF the undersigned have executed these premises the day and year first above written.

X Correction deed taken Aug. 4, 1959, changes this to "Berne Memorial Park."

A. C. S.

John P. Simpson

John P. Simpson

Hazel M. Simpson

Hazel M. Simpson

STATE OF WASHINGTON)
) ss:
County of Pierce)

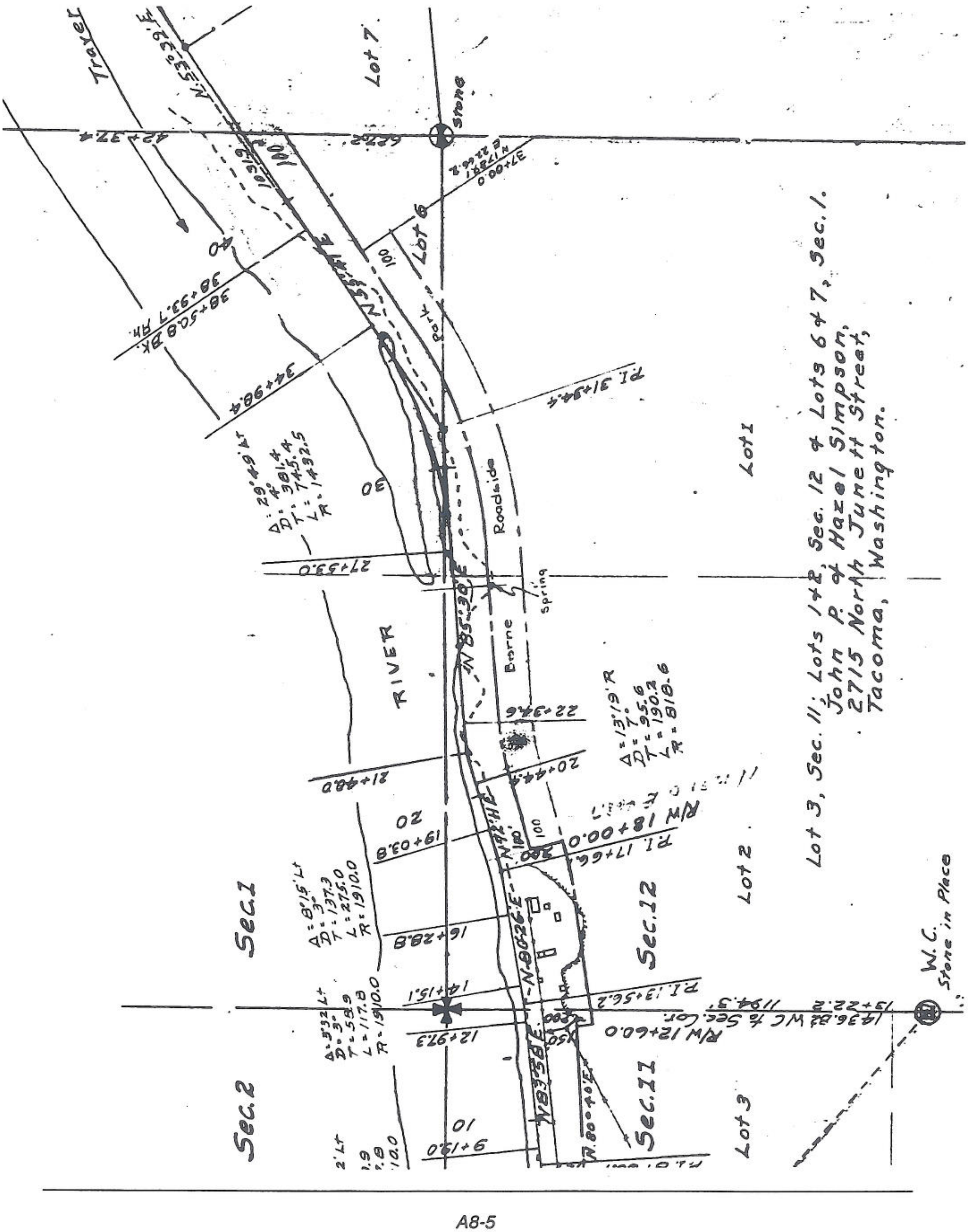
On this 22nd day of December, 1953, before me, the undersigned, a Notary Public in and for the State of Washington, personally appeared John P. Simpson and Hazel M. Simpson, known to me to be the persons whose names are subscribed to the within instrument and acknowledged to me that they executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Notarial Seal the day and year in this certificate first above written.

Signe Benton

Notary Public for the State of Washington
Residing at Tacoma
My Commission Expires March 5, 1955

(NOTARIAL SEAL)


Lot 3, Sec. 11; Lots 1+2, Sec. 12 & Lots 6 + 7, Sec. 1.
John P. & Hazel Simpson,
2715 North Junett Street,
Tacoma, Washington.
Sec.1
Sec.2
Sec.11
Sec.12
Lot 1
Lot 2
Lot 3
Lot 6
Lot 7
RIVER
Roadside
Park
Spring
Stone
W.C.
Stone in Place
R/W 18+00.0
R/W 12+60.0
P.I. 17+66
P.I. 13+56.2
P.I. 31+34.4

-2-

FAP 257 A Flathead

JOHN P. SIMPSON ET UX

TO

STATE OF MONTANA

BARGAIN AND SALE DEED

No. 4980

RECORDED ON PAGE 518

VOLUME 423 RECORD OF DEEDS

Flathead COUNTY

ON August 12, 1959

OF STATE ON August 20

1959

FAP 257 A

JOHN P. SIMPSON et ux

to

STATE OF MONTANA

Dated: Dec. 22, 1953

BARGAIN AND SALE DEED

425

206

559 RECORD

Flathead COUNTY

Feb. 24 1954

Mar 7 1954

A. C. SHANEY, Land Agent

C. E. CUNNINGHAM, Secretary

Jan. 4, 1954

FPA 257-A

Roadside Park-Bedrock Canyon

At its meeting on August 26th, 27th and 28th, 1953, the Commission approved the purchase of a tract in Bedrock Canyon, for use as a roadside Park, at a cost of $150.00, from John P. and Hazel M. Simpson of Tacoma, Washington.

In negotiating for the deed it was necessary for us to agree to two conditions, as follows:

(1) That the land be used only for right of way and roadside park purposes, and that in the event of a breach of the covenant the title be forfeited to the grantors, their successors or assigns; and,

(2) That the park be named and known as "Borne Roadside Park", and that signs placed upon the land to so attest.

Billie and Mike Borne were the uncles of Mrs. Simpson. Billie homesteaded the land in the canyon, possibly inthe late '80's or early '90's, and lived there until his death several years ago. Both of the Bornes were well-known to the writer as a small boy.

In line with the Commission's expressed policy of honoring the memory of the State's pioneers where it can fittingly do so, it is recommended that the Commission accept the conditions set forth above.

A.C.SHANEY, Land Agent

ACS:ak

cc: Maintenance Engr.

Roadside Camp in Bad Rock Canyon

Montana's state highway department is establishing a roadside park in Bad Rock canyon along U. S. highway No. 2.

Fred Wells, Kalispell, division maintenance engineer, also has recommended that the rustic port-of-entry building with its modern rest rooms be moved to the canyon, and that the entire grounds there be landscaped.

It is felt that having the roadside park and port-of-entry station together will result in better maintained facilities for Montana visitors, and in addition provide less highway hazards than the present port-of-entry location.

The development will be near the fountain erected by Kalispell, Whitefish, West Glacier and Martin City Lions clubs. A Lions group has since been organized in Columbia Falls.

Bad Rock canyon is the gateway into the Flathead valley for the Great Northern railroad, Flathead river and U. S. highway No. 2. The scenic location, without any developed accommodations, is receiving extensive use by motorists as a camping and picnic spot. Sanitary situations are serious.

Encouraging the State Highway Commission decision to make the canyon spot a roadside park was the persistant efforts of Mrs. Maybelle Kelley, who carries the star route mail from Columbia Fall, to Hungry Horse and Martin City. A mailcarrier in this area since 1918, Mrs. Kelley, a grandmother, drives her mail truck through the canyon four times a day.

Complete lack of accommodations for Montana visitors in scenic Bad Rock canyon disturbed her. There were campers and picnickers all through the summer, but no facilities.

Mrs. Kelley wrote Governor J. Hugo Aronson and Scott P. Hart, state highway engineer in Helena. She suggested a series of editorials in the Hungry Horse News, local newspaper, and included editorials with her letters.

W. E. Bawden, maintenance engineer for the highway department in Helena wrote "I am pleased to advise you that we will make arrangements to have two toilets placed in this park immediately. . . . It is possible that we can also place some tables . . . I feel sure that we can classify this camp site as a roadside park and make some improvements in the facilities and its policing."

The star route mail carrier to Hungry Horse and Martin City from Columbia Falls is accomplishing her mission

1954 HHN

—Form 4

INTER-DEPARTMENTAL MEMORANDUM

STATE HIGHWAY COMMISSION

Kalispell, Montana - May 21, 1949

STATE HIGHWAY COMMISSION
RECEIVED
MAY 23 19

Ray Spurzem, District Engineer

Subject: FAP 2

A. G. Swaney, Land Agent

State Hwy Engr.
Adm. Aid & Secty.
Construction
Maintenance
Location & Plans
Bridge
Personnel
Accounting
Attorney

Attached, herewith, please find two application forms, completed by the Lions Club of Kalispell, Whitefish and Martin City, for permission to erect a fountain at a large spring on the above mentioned project.

I have seen the plans of this proposed fountain and believe it will be a wonderful improvement and will in no way interfere with any of our operations.

RS: ah

Ray Spurzem

Avoid Verbal Instructions

FAP 257-A .... (Project affected)

.... (Maintenance number)

APPLICATION FOR PERMIT TO

Construct Drinking Fountain in Bad Rock Canyon on Hiway #2
(insert nature of permit)

1. Name of Applicant: Martin City, Whitefish & Kalispell Lions Clubs

2. Address of Applicant: Kalispell Lions Club, Kalispell, Montana
P. O. Box 747

3. If Applicant is a Corporation give state of incorporation and names of President and Secretary:

4. Nature of Permit desired: (give sufficient detail to permit thorough understanding by officers of department reviewing this application).

The Martin City, Whitefish and Kalispell Lions Clubs request permission to construct a public drinking fountain at the spring in Bad Rock canyon on U. S. Hiway Nbr 2. Said fountain to be constructed of native rock as pictured on enclosed drawings and blue prints and costs of construction to be assumed by the above mention Lions Clubs. This fountain is proposed as a public service to the people and the state, and as a convenience for those using Hiway #2.

5. Submit four blueprints or sketches the size of this sheet showing details and specifications of proposed installations or structures (If desired, the back of this form may be used for sketch).

6. Highway survey stations at or near which installations or structures will be installed:

State Hiway Dept., Kalispell, Montana

7. For how long a period is the permit desired:

For as long as is necessary to complete the project.

8. Remarks:

Construction of this project is proposed to begin as soon as permission is grantedby the State Highway Commission.

Dated at Kalispell, Montana, this sixteenth day of May 1949.

Reuben Nordtome
President, Kalispell Lions Club
....
(signature of applicant)
Secretary, Kalispell Lions Club

RECOMMENDED FOR APPROVAL:

May 24, 1949
(date)

....
District Engineer at Kalispell

APPROVED:

5-23-49
(date)

....
(signature)

....

INSTRUCTIONS CONCERNING USE OF THIS FORM: Applicant will complete this form in triplicate and transmit it to the District Engineer of the Montana Highway Department within whose district the highway is situated. The District Engineer will, if he approves application, indicate his approval by signing all copies and forwarding two copies to Right of Way Acquisition Unit, Helena; if he disapproves he shall indicate reasons therefor in letter of transmittal. If application is approved in Helena, a permit will be completed and returned to District Engineer who will have permittee sign acceptance on all copies, the original of which will be delivered to him. District Engineer will retain one copy for his files, returning remaining two copies to Helena, where one will be filed in Right of Way office and the other in Maintenance Section.

Agreement # 92-10-06

MEMORANDUM OF UNDERSTANDING

BETWEEN

MONTANA DEPARTMENT OF TRANSPORTATION

AND

U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION

AND

USDA FOREST SERVICE, FLATHEAD NATIONAL FOREST

This agreement, made and entered into by and between the Montana Department of Transportation, hereinafter referred to as the State; the U.S. Department of Transportation, Federal Highway Administration, hereinafter referred to as the Federal Highway Administration; and the USDA Forest Service, Flathead National Forest, hereinafter referred to as the Forest Service; under the provisions of the Multiple Use and Sustained Yield Act of June 12, 1960 (16 U.S.C. 528-531).

WITNESSETH:

WHEREAS, the State and the Federal Highway Administration are responsible for construction and reconstructing public highways; and

WHEREAS, the Forest Service is responsible for providing recreation opportunities to the general public; and

WHEREAS, the State and the Federal Highway Administration are considering several alternatives for reconstruction of a portion of U.S. Highway 2, and one or more of those alternatives will require the relocation of the Berne Park Memorial Site; and

WHEREAS, if such an alternative is chosen, the State, Federal Highway Administration, and the Forest Service desire to construct a boat ramp and related facilities for the use of the general public at the new site;

NOW THEREFORE, in consideration of the above premises, the parties hereto agree that the contemplated mitigation work will be carried out during the term of this agreement, only if there is no feasible and prudent alternative to the relocation of Berne Park as determined through the NEPA and 4(f) process. Further, it is understood that this agreement will not in any way limit the evaluation of alternatives. No project development will proceed until the NEPA process has been completed. If an alternative is eventually selected which will require the relocation of Berne Park, the parties hereto also agree as follows:

A. <u>The State and the Federal Highway Administration Shall</u>:

1. Acquire land for the relocation of U.S. Highway 2 and the Berne Park Memorial Site.

2. Obtain title to the land for a boat ramp and related facilities in the name of the United States.

3. Construct the new Berne Park Memorial Site and the access road to the proposed boat ramp.

B. The Forest Service Shall:

1. Prepare the deeds, obtain title opinion from the Office of General Council, review the Certificate of Survey, and accept the lands under the Act of October 10, 1978 (7 U.S.C. 2269).

2. Once the title has been obtained by the Forest Service and if after completion of the NEPA and 4(f) process it is determined that Berne Park is to be relocated, then the Forest Service will construct the proposed boat ramp, toilet facilities, and foot path.

3. Be responsible for maintenance of the facilities associated with the boat ramp.

C. It is Mutually Agreed and Understood By and Between the Said Parties That:

1. No contribution herein provided for shall entitle the State to any share or interest in any land, materials, and equipment acquired. All such land, interest in land, materials, and equipment shall remain the property of the United States.

2. Nothing herein shall be construed as obligating any of the parties to expend or as involving the United States in any contract or other obligation for the future payment of money in excess of appropriations authorized by law and administratively allocated for this work.

3. The term of this agreement shall extend from the time of execution of all the parties hereto and shall continue until construction (if any) of the new road is completed. In the event there is no construction, this agreement expires upon the completion of the NEPA/4(f) process.

4. Nothing herein obligates either party to perform any action until all environmental and necessary other laws have been complied with.

IN WITNESS WHEREOF, the parties hereto have executed this agreement as of the last date written below.

Hank Honeywell — 4-2-92

USDT, FEDERAL HIGHWAY ADMINISTRATION — DATE

Marv J. Johnson — 4/2/92

MONTANA DEPARTMENT OF TRANSPORTATION — DATE

Joel D. Holtrop — 4/14/92

USDA FOREST SERVICE, FLATHEAD NATIONAL FOREST — DATE

MAL:D:CD:kmc:2.jrh

State Historic Preservation Office
Montana Historical Society
1410 8th Avenue • PO Box 201202 • Helena, MT 59620-1202 • (406) 444-7715

MASTER FILE COPY

JUN 1 1994
ENVIRONMENTAL BUREAU

May 28, 1994

RECEIVED
JUL 28 1994
ROBERT PECCIA & ASSOCIATES

Gordon J. Stockstad, Acting Chief
Environmental & Hazardous Waste Bureau
Montana Department of Transportation
2701 Prospect Avenue
P.O. Box 201001
Helena, MT 59620-1001

Re: F 1-2(39)138
Columbia Heights - Hungry Horse
Control No. 1290

Dear Gordon:

Thanks for the opportunity to review the results of a cultural resource inventory to record 24PH583, the Badrock Canyon Tote Road. Thanks also for the opportunity to meet with you this past week and consider this site.

As we discussed, the historical date of the Tote Road places it outside the historic road context time parameters currently established under the Historic Roads and Bridges Programmatic Agreement. Hence, it is appropriate to address the National Register of Historic Places eligibility of this feature. So, we concur with your finding that the Tote Road appears to qualify for listing in the National Register of Historic Places under Criteria A and C, for its associations with construction of the Great Northern Railroad and for the way in which it illustrates road engineering of the time. The general corridor is also likely to have been an important, though difficult to traverse, corridor before and after the 1890s.

We will be glad to review a finding of effect as it is available.

Sincerely,

Marcella

Marcella Sherfy
Montana State Historic Preservation Officer

File: COMP, MDOH

State Historic Preservation Office
Montana Historical Society
1410 8th Avenue • PO Box 201202 • Helena, MT 59620-1202 • (406) 444-7715

RECEIVED
AUG 30 1994
ENVIRONMENTAL BUREAU

MASTER FILE COPY

August 28, 1994

Gordon J. Stockstad, Acting Manager
Environmental Services
Montana Department of Transportation
2701 Prospect Avenue
P.O. Box 201001
Helena, MT 59620-1001

Re: F 1-2(39)138
Columbia Heights - Hungry Horse
Control No. 1290

Dear Gordon:

Thanks for the opportunity to comment on the project identified above.

I concur with your finding that the proposed highway project will have an effect on the Badrock Canyon Tote Road (24FH538), but that the effect will not be adverse. I share your thinking that a very small portion of the actual road tread will be impacted by the project and that the setting for the historic roadbed--although illustrative of continuing travel, communication, and power generation patterns--has been substantially affected by modern construction. However, I do not anticipate a degree of loss sufficiently substantial to be identified as adverse.

