RECLAMATION

Managing Water in the West

Executive Summary

Northwest Area Water Supply Project
Final Supplemental Environmental Impact Statement

U.S. Department of the Interior
Bureau of Reclamation
Great Plains Region

April 2015

Mission Statements

The Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American Public.

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United States Department of the Interior

BUREAU OF RECLAMATION
Great Plains Regional Office
P.O. Box 36900
Billings, MT 59107-6900

IN REPLY REFER TO:

APR 0 7 2015

Subject: Distributions of the *Final Supplemental Environmental Impact Statement for the Northwest Area Water Supply Project*

Dear Interested Party:

Enclosed is a copy of the *Final Supplemental Environmental Impact Statement for the Northwest Area Water Supply Project* (SEIS). This Executive Summary includes a compact disk located on the inside back cover which includes the Final SEIS document, appendices, and reference supporting documents.

This report was prepared by the U.S. Department of the Interior, Bureau of Reclamation pursuant to Section 7 of the Dakota Water Resources Act of 2000, and the National Environmental Policy Act of 1969. The Final SEIS has been prepared with assistance from cooperating agencies including other federal, state and local government agencies. The SEIS analyzed the environmental effects of the proposed action alternatives and the consequences of the no action alternative. The purpose of the proposed action is to provide a reliable, high quality water supply to communities and rural water systems in northwestern North Dakota through 2060.

Reclamation has identified the Missouri River and Groundwater Alternative as the preferred alternative in the Final SEIS. This alternative would use Lake Sakakawea as the primary water supply for the project combined with water from the Minot and Sundre aquifers. The preferred alternative includes modifications to the Snake Creek Pumping Plant as the intake option and Conventional Treatment as the Biota water treatment plant option.

An appendix of the Final SEIS includes all the comments received on the Draft SEIS and Reclamation's responses to those comments. No decision will be made on the proposed action until at least 30 days after the release of the Final SEIS. After the minimum 30-day waiting period, Reclamation will complete a Record of Decision which will state the alternative selected and discuss factors leading to the decision.

For additional information, please contact Alicia Waters, Dakotas Area Office, Bureau of Reclamation, at 701-221-1206 or awaters@usbr.gov.

Sincerely,

Michael J. Ryan
Regional Director

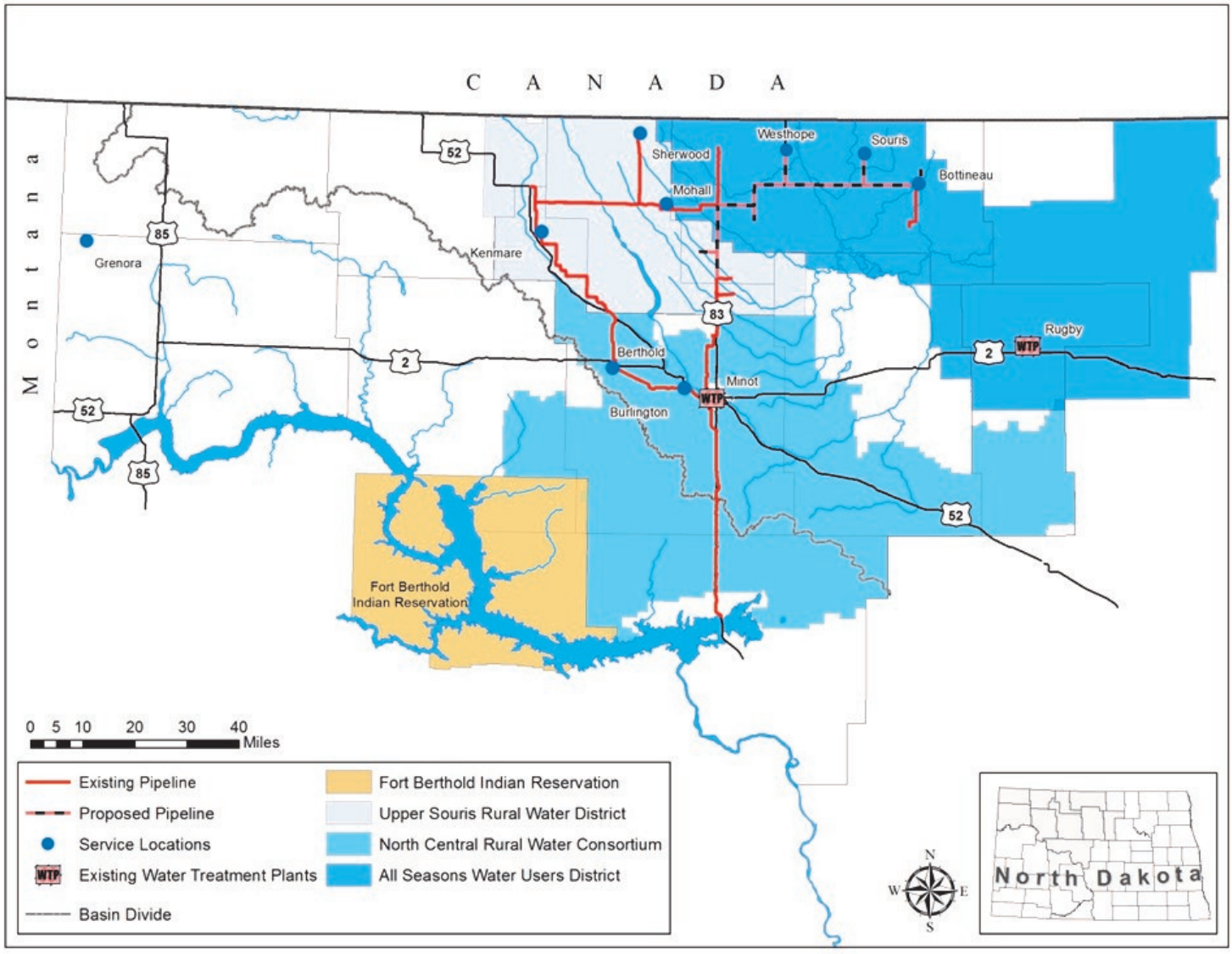
Enclosure

Introduction

The Northwest Area Water Supply Project (Project) in North Dakota is a municipal, rural, and industrial water supply project authorized by the Garrison Diversion Reformulation Act of 1986 as amended by the Dakota Water Resources Act of 2000. The Project has been under consideration and partial construction since 2002 and if completed, would resolve long-standing water supply and water quality problems in a ten-county area in northwestern North Dakota. The Project would provide a reliable, high quality water supply to serve the projected population through 2060.

Construction of Project facilities began in 2002 after the Bureau of Reclamation (Reclamation) completed an environmental assessment and finding of no significant impact, and the Secretary of the Interior signed a determination of compliance with the Boundary Waters Treaty of 1909. By 2010, 45 miles of buried main transmission pipeline from Lake Sakakawea to Minot had been built along with several segments of the originally planned distribution system.

Reclamation prepared this supplemental environmental impact statement (SEIS) to evaluate and update the estimated future water needs through 2060 and to examine a full range of reasonable alternatives to meet this future need. Analyses presented in the prior environmental assessment and environmental



Map of Northwest Area Water Supply Project Constructed and Proposed Facilities in North Dakota

impact statement (EIS) were updated and the potential effects of global climate change were evaluated. These analyses were used to compare the impacts of completing the Project (action alternatives) to the consequences of the future without further Reclamation funding for the Project (No Action Alternative). Cooperating agencies assisting in the preparation of the SEIS include the U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, North Dakota State Water Commission, City of Minot, and Garrison Diversion Conservancy District. The SEIS supplements the 2008 Final EIS on Water Treatment.

Construction of Project Main Transmission Pipeline

Reasons for the SEIS

After Project construction began in April 2002, the Province of Manitoba, Canada, filed a lawsuit in October 2002 against the U.S. Department of the Interior in U.S. District Court in Washington, D.C. The province challenged the adequacy of the environmental assessment and finding of no significant impact and requested an injunction prohibiting expenditure of federal funds on the Project.

In 2005 the U.S. District Court ordered Reclamation to revisit the finding of no significant impact after completing further environmental analysis. The order stated that additional analyses should consider potential impacts associated with not fully treating Missouri River water at its source, as well as the impacts of pipeline leaks and possible failure of water treatment systems. The court also partially denied the plaintiff's request for an injunction, allowing Project construction to continue with some restrictions. In response to the court order, Reclamation prepared an EIS in consultation with other federal, tribal, state and local government agencies, which also included public input. The EIS evaluated a wide range of methods for treating water from Lake Sakakawea in the Missouri River basin prior to conveyance of treated water via buried pipeline to users within the Hudson Bay basin. The EIS also evaluated environmental impacts that could occur due to pipeline leaks and failure of the water treatment systems. A Final EIS on Water Treatment was published in 2008 and Reclamation signed a Record of Decision in 2009.

Shortly thereafter, the Province of Manitoba filed a supplemental complaint contending the Final EIS was insufficient. The state of Missouri also filed a complaint against the U.S. Department of the Interior and the U.S. Army Corps of Engineers in the same District Court. The state of Missouri alleged Reclamation's Final EIS was insufficient and that the Corps of Engineers failed to complete a separate National Environmental Policy Act (NEPA) assessment of the Project. These two complaints were joined by the District Court. In March 2010, the court remanded the case to Reclamation and ordered that the injunction imposed in 2005 remain in effect. The court found the Final EIS inadequately examined cumulative impacts of water withdrawals on Lake Sakakawea and on the Missouri River as well as the consequences of transferring potentially invasive species into the Hudson Bay basin. This SEIS evaluates these issues, and also reconsiders the purpose and need for the Project, evaluates a full range of reasonable alternatives, and evaluates and discloses impacts to affected resources.

