ADOPTION OF EXISTING ENVIRONMENTAL REVIEW (EA/EIS)

Part I. Proposed Action Description

Applicant/Contact Name & Address: CENTRAL MONTANA REGIONAL WATER AUTHORITY
PO BOX 660
ROUNDUP, MT 59072

Contact: Monty Sealey
PO Box 660
Roundup, MT 59072

Type of Action: **Application for Beneficial Water Use Permit No. 41S 30065672**
Application to Change a Water Right No. 41S 30065673

Location Affected by Action:
The system will supply the incorporated and unincorporated communities of Utica, Hobson, Moore, Buffalo, Judith Gap, Harlowton, Rothiemay, Ryegate, Lavina, Roundup, Musselshell, Melstone, and Broadview, spanning Judith Basin, Wheatland, Golden Valley, Musselshell, and Yellowstone Counties. Additionally, the system will provide water service to domestic customers and for stock water purposes located along the pipeline route.

Narrative Summary of Proposed Action:
The Applicant proposes to divert groundwater from the Madison Aquifer, by means of a wellfield containing five manifolded wells from January 1 through December 31, at a combined flow rate of 2,540 gallons per minute (gpm), up to 825.7 acre-feet (af) annually. One well has been drilled to a depth of 2,250 feet, and is referred to in this document as CMRWA #2 (the remaining four wells, CMRWA #3 - #6, have not been drilled). The points of diversion, known collectively as the Ubet Wellfield, including five wells, are generally located in Sections 27, 28, 33, and 34, T12N, R15E, Judith Basin County. The proposed purposes are municipal, multiple domestic, and stock. The primary purpose for the appropriation is municipal water to be served by a regional water system.

This permit application is being processed concurrently with Application to Change a Water Right No. 41S 30065673. In the change application process the Applicant is proposing to add a point of diversion to the Ubet Wellfield (5 wells). The plan under the change application is for groundwater appropriations to occur from either the Ubet Wellfield or the currently authorized well in 41S 30019140 near Utica, MT.

Additional information related to these two applications can be obtained by reviewing the Department's Preliminary Determinations posted on the DNRC website for public notice purposes. The Department finds there will be no adverse effects to existing water users based on the proposed actions.

Part II. Existing Environmental Review Information

Title: Musselshell-Judith Rural Water System
Central Montana Regional Water System
Environmental Assessment

Publication Date: June 2013
Lead Agency: Prepared for USDI Bureau of Reclamation by Tetra Tech

Location Where Interested Parties Can View or Obtain the Document: DNRC Website

Part III. Criteria for Adopting Existing Environmental Review

☒Yes ☐No	Does the existing environmental review cover an action paralleling or closely related to the proposed action?
☒Yes ☐No	Is the information in the existing environmental review accurate and clearly presented?
☒Yes ☐No	Is the information in the existing environmental review applicable to the action being considered?
☒Yes ☐No	Were all appropriate Agencies consulted during preparation of the existing environmental review?
☒Yes ☐No	Were alternatives to the proposed action evaluated as part of the existing environmental review effort?
☒Yes ☐No	Have all of the impacts of the proposed action been accurately identified as part of the existing environmental review?
☒Yes ☐No	If the existing environmental review identifies any significant impacts as a result of the proposed action, will they be mitigated below the level of significance?

Part IV. Conclusion

If the answers to ALL of the questions listed above are “Yes”, the existing environmental review can be considered sufficient to satisfy DNRC’s MEPA review responsibilities.

Name: Douglas D. Mann
Title: DNRC Water Resources – Lewistown Regional Office
Date: 3/11/2014

APPENDIX 3

MUSSELSHELL JUDITH RURAL WATER SYSTEM

ENVIRONMENTAL ASSESSMENT

Feasibility Report

JUNE 2013

Musselshell-Judith Rural Water System

Central Montana Regional Water System

Environmental Assessment

Prepared for:

Bureau of Reclamation (Montana Area Office)

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Billings, MT 59101
(406) 247-7300
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Prepared by:

Tetra Tech

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Tetra Tech Project No. 114-570336

March 2013

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

ACHP	Advisory Council on Historic Preservation
AD	Anno Domini - the Year of Our Lord
APLIC	Avian Power Line Interaction Committee
BC	Before Christ
BLM	US Bureau of Land Management
CEQ	Council on Environmental Quality
cfs	Cubic Feet Per Second
CMRWA	Central Montana Regional Water Authority
DEQ	Montana Department of Environmental Quality
DNRC	Montana Department of Natural Resource and Conservation
EA	Environmental Assessment
EDU	Engineering Development Unit
EO	Executive Order
EPA	US Environmental Protection Agency
ESA	Endangered Species Act
gpm	Gallons Per Minute
HDPE	High Density Polyethylene
ID Team	Interdisciplinary Team
MCL	Maximum Contaminant Level
MDT	Montana Department of Transportation
MEPA	Montana Environmental Policy Act
mg/L	Micrograms Per Liter
MTFWP	Montana Fish, Wildlife and Parks
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
MJRWS	Musselshell-Judith Rural Water System
MTNHP	Montana Natural Heritage Program
MPDES	Montana Pollution Discharge Elimination System
NRHP	National Register of Historic Places
OM&R	Operation, Maintenance, and Replacement
PRV	Pressure Reducing Valve
PVC	Polyvinyl Chloride
Reclamation	US Department of the Interior, Bureau of Reclamation
RRWSP	Reclamation Rural Water Supply Program
ROW	Right-of-Way
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan+
US	United States
USACE	US Army Corps of Engineers
USFWS	US Fish and Wildlife Service

CHAPTER 1
PURPOSE AND NEED

1.1 Background

The Central Montana Regional Water Authority (CMRWA) is a public, non-profit organization consisting of a coalition of cities and towns in central Montana who have a long legacy of inadequate drinking water supplies (see **Figure 1**). The CMRWA was legally created in 2005 as a public water authority in the state of Montana. The CMRWA is governed by a board of directors with members from the various communities to be served by the water system. The goal of the Musselshell-Judith Rural Water System (MJRWS) is to provide a reliable and adequate quantity of high quality drinking water for the member communities. The proposed project consists of developing groundwater wells within the Madison Aquifer to supply water to each of the current seven member communities[1] (Hobson, Judith Gap, Harlowton, Lavina, Broadview, Roundup, and Melstone), as well as smaller communities and local users along the pipeline route.

The proposed water project (see **Figure 1**) includes the development of a well field approximately 6 miles northwest of Judith Gap, Montana. The well field will consist of deep wells drawing water from the Madison Aquifer. The proposed water pipeline is approximately 230 miles long, beginning at the well field location northwest of Judith Gap, going north to Utica, Hobson and possibly Moore (**Figure 2**), south to Judith Gap and Harlowton, east to serve Lavina, Broadview (**Figure 3**), Roundup and Melstone (**Figure 4**). The proposed project would provide municipal water for an estimated 4,750 people initially and eventually serve approximately 7,300 people[2].

The primary funding for design and construction of the MJRWS will come from the federal government, state of Montana and loans repaid by the CMRWA through the charges assessed system users. In order to obtain federal and state funding for the project, the project needs to be federally authorized and be appropriated federal funds. In December 2006, the President signed P.L. 109-451, the Rural Water Supply Act of 2006. Title I of the Act authorized the establishment of the Rural Water Program to enable the US Department of the Interior, Bureau of Reclamation (Reclamation) to work with rural communities and Tribes, throughout the west to assess rural water supply needs and to identify options to address those needs through appraisal and feasibility studies. The Act requires Reclamation to establish comprehensive programmatic criteria, including prioritization and eligibility criteria, as well as criteria to evaluate appraisal and feasibility studies. The Act does authorize funding for the planning phases of these projects but does not provide design and construction funding. The Act also requires that a project sponsor successfully complete the prescribed studies prior to requesting federal authorization and appropriation.

CMRWA has been evaluating the feasibility of possible alternatives for providing quality and reliable water to users in central Montana. In 2007, CMRWA received a water right for 300 gallons per minute (gpm) on the Utica test well, with water from the Madison Aquifer. Testing of

[1] The community of Ryegate recently voted to not participate in the MJRWS, however the route analysis has been completed and is remaining as part of the Feasibility Report for reference as a possible option should Ryegate rejoin the MJRWS.

[2] Stated population and water demand numbers do not include Ryegate (current population of 245 people).

the well has shown that there is high quality water available that meets all Safe Drinking Water Act standards. In addition, the site has adequate water quantity to serve the CMRWA members throughout the planning period as the Madison Aquifer is underutilized in this portion of Montana. More recently a second test well was completed at the preferred wellsite of Ubet in late 2012. The results of that well showed that the producing zone of the aquifer could be reached at a shallower depth (2,250 feet versus over 3,000 feet below ground surface) and could support higher pumping rates, potentially decreasing the number of wells necessary from 5 to 3. The Ubet test well shows the same high quality water and sufficient quantity to serve the proposed system throughout the planning period.

The CMRWA has also completed an Appraisal Report of the project which was approved by Reclamation in July of 2010 (Great West Engineering, 2010a). The Appraisal Report evaluated routing and costs associated with one alternative for a rural water system to serve the members of the CMRWA. The Appraisal Report determined that the project was technically and economically feasible while having minimal environmental impacts.

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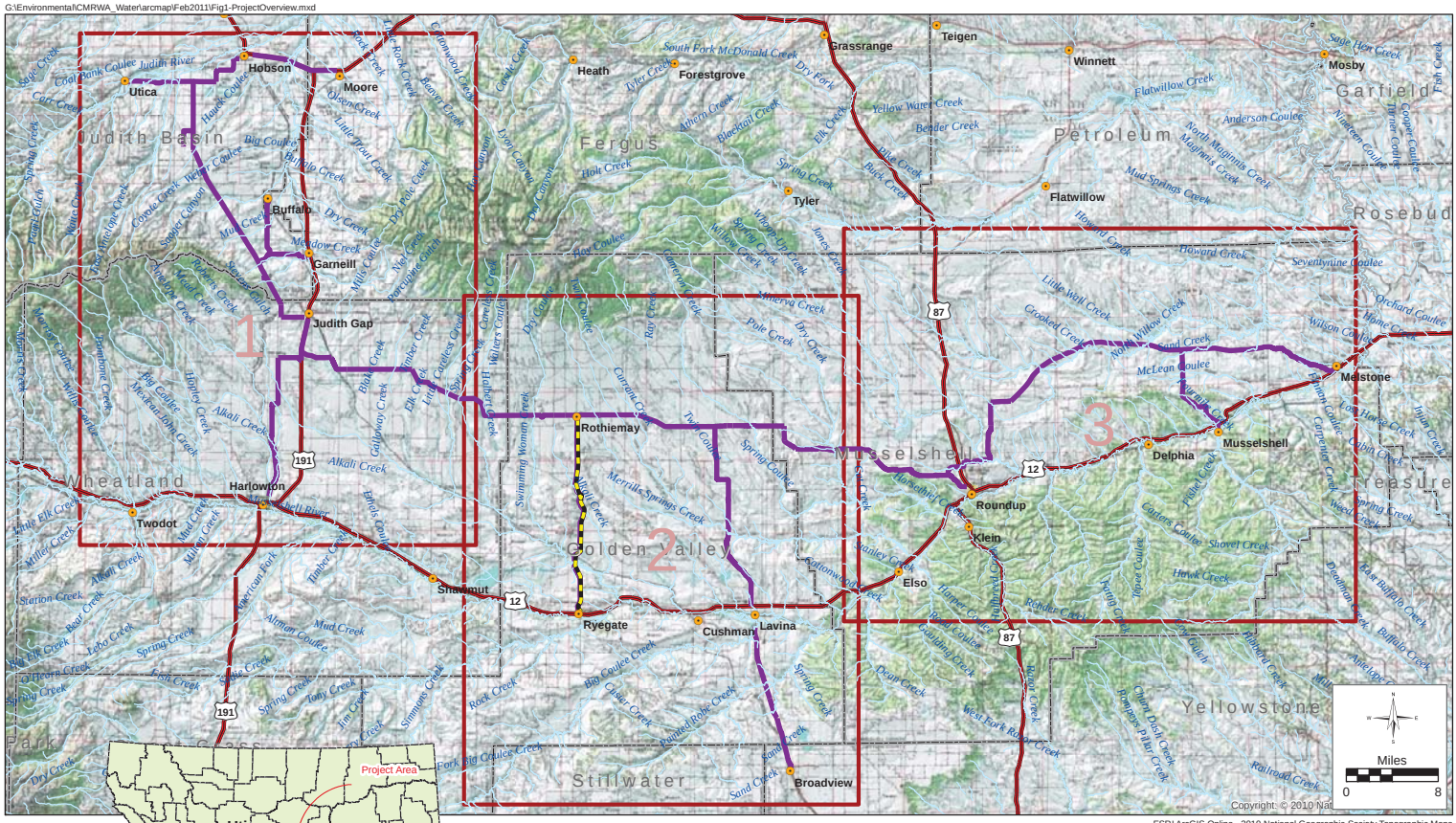

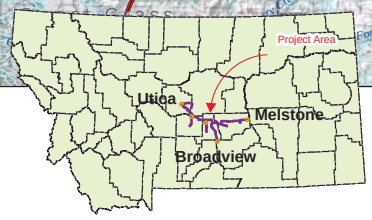

Towns
Streams
Highways
Rye Gate
Pipeline Route
County Boundary
Map Segment

February 2013
Figure 1
Project Overview
Central Montana
MJRWS Environmental Assessment

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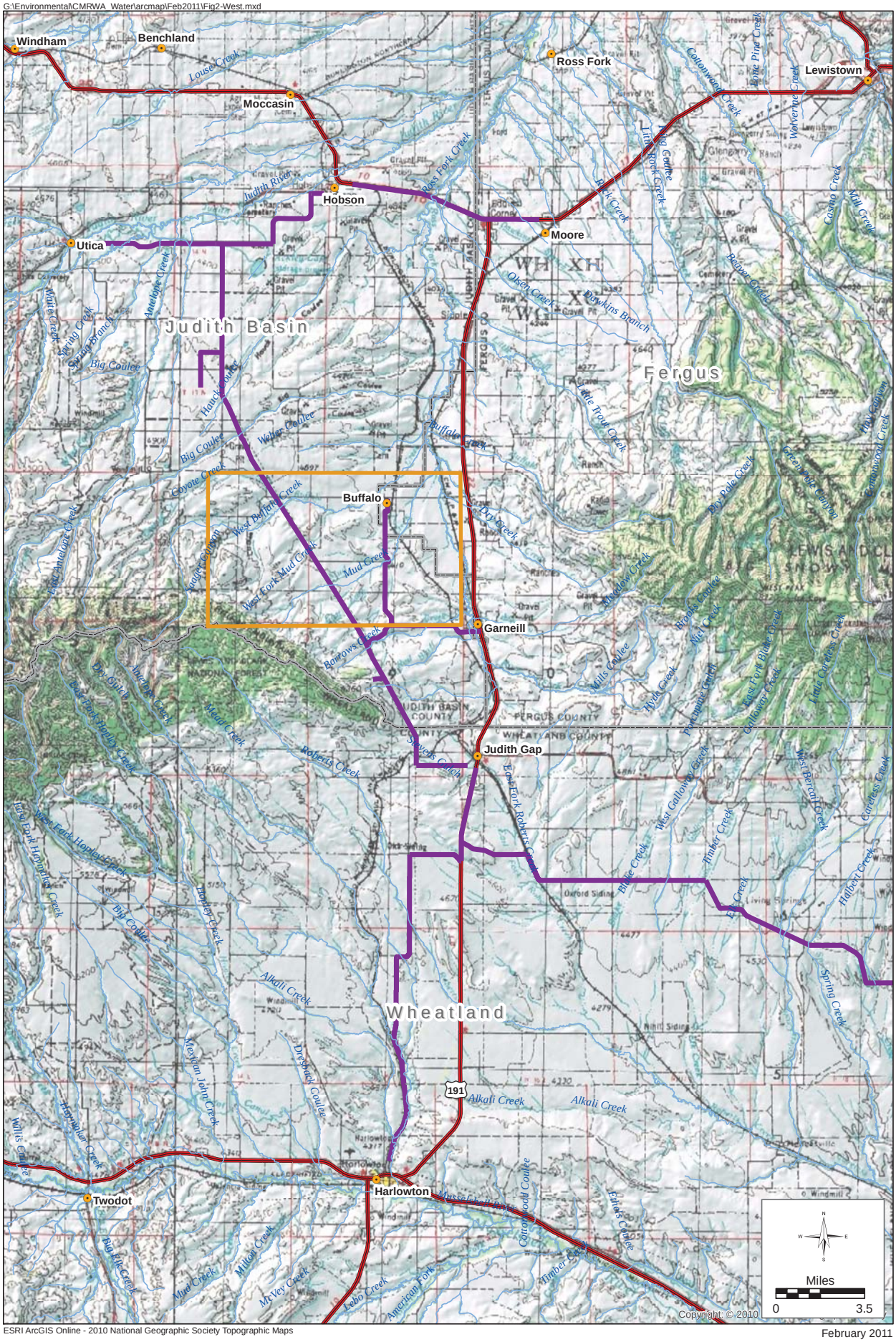

ESRI ArcGIS Online - 2010 National Geographic Society Topographic Maps

February 2011

Water Supply Boundary (Well Field)
County Boundary
Streams
Pipeline Route
Highways

Figure 2

Segment 1 - Western Portion

Central Montana

MJRWS Environmental Assessment

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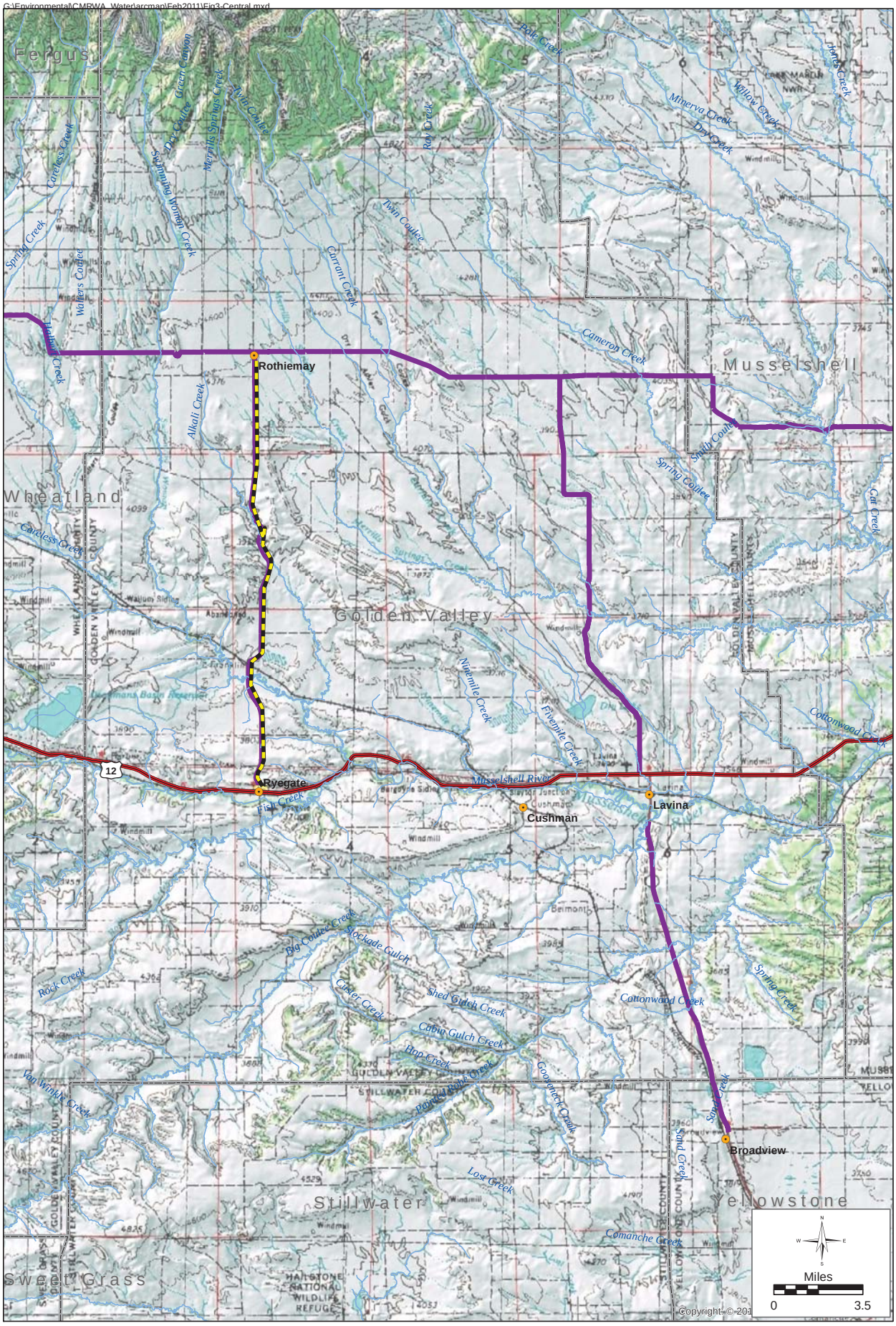


