

MINUTES

**Joint Meeting of
North Dakota State Water Commission and
Garrison Diversion Conservancy District
Devils Lake, North Dakota**

July 1, 1993

The North Dakota State Water Commission and the Garrison Diversion Conservancy District held a joint meeting at Camp Grafton in Devils Lake, North Dakota, on July 1, 1993. Chairman, Governor Edward T. Schafer, called the meeting to order at 1:30 PM. The roll call of each Board was taken, and the agenda presented.

STATE WATER COMMISSION MEMBERS PRESENT:

Governor Edward T. Schafer, Governor
Sarah Vogel, Commissioner, Department of Agriculture, Bismarck
Mike Ames, Member from Williston
Judith Dewitz, Member from Tappen
Elmer Hillesland, Member from Grand Forks
Jack Olin, Member from Dickinson
Harley Swenson, Member from Bismarck
Robert Thompson, Member from Page
David Sprynczynatyk, State Engineer and Chief Engineer-
North Dakota State Water Commission, Bismarck

STATE WATER COMMISSION MEMBER ABSENT:

Florenz Bjornson, Member from West Fargo

**GARRISON DIVERSION CONSERVANCY DISTRICT EXECUTIVE COMMITTEE
AND BOARD MEMBERS PRESENT:**

Robert Strand, Chairman, Executive Committee
Norman Haak, First Vice Chairman, Executive Committee
Steve Metzger, Second Vice Chairman, Executive Committee
Rick Anderson, Director, Executive Committee
Richard Fugelberg, Director, Executive Committee
LeRoy Johnson, Director, Executive Committee
Milton Lochow, Director, Executive Committee
Charles Richter, Director, Executive Committee
Warren L. Jamison, Manager, Executive Committee
Russell Dushinske, Executive Committee, Ex-Officio
Lester Anderson, Board Member, Bottineau County
Stephen Ashley, Board Member, McHenry County
Paul Christianson, Board Member, Renville County
Lester DeKrey, Board Member, Barnes County
Argil Froemke, Board Member, Ransom County
David Johnson, Board Member, Benson County
Roger Johnson, Board Member, Nelson County

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Charles Klosterman, Board Member, Richland County
Jon Lindgren, Board Member, Cass County
Maurice Orn, Board Member, Sargent County
Frank Orthmeyer, Board Member, Grand Forks County
Tilmer Reiswig, Board Member, Sheridan County
Jerrold Roble, Board Member, Wells County
Thomas Shockman, Board Member, LaMoure County
Connie Sprynczynatyk, Board Member, Burleigh County

GARRISON DIVERSION CONSERVANCY DISTRICT BOARD MEMBERS ABSENT:

J. C. Eaton, Board Member, Ward County
Kenneth Leninger, Board Member, Griggs County

The attendance register is on file in the State Water Commission offices (filed with official copy of minutes).

The meeting was recorded to assist in compilation of the minutes.

**GARRISON DIVERSION PROJECT -
PROJECT UPDATE; AND FISCAL
YEAR 1994 BUDGET
(SWC Project No. 237)**

Warren Jamison, Manager of the Garrison Diversion Conservancy District, gave a status report on the Garrison Diversion Project, and the budget for Fiscal Year 1994.

Mr. Jamison reported Dan Beard has been appointed to the position of Commissioner of Reclamation. Commissioner Beard is scheduled to tour the Garrison Diversion Project area on July 7, 1993. Mr. Jamison briefed the group on activities of some of the project components.

Mr. Jamison discussed the Fiscal Year 1994 budget for the Garrison Diversion Project. The administration has recommended \$30 million for the project, which has been approved by the House. The House Appropriations Committee included the following language:

"Garrison Diversion Unit of North Dakota, within funds provided for the Garrison Diversion Project in North Dakota and, after substantial completion of the draft Sykeston Canal alternative study, the Bureau of Reclamation is directed to begin a programmatic Environmental Impact Study (EIS) on the Garrison Diversion Unit and to continue to cooperate with the feasibility study and EIS on Devils Lake stabilization. The Bureau of Reclamation is also directed to continue preconstruction design work on the Turtle Lake Irrigation and Wildlife area with the funds provided for in Fiscal Year 1994."