I do recommend that you provide the Advisory Council on Historic Preservation with all the incoming concerns and materials that you've received so that they'll have the full benefit of that background as they comment. I also recommend that you advise those interested in the Tote Road that you are now seeking the Council's comments.

Thanks!

Sincerely,

Marcella

Marcella Sherfy
Montana State Historic Preservation Officer

File: COMP, MDOT

Montana Department of Transportation
2701 Prospect Avenue
PO Box 201001
Helena MT 59620-1001

Marc Racicot, Governor

RECEIVED
NOV 1 1994

Marcella
OCT 1 1994
MASTER FILE COPY

October 6, 1994

RECEIVED
NOV 02 1994
ROBERT PECCIA & ASSOCIATES

Marcella Sherfy
State Historic Preservation Office
1410 8th Avenue
P.O. Box 201202
Helena, MT 59620-1202

Subject: F 1-2(39)138
Columbia Heights - Hungry Horse
Control No. 1290

Enclosed is the revised Determination of Effect for the Badrock Canyon Tote Road (24FH583). The geological survey of the canyon earlier this year revealed that a second segment of the tote road would have to be removed for safety reasons. At this point, however, the tote road rests on a talus slope that is only 2-3 feet wide for a length of about 40-feet. Although the segment is part of the original alignment, three feet is much too narrow to accommodate wagons which indicates that the majority of the roadway has eroded away since the 1920s. Because the proposed impact is not significantly greater than originally resolved, we continue to support our earlier determination that the planned Columbia Heights - Hungry Horse project would have **No Adverse Effect** to the Badrock Canyon Tote Road.

If you have any questions, please contact Jon Axline at 444-6258.

Joel Marshik

Joel Marshik, Manager
Environmental Services

Enclosure

cc: James T. Weaver, P.E., Missoula District Engineer
Carl S. Peil, P.E., Preconstruction Bureau
Dale Paulson, FHWA
Dan Norderud, Peccia & Associates

CONCUR
MONTANA SHPO
DATE 10-30-94 SIGNED M. Sherfy

An Equal Opportunity Employer

COPY

U.S. Department of Transportation
Federal Highway Administration

400 Seventh St., S.W.
Washington, D.C. 20590

CONCUR

JAN 26 1995

Advisory Council on Historic Preservation

Director, Western Office

January 6, 1995

Claudia Nissley, Director
Advisory Council on Historic Preservation
730 Simms Street, Suite 450
Golden, CO 80401

Subject: F 1-2(39)38
Columbia Heights - Hungry Horse
Control No. 1290

Enclosed is the Determination of Effect and SHPO correspondence for the above project. The Montana SHPO has determined that the proposed project would have **No Adverse Effect** to Bad Rock Canyon Tote Road (24FH583) in Flathead County, Montana and we request your concurrence.

If you have any questions, please contact Jon Axline at the Montana Department of Transportation. He can be reached at (406) 444-6258.

Sincerely,

Dale W. Paulson
Environmental Coordinator

Enclosure

c: Jon Axline, MDT

Appendix 9: List of Written Comments Received from Individuals

OCTOBER, 1989 SCOPING MEETING TO PUBLICATION OF DEIS

NAME	COMMENT NO.	TYPE OF WRITTEN COMMENT RECEIVED
Allred	**83**	**mdoh fm**
Andrade	55	ccp form
Barnard	138 **15**	postcard **ccp form (alts)**
Barnett	**14**	**ccp form (alts)**
Bechle	99	ccp form
Bibler/Parker	50	letter
Blank	32, 102 **65**	ccp form,postcard **postcard**
Bloom	26, 94 **61**	ccp form, letter **letter**
Bouchey	12	mdoh form
Boggs	56	ccp form
Bouse'	51, 104 **35**	ccp form, postcard **ccp form (alts)**
Briggs	**56**	**postcard**
Bruno	64	letter
Buentemeier	92	letter
Burgard	**82**	**mdoh fm and supplemental matls**
Carlton	90	ccp form
Cassady	**81**	**letter**
Cassidy	**78**	**telephone message notes**
Caton	88	ccp form

CCP	**30,31,32,33** **54,86**	**mdoh fm (3), ccp form (alts)** **letter, mdoh fm w/attach**
Chase	47, 48	mdoh forms (2
Christoph	78 **20**	ccp form **ccp form (alts)**
Clark	71, 110	ccp form, postcard
Clawson	66, 108	ccp form, postcard
Cohen	63	ccp form
Collard	139	ccp form
Collins	140	ccp form
Connelly	**85**	**ccp form (alts)**
Cozzens	**63**	**postcard**
Crittenden	96	ccp form
Dagger	41	ccp form
Dakin, Wm./S.	14 **25**	ccp form **letter**
Danesh	9	ccp form
Davis, J.	134 **76**	ccp form **postcard**
Decker	74 **70**	letter **postcard**
Dettman	**34**	**letter**
Devries	6	ccp form
Divoky	27, 28	mdoh forms (2)
Dodge	**72**	**postcard**
Donofrio	87	ccp form
Elliot, B.	**27**	**ccp form (alts)**
Elliot, L.	129, 132	ccp form, postcard
Ellis	100	ccp form

Feather	85	ccp form
	10,50	**ccp form (alts), postcard**
Flake	**45**	**postcard**
Fleming	36	letter
Flowers	**36**	**ccp form (alts)**
Frank	13	ccp form
	5	**ccp form (alts)**
Fredenburg	**2**	**water users survey - Berne Park**
Frederick	76	ccp form
	69	**postcard**
Garrett	40	ccp form
Getman	43, 107	ccp form, letter
Giacomino	37	mdoh form
Guernsey	77, 112	cccp form, letter
Gustafson	39	ccp form
Gutkoski	**59**	**postcard**
Hadden	141	ccp form
Hammer	10	ccp form
	40	**postcard**
Hanson	11	ccp form
	11	**ccp form (alts)**
Hartranft	72,111	ccp form, postcard<R>
	21	**ccp form (alts)**
Herbaly	**46**	**letter to CCP**
Heberling	22	ccp form
Heldstab	4, 5	mdoh forms (2)
Holmes	67	ccp form
Holwick	**23,23a**	**ccp form (alts), rec survey**
Hudgens	42, 103	ccp form, postcard

Hughes	119	ccp form
Hula	**8,8a**	**ccp form (alts),rec survey**
Ivers	2, 3	mdoh forms (2)
Jessepe	122	ccp form
Johnson, D.	**16,46**	**ccp form (alts), postcard**
Johnson, G.	44	ccp form
Johnson, J.M.	**71**	**postcard**
Jones, C.	81	ccp form
Kezar	121 **12,47**	ccp form **ccp form (alts), postcard**
Knight	**66**	**postcard**
Kopp	79	ccp form
Krawiec/Simmons	24, 93 **60**	ccp form, postcard **postcard**
Kuhl	97	ccp form
Lane	**75**	**postcard**
Lawrence	1	mdoh form
Loane	34 **7,41**	ccp form **ccp form (alts), postcard**
Martin (NPCA)	135 **1**	letter **letter submitted @ meeting same as comment 135 other file**
Martineau, F.	**67**	**postcard**
Martineau, L.	118, 125 **73**	ccp form, postcard **postcard**
McClelland	**24**	**letter**
McDonald	**83**	**mdoh fm**
McElveen	**6,49**	**ccp form (alts), postcard**
McFadzen	65	ccp form

McGill	**74**	**postcard**
McGuire	**62**	**postcard**
Morton	**80**	**mdoh fm and comments @ mtg.**
Murphy, C.	23	ccp form
Murphy, W.	84	ccp form
No Name	15, 16	mdoh forms (2)
No Name	109	postcard
No Name	**77**	**copy of comments made @ mtg.**
Nugent	89	ccp form
Owen	86, 113	ccp form, postcard
Palin/McKinney	49	ccp form
Perrine	**22,38**	**ccp form (alts), mdoh fm**
Percival	54 **43**	ccp form **postcard**
Petrashek	83	ccp form
Pharis	75	ccp form
Pittman	**44**	**postcard**
Pratt	**28,29**	**ccp form (alts), letter**
Reynolds	82	ccp form
Richardson	58, 115	ccp form, postcard
Riegel	21	ccp form
Rosetta	80	ccp form
Royer	19	letter
Rudd	35	ccp form
Schwede	45, 46	mdoh forms (2)
Schwickert	20	ccp form
Shaw	57, 116	ccp form, postcard

Sigler	17, 18	mdoh forms (2)
Simmons, P.	**9,51**	**ccp form (alts), postcard**
Smith	131	ccp form
Snow	101 **18,48**	ccp form **ccp form (alts), postcard**
Spady	117	postcard
Steele	7	mdoh form
Stewart	33	ccp form
Stoecker	53,69	ccp form, mdoh form
Stolte	30	ccp form
Stringfellow	29	mdoh form
Strong	98	ccp form
Sutton	126	ccp form
Swanson, D.	**26**	**letter**
Swanson, J.	91	letter
Taylor	68	letter
Thomassen	136 **4,19** **19a**	letter **water users survey,** **ccp form (alts), rec survey**
Togni	8	ccp form
Van Dyck	105	postcard
Van Schoyck	**3**	**water users survey**
Van Valkenburg	62 **13,39**	ccp form **ccp form (alts), postcard**
Von Alten	**57**	**postcard**
Wagner	**37**	**mdoh fm, plus comments**
Walden, J.	70	ccp form
Walden, S.	61	ccp form

Walker, E.P.	38 **55**	ccp form **postcard**
Washatko	**47**	**ccp form (alts)**
Wetzler	142	postcard
Willows, J.	130, 133 **68**	ccp form, postcard **letter**
Willows, S.	52,59,73 123,127,128 **137, 79**	letters from Coalition **copy of comments made @ mtg.**
Wilson, R.C.	31, 106 **64**	ccp form, postcard **letter**
Yanishevsky	60, 114 **17,42**	ccp form, postcard **ccp form (alts), postcard**
Yates	25, 124	ccp form, postcard
Yaw	**58**	**postcard**
Zall	120	ccp form

NOTES:

mdoh forms refer to preprinted forms provided by MDOH at public scoping meeting. Two forms were available - one for important project issues and one for comments on range of alternatives presented.

ccp form refers to preprinted comment forms supplied by the Coalition for Canyon Preservation. The forms were distributed to CCP affiliates with an information sheet outlining the groups concerns for this project.

mdoh fm refers to a preprinted comment form on alternatives made available to public at June 26 meeting.

ccp form (alts) refers to a preprinted comment form supporting Alt 3 in Columbia Heights and Alt 4 in rural areas of corridor.

Numbers and comment descriptions in bold face represent comments received or considered after June 26, 1990 to the release of the DEIS.

Appendix 10: List of Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
AADT	Annual Average Daily Traffic
ACC/MVMT	Accidents per Million Vehicle Miles of Travel
ACHP	**Advisory Council on Historic Preservation**
ADT	Average Daily Traffic
ARM	Administrative Rules of Montana
ATR	Automatic Traffic Recorder
BPA	U.S. Department of Energy, Bonneville Power Administration
CCIZG	**Canyon Citizen Initiated Zoning Group**
CCP	Coalition for Canyon Preservation
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO	Carbon monoxide
COE	U.S. Department of the Army, Corps of Engineers
dBA	Decibel Measurement on the A-weighting Scale
DEIS	Draft Environmental Impact Statement
DHV	Design Hourly Volume
DNRC	Montana Department of Natural Resources and Conservation
DOI	**U.S. Department of the Interior**
DSL	Montana Department of State Lands
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
4(f)	Section 4(f) of the 1966 U.S. Department of Transportation Act
404(b)(1)	**Section 404 of the Clean Water Act, (b)(1) Regulatory Guidelines**

Changes made since the Draft EIS are shown in ***bold-faced*** *text.*

FAP	Federal-Aid Primary
FAS	Federal-Aid Secondary
FEMA	Federal Emergency Management Agency
FEIS	Final Environmental Impact Statement
FHPM	Federal-Aid Highways Program Manual
FHWA	U.S. Department of Transportation, Federal Highway Admnistration
FPPA	Farmland Protection Policy Act
FWP	Montana Department of Fish, Wildlife & Parks
HCM	Highway Capacity Manual
HRA	Historical Research Associates, Inc.
ISTEA	**Intermodal Surface Transportation Efficiency Act of 1991**
LOS	Level of Service
MA	USFS Management Area
MDHES	Montana Department of Health and Environmental Sciences
MDOH	Montana Department of Highways
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
MOA	**Memorandum of Agreement**
MOU	Memorandum of Understanding
MP	Milepost Location on US 2
MPDES	Montana Pollutant Discharge Elimination System
NAAQS	National Ambient Air Quality Standards
NAC	FHWA Noise Abatement Criteria
NCDE	Northern Continental Divide Grizzly Bear Ecosystem
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program

NHS	**National Highway System**
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NPS	U.S. Department of the Interior, National Park Service
OEA	OEA Research
PM-10	**Particulate Matter 10 microns or less in diameter**
PSD	Prevention of Significant Deterioration
ROD	Record of Decision
RPA	Robert Peccia and Associates, Inc.
SCS	U.S. Department of Agriculture, Soil Conservation Service
SHPO	Montana Historial Society, State Historic Preservation Office
30HV	30th Highest Hourly Volume of the Year
TSM	Transportation System Management
USC	United States Code
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Department of the Interior, Fish and Wildlife Service
US 2	U.S. Highway 2
WET	**Wetlands Evaluation Technique**

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Appendix 12: Evaluation of Significance of the South Fork of the Flathead River Bridge

The South Fork of the Flathead River Bridge at Hungry Horse **would be demolished following construction of the new bridge included with the proposed action.** The bridge is included under the **general provisions** of the Programmatic Agreement regarding historic roads and bridges in the State **approved in 1989. A copy of the Programmatic Agreement is included with this Appendix.** The **South Fork of the Flathead River** bridge is not significant to understanding the history and development of this type of bridge in Montana. Instead, it is an unexceptional example of a design common to the state's highway system.

Constructed in 1938 by Thomas Staunton of Great Falls, the South Fork of the Flathead River Bridge at Hungry Horse is a steel girder and floor beam structure. The bridge was fabricated by the Minneapolis Steel & Machine Company with reinforced steel manufactured at the Bethlehem Steel Company plant in Seattle. Consisting of five spans, the bridge is 592-feet in length. The spans include three continuous deck plate girder spans (two at 110-feet and one at 137'6") and two simple 92-foot deckplate girder spans. There are two reinforced concrete T-beam approaches leading to the bridge. The concrete deck is supported by ten I-beam steel girders and approximately 90 steel floor beams placed at right angles to the girders. The bridge is supported by four concrete piers. The two-lane bridge is 29'1" wide with a curb-to-curb width of 26-feet. The bridge was constructed to a standard design load of H-15.

The first steel girder and floor beam bridges were constructed in Montana for the railroads in the late 1880s. The design was particularly suited to the railroads since the bridges were structurally stable and were able to accommodate fast-moving heavy traffic. Ninety-eight steel girder and floor beam bridges for vehicular traffic have been constructed in Montana since 1909. The first steel girder and floor beam bridge was built in 1909 by Jefferson County construction crews and is located three miles north of Basin on Cataract Creek; the bridge was rebuilt in 1979. Although this type of bridge was constructed continually by the Montana Highway Department from the 1930s, most of the spans were constructed in conjunction with interstate projects during the 1960s (34 steel girder and floor beam bridges in Montana are associated with the interstate highways). Of the 98 bridges constructed in Montana, all are still in use and only 14 have been rehabilitated.

Four steel girder and floor beam bridges are located in Flathead County: the South Fork of the Flathead River Bridge at Hungry Horse (1938), the Flathead River northwest of Big Fork (1955), the South Fork of the Flathead River near Coram (1960), and the Middle Fork of the Flathead River at Essex (1968). While the South Fork of the Flathead Bridge was the earliest steel girder and floor beam structure constructed in the county, there are 15 bridges older than that bridge in Montana -- five of which are located in the northwest part of the state: Pinkham Creek southwest of Eureka (1914), Sweathouse Creek near Victor (1917), in Mineral County near Alberton (1933), and two on the East Fork of the Bitterroot River southeast of Conner (1937). Only six of the 15 pre-1938 bridges have been rehabilitated by the Montana Department of Transportation.

The South Fork of the Flathead River Bridge was one of 137 bridges built by the Montana Highway Department in 1938. The majority (93) were timber bridges constructed under Works Progress Administration (WPA) sponsorship -- primarily in eastern Montana. Twelve counties (Richland, Teton, Blaine, Carter, McCone, Cascade, Park, Yellowstone, Fallon, Phillips, Big Horn, and Valley) accounted for 75% of the bridges built that year.

The South Fork of the Flathead River Bridge at Hungry Horse is not significant for the purposes of Section 4(f) (49 U.S.C. 303). It does not display any unusual design features and is common to the style. The first steel girder and floor beam bridge was built in Jefferson County in 1909 and the last was constructed in 1988 in Dawson County. The design of the bridge has changed little since 1909; the only difference is in the quality of the building material used in the bridge's superstructure.

Since there are 98 steel girder and floor beam bridges located on Montana's primary and secondary highways and only 14 of them have been rehabilitated, this indicates that 84 bridges retain considerable integrity of design, materials, feeling and association with the history and development of this style bridge. The South Fork of the Flathead River Bridge does not display any unusual design features and is not singularly important to our understanding of the history and development of bridge construction in Montana. There are 43 steel girder and floor beam bridges located on the state's primary and secondary road system and 55 bridges located on the Interstate system -- all are nearly identical in design. Until recently, the steel girder and floor beam bridge was commonly used by the Montana Department of Transportation for spanning obstacles wider than 130-feet. Since the deck is supported by two girders on this type of bridge, failure of one of the girders jeopardizes the usefulness of the bridge. Currently, the MDT relies on four beam girder bridges since the failure of one girder does not force the closure of the bridge.

May 9, 1989

OCT 15 1993

ROBERT PECCIA
& ASSOCIATES

PROGRAMMATIC AGREEMENT

Among the Federal Highway Administration (FHWA), the Montana State Historic Preservation Office (MSHPO), and the Advisory Council on Historic Preservation (ACHP), to develop a historic preservation plan to establish processes for integrating the preservation and use of historic roads and bridges with the mission and programs of the FHWA in a manner appropriate to the nature of the historic properties involved, the nature of the roads and bridges in Montana, and the nature of FHWA's mission to provide safe, durable and economical transportation.