ESRI ArcGIS Online - 2010 National Geographic Society Topographic Maps

Streams
Highways
Pipeline Route
County Boundary

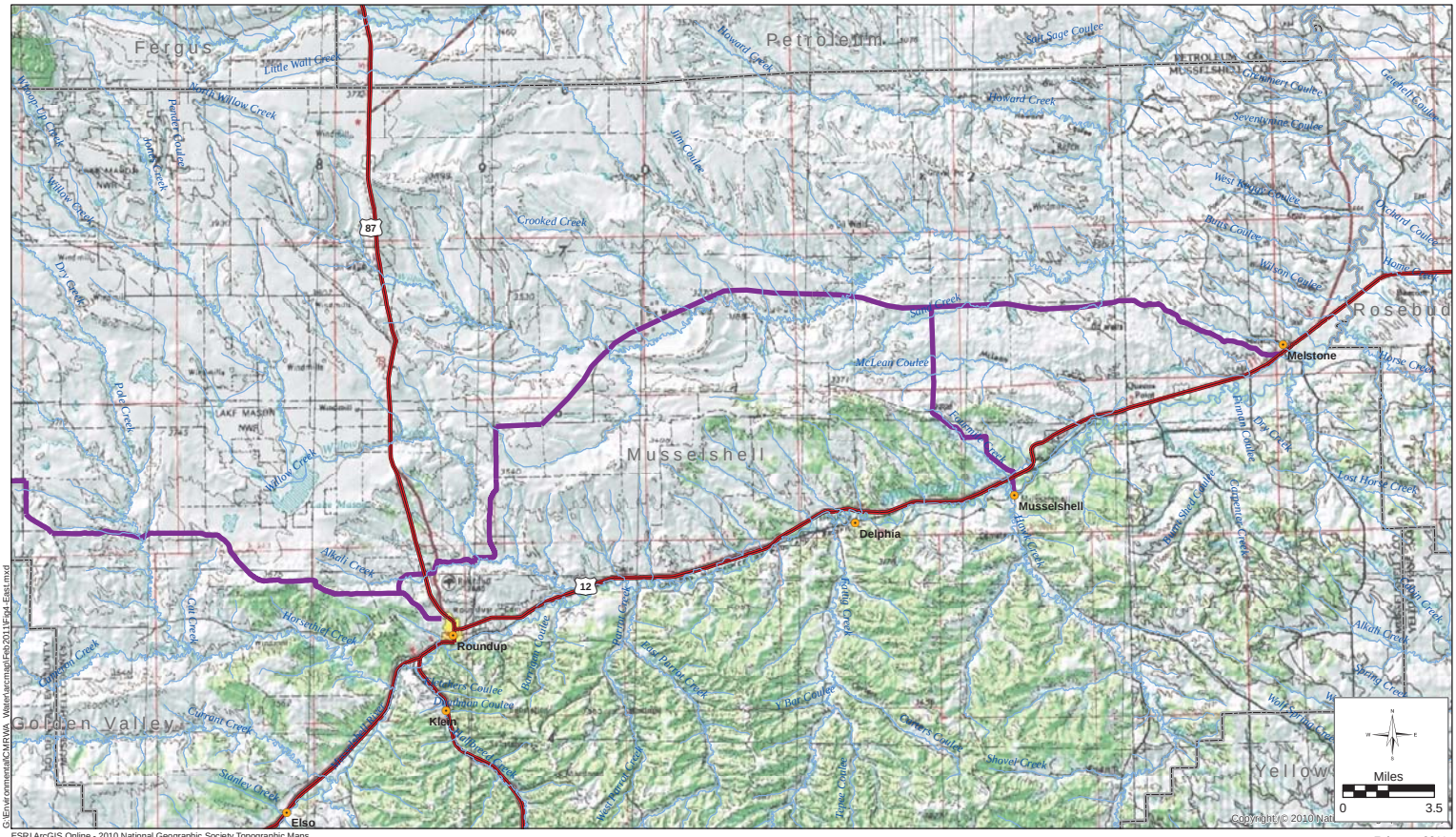
February 2011

Figure 3

Segment 2 - Central Portion

Central Montana

MJRWS Environmental Assessment



Q:\Environmental\CMR\WA_Water\gis\map\Feb2011\Fig4_East.mxd

ESRI ArcGIS Online - 2010 National Geographic Society Topographic Maps

Streams
Highways
Pipeline Route
County Boundary

February 2011

Figure 4

Segment 3 - East Portion

Central Montana

MJRWS Environmental Assessment

The Phase I Feasibility Report (Great West Engineering, 2009) evaluated and determined the preferred water supply and well field site for the project. In addition, the Phase II Feasibility Report (Great West Engineering, 2010b) examined and identified the preferred alternatives for infrastructure such as pipelines, storage, pumping, and controls. The final Feasibility Report will incorporate the first two phases of feasibility report work along with the preparation of an Environmental Assessment.

Continuation of the project will require federal and state actions to occur, including spending federal and state money and issuance of state and federal permits (see Section 2.3 for more details). This report was funded through a Reclamation Rural Water Supply Program (RRWSP) grant obtained through the Bureau of Reclamation in September 2011.

The purpose of this report is two-fold. First, this report was crafted to investigate environmental resources in the project areas and benefits of the project which is a priority for projects funded through the RRWSP. Second, this report also evaluates potential environmental impacts and recommends standard mitigation procedures for eliminating or minimizing impacts on resources. This EA will be submitted with the Feasibility Report which is expected to be completed by March 2013.

This report has been prepared in compliance with the National Environmental Policy Act (NEPA), the Montana Environmental Policy Act (MEPA), and other relevant laws and regulations. This report discloses the direct, indirect, secondary, and cumulative environmental effects that would result from the Proposed Action and No Action alternatives.

1.2 Purpose and Need

The purpose of the project is to provide consistent and reliable water to communities within central Montana. Many communities within central Montana deal with challenges in obtaining reliable, quality drinking water throughout the year. Below is a summary of the need and challenges that communities face within the CMRWA planning area:

- The town of Harlowton has wells with high sulfate content that make the water very difficult to drink without treatment. Harlowton also has one well that recently began producing high levels of black silt from the aquifer that has forced the town to shut this well down. Without this well the town cannot meet peak summer demands of the system.
- The town of Ryegate utilizes an infiltration gallery[3] from the banks of the Musselshell River. The Montana Department of Environmental Quality (DEQ) has repeatedly questioned whether the water supply is “Groundwater Under the Direct Influence of Surface Water”. If the DEQ determines that the source is under the influence of surface water, the town will need to install expensive water treatment facilities.
- The town of Broadview operates on two deep, low-production and poor quality wells. If either well were to go out of service, the town would not be able to meet the average daily flow needs of the community, which is a significant public health and safety threat to the residents.
- The city of Roundup obtains its water from a coal mine and the water is mineralized and nearly undrinkable. Almost all residents buy bottled water and/or use costly in-home

[3] **Infiltration galleries** may be used to collect water from the aquifer underlying a river. Water from an infiltration gallery has the advantage of bank filtration to reduce the water treatment requirements for a surface withdrawal.

reverse osmosis water treatment[4] units. In addition, residents are forced to operate water softeners because the water is corrosive to appliances.

- The town of Melstone has nearly run out of water several times in the past fifteen years as flows in the Musselshell River approached zero. More recently they've constructed two new production wells; however, both exceed the secondary standard for TDS (total dissolved solids). Additionally there are iron bacteria in the wells which require ongoing maintenance for the life of the wells as it cannot be completely eliminated.
- The town of Lavina does not have a central water distribution system. Instead users throughout the community are served by private groundwater wells. There are three public water systems in the community that serve single buildings, namely the school, the Lavina Crossing Café and the Cozy Corner Bar. Water quality is exceedingly poor in Lavina. Groundwater produced by local wells is accompanied by high concentrations of total dissolved solids, sulfates, and nitrates. Not only do these contaminants impart a very poor aesthetic quality to the source water but nitrates also pose a threat to public health and safety, especially to infants younger than six months.
- The town of Hobson does not have a central water distribution system; rather, the town is served by a fill station that is replenished by a groundwater well. In conjunction with the fill station that serves the general population, there are several transient non-community water systems located throughout the town that are largely associated with commercial establishments. Water quality of these water systems is commonly poor, caused in part by the high concentration of nitrates in the groundwater present in all of the systems, with the exception of the Hobson School. Nitrates are frequently detected at over 50 percent of the maximum contaminant level (MCL) of 10 micrograms per liter (mg/L) stipulated in the National Primary Drinking Water Standards, which requires that the systems be monitored quarterly. On several occasions, the MCL for nitrate has been exceeded.

Recent drought conditions have caused the Musselshell River to dry up for periods exceeding one month at several communities during 2001 through 2004. In addition, well levels have dropped during the same period. Communities that use the Musselshell River or groundwater for their water source find that the water exceeds several of the US Environmental Protection Agency (EPA) standards for secondary MCLs. Difficulty in treating the river water to meet the recent EPA Second Long Term Enhanced Surface Water Treatment Rule makes it very costly to use the river for drinking water. The very poor quality of groundwater in the Musselshell region and the dwindling quantity make it difficult to use groundwater in the Musselshell Valley.

1.2.1 Rural Water Supply Act

The Rural Water Supply Act directs the Secretary of the Interior to carry out a rural water supply program in states, such as Montana, and to identify opportunities for, plan the design of, and oversee the construction of water supply projects for small communities and rural areas. The Act requires any activity performed under this title to be carried out in cooperation with a qualifying non-federal project entity. The Act requires the completion of Appraisal Reports and Feasibility Studies in order to determine and rank need and feasibility of projects. For those projects that are accepted, the Act authorizes appropriations for FY2007-FY2016. The CMRWA

[4] **Reverse osmosis** is a filtration method that removes many types of large molecules and ions from solutions by applying pressure to the solution when it is on one side of a selective membrane. The result is that the solute is retained on the pressurized side of the membrane and the pure solvent is allowed to pass to the other side.

received a $200,000 grant through the first Funding Opportunity Announcement issued by Reclamation under the Rural Water Supply Act in July 2009. These funds were utilized to investigate renewable energy alternatives, complete a water and energy conservation plan, complete much of the background work for this EA and investigate innovative technologies for implementation in the project. This work has been incorporated into the overall Feasibility Report and EA being completed for the project.

The CMRWA has completed the Appraisal Report and the Phase I and Phase II Feasibility Reports (Great West Engineering, 2009) (Great West Engineering, 2010a) (Great West Engineering, 2010b). This is in accordance with the Rural Water Supply Act requirements that the Appraisal Report fully investigate the technical, economic, and financial feasibility of a project. Criteria applied by Reclamation to determine whether the appraisal's findings are a viable alternative and are suitable for further investigation are defined in Section 404.44 of the Rural Water Supply Program. The MJRWS will provide a reliable, high quality drinking water source.

1.3 Public Involvement

Scoping is a process to determine the scope and significance of issues related to a proposed action, in this case, the development of the MJRWS and the appropriation of federal and state funds. Knowing the scope and significance of issues allows for development of reasonable alternatives, and an accurate and timely environmental analysis. In addition, scoping helps identify issues important to the management of public land and resources in the area, as well as issues to be examined in the planning process. The scoping process is designed to encourage public participation and to solicit public input.

Scoping is an essential step to ensure that all issues are identified. Issues raised during scoping guide what is evaluated in the EA. The scoping period began on November 15, 2010, with the publication of the scoping meeting notices, and closed on December 30, 2010. However, the CMRWA did extend the comment period to January 30, 2011 to several parties which requested an extension. Scoping meeting notices were mailed to all government agencies or individuals determined to be a stakeholder in the MJRWS, including all landowners within 1 mile of the proposed pipeline route. The CMRWA hosted three public scoping meetings to present the proposal. These meeting occurred from 4:00 to 6:00 pm in Roundup on December 7, 2010; Harlowton on December 8, 2010; and Lewistown on December 9, 2010.

A press release introducing the MJRWS and announcing the public scoping meeting was published in the following newspapers:

- Lewistown News-Argus
- Judith Basin Press
- Roundup Record Tribune
- The Times Clarion (Harlowton)
- Great Falls Tribune
- Billing Gazette
- Billings Times

Attendance was recorded using sign-in sheets at the registration station. The Roundup meeting had the highest attendance with approximately 50 people signing in. Thirteen people signed in for the Harlowton meeting, while 18 people signed in for the Lewistown meeting. During the

scoping meeting, a brief presentation was given describing the proposed action and the NEPA/MEPA process. Afterwards, participants were invited to ask questions.

Communications (letters, e-mails, telephone calls) were received from 31 people, agencies, and groups by December 30, 2010. These communications were reviewed and comments identified and categorized for analysis in this report.

1.4 Issues

Below is a summary of the issues raised during scoping. These issues are explained in greater detail in the Alternatives, Affected Environment, and Environmental Consequences chapters.

1.4.1 Water Resources

- Comments were submitted that expressed concern over the impacts of the proposed action on water availability and water quality. Specifically the impacts on surface water resources, groundwater availability, private wells, water rights, concerns that withdrawal would exceed aquifer recharge, concern that the project may not be sustainable or that impacts would not be realized until years into the future, concern over drilling procedures and that improper procedures would impact water quality, impacts to Big Spring or Warm Spring, impacts to the water availability for Lewistown, and impacts on long-term water availability.
- Mitigation was also suggested within comments such as: commitment from CMRWA that, in the event that existing water availability is impacted by the MJRWS, the MJRWS water usage be reduced to a level that no longer effects the citizens of central Montana; monitoring be conducted and recorded on the flow of Big Spring in order to establish baseline and detect any impacts; commitment from CMRWA to either cap well or provide compensation to those existing water users if existing water resources are impacted by the operation of MJRWS; and, collect viable, and reliable data regarding the discharge from the Madison Aquifer prior to MJRWS development.

1.4.2 Cultural Resources

- Comment requested that if the pipeline crosses a land that has not received previous disturbance, have a cultural resource inventory conducted prior to ground disturbing activities.
- Comment requested that in the event that cultural materials are found during construction activities, cease disturbance activities, contact State Historic Preservation Officer (SHPO) and have a site investigation conducted.

1.4.3 Energy Sustainability

- Some comments requested consideration of the possibility of using the pipeline head to generate electrical power that could either be sold or utilized on the project as a measure that might reduce total cost and conserve energy. Also, the project should consider every opportunity to produce energy from sustainable sources to include utilization of the pipeline head where feasible plus wind, solar, and other sources.

1.4.4 Alternatives

- Comments suggested alternatives such as: instead of implementing MJRWS, develop water treatment systems and treat the existing water sources; build local dams to capture surface runoff as a water source for isolated and relatively small communities; or, consider locating the proposed well field in the Wheatland Basin, a separate groundwater basin, so that there is no possibility of interfering with flows in the Judith Basin.

- Comments were also submitted that requested the route cross through their property or request that MJRWS service their property.

CHAPTER 2
ALTERNATIVES

This section provides a detailed description of the alternatives reviewed in the EA.

2.1 No Action Alternative

Under the no action alternative, the federal government would not provide funding for the MJRWS and it is likely that the water pipeline would not be constructed because the cost would render the project unfeasible. The MJRWS would not be developed and residents in many areas within the central Montana region would continue to receive water of inconsistent quality and quantity.

2.2 Proposed Action

2.2.1 Service Provided

The proposed water system would provide water service for drinking, household, livestock, and yard irrigation (not crop irrigation) to member communities and individual rural users who are located within a reasonable and yet to be defined distance of the pipeline route that elect to receive the service. These rural users include individual households, farms, ranches, and businesses. Incorporated communities responsible for supplying water to their residents may decide to get their supply from the MJRWS. The CMRWA board of directors will determine who may be served by the system, generally on a first come, first served basis for uses approved in the Rural Water Supply Act. The following description includes a system designed to serve a population of 7,300 people in the CMRWA member communities and along the route. Individuals in rural areas along the pipeline route who are not connected to an existing water system in one of the member communities will be responsible for the cost of running supply lines from the main pipeline to their homes, business, and stock watering areas.

2.2.2 Well Development

The wells would be developed on the Ubet site located on state and/or privately owned land west of Garneill (see **Figure 2**) consisting of three wells approximately 2,250 feet deep based on results of the recently completed Ubet test well. The Ubet site had the lowest capital and operation and maintenance costs of the system, and was therefore selected to be the location for the proposed action.

2.2.3 Capacity

Projections for maximum day demand are 1,750 gpm for the current population and 2,720 gpm in 2065. The average day demand projections for the current population and 2065 were 500 gpm and 775 gpm, respectively. These rates correspond to 815 acre-feet[5] of water per year for the 2012 projection, and 1,250 acre-feet per year in 2065. This rate is the target for source development to serve the system meeting the Montana DEQ requirements. The associated water right permit would be limited to 2,720 gpm, corresponding to the maximum rate produced at any time for the system from the source of supply. Redundant capacity to 4,500 gpm would be permitted by redundant well designations, which is allowed for municipal systems under

[5] An acre foot is a volume measurement of one acre of water, one foot deep. It amounts to 325,851 gallons.

Montana's water laws. Redundant capacity is needed should something happen to one of the wells.

2.2.4 Storage

Four proposed storage facilities would consist of buried concrete tanks. The storage facilities will include a 550,000 gallon tank northwest of Judith Gap, a 150,000 gallon tank southwest of Utica, a 550,000 gallon tank just west of Rothiemay, and a 100,000 gallon tank west of Broadview.

2.2.5 Pump Stations

The well field pumping facility consists of connecting the wells directly to the distribution system and, therefore, eliminating any need for a supplemental pump station and day tank near the well field. However, a small pump station will be needed near Lavina to deliver water to Broadview. There will also be a 1,000 to 1,500 square foot building near the well field to house controls, electrical, valves, treatment equipment, meters, and manifold piping prior to delivery to the distribution system.

2.2.6 Pipeline

Because the number of people who would elect to be served by the supply system is yet undetermined, the details on the pipeline are preliminary. The proposed pipeline is approximately 230 miles in length and pipe diameters will range in size from 4 to 20 inches depending on the location. Pipe materials will consist mainly of High Density Polyethylene (HDPE) or Polyvinyl Chloride (PVC) with the use of ductile iron pipe or steel pipe where required due to high pressures (exceeding 200 pounds per square inch). All piping would be buried approximately 6.5 feet below ground surface to avoid frost. The pipeline is located adjacent to state or county road for most of the route; therefore, Right-of-Way (ROW) encroachment permits would be required. Pipeline installation would disturb an area approximately 20 feet in width.

2.2.7 Power Lines

The proposed action would include new power lines to be installed to the well field. This would include about 4 miles of new three-phase line from its current location in Garneill out to the well field. From the well field, the new power lines would branch out to the individual wells. New power lines would be placed within the ROW of the county road until the line reaches the well field.

There would also be new power lines installed to service the new booster station near Lavina, and to service up to three pressure reducing valve (PRV) vaults that are located near existing power lines. It is estimated that approximately 1.5 miles of new power lines would be required to service these locations. PRV vaults in remote locations will be powered through solar panels or hydro-powered generators rather than grid power.

2.2.8 Staging Areas

Staging areas will be primarily needed for pipeline installation since other project elements (wells and storage tanks) will have adequate property available to stage equipment within land leased or purchased by the CMRWA. It is estimated that three rural staging areas along the pipeline route will be needed where distances to member communities and the new wells or storage tanks will be more than 20 miles. The staging areas will be used as a central location to store pipe, construction equipment and other items necessary for construction of the pipeline.

The rest of the staging areas will be located in or near member communities, or at new well and storage tank project sites.

Each staging area will be approximately one acre and likely be privately owned property which will either be leased by the CMRWA or by the contractor. It is preferable to locate rural staging areas near an occupied farm or ranch to reduce the potential for vandalism or theft.

2.2.9 Site Reclamation and Monitoring

All disturbed areas would be reclaimed and reseeded with a seed mix approved by the appropriate county weed district. Weed treatment would occur along the route for five years post-disturbance in order to ensure that weeds do not become established in disturbed areas.

Development and implementation of mitigation measures, post-construction monitoring, and reclamation would be conducted under the oversight and direction of the interdisciplinary team (ID Team) which would include at least one member from the US Army Corps of Engineers (USACE), US Fish and Wildlife Service (USFWS), Montana Department of Natural Resources and Conservation (DNRC), Reclamation, and the CMRWA. The function of the ID Team would be to evaluate and recommend proposed pipeline alignments that minimize resource impacts and to review completed work to ensure that mitigation measures were successfully completed.

2.2.10 Infrastructure

A wireless based supervisory control and data acquisition (SCADA) system will be used to monitor and control the water supply system. The wireless system would be a Federal Communications Commission licensed radio broadcast system consisting of four separate radio links distributed strategically throughout the system. The SCADA system will monitor well operation, chemical dosing, tank levels, flow meters, and pressures at the PRV vaults. Information on all system operations, 24 hours a day, will be transmitted to a central computer located in the main control building of the system operator. The SCADA programming will also include various scenarios which will trigger alarms to alert the operator of specific problems within the system. For example, all tanks will be equipped with low and high level alarms and flow meter data will trigger an alarm if flows are significantly above or below normal at any area within the system to alert the operator that there might be a water line break. The SCADA system will also allow the system to be operated remotely including turning well pumps on or off, adjusting chemical dose rates, adjusting water tank levels, etc.