**GARRISON DIVERSION PROJECT -
SEVEN-YEAR PLAN PROPOSAL
(SWC Project No. 237)**

Warren Jamison discussed future Garrison Diversion Project development in accordance with the 1986 Reformulation Act. He presented and explained a pro-

posed Seven-Year Plan, goals and objectives, which are attached hereto as **APPENDIX "A"**. The plan goal, according to Mr. Jamison, is that by the year 2000, the principal water supply works be completed to deliver Missouri River water to eastern North Dakota, including the James River, Sheyenne River, Red River and Devils Lake.

Mr. Jamison said it is the intent of the Garrison Diversion Conservancy District and the State of North Dakota that the following objectives be accomplished by the year 2000:

- 1) Complete the central supply works:
 - a) Complete a connecting link between the McClusky Canal and New Rockford Canal
 - b) Develop project components consistent with the 1986 Reformulation Act, the Statement of Principles, the 1909 Boundary Waters Treaty, and the National Environmental Policy Act (NEPA)
- 2) Provide water for municipal, rural and industrial water users in North Dakota
- 3) Provide mitigation and enhancement of fish and wildlife
- 4) Enhance water-based recreation
- 5) Provide Missouri River water for irrigated agriculture

**GARRISON DIVERSION PROJECT -
CONCEPTUAL ALTERNATIVE
PLAN PROPOSAL
(SWC Project No. 237)
(Joint Resolution No. 93-7-461)**

Warren Jamison presented and discussed the Garrison Diversion Unit Conceptual Alternative discussion paper draft, attached hereto as **APPENDIX "B"**.

Mr. Jamison stated the paper will discuss several options for meeting the principal mission of the Garrison Diversion Unit. That mission, as stated in the proposed Seven-Year Plan, is the delivery of Missouri River water to the areas of need in the James River, Sheyenne River, Red River and the Devils Lake Basins. He said the principal option of discussion will be the completion of the major supply works through a major pipeline. There is also a discussion of the pipeline option based on a small pipe from the New Rockford Canal

to the cities of Grand Forks and Fargo, and a second rural economic development phase based on a water supply for agricultural use.

Mr. Jamison stated that the federal Administration Task Group's recommendation of October, 1990, results in no further construction on any of the major supply facilities, leaving from five to eight years of modest appropriations to expend the remaining MR&I authorization and complete the refuge mitigation. Beyond that, the Administration contemplates only minimal funding to secure and maintain the pumping plants and canals.

In conclusion, Mr. Jamison said it is important to remember that the intent of the paper is to promote discussion within North Dakota and is not an official proposal adopted by anyone at this time.

Secretary Sprynczynatyk said it would be appropriate for the State Water Commission and the Garrison Diversion Conservancy District to consider a joint resolution to encourage the comprehensive evaluation of all possible options for the completion of the principle water delivery system of the Garrison Diversion Unit.

It was moved by Commissioner Hillesland, seconded by Russ Dushinske, and unanimously carried, that Resolution No. 93-7-461, To Encourage the Comprehensive Evaluation of all Possible Options for the Completion of the Principle Water Delivery System for the Garrison Diversion Unit, be approved by the State Water Commission and the Garrison Diversion Conservancy District. SEE APPENDIX "C"

GARRISON DIVERSION PROJECT -
MR&I WATER SUPPLY PROGRAM
FISCAL YEAR 1993 FUNDING
(SWC Project No. 237-3)

The Garrison Diversion Unit federal appropriations for Fiscal Year 1993 for the MR&I Water Supply Program includes \$14,550,000, as follows:

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Southwest Pipeline Project	\$ 9,850,000
Ramsey County Rural Water	2,340,000
Missouri West Rural Water	2,497,235
Garrison Rural Water	1,300,000
State Reimbursement	1,001,441
Unallocated Funds	75,000
Feasibility Study	25,000
Administration	176,476
	<u>\$ 17,265,152</u>

Fiscal Year 1993 Appropriation	\$ 14,550,000
Fiscal Year 1992 Reimbursement	\$ 2,175,000
Previous Reimbursement	<u>\$ 540,152</u>
	<u>\$ 17,265,152</u>

Secretary Sprynczynatyk explained the Fiscal Year 1993 funding for the following projects:

Southwest Pipeline Project: Funding will allow the triple pump station to be completed by the end of 1994, providing water service to ten additional communities.