Project Timeline

2001
- Determination by the Secretary of the Interior that the Project complies with the Boundary Waters Treaty of 1909
- Final Environmental Assessment and Finding of No Significant Impact

2002
- Project Construction Begins
- Province of Manitoba filed a legal challenge in U.S. District Court in October

2003

2004
- Construction continued on features already under contract as the legal proceedings continued

2005
- Court order remanded the case to Reclamation for further environmental analysis and allowed construction to proceed with specific approval from the Court.

2006
- Reclamation initiated an EIS on Water Treatment

2007

2008
- Final EIS on Water Treatment released

2009
- Reclamation signed a Record of Decision
- Manitoba filed supplemental complaint and the State of Missouri filed a complaint in the same District Court

2010
- Court remanded the case to Reclamation for further environmental analysis
- Reclamation published a Notice of Intent to prepare a Supplemental EIS (SEIS)

2011
- Reclamation conducted public scoping

2012

2013

2014
- Release of Draft SEIS for public review and comment

2015
- Release of Final SEIS to the public

Changes from Draft to Final SEIS

This Final SEIS responds to substantive comments received on the Draft SEIS from reviewing state and federal agencies, organizations, and members of the public. Some changes were incorporated into the Final SEIS in response to comments on the Draft SEIS, but these revisions do not fundamentally change the impact analysis or results presented in the SEIS.

Primary changes from the Draft SEIS:

1) Information regarding new downscaled hydrologic projections for the U.S. portion of the Souris River was added to the Climate Change section.
2) Updated information in the Federally Protected Species sections in response to changes in species' status under the Endangered Species Act.
3) Information was added to the Aquatic Invasive Species (AIS) section to further explain the study methods used and clarify the potential economic impacts.
4) Reclamation changed the Biota WTP option included in the Preferred Alternative (Missouri River and Groundwater Alternative).
5) Additional supporting documents related to the *Transbasin Effects Analysis Technical Report* are included with the Final SEIS.
6) Appendix K includes responses and comments received on the Draft SEIS.
7) Reclamation prepared a final biological assessment in compliance with the Endangered Species Act, provided in Appendix L.
8) Appendix M provides further explanation of the missing and incomplete information disclosed in the SEIS.

Public Hearing in Minot, North Dakota, July 2014

Proposed Action

The proposed action is to construct a project that provides drinking water to local communities and rural water systems in northwestern North Dakota, including the City of Minot. The Project would supply water to specific delivery points. Each community or rural water system would be responsible for connecting to the distribution line and delivering water through their water system to end users.

Northwest North Dakota Needs Reliable High Quality Water

Project Members

Rural Water Associations and Districts					
All Seasons Water Users District			North Central Rural Water Consortium		
West River Water and Sewer District			Upper Souris Water Users		
Cities and Municipal Areas					
Berthold	Bottineau	Burlington	Grenora	Kenmare	Minot
Mohall	Rugby	Sherwood	Souris	Westhope	

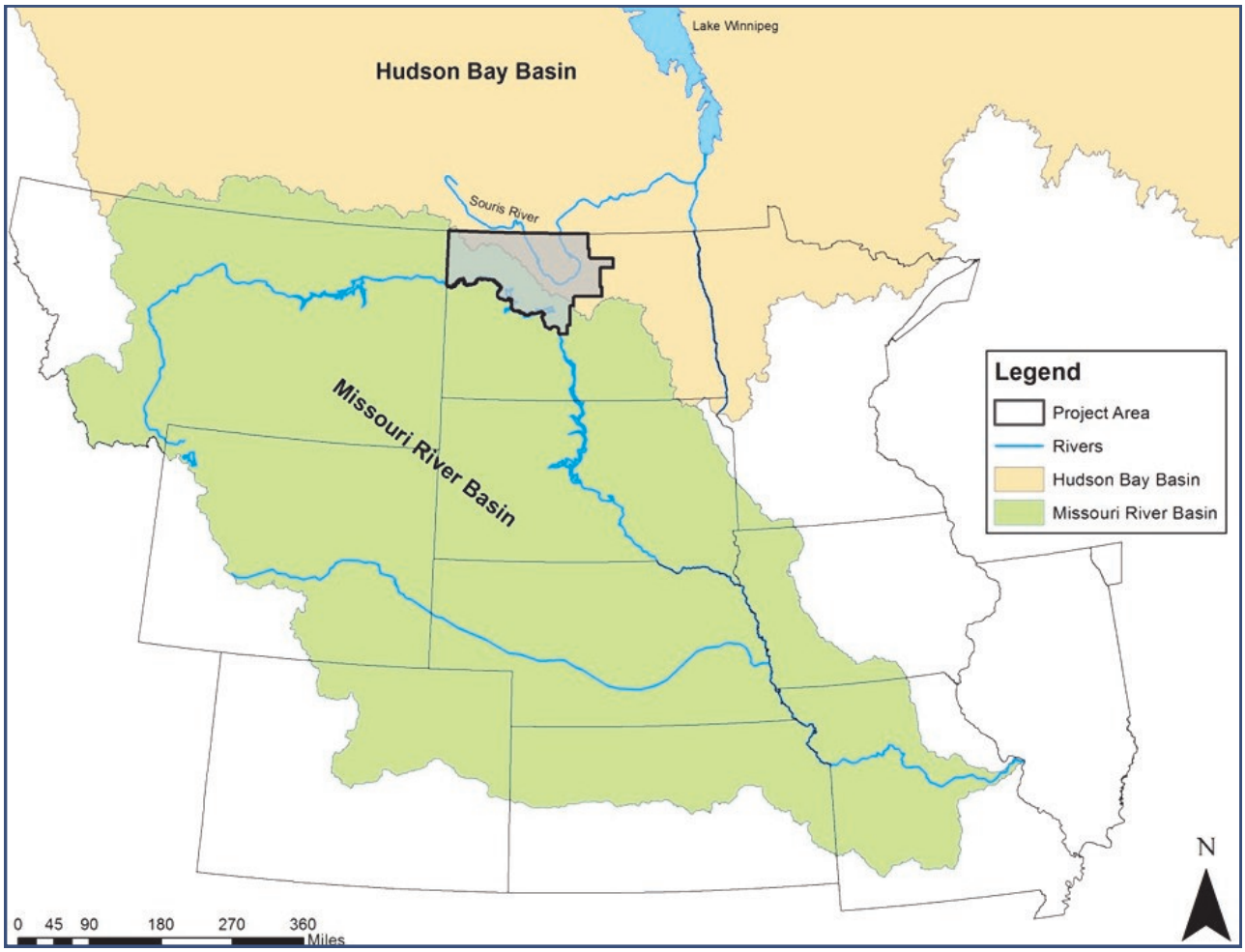
Construction would be administered under a cooperative agreement between the Garrison Diversion Conservancy District and Reclamation. Garrison Diversion along with the North Dakota State Water Commission, the Project sponsor, would be responsible for following standard construction practices, procurement regulations and all applicable local, state, or federal laws. Reclamation provides oversight, and is the lead federal agency for National Historic Preservation Act and National Environmental Policy Act compliance.

The purpose of the proposed action is to provide a reliable, high quality water supply to communities and rural water systems in northwestern North Dakota for municipal, rural, and industrial uses; the Project is designed to serve water needs through 2060.

The Project is needed because the existing water supplies are not of sufficient quality or quantity to reliably meet current needs or projected growth in the Project Area during the 50-year planning period.

- Project members are supplied by groundwater, and supplies currently are constrained by water quality that does not meet all drinking water standards.
- Some Project members also have insufficient quantities of water available to meet current and/or anticipated future demand.

The *Water Needs Assessment Technical Report* estimates the population that would be served by the Project will increase from approximately 78,000 to 82,000 people by 2060. This increase is due to inclusion of rural populations into rural water systems or communities, as well as population growth in urban areas.



Project Area in the Missouri River and Hudson Bay Basins

At least five communities or rural water systems would face water shortages in their service areas in the near future. Mohall, for example, has historically experienced water shortages during periods of peak water use. In other communities, although water supplies meet current demands, supplies would not meet estimated future demands. A population-based water demand model was used to project water needs, based on data from the U.S. Census and water user surveys circulated to Project members.

In 2010 water use was approximately 7.9 million gallons per day. By the end of the planning period in 2060, the projected average daily water need would rise to around 10.40 million gallons per day (average use) and 27 million gallons per day (peak use).

In addition to water shortages, Project members are also experiencing poor water quality. The U.S Environmental Protection Agency regulates drinking water through the Safe Drinking Water Act. The city of Kenmare's groundwater source violates the primary drinking water standard for arsenic and many Project members rely on water sources that do not meet secondary standards.

Missouri River

In terms of industrial use, the Project is not designed to supply water for irrigation or for oil and gas production. Some livestock water needs would be served by the Project via rural water districts and are included in the rural water estimates as an industrial need.

This SEIS complies with the court order by taking a hard look at cumulative impacts of water withdrawals from Lake Sakakawea and the Missouri River and consequences of biota transfer into the Hudson Bay basin, including Project effects in Canada.

The SEIS considers direct, indirect, and cumulative effects of the proposed construction and use of inbasin surface and groundwater sources, as well as imported Missouri River basin water to meet Project needs.

The geographic scope of analysis varies by resource but generally covers the Missouri and Souris River basins and extends into Canada. The Hudson Bay basin, which includes Canada's Lake Winnipeg and the surrounding communities, is within the scope of study. Lake Winnipeg area is included because the Souris River flows north into Manitoba where it meets the Assiniboine River, which flows into the Red River and eventually flows into Lake Winnipeg. Thus, aquatic invasive species transfer from the Missouri River to the Souris River could potentially affect this area.

Alternatives

Alternatives were identified using a structured alternative development and screening process, as described in Chapter 2 and Appendix C, *Alternatives Formulation*. The alternatives evaluated represent a full range of reasonable alternatives to meet the purpose and needs of the Project. Four action alternatives, as well as the No Action Alternative were evaluated. The NEPA regulations require analysis of a No Action Alternative to compare to action alternatives.