WHEREAS, Congress has mandated that highway bridges be evaluated, and where found substandard, be rehabilitated or replaced and has provided funding for these purposes, to insure the safety of the traveling public (through the Highway Bridge Replacement and Rehabilitation Program); and

WHEREAS, the American Association of State Highway and Transportation Officials (AASHTO) has standards regulating the construction and the rehabilitation of highways and bridges that must be met by the FHWA to insure the safety of the traveling public; and

WHEREAS, Congress declares it to be in the national interest to encourage the rehabilitation, reuse and preservation of bridges significant in American history, architecture, engineering and culture; and

WHEREAS, the FHWA proposes to make Federal funding available to the Montana Department of Highways (MDOH) for its ongoing program to construct and rehabilitate roads and bridges, and MDOH concurs in and accepts responsibilities for compliance with this Agreement; and

WHEREAS, the FHWA has determined that the construction and improvement of highways may have an effect on historic roads and bridges that are listed in the National Register of Historic Places, or may be determined eligible for listing, and have consulted with the ACHP and the MSHPO pursuant to Section 800.13 of the regulations (36CFR800) implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 470f); and

WHEREAS, the parties understand that not all historic roads and bridges fall under the jurisdiction or sphere of influence of the FHWA, and that to encourage other parties to participate in preservation efforts, an education to foster a preservation ethic is needed; and

NOW THEREFORE, FHWA, MSHPO, and ACHP agree, and MDOH concurs, that the following program to enhance the preservation potential of historic roads and bridges, and to promote management and public understanding of and appreciation for these cultural resources will be enacted in lieu of regular Section 106 procedures as applied to historic roads and bridges only.

Stipulations

The Federal Highway Administration will ensure that the following program is carried out:

The Federal Highway Administration, in cooperation with the Montana Department of Highways, will develop a preservation plan to ensure the preservation and rehabilitation of the states significant historic roads and bridges, and will develop an on-going educational program to interpret significant historic roads and bridges that illustrate the engineering, economic, and political development of roads in Montana. Specifically:

A. For Public Education

1. MDOH will prepare technical documentation of the history of roads and road construction, and of the history of bridge building in the state, according to a format developed by MDOH in consultation with the MSHPO and in compliance with the Secretary of the Interior's Standards for Preservation Planning. From this documentation MDOH will prepare narrative histories suitable for publication for the general public.. Draft copies of the documentation and the narrative histories will be submitted to the FHWA, MSHPO and a list of qualified reviewers to be determined by FHWA, MDOH and MSHPO by December 1, 1990, and 45 days will be allowed for reviewers to comment. MDOH will prepare final documentation and histories by May 1, 1991. Final copies will be distributed to the district, area, and field offices of the MDOH, to the County Commissioners, county road and bridge departments, and county historical societies, to the owners of significant roads and bridges identified in the documentation, to the Montana Historical Society Library and the Montana State Library, and to the general public as requested.

2. MDOH will develop and make available to newspapers and publishers of historical and of engineering journals articles suitable for public information on historic roads and bridges and on their construction and continued significance.

3. MDOH will augment its historic sign program by developing interpretation for the traveling public at existing rest areas or pull-overs to explain Montana's road construction and bridge engineering. It will develop on-site interpretation for significant resources that can be viewed and appreciated by the public.

4. By April 15, 1990 MDOH will develop and circulate a traveling exhibit that portrays the history of the development of transportation in Montana.

5. By December 1, 1991 MDOH will develop and circulate a public program (slide/tape or video) of approximately 20 minutes, suitable for use at public or organization gatherings, classrooms, etc.

B. For Historic Road and Bridge Preservation

1. The FHWA, in co-operation with the MDOH, will prepare a plan for the preservation of significant and representative road segments and bridge types around the state as identified in the research in part A. of this Agreement. The Historic Preservation Plan (HPP) will be presented to the FHWA, MSHPO, the ACHP and list of qualified reviewers by September 1, 1991, and 45 days comment period will be

allowed for discussion and adoption. FHWA will work to resolve disagreement on the proposed HPP. If agreement cannot be reached by December 1, 1991, all FHWA undertakings affecting historic roads and bridges will again become subject to 36 CFR 800 procedures.

The HPP for historic roads and bridges shall be prepared in accordance with the following guidelines:

a. The essential purpose of the HPP will be to establish processes for integrating the preservation and use of historic roads and bridges with the mission and programs of the FHWA and the MDOH in a manner appropriate to the nature of the historic properties involved, the nature of the roads and bridges in Montana, and the nature of FHWA's mission, to provide safe, durable and economical transportation;

b. In order to facilitate such integration, the HPP, including all maps and graphics, will be made consistent with the Federal Aid road and bridge numbering systems;

c. The HPP will be prepared in consultation with the owners, managers, caretakers, or administrators of historic roads and bridges, including county governments, city governments, federal agencies, and private individuals or corporations, and with interested parties or organizations, including the American Society of Civil Engineers - Montana Section, and the Montana Society of Engineers;

d. The HPP will be prepared with reference to the Secretary of Interior's Standards and Guidelines for Preservation Planning (48 FR 44716-20); and

e. The HPP will be prepared by or under the supervision of an individual who meets, or individuals who meet, at a minimum, the "professional qualifications standards" for historian and archaeologist in the Secretary of the Interior's Professional Qualifications Standards (48 FR 44738-9).

2. The contents of the HPP will be developed in conjunction with the MSHPO, and will include, but not be limited to, a schedule for the anticipated implementation of the various elements, plus the formulation and presentation of programs to:

   a. Preserve historic bridges that do not meet safety rating standards by rehabilitation in a manner that would preserve important historic features while meeting as many AASHTO standards as can be reasonably met;

   b. When a historic bridge must be replaced, give full consideration and demolition savings to reuse of the historic bridge in place by another party.

   c. When a historic bridge must be replaced and in place preservation is not feasible, give full consideration and financial assistance to relocating and rehabilitating the historic bridge as a part of the replacement project;

d. Develop and implement a program to encourage relocation and reuse of bridges of historic age that cannot be preserved in place or used on another location by the state or county;

e. Provide a financial incentive by offering demolition savings on all relocation and reuse of bridges of historic age;

f. Develop a list of historic roads and bridges that can be preserved. The list should include the variety available to reflect Montana highway construction history, while considering current condition and use. The list should be presented to and discussed with managing units to solicit their cooperation and/or participation in the preparation of the HPP; and

g. Devise a program to pursue the preservation of the state's representative and outstanding examples of road and bridge technology. A list of historic roads and bridges that shall be preserved will be developed to implement this program, given currently known commitments to do so by property managers and subject to change by obtaining future commitments for other properties covered by this Agreement.

3. The HPP will not include information developed in Part A. above, narrative histories, but will be guided by and used in conjunction with Part A. above, and will be distributed to the same parties.

4. MDOH will prepare a report annually on its implementation of the HPP, and provide this report to the FHWA, the SHPO, and the ACHP for review, comment, and consultation as needed.

C. Other Legal and Administrative Concerns

1. FHWA will continue to inventory, evaluate, seek determinations of eligibility, and fully comply with 36 CFR 800 for all undertakings with the potential to affect historic properties besides roads and bridges which are hereby excluded from such consideration.

2. The MSHPO, and the ACHP may monitor FHWA and MDOH activities to carry out this PA, by notifying FHWA in writing of their concerns and requesting such information as necessary to permit either or both MSHPO and ACHP to monitor the compliance with the terms of this Agreement. FHWA will cooperate with the SHPO, and the ACHP in carrying out their monitoring and review responsibilities.

3. FHWA will carry out the existing MOA's to preserve or record historic bridges that are now scheduled for replacement.

4. If a dispute arises regarding implementation of this PA, FHWA will consult with the objecting party to resolve the dispute. If any consulting party determines that the dispute cannot be resolved, FHWA will request further comments of the ACHP.

5. During any resolution of disagreements on the PA, and/or in the event MDOH does not carry out the terms of the PA, FHWA will carry out the procedures outlined in 36 CFR 800 for all undertakings otherwise covered by the agreement.

Execution of this PA evidences that FHWA has afforded the ACHP a reasonable opportunity to comment on FHWA's program to construct and improve Montana highways when these undertakings affect historic roads and bridges, and that FHWA has taken into account the effects of these undertakings on significant historic roads and bridges.

BY: FEDERAL HIGHWAY ADMINISTRATION

Roger K. Scott
5-11-89
Roger K. Scott
Division Administrator
Date

BY: MONTANA STATE HISTORIC PRESERVATION OFFICER

Marcella Sherfy
5-11-89
Marcella Sherfy, MSHPO
Date

BY: ADVISORY COUNCIL ON HISTORIC PRESERVATION

Robert D. Bush
6-1-89
Executive Director
Date

CONCUR
BY: MONTANA DEPARTMENT OF HIGHWAYS

Stephen C. Kologi
May 11, 1989
Stephen Kologi, P.E., Chief
Preconstruction Bureau
Date

Appendix 13: Preliminary Identification of Best Management Practices (BMPs) for Erosion Control

BACKGROUND

In January 1993, a Standard Erosion Control Work Plan for use by highway designers was completed. The work plan is intended to enhance and streamline the selection and design of temporary site-specific erosion control Best Management Practices (BMPs) for highway construction projects. BMPs are defined as physical, structural and/or managerial practices that when used alone or in combination, prevent or reduce erosion and release of sediment from the construction site.

The work plan does not address the design of permanent erosion control measures like permanent seeding mixes, permanent channel protection, or construction of retaining walls. Highway engineers will continue to design such measures using currently adopted practices.

The Montana Pollutant Discharge Elimination System (MPDES) regulations (A.R.M. 16.20.1314) requires a storm water discharge permit for construction activity in which clearing, grading, and excavating will result in the disturbance of more than total 5 acres or if a disturbance of greater than 1 acre is located within 100 feet of surface waters. A Storm Water Erosion Control Plan must be submitted to and approved by the MDHES Water Quality Bureau prior to construction. The objective of such a plan is to minimize the erosion of disturbed areas during and after construction of the project. The Storm Water Erosion Control Plan is the means for controlling pollutants in storm water discharges. With careful planning and proper implementation, the likelihood of pollutants reaching surface waters will be lessened.

The work plan is based on seven major principles of soil erosion and sedimentation control. These principles are:

- plan the development to fit the project setting,
- minimize the extent of disturbed area and duration of exposure,
- stabilize and protect disturbed areas as soon as possible,
- keep runoff velocities low,
- protect disturbed areas from runoff,
- retain sediment with the corridor or site area, and
- implement a thorough maintenance and follow-up program.

The work plan provides highway designers with a process to identify BMPs for erosion and sedimentation control. The selection of BMPs is based on the distance to surface water or wetlands, precipitation amount and intensity, soil properties, slopes, and the presence of critical resources (like threatened or endangered species habitat, prime fisheries, cultural sites, and hazardous materials/wastes). BMPs fall into three categories including slope protection measures, sediment retention, and waterway protection.

BMPs identified on the basis of the procedures identified in the *Highway Construction Standard Erosion Control Work Plan* (January 25, 1993) will be included with the design plans and profile sheets for

Control Work Plan (January 25, 1993) will be included with the design plans and profile sheets for construction projects.

IDENTIFICATION OF BMPs FOR THE COLUMBIA HEIGHTS-HUNGRY HORSE PROJECT

The procedures outlined in the erosion control work plan were applied to the preliminary design of the preferred alternative presented in Appendix 4 to identify BMPs that may be appropriate for the project area. The BMPs were determined based on the proposed action's proximity to the Flathead River and wetlands, the types of soils present in the project area, and presence of critical resources. Based on these site-specific conditions, slope protection BMPs and sediment retention BMPs that may be appropriate for the proposed action were identified.

TABLE A13-1 presents preliminary slope protection and sediment retention BMPs for the proposed reconstruction of US 2 between Columbia Heights and Hungry Horse. The table shows Project Stations (see Appendix 4) where the identified BMPs are appropriate, considerations for BMP selection, and specific BMPs that may be applicable for this project. Note that the identified BMPs may be used singly or in combination for specific project area locations. The highway designer will have the ultimate responsibility for selecting and designing BMPs for this project.

The BMPs that were identified as appropriate for the project area are briefly described below.

<u>Slope Protection BMPs</u>

Run-on Control/Diversion - a ridge of compacted soil and/or a ditch on the top of slopes, large flat disturbed areas, and stockpile areas to intercept storm water runoff from the drainage area above the unprotected slopes and direct it towards a stabilized outlet. This BMP is always used in conjunction with others like mulching or temporary seeding.

Slope Roughening or Serrating - a rough soil surface on slopes with horizontal depressions/stair stepping cuts or terraces created by appropriate machinery. This BMP is always used in conjunction with others like mulching or temporary seeding.

Temporary Seeding - the establishment of a temporary vegetative cover by seeding with rapidly growing annual plants. Often used in conjunction with other BMPs.

Erosion Control Blankets - a vegetative mulch material or synthetic geomembrane that has an attached anchoring mechanism. The blanket can be used on exposed soils, to enhance plant establishment, or to line ditch bottoms.

<u>Sediment Retention BMPs</u>

Straw Bale Barriers in Ditches @ 200' Intervals - a temporary sediment barrier consisting of a row of entrenched and anchored straw bales. Straw bale barriers are temporary erosion control measure that may be used for concentrated flow applications and are used primarily to reduce runoff velocity. The distance between straw bale barriers is dependent upon the longitudinal slope steepness (grade) that requires sediment retention.

Silt Fences in Ditches @ 200' Intervals - a temporary sediment barrier consisting of a filter fabric stretched and attached to supporting posts. Wire fence backing is needed for several types of filter fabrics commonly used. Silt fences assist in sediment control by retaining some of the eroded soil particles and slowing the runoff velocity to allow particle settling. The distance between silt fences

Silt Fences Parallel with the Toe of Fill Slopes - these temporary sediment barriers are used at the toe of fill slopes when water is adjacent to the construction activity. The fences are placed at 50-foot intervals parallel to the fill slope.

Dugout Ditch Basins - one or a series of small dugout basins along a concentrated runoff flow path constructed to reduce runoff velocity and promote sediment settling. Dugout ditch basins act as simplified sediment traps.

Waterway protection would be implemented for construction along the Flathead River in Badrock Canyon and at the new bridge site on the South Fork of the Flathead River. Waterway protection consists of measures or guidelines for construction activities that directly impact or contact surface water such as channel changes for culvert installation and streambank disturbances or berms for bridge construction projects. The design and specification of waterway protection measures shall comply with the Standard and Supplemental Specifications, as well as the Memorandum of Understanding with MDFWP concerning the Montana Stream Protection Act.

TABLE A13-1
BEST MANAGEMENT PRACTICES (BMPs) FOR EROSION CONTROL

				* CLASS					** SLOPE PROTECTION BMP's									** SEDIMENT RETENTION BMP's														
STA.	TO STA.	LOC.	C/F	SURFACE WATER	PREC.	SOIL PROPERTIES	SLOPE	CRITICAL RESOURCES	1	2A	2B	3A	3B	4	5	6	7	1	2A	2B	2C	3A	3B	3C	3D	4A	4B	4C	4D	5	6	7
452+62.06	457+00	RT	C	III	II	II	IV	III																								
458+00	467+00	RT	C	III	II	II	III	III																								
468+00	491+00	RT	F	III	II	I	IV	III																								
492+00	497+00	RT	C	III	II	II	III	III		X				X					X													
498+00	499+00	RT	C	III	II	II	II	III		X				X					X													
500+00	503+00	RT	C	III	II	II	I	III			X			X					X													
504+00	505+00	RT	C	III	II	II	IV	III																		X				X		
506+00	507+00	RT	F	III	II	I	III	III						X																		
508+00	509+00	RT	F	III	II	I	II	III						X																		
510+00	511+00	RT	F	III	II	I	III	III						X																		
512+00	515+00	RT	F	III	II	I	II	III						X																		
516+00	517+00	RT	F	III	II	I	III	III						X																		
518+00	519+00	RT	C	III	II	II	III	III																								
520+00	523+00	RT	C	III	II	II	II	III		X				X																		
524+00	525+00	RT	C	III	II	II	III	III																								
526+00	527+00	RT	F	III	II	I	III	III																								
528+00	533+00	RT	C	III	II	II	III	III																								
534+00	537+00	RT	F	III	II	I	III	III																								
538+00	545+00	RT	F	III	II	I	III	III						X																		
546+00	551+00	RT	F	III	II	I	IV	III																								
552+00	575+00	RT	C	III	II	II	III	III		X				X					X													
576+00	577+00	RT	C	III	II	II	II	III		X				X					X													
578+00	590+00	RT	C	III	II	II	I	III			X			X					X													
591+00	604+00	RT	C	III	II	III	I	III																								
605+00	610+00	RT	C	III	II	II	III	III		X				X																		
611+00	613+00	RT	C	III	II	III	I	III																								
614+00	618+00	RT	F	III	II	I	III	III																								
619+00	621+00	RT	C	III	II	II	III	III											X													
622+00	627+00	RT	C	III	II	II	I	III			X			X					X													
628+00	629+00	RT	C	III	II	II	III	III																								
630+00	637+00	RT	F	III	II	I	III	III																								
638+00	643+00	RT	C	III	II	II	III	III																								
644+00	651+00	RT	C	III	II	II	II	III		X				X					X													
652+00	657+00	RT	C	III	II	II	I	III			X			X																		
658+00	664+00	RT	F	III	II	I	III	III						X												X				X		
665+00	672+00	RT	F	III	II	I	III	III								X										X				X		
673+00	677+00	RT	F	III	II	I	II	III		X				X																		
678+00	684+00	RT	F	III	II	I	III	III		X				X																		
684+00	692+88.48	RT	F	III	II	I	IV	III																								