All of the information gathered by the SCADA system will ensure the water system is run as economically as possible. It will also aid the operators in addressing problems as they arise instead of only during periodic site visits. All of the pumping and flow meter data collected will be used to determine how many more customers can be served as well as when, and if, expansion is necessary.

2.2.11 Disinfection System

Water drawn from the Madison Aquifer meets all primary and secondary standards established in the Safe Drinking Water Act; therefore, no water treatment for the MJRWS is required; however, due to the length of the pipeline and long residence times disinfection will be provided. Generally, disinfection treatment is comprised of two components: primary and secondary disinfection. Primary disinfection is employed to achieve contact time (CT) requirements stipulated in the SDWA for providing 4-log inactivation of viruses and 3-log inactivation of *Giardia lamblia* cysts – this would only be required of the MJRWS if the source water sampling contained a positive fecal indicator. The role of secondary disinfection is to maintain a disinfectant residual throughout the distribution system to preserve the protective barrier against potential contamination by waterborne pathogens. Primary disinfection would likely involve liquid chlorine (sodium hypochlorite at 12.5 percent solution). Primary disinfection will likely be supplemented with the injection of ammonia to produce chloramines which helps maintain the chlorine residual for a longer time. This is important because of the long residence time of water

in the pipeline. Chloramines are well suited for secondary disinfection because they can be maintained for up to 21 days. Ozone or ultraviolet light could also be considered during the design phase.

2.2.12 Construction and Implementation Schedule

The construction schedule will be divided into multiple phases. The number of phases required for the project to be completed will be dependent on the annual appropriations granted to the project. Should the annual budget not be sufficient to complete a full phase, a phase can be divided into further subphases (**Table 1)**.

Table 1. Implementation Schedule

Activity	Date
Bureau of Reclamation Approval of Appraisal Report	June 2010
Complete Feasibility Report, Environmental Assessments and Water Conservation Plan	June 2011
Federal Review of Feasibility Report	June – October 2013
Value Planning/DEC & Certification Review	September 2013
Federal Approval of Appraisal Report	June 2014
Federal Authorization of Project	June – October 2014
Phase I Project Design	October 2014 – March 2015
Phase I Construction Initiated	May 2015
Completion of Construction Phases 2 through 5	2020

The planned phases for the project are as follows:

- Phase 1: Well field, Storage Tank, Service to Judith Gap, Harlowton and Surrounding Area

  Anticipated Schedule: May 2015 – December 2015

  The project must begin with drilling of at least two water supply wells and include the 550,000 gallon storage facility near Judith Gap. The second largest community within the water system is Harlowton which is located approximately 25 miles south of the well field. Additionally in the first phase the communities of Judith Gap, Garneill, and Buffalo and rural users anywhere between the well field and these communities would be connected to the new water system. This first phase would serve approximately 1,200 people.

- Phase 2: Main Water Line, Storage Tank and Service to Roundup

  Anticipated Schedule: April 2016 – November 2016

  Roundup is the largest community within the water system with a population of 2,376. This second phase would provide service not only to Roundup but also to any rural users along the nearly 65 miles of pipeline between Judith Gap and Roundup. This is also the main water line which must be completed in order for other small communities to the east and south to receive water service. The second 550,000 gallon water storage tank is also to be located along this line, just west of the small community of Rothiemay.

- Phase 3: Water Line to Lavina/Broadview and Booster Station at Lavina

  Anticipated Schedule: April 2017 – November 2017

  The water line to Lavina/Broadview will include the installation of a booster station south of Lavina to provide water to the Broadview system. Additionally a new storage tank will be constructed in Broadview to provide adequate storage for peak day demands and fire

suppression. The completion of this phase will provide service to approximately 450 people.

- Phase 4: Water Line to Utica/Hobson and Moore

  Anticipated Schedule: April 2018 – November 2018

  The water line to Utica/Hobson and Moore will provide service to approximately 500 people (along with any rural users along the lines which choose to connect). The final water storage tank, 150,000 gallons, will also be constructed during this phase to provide storage for the Northern area of the MJRWS.

- Phase 5: Water Line to Musselshell/Melstone and Disinfection Facilities

  Anticipated Schedule: April 2019 – November 2019

  The final phase of construction will be to complete the water line to those customers furthest from the new well field – Musselshell and Melstone. This line will service nearly 200 people in the two communities and any rural users along the pipeline who choose to connect. Additionally this phase will include two disinfection re-injection sites which will be located at the PRV vault locations. Because of the distance from the initial disinfection point and time sodium hypochlorite and chloramines can reside in the system, it will be necessary to re-inject a disinfectant at two locations prior to servicing Musselshell and Melstone to maintain the correct chlorine residuals required.

While these phases may be divided into further subphases. It is anticipated that all construction should be complete by the end of 2020.

2.2.13 Cost and Funding

The total cost of the MJRWS is expected to be approximately $91,000,000. The most expensive components of the project are the pipeline and well system development. Operation, maintenance, and replacement (OM&R) for the proposed action is expected to cost $575,000 (**Error! Reference source not found.**).

Table 2. Proposed Action Cost Summary

Description		Construction Cost Estimate
Pipelines		$33,188,000
Pipeline Easements		$89,000
Cathodic Protection		$332,000
Well System		$7,206,000
Pump Stations		$339,000
Control System(s)		$910,000
Major PRV/Flow Control Vaults		$590,000
Chemical Feed Pumps and Storage		$75,000
Subtotal Major Field Items		***$44,178,000***
Appurtenant Items	15%	$6,627,000
Subtotal		*$50,805,000*
Mobilization	5.0%	$2,540,000
Subtotal		$53,345,000

Contractor State Tax	1.0%	$533,000
Subtotal		*$53,878,000*
Design Contingencies	10%	$5,388,000
Subtotal		*$59,266,000*
Construction Contingencies	20%	$11,853,000
Subtotal		***$68,787,000***
Water Storage Tanks		$4,069,000
Solar Arrays		$707,367
Total Field Cost		**$73,565,000**
Non-Contract Costs	23.5%	$17,288,000
Total Project Cost (Rounded)		**$90,852,000**

Table 3. Maintenance Cost Summary

Central Montana Regional Water Authority	
Musselshell Judith Rural Water System	
Average Day Demand = 0.727 MGD (Current)	
Preferred Alternative	
Cost Summary	**Annual Cost**
Personnel	$ 208,000
Supplies	$ 16,834
Equipment	$ 52,000
Power	$ 142,387
Solar Cost Savings	$ 18,200
Water Purchase	$ -
Replacement	$ 102,040
Administration & General	$ 72,400
Total (rounded)	**$ 575,000**

Error! Reference source not found. represents the three funding strategies that were considered within the Appraisal and Feasibility studies. The preferred funding strategy involves a Rural Development loan at 3.375% at 40 years at a cost of $34.40 per month per equivalent dwelling unit (EDU).

Table 4. Funding Strategies Considered

Item	RD loan 3.375% 40 year term	SRF loan 3.75% 30 year term	Local loan 5.0% 30 year term
Total Project Capital Cost	$ 90,852,000	$ 90,852,000	$ 90,852,000
Federal Grant Share (75%)	$ 68,139,000	$ 68,139,000	$ 68,139,000
State Grant Share (12.5%)	$ 11,357,000	$ 11,357,000	$ 11,357,000
Local Share (12.5%)	$ 11,357,000	$ 11,357,000	$ 11,357,000
Loan Reserve	$ -	$ 637,000	$ -
Total Loan	$ 11,357,000	$ 11,993,000	$ 11,357,000
Annual Loan Payment	$ 522,000	$ 673,000	$ 739,000
Coverage on Loan	$ 52,000	$ 135,000	$ 148,000
Total Annual Debt Service Cost	$ 574,000	$ 807,000	$ 887,000
Annual O&M Cost	$ 575,400	$ 575,400	$ 575,400
Total Annual Cost	$ 1,149,400	$ 1,382,400	$ 1,462,400
Monthly User Cost (1)	$ 34.40	$ 41.40	$ 43.80

(1) Assumes 2,785 EDU's.

2.3 Permits, Licenses, and Other Authorizations Required

The following permits and plans will be submitted during the design phase:

- Authorization under the General Permit for Stormwater Discharge Permit / Stormwater Pollution Prevention Plan
- Montana Department of Transportation / ROW Encroachment Permit
- County ROW Encroachment Permit
- Bureau of Land Management ROW grant
- State Lands Easement
- USACE, 404 Permit, Clean Water Act
- Stream Bank Protection, County 310 Permit
- County Weed Board Submission of a weed management plan
- Railroad Crossing Easement
- Montana DNRC (water rights review and approval)

2.4 Environmental Commitments

Environmental commitments are implemented to avoid, mitigate, or monitor environmental impacts associated with the proposed action. These commitments have been developed in coordination with federal, state, county, and local agencies. These commitments would be implemented before construction and operation unless otherwise specified. The project budget includes significant resources to conduct a more detailed identification of natural resources and development of site specific mitigation measures during design.

2.4.1.1 Prime and Unique Farmlands and Soils

- Maximize construction of pipelines next to existing roads to eliminate or reduce the need for new maintenance or access roads;
- Return topography to preconstruction contours and mound soil over pipeline to allow settling;
- Control erosion by reseeding areas disturbed by pipeline placement as soon as possible following construction during acceptable dryland seeding timeframes in either the fall or spring;
- Topsoil would be separated and stockpiled before pipeline excavation greater than 18 inches wide (using backhoes). If pipelines are plowed in or trenchers are used (18 inches or less), the topsoil may be incorporated with subsoil during backfilling;
- Replace the topsoil as the last step in the backfilling process, so the protective soils will be returned to the soil horizon;
- Install sediment barriers to reduce water erosion on slopes greater than five percent;
- Leave buffer stripes of undisturbed vegetation adjacent to waterways;
- Where necessary, scarify topsoil before seeding in order to prevent compaction or crusting. Leave soil in a roughened condition until it is seeded to prevent wind erosion;
- Hydromulch slopes steeper than 15 percent;
- Install water bars to divert run-off from disturbed area;
- Backfill immediately after pipeline is placed in trenches;
- Consult with members of the ID Team for technical assistance in avoiding, minimizing and monitoring for lost or degraded water resource values; and
- Project related sand and gravel pits will comply with all federal and state regulations.

2.4.1.2 Water Resources and Water Quality

- Stream crossings in the project area would conform to state and federal standards;
- Place silt barriers to control sediment on slopes in excess of five percent at stream crossings and adjacent wetlands;
- Stockpile soil from trenches out of the water and waterway crossings and replace after pipeline construction;
- Select stream crossing sites where the channel is relatively stable and not side-cutting;
- Construct stream crossings perpendicular to the axis of the stream channel;
- The ID Team would identify stream crossings that require under-boring. Typically, perennial streams and wetlands would be under-bored. These streams would be under-bored unless the ID Team's review of geologic data determines boring would be unfeasible;
- Open-trench methods would occur on those streams that could be trenched and reclaimed during a period in which water is not flowing or present within the stream;
- Restore original streambank contours;
- Service and refuel construction equipment at least 250 feet from all waterbodies and wetlands;

- Consult with members of the ID Team for technical assistance in avoiding, minimizing, and monitoring for lost or degraded water resource values;
- Obtain state and federal streambank permit and comply with any additional requirements outlined by agencies;
- The mitigation standards for adverse effects to existing surface and groundwater users are established in state of Montana statutes governing water rights. In summary, new water development is not allowed to adversely affect a prior appropriator to any degree. Adverse effects to surface and groundwater users will be addressed in the water right permitting process. If any adverse effects are identified they will be resolved before a water right permit is issued; and
- Monitoring of potentially affected surface waters and springs will be investigated on a case-by-case basis during the water right permitting process. Some monitoring in the Utica area is already planned based on the water right permit for the well at that location. It is possible that additional monitoring could be identified in relation to development of additional wells. The distance from where a well is located to where a spring may be monitored will be based on technical evaluation of the hydrogeological conditions. This evaluation will consider the magnitude of the CMRWA water development and the ability to measure associated depletions. The CMRWA plans to permit a total of 1,220 acre-feet of water, which equates to a continuous flow rate of 1.7 cubic feet per second (cfs).

2.4.1.3 Vegetation

- Minimize disturbance to sagebrush (*Artemisia* spp.) plants. In the event sagebrush plants are removed or killed, plants would be reestablished through seeding or replanting;
- Reseed disturbed native grassland with a native seed mix and rate approved by the ID Team in order to ensure rapid revegetation;
- Broadcast seed where appropriate in order to minimize visual impacts;
- Identify areas of noxious weed infestation located within or adjacent to disturbance areas and treat prior to disturbance activities;
- Prepare and submit a noxious weed control plan to each county weed district prior to construction activities;
- Construction equipment will have mufflers and spark arresters to reduce fire risk;
- Consult with members of the ID Team for technical assistance in avoiding, minimizing, and monitoring for lost or degraded vegetation values; and
- Control weeds within pipeline corridor on an on-going basis as part of regular operation and maintenance.

2.4.1.4 Wetlands

Wetlands are protected under Section 404 of the Clean Water Act; therefore, disturbance to wetlands will be avoided whenever possible. In the event that impacts to wetlands cannot be avoided, the following mitigation compensation measures would be followed:

- Wetlands would be delineated and the functions and values would be assessed by a certified wetland biologist and a 404 permit would need to be obtained for all jurisdictional wetlands;
- Temporary supporting platforms would be used when working in wetlands to minimize damage to the wetland;

- Silt barriers would be used when disturbance areas occur adjacent to wetlands in order to control sediment;
- In the event that wetlands were disturbed or excavated, hydric soils would be stockpiled and the soil horizon would be redeveloped upon completion of construction;
- If pipeline profiles indicate draining of a wetland, bentonite plugs would be installed around the pipe on both sides of the wetland;
- Disturbed wetlands would be restored to original contour; and
- Restored wetlands would be monitored for three years post-construction to ensure that the functional capacity of the wetland was restored.
- Wetland crossings will be directionally bored or drilled where feasible to mitigate/limit impact.

2.4.1.5 Fish and Wildlife

- Aquatic resources for fish and wildlife would be protected by the implementation of Water Resources and Water Quality mitigation measures. All perennial streams and wetlands would be under-bored. These streams would be under-bored unless the ID Team's review of geologic data determines boring would be unfeasible. When open-trench methods are used, they would be conducted during a period in which there is no water present in the stream and construction and reclamation activities would be completed prior to water returning to the system;
- Consult members of the ID Team for technical assistance in avoiding, minimizing, and monitoring for lost or degraded fish and wildlife resources;
- No construction activities would be allowed within 2 miles of a sharp-tailed grouse (*Tympanuchus phasianellus*) or a greater sage-grouse (*Centrocercus urophasianus*) lek during periods of breeding or nesting (March 15 through June 15);
- Minimize disturbance to sagebrush plants. In the event sagebrush plants are removed or killed, plants would be reestablished through seeding or replanting; and
- All newly constructed power lines would be in compliance with the Avian Power Line Interaction Committee (APLIC) *Suggested Practices on Power Lines: The State of the Art in 2006* (APLIC, 2006) in order to avoid impacts to raptors.

2.4.1.6 Species of Concern and Federally Listed Species

- The Montana Fish, Wildlife and Parks (MTFWP), Montana Natural Heritage Program (MTNHP), and the USFWS would be consulted regarding the proposed activities to ensure that no unacceptable impacts to species of concern, threatened, endangered, candidate, or proposed species or their habitat occur.

2.4.1.7 Social and Economic

- Traffic and maintenance of traffic flow would be a high priority during any construction activities within the highway ROW. Disruptions of traffic would be kept to a minimum ensuring less than a 10 minute delay. All crossings or construction within ROWs would require permit/permission of appropriate federal, state, or county agency;
- Pipeline design would ensure that any potential pipeline breaks would not endanger adjacent roads; and
- As the pipeline is developed, residents and landowners will have an opportunity to receive water from the supply system wherever it is feasible.

2.4.1.8 Cultural Resources

As suggested by SHPO, cultural resources would be protected by implementing the following mitigation measures:

- If disturbance activities are to occur within an area that has never previously been disturbed, a cultural resource investigation would be conducted prior to disturbance.
- If, at any time during construction, cultural resources are discovered, SHPO would be contacted and a cultural inventory would be conducted.

2.4.1.9 Hazardous Materials

- Prior to ground disturbing activities, records would be reviewed to identify any pipelines, Underground Storage Tanks, Leaking Underground Storage Tanks, or any other potential sources of hazardous material. Hazardous material features would not be disturbed during construction activities;
- If contaminated soils/sites are unexpectedly encountered during construction, construction would cease immediately and a qualified hazardous material professional would be consulted to ensure compliance with applicable laws, rules, and regulations. As appropriate, the Montana Department of Environmental Quality (MDEQ), EPA, and the MDT will be contacted and consulted;
- CMRWA would ensure that all contractors have a spill prevention and clean-up plan to minimize potential for effects; and
- Construction materials would be provided from state of Montana approved existing gravel sources and no new resource exploration will likely be required.

2.5 Alternatives Considered, but Eliminated from Detailed Study

2.5.1 Water Sources

- Well Development Sites- Several sites were evaluated for the location of well development and the Ubet location was selected as the most feasible and efficient location. The Ubet location has the second lowest capital cost and OM&R costs of any alternative. The primary reason that the Ubet outranked the Lode location was due to the fact that the steep dip of the Madison Formation in the Lode area makes the target depth of the wells more at risk than the Ubet site where the formation lies relatively flat;
- Surface Water- Supplementing the current water supplies with surface water sources such as streams, rivers, or building dams was considered. However, the surface water resources did not meet the purpose and need of providing consistent and reliable quantity of high quality water. Water available from surface water sources does not meet the EPA's water quality standards and the cost for treatment of the water would not be feasible. In addition, surface water within the Musselshell basin is generally closed for new development because no water rights are available;
- Other Groundwater Sources – No technically feasible alternatives were identified for developing the quantity and quality of water needed by the CMRWA from other aquifers besides the Madison Aquifer in this portion of Montana;
- Centralized Water Treatment Facility to Improve Existing Supply – The use of existing water sources combined with a new treatment facility to serve the regional water system was screened from further consideration due to the fact that there is not an existing water resource capable of supplying the future demand of the whole system. The average day demand is expected to rise from 500 currently to 775 gpm in 2065 for the service area,

while the maximum day demand for is expected to rise from 1,750 to 2,720 gpm. None of the member communities have the capacity to serve the maximum day demand therefore, a single centralized water treatment facility is not feasible; and

- Multiple Water Treatment Facilities – Multiple water treatment facilities utilizing existing supplies of water would fragment the regional water system. For example, if a treatment plant were installed in Harlowton as well as in Roundup, the incentive and economic feasibility of connecting the two communities and serving the small communities and rural users in between is greatly diminished. The operation and maintenance costs of a reverse osmosis water treatment plant depend on the size, but would have a greater effect on the individual user's water rates than the regional water system utilizing a new source of water which requires no treatment other than disinfection. Additionally, even if treatment plants were installed in those communities with water quality problems, that would not solve the problems in the communities that have issues with water quantity. Because the alternative would only address the water quality issues at an increased operation and maintenance cost for some of the member communities, but none of the water quantity issues and none of the rural users, it was not selected as the preferred alternative.

2.5.2 Pipeline Routes

In order to select the most efficient and feasible route for the pipeline, the project area was divided into subregions. Each subregion was evaluated considering factors such as geology, capital cost, accessibility/ROW, and natural resources. Originally, a route was proposed and evaluated in the Appraisal Report called the High Waterline Route.

Almost all of the alternatives evaluated in the Utica subregion (**Figure 2**) presented some economic advantage over the initially proposed High Waterline Route. Those evaluated routes that involved the modified orientation of the 20-inch diameter trunk line between the well field and the Judith Gap storage reservoir had the most potent impact on capital cost. Hence, it follows that the Powerline-Ridge-Central Route scored the highest in the decision matrix—largely due to its economic feasibility—and was selected as the preferred alternative for the Utica subregion.

In selecting the proposed route through the Judith Gap subregion (**Figure 3**), accessibility was initially the preponderant consideration in the configuration of potential routes and the other evaluated routes were ultimately found to be less economically feasible than the initially proposed High Waterline Route. Some slight modifications were made to the High Waterline Route such as the Roundup Bypass. Similar to the Judith Gap subregion, it was immediately obvious that the initially proposed High Waterline route would be the most economically feasible route within the Melstone subregion (**Figure 4**). However, the Gas Pipeline Route scored the highest in the decision matrix due to the enhanced accessibility and ease of construction it offers at a marginal increase in capital cost. Hence, it was selected as the preferred alternative for the Melstone subregion.

2.6 Summary Comparison of Alternatives

Table 5 summarizes the effects of the alternatives on the resources. Additional detail on the effects analysis and outcomes can be found in Chapter 4.

Table 5. Summary of Effects

Resource	No Action	Proposed Action
Geology and Soils	No Impact	Minimal soil disturbance. Site reclamation will minimize long-term impacts. Future maintenance may disturb small amounts of soil.