No Action Alternative

The No Action Alternative describes future water supply and changes in the affected environment without additional Reclamation funding for the Project. It was developed using the best available information and includes any reasonably foreseeable federal, state, tribal, and local water supply projects that may be constructed in the Project area through 2060.

Since 2008, the City of Minot has been temporarily supplying groundwater to Berthold, Burlington, Deering, Kenmare, Mohall, and the North Central Rural Water Consortium to alleviate some of the area's most severe water quality problems. These interim water service contracts expire by 2018, although they may be terminated earlier because groundwater in the Minot and Sundre aquifers is being withdrawn at an unsustainable rate.

Under the No Action Alternative at least five communities or rural water systems would experience water shortages in their service areas and many members would fail to meet Safe Drinking Water Act secondary water quality standards without additional treatment. Kenmare's local groundwater source violates the primary drinking water standard for arsenic so the community would have to upgrade or replace their water treatment plant to meet primary standards, or find an alternate water source.

Action Alternatives

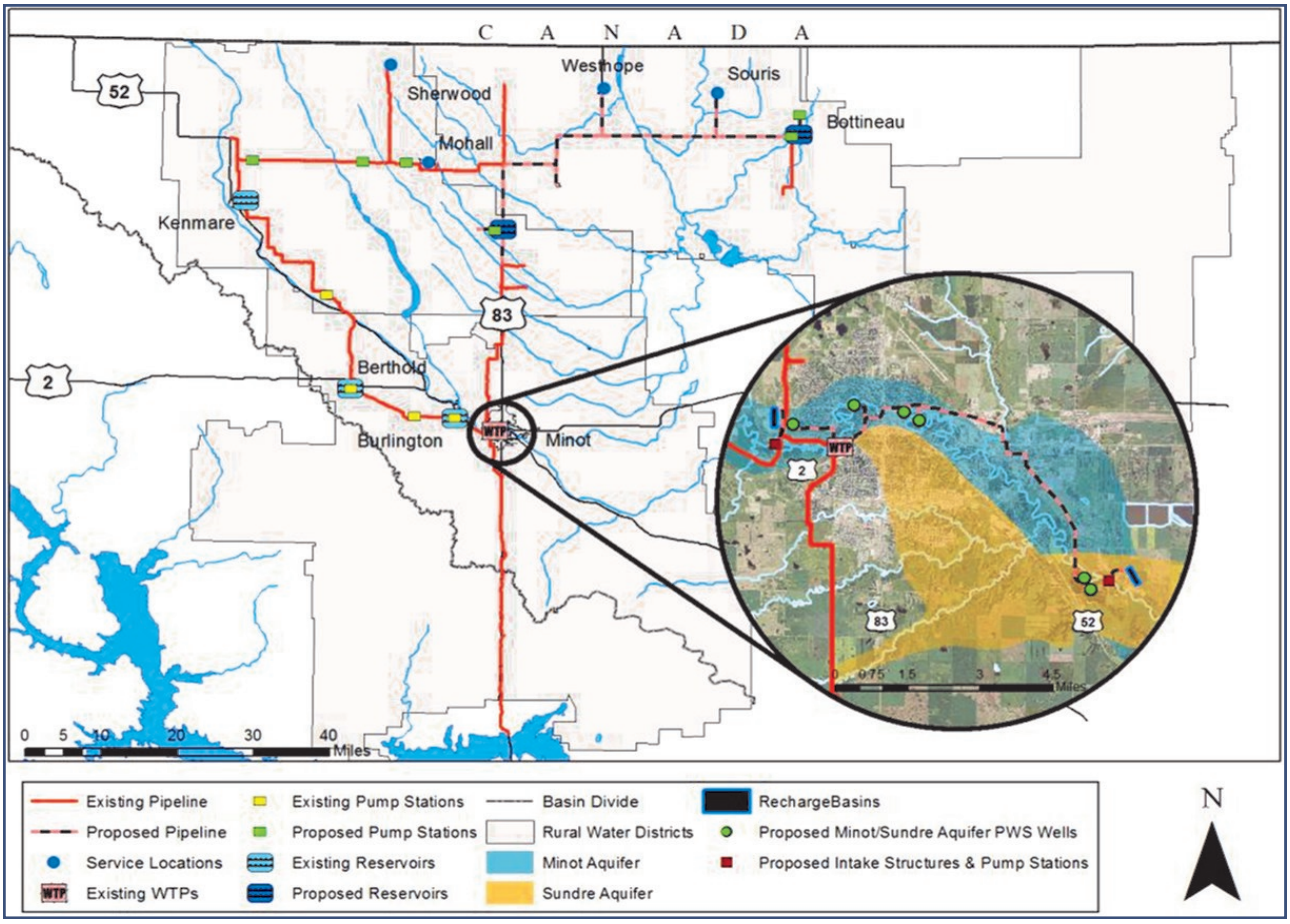
Action alternatives fall into two categories – those using only inbasin water sources (Souris River and groundwater) and those proposing to use water from the Missouri River. One Missouri River alternative would blend water from Lake Sakakawea with Souris River water and groundwater. The other Missouri River alternative would blend water from Lake Sakakawea with groundwater. While all action alternatives would include many of the same components, they differ in the components related to water sources and the volume of water to be withdrawn from inbasin and/or Missouri River sources.

Component – a facility designed for the Project that forms an alternative when combined with other components.

Option – an alternate way of implementing a component.

Pipeline construction

Inbasin Alternatives



Map of Existing and Proposed Inbasin Alternative Components

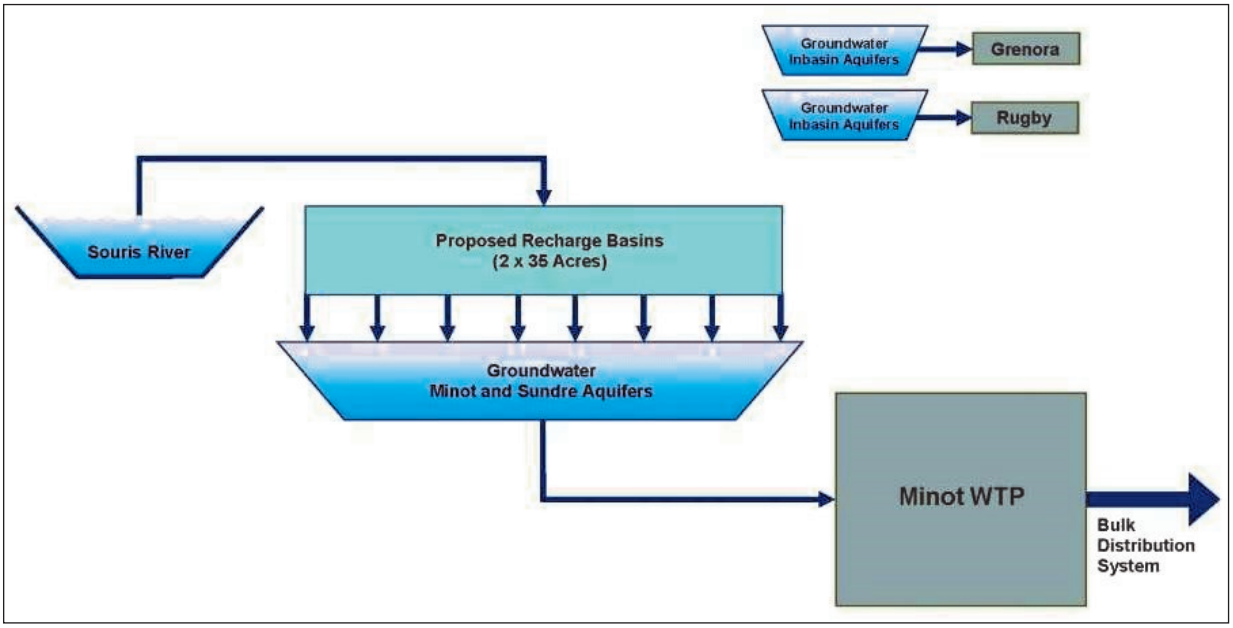
Inbasin Alternative Components

Components	Status
Minot Aquifer Recharge Facilities	Proposed
Sundre Aquifer Recharge Facilities	Proposed
Groundwater Collection Facilities	Existing and Proposed
Main Transmission Pipeline (buried)*	Existing
Minot WTP Upgrades	Existing and Proposed
High Service Pump Station and Reservoir at Minot WTP	Existing
Souris River Intake at Minot WTP**	Existing
Bulk Distribution Pipelines (buried)	Existing and Proposed
Storage Reservoirs	Existing and Proposed
Pump Stations	Existing and Proposed
Rugby Water Treatment Plant Upgrades	Existing

Note: Inbasin alternatives include the same components but differ in volume of water used from each source
*Included in the alternatives but not put to beneficial use
**Used in Groundwater with Recharge and the Souris River alternative only

Groundwater with Recharge Alternative

This inbasin alternative would rely on existing Minot and Sundre aquifer wellfields as primary sources of water for the Project. Souris River water would be used to artificially recharge these aquifers. Groundwater would be piped to and treated at the existing Minot water treatment plant (WTP) and supplied to Project members through a water distribution system. Estimated total cost of this alternative is $216.6 million for construction and $8.8 million for annual operation, maintenance and replacement costs.