Missouri West Rural Water, Phase I: This project will provide a new water supply system, that will provide a water supply to New Salem, Crown Butte subdivision, Riverview Heights subdivision, and 270 rural users in northern Morton County. The project is anticipated to be completed this year. The addition of 70 new water users and a new business starting in New Salem will require an upgrade to the project's pump stations. Those new requests for water service will use up surplus water that exists in the system's current design.

Garrison Rural Water Project: The project will provide a new water supply system that will supply water to 246 users in the Garrison area, including Fort Stevenson State Park. The City of Garrison will provide bulk water service to the rural system. The contractor is preparing for construction.

Ramsey County Rural Water Project: Phase II of this projects has been funded, which includes a new well field, raw water transmission pipeline, and a water treatment plant. The system will serve over 715 rural users, Churchs Ferry, Penn, Grahams Island State Park and Shelters Grove State Park. The connection of curb stops to individual service connections is progressing well. Remaining to be completed is the painting of the water tower, connecting Grahams Island State Park to the main pipeline and seeding on the main pipeline. The estimated cost to provide bulk water service to Grahams Island and Shelters Grove State Parks is \$290,000.

Secretary Sprynczynatyk indicated that the City of Tolna has requested bulk water service from the Ramsey County Rural Water Project. The estimated cost to provide this service is \$300,000, and the city has indicated its willingness to provide the 35 percent non-federal share of the costs. Secretary Sprynczynatyk stated the project funding as approved appears to be sufficient to provide the City of Tolna with bulk water service without an additional MR&I grant or State Water Commission loan funds.

It was the recommendation of the State Engineer that the State Water Commission and the Garrison Diversion Conservancy District approve the City of Tolna as a component of the Ramsey County Rural Water Project.

It was moved by Commissioner Olin and seconded by Commissioner Vogel that the State Water Commission approve the City of Tolna as a component of the Ramsey County Rural Water Project.

Commissioners Ames, Dewitz, Hillesland, Olin, Swenson, Thompson, Vogel, and Chairman Schafer voted aye. There were no nay votes. The Chairman declared the motion unanimously carried.

The Garrison Diversion Conservancy District Board of Directors considered the State Engineer's recommendation and a motion was unanimously passed to approve the City of Tolna as a component of the Ramsey County Rural Water Project.

State Reimbursement: Secretary Sprynczynatyk stated that the MR&I funding of \$1,001,441 for state reimbursement would have been used for the 35 percent state loans for MR&I projects. Because the state auditor now considers these funds as federal funds, the funds cannot be used for state loans as previously thought. To ensure use of the \$1 million for MR&I projects, state funds were reallocated from the Southwest Pipeline Project to MR&I contract fund loans. The Southwest Pipeline will use the reimbursement funds as federal funds and, thus, both the MR&I projects and the Southwest Pipeline Project will have the same overall level of funding as first approved.

It was the recommendation of the State Engineer that the State Water Commission and the Garrison Diversion Conservancy District approve the reallocation of the MR&I funding of \$1,001,441 for state reimbursement to the Southwest Pipeline Project, for a total allocation of \$10,851,441.

It was moved by Commissioner Swenson and seconded by Commissioner Hillesland that the State Water Commission approve the reallocation of the MR&I funding of \$1,001,441 for state reimbursement to the Southwest Pipeline Project, for a total allocation of \$10,851,441.

Commissioners Ames, Dewitz, Hillesland, Olin, Swenson, Thompson, Vogel, and Chairman Schafer voted aye. There were no nay votes. The Chairman declared the motion unanimously carried.

The Garrison Diversion Conservancy District Board of Directors considered the State Engineer's recommendation and a motion was unanimously passed to approve the reallocation of the MR&I funding of \$1,001,441 for state reimbursement to the Southwest Pipeline Project, for a total allocation of \$10,851,441.