TABLE A13-1
BEST MANAGEMENT PRACTICES (BMPs) FOR EROSION CONTROL

				* CLASS					** SLOPE PROTECTION BMP's									** SEDIMENT RETENTION BMP's														
STA.	TO STA.	LOC.	C/F	SURFACE WATER	PREC.	SOIL PROPERTIES	SLOPE	CRITICAL RESOURCES	1	2A	2B	3A	3B	4	5	6	7	1	2A	2B	2C	3A	3B	3C	3D	4A	4B	4C	4D	5	6	7
452+62.06	461+00	LT	C	III	II	II	III	III																								
462+00	491+00	LT	F	III	II	I	IV	III																								
492+00	499+00	LT	C	III	II	II	III	III		X				X					X													
500+00	503+00	LT	C	III	II	II	II	III		X				X					X													
504+00	505+00	LT	F	III	II	I	II	III						X																		
506+00	517+00	LT	F	III	II	I	III	III						X																		
518+00	523+00	LT	C	III	II	II	III	III		X				X					X													
524+00	527+00	LT	F	III	II	I	III	III						X																		
528+00	533+00	LT	C	III	II	II	III	III																								
534+00	549+00	LT	F	III	II	I	III	III						X																		
550+00	553+00	LT	C	III	II	II	III	III		X				X																		
554+00	555+00	LT	F	III	II	I	III	III						X																		
556+00	557+00	LT	C	III	II	II	III	III																								
558+00	559+00	LT	F	III	II	I	III	III																								
560+00	561+00	LT	C	III	II	II	III	III																								
562+00	567+00	LT	F	III	II	I	III	III																								
568+00	579+00	LT	C	III	II	II	III	III		X				X					X							X				X		
580+00	590+00	LT	F	I	II	I	IV	I	X							X													X			
591+00	592+00	LT	F	I	II	I	I	I	X							X													X			
593+00	594+00	LT	F	I	II	I	IV	I	X							X													X			
595+00	598+00	LT	C	I	II	II	III	I	X							X																
599+00	608+00	LT	F	I	II	I	I	I	X							X													X			
609+00	613+00	LT	F	I	II	I	III	I	X							X													X			
614+00	620+00	LT	F	I	II	I	I	I	X							X													X			
621+00	635+00	LT	C	I	II	II	III	I	X							X			X							X				X		
636+00	637+00	LT	F	II	II	I	III	I		X	X																		X			
638+00	653+00	LT	F	II	II	I	III	I		X	X																		X			
654+00	661+00	LT	F	II	II	I	II	I		X	X																		X			
662+00	663+00	LT	F	I	II	I	I	I	X							X													X			
664+00	672+00	LT	F	I	II	I	III	I								X													X			
673+00	677+00	LT	F	III	II	I	III	III		X				X															X			
678+00	679+00	LT	C	III	II	II	III	III																								
680+00	681+00	LT	F	III	II	I	IV	III																								
682+00	692+88.48	LT	C	III	II	II	III	III																								

* THE CLASS OF THE AREAS AFFECTED IS DETERMINED USING THE MDT STANDARD EROSION CONTROL WORK PLAN (JANUARY 25, 1993)

** THE EXACT LOCATION AND THE EXTENT OF BMP's USED CAN BE ADJUSTED AS DIRECTED BY THE FIELD ENGINEER

BMP DESIGNATIONS

1. SLOPE PROTECTION BMP's

- 1 RUN ON CONTROL/DIVERSION
- 2A SLOPE ROUGHENING
- 2B SLOPE SERRATING
- 3A MULCHING - STRAW TUCKING
- 3B HYDROMULCHING
- 4 TEMPORARY SEEDING
- 5 VEGETATION SODDING
- 6 EROSION CONTROL BLANKET
- 7 SLOPE DRAINS

2. SEDIMENT RETENTION BMP's

- 1 VEGETATIVE BUFFER STRIP
- 2A STRAW BALE BARRIERS IN DITCHES WITH LONGITUDINAL SLOPES 1% TO 3% AT 200' INTERVALS
- 2B STRAW BALE BARRIERS IN DITCHES WITH LONGITUDINAL SLOPES 3% TO 5% AT 100' INTERVALS
- 2C STRAW BALE BARRIERS IN DITCHES WITH LONGITUDINAL SLOPES 5% TO 7.5% AT 50' INTERVALS
- 3A GRAVEL FILTER BERMS IN DITCHES WITH LONGITUDINAL SLOPES 2% TO 3% AT 300' INTERVALS
- 3B GRAVEL FILTER BERMS IN DITCHES WITH LONGITUDINAL SLOPES 3% TO 5% AT 150' INTERVALS
- 3C GRAVEL FILTER BERMS IN DITCHES WITH LONGITUDINAL SLOPES 5% TO 7.5% AT 50' INTERVALS
- 3D GRAVEL FILTER BERMS PARALLEL WITH THE TOE OF FILL SLOPES
- 4A SILT FENCES IN DITCHES WITH LONGITUDINAL SLOPES 2% TO 3% AT 200' INTERVALS
- 4B SILT FENCES IN DITCHES WITH LONGITUDINAL SLOPES 3% TO 5% AT 100' INTERVALS
- 4C SILT FENCES IN DITCHES WITH LONGITUDINAL SLOPES 5% TO 7.5% AT 50' INTERVALS
- 4D SILT FENCES PARALLEL WITH THE TOE OF FILL SLOPES
- 5 DUGOUT DITCH BASINS
- 6 DRAINS, BASINS, AND SETTLING BASINS
- 7 PIPE INLET/OUTLET PROTECTION AND SEDIMENT TRAPS

Appendix 14: Draft Section 404(b)(1) Evaluation

APPLICANT: Montana Department of Transportation

APPLICATION NUMBER: ______________________________

PROJECT: Columbia Heights - Hungry Horse (US 2 Highway Reconstruction)
Flathead County, Montana
Project F1-2(39) 138

I. INTRODUCTION

The 404(b)(1) guidelines, found in Title 40 of the Code of Federal Regulations, Part 230, are the substantive criteria used in evaluating discharges of dredged or fill material in waters of the United States under Section 404 of the Clean Water Act and are applicable to all 404 permit decisions. Fundamental to these Guidelines is the precept that dredged or fill material should not be discharged into the aquatic ecosystem unless it can be demonstrated that such discharges would not have unacceptable adverse impacts either individually or in combination with known and/or probable impacts of other activities affecting the ecosystems of concern.

Subpart B of the guidelines establishes four conditions which must be satisfied to make a finding that the proposed discharge complies with the guidelines. Paragraph 230.10 provides that:

a) Except as provided under Section 404 (b)(2), no discharge of dredged material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem, so long as the alternative does not have other significant adverse environmental consequences;

b) No discharge of dredged or fill material shall be permitted if it violates state water quality standards, Section 307 of the Clean Water Act, or the Endangered Species Act of 1973;

c) No discharge shall be permitted if it causes significant environmental impacts; and

d) Except as provided under Section 404 (b)(2), no discharge shall be permitted unless appropriate and practicable steps have been taken which will minimize potential adverse impacts of the discharge on the aquatic ecosystem.

Mitigation to offset significant and insignificant adverse impacts may be developed which could result in bringing a project into compliance with the guidelines. Impacts must be avoided to the maximum extent practicable and remaining unavoidable impacts will then be mitigated to the extent appropriate and practicable by requiring steps to minimize impacts and, finally by compensation for loss of aquatic resource values.

Section 230.11 sets forth the factual determinations which are to be considered in determining whether a discharge satisfies the four conditions of compliance. These determinations are contained in the following evaluation.

II. PROJECT DESCRIPTION

A. LOCATION OF THE PROPOSED ACTION

The Montana Department of Transportation (MDT) proposes to reconstruct 4.4 miles of U.S. Highway 2 (US 2) in Flathead County, Montana. The proposed project begins east of Columbia Falls near the intersection of US 2 and Secondary Highway 206 and extends northeasterly across the South Fork of the Flathead River to Hungry Horse. FIGURE I-1 in the Final EIS shows the location of the proposed action.

The project begins at Milepost (MP) 138.3 in Columbia Heights, a small residential area with a densely developed commercial strip along US 2. East of the Columbia Heights from MP 138.5 to MP 140.5, the existing highway passes through suburban and rural residential development. The highway enters Badrock Canyon at about MP 140.5, where it parallels or is adjacent to the main stem of the Flathead River for some two miles. The road crosses the South Fork of the Flathead River just west of Hungry Horse.

In Badrock Canyon, US 2 passes through a moderately thick forest with the steep north slope of Columbia Mountain to the south of the highway and the main stem of the Flathead River parallels the road to the north. A riprap-faced embankment, placed during previous improvements on US 2, encroaches on the river for about 1/2 mile adjacent to Berne Memorial Park. A narrow strip of vegetation between the river and the highway near Berne Memorial Park in the Canyon supports mature cottonwoods and conifers. The existing highway between Berne Park and Hungry Horse does not encroach on the river.

B. GENERAL DESCRIPTION

Based on investigations prepared for the Final EIS, the preferred highway design alternative for the proposed reconstruction of US 2 between Columbia Heights and the west entrance to Badrock Canyon is a four-lane road with a center median/left turn lane. Through Badrock Canyon to the project's end in Hungry Horse, the preferred design is an undivided 64-foot-wide four-lane road. A new four-lane bridge would be constructed parallel to and immediately downstream from the existing structure west of Hungry Horse.

Plan drawings showing the preferred alternative are contained in APPENDIX 4 of the Final EIS. These drawings show the location of the new road relative to the existing highway, the new right-of-way limits required for the facility, and the construction limits (the area likely to be disturbed during construction of the facility) for the preferred alternative. The preferred alternative includes the construction of approximately 2,100 lineal feet of vertical retaining wall between the new highway and the Flathead River. The retaining wall is proposed for construction between Project Stations 599+00 to 620+00.

C. AUTHORITY AND PURPOSE

The proposed project would reconstruct a deteriorating and narrow two-lane highway that is more than 60 years old. The proposed action would also eliminate deficiencies in alignment and would better accommodate the operational and traffic safety demands of current and future traffic in the corridor. Part I of the Final EIS offers a detailed description of the purpose and need for this project and provides materials to support the identified purposes and needs.

D. GENERAL DESCRIPTION OF THE DREDGED OR FILL MATERIAL

1. General Characteristics of Material

Preliminary soils testing for ten locations in the corridor done by MDT indicates that most soils encountered between Columbia Falls and the South Fork River fall into American Association of State Highway and

Transportation Officials (AASHTO) soil classification of A-1. These soils generally had from 4" to 12" of topsoil and were underlain by gravelly materials. Soils tested west of Hungry Horse near the South Fork of the Flathead River were classified as A-4. Generally, these soils have little if any topsoil and are underlain by silt, sandy silt, and gravel. Both the A-1 and A-4 classifications denote soils that are susceptible to erosion.

Geologic materials likely to be encountered with the proposed rock excavation in Badrock Canyon consists of limestones, dolomites, and argillites associated with Precambrian Belt series. These ancient sedimentary rocks form the massive outcrops in Badrock Canyon and are generally resistant to weathering.

2. Quantity of Material

Badrock Canyon Encroachment - The Draft EIS proposed that fill embankments be constructed in and along the Flathead River in Badrock Canyon between Project Stations 590+00 and 593+00 and from Stations 599+00 to 620+00. This design would require the placement of 8,300 cubic yards of fill below the ordinary high water mark. Comments on the Draft EIS suggested that measures to reduce the encroachment and associated impacts in Badrock Canyon be investigated. Therefore, alternate design measures like the use of retaining walls, mechanically stabilized oversteepened fill slopes, and structures to support a portion of the roadway were evaluated for the design of US 2 in the Canyon. The evaluations showed that many of the measures could substantially reduce the area of encroachment at this location.

Based on the results of subsequent design investigations, MDT modified its preferred alternative to include a vertical, mechanically-stabilized retaining wall from Stations 599+00 to 620+00. The preferred alternative would also eliminate the minor encroachment between Stations 590+00 and 593+00, proposed in the Draft EIS, by steepening the slopes of the embankment to avoid placing fill below the ordinary high water mark. The preferred alternative would place about 1,350 cubic yards of fill material below the ordinary high water mark. The design modifications incorporated into the preferred alternative reduced the amount of fill to be placed below the ordinary high water mark by some 78% over the design proposed in the Draft EIS.

If the design of the retaining wall requires additional erosion protection at the base of the wall where prolonged contact with the river is likely, an estimated 300 cubic yards of rock riprap would also be placed below the ordinary high water mark. The final design of the retaining wall will determine if this is necessary.

South Fork Encroachment - Piers for a new four-lane wide bridge would be constructed within the channel of the South Fork of the Flathead River. Although no preliminary design work has been completed on for the new bridge, it would likely require the construction of three piers in the river channel. The existing structure has four piers in the channel. Following construction of the new bridge, the existing structure would be removed.

Wetlands - The estimated quantity (in cubic yards) of fill material that would be discharged into wetland sites affected by the proposed action are listed below.

Wetland Site 2 (north) - 6,650 cubic yards of fill
Wetland Site 2 (south) - 2,900 cubic yards of fill
Wetland Site 5 - 5,080 cubic yards of fill (total at 4 individual sites between US 2 and river)
Wetland Site 5 - 24,600 cubic yards of fill on west approach to new South Fork bridge

Please note that Wetland Site 4, located on an old river terrace west of Badrock Canyon, would also be affected by the proposed action. However, no fill material would be placed in this wetland because portions of the site would be excavated and drained to accommodate construction of the new highway.

3. Sources of Fill Material

A mechanically stabilized retaining wall in Badrock Canyon would be constructed using select granular backfill placed behind a vertical wall face made of precast concrete panels or gabions. Metal reinforcing strips, made of galvanized or epoxy-coated steel are placed between lifts of backfill and are tied to the face of the retaining wall. Filter fabric is commonly used behind all wall joints to prevent washout of fine backfill material. Native materials generated through excavation for the roadway could be processed with on-site crushing equipment and used if the material meets the specifications for select granular backfill. Otherwise select granular backfill material would be imported to the project area.

Fill material placed in isolated wetlands or for the construction of approaches to the new bridge over the South Fork of the Flathead would be embankment material generated by excavation within the project site.

If sufficient embankment material is not generated from excavation on the project site, a local source of fill material would be used. It is expected that particle size and shape would be similar to that at the discharge sites, although the density of the fill material may be greater after road bed compaction. Potential borrow sites in the general vicinity of the proposed action have not yet been investigated.

E. DESCRIPTION OF THE PROPOSED DISCHARGE SITES

1. Location of Sites

The main stem of the Flathead River and the South Fork of the Flathead River would be encroached upon by the proposed reconstruction activities in the eastern half of the project corridor. Modifications to the horizontal alignment of US 2 in Badrock Canyon would encroach upon the main stem of the Flathead River. The project also crosses the South Fork of the Flathead River immediately west of Hungry Horse. A new bridge across the South Fork would be constructed immediately downstream from the existing structure.

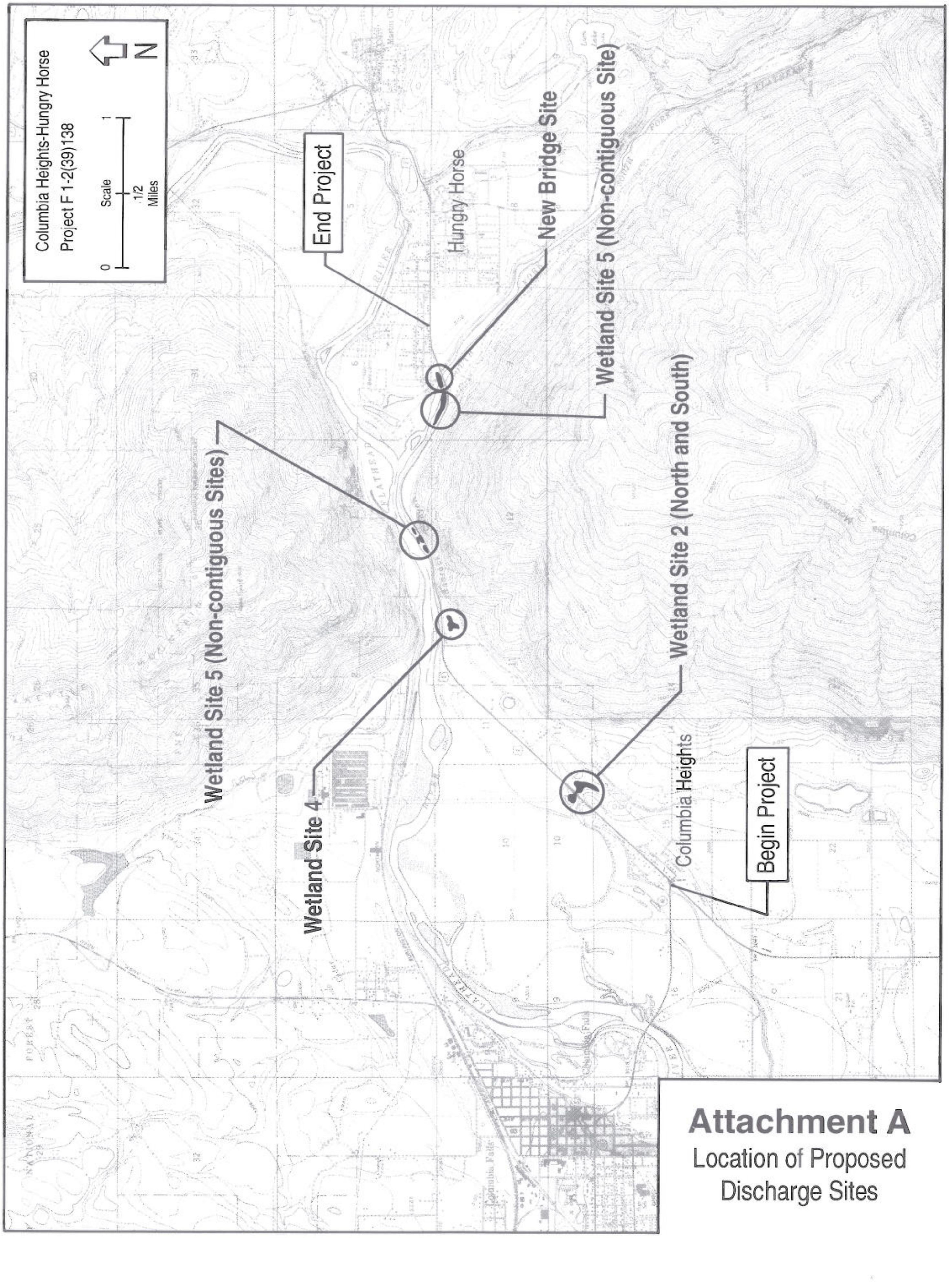
The proposed action would also affect several small isolated wetlands and minor amounts of riparian wetlands located within the project corridor. FIGURE III-6 in the Final EIS shows the location of wetlands within the project area. Specific areas within the project corridor where encroachment on surface waters and impacts to wetlands are likely are shown in ATTACHMENT A.