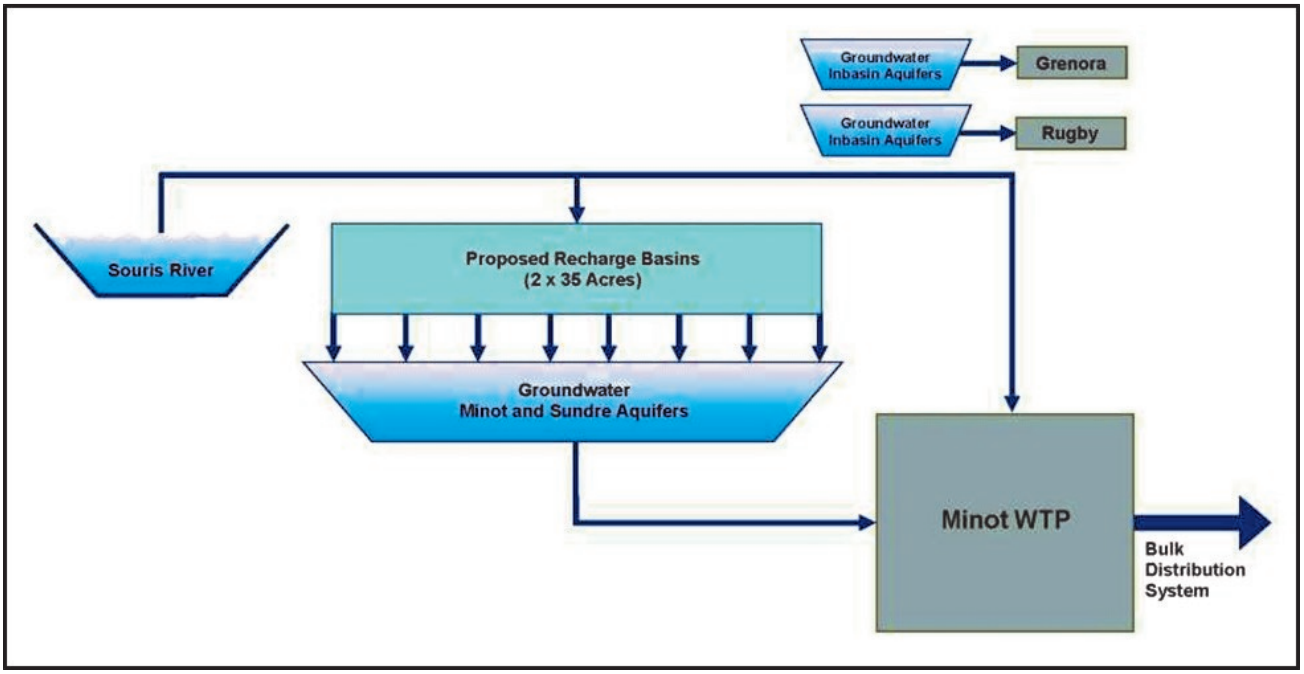
Groundwater with Recharge Alternative

Groundwater with Recharge Alternative

Advantages	Disadvantages
Lowest cost alternative	Project would need to acquire an additional water permit for withdrawal from the Souris River, which would be junior to existing water permits
Biota WTP would not be necessary	Finished water would not meet all Safe Drinking Water Act secondary water quality standards
Project construction and operation would create new jobs and provide economic benefits	Flows in the Souris River are extremely variable, making this a potentially unreliable water source for aquifer recharge.
	Would substantially increase the number of near-zero flow days in the Souris River
	Water quality, aquatic biological communities, and recreation would be adversely impacted by lower flows in the Souris River.
	There is uncertainty regarding technical feasibility of aquifer recharge in the Project Area
	Decreased flows in the Souris River would adversely affect the J. Clark Salyer National Wildlife Refuge
	Flows below 20 cfs downstream of Minot would be more frequent, which could become an issue in maintaining minimum flow at the international border
	Would result in permanent construction impacts due to construction of aquifer recharge facilities

Groundwater with Recharge and Souris River Alternative

This inbasin alternative would use water from existing Minot and Sundre aquifers to serve as a primary water source and would use Souris River water to artificially recharge these aquifers. In addition Souris River water would supply the Minot WTP during certain periods. Groundwater would be piped to the Minot WTP, blended with Souris River water when available, and treated for delivery to Project members through a distribution system. Components would be the same as the other inbasin alternative (see table above) but would also include the use of an existing Souris River intake. Estimated total cost of this alternative is $217.1 million for construction and $8.8 million for annual operation, maintenance and replacement costs.

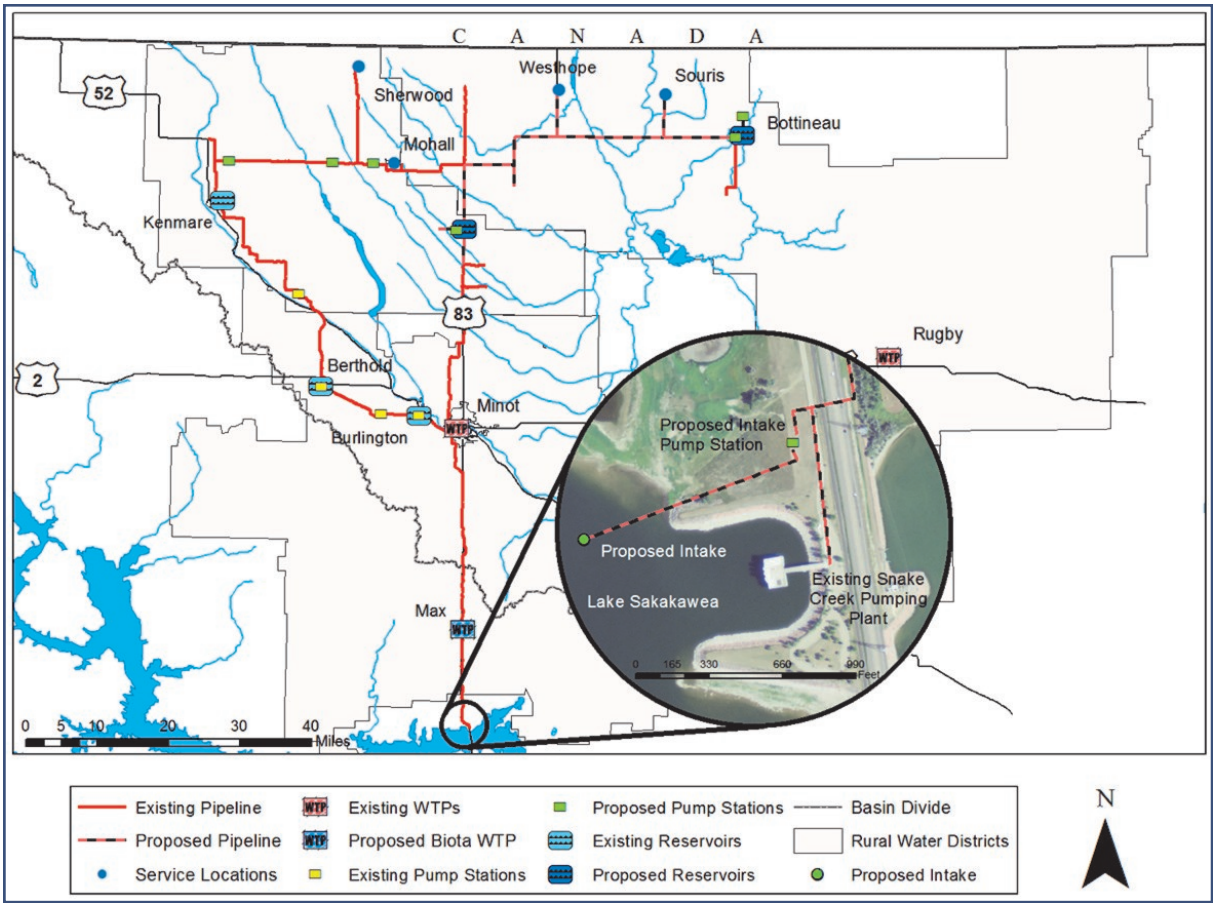


Groundwater with Recharge and Souris River Alternative

Groundwater with Recharge and Souris River Alternative

Advantages	Disadvantages
Second lowest cost alternative	Project would need to acquire an additional water permit for withdrawal from the Souris River, which would be junior to existing water permits
Biota WTP would not be necessary	Finished water would not meet all Safe Drinking Water Act secondary water quality standards
Project construction and operation would create new jobs and provide economic benefits	Flows in the Souris River are extremely variable, making this a potentially unreliable water source for aquifer recharge or direct delivery
	Would substantially increase the number of near-zero flow days in the Souris River
	Water quality, aquatic communities, and recreation would be adversely impacted by lower flows in the Souris River.
	There is uncertainty regarding technical feasibility of aquifer recharge in the Project Area
	Decreased flows in the Souris River would adversely affect the J. Clark Salyer National Wildlife Refuge
	Flows below 20 cfs downstream of Minot would be more frequent, which could become an issue in maintaining minimum flow at the international border
	Would result in permanent construction impacts due to construction of aquifer recharge facilities