**GARRISON DIVERSION PROJECT -
MR&I WATER SUPPLY PROGRAM
FISCAL YEAR 1994 FUNDING
(SWC Project No. 237-3)**

The Garrison Diversion Unit federal appropriation for Fiscal Year 1994 is estimated to be \$30 million, which includes \$14,550,000 for the MR&I Water Supply Program. The

State Engineer presented and recommended tentative approval of the following projects that qualify for Fiscal Year 1994 funding, contingent upon approval of a federal Fiscal Year 1994 appropriation for the Garrison Diversion Project and subject to future revisions:

	<u>Project Cost</u>	<u>MR&I Grant</u>
Southwest Pipeline Project	\$ 7,275,000	\$ 7,275,000
Grand Forks Water Treatment	1,437,073	934,047
Langdon Water Treatment	410,431	266,780
Dickey Rural Water	4,500,000	2,925,000
Lehr Water Supply	354,000	230,000
Glenfield Water Supply	225,000	146,000
Hannaford Water Supply	165,200	107,380
Fargo Water Supply	2,100,000	1,365,000
Unallocated Funding	1,761,682	1,145,293
Feasibility Study	100,000	25,000
Administration	174,000	130,500
	<u>\$18,502,386</u>	<u>\$14,550,000</u>

It was moved by Commissioner Olin and seconded by Commissioner Thompson that the State Water Commission approve the State Engineer's recommendation for tentative approval of the Fiscal Year 1994 Garrison MR&I Water Supply Program budget. This motion is contingent upon approval of a federal Fiscal Year 1994 appropriation for the Garrison Diversion Unit Project and is subject to future revisions.

Commissioners Ames, Dewitz, Hillesland, Olin, Swenson, Thompson, Vogel, and Chairman Schafer voted aye. There were no nay votes. The Chairman declared the motion unanimously carried.

The State Engineer's recommendation to consider tentative approval of the Fiscal Year 1994 MR&I Water Supply Program budget was to be considered at the Garrison Diversion Conservancy District Board of Directors meeting on July 2, 1993.

**GARRISON DIVERSION PROJECT -
SAFE DRINKING WATER ACT
(SWC Project No. 237-3)**

At the April 6, 1993 meeting, the State Water Commission directed the State Engineer and staff to provide a position paper on the Environmental Protection Agency's Safe Drinking Water Act rules and regulations relating to surface water treatment, effective July 1, 1993. Approximately 20-30 communities in North Dakota could be affected by the new rules.

Dale Frink, Director of the State Water Commission's Water Development Division, presented the position paper, attached hereto as **APPENDIX "D"**.

Secretary Sprynczynatyk reported that applications have been received from communities requesting funding to upgrade their water treatment plants. The State Water Commission and the State Health Department are working with the communities to address this matter and to assist them to solve their problems.

Chairman Schafer commented that compliance with the guidelines of the Safe Drinking Water Act is not unique to North Dakota. At the National Governors Association conference, he said many of the governors expressed concern that their state will have difficulty in complying with the guidelines.

Secretary Sprynczynatyk commented that North Dakota does have an advantage over other states in that there are funds available in the Garrison MR&I Water Supply Program to help the communities correct their problems.

Commissioner Vogel expressed concern regarding the criteria used to rank MR&I projects and address the needs. It was the consensus of the Commission members that the MR&I priority criteria used for making recommendations for funding for water supply projects be reviewed. Chairman Schafer directed the State Engineer to appoint a committee of three Commission members and the Manager of the Garrison Diversion Conservancy District to review the criteria.

(The following were appointed to the MR&I Priority Criteria Review Committee: Commissioners Vogel, Swenson and Dewitz, Warren Jamison and Secretary Sprynczynatyk. The Garrison Conservancy District will also be represented by Directors Rick Anderson and Frank Orthmeyer.)

**NORTHWEST AREA WATER SUPPLY -
PROJECT UPDATE
(SWC Project No. 237-4)**

James Lennington, Northwest Area Water Supply Project Coordinator, provided background information and a status report

on the Northwest Area Water Supply Project (NAWS), attached hereto as **APPENDIX "E"**.

On October 1, 1992, the Garrison Diversion Conservancy District approved \$533,000 of funds for the prefinal design of the Northwest Area Water Supply system. It was further agreed that the State Water Commission would oversee the development of the prefinal design. On December 24, 1992, the engineering team of Houston Engineering, Fargo; American Engineering, Bismarck; and James Montgomery, Boise, Idaho, was selected to complete the prefinal design. In February, 1993, work on the prefinal design commenced.

Mr. Lennington stated the prefinal design of NAWS is expected to be completed by July 1, 1994. The goal of the prefinal design is to move the project to a point where final design can begin. The prefinal design will concentrate on identifying user needs, the execution of water service agreements with communities and rural water associations, and preparation of drawings and design reports defining the selected project configuration. To get the prefinal design phase off to a successful start, a series of 10 public meetings were held in a ten-county area in northwest North Dakota.