2. Size of Sites

Badrock Canyon Encroachment - As indicated above, a vertical retaining wall would be constructed from about Project Station 599+00 to 620+00. However, the encroachment on the ordinary high water mark would occur between Stations 600+86 and 607+07. The construction of a vertical retaining wall would affect about 6,500 square feet of area below the ordinary high water mark. An additional 3,100 square feet of area below the ordinary high water mark would be affected if riprap protection was placed at the base of the retaining wall for erosion protection. However, all of the area where the retaining wall would be constructed is within the 100-year floodplain of the Flathead River.

South Fork Encroachment - No preliminary design work has been completed for the new bridge that would span the South Fork of the Flathead River. However, preliminary reviews by the MDT Bridge Bureau indicate that the new bridge would likely have three piers in the river instead of four like the existing structure. Excavation of the streambed will be necessary to build footings for the piers that will be within the river channel. Assuming that three piers would be constructed in the channel of the South Fork, a total of 1,935 cubic yards of the streambed would have to be excavated to accommodate the footings for the piers. This figure is based on an estimated area of excavation for each footing of 67'x 23'x 13'.

It is also assumed that the abutments necessary for the new bridge would be constructed above the



Attachment A
Location of Proposed
Discharge Sites

ordinary high water mark on each river bank of the South Fork of the Flathead River.

Wetlands - Five wetlands sites, shown on FIGURE III-6 in the Final EIS, were identified for detailed analysis within the general project corridor. Only three of the five sites (Sites 2, 4, and 5) would be affected by the proposed highway reconstruction. The total acreage associated with each affected wetland site, the area of each site within the proposed right-of-way, and the amount of each site disturbed by construction are shown below.

Please note that the 16.1 acres of wetlands associated with Site 5 shown in the following table is comprised of 19 individual wetland and riparian areas ranging in size from 0.2 to 2.6 acres.

Affected Wetland Site	Total Acres in Site	Acres in New R/W	Acres Disturbed by Construction
Wetland Site 2	4.9	0.27 (north of US 2) 0.22 (south of US 2)	0.18 (north of US 2) 0.13 (south of US 2)
Wetland Site 4	1.1	0.90	0.71
Wetland Site 5	16.1	4.51	1.15

3. Type of Sites Affected

Several types of discharge sites would be associated with the proposed action. In Badrock Canyon, a vertical retaining wall and granular backfill would be placed in or along the main stem of the Flathead River. At the proposed crossing of the South Fork of the Flathead River, the stream bed would be excavated to allow for the construction of bridge piers and the construction of the western approach to the new bridge would place embankment materials in a riparian wetland adjacent to the South Fork. Other discharges would occur at individual, confined wetland areas within the new right-of-way due to the widening of the highway.

4. Types of Wetland Habitat Affected

The types of habitat that exists at the wetlands affected by the proposed action is summarized below:

Site 2: The portion of the site located north of the highway is inundated most of the year and is characterized by rooted emergent vegetation (W-1) surrounded by a narrow band of shrubs and trees (W-4, R-7). The area south of the highway is larger and covered by a shallow pond through much of the year but is primarily influenced by a permanent high water table. Rooted emergent vegetation, wet site graminoids and forbs predominate this part of the wetland site. A narrow band of wetland/riparian communities (W-4/R-7) rings the southern portion of Site 2.

Site 4: This wetland site, located on an old terrace of the Flathead River west of Badrock Canyon, is comprised of a shallow pond fed by a spring on Columbia Mountain. The pond is inundated most of the year. Vegetated wetland habitat present at this site include primarily shrubs (W-3), and a herbaceous cover of wet site graminoids and forbs (W-2). Very small unmappable inclusions of cattail (W-1) exist at the south end of the pond where the feeder stream enters.

Site 5: This site includes all of the narrow, non-contiguous wetlands found within larger riparian communities along the Flathead River between the House of Mystery and Hungry Horse. These areas are typically located within the 100-year floodplain and are found in depressions formed by past flood events. The wetland communities are characterized by dense shrubs (W-3) and a deciduous overstory with a dense shrub understory (W-7). Standing water does not exist at these sites but the Flathead River is near.

Additional information on affected wetlands and a detailed description of wetland habitat types can be found in Part III and APPENDIX 6, respectively, in the Final EIS.

5. Timing and Duration of Discharge

Reconstruction of the highway and construction of the new bridge across the South Fork of the Flathead River is anticipated to occur over two full construction seasons. It is estimated that 90 days would be required to build the required 2,100 lineal feet of vertical, mechanically-stabilized retaining wall in Badrock Canyon. Work on the retaining wall would be sequenced depending upon the level of the river at the time of construction. It is assumed that retaining wall construction would begin in June at the east end of the structure (Station 620+00) and progress westward. Such a sequence would minimize the chance that construction would be affected by highwater conditions in the river.

The placement of embankment materials in the small wetland areas associated with Site 2 would be accomplished in one or two days.

Approximately three months would be required to construct the footings and piers for the new bridge to an height that would be above the normal water level in the South Fork.

F. DESCRIPTION OF DISPOSAL METHOD

The following sections describe the general construction methods that would be employed to build the new road and bridge in the vicinity of surface waters and wetlands.

Badrock Canyon Encroachment - Cofferdams must be placed in the river along the riverbank area where the construction of the proposed vertical retaining wall would encounter water. After the cofferdams area placed, river water trapped behind the temporary dams would pumped out to expose the river bed and facilitate the excavation activities necessary to construct the lower portion of the retaining wall. Excavated materials and water confined in the cofferdams would be transferred to a temporary settling pond to remove sediments. The retained sediment would be disposed of in locations which would prevent its reintroduction to surface waters. No locations for a temporary settling pond have been investigated for the EIS. However, the location for such a facility would be identified before construction permits are obtained.

The preliminary designs for the vertical retaining wall indicate that the wall would be placed below the ordinary high water mark between Stations 600+86 and 607+07. It should be noted that surface water may not be directly encountered in this area if construction of the wall is undertaken during low water conditions on the Flathead River. However, depending on the elevation of the river at the time of construction, the water table in the riparian zone may be encountered during construction.

Placement of Fill in Wetlands - Fill materials would be placed in isolated wetland by large earthmoving and shaping equipment. Excess materials from adjacent areas of the project would be transported to sites where additional fill is needed to elevate the subgrade of the roadway.

Construction of Bridge Piers - The new bridge over the South Fork of the Flathead River would require that the streambed be excavated to construct footings and piers for the structure. The contractor for the bridge would most likely build one pier at a time to an elevation that is above the water level in the river. Typically, sheet pile cofferdams would be driven around the location of each pier and the area of streambed enclosed by the cofferdams would be excavated. Steel piles would be driven at the footing location and a concrete seal some 4-5 feet thick would be poured underwater to provide a base upon which the footing would be constructed.

After the concrete seal is in place, the area confined by the cofferdam would be dewatered. Forms and reinforcing steel for the footing and pier would be then be placed. Concrete for the footing would then be poured and allowed to cure. Subsequent work to erect the reinforced concrete pier would then be initiated after an appropriate curing time for the concrete in each footings.

Temporary work bridges would be required so equipment and workers can access the location of the new piers from the river bank. Material excavated for the pier footings and water from the area enclosed by the cofferdams at each pier location would be transported to a settling pond to remove sediments.

III. FACTUAL DETERMINATIONS (Section 230.11)

Potential impacts of the discharge of fill material into the Flathead River system and isolated wetlands affected by the proposed reconstruction of US 2 between Columbia Heights and Hungry Horse are evaluated below. Please note that information on existing water quality in the Flathead River, the substrate, and other aspects of the aquatic ecosystem is presented in APPENDIX 5 of the Final EIS.

A. PHYSICAL SUBSTRATE DETERMINATIONS

The materials contained in the substrate of project area streams are dependent upon the velocity of flows. Fine sediments are usually deposited in pools and along calm riverbank areas while gravel and cobbles are likely to be encountered beneath smooth flowing sections of river. The substrate of the Flathead River below the confluence with the South Fork is influenced by both natural riverine cycles and regulated flow releases from Hungry Horse Dam. The substantial amount of suspended sediments and organic particulates present in the water during spring runoff maintains a mix of substrate types characteristic of free-flowing waters in other sections of the Flathead River system.

The substrate of the South Fork of the Flathead River is markedly different than that of the main stem due to the effects of flows from Hungry Horse Dam. Since the operation of the dam, high flows have washed sediments and gravel from the stream bottom and the inflow of replacement materials from upstream sites has been isolated above Hungry Horse Reservoir. As a result, large cobbles and boulders now comprise the streambed of the South Fork and substrate materials have been compacted by the force of high water flows.

1. Substrate Elevation and Slope

The elevation and slope of the streambeds in the main stem of the Flathead and the South Fork would not be adversely affected by the proposed action. The placement of fill materials along the banks of the river would cause minor, localized changes to the elevation and slope of the stream bottom.

2. Compare Fill Material and Substrate at Discharge Sites

Badrock Canyon Encroachment - The substrate in the vicinity of the proposed discharge site in Badrock Canyon is expected to consist of smooth cobbles, gravel and fine sediments along the river bank. The fill used in this portion of the project would be the materials required to construct a vertical retaining wall between the new highway and the Flathead River. These materials would consist of unreinforced concrete (for leveling pads for the wall), precast concrete panels or gabion facing for the wall, steel reinforcing straps, and select granular backfill behind the wall.

Isolated Wetlands - Substrates in wetland areas affected by the project would consist of fine sediments transported by feeder streams and by runoff during precipitation events and snowmelt. The material placed in isolated wetlands affected by the proposed action would be embankment materials generated through excavation of areas near each wetland. These materials would be expected to be of the same parent constituents as substrate materials.

A vertical retaining wall would be constructed through four non-contiguous wetland stringers found in the floodplain the Flathead River. These areas contain fine sediments, sands, and gravel deposited by past flooding along the river channel. An overstory of deciduous trees and a dense stand of shrubs also exist in these riparian wetlands.

South Fork Encroachment - Large cobbles and boulders comprise the streambed of the South Fork and substrate materials have been compacted by the force of water releases from Hungry Horse Dam. The fill placed in the channel of the South Fork of the Flathead would be materials associated with the construction of piers for bridges. Steel piles would be driven to anchor each footing to the streambed. The footings and the piers for the new bridge would be made from reinforced concrete.

3. Dredged/Fill Material Movement

The fill materials used in the Badrock Canyon and South Fork encroachments would consist of materials that are not prone to movement by water action. It is possible that the placement of these features in the river channel could cause minor scouring in areas immediately downstream from the piers or along the base of the retaining wall. The substrate materials in the South Fork (large river cobbles with little fine sediment or gravel) is expected to be relatively resistant to scouring action. The design of these facilities will minimize the possibility of adverse hydraulic actions on the wall. Piers will be designed to offer the least resistance to flow by aligning the pier with the flow direction and will be of the smallest possible cross-section to minimize the potential for scouring.

The fill materials placed in wetlands would not be expected to move since the affected sites are isolated, and contained areas predominantly fed by surface water runoff. A vertical retaining wall constructed through these isolated wetlands would be expected to encounter water occasionally during periods of high runoff. These riparian wetlands are likely to be flooded during 3 to 5 years in any ten-year period. The design of the retaining wall will minimize the adverse effects of hydraulic action on the wall the surrounding area.

4. Physical Effects on Benthos, Invertebrates, Vertebrates

a. Physical Effects on Benthos

The proposed highway project would destroy benthic organisms along riverbanks or in inundated wetland areas where fill materials would be placed. The fill material would also eliminate a minor amount of bottom habitat available to organisms through a slight decrease in the width of the river channel. Benthic organisms would be destroyed in a parts of Wetland Site 4 (located on a river terrace west of Badrock Canyon) which must be drained to accommodate construction of the new highway.

The construction of new bridge piers would also destroy aquatic organisms living on the bottom of the South Fork River and remove potential habitat on the stream bottom for other organisms. Studies indicate that the benthic community in the South Fork of the Flathead River below Hungry Horse Dam is less diverse than in other parts of the Flathead River system due to releases of cold water from Hungry Horse Reservoir and the absence of fine sediments.

b. Physical Effects on Invertebrates

The primary effect to aquatic invertebrates expected to result from the proposed highway construction is that aquatic insects located along the river bank or in wetlands would be buried by the placement of fill materials. Construction activities in the river could dislodge insects from existing habitat and cause them to be transported downriver by water currents. There is a potential that short-term, localized increases in suspended sediments from fill material placed in surface water. This could adversely affects aquatic insects that rely upon sight to find food.

c. Physical Effects on Vertebrates

Bald eagles and fish in the Flathead River system are the vertebrate species of primary concern for this highway reconstruction project. The proposed action's impacts on bald eagles and their habitat are described in Part IV of the Final EIS.

Adverse impacts to fish could potentially result from the proposed action if substantial amounts of sediments from the erosion of disturbed areas are transported into the river system. These sediments could adversely affect stream habitat for fish by increasing silt in spawning gravel and rearing habitat, suffocating eggs or fry, or by affecting the aquatic organisms that fish rely upon as a major food source. Measures incorporated into the proposed action would minimize the likelihood that such potentially significant adverse impacts would occur in the project area.

Fish could also be adversely affected through the introduction of toxic materials to the water through highway runoff or through accidental spills. The potential for a toxic spill exists in the Badrock Canyon to Hungry Horse section of the project area due to the proximity of the existing and new highway to the Flathead River and the fact that vehicles transport a variety of hazardous materials over US 2.

As indicated in Part IV of the Final EIS, analyses indicate that pollutants associated with highway runoff and snowplowing or deicing would have minor effects on the quality of waters in the Flathead River. This conclusion also suggests that the effects of such pollutants on fish would be minor.

The effects of the proposed action on other vertebrates found in the project area are described in Part IV of the Final EIS.

5. Erosion and Accretion Patterns

The proposed action would not alter erosion or accretion processes associated with the main stem or South Fork of the Flathead River.

6. Actions Taken to Minimize Impacts (Subpart H)

The proposed action would include several measures designed to minimize impacts to substrates at the site of each encroachment. These will measures include:

- confining the discharge to the smallest area possible to minimize the number of benthic organisms that are destroyed or displaced;
- using fill materials that are similar to the substrate whenever possible; and
- timing the necessary work in wetlands or below the ordinary high water mark to minimize impacts.

Additionally, MDT's newly developed *Highway Construction Standard Erosion Control Workplan* will be used by highway designers to identify Best Management Practices (BMPs) for erosion control that are specific to the proposed action. The identified BMPs will be based on the proximity to surface waters and other sensitive resources. The contractor for the project will be required to follow the recommended BMPs during the construction of this project. The intent of this effort is to identify measures that will limit or prevent erosion of disturbed areas of the project and minimize the potential for sediments to be transported into surface waters during and after construction.

A list of possible BMPs that may be appropriate for this project area presented in APPENDIX 13 of the Final EIS. Note that the selection of BMPs would be done during final design activities for the project and would be at the discretion of the highway designer.

B. WATER CIRCULATION, FLUCTUATION, and SALINITY DETERMINATIONS

1. Water

Discussions about the existing water chemistry, water circulation characteristics, and water fluctuations for waters in the project area are contained in Part III and APPENDIX 5 of the Final EIS. The sections below focus on the proposed action's effects on these aspects of local water quality.

a. Salinity

The proposed action would not substantially alter the salinity of waters in the Flathead River system.

b. Water Chemistry

The proposed action would not cause changes the water chemistry or pH levels in the Flathead River system. Nor would the proposed action discharge mineral constituents to surface waters in concentrations that would substantially change the alkalinity or hardness of surface waters.

c. Suspended Sediments

The proposed action could cause temporary and minor increases in suspended sediments during construction activities in or near surface waters as fines present in fill are transported from disposal sites by water currents.

d. Clarity (Turbidity)

The placement of fill materials may cause minor and temporary increases in turbidity during activities associated with the construction of the encroachments.

e. Color

The deposition of fill materials into the Flathead River would disrupt the substrate and could temporarily increase sediment concentrations for short periods during construction. An increase in suspended sediments may alter the color of waters in the vicinity of the discharge site for short periods immediately following the deposition of fill. This change in color would be more apparent if the discharge occurred during base flow conditions rather than during the spring runoff when high concentrations of sediments are present giving the river a milky color.

f. Odor

The proposed action would not contribute odor-causing materials to waters in the project area.

g. Taste

The proposed action is not likely to introduce substances to the waters of the Flathead River system that would impart objectionable tastes to the water.

h. Dissolved Gas Levels

The proposed action would not cause notable increases in the turbulence of flows in the river system and is unlikely cause changes in the level of dissolved oxygen present in the water.

i. Nutrients

The preferred alternative initially presented in the Draft EIS would have placed rock excavated from the west outcrop in Badrock Canyon directly into the river to allow the alignment of the new road to be improved. Concerns about potential water quality degradation from the introduction of residual nitrate from explosives used for excavating rock were expressed by the Montana Department of Health and Environmental Sciences Water Quality Bureau.

The design of the preferred alternative in Badrock Canyon was examined again during the development of the Final EIS in response to public and agency comments about reducing the extent of the river encroachment in the Canyon. As a result of this reevaluation, the preferred alternative was modified to include a vertical retaining wall. The use of a vertical retaining wall would eliminate the need to place excavated rock which may contain residual nitrate into the Flathead River. Therefore, the proposed action is not expected to add substantial concentrations of nutrients to surface waters of the Flathead River system.

j. Eutrophication

The proposed action would not contribute quantities of sediments or nutrients to the Flathead River system sufficient to accelerate the natural process of eutrophication presently occurring in Flathead Lake.

k. Water Temperature

The proposed action would not significantly increase the temperature of flowing waters in the Flathead River system or in isolated wetlands.