Table 5. Summary of Effects

Resource	No Action	Proposed Action
Surface Water	No Impact	Small, short-term impact on quality minimized by environmental commitments. No impact on quantity.
Groundwater	No Impact	993 acre-feet to 1,275 acre-feet per year of demand when the system is complete. Predicted head change of 0.2 feet at Big Spring no head change at Warm Spring. No impact on the groundwater system.
Vegetation	No Impact	Soil disturbance leading to weed infestation minimized by reclamation and a weed treatment plan.
Wetlands	No Impact	Temporary disturbance of wetlands. Mitigation will ensure effects are short-term.
Wildlife	No Impact	Temporary disturbance of wildlife in the area. Effects on avian species minimized by mitigation measures on the power lines. No long-term impacts on wildlife.
Species of Concern and Federally Listed Species	No Impact	No impact on federally listed species, impacts on species of concern would be the same as effects on wildlife.
Fish	No Impact	No impact on fish species.
Social and Economic	No Impact	Temporary employment and increase in economic activity associated with construction. Minimal long-term employment for system operation. Businesses that provided services related to water quality, bottled water or appliances may see decreased activity. No Environmental Justice impacts.
Cultural Resources	No Impact	No impact anticipated. Through proper pre-design cultural resource surveys, impacts should largely be avoided.
Land Use	No Impact	Short-term impact during pipeline construction. No long-term impacts.

CHAPTER 3
AFFECTED ENVIRONMENT

3.1 Geology and Soils

The Madison Aquifer occurs primarily within the Mission Canyon formation of the Madison Group. This group consists of the Lodgepole (oldest), Mission Canyon, and Charles (youngest) Formations. The aquifer can occur in the Lodgepole, but is generally not present in the Charles. The Lodgepole and Mission Canyon formations are carbonate rocks, consisting of dolostone[6] and limestone, whereas the Charles is characterized by dolostone, limestone and evaporite deposits of anhydrite and gypsum[7]. The occurrence of the Charles Formation is important because it can add several hundred feet of depth to the aquifer. The Charles also can impart poorer quality water to a well, although it is low permeability and can be cased off to prevent this occurrence.

Both the Little Belts and Big Snowy Mountains are uplifted areas underlain by older rocks that are tilted into the adjacent basins. Moving from the range fronts into the basin, the rocks at the surface become progressively younger. Because the rocks in places are steeply dipping into the basins, younger rocks occur at the surface. This rapid change in depth is particularly severe along the south side of the Big Snowy Mountains where the rocks dive into the Wheatland Basin.

3.1.1 Soils

A complete list of the soil series that occur within the project area is located within Appendix A. **Table 6** shows the characteristics of the 10 most prevalent soils within the project area. The majority of soils within the project area are deep, well drained soils, with medium to slow permeability. Erosion potential for these soils is typically determined by slope. The soils displayed in **Table 6.** Ten Most Prevalent Soil Series within Project Area are very representative of the soils within the project area. The parent materials for these soils are: alluvial soils, glacial soils, or upland soils derived from sandstone or shale.

The predominant land use within the MJRWS project area is agriculture, both farming and ranching. As part of the 1981 Farmland Protection Policy Act, the Natural Resources Conservation Service is required to classify farmlands as: prime farmland; prime farmland, if irrigated; statewide or locally important farmlands; or not prime farmland. Prime farmland, as a designation assigned by the US Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. State or local important farmland soils are those that fail to meet one or more of the requirements of prime farmland, but are important for the production of food, feed, fiber or forage crops. They include those soils that are nearly prime farmland and that economically produce high yields of crops when treated or managed according to acceptable farming methods. **Table 7** displays the acres of farmland classifications located within the project area.

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[6] A rock consisting of at least 50 percent dolomite (calcium-magnesium-carbonate). Dolomite is a mineral that forms primarily by alteration of limestone, typically at shallow depth and not too long after deposition of the limestone. It is a more dense mineral than calcium carbonate and so the alteration results in increased porosity of the rocks.

[7] Gypsum is a calcium sulfate salt that precipitates during evaporation of water from an isolated water body (e.g, lake, bay or lagoon). Anhydrite forms from gypsum during burial, typically at depths greater than 1,000 feet.

Table 6. Ten Most Prevalent Soil Series within Project Area

Soil Series	Taxonomic Class	Drainage/Surface Runoff Potential	Acres within Project Area
Arbor	Fine-loamy, mixed, superactive, mesic Typic Hapludolls	Medium	1,801
Cabbart	Loamy, mixed, superactive, calcareous, frigid, shallow Aridic Ustorthents	Well drained; moderate permeability	2,960
Crago	Loamy-skeletal, carbonatic, frigid Aridic Calciustepts	Well drained; moderate permeability above the sandy-skeletal material and rapid in the sandy-skeletal material	2,467
Darret	Fine, mixed, superactive, frigid Typic Argiustolls	Well-drained; moderately slow or slow permeability	1,364
Delpoint	Fine-loamy, mixed, superactive, frigid Aridic Haplustepts	Well drained; moderate permeability	1,082
Gerdrum	Fine, smectitic, frigid Torrertic Natrustalfs	Well drained; very slow permeability	2,484
Judith	Fine-loamy, carbonatic, frigid Typic Calciustolls		2,567
Marvan	Fine, smectitic, frigid Sodic Haplusterts	Well drained; very slow permeability	1,279
Neldore	Clayey, smectitic, nonacid, frigid, shallow		
Aridic Ustorthents	Well drained; slow permeability		2,004
Yawdim	Clayey, smectitic, calcareous, frigid, shallow Aridic Ustorthents	Well drained. Runoff is slow to very rapid. Permeability is slow	1,061

Table 7. Acres of Farmlands within Project Area

County	Farmland Classification		
	Prime Farmland	Prime Farmland if Irrigated	Farmland of Statewide Importance
Fergus	15.8	27.3	105.6
Golden Valley	0	166.7	471.8
Judith Basin	69.0	754.4	3,048.3
Musselshell	0	45.2	1,288.5
Wheatland	0	68.9	144.7
Yellowstone	20.2	8.6	0

3.2 Water Resources and Water Quality

3.2.1 Surface Water Features and River Crossings

A number of streams and rivers bisect the pipeline corridor for the proposed action (**Figure 1**). The majority of these drainages occur within the western and central portion of the pipeline

route while the eastern portion of the pipeline route is considerably more arid. Major river systems within the study area are the Judith River and the Musselshell River. The pipeline would cross the Judith River near Utica and the Musselshell River at Lavina and Musselshell.

The Musselshell River is a tributary of the Missouri River, approximately 467 miles long (including it two primary tributaries), in central Montana.

The Judith River is a tributary of the Missouri River, approximately 124 miles (200 kilometers) long, running through central Montana and the US. The Judith River is a Class I river from the confluence with Big Spring Creek to its confluence with the Missouri River for public access for recreational purposes. Class I waters are defined as those which are capable of recreation use and have been declared navigable or which are capable of specific kinds of commercial activity, including commercial outfitting with multiperson watercraft.

The MTFWP has published a list of dewatering concern areas (FWP 2003). The two categories of dewatering are:

1. Chronic dewatering -- streams where dewatering is a significant problem in virtually all years; and

2. Periodic dewatering -- streams where dewatering is a significant problem only in drought or water-short years.

Within the Judith River drainage there are approximately 64 miles of river and tributaries that are chronically dewatered: Cottonwood Creek: McMillan ditch to Big Spring Creek, Judith River: Ackley Lake diversion – Big Spring Creek, and the Ross Fork Creek.

Within the Musselshell River drainage there are estimated 490 miles of chronic dewatered river miles including its tributaries: American Fork Creek, Big Elk Creek, Careless Creek: Bercail to Franklin, Cottonwood Creek, Flatwillow Creek: Durfee Creek to Petrolia Reservoir, Musselshell River: Deadmans Basin Supply Canal to mouth, North Fork Musselshell River: Bair Reservoir to mouth, and South Fork Musselshell River: Muddy Creek to mouth, Spring Creek, and Swimming Woman Creek.

Many of the tributary streams in the project area only have running water two months of the year.

3.2.2 Groundwater Resources (Madison Aquifer)

The proposed wells would access and deliver water from the Madison aquifer. Groundwater flow direction in the Madison Aquifer is to the northeast towards the North Dakota and Canadian borders. The Madison aquifer is virtually undeveloped in the project area. Big Spring to the south of Lewistown, the Hanover Well northwest of Lewistown and Warm Spring, also to the northwest of Lewistown are the only known discharges from the Madison in the area (Feltis, 1973). The CMRWA well in Utica was the first new Madison diversion.

Static Water Level

Static water level refers to the level which groundwater would rise in a well that penetrates an aquifer under steady state non-pumping equilibrium. In relation to the top of the aquifer, static water levels limit (difference in hydraulic head from static water level to top of pump intake or top of well screen) how much drawdown can be realized during pumping. In relation to ground surface, pumping water level determines how much pumping lift (dynamic hydraulic head) is required to produce water to the public water system. Flowing artesian conditions refer to the case where a static water level is higher than ground surface, and water flows freely from the well without pumping.

One of the goals in evaluating well field alternatives was to identify areas where static water would be shallower or possibly flowing artesian, while also providing sufficient drawdown to allow for pumping at the maximum desired rate. The ideal well field location would develop Madison wells that flow directly to the water system with sufficient pressure to avoid any pumping requirements.

At the site of the recent test well, the aquifer at the Ubet well field site was reached at 2,250 feet below ground surface and has a static water level of 260 feet below ground surface; indicating confined groundwater conditions. Confined groundwater is water that is under sufficient pressure to rise above the level at which it was first encountered in a well, and it may or may not flow to or on the ground surface. A Montana Power wildcat well east of Garneill had a static water level of 4,380 feet above mean sea level, or depth to water of 200 feet below ground surface. Under these conditions, there is an abundance of available drawdown; and the static lift required for pumping would be considerably less than some of the alternative well field developments.

Madison Aquifer Recharge

Great West Engineering analyzed the aquifer recharge to the Madison Formation in the Phase I Feasibility Report (Great West Engineering, 2009) to assess how much recharge may occur directly up-gradient from prospective wellfield locations, and to estimate the actual recharge for use in determining legal availability of water, a requirement of water right permitting. It is estimated that the mean recharge to the Madison Formation in the Judith Basin totals approximately 235,000 acre-feet per year (2009). Of this amount, approximately 180,000 acre-feet per year originates in the Little Belt Mountains (Zimmerman, 1966).

3.3 Vegetation

The project area is located within the Northwestern Great Plains Ecoregion, which is largely an unglaciated, semiarid and rolling plain that is underlain by shale, siltstone and sandstone. This ecoregion is primarily used for rangeland. The dominant vegetation communities present within the project area are typical communities for the Northwestern Great Plains Ecoregion. The most common communities are grasslands and shrublands (Woods et al., 2002). The majority of grasslands have been altered. Farmlands consist of both dry and irrigated farmlands. Shrubland communities are mesic or xeric shrub communities, typically sagebrush grassland communities.

3.3.1 Noxious Weeds

A noxious weed, as defined by the Federal Noxious Weed Act of 1974, is a plant, which is of foreign origin, and can directly or indirectly injure crops, other useful plants, livestock, or poultry or other interests of agriculture, including irrigation, or navigation, or the fish or wildlife resources of the US or the public health. Noxious weeds occur throughout the project area, typically occurring within or adjacent to areas that have experienced ground disturbing activities.

During the Environmental Screening survey, which occurred throughout the majority of the proposed pipeline route in 2007, the presence

Table 8. Weed Species Observed within Project Area

Common Name (Dominant)	Scientific Name
Curlycup Gumweed	*Grindelia squarrosa*
Sunflower	*Helianthus spp.*
Occasional	
Knapweed Species	*Centaurea spp.*
Leafy Spurge	*Euphorbia esula*
Canada Thistle	*Cirsium arvense*
Musk Thistle	*Carduus nutans*
Showy Milkweed	*Asclepias speciosa*
Wild Licorice	*Glycyrrhiza lepidota*
Aster	*Aster spp.*
Sow Thistle	*Sonchus arvensis*
Species were observed within pipeline corridor from 9-10-07 to 9-12-07	

of noxious weeds was observed and recorded. **Table 8** lists noxious weeds that are known to occur within the pipeline route; however, additional weeds may occur within portions of the pipeline route that were not surveyed during the Environmental Screening survey.

3.4 Wetlands

Wetlands are a subset of Waters of the US and are regulated under 33 CFR and 40 CFR 230, EPA. Wetlands are defined as: "those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions". Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands have the following general diagnostic environmental characteristics:

(1) Vegetation. The prevalent vegetation consists of macrophytes that are typically adapted to hydric areas. Hydrophytic species, due to morphological, physiological, and/or reproductive adaptations have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions.

(2) Soil. Soils are present and have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions.

(3) Hydrology. The area is inundated either permanently or periodically at mean water depths <6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation. *The period of inundation or soil saturation varies according to the hydrologic/soil moisture regime and occurs in both tidal and nontidal situations.*

Wetlands within the majority of the project area were observed and noted during the Environmental Screening survey conducted in 2007. The majority of the wetlands observed occurred within the western and central portion of the project area.

Wetlands are regulated by the USACE and protected under Section 404 of the Clean Water Act.

3.5 Wildlife Resources

The wildlife species present within the project area are representative for species found within the Northwestern Great Plains Ecoregion. The project area bisects six counties within central Montana which is an area with an abundance of diverse wildlife species. This region offers a wide variety of both game and nongame species, including many migratory birds and raptors. During the Environmental Screening survey that was conducted along the preliminary proposed route, a list of observed wildlife species was recorded (**Error! Reference source not found.**). While the current proposed route differs in some areas from what was evaluated in the Environmental Screening, the same habitats are represented along both routes; therefore, it can be assumed that the wildlife species would be consistent between the routes.

Table 9. Wildlife Species Observed during Field Surveys

Common Name	Scientific Name	State Status1
American Crow	*Corvus brachyrhynchos*	S5B
American Kestrel	*Falco sparverius*	S5
Badger (burrows)	*Taxidea taxus*	S4
Bank Swallow	*Riparia riparia*	S5B
Black-billed Magpie	*Pica hudsonia*	S5
Black-tailed Prairie Dog	*Cynomys ludovicianus*	Species of Concern[2], S3
Brewer's Blackbird	*Euphagus cyanocephalus*	S5B
Brown-headed Cowbird	*Molothrus ater*	S5B

Table 9. Wildlife Species Observed during Field Surveys

Common Name	Scientific Name	State Status1
Canvasback	*Aythya valisineria*	S5B
Common Raven	*Corvus corax*	S5
Golden Eagle	*Aquila chrysaetos*	Species of Concern2, S3
Great Blue Heron	*Ardea herodias*	Species of Concern2, S3
Horned Lark	*Eremophila alpestris*	S5
Killdeer	*Charadrius vociferous*	S5B
Mallard	*Anas platyrhynchos*	S5
Mountain Bluebird	*Sialia currucoides*	S5B
Mountain Cottontail Rabbit	*Sylvilagus nuttallii*	S4
Mourning Dove	*Zenaida macroura*	S5B
Mule deer	*Odocoileus hemionus*	S5
Northern Harrier	*Circus cyaneus*	S4B
Porcupine	*Erethizon dorsatum*	S4
Prairie Falcon	*Falco mexicanus*	S4
Pronghorn	*Antilocapra americana*	S5
Raptor (unidentified)	--	--
Red-tailed Hawk	*Buteo jamaicensis*	S5B
Sandhill Crane	*Grus canadensis*	S5B, S2N
Sharp-tailed Grouse	*Tympanuchus phasianellus*	S4
Sparrow (unidentified)	*Emberizidae spp.*	--
Swainson's Hawk	*Buteo swainsoni*	S4B
Vesper Sparrow	*Pooecetes gramineus*	S5B
White-tailed Deer	*Odocoileus virginianus*	S5

Species were observed within sight distance of the pipeline corridor from 9-10-07 to 9-12-07.

[1]Montana State Rank Definitions (MTNHP, 2013a):

S2 – At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.

S3 – Potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.

S4 – Apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining.

S5 – Common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range.

B (Breeding) – Rank refers to the breeding population of the species in Montana. Appended to the state rank, e.g. S5B = Common during breeding season.

N (Nonbreeding) – Rank refers to the non-breeding population of the species in Montana. Appended to the state rank, e.g. S2N = At risk during migration.

[2]Species of Concern (MTNHP, 2013a) – Montana Species of Concern are native taxa in the state that are considered to be at-risk by the MTNHP and MTFWP due to declining population trends, threats to their habitats, restricted distribution, and/or other factors.

3.6 Species of Concern and Federally Listed Species

3.6.1 Species of Concern

Montana Species of Concern are native taxa in the state that are considered to be "at risk" by the MTNHP and MTFWP due to declining population trends, threats to their habitats, restricted distribution, and/or other factors (MTNHP, 2013a). **Error! Reference source not found.** lists pecies of concern that the MTNHP identifies as having the potential to occur within the project

area (MTNHP, 2012)(MTNHP, 2013b)

Table 10. Species of Concern with Potential to Occur within the Project Area

Common Name	Scientific Name	County	State Status[1]
Mammals			
Black-tailed Prairie Dog	*Cynomys ludovicianus*	Fergus, Golden Valley, Judith Basin, Musselshell, Wheatland, and Yellowstone	S3
Dwarf Shrew	*Sorex nanus*	Fergus, Golden Valley and Judith Basin	S2, S3
Fringed Myotis	*Myotis thysanodes*	Fergus and Judith Basin,	S3
Hoary Bat	*Lasiurus cinereus*	Fergus, Golden Valley, Judith Basin, Musselshell, and Yellowstone	S3
Preble's Shrew	*Sorex preblei*	Fergus, Golden Valley, Judith Basin and Wheatland	S3
Spotted Bat	*Euderma maculatum*	Yellowstone	S2
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Fergus, Musselshell and Yellowstone	S2
Birds			
American Bittern	*Botaurus lentiginosus*	Fergus, Golden Valley and Yellowstone	S3B
Baird's Sparrow	*Ammodramus bairdii*	Fergus, Musselshell, Wheatland, and Yellowstone	S3B
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Musselshell and Yellowstone	S3B
Black-necked Stilt	*Himantopus mexicanus*	Golden Valley and Yellowstone	S3B
Black Tern	*Chlidonias niger*	Golden Valley and Yellowstone	S3B
Bobolink	*Dolichonyx oryzivorus*	Fergus, Judith Basin and Yellowstone	S3B
Brewer's Sparrow	*Spizella breweri*	Fergus, Golden Valley, Musselshell, Wheatland, and Yellowstone	S3B
Burrowing Owl	*Athene cunicularia*	Fergus, Golden Valley, Musselshell, Wheatland, and Yellowstone	S3B
Chestnut-collared Longspur	*Calcarius ornatus*	Fergus, Golden Valley, Musselshell, Wheatland, and Yellowstone	S2B

Table 10. Species of Concern with Potential to Occur within the Project Area

Common Name	Scientific Name	County	State Status[1]
Ferruginous Hawk	*Buteo regalis*	Fergus, Golden Valley, Judith Basin, Musselshell, Wheatland, and Yellowstone	S3B
Golden Eagle	*Aquila chrysaetos*	Golden Valley, Musselshell, Wheatland, and Yellowstone	S3
Great Blue Heron	*Ardea herodias*	Fergus, Golden Valley, Judith Basin, Wheatland, and Yellowstone	S3
Greater Sage-grouse	*Centrocercus urophasianus*	Fergus, Golden Valley, Musselshell, Wheatland, and Yellowstone	S2
Loggerhead Shrike	*Lanius ludovicianus*	Fergus, Golden Valley, Musselshell, Wheatland, and Yellowstone	S3B
Long-billed Curlew	*Numenius americanus*	Fergus, Golden Valley, Judith Basin, Musselshell, Wheatland, and Yellowstone	S3B
McCown's Longspur	*Rhynchophanes mccownii*	Golden Valley, Musselshell, Wheatland, and Yellowstone	S3B
Mountain Plover	*Charadrius montanus*	Fergus, Golden Valley, Musselshell, Wheatland	S2B
Peregrine Falcon	*Falco peregrinus*	Yellowstone	S3
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Musselshell and Yellowstone	S3B
Sage Thrasher	*Oreoscoptes montanus*	Golden Valley and Musselshell	S3B
Sprague's Pipit	*Anthus spragueii*	Fergus, Golden Valley, Judith Basin and Wheatland	S3B
Veery	*Catharus fuscescens*	Fergus, Musselshell, Wheatland, and Yellowstone	S3B
Yellow-billed Cuckoo	*Coccyzus americanus*	Yellowstone	S3B
Reptiles and Amphibians			
Common Sagebrush Lizard	*Sceloporus graciosus*	Fergus, Musselshell and Yellowstone	S3

Table 10. Species of Concern with Potential to Occur within the Project Area

Common Name	Scientific Name	County	State Status[1]
Greater Short-horned Lizard	*Phrynosoma hernandesi*	Golden Valley, Musselshell, Wheatland, and Yellowstone	S3
Great Plains Toad	*Anaxyrus cognatus*	Musselshell	S2
Milksnake	*Lampropeltis triangulum*	Fergus, Musselshell and Yellowstone	S2
Plains Spadefoot	*Spea bombifrons*	Fergus, Golden Valley, Musselshell, and Yellowstone	S3
Spiny Softshell	*Apalone spinifera*	Fergus, Golden Valley, Musselshell, Wheatland, and Yellowstone	S3
Western Hog-nosed Snake	*Heterodon nasicus*	Musselshell and Yellowstone	S2
Fish			
Blue Sucker	*Cycleptus elongatus*	Fergus	S2, S3
Northern Redbelly Dace	*Chrosomus eos*	Fergus, Golden Valley, Judith Basin, Musselshell, Wheatland	S3
Northern Redbelly X Finescale Dace	*Chrosomus eos x chrosomus neogaeus*	Fergus, Golden Valley, Judith Basin, Wheatland	S3
Paddlefish	*Polyodon spathula*	Fergus	S1, S2
Pallid Sturgeon	*Scaphirhynchus albus*	Fergus	S1
Sauger	*Sander canadensis*	Fergus, Musselshell and Yellowstone	S2
Sicklefin Chub	*Macrhybopsis meeki*	Fergus	S1
Sturgeon Chub	*Macrhybopsis gelida*	Fergus	S2, S3
Westslope Cutthroat Trout	*Oncorhynchus clarkii lewisi*	Fergus, Judith Basin, Wheatland	S2
Plants			
Bush Morning-glory	*Ipomoea leptophylla*	Yellowstone	S1, S2
Hot Spring Phacelia	*Phacelia thermalis*	Fergus	S1, S3
Little Indian Breadroot	*Pediomelum hypogaeum*	Fergus, Golden Valley	S2, S3
Long-styled Thistle	*Cirsium longistylum*	Fergus, Judith Basin, Wheatland	S2, S3
Missoula Phlox	*Phlox kelseyi var. missoulensis*	Judith Basin	S2, S3
Persistent-sepal Yellow-cress	*Rorippa calycina*	Yellowstone	SH
Platte Cinquefoil	*Potentilla plattensis*	Judith Basin	S2
Rocky Mountain Twinpod	*Physaria saximontana var. dentata*	Fergus	S3
Roundleaf Water-	*Bacopa rotundifolia*	Fergus and	S3?