Missouri River Alternatives



Map of Existing and Proposed Missouri River Alternatives Components

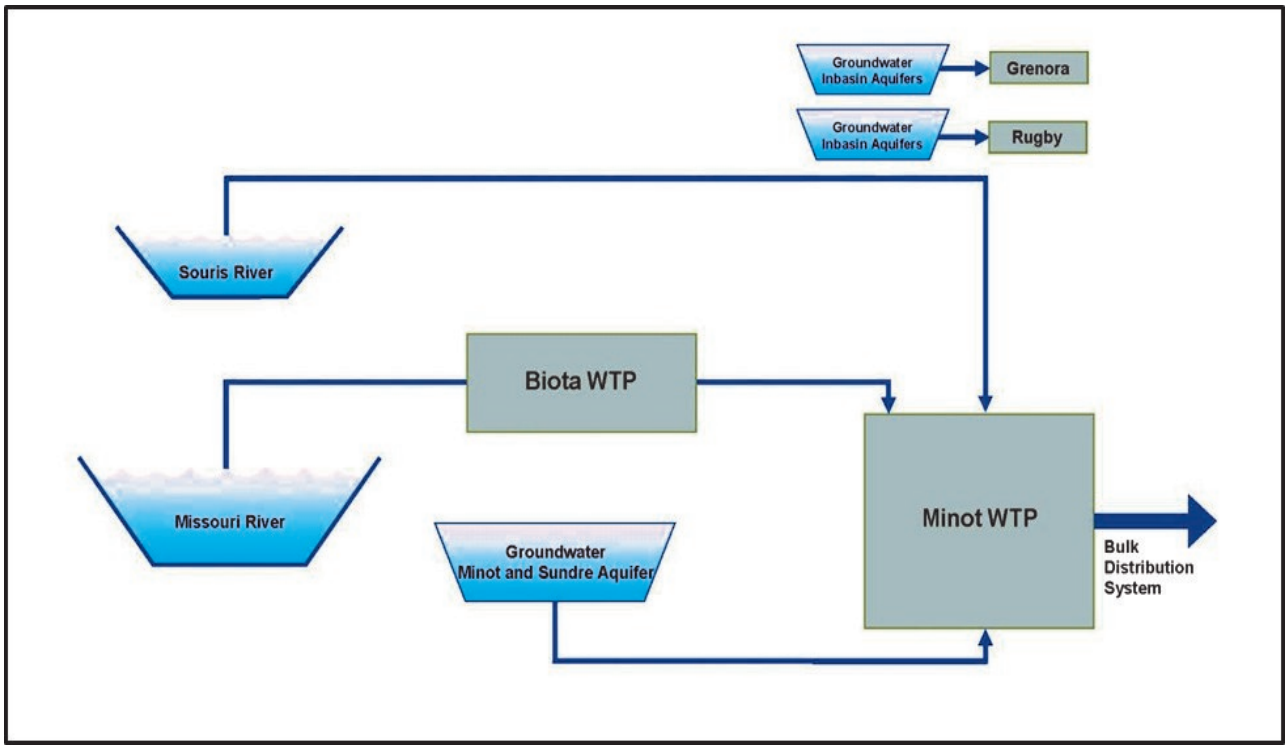
Missouri River Alternative Components

Facility	Status
Biota WTP and Pump Station	Proposed
South Prairie Storage Reservoir	Proposed
Main Transmission Pipeline (buried)	Existing
Bulk Distribution Pipelines (buried)	Existing and Proposed
Minot WTP Upgrades	Existing and Proposed
Souris River Intake at Minot WTP*	Existing
High Service Pump Station and Reservoir at Minot WTP	Existing
Storage Reservoirs	Existing and Proposed
Pump Stations	Existing and Proposed
Rugby WTP Upgrades	Existing

Note: Missouri River alternatives include the same components but differ in volume of water used from each source
*Intake used in the Missouri River and Conjunctive Use alternative only

Missouri River and Conjunctive Use Alternative

This Missouri River alternative would convey water from Lake Sakakawea to the Biota WTP in the Missouri River basin. After treatment at the Biota WTP, water would be conveyed in a buried pipeline to the Minot WTP and blended with water from the Souris River and Minot and Sundre aquifers. Following treatment at the Minot WTP, water would be distributed to Project members through a distribution system. Two options for a new intake and pump station at Lake Sakakawea and five options for a Biota WTP are evaluated. The range of total estimated costs for this alternative is $205.7 to $276.7 million for construction and $9.5 to $10.8 million for annual operation, maintenance and replacement. Costs depend on the intake and Biota WTP options included.



Missouri River and Conjunctive Use Alternative

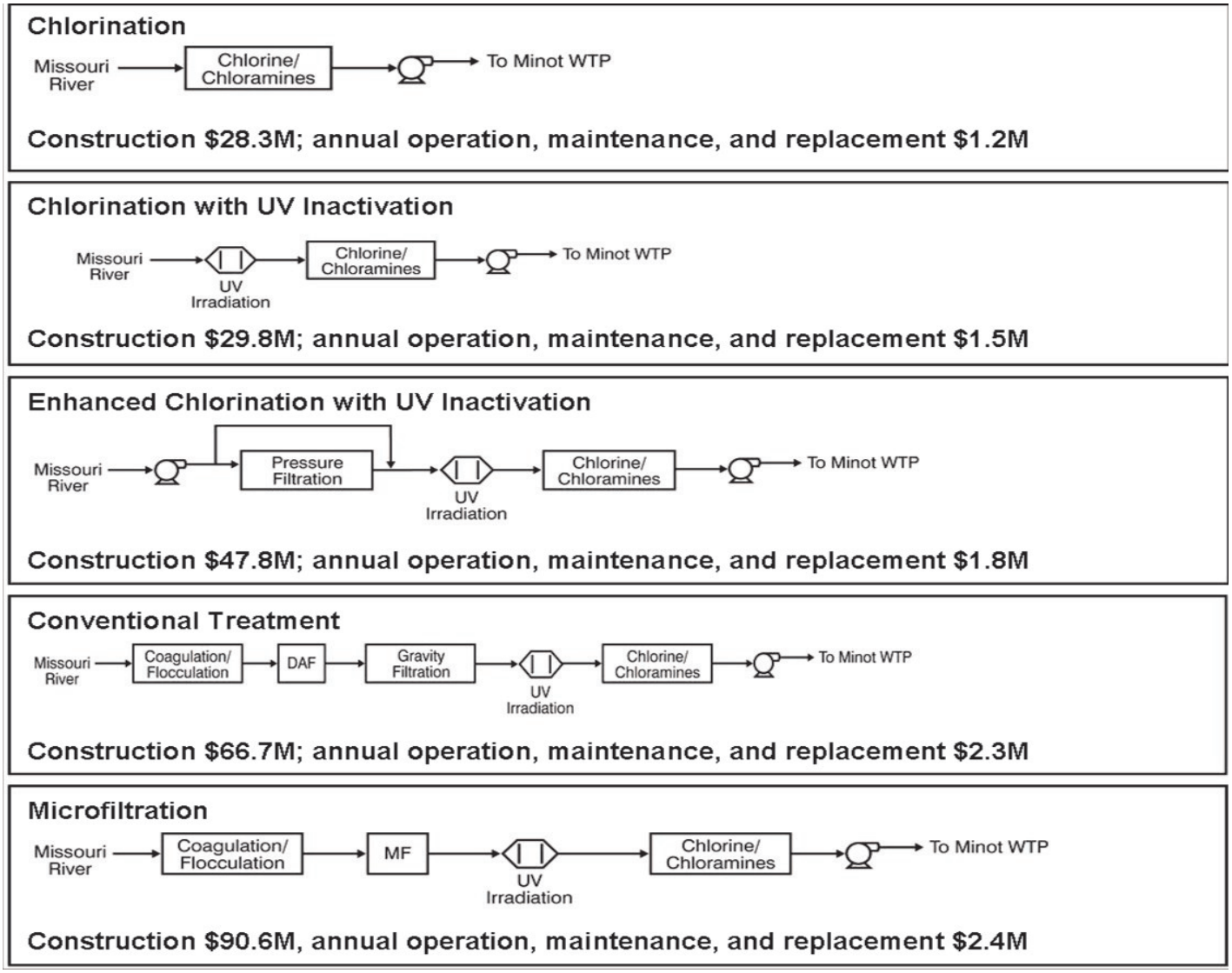
Missouri River and Conjunctive Use Alternative

Advantages	Disadvantages
The Missouri River would provide a reliable source of water and the Project holds a water permit for Lake Sakakawea	Highest cost alternative
Finished water would be of high quality, meeting all Safe Drinking Water Act (primary and secondary) standards	The Project would need to acquire an additional water permit for withdrawal from the Souris River, which would be junior to existing water permits
Using Missouri River water would reduce demands on Minot and Sundre Aquifers	Decreased flows in the Souris River due to the Project would adversely affect J. Clark Salyer National Wildlife Refuge
Minimal permanent impacts associated with construction activities	Biota WTP would be required
Project construction and operation would create new jobs and economic benefits	Operational complexity of treating water from three sources with varying water quality

Two options are evaluated for an intake and pump station at Lake Sakakawea:

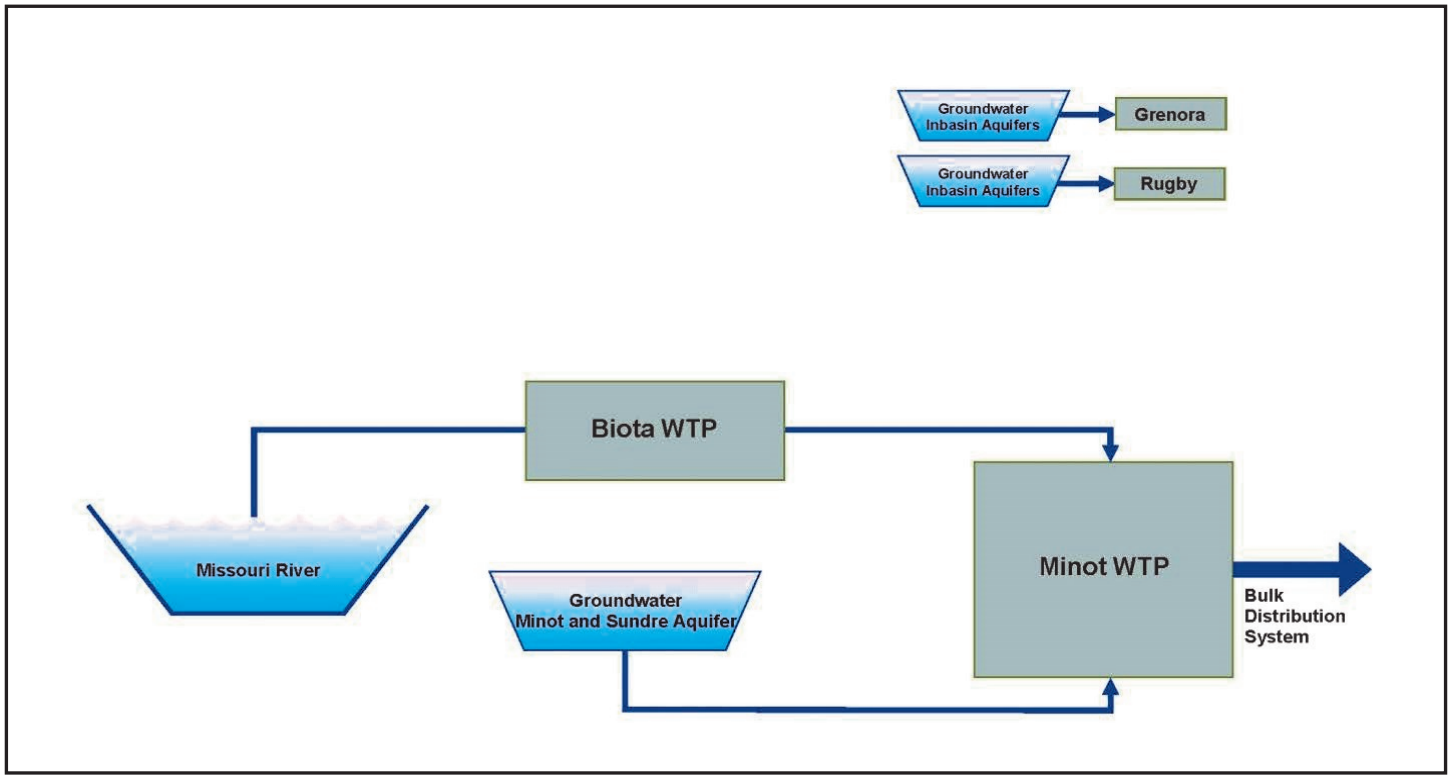
- Modify existing Snake Creek Pumping Plant (approximately $14 million to construct and $1 million annually for operation, maintenance and replacement) or
- Build a new intake adjacent to Snake Creek Pumping Plant (approximately $23 million to construct and $1.1 million annually for operation, maintenance and replacement)