2. Current Patterns and Circulation

a. Current Patterns, Drainage Patterns, Normal and Low Flows

The proposed action would produce minor and localized changes to current patterns in the vicinity of the encroachment in Badrock Canyon due to the placement of fill and construction of a vertical retaining wall.

The current pattern of the South Fork of the Flathead River would be altered during the construction of the proposed bridge due to the existence of additional piers within the riverbed. The new piers, together with those of the existing bridge, would be expected to change current patterns in the vicinity of the structures throughout the construction period for the new bridge. Upon completion of the new bridge, the existing structure would be removed. Current patterns in the South Fork after the old bridge is removed would not be substantially different than those presently experienced at this location.

The proposed action would not alter localized drainage patterns or affect the total flow of water in the main stem or South Fork of the Flathead River.

b. Velocity

At the point of maximum encroachment (Station 605+50), the proposed vertical retaining wall along the bank of the Flathead River in Badrock Canyon would reduce the width of the channel (at the elevation of the ordinary high water mark) by less than 4%. The channel width, at the elevation of the ordinary high water mark, is naturally reduced in width by more than 40% at Fisherman's Rock, located immediately downstream from the propose encroachment at Project Station 598+50. The reduction in channel width caused by building a vertical retaining wall along the riverbank is not expected to cause a notable increase in the velocity of the river flow at this location.

Likewise, the construction of the new bridge over the South Fork is not expected to cause substantial changes to the velocity of existing flows in the river. The proposed project would construct a new bridge but would also remove the existing structure at the completion of the project. Conditions in the channel would be similar to those that presently exist. The volume of flow released from Hungry Horse Dam will continue to be the primary determinant of river velocity in the South Fork of the Flathead River.

c. Stratification

The proposed action would not be expected to contribute to the stratification of waters in the Flathead River in Badrock Canyon or in the South Fork.

d. Hydrologic Regime

The proposed action would not affect the hydrologic regime present in the Flathead River system.

e. Aquifer Recharge

The proposed action would not adversely affect aquifer recharge areas.

3. Normal Water Level Fluctuations

The proposed action would not change normal water level fluctuations in the Flathead River system. Hydraulic calculations showed that the elevation of the 100-year flood on the main stem of the Flathead River in Badrock Canyon would remain the same or decrease slightly with the fill area proposed in the Draft EIS. The preferred action included in the Final EIS incorporates a vertical retaining wall through Badrock Canyon, a measure that would reduce the extent of the proposed encroachment by some 80% over the embankment proposed in the Draft EIS. Therefore, it can be inferred that the impacts on 100-year flood elevations would be generally unaffected by the proposed action.

4. Salinity Gradients

Salinity gradients form where salt water from the ocean meets and mixes with fresh water from the land. This situation does not occur within the project area.

5. Actions That Will Be Taken To Minimize Impacts

An Erosion Control Plan for the final design of the proposed action will be completed to identify best management practices (BMPs) for the control of erosion and sedimentation. The BMPs will be implemented during and after construction to minimize the potential for water quality degradation from sediments transported to receiving waters from disturbed areas and the roadway.

C. SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

1. Expected Changes in Suspended Particulates and Turbidity Levels At or Near the Disposal Sites

The placement of fill may introduce amounts of fine materials to Flathead River surface waters causing temporary increases in the level of suspended sediments following deposition. During construction in or along the river, some bottom sediments would likely be resuspended due to turbulence caused deposition activities. Turbidity levels in the vicinity of river encroachments or affected wetlands may be elevated for short periods during and after deposition of fill.

The potential for runoff from areas adjacent to the river and wetlands to transport sediments to surface waters causing increases in turbidity also exists. The potential for introducing sediments to surface waters would be highest during construction activities when vegetation over large areas of the corridor has been removed exposing erodible soil materials.

2. Effects on Chemical and Physical Properties of the Water Column

a. Light Penetration

Light penetration may be affected by disturbances to the substrate and with the introduction of minor amounts of new materials associated with the discharge that may be suspended in the water. These impacts would be short-term and occur only during the construction of the Badrock Canyon encroachment.

The construction of bridge piers would disturb bottom sediments due to excavation of the streambed. Pumping to dewater cofferdams around bridge pier locations could also cause temporary increases in turbidity.

b. Dissolved Oxygen

Concentrations of suspended particulates may be elevated for short periods during construction activities, however, turbid conditions would not persist long enough to increase water temperatures or substantially lower the rate of photosynthesis and primary productivity.

c. Toxic Metals and Organics

The fill materials used for construction of the proposed action would be locally obtained. Water quality data for the Flathead River upstream and downstream of the project area does not suggest that soils constituents in the project area are a source of toxic metals or organics. There is no reason to indicate that fill materials used for this project would contain concentrations of toxic metals or organics at higher levels than those that naturally occur in the area.

d. Pathogens

The proposed fill materials would not be expected to introduce pathogens to surface waters. Potential sources of viruses or pathogenic organisms are not known to exist in the project area.

e. Aesthetics

The proposed action could produce localized adverse effects on the aesthetics of the water during the placement of fill materials if water turbidity levels are elevated for short periods during construction activities and following the deposition of fill in wetlands. The fill activities associated with the proposed action would not be expected to produce suspended particulates in quantities that would create turbid plumes in the river.

3. Effects on Biota

a. Primary Production, Photosynthesis

As indicated in 2b above, turbid water conditions would not be expected to persist long enough to substantially lower the rate of photosynthesis and primary productivity. Turbidity increases would be localized to the area where the retaining wall would be constructed and where material is placed in wetlands.

b. Suspension/Filter Feeders

Collectors and filter feeders capture and use organic particles suspended in the current. Suspension and filter feeders (like net-spinning caddis larvae and burrowing mayfly nymphs) in waters of the project area would be destroyed if their habitat is located in areas where fill materials would be deposited. Other short-term impacts may occur if suspended fines from the fill materials alter or reduce the amount of organic particles available to these organisms. Such impacts would be persist only for short periods during construction activities.

c. Sight Feeders

Long-term adverse impacts on sight feeders in the Flathead drainage (like stonefly nymphs) are not likely because the level of particulates suspended in the water column would be elevated for only short periods immediately following deposition of fill materials.

4. Actions Taken to Minimize Impacts

An Erosion Control Plan for the final design of the proposed action will be completed to identify best management practices (BMPs) for the control of erosion and sedimentation. A preliminary evaluation of BMPs for erosion control in the project area based on the layout of the preferred alternative was completed for the Final EIS. APPENDIX 13 in the Final EIS contains a list of possible erosion control measures that may be appropriate for area of the project. This list of BMPs was identified based on the procedures outlined in MDT's *Highway Construction Erosion Control Workplan.*

The BMPs identified through preliminary design activities generally include measures for erosion control on roadside slopes (like run on control, slope roughening, temporary seeding, and the use of erosion control blankets) and sediment retention measures (like using straw bale barriers, silt fences, and dugout ditch basins).

Coffer dams would be employed to construct the proposed vertical retaining wall in Badrock Canyon and the footings and piers for the new bridge over the South Fork of the Flathead River. This measure will confine and isolate the areas of construction from river action so that the potential for increasing turbidity is minimized. Dewatering the areas confined by coffer dams would decrease the likelihood for construction activities to introduce materials to the river that would increase turbidity levels.

D. CONTAMINANT DETERMINATIONS

1. Evaluation of the Biological Availability of Pollutants in Dredged or Fill Material

a. Physical Characteristics of Fill or Dredge Materials

The primary material to be used as fill would be generated through excavation within the project area. Embankment materials would not be imported to the project area unless sufficient quantities are unavailable. A localized source for fill would be used if additional material is needed for the project. Local sources of fill material would be expected to consist of particle sizes and constituents similar to those of the project area.

b. Hydrography in Relation to Known or Anticipated Sources of Contamination

The location of US 2 adjacent to the Flathead River in Badrock Canyon presents a situation in which contaminants from highway runoff or accidental spills could directly enter the river system. Little or no roadside area exists between the river and the highway to collect or attenuate spills of potential contaminants. Likewise, highway runoff or an accidental spill on the new bridge could introduce contaminants directly into the South Fork of the Flathead River.

c. Results from Previous Testing of the Material or Similar Material in the Vicinity of the Project

No previous testing of materials in the project area has been done to determine if contaminants are present.

d. Known, Significant Sources of Persistent Pesticides from Land Runoff or Percolation

There are no known significant sources of pesticides present in the project area. MDT has proposed that an herbicide spraying program be implemented to combat spotted knapweed infestation on lands near the House of Mystery acquired for the development of replacement parkland and a new river access site. Herbicide treatments for these lands would be accomplished by the Flathead County Weed District based on detailed instructions from MDT about where to spray and what herbicide is to be used, particularly in areas where riparian vegetation exists.

e. Spill Records for Petroleum Products or Designated (Section 311 of CWA) Hazardous Substances

A review of spill records maintained by the Montana Department of Health and Environmental Science (MDHES) Water Quality Bureau since 1972 showed that there are have been no spills of petroleum products or other designated hazardous substances for US 2 within the project area. Records show that a minor spill (about 2 gallons of transformer oil) occurred in 1990 at was reported at Hungry Horse Dam on the South Fork of the Flathead River. Records also show that since 1972, spills of gasoline or road oil have occurred on Highway 2 between West Glacier and Essex during 1973, 1979, and 1985.

The MDHES Solid and Hazardous Waste Bureau has no records of leaking underground fuel storage tanks at the gas stations located in Columbia Heights.

f. Other Public Records of Significant Introduction of Contaminants from Industries, Municipalities, or Other Sources.

Spills of oils containing PCBs also occurred at the Columbia Falls Aluminum Plant, located on the northeast of Columbia Falls during 1983 and 1991. The plant is located about one mile north of US 2 on the north side of the main stem of the Flathead River. Records did not indicate that materials from these spills entered the Flathead River system.

There are no industrial facilities in the project area listed on the National Priorities List (Superfund) maintained by EPA. Three facilities in the Columbia Falls area fall under the State of Montana's Mini-Superfund Law, however, none of these sites are located in the project area.

g. Known Existence of Substantial Material Deposits of Substances Which Could be Released in Harmful Quantities to the Aquatic Environment by Man-induced Discharge Activities

There are no substantial material deposits of substances which could be harmful if released into the aquatic environment through discharge activities known to exist in the project area.

h. Other Sources of Contaminants

Other sources of contaminants that may be present in the project area are described in the following paragraphs.

Road Salts/Deicing Chemicals - The project area is subject winter weather that often produces snow-covered or icy road conditions on US 2. Maintenance activities during periods when such road conditions persist include the application of sand, salt, or other deicing chemicals. In portions of the corridor where the road exists adjacent to the river, these materials may be directly transported to receiving waters by subsequent snow plowing or by runoff from the highway generated by melting snow and ice. Analyses completed for the Final EIS indicate that such substances are not likely to be introduced into the Flathead River in concentrations that would substantially degrade water quality.

Dust Suppressants - The Montana Department of Health and Environmental Sciences Air Quality Bureau has expressed concerns about the generation of particulate matter within the corridor during and following construction of the highway. The agency recommended that water and/or chemical dust suppressants be used to minimize road dust. In the absence of erosion control measures, surface runoff from the construction zone and roadway could transport chemicals from dust suppressants to receiving waters affecting water quality.

Explosives Used in Rock Excavation - Excavation of the western rock outcrop at Berne Memorial Park would be accomplished through blasting. Blasting agents may contain constituents (primarily nitrates) that could adversely affect the quality of surface waters. Rock excavated from this outcrop was initially proposed for use as fill material in Badrock Canyon. However, the design of the preferred alternative was modified for the Final EIS to include a vertical retaining wall and not a riprap faced embankment in this location. This design modification would not place rock containing traces of blasting agents and residual nitrate into the river.

Rock excavated from the outcrop would be crushed and placed under the road surface in areas where fill is needed or used as aggregate in surfacing materials.

Rock Weathering Stain - The USFS Flathead National Forest, Hungry Horse Ranger District suggested that MDT consider treating the newly exposed rock face at the west end of Berne Memorial Park with a chemical stain that produces a weathered appearance. Such stains have been successfully used by the Colorado, California, Nevada, and Arizona Departments of Transportation, the U.S. Forest Service (Lolo National Forest in Montana), and the Bureau of Land Management, but the stain has not previously been used by MDT. The supplier of a weathering stain called "Permeon", made of sulfates of manganese and iron with an acetate activator, indicated that the stain is safe for use near surface waters. The material is applied at a rate that produces little, if any, runoff from the rock face.

Further investigations of the effects of such stains on water quality and the appropriateness of the product's use in Badrock Canyon area is necessary before this treatment would be included as part of the proposed action.

2. Contaminant Determination

An evaluation of the information presented **in 1a. through 1h.** above indicates that there is no reason at this time to believe the proposed fill material is a carrier of contaminants. Therefore, the material would be expected to meet the testing exclusion criteria.

E. AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

1. Effects on Plankton

For highway reconstruction projects, changes to water transparency due to suspended sediments and pollutants due to from surface runoff, are the primary concerns. The proposed reconstruction of US 2 is expected to cause only short-term changes in water clarity during the placement of fill materials, installation of coffer dams, or dewatering activities.

2. Effects on Benthos

The proposed action's potential effects on benthos were generally described in III. A. Physical Substrate Determination presented earlier in this 404(b)(1) evaluation.

3. Effects on Nekton

Nekton are actively swimming aquatic organisms (like fish) able to navigate independently of water currents. The proposed action's potential impacts on nekton were generally described in the III. A. Physical Substrate Determination presented earlier in this 404(b)(1) evaluation. Part IV of the Final EIS also contains a discussion of the impacts on fish that may potentially occur from the proposed action.

4. Effects on Aquatic Food Web

The discharge activities associated with the proposed action would not cause long-term disruptions to or adversely impact the aquatic food web that exists in the Flathead River system.

5. Effects on Special Aquatic Sites

Special aquatic sites are geographic sites possessing special ecological characteristics of productivity, habitat, wildlife protection, or other important and easily disrupted ecological values. These areas are generally recognized as significantly influencing or positively contributing to the overall environmental health or vitality of the entire ecosystem within at region.

a. Sanctuaries and Refuges

There are no areas within the project area that have been designated as wildlife or waterfowl sanctuaries or refuges by State, Federal or local agencies.

b. Wetlands

Wetlands affected by the proposed action consist of isolated wetlands and riparian wetlands associated with the Flathead River. A total of 5.58 acres of jurisdictional wetlands for Section 404 purposes exist within the probable right-of-way corridor for the proposed highway reconstruction. About 1.8 acres of these jurisdictional wetlands would be disturbed by construction.

c. Mud Flats

Mud flats are broad flat areas along seacoasts or inland lakes, ponds or rivers. They are usually vegetated with There are no mud flats within the limits of this proposed action. The project would not create new mud flats.

d. Vegetated Shallows

Vegetated shallows are permanently inundated area that under normal circumstances support communities of rooted aquatic vegetation like cattails and sedges. Wetland impacts have been addressed in this Evaluation and are discussed in Part IV of the Final EIS.

e. Riffle and Pool Complexes

Steep gradient sections of streams are sometimes characterized by a series of riffles and pools. The rapid movement of water over a coarse substrate in riffles produces a flow with a turbulent surface. Riffles have high dissolved oxygen levels in the water. Pools are deeper areas of the flow with associated slower stream velocities and a finer substrate. Riffles and pools exist underneath the existing bridge over the South Fork of the Flathead River. However, the flow regime from Hungry Horse Dam obscures the natural sequence of riffles and pools in this reach of river.

The proposed new bridge would affect the riffle and pool complexes in the South Fork by placing piers in the river. The effect on these aquatic features would be similar to that caused by the existing structure. Employing one less pier in the channel than used for the existing bridge would be beneficial in limiting the effects on riffle and pool complexes. The bridge piers in the South Fork of the Flathead River would be designed and constructed to minimize the potential for scour in the vicinity of the piers.

The proposed action would not disrupt riffle and pool sequences present in the main stem of the Flathead River since the discharge of materials would occur in a very localized area along the river bank.

6. Effects on Threatened/Endangered Species and their Habitat

The U.S. Fish and Wildlife Service (USFWS) indicates that the grizzly bear is a resident near the project and the bald eagle breeds in the general vicinity and winters along the main stem and along the South Fork of the Flathead Rivers. The peregrine falcon is a seasonal migrant to the area and the gray wolf is a potential resident of lands near the proposed project.

The Biological Opinion written by the USFWS indicated that the proposed action will not adversely affect the endangered gray wolf and peregrine falcon and the threatened grizzly bear. However, the project may affect bald eagles due to impacts of removing riparian vegetation that serves as habitat for the species. As a result of this determination, the MDT and the Federal Highway Administration entered into formal consultation with the USFWS about potential impacts on habitat important to the species.

The formal consultation process was completed on March 24, 1992 when the USFWS issued its opinion that the proposed action is not likely to jeopardize the continued existence of the species. The result of this consultation was the development of conservation recommendations that will be incorporated into the development of the project. The Biological Opinion and conservation recommendations are contained in Part VI of the Final EIS.

The USFWS also recently elected to conduct a formal review to determine whether listing the bull trout as a threatened or endangered species is warranted.

7. Effects on Other Wildlife, Mammals, Birds, Herpetiles, Fish, Invertebrates, Candidate Endangered Species, State Endangered Species, and Species of Special Interest or Concern and their Habitat.

Montana's Department of Fish, Wildlife & Parks considers bull trout and westslope cutthroat trout to be species of special concern. This designation recognizes the limited range of these species of trout and their sensitivity to habitat degradation, to harvest by fishermen, and to potential competition or intermingling with non-native fish species. The proposed action's potential effects on fish were presented previously in this evaluation.

The impacts of the proposed action on other wildlife, birds, herpetiles, fish, and other species of special interest or concern is discussed in Part IV of the Final EIS.

8. Actions taken to Avoid and Minimize Impacts

During the development of alternatives for the EIS, other locations for the proposed roadway that would avoid or minimize impacts to riparian lands in Badrock Canyon were investigated. Such location alternatives were eliminated from consideration because they would result in the loss of the spring used as a public water source at Berne Memorial Park and would require the excavation of both rock outcrops in Badrock Canyon. Part II of the Final EIS provides more detailed information on other location alternatives considered for US 2.