Table 10. Species of Concern with Potential to Occur within the Project Area

Common Name	Scientific Name	County	State Status[1]
hyssop		Yellowstone	
Scarlet Ammannia	*Ammannia robusta*	Yellowstone	S2
Small Dropseed	*Sporobolus neglectus*	Wheatland	S1, S3
Square-stem Monkeyflower	*Mimulus ringens*	Fergus	S1

Source: (MTNHP, 2012) (MTNHP, 2013b)
[1]Montana Species Ranking Codes (MTNHP, 2013a):
S1 – At high risk because of extremely limited and/or rapidly declining population numbers, range and/or habitat, making it highly vulnerable to global extinction or extirpation in the state.

S2 – At risk because of very limited and/or potentially declining population numbers, range and/or habitat, making it vulnerable to global extinction or extirpation in the state.

S3 – Potentially at risk because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.

B (Breeding) – Rank refers to the breeding population of the species in Montana. Appended to the state rank, e.g. S5B = Common during breeding season.

? = Inexact Numeric Rank – Denotes uncertainty; inexactness

SH = Historical, known only from records usually 40 or more years old; may be rediscovered.

Other species of concern are listed for one or more of the six counties that the project area crosses, but they do not have the potential to occur within the project area due to lack of suitable habitat and/or the project area is not within the species known geographic range; therefore, these species were not included in **Table10**.

3.6.2 Federally Listed Species

The Endangered Species Act (ESA) was passed in 1973 to protect endangered and threatened species and their habitats. **Error! Reference source not found.** lists the threatened, endangered and candidate species that the USFWS has identified with the potential to occur within the six counties the proposed pipeline would cross (USFWS, 2012).

Table 11. Federally Listed Species by County

Common Name	Scientific Name	County	Status
Black-footed Ferret	*Mustela nigripes*	Fergus, Golden Valley, Musselshell, Wheatland, and Yellowstone	Endangered
Greater Sage-grouse	*Centrocercus urophasianus*	Fergus, Golden Valley, Musselshell, Wheatland, and Yellowstone	Candidate
Sprague's Pipit	*Anthus spragueii*	Fergus, Golden Valley, Judith Basin, Musselshell, Wheatland, and Yellowstone	Candidate

One endangered species, pallid sturgeon (*Scaphirhynchus albus*), and two candidate species, wolverine (*Gulo gulo luscus*) and the whitebark pine (*Pinus albicaulis*), are also listed for one or more of the six counties that the project area crosses, but were not included in **Table 11** because they do not have the potential to occur within the project area due to lack of suitable habitat and/or the project area is not within the species known geographic range.

The USFWS was consulted to identify any threatened or endangered species that have the potential to occur in the project area. Endangered species are plants and animals that are in danger of extinction throughout all or a significant portion of its range. Threatened species are plants and animals that are likely to become endangered within the foreseeable future. Of the species that have actual threatened or endangered species status, only the black-footed ferret (*Mustela nigripes*) has been identified by the USFWS to have the potential to occur within the project area.

Candidate species are plants and animals for which the USFWS has sufficient information on their biological status and threats to propose them as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities. Candidate species receive no statutory protection under the ESA. However, the USFWS encourages the conservation of these species because they are by definition species that may warrant future protection under the ESA.

Proposed species are those candidate species that were found to warrant listing as either threatened or endangered and were officially proposed as such in a Federal Register notice after the completion of a status review and consideration of other protective conservation measures. No proposed plant or animal species were identified to occur within any of the six counties that the project area crosses.

No threatened or endangered plants were identified to occur within any of the counties involved in the proposed action.

Below is a discussion of species that have been identified to occur within the project area or that have had mitigation measures developed in order to protect them:

3.6.2.1 Greater Sage-grouse

Sagebrush is the preferred habitat for the greater sage-grouse. Sage-grouse typically use sagebrush covered benches in June to July and move to alfalfa fields or greasewood bottoms when forbs on the benches dry out. In August to early September, sage-grouse move back to sagebrush (Peterson, 1970). Sage-grouse are known for their elaborate courtship rituals. Each spring, males congregate in leks and perform a "strutting display". Groups of females observe these displays and select the most attractive males to mate with. Leks generally occur in open areas adjacent to dense sagebrush stands, and the same lekking ground may be used by grouse for decades. Lek activity extends from March to May. Sage-grouse populations have been declining for several decades. The USFWS has determined that the greater sage-grouse warrants protection under the ESA, but that listing the species under the ESA is precluded by the need to address other listing actions of a higher priority. Year-round sage-grouse habitat occurs through central and eastern Montana.

The Montana Department of Fish, Wildlife and Parks provided information on the location of known sage grouse leks near the proposed route. The data showed that there were 36 known leks within 2 miles of the proposed route.

- 9 leks were unconfirmed, no subsequent survey has confirmed the lek.
- 22 leks were confirmed active, leks have been used.
- 4 leks were **c**onfirmed Inactive, it has been 10 years with no lek activity.
- 1 lek was confirmed extirpated, birds have permanently abandoned the lek due to habitat changes (e.g., plowing, urban development, overhead power line).

3.6.2.2 Black-footed Ferrets

Black-footed ferrets are associated with prairie dogs and use their habitat such as: grasslands,

steppe, and shrub steppe. The ferrets do not dig their own burrows and rely on abandoned prairie dog burrows for shelter. Only large complexes (several thousand acres of closely spaced colonies) can support and sustain a breeding population of black-footed ferrets.

All known populations are a result of the reintroduction of captive bred ferrets. In 1998, a total of 217 kits were allocated for reintroduction and field breeding programs. Seventy-seven ferret kits were allocated to two separate release sites on a Montana experimental reintroduction area: 55 kits to the Ft. Belknap Indian Reservation and 22 kits to the Charles M. Russell National Wildlife Refuge.

None of the three reintroduced ferret populations is well established at this time, and there is ongoing concern about the genetic viability of the captive population. In Montana, the goal is to reestablish two viable populations with a minimum of 50 breeding adults in each.

The release sites are located over 80 miles away from the project area; however, prairie dog towns do occur within the region of the project area and the project area should be considered as black-footed ferret habitat. Only one prairie dog town was observed during the Environmental Screening survey conducted in 2007. The town was located northeast of Roundup and did not occur within the project area.

3.7 Fish

Fisheries habitat within the project area varies, although the majority of streams within the project area that have viable fisheries are tributaries of the Musselshell River or the Judith River. Both the Musselshell River and the Judith River are also present within portions of the project area. **Error! Reference source not found.** lists species that have distribution within the project rea based on the MTFWP database MFISH (MFWP, 2013).

The Musselshell River is one of Montana's cold water rivers with cutthroat trout (*Oncorhynchus clarkii* spp.) in the upper reaches and walleye (*Sander vitreus*), sauger (*Sander canadensis*), channel catfish (*Ictalurus punctatus*), and paddlefish (*Polyodon spathula*) in the lower parts. Three species of fresh-water mussels are native to the river with many species of shellfish, crawdads and other aquatic life.

Table 12. Fish Species with Potential to Occur within the Project Area

Common Name	Scientific Name	Common Name	Scientific Name
Black Bullhead	*Ameiurus melas*	Mottled Sculpin	*Cottus bairdii*
Black Crappie	*Pomoxis nigromaculatus*	Mountain Sucker	*Catostomus platyrhynchus*
Blue Sucker	*Cycleptus elongatus*	Mountain Whitefish	*Prosopium williamsoni*
Brassy Minnow	*Hybognathus hankinsoni*	Northern Pike	*Esox lucius*
Brook Stickleback	*Culea inconstans*	Northern Redbelly Dace	*Chrosomus eos*
Brook Trout	*Salvelinus fontinalis*	Northern Redbelly X Finescale Dace	*Chrosomus eos x chrosomus neogaeus*
Brown Trout	*Salmo trutta morpha*	Plains Minnow	*Hybognathus placitus*
Burbot	*Lota lota*	Rainbow Trout	*Oncorhynchus mykiss*
Channel Catfish	*Ictalurus punctatus*	River Carpsucker	*Carpiodes carpio*
Cisco	*Coregonus artedi*	Sand Shiner	*Notropis stramineus*
Common Carp	*Cyprinus carpio*	Sauger	*Sander canadensis*

Emerald Shiner	*Notropis atherinoides*	Shorthead Redhorse	*Moxostoma macrolepidotum*
Fathead Minnow	*Pimephales promelas*	Smallmouth Bass	*Micropterus dolomieu*
Flathead Chub	*Platygobio gracilis*	Smallmouth Buffalo	*Ictiobus bubalus*
Freshwater Drum	*Aplodinotus grunniens*	Stonecat	*Noturus flavus*
Goldeye	*Hiodon alosoides*	Unknown Minnow/Trout	
Green Sunfish	*Lepomis cyanellus*	Walleye	*Sander vitreus*
Lake Chub	*Couesius plumbeus*	Western Silvery Minnow	*Hybognathus argyritis*
Largemouth Bass	*Micropterus salmoides*	Westslope Cutthroat Trout	*Oncorhynchus clarkii lewisi*
Longnose Dace	*Rhinichthys cataractae*	White Sucker	*Catostomus commersoni*
Longnose Sucker	*Catostomus catostomus*	Yellow Perch	*Perca flavescens*
Source: (MTFWP, 2013)			

3.8 Social and Economic Resources

The socioeconomic and environmental justice analysis includes Fergus, Golden Valley, Judith Basin, Musselshell, Wheatland, and Yellowstone counties, portions of which would be serviced under the proposed action. Population numbers and employment rates are reported based on the latest available information. Most of the information is available from 2009 as the 2010 census data was not available at the time of this analysis. The data is representative of the overall social and economic conditions of the area.

3.8.1 Socioeconomics

The proposed water pipeline would be approximately 230 miles long and cross six central Montana counties (

Figure 1). The combined population of these counties was 165,757 in 2009, representing 17 percent of the population in Montana (US Census Bureau, 2010). Yellowstone County was the most populated county considered in this analysis representing 87 percent of the population (US Census Bureau, 2010). Yellowstone County includes the city of Billings which had an estimated population of 105,845 in 2009 (US Census Bureau, 2010). Billings would not be served by the proposed action. The proposed project would, however, provide municipal water for an estimated 4,750 people initially and eventually serve 7,300 people.

The areas serviced by the proposed action are primarily rural agricultural areas. These six counties were sparsely populated, covering 13,310 square miles of land and had a population density of 0.08 people per square mile. Approximately 24 percent of the population within the counties was composed of non-whites. An estimated 23 percent of the population was under the age of 18, while 19 percent of the population was 65 years or older (US Census Bureau, 2010). Of those eligible for employment, unemployment rates from December 2009 to November 2010 were 6.0 to 6.9 percent for Fergus, Judith Basin, Musselshell, and Wheatland counties and 5.0 to 5.9 percent for Golden Valley and Yellowstone counties. These values were below the national average unemployment rate of 9.7 percent for the same period (BLS, 2010).

3.8.2 Environmental Justice

Executive Order (EO) 12898 was signed by President Clinton in 1994 and orders federal agencies to identify and address “disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States” (EPA, 1994).

The analysis of potential environmental justice issues associated with the project followed guidelines described in the Council for Environmental Quality’s Environmental Justice Guidance under the NEPA (CEQ, 1997). The analysis method has three parts: (1) the geographic distribution of low-income and minority populations in the affected area is described; (2) an assessment of whether the impacts of construction and operation of the project would produce impacts that are high and adverse is conducted; and (3) if impacts are high and adverse, a determination is made as to whether these impacts would disproportionately impact low-income or minority populations.

A description of the geographic distribution of low-income and minority population groups was based on demographic data from the 2000 Census. According to the guidance (CEQ, 1997), low-income populations in an affected area should be identified with poverty thresholds from the Census Bureau. Percent minority population data was analyzed by Block Group. A census Block Group is a cluster of census blocks within a census tract. Block Groups generally contain between 600 and 3,000 people, with an optimum size of 1,500 people (US Census Bureau, 2005).

Percent population below the poverty level data was analyzed by Census Tract. A Census Tract is a small, relatively permanent statistical subdivisions of a county delineated by local participants as part of the U.S. Census Bureau's Participant Statistical Areas Program. Census tracts generally have between 1,500 and 8,000 people, with an optimum size of 4,000 people (US Census Bureau, 2005). Block Group data for percent population below the poverty level was not available for this analysis.

Minority is defined as individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. The Council on Environmental Quality (CEQ) guidance states that minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is

meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. For this analysis, the number of non-white individuals was summed and divided by the total number of individuals in the Block Group. The census includes the Native Hawaiian and Pacific Islander, Other, and Two or more races categories. The minority populations (of any single race) in 2000 in the analysis area by census tract ranged from less than 1.0 percent to 4.6 percent, much less than the 9.4 percent of minorities throughout the state of Montana (Table 13).

Table 13. Minority and Low-Income Populations

Location	Total Population	Percent Minority	Percent Below Poverty
Block Group 3, Census Tract 301, Fergus County	2,394	2.5	12.2
Block Group 1, Census Tract 1, Golden Valley County	1,044	0.9	16.5
Block Group 3, Census Tract 1, Judith Basin County	867	1.0	16.3
Block Group 1, Census Tract 1, Musselshell County	772	1.2	12.7
Block Group 1, Census Tract 2, Musselshell County	1,343	2.5	13.4
Block Group 2, Census Tract 2, Musselshell County	785	4.6	13.4
Block Group 1, Census Tract 1, Wheatland County	669	3.9	11.1
Block Group 1, Census Tract 14, Yellowstone County	4,403	4.3	5.2
State of Montana	918,751	9.4	10.5
Source: (US Census Bureau, 2010). Summary File 1, Table P9 and Summary File 3, Table P14.			

3.9 Cultural Resources

The project area is located within the prehistoric cultural area known as the Northwestern Plains, a region that extends from central Alberta to southern Wyoming and from western North Dakota to western Montana. The prehistoric inhabitants of the Northwestern Plains existed for 12,000 years as semi-nomadic hunters and gatherers. The archaeological record suggests minor changes in tool technologies and subsistence strategies over time. A primary focus on bison is evident during the last 4,000 years (Frison, 1994).

The prehistory of the Northwestern Plains has been classified into four traditions or periods based on similarities of artifact assemblages and overall adaptive strategies. The time periods are known as Paleoindian, Plains Archaic, Late Prehistoric and Equestrian Nomadic.

The Paleoindian Tradition (10,000-5500 Before Christ (BC)) occurs during the Pre-Boreal and Boreal climatic episodes, a time when the climate is cool, moist and conducive to forest expansion (Bryson, 1970). Paleoindian sites are rarely found on the more homogeneous upland prairie. The Paleoindian Tradition is further classified into Clovis, Goshen, Folsom, Hell Gap-Agate Basin, Cody and Parallel Oblique Flaked complexes.

The Plains Archaic Tradition (5500 BC- Anno Domini – the Year of Our Lord (AD) 250) begins during a relatively dry climatic episode known as the Altithermal. Early Plains Archaic sites are generally found in the same environment as Paleoindian sites, in protected mountains, foothills and major river valleys. A change in subsistence and settlement strategies occurs in the middle part of this tradition when sites are increasingly found across the open prairie. Subsistence changes include an increased reliance on bison and the utilization of plant resources. Complexes of the Plains Archaic include Bitterroot-Mummy Cave, Oxbow, McKean and Pelican Lake.

The Late Prehistoric (750 BC-AD 1800) is a time of increasing specialization of plains living and utilization of plains resources, most importantly bison. The early part of the Late Prehistoric is marked by the replacement of the atlatl by the bow and arrow. This more efficient weapon, coupled with communal hunting techniques, allowed the Plains Indians to become premier bison hunters. Late Prehistoric complexes include Besant, Avonlea and Old Women's.

The Equestrian Nomadic Tradition is the transitional time between the Prehistoric and Historic periods. This tradition is distinguished by the significant changes in subsistence economies, demographics, social organization and settlement patterns that resulted from the acquisition of the horse. The horse arrived in the Southern Plains around AD1600 but did not appear on the Northern Plains until AD 1725-1750. With the arrival of the horse, populations became more homogenous and sedentary (Moran, 1982). Mounted bison hunters could roam farther and it decreased the necessity for entire tribes to move (Secoy, 1953).

The Historic Period begins in 1805 with the arrival of the Lewis and Clark Expedition. The expedition reported on the vast numbers of fur bearing animals in the Upper Missouri area and as a result, fur trappers arrived in Montana to identify and exploit fur resources for export to the east (Malone & Roeder, 1976). The fur trade was the primary focus of most Anglo-Indian activities in the Northern Plains until the 1860s when the fur trade collapsed.

Gold was discovered in southwestern Montana in 1862 at Bannock. Subsequent discoveries were made at Alder Gulch in 1863 and Last Chance Gulch in 1864. The influx of miners and other emigrants into Montana led to mounting tensions between the whites and Indians. In order to protect business interests and emigrants in Montana, the military constructed several forts that included Fort Benton (1865), Camp Cooke (1866), Fort Shaw (1867), Fort Ellis (1867), Forts Keogh and Custer (1877), Fort Assiniboine (1879) and Fort Maginnis (1880) (Freedom, 1984); (McElroy, 1954). Battles, from small skirmishes to others that resulted in high casualties, were not uncommon in Montana. The Battle of Little Bighorn occurred in eastern Montana in June 1876. The following year, the Nez Perce passed through the project area during their trek north toward Canada and escape from the US military.

Immigration increased at the end of the 1880s with the arrival of the Northern Pacific and the Great Northern railroads. The railroads had received huge land grants and were actively promoting the agricultural potential of Montana. Laws had also been passed by Congress that permitted settlement of public domain land. Under the Homestead Act of 1862, the Timber Culture Act (1873), and the Desert Land Act (1877), over 38 million acres of public land in Montana were patented (Hibbard, 1965). Life was good for the homesteaders in the early 1900s. Rain was plentiful and grain prices were high with the advent of World War I in Europe. However, by 1919, the homesteading boom was over and that state was at the beginning of a 20 year drought, wind, and poverty (Malone & Roeder, 1976). Over 60,000 people left Montana in the 1920s and approximately 20 percent of the farms were abandoned. The agricultural business needed to recreate itself before it began to recover from the hard times of the 1920s and 1930s. Land units were consolidated, crops were diversified, operations were mechanized, and new scientific methods in agriculture were employed. Into the 1970s, agriculture continued to be the heart of the state's economy, providing its largest cash income and the marketing base for dozens of towns and cities (Malone & Roeder, 1976).

3.9.1 Section 106 Compliance Process

Compliance with federal legislation concerning cultural resources is required, most notably Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended through 1992, and National Register of Historic Places (NRHP) implementing regulations 36 CFR Part 800. The NHPA stipulates that a federal agency must consider the effects of an undertaking on any district, site, building, structure, object or properties of traditional and cultural importance

included in or eligible to the NRHP. Eligibility to the NRHP is based upon integrity of location, design, setting, materials, workmanship, feeling and association; and an association with one or more of the following criteria:

A. Events that have made a significant contribution to the broad patterns of our history;

B. Lives of persons significant in our past;

C. Embodies the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master; or

D. Has yielded or may be likely to yield information important to prehistory or history.

The agency must consult with the SHPO and the Advisory Council on Historic Preservation (ACHP) to provide them an opportunity to comment on the effects. Reclamation is the lead federal agency for this undertaking and as such, the Reclamation is responsible for compliance with Section 106 of the NHPA and 36 CFR Part 800. The following discussion can be viewed as applicable to the initial stages of the compliance process.