Five Biota WTP options for Missouri River alternatives are evaluated. These would provide treatment to reduce the risk of a Project-related transfer of aquatic invasive species to the Hudson Bay basin. The options propose a range of treatments starting with chemical disinfection and incrementally adding treatment technologies to further reduce risk; costs increase with added treatment.



Missouri River and Groundwater Alternative

This Missouri River alternative would use Lake Sakakawea for a primary water supply. No Souris River water would be used. Water from Lake Sakakawea would be conveyed to the Biota WTP in the Missouri River basin. After treatment at the Biota WTP, the water would be conveyed in a buried pipeline to the Minot WTP and blended with water from the Minot and Sundre aquifers. Following treatment at the Minot WTP, water would be supplied to Project members through a distribution system. This alternative includes two options for a new intake and pump station and five options for a Biota WTP as described previously. Estimated range of total cost is $205.6 to 276.8 million for construction and $9.6 to $10.9 million for annual operation, maintenance and replacement costs. Cost depends on intake and Biota WTP options included.



Missouri River and Groundwater Alternative

Missouri River and Groundwater Alternative

Advantages	Disadvantages
The Missouri River would provide a reliable source of water and the Project holds a water permit for Lake Sakakawea	Second highest cost alternative
Finished water would be of high quality, meeting all Safe Drinking Water Act (primary and secondary) standards	Biota WTP would be required
Using Missouri River water would reduce demands on the Minot and Sundre aquifers	
Minimal permanent impacts associated with construction activities	
No impacts to the Souris River and related resources	
Project construction and operation would create new jobs and economic benefits	

Preferred Alternative

Reclamation has identified a preferred alternative in this SEIS. According to Reclamation's NEPA Handbook, in identifying a preferred alternative Reclamation should consider:

- If an alternative exists which has consensus of the affected community, is reasonable and practicable, meets the purpose and need for action, and is within Reclamation's statutory authority to implement, Reclamation should designate it as the preferred alternative.
- The preferred alternative should be an alternative that completes the action and that best meets the purpose and need for the action as defined in the SEIS.

Reclamation compared all alternatives in terms of how each addressed the purpose and need (i.e., a reliable supply of high quality drinking water), environmental impacts and non-environmental issues identified during the SEIS process, and the estimated construction and operation, maintenance and replacement costs. Based on this information, Reclamation has identified the Missouri River and Groundwater Alternative as the preferred alternative. This alternative would include modifications to the Snake Creek Pumping Plant as the intake option and Conventional Treatment Biota WTP option.

The Draft SEIS identified the Chlorination with UV Inactivation Treatment as the Biota WTP option included in the preferred alternative. The Final SEIS identifies a different Biota WTP option – Conventional Treatment, as part of the preferred alternative. This change in the Biota WTP option was made in response to comments submitted by the U.S. EPA. EPA outlined concerns that the Chlorination with UV Inactivation option, which includes treatment processes prior to filtration, has the potential to form disinfection byproducts. Disinfection byproducts are regulated by the Safe Drinking Water Act. To address this concern, the Biota WTP option was changed. This change is based on Project's ability to comply with drinking water regulations; however, this option does include filtration which will also further reduce the Project-related risk for AIS transfer. The Conventional Treatment Biota WTP option does not reflect the level of treatment necessary to address concerns relative to the Project-related risk of AIS transfer. All of the options evaluated in the SEIS would be sufficient to reduce that risk.

With an estimated total construction cost of $244 million and an annual operation, maintenance and replacement cost of approximately $10.7 million, the Missouri River with Groundwater Alternative would provide a reliable source of high quality water to the Project area to meet the Project purpose and need through 2060. The preferred alternative would provide Project members with drinking water that meets both primary and secondary standards. This alternative would not require additional water permits, would not impact the Souris River or the J. Clark Salyer National Wildlife Refuge, and would have minimal effects on the Missouri River and related resources.

The risk of a Project-related transfer and establishment of aquatic invasive species would be much smaller than the risk of transfer and establishment through existing non-Project pathways. To reduce the risk of a Project-related transfer of aquatic invasive species, this alternative would include the Conventional Treatment Biota WTP option, which provides protection against the organisms of concern and includes a physical barrier for removal.

With proposed best management practices (BMPs) and environmental commitments described in Appendix F, the Missouri River with Groundwater Alternative would have fewer environmental effects than other alternatives that meet the purpose and need. Appendix C provides the detailed rational for Reclamation's identification of the preferred alternative.

Summary of Environmental Consequences

To evaluate environmental effects of the alternatives, two primary comparisons are made in this SEIS (43 Code of Federal Regulations 46):

> *No Action Alternative Compared to Existing Conditions*: consequences to be expected if the Project is not completed.
>
> *Action Alternatives Compared to No Action Alternative*: evaluates the net effects or impacts of each action alternative compared to the No Action Alternative.

In this analysis, the consequences of the No Action Alternative (future condition through 2060) are identified by comparing to existing conditions. The No Action Alternative is the basis to which all action alternatives are compared to identify potential impacts. The consequences of the No Action Alternative are identified on the following page.

Impacts of Action Alternatives

Two issues identified by the court are highlighted in this section: 1) cumulative impacts of water withdrawals on Lake Sakakawea and on the Missouri River and 2) consequences of transferring potentially invasive species into the Hudson Bay basin. See Chapter 4 for a more comprehensive discussion of resource effects. Given implementation of best management practices, most construction impacts would be temporary, although some permanent impacts would result from construction of aboveground facilities. Impacts of Project operations would be permanent. If an action alternative is selected for implementation in the Record of Decision, Reclamation has committed to do adaptive management planning with respect to concerns of aquatic invasive species and the treatment efficacy of the Biota WTP.

Environmental commitments listed in the Chapter 4 and in Appendix F would be implemented to mitigate adverse environmental impacts not avoided by BMPs. The Summary of Action Alternative Construction Impacts table identifies whether each alternative would have a beneficial, adverse, or minimal/no effect on a resource when compared to the No Action Alternative. All temporary impacts are evaluated and determined to be minimal.

The Summary of Operational Impacts table shows impacts that could be expected to occur from operation of an alternative. This table summarizes the effects of action alternatives when compared to No Action and whether the effects are beneficial, adverse, or minimal.

Consequences anticipated changes to resources under the No Action Alternative

Impacts/Effects anticipated changes to resources attributable to the construction or operation of the action alternatives

Temporary impacts generally would result from construction and would be short-term. The resource would be return to its previous condition within 1 to 3 years.

Permanent impacts are long-term changes or reoccurring changes to a resource.

Consequences of the No Action Alternative

Issues	Consequences
Water Resources	
Groundwater	Minot and Sundre aquifers would continue to decline due to existing and increasing withdrawals that exceed natural recharge. Aquifers used to by other communities may also decline due to increased withdrawals as temporary water supply contracts with the City of Minot expire.
Missouri River Flows	Water withdrawals would increase over existing conditions. The average annual depletion would be 516,000 ac-ft greater than it is now due to increased water demands from projected population growth, expanded industrial use, and new water projects in the Missouri River basin. The depletions, along with continuing reservoir sedimentation, would generally result in slightly reduced streamflow.
Missouri River System Storage	Small reduction in average Missouri River System storage, primarily due to future sedimentation plus a very small reduction due to reasonably foreseeable future non-Project depletions.
Missouri River Reservoir Levels	Reservoir levels would rise as a result of continuing sedimentation.
Aquatic Invasive Species	
Risk to Hudson Bay Basin	The risk of aquatic invasive species transfer to and establishment in the Hudson Bay basin through existing pathways would continue.
Environmental and Economic Impacts from Aquatic Invasive Species	Adverse environmental and economic impacts of aquatic invasive species could increase due to transfer through existing pathways, potential future invasions through new pathways, and expanded distribution and abundance of aquatic invasive species already in the Hudson Bay basin.
Vegetation	
Vegetation	Potential shift in species composition toward drought-tolerant or salt-tolerant species if groundwater sources are overused without sufficient natural recharge.
Wetlands and Riparian Areas	
Groundwater Changes to Wetlands and Riparian Areas	Increased groundwater use in parts of the Project Area could adversely affect wetlands and riparian areas connected to groundwater.
Missouri River Flows	Very small change to wetlands and riparian areas.
Socioeconomics	
Souris River Basin	Project communities would lack sufficient water supply to meet future demands and/or would have poor quality water that fails to meet drinking water regulations. Households could incur annual appliance depreciation costs due to poor water quality. Additionally, some residents might rely on supplemental water supplies, such as bottled water and water services (laundromats) in the response to poor quality water.
Missouri River System	The primary economic consequence of No Action would be reduced navigation benefits from continuing reservoir sedimentation and effects on System releases from reduced storage capacity.