As of June 8, 1993, Mr. Lennington reported the State Water Commission has received NAWS Agreements of Intent from 40 communities and 8 rural water associations. The population represented by these communities and rural water associations is estimated at 90,000 people. The cities of Parshall and New Town, which are located on the Fort Berthold Indian Reservation, are included in the project.

At the April 6, 1993 meeting, the question was once again raised of including the Fort Berthold Indian Reservation in the project. The State Water Commission directed the State Engineer to contact the Chairman of the Three Affiliated Tribes to see if it is willing to join with the state in seeking authorization for the Na chiin Huun - Dakota Project. Secretary Sprynczynatyk indicated he wrote to Chairman Wilbur Wilkinson on April 19, 1993, and to date has not received a response to his letter. Secretary Sprynczynatyk indicated it is his intent to write another letter to the Chairman of the Three Affiliated Tribes concluding that since he has not provided a response the Three Affiliated Tribes is not interested in joining with the state in developing the Na chiin Huun - Dakota Project and, thus, development of the Northwest Area Water Supply Project will proceed.

Hank Trangsrud, Houston Engineering, Fargo, presented the prefinal design project schedule and a progress report. He reviewed the criteria for the tasks and the final product of the prefinal design will include estimating costs and projecting schedules and costs.

Mr. Lennington briefed the group on the Northwest Area Water Supply Advisory Committee meeting held in Minot on June 23, 1993, to discuss progress by the engineering team on the prefinal design and a request to be included in the prefinal design by the owner of a mobile home park. Upon consideration of the request, the Advisory Committee rejected the request on advice from the legal council; however, the owner wants the committee to reconsider the request.

Mr. Lennington stated that in order to prevent future misunderstandings and to clarify eligibility for participation in NAWS, the Advisory Committee directed the NAWS coordinator to draft an eligibility policy for consideration by the committee. On advice of the State Water legal council, the Advisory Committee voted unanimously to recommend that the Commission promulgate administrative rules concerning eligibility for participation in the NAWS project.

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**NORTHWEST AREA WATER SUPPLY -
APPOINTMENT OF COMMISSIONER
MIKE AMES TO SERVE ON
NORTHWEST AREA WATER SUPPLY
ADVISORY COMMITTEE
(SWC Project No. 237-4)**

On April 4, 1991, SB 2357 was signed by Governor Sinner establishing the Northwest Area Water Supply Advisory Committee. The committee consists of nine members appointed by the State Engineer according to

guidelines specified in the legislation. The legislation specifies that one of the members of the Advisory Committee shall be a member of the State Water Commission, recommended by the State Water Commission. Lorry Kramer previously represented the State Water Commission on the NAWS Advisory Committee.

It was the recommendation of the State Water Commission that Commissioner Ames, as a resident of the NAWS project area, be appointed as the State Water Commission representative on the NAWS Advisory Committee.

Secretary Sprynczynatyk appointed Commissioner Ames to serve on the Northwest Area Water Supply Advisory Committee to represent the State Water Commission.

**BIOTA TRANSFER STUDY UPDATE
(SWC Project No. 1828)**

Dr. Jay Leitch, North Dakota State University, said the Biota Transfer Study was initiated

in 1986 as a result of the Garrison Diversion Study report. He said the study never really moved forward until 1988 due to lack of Canadian interest.

Dr. Leitch reported on the activities of the Biota Transfer Study Technical Advisory Team and discussed the progress of seven ongoing or recently completed studies.

Dr. Leitch said science has a major role to play in the continuing effort to manage natural resources. The Biota Transfer Study is making a contribution to the study of sustainable resource management. The question under examination, phrased as a resource management question, is -- can water transfer between the Missouri and Hudson Basins be ecologically sustainable? Dr. Leitch provided copies of a report "The Role of Science in Environmental Problem Solving", which addresses this question and provides information on biota in Lake Winnipeg, ozonation of water as a treatment and bait-bucket transfer. Dr. Leitch's report is attached hereto as **APPENDIX "F"**.

Dr. Leitch discussed the funding process for the Biota Transfer Study and related budget costs. He said they now have Canadians working on the studies and would like to minimize any negative effect due to funding constraints. The Bureau of Reclamation, the State Water Commission and the Garrison Diversion Conservancy District are the sponsors for the study. Dr. Leitch expressed concern relative to the future direction and funding for the study.