3.9.1.1 Cultural Resource Record Search

In February 2011, Tetra Tech submitted a Class I literature and file search request to the Montana SHPO for 408 legal sections that include the proposed wellfield and proposed pipeline route. SHPO Cultural Records Manager, Damon Murdo, returned databases of past projects and cultural resources identified in the 408 sections. A total of 133 cultural resource projects have been conducted across 179 of the 408 sections and 204 sites have been recorded in 81 of the 408 sections researched.

Of the 204 cultural sites identified, 32 sites (15.7 percent) are recommended not eligible to the NRHP, 132 sites (64.7 percent) have an undetermined eligibility, and 40 sites (19.6 percent) are recommended eligible or are listed on the NRHP. Of the sites identified, 47 are prehistoric and represent 25 lithic scatters, 9 buffalo jumps/pounds, 5 petroglyphs/pictographs, 3 firehearths/roasting pits, 2 rock alignments/structures, a tipi ring, a burial, and a paleontological locality.

The remaining 157 sites are historic and site types include 30 residences, 28 historic commercial developments, 28 railroad/stage routes, 10 homesteads/farmsteads, 8 architectural sites, 6 irrigation systems, 5 Euro-American sites, 5 gas stations, 3 grain elevators, 3 hotels, 3 railroad buildings/structures, 3 trash dumps, 2 building foundations, 2 districts, 2 mining sites, 2 outbuildings, 2 political/government sites, 2 post offices, 2 roads/trails, 2 vehicular/foot bridges, an agricultural site, a cairn, one church, a coal mine, a communication site, a conservation site, a fraternal lodge, a religious site, and a school.

Two hundred and four sites were identified in sections where the proposed wellfield and pipeline route are located. At this point, it is not known how many sites are located within the undisturbed proposed ROW as the site database only describes site location to the quarter-section. Additionally, the proposed pipeline route may be altered in the future so the results of the record search should be used as a guide for estimating site types and relative proportion of site types that will be encountered as the project progresses.

Previous research in the Northwestern Plains has demonstrated that both prehistoric and historic sites tend to be located near water sources and on top of buttes and ridges. The proposed pipeline route crosses the Judith and Musselshell rivers; it also crosses or is located next to numerous creeks, coulees, lakes and springs. Additionally, the topography in the project area can be rugged and prehistoric sites are commonly found on top of buttes and ridges that overlook drainages.

The potential number of sites located in the project ROW and the general topography of the project area indicate that cultural resources will be encountered during planning and construction of the proposed project. Only 15.7 percent of the sites have been recommended not eligible to the NRHP; eligibility of the remaining sites is undetermined (64.7 percent) and listed/recommended eligible (19.6 percent) to the NRHP. Sites with undetermined eligibility that fall within the project ROW will need to be evaluated, and if eligible to the NRHP, these sites will need to be mitigated or the pipeline route will need to be adjusted to avoid any significant cultural resources prior to pipeline construction. Additionally, communication between Monty Sealey (CMRWA) and Damon Murdo (SHPO) determined that if the wellfield or pipeline route crosses undisturbed land, a cultural resource inventory will be conducted in these areas prior to ground disturbing activities.

3.10 Land Use

The proposed pipeline route bisects lands owned by state, federal, and private entities. Although the final route has not been decided, approximately 216 miles of the proposed pipeline route would cross privately-owned lands. Approximately 14 miles of the pipeline would cross Montana State Trust Lands and approximately 10 miles would cross Bureau of Land Management (BLM) lands.

Land use within the project area has relatively little diversity, as it is predominately agriculture. Dryland and irrigated farming and livestock grazing are the most common land uses within the project area.

The pipeline route does intersect or terminate within a number of small towns**.** Land use within areas surrounding the towns often consisted of scattered residential and storage areas. Below is a list of towns located within or adjacent to the project area: Harlowton, Judith Gap, Garneill, Buffalo, Utica, Hobson, Rothiemay, Ryegate, Lavina, Broadview, Roundup, Musselshell, and Melstone.

CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter describes the direct, indirect, secondary, and cumulative effects of the alternatives on the resources described in Chapter 3. Direct, indirect, and secondary effects are caused by the project or by the effects of the project. Cumulative effects are the combination of the direct, indirect, and secondary effects along with past, present and reasonably foreseeable actions that have or will have effects on the same resources. When determining what is "reasonably foreseeable" actions have to be proposed and not just speculative. For example, rumors may have been circulated that a wind farm is being considered, but if no plans have been published or permit applications submitted, it is too speculative to be considered in the cumulative impacts. For the purposes of the cumulative effects analysis, the following past, present and reasonably foreseeable actions were considered where appropriate.

- Livestock grazing – Many of the lands within and adjacent to the project area are currently used for the grazing of livestock and that activity would continue.
- Farming – Many of the lands within or adjacent to the project area are used for farming.
- Hunting and other recreational uses – limited deer, antelope, and upland bird hunting could continue.

4.2 Geology and Soils

4.2.1 No Action Alternative

The no action alternative would have no impacts on soils and geology. Water extraction through private wells and surface disturbance to soils would continue at their present rate. The communities and residents within the project area would continue soil disturbance activities at the current rate and this would not be altered by the no action alternative.

4.2.2 Proposed Action

As part of the Phase l and Phase ll of development for the proposed action (Great West Engineering, 2009) (Great West Engineering, 2010a), geology within the region of the project area has been studied extensively. These studies revealed that well development or other aspects of the proposed action would not have an impact on geology. Review of the US Department of Agriculture Natural Resources Conservation Service soils survey for the well field did not suggest that there were soils present that would be highly erodible or unsuitable for well development.

The pipeline and storage tank development would disturb soils and prime farmland along the pipeline route. However, review of the soil series that occur within the project area did not reveal any highly erodible soils that would be unsuitable for pipeline development. In addition, implementation of the Environmental Commitments outlined in Section 2.4.1.1 would avoid and minimize impacts.

Disturbance areas would be kept to a minimum and displaced soil would be backfilled over the trench immediately after the pipeline section was installed. Reclamation would occur as soon as possible upon completion of installation. Stockpiled topsoil would be returned during reclamation and reclaimed areas would be immediately reseeded. In addition, construction is scheduled to occur within phases over a five year period; therefore, disturbed and exposed soil would be limited to smaller segments within the project area. Some prime farmlands and farmlands of

statewide importance may be disturbed during installation of the pipeline. However, the majority of disturbed areas would occur within or immediately adjacent to state and county ROW s and would have relatively less value. These areas would also be reclaimed as soon as disturbance activities were completed.

Operation and maintenance activities would have minor to no impacts on soil or geology. The majority of operation and maintenance activities would have no impacts. It is foreseeable that through the life of the project, there would be portions of the pipeline that would need to be replaced or repaired and this would require soil disturbing activities. However, as previously discussed, soils within the project area are not highly erodible and disturbed soils would be reclaimed and reseeded.

4.2.3 Cumulative Impacts

Soil disturbance will continue at the current rate from farming and grazing. Because the proposed action or the no action alternative would have minimal impacts on soils, there would be minimal cumulative effects on soils.

4.3 Water Resources and Water Quality

4.3.1 No Action

The no action alternative would result in no impacts on water resources and water quality. Other than the fact that, other shallow groundwater resources and limited surface water resources would continue to be developed to account for the estimated 30 percent growth in population over a 50 year timeframe. Shallower groundwater resources in the region of good quality and abundant supply are scarce. Competition for this limited resource would continue to develop as growth occurs. There would be no change in water supply within the regional Madison Aquifer, and no disturbance associated to construction activities to adversely impact surface water quality.

4.3.2 Proposed Action

4.3.2.1 Surface Water

Pipeline and Storage Tank Construction

Stormwater runoff for the proposed pipeline construction would be permitted under a Montana Pollution Discharge Elimination System (MPDES) permit [Stormwater Pollution Prevention Plan (SWPPP) for Construction Activities] through the Montana DEQ. The proposed action may cause a small, temporary increase in turbidity where the pipeline crosses the smaller streams during construction, but would end after completion of the project. The impacts would be minimized by timing construction in the late summer and fall of the year when most small streams are dry. Streambed construction would be regulated under USACE 404 permitting (authorized under the Clean Water Act) and Stream Bank Protection 310 in the respective counties.

4.3.2.2 Groundwater

The average day demand from the well field would range from 500 gpm currently up to 775 gpm in 2065. These rates correspond to 815 acre-feet per year and 1,250 acre-feet per year (484 acre-feet per year of this volume is already appropriated through the Utica Test Well water right). The associated water right permit would be limited to 2,720 gpm, the maximum daily demand at full build-out in 50 years. However, redundant capacity of the system would be designed for 4,500 gpm, which is allowed for municipal systems under Montana’s water laws.

Beneficial use of water is a constitutional right of all Montanans. Development of the CMRWS proposed action would require permitting the proposed appropriation's through the Montana DNRC Water Rights Bureau, New Appropriations Rules under the Montana Water Use Act, Title 85, chapter 2, parts, 1-4, MCA (DNRC, 2010). Under new appropriations rules the CMRWS would have to: 1) file a permit for beneficial water use and demonstrate through development and testing the source of the appropriation (Madison Aquifer) has the physical groundwater availability (ARM 36.12.1703); 2) show it is legally available through assessment of existing legal demands (ARM 36.12.1704) relative to an approved assessment of the total available supply and the physical demand (ARM 36.12.1705); 3) determine if any adverse effects will result from the appropriation on existing appropriations (ARM 36.12.1706); and 4) demonstrate that adequate diversion means and operations exist for the proposed appropriation.

Determination of the adequacy of data presented in the beneficial water use permit would be assessed by the Montana DNRC hydrogeologists and water rights specialists. If deemed complete, the permit application would be published for a 30-day objection period, after which pending resolution of any objections, Montana DNRC would issue a provisional permit to appropriate water. Upon full build-out of the first stage of development (and presumably after each subsequent stage), CMRWS would file a Project Completion Notice with the Montana DNRC converting the provisional permit into a water right.

Based on review of the feasibility study and the proposed action, water rights permitting would likely be successful. Beneficial use of the proposed appropriation is well defined. Physical availability, as determined by the Ubet test well, will support three (3) wells each with a capacity of 1,500 gpm. Full details of the Ubet test well construction and testing are included in the Final Feasibility Report. The well constructions will conform to water well rules and fully penetrate the target aquifer (i.e. the diversions will be adequate).

The Phase I Feasibility Report provides detailed analyses of the proposed groundwater development's legal availability on existing water rights that utilize the Madison Formation or benefit from its surface water discharge in the form of large springs (Great West Engineering, 2009). Adverse effects to other wells would not likely be considered an important issue in the water rights permitting process as they are few and are far from the Ubet well field..

In Judith Basin there are three documented Madison Aquifer diversion points; Big Spring, Warm Spring, and the Hanover Well (as shown on Figure 2-20 Phase I, (Great West Engineering, 2009)). Discharge from existing Madison diversions in Judith Basin total 257 cfs or 186,367 acre feet per year (Table 4-1) (Great West Engineering, 2009). These diversions constitute the total legal demands on the Madison Aquifer in Judith Basin. Recharge estimates vary; however a net discharge from the Madison Aquifer into North Dakota is believed to exist.

Regional groundwater flow modeling (Downey, 1984) estimated that 17 cfs, or 12,300 acre-feet per year of water leaves the Little Belt-Big Snowy Mountains area in the Madison Aquifer. This net flow surplus is downstream of the existing diversions at Big and Warm Springs, and the Hanover Well. Some of this flow may originate from the eastern Big Snowy Range and eastern Judith mountains; however a significant proportion would also be derived from the Little Belt Mountains. This basin wide water balance surplus volume exceeds the requirements of the CMRWS proposed action by an order of 10 or more.

The basin wide water balance approach is a conservative method to assessing the legal availability since the Montana DNRC New Appropriations guidance (ARM 36.12.1705) defines legal availability by the area of potential impact (determined by forward modeling the projected drawdown at the end of the period of appropriation). Drawdown is expressed as a cone of depression originating at the pumping well or well field extending out a radial distance to a minimal drawdown point of 0.01 feet (a much smaller geographic area than the whole basin).

Approximately 180,000 acre-feet of recharge per year is contributed to the Madison Aquifer from the outcrops in the Little Belts Mountains (Zimmerman, 1966). This volume accounts for nearly the entire legal demand of the existing diversions. Although Big Spring appears to be entirely recharged from the Big Snowy range, it is likely that some recharge at Warm Springs and the Hanover Well is derived from the Little Belts.

The effect of proposed action withdrawal on these diversions was further evaluated in the Phase I Feasibility Study by statistical analysis of recharge and groundwater flow modeling. Considering uncertainty in the various recharge analyses, the inter-quartile range was estimated from 211,300 to 257,100 acre-feet per year. These analyses indicate that there are between 25,000 to 71,000 acre-feet of recharge surplus over the existing legal demand. The Phase I Feasibility Study presented results of a groundwater model which simulated 1,275 acre-feet of water withdrawal each year spanning a 15 year timeframe. Steady state conditions (pumping equilibrium) were established in less than 12 years.

The model was primarily used to evaluate if there was any head change in the aquifer at the existing diversions. Based on input from the Utica Test Well aquifer testing, calibrated to both the reported discharges and hydraulic heads at the Madison Aquifer diversions, the model resulted in a head change of about 13 feet within a 1 mile radius of the well field. The model predicted a head change of 4 feet at the Hanover Well, and 0.2 feet of head change at Big Spring. The head change at Warm Spring was calculated to be 0.0 feet. Furthermore the model results postulated that it would be unlikely that any impact would be realized in the actual groundwater system due to aquifer heterogeneity and occurrence of inferred high transmissivity features feeding the spring diversions.

The Hanover Well is not an issue with respect to water right permitting because it is a well rather than a spring and interference drawdown is shown to be minimal. The projected well interference at the Hanover Well due to the proposed well field withdrawals (4 feet) would not constitute an adverse effect, as water rights do not protect pressure, but only rate and volume of production. Shallow groundwater users in proximity of the proposed well field also present a concern for groundwater development, and likely would result in additional monitoring.

The water right permit for the Utica Test Well dealt with these issues and was successful at securing a water right under the condition that springs and other wells in the area be inventoried and monitored during well field testing and use. It is likely that Montana DNRC would insist upon a similar conditional monitoring requirement to the Ubet well field's provisional permit. The well field development is to take place in stages of one to two wells at a time. If results of monitoring indicate adverse effects from well field withdrawals on existing water rights develop and cannot be mitigated, then the project will be abandoned (Great West Engineering, 2010a).

Technical analysis can demonstrate that adequate recharge is present in Judith Basin to serve the planned CMRWA diversion and all existing diversions (water is legally available within the Madison Aquifer, particularly when considered on the basis of ARM 36.12.1705). Aquifer conditions at the spring discharges are characterized by discrete, highly transmissive zones that convey extremely large flow rates to the diversion points. These conditions support that aquifer properties are discontinuous; implying the continuity from the well field locations to the springs is unlikely. The large separate distances of 30 miles or more supports this conclusion. As a result of these conditions, adverse effects from the proposed aquifer withdrawal are not expected to be significant (ARM 36.12.1706) and monitoring of existing diversions will likely be a required contingency to the water right permit.

4.3.3 Cumulative Impacts

Existing appropriations within the Madison Aquifer are well documented and have established legal claims on the available groundwater resource. This legal claim would be accounted for during the permitting process that CMRWA will go through to develop the proposed action. There are no known reasonably foreseeable future groundwater developments in the Madison Aquifer in the Judith Basin other than the proposed action by CMRWA. Any future development would have to go through the same permit process as the CMRWA proposed action and would be subject to Montana Water Law (prior appropriation).

4.4 Vegetation

4.4.1 No Action Alternative

Vegetation would not be impacted by the no action alternative. Under the no action alternative, ground disturbing activities and disturbance to plants and their habitat would occur at the present rate.

4.4.2 Proposed Action

The proposed action would have temporary impacts on vegetation; however, these impacts would occur over a relatively small area and would be reclaimed upon completion of installation. Well development would remove vegetation at the well location and footprints from drilling and well installation equipment would damage and remove vegetation. Disturbance would be kept to a minimum and vegetation would be reseeded and restored.

Pipeline and storage tank construction and installation activities would remove vegetation along the pipeline route and storage tank footprint. However, sensitive plants such as sagebrush would be avoided whenever possible. Areas of native grassland disturbed by construction activities would be reseeded with an ID Team approved native seed mix. All disturbed areas would be reclaimed and reseeded as soon as possible. The majority of disturbed areas associated with pipeline installation would occur within or immediately adjacent to state and county ROWs. These areas were likely previously disturbed and do not represent rare or sensitive vegetation communities.

The introduction or spread of noxious weeds is always a potential when surface disturbance occurs. Well development and pipeline and storage tank installation activities would entail ground disturbing activities; however, construction would be implemented in phases over a five year period which would reduce opportunities for weed establishment. In addition, weed infestations within disturbance areas would be identified and treated prior to disturbance. This would decrease the potential for future weed establishment because individual disturbance areas would be small and isolated from each other. A weed control plan would also be developed and submitted to each county weed district prior to disturbance activities. These mitigation measures would significantly decrease the potential for new weed infestation associated with the proposed activities.

Operation and maintenance activities would have limited impacts on vegetation and weeds, as there would be no surface disturbance associated with the activities. Although, it is feasible that portions of the pipeline may need to be maintained or replaced. This would require removal or damage to existing vegetation; however, disturbed areas would be reseeded and reclaimed which would minimize impacts.

4.4.3 Cumulative Impacts

Because the proposed action or the no action alternative would have no impacts on vegetation or weeds, there would be no cumulative effects on vegetation or weeds.

4.5 Wetlands

4.5.1 No Action Alternative

The no action alternative would not affect wetlands within the project area. Wetlands are protected under Section 404 of the Clean Water Act and disturbance to wetlands within the project area would occur at their current rate. All disturbances to jurisdictional wetlands would continue to be reviewed and approved by the USACE.

4.5.2 Proposed Action

Wetlands occur within portions of the project area. Disturbance of wetlands would be avoided wherever possible. It is likely that wetlands may need to be crossed during pipeline construction and installation. When wetlands are identified as needing to be bisected by the pipeline, a complete wetland delineation by a certified wetland biologist would occur. After determination of whether or not the wetland is jurisdictional, a review from the ID Team would occur to determine if the wetland would be bored under or if open-trenching was acceptable. Any ground disturbing activities associated with the proposed action that would occur within a jurisdictional wetland would require a complete review from the USACE. A Section 404 permit would be submitted and compliance with any identified mitigation would occur.

Section 2.4.1.4 of the EA also identifies additional mitigation measures that would avoid or minimize impacts to wetlands. Any disturbed wetlands would be immediately reclaimed as soon as possible and stock-piled hydric soils would be replaced. Wetlands would also be restored to the previous contours. In addition, restored wetlands would be monitored for three-years after restoration to ensure reestablishment of functions and values.

The proposed action would result in some disturbance of wetlands and temporary disturbance of wetland functions and values within those disturbed wetlands. However, due to the mitigation measures, it is expected that a relatively small area of wetlands would be disturbed. Implementation of post-disturbance mitigation measures would ensure that impacts are short-term.

4.5.3 Cumulative Impacts

Neither of the alternatives would result in cumulative impacts to wetlands. Due to the implementation of mitigation measures, significant impacts to wetlands would not occur with the no action or the proposed action alternatives; therefore, cumulative impacts would not occur.

4.6 Wildlife Resources

4.6.1 No Action

The no action alternative would result in no impacts to wildlife species within the project area. There would be no change in water supply within the region, no disturbance associated with construction activities, and habitats and wildlife would not be disturbed or impacted by the no action alternative.

4.6.2 Proposed Action

4.6.2.1 Well Development

As discussed in Section 4.3, the development of the proposed wells would not impact the water availability or water quality within the region. Water available to wildlife within springs, streams and rivers would continue to be available at levels consistent to what currently exists. Disturbance activities associated with well development would be short-term and any displaced wildlife would resume activities within the well field area after completion of well development.

The relatively small area of land associated with well development would be reclaimed and would not have any long-term impacts on habitat.

New utility poles and power lines would be installed to power the new wells. These utility poles/lines would be constructed in compliance with the Avian Power Line Interaction Committee's suggested practices for power pole/line development to avoid impacts to raptors (APLIC, 2006). Compliance with these recommendations would avoid any negative impacts to raptors.

4.6.2.2 Pipeline and Storage Tank Construction

Land disturbance activities associated with the pipeline construction would occur within a small area along the route (approximately 20 feet in width). Construction and installation of the proposed action would occur within or adjacent to phases over a five year period which would minimize any disturbances to wildlife or their habitat. In addition, the majority of construction and installation activities would occur within or immediately adjacent to state and county ROWs. These areas are adjacent to roads and receive regular disturbance due to traffic and road maintenance activities.