Summary of Action Alternative Construction Impacts

Resource Issue	Groundwater with Recharge	Groundwater with Recharge and Souris River	Missouri River Conjunctive Use	Missouri River and Groundwater
Water Resources				
Crossings, intakes, water quality	►		►	
Fisheries and Aquatic Invertebrate				
Habitat Loss	► ≤ 1 ac		► ≤ 2 ac	
Land Use				
Temporary Change	► 1131 ac		► 1065 ac	
Permanent Conversion	● 79 ac		● 17 ac	
Vegetation				
Temporary Disturbance	► 163 ac		► 118 ac	
Permanent Loss	● 65 ac		● 12 ac	
Wetlands and Riparian Areas				
Temporary Disturbance	► 19 ac		► 17 ac	
Permanent Loss	► ≤ 1 ac		► ≤ 1 ac	
Wildlife				
Temporary Habitat Disturbance	► 1131 ac		► 1065 ac	
Permanent Habitat Loss	● 79 ac		● 17 ac	
Additional Resources				
Federally Protected Species	►		►	
Historic Properties	►		►	
Indian Trust Assets	►		►	
Paleontological Resources	►		►	
Environmental Justice	►		►	
Socioeconomics				
Job Creation	◉ 147	◉ 148	◉ 132 - 231	
Annual Wages	◉ $5.7 M	◉ $5.8 M	◉ $5.1 M - $9.0 M	
Annual Economic Output	◉ $18.7 M	◉ $18.8 M	◉ $16.8 M - $29.3 M	

Note: Values approximate.

Summary of Operational Impacts of the Action Alternatives

Resource Issue	Groundwater with Recharge Alternative	Groundwater with Recharge and Souris River Alternative	Missouri River and Conjunctive Use Alternative	Missouri River and Groundwater Alternative
Water Resources				
Souris River Flows	●		●	▸
Souris River Water Quality	●		▸	
Groundwater Quantity	◉		◉	
Groundwater Quality	▸		▸	
Missouri River Flows	▸		▸	
Missouri River System Storage	▸		▸	
Missouri River Reservoir Levels	▸		▸	
Fisheries and Aquatic Invertebrates				
Change in Souris River Flows	●		●	▸
Change in Missouri River Flows	▸		▸	
New Intakes	▸		▸	
Aquatic Invasive Species				
Risk to Hudson Bay Basin	▸		▸	
Environmental and Economic Impacts	▸		▸	
Land Use				
Effects on National Wildlife Refuge	●		●	▸
Wetlands and Riparian Areas				
Change in Souris River Flows	●		▸	
Change in Aquifer Levels	▸		▸	
Change in Missouri River Flows	▸		▸	
Wildlife				
Effects on National Wildlife Refuge	●		●	▸
Additional Resources (Souris River and Missouri River Basins)				
Federally Protected Species	▸		▸	
Historic Properties	▸		▸	
Indian Trust Assets	▸		▸	
Environmental Justice	▸		▸	
Socioeconomics				
Drinking Water Quality	◉		◉	
Job Creation	◉ 105		◉ 113 - 129	
Annual Wages	◉ $4 M		◉ $4.3 M - $4.9 M	
Annual Economic Output	◉ $14.3 M		◉ $15.5 M - $17.6 M	
Missouri River System Economic Benefits	▸		▸	

Note: Socioeconomic values approximate.

Climate Change

The effects of the Project on climate change from greenhouse gas emissions will be minor. However, climate projections suggest that the Project would be affected by climate change.

Souris River Basin

Based on regional climate projections, future precipitation will likely increase about 10% in the Souris River Basin and average annual temperatures will rise around 5˚ Fahrenheit. Higher winter flows, earlier spring peak flows, and lower summer flows are more likely. Intense, heavy rainfall interspersed with longer relatively dry spells may become more frequent; existing highly variable flows in the Souris River are likely to become more so.

Reservoirs on the Souris River upstream of Minot are limited in their ability to capture and store increased winter flows for use during the summer. Decreased summer flows would make inbasin alternatives less reliable because less water would be available when needed for aquifer recharge or direct delivery.

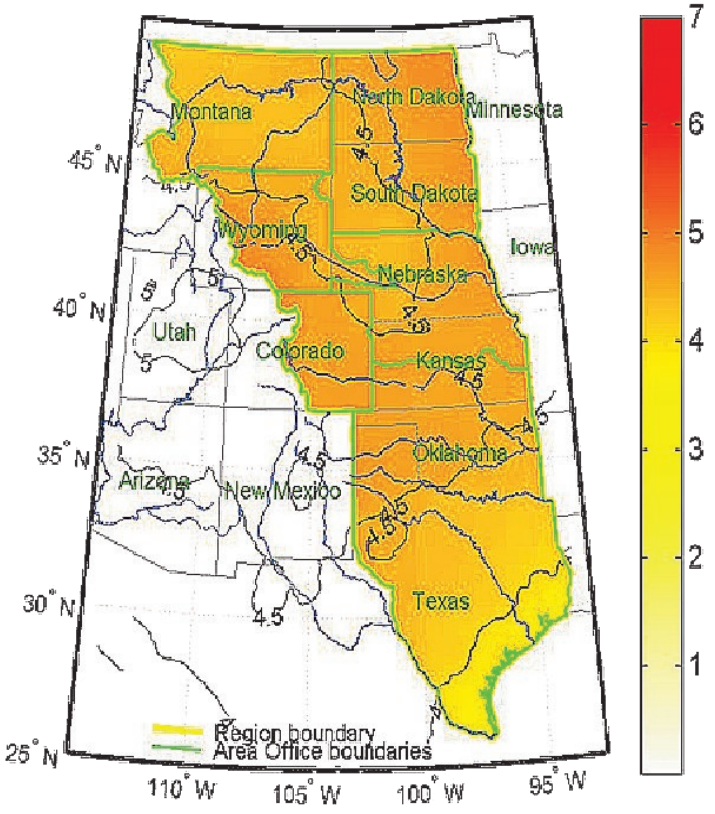
Missouri River Basin

Climate change will likely increase the amount of water available for Project withdrawals for alternatives using water from the Missouri River. The best available scientific information indicates that runoff in the Missouri River basin is likely to increase in the future due to climate change. More runoff would raise reservoir levels and increase reservoir releases resulting in higher streamflow downstream from mainstem reservoirs. Potential effects of climate change on the Missouri River would more than offset Project water withdrawals.

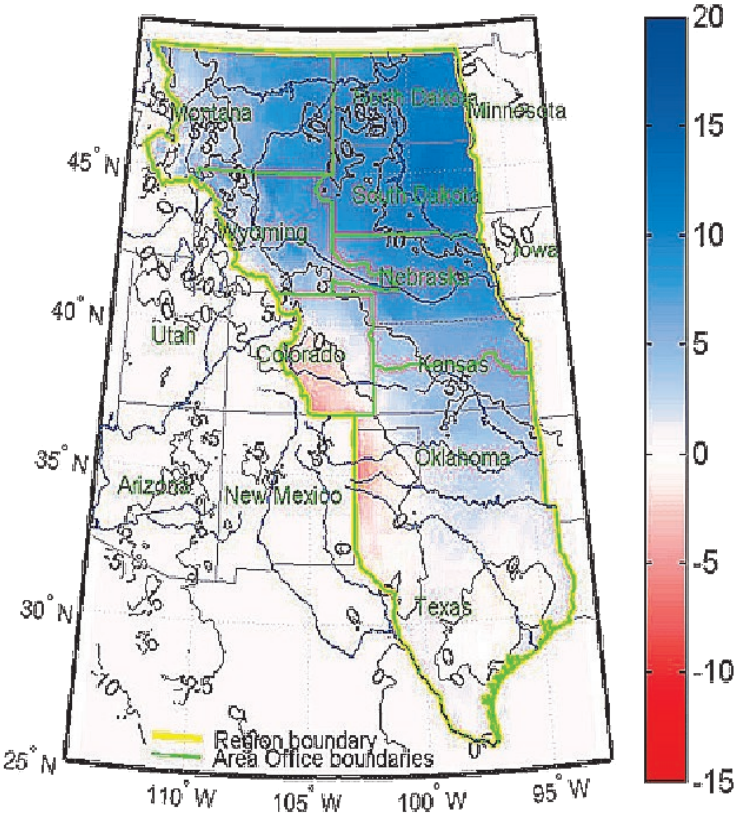
Water Resources

Adverse impacts to flows and water quality in the Souris River would be unavoidable for alternatives

Great Plains Region
Change in Mean Annual Temperature, deg F
2040-2069 from 1950-1979



Great Plains Region
Change in Mean Annual Precipitation, Percentage
2040-2069 from 1950-1979