Measures to minimize other environmental impacts of the proposed action are generally discussed at the end of Part IV of the Final EIS.

9. Compensatory Actions Taken to Mitigate Impacts

Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts which remain after all appropriate and practicable minimization has been required. The *Memorandum of Agreement Between the Environmental Protection Agency and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines* dated February 6, 1990 indicates that first priority be given to compensatory actions (e.g. restoration of existing degraded wetlands or creation of man-made wetlands) in areas adjacent or contiguous to the discharge site. If on-site compensatory mitigation was not practicable, off-site compensatory mitigation within the general project area should be pursued.

The Only Alternatives Wetlands Finding for this proposed action is included as an Appendix to the Final EIS (see APPENDIX 15). This Finding outlines the compensatory actions taken to mitigate the proposed action's impacts on wetlands and identifies opportunities for constructing a replacement wetland or enhancing an existing wetland in the vicinity of the proposed highway project.

10. Monitoring of Mitigative Actions

Standard specifications for wetlands designed as mitigation for impacts due to highway construction call for inspections to occur before, during, and after the replacement wetland is built by the project manager, MDT's wetland biologist, and/or MDT's agronomist. MDT will inspect wetlands constructed as mitigation for impacts during:

- a plan-in-hand visit prior to initiating development of the wetland;

- a visit made prior to the final grading for the wetland;
- the period when the wetland is planted;
- the first full summer after completion of wetland construction to determine the preliminary success of the project; and
- a final inspection in the second full summer following completion of the wetland construction.

Agency reviews required prior to obtaining construction permits will also ensure that any discharges, pumping, or dewatering during construction activities do not degrade surface waters or wetlands.

F. PROPOSED DISPOSAL SITE DETERMINATIONS

1. Mixing Zone Determination

a. Depth of Water at the Disposal Site

Based on a surveyed river cross-section, the Flathead River in Badrock Canyon (at the elevation of the ordinary high water mark) where the vertical retaining wall is proposed is approximately 5 feet deep. The depth of the river at this location varies by season. River water may or may not be directly encountered in this vicinity during the construction of the retaining wall.

The depth of water in the South Fork of the Flathead River is variable and fluctuates with the releases from Hungry Horse Dam.

Ponded water in the four non-contiguous wetlands located within the floodplain in Badrock Canyon is likely to be encountered during years when high spring runoff volumes are present. The depth of ponded water at these sites during such events is estimated to be 3 feet or less.

The depth of ponded water at Site 2 located near Project Station 505+00 is quite shallow and assumed to be less than 3 feet. The depth of water at Wetland Site 4, located west of the mouth of Badrock Canyon is estimated to be 2 feet or less.

b. Current Velocity, Direction, and Variability at Disposal Sites

Currents and water circulation are discussed in Part III. B. 2. of this Evaluation.

c. Degree of Turbulence

Turbulent conditions created by the discharge of fill materials would be minor and occur only during the construction of the proposed action.

d. Water Column Stratification

The proposed action is not likely to introduce sediments into the water that would release contaminants to the water column in sufficient concentrations to produce a degradation of water quality.

e. Discharge Vessel and Speed

This consideration is not applicable to this project.

f. Rate of Discharge

The rate of discharge is discussed in Part II. D. 5. of this Evaluation.

g. Ambient Concentration of Constituents of Interest

The ambient concentration of constituents of interest in the Flathead River system are presented in APPENDIX 5 of the Final EIS. This appendix contains a listing of the measured water quality parameters for the Flathead River at Columbia Falls.

h. Dredged or Fill Material Characteristics

The characteristics of the proposed fill materials are discussed in Part III. D. 1. of this Evaluation.

i. Number of Discharges Per Unit of Time

The rate of timing and duration of the proposed discharge is discussed in Part II. D. 5. of this Evaluation.

j. Other Factors Affecting Rates and Patterns of Mixing

The primary factor affecting the rate and pattern of mixing in the main stem and the South Fork of the Flathead River is the release of water from Hungry Horse Dam. These releases cause water levels in both the South Fork and main stem to fluctuate notably.

2. An Evaluation of the Appropriate Factors in F(1) Above

The evaluation of the appropriate factors above indicate that the disposal sites and the size of the mixing zones are acceptable.

3. Actions to Minimize Adverse Discharge Effects

All appropriate and practicable steps have been taken, through application of recommendation of Section 230.70 - 230.77 to ensure minimal adverse effects of the proposed discharge. These measures are listed elsewhere in this Evaluation and in Part IV of the Final EIS.

4. Determination of Compliance with Applicable Water Quality Standards

The following section identifies applicable federal water quality standards and indicates whether or not the proposed action would comply with these standards.

> <u>Clean Water Act, as amended, (Federal Water Pollution Control Act) 33 U.S.C. 1251 et seq.</u> - In compliance. Although Section 404 permit processing has not been initiated, MDT has already coordinated with the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency. These coordination efforts identified the need for an individual 404 permit for discharge activities associated with the proposed action .
>
> <u>Coastal Zone Management Act, as amended, 16 U.S.C. 1531, et seq.</u> - This Act is not applicable because the project area does not involve a coastal zone.
>
> <u>Estuary Protection Act, 16 U.S.C. 1221, et seq.</u> - This Act is not applicable because the proposed action does not involve an estuary.

Federal Water Project Recreation Act, as amended, 16 U.S.C. 460-1(12) et seq. - This act is not applicable because the project is not considered to be a water project.

Fish and Wildlife Coordination Act, as amended, 16 U.S.C. 661, et seq. - In compliance. The Montana Department of Fish, Wildlife & Parks and the U.S. Fish and Wildlife Service were coordinated with and their comments have been incorporated into the EIS for this project.

Marine Protection, Research, and Sanctuaries Act, 33 U.S.C. 1401, et seq. - This Act is not applicable because the proposed action does not involve the discharge of materials into the ocean.

Rivers and Harbors Act, 33 U.S.C. 401, et seq. - This Act is not applicable because the proposed action would not place obstructions in a navigable waterway.

Watershed Protection and Flood Prevention Act, 16 U.S.C. 1101, et seq. - This Act is not applicable because the proposed action does not involve the construction of dams in an upstream watershed.

Wild and Scenic Rivers Act, as amended, 16 U.S.C. 1271, et seq. - In compliance. The proposed action would affect 0.84 acres of the Middle Fork of the Flathead Recreational River Corridor. Coordination with the U.S. Forest Service, the agency with management responsibility for the Recreational River Corridor, indicates that the proposed action would not produce significant impacts on the values or resources of this segment of the Wild and Scenic Rivers System.

The portion of the Flathead River system affected by the proposed action is not on the National Inventory of Rivers potentially eligible for inclusion in the Wild and Scenic Rivers System. The proposed action does not foreclose the opportunity for additional portions of the Flathead River in the project area to be studied for potential eligibility and inclusion in the Wild and Scenic Rivers System.

Floodplain Management (Executive Order 11988) - In compliance. The project would not have significant effects on the floodplain.

Protection of Wetlands (Executive Order 11990) - In compliance. The project must involve work below the ordinary high water line to accomplish its purpose.

A discussion of the proposed action's compliance with state water quality standards is presented later in this evaluation.

5. Potential Effects on Human Use Characteristics

a. Municipal, Private and Potential Water Supply

Municipal Water Supplies - Columbia Falls, located some two miles west of the project, has a municipal water system. The Cedar Creek watershed located some 2 miles north and east of the community provides more than 90% of the annual supply of water. Cedar Creek Reservoir was constructed to store water from the watershed. Columbia Falls also uses water from two wells to supplement the existing surface supply.

The community of Hungry Horse also has a small municipal system capable of serving about 1,000 people. Water is provided for the system by a single well located near the confluence of the South and Middle Forks of the Flathead River. Water for the Hungry Horse municipal system is stored in a 100,000 gallon tank.

Neither the quantity or quality of waters for these municipal water sources would be affected by the proposed action.

Private Water Supply - Private wells are used for domestic and agricultural purposes throughout serve the remainder of the residents within the project area. The proposed action would not affect the quality or productivity of these water supplies.

b. Recreational and Commercial Fisheries

The Flathead River does not support commercial fishing activities, but is well known as a sport fishery. The main stem of the Flathead River and its tributaries support fish that are both native and introduced to the area. Game fish species expected to occur in the South Fork and main stem of the Flathead include westslope cutthroat trout and bull trout (species of concern in Montana), kokanee salmon, rainbow trout, and mountain whitefish. Less frequently found in the river system are brook trout, Yellowstone cutthroat trout, lake trout, and lake whitefish.

Kokanee salmon, an important gamefish in Flathead County, has suffered drastic reductions in numbers in recent years due to the operations of Kerr and Hungry Horse dams, competition with *Mysis* shrimp in Flathead Lake, predation, and other factors. Historically, the species is known to have spawned in approximately 42 locations in the main stem of the Flathead River. Five of these spawning sites are located in the reach that flows through the project area.

The proposed action could temporarily disrupt habitat used by fish or cause short-term displacements of some fish species, however, no long lasting adverse impacts on the quality of the Flathead River recreational fishery are anticipated.

c. Water-related Recreation

A portion of the Middle Fork of the Flathead River above the confluence of the South Fork is designated as a Recreational River segment of the Wild and Scenic River System. Correspondence from the USFS Hungry Horse District Ranger contained in Part VI of the Final EIS indicates that other than short-term impacts associated with construction, the proposed action should not cause significant impacts on the Middle Fork of the Flathead Wild and Scenic River Corridor.

This project would beneficially affect water-related recreation in the area through the provision of a new river access site on the main stem of the Flathead River near the House of Mystery. This proposed recreation site would be jointly developed with the USFS Flathead National Forest. The new site would facilitate recreational use on the Middle Fork of the Flathead Wild and Scenic River segment by providing a convenient and safe point for Recreational River users to leave the river. The river access would also enhance water-related recreation at other downstream locations on the Flathead by providing a new location for floaters to enter the river.

The proposed development of this facility is discussed in Final Section 4(f) Evaluation attached to the Final EIS.

d. Aesthetics of the Aquatic Ecosystem

The proposed discharges of fill material associated with the highway reconstruction project would not degrade water quality, introduce inappropriate development, encourage unplanned and incompatible human access, or destroy vital elements of the landscape that contribute to the visual distinctiveness and diversity of the area.

The proposed action would remove portions of the riparian cottonwoods and conifers that exist between the existing highway and the main stem of the Flathead River to accommodate the construction of a vertical retaining wall. The excavation of one of two large rock outcrops at Berne Memorial Park would affect the visual appearance of this part of Badrock Canyon. However, these changes to the local landscape would not substantially alter the character of this portion of the project corridor. Similar impacts on these features have occurred during previous highway construction in Badrock Canyon. Part IV of the Final EIS describes the extent of these visual impacts.

e. Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, Refuges/Sanctuaries and Similar Preserves

The proposed action would impact Berne Memorial Park, a roadside park located in Badrock Canyon. The primary impacts would be moving roadside exhibit signs to a replacement park area located west of Badrock Canyon, limitation on access and parking at this location, and the excavation of the westernmost cliff at the park.

The impacts of the proposed highway reconstruction and measures MDT has proposed as mitigation for the effects on the park are fully discussed in the Final Section 4(f) Evaluation attached to the Final EIS.

The proposed action would not affect other parks, monuments, wilderness areas, refuges, or similar preserves.

G. DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

Cumulative effects are the changes in the aquatic ecosystem that are attributable to the collective effects of a number of individual discharges of fill material. Although the impact of a particular discharge may be a minor change in itself, the cumulative effect of many such changes can result in a major impairment of the water resources and interfere with the productivity and water quality of existing aquatic ecosystems.

The effects of proposed highway developments combined with rapid and sustained residential and commercial growth within the upper Flathead River valley could contribute to substantial wetland impacts and losses in the region, if such effects were not mitigated. Plans to mitigate impacts on wetlands and other elements of the aquatic ecosystem are required elements of the proposed highway reconstruction projects.

Highway reconstruction and other activities within or adjacent to wetlands or surface waters presents the potential for spreading noxious weeds. Invasion of wetlands by species like spotted knapweed, Canada thistle, or purple loosestrife is a primary concern. Such species have become established in portions of the Ninepipe National Wildlife Refuge, a large wetlands complex located south of Polson.

Other cumulative effects of the proposed action are discussed throughout Part IV of the Final EIS.

H. DETERMINATION OF SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

Secondary effects are the effects on an aquatic ecosystem that are associated with the discharge of fill materials but do not result from the actual placement of the fill material. The most apparent secondary effect on the aquatic ecosystem is the potential for spills of fuel, oil, hydraulic fluids, or other substances during construction activities and the subsequent use of the facility. Such spills have the potential to degrade water quality and adversely affect all elements of the aquatic ecosystem.

Although records show that no spills of hazardous substances have occurred for at least the last 20 years on US 2 in the project area, the potential for such a spill always exists. There are few, if any, restrictions placed on the use of US 2 by firms transporting hazardous substances by truck.

Secondary impacts on the aquatic ecosystem also occur when minor amounts of road sands and salts are plowed directly into the Flathead River during snow plowing activities during the winter. Snowmelt and stormwater runoff from the highway also transports small amounts of materials that can degrade water quality to adjacent surface waters and wetlands.

Other secondary (indirect) effects of the proposed action are discussed in Part IV of the Final EIS.

IV. FINDINGS OF COMPLIANCE

A. ADAPTATION OF THE SECTION 404(b)(1) GUIDELINES TO THIS EVALUATION

The evaluations contained herein are based on a preliminary design of the preferred alternative prepared solely for the purpose of identifying and quantifying the environmental impacts associated with the proposed action. This project must receive design and location approvals before the proposed action can be advanced to the design stage.

Therefore, this evaluation deviates slightly from the requirements outlined in 230.10 and may not fulfill all the requirements of these guidelines. Some project specific information required for the Section 404(b)(1) evaluation can not be accurately predicted until final design plans are available, however, many of the conclusions offered in this document are not expected to change based on the final design of the proposed facility.

B. EVALUATION OF AVAILABILITY OF PRACTICABLE ALTERNATIVES TO THE PROPOSED DISCHARGE SITE WHICH WOULD HAVE LESS ADVERSE IMPACT ON THE AQUATIC ECOSYSTEM

1. Alternatives Considered That are Available and Practicable

MDT chose to develop its preferred highway design following an alignment through Badrock Canyon that would require excavation of the westernmost cliff area in Berne Memorial Park but leave a free-flowing spring, an important source of water for some area residents, and much of the natural terrain above the existing turnout in Berne Memorial Park unaffected.

The preferred alternative identified in the Draft EIS, generated comments from the public and reviewing agencies about the extent of the riprap fill area proposed in Badrock Canyon. Comments recommended that measures to reduce the amount of fill material proposed for placement in the Flathead River be further investigated. Based on these comments, a variety of design modifications were evaluated including using embankments with steepened (1:1) slopes; incorporating a vertical retaining wall; and using a cantilevered structure or a bridge to support portions of the road. These design modifications were evaluated in detail to determine if they were reasonable for being incorporated with the preferred highway design in Badrock Canyon. Part II of the Final EIS contains a summary of the evaluation of these alternative design measures for US 2 in Badrock Canyon.

As indicated previously in this Evaluation, MDT modified its preferred alternative to include a vertical retaining wall along the Flathead River in Badrock Canyon. This design feature reduces the amount of fill placed below the ordinary high water mark of the Flathead River by almost 80% over the riprap-faced embankment initially proposed for this section of US 2 in the Draft EIS. This design modification also reduces the extent of the impact to four non-contiguous wetlands located in the floodplain of the Flathead River in Badrock Canyon. A vertical retaining wall minimizes the amount of riparian vegetation that must be removed to accommodate the new road in this section of the project area.

The proposed construction in wetlands is unavoidable since these aquatic sites exist adjacent to the existing highway. Alignment shifts to avoid the sites generally impact other sensitive resources within the project area like a public park or cause other significant impacts. Reducing the size of the new roadway is not a practicable alternative since the amount of traffic expected to use this facility in the foreseeable future can be efficiently and safely accommodated only by providing a four-lane highway.

C. COMPLIANCE WITH APPLICABLE STATE WATER QUALITY STANDARDS

The proposed project would be in compliance with both the Montana Water Quality Act for Section 3(a) authorizations, and the Montana Stream Protection Act (MCA 87-5-501 through 509) with the following:

- a 124SPA Stream Protection Act Permit from the Montana Department of Fish, Wildlife and Parks (MDFWP); and
- a Memorandum of Authorization and Agreement (MAA) from the MDFWP.

All work would be done in accordance with Section 319 of the Water Quality Act of 1987 (P.L. 100-4). Control of water pollution for both specific and non-point sources would be described in the National Pollutant Discharge Elimination System Permit (P.L. 92-500) for the proposed action. The proposed action would require a Clean Water Act (33 U.S.C 1251-1376) - Section 402/Montana Pollutant Discharge Elimination System (MPDES) Permit from the Montana Department of Health and Environmental Sciences' (MDHES) Water Quality Bureau. Dewatering cofferdams, required for the construction of the vertical retaining wall in Badrock Canyon and for the construction of bridge piers, requires that an MPDES permit be obtained for the proposed action.

MDHES Water Quality Bureau must certify that any discharges into state waters will comply with certain water quality standards before federal permits or licenses can be granted. The authority for this action comes from Section 401 of the Clean Water Act. The certification must be provided to the Corps of Engineers by MDHES prior to the issuance of a Section 404 permit.

An Storm Water Erosion Control Plan based on the final design of the proposed action would be submitted to the MDHES Water Quality Bureau in compliance with their Montana Pollutant Discharge Elimination System Regulations (ARM 16.20.314). Best Management Practices would be used in the design of this Plan using guidelines established in MDT's *Highway Construction Standard Erosion Control Workplan*. The objective of the Plan is to minimize erosion of disturbed areas during and following the construction of the proposed action.

The preparers of the EIS have applied the guidelines from the Workplan and identified a range of Best Management Practices (BMPs) for erosion and sediment control based on the preliminary design of the preferred alternative. The BMPs that may be appropriate for various areas of the proposed action based on the preliminary design of the preferred alternative are listed in APPENDIX 13 of the Final EIS.