The distribution of wildlife is low within these areas relative to the region. However, construction activities would temporarily displace any present wildlife in the area of the activities. Disturbance and associated displacement would be brief and disturbed areas would be reclaimed and reseeded upon completion of construction and installation. Any wildlife displaced within a specific area during the pipeline installation phase would resume to normal activities upon completion of the activities.

4.6.2.3 Operation and Maintenance

The majority of the operation and maintenance activities would have no impact on wildlife species. Typically, there would be no noise or surface disturbing activities that would affect wildlife. It is likely that some pipeline replacement or maintenance activities would require surface disturbing activities. These activities would be short-term and disturbed areas would be reclaimed, so there would be no long-term impacts on wildlife.

4.6.3 Cumulative Impacts

Grazing, farming, fire suppression and hunting would continue to affect wildlife as they have in the past. The additional minimal impacts from the proposed action on wildlife will have minimal cumulative effects.

4.7 Species of Concern and Federally Listed Species

4.7.1 No Action Alternative

The no action alternative would not affect species of concern and federally listed species. There would be no change in current activities or trends within the project area; therefore; there would be no impacts to species of concern and federally listed species.

4.7.2 Proposed Action

The project area overlaps the distribution with a variety of state recognized species of concern. The impacts to these species would not differ from those impacts discussed within the Wildlife Resources Section 4.6.

Portions of the proposed pipeline may come within the vicinity of sharp-tailed grouse or greater sage-grouse leks. However, mitigation measures presented within the proposed action would protect grouse during their breeding and nesting season and ensure that the proposed action would not impact them. Construction activities would not occur within 2-miles of a sharp-tailed

grouse or a greater sage-grouse lek during periods of breeding or nesting (March 15 through June 15) (Connelly et al., 2000).

There is the potential that in the future, prairie dog towns may expand to areas within the project area and black-footed ferrets may potentially utilize these areas. However, this would likely occur during the operation and maintenance phase of the project and activities would not impact surface resources. In the event that any future disturbance activities would need to occur within an area of black-footed ferret distribution, the ID Team and USFWS would be consulted to ensure that activities do not affect ferrets.

4.7.3 Cumulative Impacts

The no action and the proposed action alternatives would have no effect on species of concern or federally listed species; therefore, there would be no cumulative impacts.

4.8 Fish

4.8.1 No Action Alternative

The no action alternative would not entail any impacts on water resources, fish habitat or fish species. Disturbance to fish or their habitat would occur at present levels.

4.8.2 Proposed Action

As discussed in Section 4.3, the proposed action would not negatively impact water quality or water availability. In addition, mitigation measures detailed in Sections 2.4.1.1 and 2.4.1.2 would protect fish habitat from sediments. Impacts to streams would be reviewed by the ID Team and perennial streams would be bored under in order to protect fish habitat and water quality. Intermittent and ephemeral streams would be open-trenched, but only during times in which construction and reclamation can be completed prior to the presence of water within the stream. These mitigation measures would ensure that the proposed action would not impact fish or their habitat.

4.8.3 Cumulative Impacts

Neither the no action alternative nor the proposed action alternatives would result in impacts on fish or their habitat; therefore, there would be no cumulative impacts.

4.9 Social and Economic Resources

4.9.1 No Action Alternative

The no action alternative would have no impact on socioeconomic characteristics or environmental justice. There would be no change from the current state in employment, populations, or economic inputs and outputs.

4.9.2 Proposed Action

4.9.2.1 Socioeconomics

Phased construction of the proposed action is scheduled to take five years to complete. During that time the proposed action would generate full-time temporary construction jobs and induce ancillary jobs. These are the people that would work on construction and others who would be employed due to the increased employment of the construction workers. This would amount to small increases in the labor force that would affect different counties depending on the phase of the construction and installation. These increases would not be considered significant.

During construction, temporary housing would be needed unless the workers can be hired locally. Local service businesses (hotels, restaurants, etc.) may experience a short-term

increase if temporary workers are needed from outside the local area. An increase in traffic on local roadways before and after construction hours as workers are commuting to and from home may be noticeable. It is unlikely that temporary construction workers will relocate their families, so it is not anticipated that there would be impacts to public services. There would be no added costs to the counties, school districts or state.

Businesses such as motels, restaurants, bars, gas stations, and grocery stores would likely experience some increase in revenue resulting from new employment of the non-resident portion of project construction crews. In particular, the consumption of goods, services, and temporary lodging in and near Judith Gap, Harlowton, Roundup and surrounding cities could be expected to minimally increase due to the presence of these non-native workers. Other local area businesses that may benefit through increased sales would likely include hardware and general merchandise stores, and equipment repair and maintenance services.

When the proposed action is completed, the project would employ four people. Salaries and benefits would range from roughly 32,000 to 73,000 dollars annually. Total wages and salaries paid to workers would contribute to the total personal income of the region. Additional personal income would be generated for residents in the county by circulation and recirculation of dollars paid out by the project for equipment maintenance. Expenditures made for equipment, energy, fuel, operating supplies and other products and services will benefit businesses in the region.

This relatively small increase in demand for local goods and services would be minimal due to the small size of the non-local workforce needed to complete the proposed action. For the same reasons, the effects to infrastructure such as schools, hospitals, housing, and utilities would also be minimal, indicating that the project would have minimal adverse economic impacts in the region and may prove economically beneficial.

Families in the project area may experience beneficial impacts on their personal finances. Presently, households spend a portion of their monthly income on water treatment equipment and maintenance of that equipment. Additionally, the poor quality of the water often shortens the lifespan of common appliances such as washing machines, incurring additional maintenance and replacement costs on family budgets. Most families in the region also spend a considerable amount of money on bottled drinking water. It is unclear how much cost savings families would benefit from under the proposed action, but a reduction in household water treatment systems and appliance maintenance and replacement represents a long-term economic benefit.

Similarly, towns serviced under the project would see a reduction in the cost of maintaining their municipal water systems. The cost savings would be the result of reducing the use of water high in sediment and minerals thereby reducing the need to replace or maintain filtration systems at the present rate. The communities will also realize significant cost savings in the operation, maintenance, replacement, and testing costs of their existing water supply infrastructure. The reduction in water system maintenance costs would vary by town depending on the demand for the various water qualities. Improved water quality may become important if drinking water standards change in the future resulting in requirements for much more expensive treatment systems.

Because appliances and equipment would need to be replaced less often, there may be a minor negative impact on local business that provide appliances, water treatment systems and supplies, bottled drinking water, and services if the demand is decreased by the improved water quality.

Growth-Inducing Effects

Presently, the poor drinking water quality in the project area could be a barrier to home development. Poor water quality, or the expense of a water filtration system could influence

them to move to areas outside the project area that have higher water quality. Following the completion of the project, families may be more inclined to relocate within the project area. This may be more evident in Yellowstone County near Billings where professionals having higher discretionary income may prefer to live in rural areas within commuting distance of Billings. Completion of the project could result in new housing within the service area further improving the local economy, increasing the population, and increasing housing demand on a small localized scale.

Environmental Justice

With regard to EO 12898, an impact would be considered a significant environmental justice effect if a low-income, minority, or subsistence population in the region of the proposed action was disproportionately affected by the proposed action.

The proposed action primarily serves small agricultural areas where the primary race is Caucasian (US Census Bureau, 2010). Review of **Error! Reference source not found.** (see ection 3.8) shows that Block Groups within the analysis have lower minority population than that of the State of Montana at 9.4 percent, indicating that the project would not have a disproportionally high impact on minority populations.

Poverty level summaries are presented by Census Tract. The percent of the population below the poverty level is higher than the overall percentage of families living below the poverty level of Montana. Furthermore, all Census Tracts but two, Tract 1 in Musselshell County and Tract 14 in Yellowstone County, have a higher percentage of families below the poverty level than county averages, indicating that the project would have a disproportionally high impact on low-income populations. The impacts from the proposed action would not be adverse and may have a positive economic benefit to the communities that would be served. The proposed action will not have significant socioeconomic impacts.

4.9.3 Cumulative Effects

Because there are no foreseeable future actions that would result in increased development in the area, no further economic impacts are anticipated at this time.

4.10 Cultural Resources

4.10.1 No Action Alternative

Under the no action alternative, the water pipeline would not be constructed and there would be no impacts on cultural resources.

4.10.2 Proposed Action

The proposed action would not significantly impact cultural resources as these resources would be protected through cultural resource inventories conducted during the design process. It is unlikely that cultural resources would be located within the majority of the proposed route as much of the route would occur within a ROW that has been previously disturbed. However, in the event that a cultural resource is discovered during construction, a cultural resource inventory would be conducted and SHPO would be consulted. In addition, within the portion of the route that has not been previously disturbed, cultural resource inventories would be conducted during design prior to ground disturbing activities. In the event that cultural resources are identified in these areas, SHPO would be contacted and consulted with to ensure protection of cultural resources. Avoidance of cultural resources is the preferred policy. If sites cannot be avoided, mitigation in the form of archaeological excavation may be required.

4.10.3 Cumulative Effects

Due to implementation of mitigation measures, there are no foreseeable future actions that would result in impacts to historical or cultural resources; therefore, there would be no cumulative effects.

4.11 Land Use

4.11.1 No Action Alternative

Under the no action alternative, land use would continue as it presently does and would not be impacted. The no action alternative would not result in any land use changes in the current agricultural practices or affect the small urban communities within the project area.

4.11.2 Proposed Action

The proposed well development would have no impact on land use within the project area. While a relatively small portion of land would be reserved for well development, this acquisition of land would not significantly affect any land uses within the project area.

Pipeline and storage tank installation would temporarily disturb land surface within the project area and would eliminate the potential for subsurface disturbance within the pipeline route. Surface disturbance activities would be minimal and short-term and would have minimal impacts and land use activities. The majority of the pipeline route would occur within or immediately adjacent to state and county ROWs in which land use opportunities to residents within the project area are limited; therefore, any restriction in surface or subsurface use associated with the pipeline would have a very minor and negligible effect on land use within the project area.

Operation and maintenance activities would have no impact on land use activities. On occasion, there may be portions of the pipeline that would need to be maintained and replaced. This would entail small segments of disturbance and all disturbances would be reclaimed. Disturbance would have no impact on land use within the project area.

4.11.3 Cumulative Effects

There would be no cumulative effects on land use. Neither the no action nor the proposed action alternatives would result in significant impacts; therefore, there would be no cumulative impacts.

CONSULTATION AND COORDINATION

The following agencies and organizations will receive copies of the draft EA to elicit input into the review of this project:

- Bureau of Indian Affairs
- Bureau of Reclamation
- Montana Fish, Wildlife and Parks
- Montana Department of Environmental Quality
- Montana Department of Transportation
- Montana State Historic Preservation Office
- US Fish and Wildlife Service
- US Army Corps of Engineers
- US Bureau of Land Management
- US Environmental Protection Agency
- US Natural Resource Conservation Service
- Judith Basin Conservation District
- Wheatland Conservation District
- Lower Musselshell Conservation District
- City of Harlowton
- Wheatland County Commissioners
- Musselshell County Commissioners
- City of Roundup
- Judith Basin County Commissioners
- Town of Judith Gap
- Golden Valley County Commissioners
- Conservation and Community Development Area
- Town of Hobson
- Town of Ryegate
- Town of Lavina
- Town of Broadview
- Town of Melstone
- Montana Department of Natural Resources
- Town of Moore
- Fergus County Commissioners
- Fergus County Conservation District
- Montana Bureau of Mines and Geology

LIST OF PREPARERS

Name/Company/Agency	Responsibility	Education/Experience
Justin Kucera	Reclamation Environmental Review	
Stephanie Micek	Reclamation Project Manager	
Robert Church Great West Engineering	Project Manager and Engineering Oversight	B.S. Civil Engineering 22 Years' Experience
Susan Hayes Great West Engineering	Project Engineering	B.S. Civil Engineering 7 Years' Experience
Cameo Flood, Tetra Tech	Project Manager, Public Involvement	B.S. Forest Management 25 Years' experience
Stacy Pease, Tetra Tech	Wildlife, Vegetation, Fish, Land Use, Soils, Wetlands	B.S. Wildlife and Fisheries Science; M.S. Watershed Management. 12 Years' experience
Jill Reid, Tetra Tech	Vegetation, Wildlife, Species of Concern and Federally Listed Species, and Fish	B.S. Biology; 13 Years' experience
Thad Jones, Tetra Tech	Social and Economic, Environmental Justice	B.S. Forestry, M.S. Forestry 10 Years' experience
William Craig, Tetra Tech	Water Rights/Water Quality	B.S. Geology, M.S. Geology, 19 Years' experience
Lynn Peterson Tetra Tech	Cultural Resources	B.A. Anthropology M.S. Anthropology 22 Years' experience

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APPENDIX A
SOILS SERIES IN THE PROJECT AREA

Soil Series	Taxonomic Class	Drainage/Surface Runoff Potential	Acres in Project Area
Arbor	Fine-loamy, mixed, superactive, mesic Typic Hapludolls	Medium	1,800.7
Absarokee	Fine, smectitic, frigid Typic Argiustolls	Well drained; moderately slow permeability	198.4
Adger	Fine, smectitic, frigid Leptic Vertic Natrustolls	Well drained; medium or slow runoff; very slow permeability	0.8
Arvada	Fine, smectitic, mesic Ustertic Natrargids	Well drained; high or very high runoff; very slow permeability	11.4
Ashuelot	Loamy, carbonatic, frigid, shallow Petrocalcic Calciustolls	well drained; moderate permeability. The petrocalcic horizon is impermeable to water and root penetration except where cracks exist.	88.8
Attewan	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Aridic Argiustolls	Well drained. Moderate permeability. Runoff is negligible to medium depending on slope.	68.9
Beckton	Fine, smectitic, mesic Aridic Natrustolls	Well to moderately well drained; medium to low runoff; slow or very slow permeability	48.4
Blacksheep	Loamy, mixed, superactive, calcareous, frigid, shallow Aridic Ustorthents	Well drained; moderately rapid permeability. Runoff is very low to medium depending on slope	89.8
Bonfri	Fine-loamy, mixed, superactive, frigid Aridic Haplustalfs	Well drained; moderately slow permeability	32.1
Bullock	Fine-loamy, mixed, superactive, frigid Aridic Leptic Natrustalfs	Well drained. Permeability is very slow or slow in the Btn horizon and moderate or moderately slow in the C horizon. Runoff is low to very high depending on slope	8.6
Busby	Coarse-loamy, mixed, superactive, frigid Haplocalcidic Haplustepts	Well drained; moderately rapid permeability. Runoff is negligible to medium depending on slope	47.9
Cabbart	Loamy, mixed, superactive, calcareous, frigid, shallow Aridic Ustorthents	Well drained; moderate permeability.	2959.7
Cheadle	Loamy-skeletal, mixed, superactive Lithic Haplocryolls	Well drained; moderate permeability	363.8
Colvin	Fine-silty, mixed, superactive, frigid Typic Calciaquolls	Poorly and very poorly drained. Runoff ranges from negligible to medium depending on slope and surface texture.	67.0
Crago	Loamy-skeletal, carbonatic, frigid Aridic Calciustepts	Well drained; moderate permeability above the sandy-skeletal material and rapid in the sandy-skeletal material	2466.5
Daglum	Fine, smectitic, frigid Vertic Natrustolls	Moderately well and well drained. Runoff is negligible to high depending on slope. Permeability is slow or very slow	5.0

Soil Series	Taxonomic Class	Drainage/Surface Runoff Potential	Acres in Project Area
Darret	Fine, mixed, superactive, frigid Typic Argiustolls	Well-drained; moderately slow or slow permeability	1,364.0
Delpoint	Fine-loamy, mixed, superactive, frigid Aridic Haplustepts	Well drained; moderate permeability	1081.5
Doughty	Fine-loamy, mixed, superactive, frigid Typic Argiustolls	Well drained; moderate permeability above the 2C horizon; moderately rapid permeabiltiy in the 2C horizon	101.6
Eapa	Fine-loamy, mixed, superactive, frigid Aridic Argiustolls	Well drained. Runoff is negligible to medium depending on slope. Permeability is moderate	152.5
Eltsac	Very-fine, smectitic, frigid Leptic Udic Haplusterts	Well-drained; very slow permeability	7.7
Ethridge	Fine, smectitic, frigid Torrertic Argiustolls	Well drained; slow permeability	202.2
Fergus	Fine, smectitic, frigid Vertic Argiustolls	Well drained. Moderately slow permeability. Runoff is negligible to high depending on slope	299.5
Gallatin	Fine-loamy, mixed, superactive Aquic Haplocryolls	Somewhat poorly drained; slow permeability	184.1
Gerdrum	Fine, smectitic, frigid Torrertic Natrustalfs	Well drained; very slow permeability	2484.2
Harlake	Fine, smectitic, calcareous, frigid Aridic Ustifluvents	Well drained; slow or very slow permeability	255.1
Havre	Fine-loamy, mixed, superactive, calcareous, frigid Aridic Ustifluvents	Well drained; moderate permeability	398.0
Hinterland	Clayey, smectitic, frigid Aridic Lithic Argiustolls	Well drained; moderately slow permeability	10.9
Hysham	Fine-loamy, mixed, superactive, calcareous, mesic Aridic Ustifluvents	Well-drained; slow permeability	18.1
Judith	Fine-loamy, carbonatic, frigid Typic Calciustolls	alluvium or colluvium derived mainly from limestone, but also from other rocks that contain large amounts of calcium carbonate.	2567.2
Kobase	Fine, smectitic, frigid Torrertic Haplustepts	alluvium derived from semiconsolidated shale and sandstone, glacial meltwater deposits, and glaciofluvial or glaciolacustrine deposits	910.2
Lawther	Fine, smectitic, frigid Typic Haplusterts	Well drained. Surface runoff is slow or medium. Permeability is slow.	27.8
Linwell	Fine, smectitic, frigid Entic Haplustolls	Well drained; slow permeability	2.6
Lostriver	Fine, smectitic, calcareous, frigid Aridic Ustifluvents	Well drained; slow permeability. Runoff is low or medium depending on slope	188.9

Soil Series	Taxonomic Class	Drainage/Surface Runoff Potential	Acres in Project Area
Maginnis	Clayey-skeletal, smectitic, frigid Lithic Haplustolls	Excessively drained; rapid runoff	20.9
Marias	Fine, smectitic, frigid Aridic Haplusterts	Well drained. Very slow permeability. Runoff is medium to very high depending on slope	327.0
Marmarth	Fine-loamy, mixed, superactive, frigid Aridic Argiustolls	Well drained. Runoff is negligible to medium depending on slope and surface texture.	230.2
Marvan	Fine, smectitic, frigid Sodic Haplusterts	Well drained; very slow permeability	1279.1
McKenzie	Fine, smectitic, frigid Chromic Endoaquerts	Poorly drained. Runoff from higher-lying land causes these soils to pond for several days or weeks following heavy rains or snow melt.	14.3
McRae	Fine-loamy, mixed, superactive, mesic Aridic Haplustepts	Well-drained; moderate permeability; slow to medium runoff	8.6
Megonot	Fine, smectitic, frigid Torrertic Haplustepts	Well drained; slow permeability	415.9
Midway	Clayey, smectitic, calcareous, mesic, shallow Ustic Torriorthents	Well drained. Runoff is low to very high depending on slope. Permeability is very slow or slow.	62.1
Musselshell	Coarse-loamy, carbonatic, frigid Aridic Calciustepts	Well drained; moderate permeability	200.4
Neldore	Clayey, smectitic, nonacid, frigid, shallow		
Aridic Ustorthents	Well drained; slow permeability		2003.9
Niart	Fine-loamy, carbonatic, frigid Aridic Calciustolls	Well drained; moderate permeability	460.8
Nobe	Fine, smectitic, calcareous, frigid Torrertic Ustorthents	Moderately well drained; very slow permeability. Soil is saturated within 60 inches during the spring.	270.5
Pierre	Fine, smectitic, mesic Aridic Leptic Haplusterts	Well drained. Runoff is low on nearly level areas and medium to very high on the more sloping areas. Permeability is very slow, except after dry periods when the initial intake may be rapid due to cracks.	49.2
Promise	Very-fine, smectitic, mesic Typic Haplusterts	Well drained. Runoff is low to very high depending on slope and surface texture. Permeability is slow or very slow.	170.4
Raynesford	Fine-loamy, carbonatic Calcic Haplocryolls	very deep, well drained soils	20.2

Soil Series	Taxonomic Class	Drainage/Surface Runoff Potential	Acres in Project Area
Rentsac	Loamy-skeletal, mixed, superactive, frigid Lithic Calciustepts	Well drained; moderate permeability.	7.1
Rothiemay	Fine-loamy, mixed, superactive, frigid Aridic Calciustolls	Well drained; moderately slow permeability	70.4
Savage	Fine, smectitic, frigid Vertic Argiustolls	Well drained; slow permeability	305.0
Sipple	Fine-loamy, mixed, superactive, frigid Typic Argiustolls	Well drained; slow runoff; moderately slow permeability	9.2
Skaggs	Loamy-skeletal, carbonatic Calcic Haplocryolls	Well drained; moderate permeability	78.0
Straw	Fine-loamy, mixed, superactive, frigid Cumulic Haplustolls	Moderately well and well drained. Moderate permeability. Runoff is negligible to medium depending on slope.	139.8
Sudworth	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Cumulic Haplustolls	Well drained; moderate permeability above the 2C horizon and rapid in the 2C horizon	9.9
Tanna	Fine, smectitic, frigid Aridic Argiustolls	Well drained; slow permeability	7.8
Teton	Fine-loamy, mixed, superactive Ustic Haplocryolls	Well drained; moderate permeability	175.6
Twilight	Coarse-loamy, mixed, superactive, frigid Haplocalcidic Haplustepts	Well drained. Surface runoff is medium to very high. Permeability is moderate or moderately rapid.	436.5
Twin Creek	Fine-loamy, mixed, superactive, frigid Typic Haplustolls	Well drained; slow or medium runoff; moderate permeability	205.9
Utica	Sandy-skeletal, carbonatic, frigid Typic Calciustolls	Excessively drained; rapid permeability	139.8
Vanda	Fine, smectitic, calcareous, frigid Torrertic Ustorthents	Well drained; very slow permeability	15.9
Verson	Clayey over loamy-skeletal, smectitic over mixed, superactive, frigid Aridic Argiustolls	Well drained; slow permeability	138.2
Volborg	Clayey, smectitic, acid, frigid, shallow Aridic Ustorthents	Well drained; slow permeability	2.1
Weingart	Fine, smectitic, frigid Torrertic Natrustalfs	Well drained; very slow permeability	47.7
Winifred	Fine, smectitic, frigid Entic Haplustolls	Well drained; slow permeability.	776.2
Yamacall	Fine-loamy, mixed, superactive, frigid Aridic Haplustepts	Well drained; moderate permeability	962.1
Yawdim	Clayey, smectitic, calcareous, frigid, shallow Aridic Ustorthents	Well drained. Runoff is slow to very rapid. Permeability is slow	1061.0
Zatoville	Fine, smectitic, frigid Torrertic Haplustepts	Well drained; slow permeability	44.1

APPENDIX B
CONSULTATION LETTERS

Monty L. Sealey

From: Burnett, Jonathan [jburnett@mt.gov]
Sent: Tuesday, December 21, 2010 2:49 PM
To: Sealey, Monty
Cc: Cebuhar, Ron
Subject: Musselshell-Judith Rural Water Project - MDT Comments
Attachments: MUSSELSHELL_JUDITH_RURAL_WATER_122010.PDF

Mr. Sealey,

Attached is an electronic version of the Montana Department of Transportation's (MDT) initial comments on the project. A hard copy of the letter was also put in the mail. Please feel free to contact me if you have any questions about our review process.