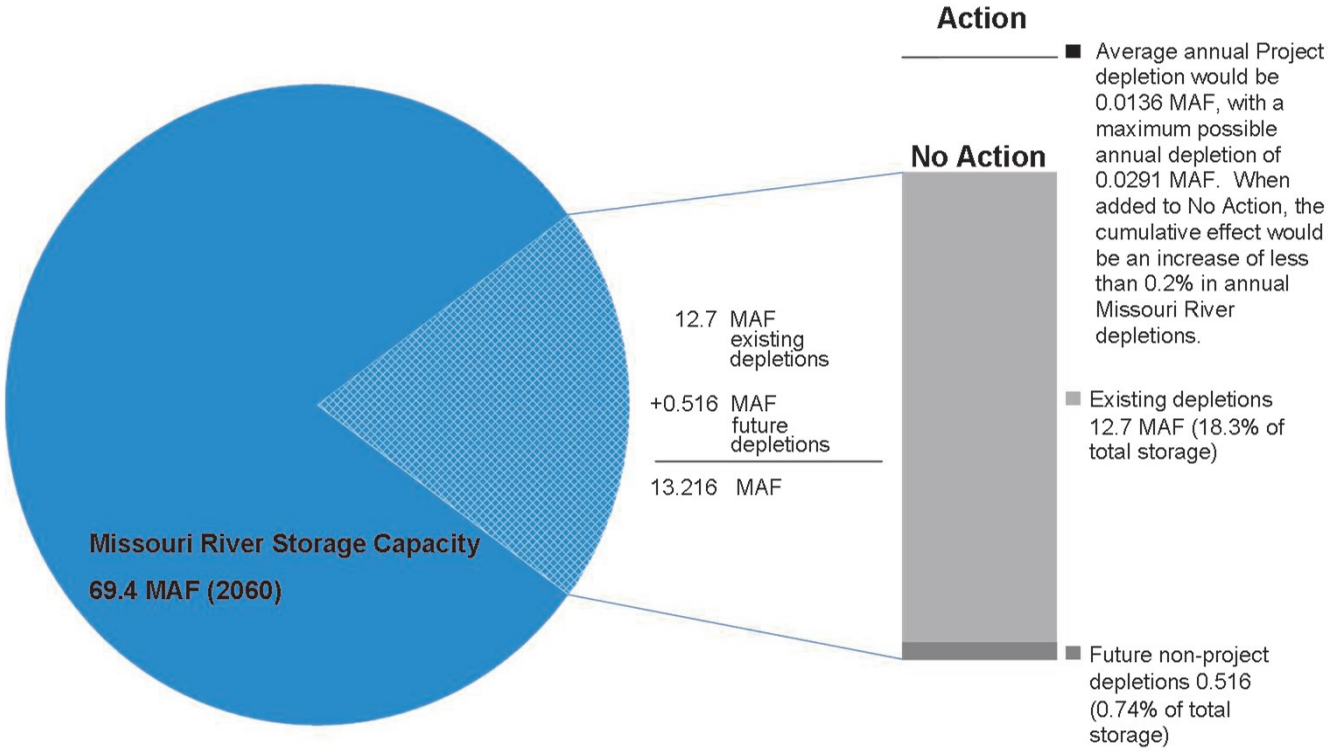
using Souris River water. Changes would be greatest with the two inbasin alternatives that use Souris River to recharge aquifers or for direct use.

The average number of days per year with near-zero flows below Minot would increase from 26 days under the No Action Alternative to 103 days and 108 days, respectively, for the Groundwater with Recharge and Groundwater with Recharge and Souris River alternatives. The percentage of years with near-zero flows would increase from 29% to 94% or 95% for each alternative, respectively. Souris River water quality (such as dissolved oxygen and temperature) would be degraded by low flows caused by inbasin alternative operation.

Groundwater quantity would improve under all action alternatives because withdrawal rates (withdrawal minus recharge) would be lower for action alternatives than for No Action. Lower net groundwater use likely would stabilize or raise groundwater levels. The inbasin alternatives would improve groundwater quality by adding surface water to the Minot and Sundre aquifers, although the effect likely would be small.

Canoe Recreation on the Souris River

Regarding cumulative impacts of water withdrawals on Lake Sakakawea and the Missouri River, this analysis considered effects of Missouri River alternatives on depletions, reservoir levels and storage, dam releases, and water quality. Potential Project depletions would be very small (average annual depletion of 0.0136 million acre feet [MAF] with a maximum possible annual depletion of 0.0291 MAF) compared to existing and reasonably



Comparison of No Action Depletions to Action Alternative's Depletions from the Missouri River System

foreseeable future non-Project depletions under No Action (13.2 million acre-feet). The cumulative effect would be an increase of less than 0.2% in annual Missouri River depletions over No Action depletions. Effects of Project withdrawals on water surface elevation and system storage would be negligible. Depletions from the Missouri River alternatives would have very little effect on dam releases.

Differences in average annual releases from Fort Peck, Garrison, and Oahe dams would be less than 0.2%. Because the effects of Missouri River alternatives on Missouri River water quantity would be negligible, there would be no measurable water quality impacts.

Fisheries/Aquatic Invertebrates

More frequent periods of low to near-zero flow in the Souris from inbasin alternatives withdrawals would reduce habitat quality and availability and could degrade water quality with adverse effects on fish and aquatic invertebrates.

Aquatic Invasive Species

Existing non-Project pathways that could introduce aquatic invasive species to the Hudson Bay basin are numerous and diverse, and would continue under the No Action Alternative and action alternatives. These exhibit a far greater risk than a Missouri River alternative for introducing aquatic invasive species to the Hudson Bay basin. The overall risk could be slightly increased if one of the Missouri River alternatives were implemented, because it would add one, very low probability pathway to an already wide variety of existing pathways.

The probability that implementation of a Missouri River alternative would result in transfer and establishment of aquatic invasive species in the

Aquatic Invasive Species Pathways

Hudson Bay basin is minimal. Nevertheless, biota treatment options and other controls designed into Missouri River alternatives, and management actions, including system monitoring and development of an adaptive management plan, would further reduce the minimal Project-related risk.

Potential impacts from Project-related transfer and establishment of aquatic invasive species would be comparable to No Action, because numerous transfer pathways already exist and impacts would be dependent on the species transferred and not the source of introduction. Missouri River alternatives would not create new types of impacts or increase severity of impacts from aquatic invasive species transferred through existing non-Project pathways.

Land Use

Construction of action alternatives would permanently change land use for some acres. Inbasin alternatives would adversely, permanently affect 79 acres. Missouri River alternatives would have slightly smaller adverse effects, 17 acres permanently affected.

Operation of inbasin alternatives would adversely affect J. Clark Salyer National Wildlife Refuge by reducing Souris River flows, which could impact wildlife and recreation. This may conflict with provisions of the National Wildlife Refuge System Improvement Act of 1997. These impacts may be unavoidable. Missouri River and Conjunctive Use Alternative also would withdraw water from the Souris River, but adverse impacts would be substantially less than inbasin alternatives.

Vegetation

Under all action alternatives, most construction impacts would occur in cultivated areas, with lesser impacts to shrubland, pasture/hay, and native prairie. Inbasin alternatives would permanently impact 65 acres of vegetation. Only 1% of the disturbed acres would be native prairie. Missouri River alternatives would disturb 12 acres permanently. Only 2% of the disturbed acres would be native prairie.

Wetlands and Riparian Areas

Both inbasin alternatives would withdraw water from the Souris River between March and August, which could cause localized effects on wetlands and riparian areas during dry and normal conditions. Changes would be most pronounced during dry and normal flows.

Wildlife

Construction of action alternatives would impact wildlife habitats but wildlife could move to nearby suitable habitat. Inbasin alternatives would permanently affect approximately 79 acres as compared to Missouri River alternatives, which would affect approximately 17 acres.

Alternatives that withdraw Souris River water would reduce inflow to J. Clark Salyer National Wildlife Refuge, which could have detrimental impacts on wildlife and waterfowl in particular. These adverse effects would be much greater under

Souris River J. Clark Salyer National Wildlife Refuge (photo credit: Marlene Welstad/USFWS)

the inbasin alternatives than with the Missouri River and Conjunctive Use Alternative. Reduced river flows during some months of the year may increase outbreaks of botulism and mortality of waterfowl; impacts would be greater during dry and normal years than in wet years. Although an adaptive management plan would be implemented as an environmental commitment, these adverse impacts may be permanent and unavoidable.

Socioeconomics

All of the action alternatives would create jobs and increase annual economic output that would benefit Project area residents and North Dakota overall during construction and operation. Statewide Project benefits of construction could range from $5 million to $9 million in average annual wages and between $17 million to $29 million in average annual economic output during the 10-year construction schedule. Economic benefits from operation of the alternatives would include annual wages of $4 million to $5 million, and annual economic output of $14 million to $18 million.

Next Steps

The Final SEIS is being made available to the public prior to a final decision on implementation of the proposed action. In accordance with NEPA requirements, there will be a minimum 30-day period between the availability of the Final SEIS and the issuance of a Record of Decision.

Comments on the Final SEIS may be offered to Reclamation for consideration during this time. Following this 30-day period, Reclamation's Great Plains Regional Director will determine the appropriate final action and issue a Record of Decision. Significant comments received and issues raised on the Final SEIS will be identified in the Record of Decision.

The selected alternative and the alternatives considered in the Final SEIS will be disclosed. Alternative(s) considered environmentally preferable will also be identified. Factors considered with respect to the alternatives and how these considerations entered into the decision will be discussed. Reclamation will include environmental commitments, means to avoid or minimize environmental harm and any monitoring or enforcement activities to ensure that environmental commitments will be met, if an action alternative is selected. This will complete the NEPA process.

Acronyms

BMPs	best management practices
EIS	environmental impact statement
M	million
MAF	million acre feet
NEPA	National Environmental Policy Act
Project	Northwest Area Water Supply Project
Reclamation	Bureau of Reclamation
SEIS	supplemental environmental impact statement
USFWS	U.S. Fish and Wildlife Service
UV	ultraviolet
WTP	water treatment plant

Enclosed CD

The enclosed disk contains the Northwest Area Water Supply Project Final Supplemental Environmental Impact Statement and its Appendices and Supporting Documents. It is designed to be used on your desktop or laptop computer. The files are opened with Adobe Reader, which is already on many computers. If you do not have Adobe Reader, it can be downloaded for free (see below).

STEP 1: Insert disk into the CD drive on your desktop or laptop computer.
STEP 2: The program will automatically run, or a notice will pop up.
STEP 3: Choose 'Run NW_Area_WSP_EIS.html' and the information will launch.

How to Install Adobe Reader

STEP 1: Go to: http://get.adobe.com/reader/
STEP 2: Follow online instructions to install

Insert cd here.