With careful planning and proper implementation of the erosion control plan, the chance of pollutants or sediments reaching surface waters will be reduced. The plan will be incorporated into the construction plans and specifications for this proposed project. Contractors will be required to strictly adhere to its provisions.

The Montana Department of Natural Resources and Conservation (DNRC) requires that the contractor for the proposed action obtain a temporary water use permit if construction activities (like dust control) use surface water at a rate of over 35 gallons per minute or use over 10 acre-feet of ground water.

D. COMPLIANCE WITH APPLICABLE TOXIC EFFLUENT STANDARD OR PROHIBITION UNDER SECTION 307 OF THE CLEAN WATER ACT

Section 307 of the Clean Water Act imposes effluent limitations or prohibitions on discharges of materials containing specified toxic pollutants into surface waters. Identified toxic pollutants include aldrin/dieldrin, several DDT compounds, endrin, toxaphene, benzidine, and polychlorinated biphenyls (PCBs).

Neither the proposed action or activities associated with it would discharge toxic pollutants identified in Section 307 of the Clean Water Act.

E. COMPLIANCE WITH THE ENDANGERED SPECIES ACT OF 1973

The proposed action would not adversely affect the endangered gray wolf or peregrine falcon or the threatened grizzly bear, however, it adversely affects habitat used by the endangered bald eagle. In compliance with Section 7 of the Endangered Species Act, formal consultation with the USFWS regarding potential adverse impacts to habitat used by bald eagles was undertaken and completed. The Biological Opinion prepared by the USFWS concluded that the proposed action is not likely to jeopardize the continued existence of the species. The issuance of the Biological Opinion concluded formal consultation on the proposed action and fulfilled the requirements of the Endangered Species Act.

F. COMPLIANCE WITH SPECIFIC MEASURES FOR MARINE SANCTUARIES DESIGNATED BY THE MARINE PROTECTION, RESEARCH, AND SANCTUARIES ACT OF 1972.

This Act is not applicable because the proposed action does not involve the discharge of materials into the ocean.

G. EVALUATION OF EXTENT OF DEGRADATION OF WATERS OF THE UNITED STATES

1. Significant Adverse Effects on Human Health and Welfare

The proposed action would not adversely affect municipal or private water supplies, recreational or commercial fisheries, plankton, fish, shellfish, or most forms of wildlife. The proposed action would adversely affect riparian vegetation that provides perching opportunities and screening for bald eagles foraging along the Flathead River. These potential adverse impacts were addressed during formal consultation with the USFWS regarding this proposed project. Please review narrative contained in Section 6 of Part III, E. Aquatic Ecosystem and Organism Determinations in this 404(b)(1) Evaluation or in Part IV of the Final EIS for a discussion of impacts and the results of formal consultation efforts with the USFWS.

2. Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent Upon Aquatic Ecosystems

The proposed action would not produce significant adverse effects on the life stages of aquatic organisms or other wildlife dependent upon the aquatic ecosystem. The project's effects on the bald eagle has been described previously in this evaluation.

3. Significant Adverse Effects on Aquatic Ecosystem, Ecosystem Diversity, Productivity and Stability

The proposed highway reconstruction would not produce significant adverse effects on the diversity, productivity or stability of the aquatic ecosystem in the project area.

4. Significant Adverse Effects on Recreational, Aesthetic and Economic Values

The proposed action would not have significant adverse effects on the recreational or economic values of the aquatic ecosystem in the project area. The project would adversely affect the appearance of Badrock Canyon by removing areas of riparian vegetation and producing a large rock cut at the west end of Berne Memorial Park. Note that riparian vegetation has been removed, rock has been excavated from the outcrops near Berne Memorial Park, and fill has been placed in the river during previous road reconstruction projects in Badrock Canyon.

H. APPROPRIATE AND PRACTICABLE STEPS TAKEN TO MINIMIZE POTENTIAL ADVERSE IMPACTS OF THE DISCHARGE ON THE AQUATIC ECOSYSTEM

The measures taken to minimize the potential adverse impacts of the proposed discharges on the aquatic ecosystem have been described previously in this Evaluation. These impacts primarily revolve focus on the potential for impacts caused by erosion of disturbed areas and the transport of sediments from the project area to nearby surface waters. These potential impacts will be addressed by employing measures during and after construction that will:

- ensure that the developments associated with this project conforms to the natural characteristics of the area;
- limit the area of land disturbed and the amount of time that disturbed areas are exposed;
- stabilize and promptly protect disturbed areas;
- keep runoff velocities low;
- prevent off-site water from entering and running over disturbed areas;
- retain sediments within the project area by filtering runoff as it flows or by detaining runoff for a period that will allow sediment particles to settle out; and
- ensure that erosion control features are functioning as intended and that adjustments or improvements are made if needed to prevent sediments from leaving the project area.

Other specific mitigation commitments proposed for this project are discussed in Parts IV and V of the Final EIS. Mitigation proposals for wetlands impacts are described in APPENDIX 15 which contains the Only Practicable Alternatives Wetlands Finding.

I. CONCLUSION

On the basis of the Guidelines, the proposed disposal sites for the discharge of dredged or fill material is specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem. These conditions area generally described in H above.

V. EVALUATION RESPONSIBILITY

a. **Prepared by:** ____

Date: __________________

b. **Reviewed by:** ____

Date: __________________

File Name: F:\HIGHWAYS\COLHTS\HYDR\404B1EIS.TXT

Appendix 15: Only Practicable Alternative Wetlands Finding

ONLY PRACTICABLE ALTERNATIVE
WETLANDS FINDING

for

F1-2(39)138
COLUMBIA HEIGHTS - HUNGRY HORSE
FLATHEAD COUNTY, MONTANA

October, 1993

1) This FINDING provides documentation that this proposed project will minimize the destruction, loss, or degradation of wetlands. This FINDING also documents the steps to preserve and enhance the natural and beneficial values of the wetlands affected by this proposed project. This proposed project's impacts to wetlands will be in compliance with Executive Order 11990.

2) It has been determined that there are no practicable alternatives to this proposed project. This FINDING is included with an environmental document in which an alternatives analysis has been performed. The alternatives evaluated are included as part of an Environmental Impact Statement and a Section 4(f) Evaluation.

3) This proposed project has been determined to include all practicable measures to minimize harm to wetlands, This determination has been made through the mitigation process described on the following page(s).

4) Based on the above considerations, it is determined that there is no practicable alternative to the proposed new construction in wetlands and that the proposed project includes all practicable measures to minimize harm to wetlands that may result from such use.

MITIGATION PROCESS

The proposed project has been coordinated with the U.S. Department of Agriculture Forest Service - Flathead National Forest, the U.S. Environmental Protection Agency, the U.S. Army Corps of Engineers, the U.S. Fish and Wildlife Service, the Montana Department of Fish, Wildlife & Parks, and with the Montana Interagency Wetlands Group.

The proposed reconstruction of US 2 between Columbia Heights and Hungry Horse would result in a direct loss of 2.17 acres of wetlands at three separate sites within the project area. Specifically, the project would affect 0.18 acres of W-1 Type wetland at Site 2, 0.84 acres of W-2 Type wetland at Sites 2 and Site 4, and 1.15 acres of W-7 Type wetland at non-contiguous locations along the Flathead River.

Please note that the preferred alternative was modified since the Wetlands Re-Evaluation report was completed. The preferred alternative in Badrock Canyon now includes a vertical retaining wall along the Flathead River. This design modification reduces the acreage of W-7 Type wetland affected by the project from 1.31 acres to 1.15 acres.

Note that additional investigations of potential impacts at Site 4, using more detailed mapping than was available for the Wetlands Re-Evaluation, showed that about 0.90 acres of W-2 Type wetland would lie within the new right-of-way for US 2. Of this total, 0.71 acres of the wetland would be within the construction limits for the highway. The Wetlands Re-Evaluation report previously indicated that 0.58 acres of W-2 Type wetland would be within the right-of-way and that some 0.26 acres would be impacted by construction.

According to the Section 404(b)(1) Guidelines and the Memorandum of Agreement (MOA) between the Corps of Engineers and the EPA, wetlands mitigation should include the following strategies (in order of preference): 1) avoidance; 2) impact minimization; 3) compensatory mitigation within the right-of-way; and 4) compensatory mitigation outside the right-of-way. In-kind compensatory mitigation is preferable to out-of-kind mitigation. These mitigation strategies may be implemented by restoring, creating, or enhancing wetlands. The overall objective of mitigation is to replace the functional values, vegetative cover types, and the amount of wetland area lost to the project.

Impact Avoidance

In accordance with Executive Order 11990, "Protection of Wetlands"; Section 404(b)(1) guidelines and the Interagency Memorandum of Understanding: Management and Mitigation of Highway Construction Impacts to Wetlands in the State of Montana (Montana Interagency Wetlands Group 1992) options to avoid wetlands were examined. Alignment alternatives considered for the proposed action were examined in Part II and in Part V of the EIS. Generally, routes to avoid wetlands were eliminated from consideration because they would produce environmental impacts equal to or greater than those associated with the proposed action. Minor alignment shifts through Badrock Canyon are possible but they would still impact wetlands along the Flathead River. Building a lesser facility would not avoid impacts to wetlands.

Impact Minimization

Because wetlands impacts resulting from the proposed highway reconstruction project can not be totally avoided, the following measures to minimize impacts on wetlands will be implemented with the project:

- A vertical retaining wall will be constructed between Stations 599+00 and 620+00, where several non-contiguous W-7 type wetlands in the floodplain of the Flathead River are located. This measure will reduce the total impact on Type 7 wetlands by 0.16 acres.

- Highway designers will use MDT's *Highway Construction Standard Erosion Control Workplan* to identify Best Management Practices (BMPs) for control of erosion and sediment transport. The selection of BMPs will be based on the distance to surface water or wetlands, precipitation intensity, soil properties, slopes, and the presence of critical resources (like threatened or endangered species habitat, prime fisheries, cultural sites, and hazardous materials/wastes).

  A Storm Water Erosion Control Plan, incorporating appropriate BMPs for the proposed construction project, will be developed and approved prior to the construction of the proposed project. The primary objective of the Storm Water Erosion Control Plan will be to minimize the erosion of disturbed areas and prevent the transport of sediments to wetlands or surface waters during the construction and post construction phases of the project.

All disturbed areas not occupied by project facilities will be promptly revegetated to stabilize soils, minimize erosion, and improve the visual aspects of the project. Interim use of mulch or other erosion control practices may be necessary or recommended at certain locations along the project, such as at the new bridge location.

- The unavoidable loss of eagle perching sites, one of the functions and values that Type 7 wetlands along the Flathead River provide, will be mitigated through coordination with the U.S. Fish and Wildlife Service (USFWS). The agency has already provided a list of conservation recommendations (contained in the Biological Opinion of the EIS) that will be included with the project.

Alternatives 3 or 4 (two-lane roads) would be the least damaging practical alternatives in the vicinity of wetlands in the project area. However, these alternatives were eliminated from further consideration because they do not fulfill all of the specified purposes and needs of the proposed action.

Compensatory Mitigation Within the Highway Right-of-Way

Because impacts to wetlands are unavoidable, measures to provide compensatory mitigation within the right-of-way were examined for the proposed project. Due to the small acreage of existing wetlands, the mountainous terrain, and the land uses adjacent to the highway viable opportunities to enhance or create new wetlands do not exist in the proposed right-of-way corridor.

Compensatory Mitigation Outside the Right-of-Way

Several opportunities to provide mitigation for impacts to wetlands outside the right-of-way for the highway exist within the immediate project area. These opportunities are discussed below:

<u>Expansion of Wetland Site 3</u>

Wetland Site 3 would not be impacted by the proposed highway reconstruction project. However, the site offers a good opportunity to replace several of the wetland communities affected by the proposed action if Site 3 was expanded into the once flooded portion southwest of the pond.

FIGURE IV-3 in Part IV of the Final EIS shows the location of this wetland and an area, estimated to be more than 2.6 acres in size, where the wetland could be expanded in addition to existing and proposed features and land ownership. The expansion of the site would require that a connection be reestablished between the existing pond and the once flooded area. The use of semi-permeable geotextile liners to maintain slow drainage in this location. The flow coming from the tributary should be adequate to provide a reliable water source to this area. Since the area has no outlet, the water source would not have to be altered.

Vegetative plantings could reflect a number of communities. However, this may be a good place to reestablish a forested cottonwood/conifer community with shrubby understory typical of W-7 Type wetland, which are the riparian community elements that would be lost at sites located between the highway and the Flathead River in Badrock Canyon.

<u>Replacement Area for Wetland Site 4</u>

The development of a replacement wetland near Site 4, shown on FIGURE IV-2 in Part IV of the Final EIS, provides an opportunity for mitigating wetlands impacts. This site is located on an old river terrace located immediately south of US 2 between Berne Road and Badrock Canyon. The existing wetland is not within the existing right-of-way but road construction along the proposed alignment of US 2 will require that new right-of-way be obtained in this area. The existing wetland would be largely lost to the proposed highway reconstruction.

Reestablishing the wetland farther upstream and behind the small access road that exists to the south of the site may be possible. The site is a good candidate for enhancement because it possesses a continuous and reliable water source that would not require alteration. Planting vegetation and creating a more complex habitat for wildlife would actually improve the function and value of this site. A replacement wetland at this location should be designed to ensure that the water source continues to serve the existing area of W-3 vegetation.

Because the site lies in an area where subsurface materials are likely to have high permeabilities, expansion of the existing wetland or creating a new wetland near the existing site may be problematic. Incorporating a semi-permeable geotextile liner may be a means to retain water and allow for slow percolation into the ground, a condition which appears to occur at the existing site.

FIGURE IV-2 shows the existing and proposed rights-of-way, construction limits, for the preferred alternative, land ownerships, major structures and features in the vicinity of Site 4. An estimated 0.7 acres would be available near the present site for a replacement wetland. This area is shown on FIGURE IV-2.

The ability to acquire private lands for replacing or enhancing wetlands and the feasibility of actually constructing such wetlands at these locations must be further evaluated if mitigation is proposed at these sites.

Mitigation Outside the Immediate Project Area

There are several possibilities for replacement or enhancement within 1-2 miles of the right-of-way, that would seem to meet the "on-site" criteria. Outside of the immediate project vicinity, there are numerous potholes and wetlands in old stream meander bend extending south toward Echo Lake. Replacement or enhancement opportunities may exist at a number of these sites. There may also be potential sites toward Glacier National Park.

If a borrow area is needed for construction materials, selection of the site should consider the viability of using the pit as a replacement site. The MDT biologists should be included in the site selection process.

MDT is currently developing a wetland replacement area near Creston, known as the Creston Easement, to offset losses for the Flathead Bridge project and, potentially, the Creston North-South project (Van Hook 1993). However, there will probably not be any "extra" replacement wetland acreage available at this time to apply to this project. There may be an opportunity to extend the Creston Easement project in the future.

Mitigation Banking

If these wetlands enhancement options discussed above are not implemented, efforts would be directed towards the replacement of a like amount of wetlands in a similar biotic region or geographical areas as called for in the Interagency MOU.

MASTER FILE COPY

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
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Date Recd. Preconst. 5-26-94

MAIL ROUTE

30 Precon Engr
30 Assist
30 Office
31 Safety Mgr
32 Road Design
33 Environment
34 Hydraulics
35 Survey & Mapping
36 Traffic Eng.
37 Traffic Operations
39 Consultant Dsn.
J.T. Weaver
L. Brazda
Legal
RPA

REPLY TO ATTENTION OF

May 10, 1994

RECEIVED

MAY 27 1994

ROBERT PECCIA ASSOCIATES

Planning Division

Mr. David S. Johnson, P.E.
Montana Department of Transportation
2701 Prospect Avenue
PO Box 201001
Helena, Montana 59620-1001

Reference: Columbia Heights - Hungry Horse Preliminary Final EIS
US 2 Reconstruction, Flathead County, MT
Project F 1-2(39)138, Control No. 1290

Dear Mr. Johnson:

Thank you for the opportunity to review the Final Environmental Impact Statement for the proposed reconstruction for U.S. Highway 2 between Colombia Heights and Hungry Horse, Flathead County, Montana.

Your letter of February 3, 1994, requests our response to three specific issues concerning the 404 and NEPA processes. We offer the following comments.

- "An indication from the Corps of Engineers that the agency agrees with the alternatives, wetlands analysis, the identified wetlands impacts, and the mitigation proposed at this stage of the project."

It appears that the appropriate documentation and evaluation has been conducted.

- " An indication of the permitability of the project. Will the Corps be able to issue a 404 permit based on the information contained in the EIS?"

The information appears sufficient at this time, however, concerns can arise that are not now known that may affect the decision to issue a permit. The decision to issue a permit is reserved until after the release and comment on the final EIS.

- "The FHWA also stated that the permitting process should be initiated at this time. What specific actions should MDT take to begin the permitting process at this stage of the project?"

The MDT should submit a Department of the Army application with the filing of the Final EIS. The application should include a copy of the Final EIS.

After reviewing the report, we found several inconsistencies between Appendix 14 and 15 and the main report relating to the number of wetland acres lost as a result of the proposed reconstruction. Table IV-5 on page IV-31 shows alternative 1 (the preferred alternative) would disturb a total of 2.33 acres of wetlands, but in Appendix 15, page A15-1, the total number of wetland acres lost is reported at 2.17 acres. On page A15-2, it is noted that a wetlands re-evaluation and a modification in the preferred alternative have reduced the number of impacted acres. The main report should reflect these changes.

The least amount of wetland impacts would be under Alternative 3 or 4, two lanes with turning lanes, and appears to be the least damaging practical alternative.

In the Draft 404(b)1 Evaluation, under the subheading **Suspension/Filter Feeders**, second sentence, it is stated that "Suspension and filter feeders...<u>may would</u> be destroyed..."

If you have any questions, please contact Ms. Jeanette Conley of our staff at (402) 221-3133. Thank you again for the opportunity to review this proposal.

Sincerely,

Richard D. Gorton
Chief, Environmental
Analysis Branch
Planning Division