Thank you,
Jon Burnett
Systems Impact Coordinator
Planning & Policy Analysis

Monty L. Sealey

From: Murdo, Damon [dmurdo@mt.gov]
Sent: Tuesday, November 30, 2010 12:09 PM
To: Sealey, Monty
Subject: MUSSELSHELL – JUDITH RURAL WATER PROJECT

Big Sky. Big Land. Big History.
Montana Historical Society

November 30, 2010

Monty Sealey
CMRWA
34 3rd Ave West
PO Box 660
Roundup MT 59072

RE: MUSSELSHELL – JUDITH RURAL WATER PROJECT. SHPO Project #: 2010112912

Dear Mr. Sealey:

Thank you for the opportunity to comment on the above-cited project. The State Historic Preservation Office will be concerned with any project where there will be new ground disturbing activities. If the new pipeline will cross any previously undisturbed land, or if new water tanks will be installed in areas where there has been no previous ground disturbance we would ask that a cultural resource inventory be conducted prior to any ground disturbing activities taking place.

However, If the project will be contained entirely within previously disturbed right-of-ways we feel there is a low likelihood cultural properties will be impacted. Should cultural materials be inadvertently discovered during this project we would ask that our office be contacted and the site investigated.

If you have any further questions or comments you may contact me at (406) 444-7767 or by e-mail at dmurdo@mt.gov. Thank you for consulting with us.

Sincerely,

Damon Murdo
Cultural Records Manager
State Historic Preservation Office

File: DEQ/AIR&WATER WASTE MNG/2010

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

Jim Lynch, Director
Brian Schweitzer, Governor

December 20, 2010

Monty Sealey
Central Montana Regional Water Authority
PO Box 660
Roundup, MT 59072

Subject: Musselshell-Judith Rural Water Project

Montana Department of Transportation (MDT) staff has reviewed your letter dated 11/23/2010 concerning the Musselshell-Judith Rural Water Project. We have the following comments.

- The Central Montana Regional Water Authority must complete Utility Occupancy and Location Agreements and the corresponding Environmental Checklists for any crossings or occupancy of MDT right-of-way. These agreements will be required prior to any work within the right-of-way.
- Plans for any work within MDT right-of-way must be submitted. MDT staff will review the plans and if appropriate, approve the work. The review may take multiple iterations.
- A traffic control plan for any work within MDT right-of-way must be submitted to MDT for review.
- A contractor agreement may be required with MDT prior to starting work within MDT right-of-way.
- The Central Montana Regional Water Authority will be responsible for obtaining all environmental permits.
- All regulatory permits and authorizations must be obtained prior to any work within MDT right-of-way.

Please contact Ron Cebuhar in the MDT Billings District Office to begin the Utility Occupancy and Location Agreement permit process. Ron can be reached at (406) 657-0239. If you have any questions concerning this initial comment letter, feel free to contact me at (406) 444-4262.

Sincerely,

Jon Burnett, Systems Impact Coordinator
Planning & Policy Analysis Bureau
Rail, Transit & Planning Division

Copies: Stefan Streeter, Billings District Administrator
Jim Skinner, Bureau Chief – Planning & Policy Analysis
Ron Cebuhar, Billings District Utility Engineering Specialist
File

Monty L. Sealey

From: Ellerhoff, Thomas [tellerhoff@mt.gov]
Sent: Monday, December 06, 2010 2:05 PM
To: Sealey, Monty
Cc: Smith, Mark; Teegarden, Todd; Mathieus, George; Hallsten, Greg; Corsi, Emily
Subject: FW: Musselshell-Judith Rural Water Project - Public Scoping - MT DEQ

Monty Sealey
Project Administrator
Central Montana Resource Conservation & Development Area Coordinator
Central Montana Regional Water Authority (CMRWA)
34 Third Avenue West
P.O. Box 660
Roundup, MT 59072

Dear Mr. Sealey:

Thank you for the information on the public scoping meetings and deadline for comments regarding the CMRWA's proposed Musselshell-Judith Rural Water Project.

Since the Department of Environmental Quality (DEQ) will be reviewing environmental documents, the preliminary engineering report, and the plans and specifications for the proposed project, that review will serve as the department's comments.

If you have any questions regarding DEQ's participation, please contact Mark Smith, P.E., supervisor of the Drinking Water Revolving Fund, Technical & Financial Assistance Bureau, Planning, Prevention & Assistance Division (406-444-5325 or marks@mt.gov).

Sincerely,

Tom Ellerhoff
Science Program Mgr.
Director's Office
DEQ
1520 East Sixth Avenue
P.O. Box 200901
Helena, MT 59620-0901
tellerhoff@mt.gov
(406) 444-6780

CITY OF LEWISTOWN

305 W. Watson, Lewistown, Montana 59457
(406) 535-1760 Fax (406) 535-3323

December 29, 2010

Central Montana Regional Water Authority
P. O. Box 660
Roundup, Montana 59072

Re: Central Montana Regional Water Project

The City of Lewistown is submitting the following comments regarding the proposed regional Musselshell-Judith Rural Water Project. It is our understanding that the Central Montana Regional Water Authority is proposing to develop a well-field north of the town of Judith Gap and construct a 230 mile long pipeline for purpose of providing water for communities and agriculture in Judith Basin, Wheatland, Golden Valley, and Musselshell counties. The proposal is to drill enough wells into the Madison formation to provide sufficient water to the project area which covers most of central Montana south of the Big Snowy Mountain range.

The City of Lewistown has concerns regarding the proposed development of a well-field into the Madison Aquifer and its potential impacts on current water supplies and more particularly the Big Spring located south of Lewistown. While Big Spring is located on the north side of the Snowy Mountains, there is very little data available to define the recharge sources for current sources of water from the Madison Aquifer. The most recent specified location for the well-field appears to be approximately ten miles closer to Big Spring than the originally proposed Utica well site.

The consultants for the water authority have estimated the cost of developing the well site and distribution system at approximately one hundred and four million dollars. The proposed plan assumes that the project will be funded primarily by federal government (75%) with additional funds from the State of Montana (12.5%). In a project as large as this, it would seem prudent and fiscally responsible to accumulate and analyze viable data relating to the current discharges from the Madison Aquifer in central Montana prior to the development of any projects that could have an adverse impact on existing uses. The City of Lewistown has installed a monitoring system at Big Spring but it has proven to be inconsistent and is difficult to maintain. More funds are needed to install better flow

devices and structures to get more accurate results. No other agency appears to be monitoring the current Madison formation water sources in Central Montana and yet it appears that both state and federal agencies are willing to allow and provide funding for large-scale development of the aquifer by the Central Montana Regional Water Authority even though the potential impacts of such a project have not been thoroughly studied. Prior to that development, the City would request and recommend that the authority contract with the Unites States Geological Survey to install and maintain monitoring systems at Big Spring to collect and record data related to the flows and water quality of the spring and the Madison Aquifer.

While the City of Lewistown can appreciate the interest of the communities that would benefit from this project, our entire urban community and much of our agricultural community also depend greatly on the flow of Big Spring. The flow from the spring is essential to maintain the in-stream water rights held by the State of Montana as well as the already permitted uses downstream. While the effects of such a large scale project may or may not have an immediate effect on Big Spring, the greater likelihood is that any negative effects may not be felt for many years. Once the system is installed at a cost of more than one hundred million dollars and put into use, the chances of shutting it down would be slim. Detrimental effects of groundwater use build up slowly over time but in the end are still detrimental. A good amount of accurate pre-development flow data from the current sources can set a baseline for this and any future development of the Madison Aquifer in central Montana. The cost of accurate and reliable monitoring systems would be pennies compared to the cost of the proposed water system.

In addition to the monitoring issue and detrimental effects of additional development, the City is also concerned about the drilling procedures used to develop any wells into the Madison Aquifer. Drilling procedures should be planned with all precautions to not damage or contaminate the formation as well as necessary preparation to properly cap the wells in the case of a run-away well or other undesired consequences.

In closing, the City of Lewistown would like to thank the Central Montana Regional Water Authority for the opportunity to comment on the proposed well development and will look forward to working with the authority as the planning for the project proceeds.

Submitted by,

Kevin L. Myhre
City Manager

BIG SPRING CREEK WATERSHED COUNCIL [redacted] Lewistown Montana

January 25, 2011

Central Montana Regional Water Authority
P.O. Box 660

Roundup, Montana 59072

Re: Musselshell-Judith Rural Water Project—Scoping Comments

We are submitting the following and one attachment as our comments regarding the proposed referenced project. It is our understanding that the authority is proposing to drill up to eight deep water wells into the Madison formation north of Judith Gap Montana in order to develop a water supply and the construction of a 260-mile long pipeline to provide water to communities in three Montana Counties.

The Big Spring Creek Watershed Council has reviewed and discussed this proposal over the last few years. We have concerns regarding the proposed development of the wellfield into the Madison aquifer and its potential impacts on water supplies, particularly the Big Springs south of Lewistown. At this time we are concerned that there is not sufficient scientific information available regarding the potential environmental impacts of the project.

While we appreciate the interest of the communities that would benefit from this project, we are also concerned for the city of Lewistown and surrounding area residents who depend on water provided from the Big Springs and Madison aquifer. While we appreciate the efforts of the communities to obtain a quality water supply, we would hope that an alternative water sources could be located and we are, therefore, opposed to this project as proposed.

Regards,

Don Pfau

Don Pfau, Chairman

1 attachment

cc: Mt. Congressional delegation

Central Montana Regional Water Authority---UBET Proposal
1-25-11

SCOPING COMMENTS from Big Spring Watershed Council

Finances and funding

This project proposes to expend tax dollars ($103M project costs) for potable water delivery to 2000+- households in a semi arid region of central Montana. To date, an additional approximately (based upon "Musselshell-Judith Rural Water System" tri fold) $1.5M has been spent or is being made available for preliminary work(s). Of the $1.5M approximately .8 of one percent comes from prospective users. The remainder was either appropriated by the Mt. Legislature, Fed tax dollars, or was granted from Montana Coal Board funds.

Consider the possibility of using pipeline head to generate electrical power that could either be sold or utilized on the project. We have no notion that this is possible or economical over the 50 span of the project but it should be considered as a measure that might reduce total costs and conserve energy.

How were the energy use cost projections in the O&M plan accounted for? It seems likely that the cost of energy over the 50-year span of this project will increase significantly. We suspect that the $.095 est. of a KWH is well below what should be projected. As a case in point the Idaho PUC has projected that 30 years from now the direct wholesale cost of certain hydro produced KWH will be $.20 each. Add to that delivery and associated costs to remote (central Mt.) areas and you might project a cost of $.40 or more per KWH, So as you look forward we suspect that your projections of power costs in the O &M annual costs should be at least tripled and perhaps much more. This annual cost, if correct, makes this the largest O&M projected cost. Right now some of our members are paying $.20 per KWH for delivered energy.

We presume that the cost of conventional electrical energy will increase by multiples of 10 or more within the 50-year life of this project. Hydro production will decrease and the cost of coal and gas powered energy will likely increase. The project should consider every opportunity to produce energy from sustainable sources to include utilization of the pipeline head where feasible plus wind, solar and other sources.

Conservation measures and concerns

Water conservation strategies to include low flow water use as if we are in a semi arid landscape with the recharge of an aquifer that, in all probability, will be adversely affected by global climate change should be a basic part of this project. The best available science indicates that we are trending toward a more arid region in the next 50 years. Water use standards should be based on appropriate use in an arid region. Cost to the consumer, over and above the base delivery use should be charged out at the real cost

of delivery. We would suspect that might be 8 to 10 times the cost per unit for base use. The current "conservation" proposals are water meters at each residence or business. This is not a conservation strategy.

One of the strategies or opportunities mentioned in this water development project is to bring more people/business into an area already short of potable water. Is that wise? We might guess that this is unwise if we wish to pass a healthy landscape to future generations.

We ration water during dry seasons but we need real conservation, recycling of wastewater, very efficient distribution from available sources and the recognition that we want to pass on this semi arid region, in tact, to future generations

At the cost of this water to taxpayers from around the United States it seems inappropriate to use this high value resource for purposes other then potable water delivery to humans and no use for livestock or other purposes. This is a water conservation strategy that may well reduce the need for volumes and costs as currently projected

What innovative water conservation initivies from Africa or the American southwest have been explored in depth and incorporated into this proposal? If none were explored why not?

By providing high quality water thru an inter basin transfer it seems likely that the price of land will increase and real-estate development will occur thus adding pressure to an already limited resource. This project should take measures that will preclude speculation resulting from imported water paid for by the nations taxpayers.

Mitigation

What effect will the proposed withdrawal of 27 trillion (?) gallons of water from the Madison aquifer over a 50 year period have on surface water quantity and quality? What science based assurances do you have that current information is adequate to make a judgment? If there will be an adverse effect then how will that be mitigated in the future and who will provide the mitigation?

Recommend that the CMRWA install water monitoring devices at appropriate surface springs within 50 miles of the well heads in order to establish baseline flows and any increase or decrease in flow over time that may result from aquifer withdrawals.

Establish mitigation standards for adverse effects to surface sources from the withdrawal of water at the proposed wells. These standards should be appropriate for the 50-year life of the project and beyond.

Effects on the aquifer

We assume that a recharge curve to the Madison will be reduced over the next 50 years. Has this eventuality been considered when developing this proposal? How will the reduced recharge affect the current surface water supplies and the total quantities of water in the Madison?

Robert Church, P.E. stated in the Lewistown meeting "the Utica well had plenty of water". Assuming that he was referring to the water reservoir in the Madison aquifer---- how much water is there?

Possible Alternatives

Reconsider local treatment plants at the far end of the proposed system i.e. Melstone, Mussleshell, Roundup and Broadview. This would reduce water deliver to almost 40% of the system miles and, perhaps, reduce initial pipeline and pumping costs by an equivalent amount. If 40 % of the infrastructure is deleted from the project and 40% of the pipeline costs are deleted then that 40% ($41.8M) might be used to build water treatment plants using locally available water or those funds could be diverted to upgrade the Billings water treatment plant.

Consider providing Broadwater and Lavina water from the Yellowstone River and the Billings water treatment plant. We suspect that treated water is already available above the city at the airport so the need for at least one lift station is eliminated and an already operating water system could be utilized thus eliminating the need to transfer water across drainage basins at a very high cost per unit.

Consider locating the proposed well field in the Wheatland Basin, a separate ground water basin, so that there is no possibility of interfering with flows in the Judith Basin. This option would eliminate the waste of energy used in pumping across hydrographic divides. If the wells are drilled on the south side of the Big Snowy or the Little Belt structural uplifts some of the concerns noted above are eliminated.

We find no consideration for building local dams to capture surface runoff as an alternative source for isolated and relatively small communities. Has this alternative been explored? If so what where the cost estimates for this option?

Potential water rights issues

What are the legal implications or issues of an inter basin transfer of water in Montana?

We suggest that you identify all spring and other surface flows from the Madison aquifer within the area that may be affected by this proposal.

Describe the legal implications, if any, of senior water rights that might be affected by this proposal. Identify all current water rights that are connected directly or indirectly to the Madison aquifer.

Conclusion

As a semi arid region of the U.S. we have yet to face the "real price" of cold clean water. This project offers an opportunity to face this reality head on. To do this will require that we adapt to climate change, which is a very complex challenge. It requires money that you are already planning to acquire, changes in culture and nimbleness of administration. To this point it appears that you have faced the construction of these facilities from an engineers perspective and that social and climate change have not been a part of your proposal.

And a final thought----Why not consider the Federal and State grants as loans from the people of Montana and the rest of the United States? Develop this system so it generates revenue that can be used to repay the gift of funds to start this project. Over the 50-year life there may be innovative ways to generate reserves that can be used for this purpose.

BIG SPRING CREEK WATERSHED COUNCIL [redacted] Lewistown Montana

January 25, 2011

Central Montana Regional Water Authority
P.O. Box 660

Roundup, Montana 59072

Re: Musselshell-Judith Rural Water Project—Scoping Comments

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Fergus
Conservation
District

Fergus Conservation District

211 McKinley, Suite 3
Lewistown, MT 59457

Phone: 406-538-7401 ext. 10 1
Fax: 406-538-9353

December 30,2010

Central Montana Regional Water Authority
PO Box 660
Roundup, MT 59072

To Whom It May Concern

At the public comment meeting in Lewistown, held on December 9,2010, it was a concern of the public that the Musselshell-Judith Rural Water System may affect the flow of springs, wells and ground water in the area. The Fergus Conservation District would like to entertain language for your consideration: Upon recognition that the Musselshell-Judith Rural Water System reduces the flow of surrounding springs, wells, and ground water the Central Montana Regional Water Authority shall reduce the amount of water usage for the Musselshell-Judith Rural Water System to a level that does not affect the water usage of Central Montana citizens.

We hope you review this language for consideration due to public concern in the area.

Sincerely,

Fergus Conservation District

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, OMAHA DISTRICT
HELENA REGULATORY OFFICE
10 WEST 15TH STREET, SUITE 2200
HELENA, MONTANA 59626-9705

REPLY TO
ATTENTION OF

December 16, 2010

Regulatory Branch
Montana State Program
Corps No. **NWO-2010-02708-MTH**

Subject: Musselshell-Judith Rural Water Project – Various Waterways

Central Montana Regional Water Authority
Attn: Monty Sealey
PO Box 660
Roundup, Montana 59702-0660

Dear Mr. Sealey:

We have reviewed the pre-application consultation for Musselshell-Judith Rural Water Project. The proposed work is located in Fergus, Judith Basin, Wheatland, Golden Valley, and Musselshell Counties, Montana.

Under the authority of Section 404 of the Clean Water Act, Department of the Army (DA) permits are required for the discharge of fill material into waters of the U.S. Waters of the U.S. including the area below the ordinary high water mark of stream channels and lakes or ponds connected to the tributary system, and wetlands adjacent to these waters. Isolated waters and wetlands, as well as man-made channels, may be waters of the U.S. in certain circumstances, which must be determined on a case-by-case basis.

In reviewing U.S. Geological Survey maps and aerial photos, this office has the following comments:

a. The proposed pipeline crosses various waters of the U.S., will these areas be directional bored?

b. The Clean Water Act requires that impacts to aquatic resources be avoided when practicable.

Based on the information provided, a DA permit may be required for this project. The entire project area should be evaluated in the field by a qualified wetland delineator in order to determine the presence of jurisdictional wetlands. This does not eliminate the requirement to obtain other applicable Federal, state, tribal and local permits.

Please contact John Short or myself at (406) 441-1375 if you have any questions and reference Corps File Number NWO-2010-02708-MTH.

Sincerely,

Shannon L. Johnson

for Todd N. Tillinger
Montana Program Manager