Secretary Sprynczynatyk explained that the 1993-1995 budget for the State Water Commission reflects a \$75,000 reduction for the Biota Transfer Study.

Chairman Strand indicated that the Garrison Conservancy District's Executive Committee has recommended to continue funding at the \$50,000 level.

Chairman Schafer directed the State Engineer and the Manager of the Garrison Diversion Conservancy District to develop a recommendation relative to the future direction and funding for the Biota Transfer Study.

**WETLANDS COORDINATION REPORT
(SWC Project No. 1810)**

Charon Johnson, No-Net Loss of Wetlands Coordinator, reviewed the duties and responsibilities

of the coordinator, which is a part of the Statement of Principles formed by the 1986 Reformulation Act.

Mr. Johnson explained that there are many types of wetlands nationwide, but the prairie potholes are principally in North Dakota. North Dakota makes up about 13 percent of the prairie pothole region and it is this type of wetland that is the largest producer of migrant bird species. To protect these potholes, North Dakota passed a no-net loss bill in 1987, which was a major shift in North Dakota policy. However, Mr. Johnson said changes in federal policy have recreated a number of problems in the state's no-net loss policy. One of his principle objectives as the No-Net Loss of Wetlands Coordinator is to work the farmers through the federal versus state policies maize and ultimately make this process work.

Mr. Johnson explained the process he goes through in trying to resolve problems. He said the people that have become involved are interested in putting the wetlands war to rest. The problem appears to be what you can use to mitigate for losses, however, the concept of no-net loss is catching on even though there are still some opposed. Mr. Johnson said he is relatively confident we can work this into a win-win situation. The final report will be available later this summer.

Mr. Johnson indicated there previously was a wetlands panel selected by the Governor, which was a helpful tool to discuss issues. He requested Governor Schafer to consider reconvening the panel.

Commissioner Hillesland discussed the state's No-Net Loss of Wetlands Program. He stressed the importance that North Dakota's Information and Education Program address the agriculture concerns. He said "in order for the no-net loss of wetlands to be a successful program, it is important for everyone to cooperate and work together. He questioned what additional efforts the State Water Commission and the Garrison Diversion Conservancy District could take to help make this a successful program.

**OAKES TEST AREA REPORT
(SWC Project No. 237)**

Richard Brohl, Project Manager for the Bureau of Reclamation, provided a status report on the Oakes research site. The 5,000-acre site is part of the Garrison Diversion Unit, which was established to test input of irrigation on water quality and how to best manage water, pesticides, herbicides, etc. To date, Mr. Brohl said no Missouri River water has been delivered which has limited the number of irrigated acres at the site to 1,200 to 1,400.

Jack Knoll, Bureau of Reclamation Land and Water Division, presented a slide presentation on the Oakes research site addressing best management practices.

Secretary Sprynczynatyk indicated that Mr. Brohl has announced his retirement as Project Manager for the Bureau of Reclamation, effective August 1, 1993.

**WATER COALITION REPORT
(SWC Project No. 1831)**

Michael Dwyer, Executive Vice President of the North Dakota Water Users Association, stated there is a critical need for the development of a statewide water coalition to address North Dakota's water supply and water distribution requirements. He said there is also a need to develop a regular communication tool for informing North Dakota decision-makers and the general public concerning water issues, including water supply, water distribution, water quality, wetlands and water use.

Mr. Dwyer presented a proposal for a statewide water coalition and for a monthly North Dakota Water Magazine, attached hereto as **APPENDIX "G"**. He said the primary goal of the statewide water coalition is to address North Dakota's water supply and water distribution issues. The objectives of the coalition will be as follows:

- 1) Implement the flagship initiatives of the North Dakota Vision 2000 Report concerning water infrastructure to secure and enhance North Dakota's future economic well-being and quality of life.

- 2) Develop and maintain statewide organization support for a statewide water supply and water distribution system.

- 3) Establish a mechanism for the exchange of information, discussion, and ideas among organizations concerning water supply and water distribution issues and projects, and provide information and education concerning these matters to federal, state and local decision-makers.

Mr. Dwyer said in connection with this effort, there is a serious need to provide concise and timely information to policy and decision-makers, and the general public concerning water issues and projects in North Dakota. A monthly water magazine, titled North Dakota Water, will meet this need and demand in the most efficient and effective manner.

The primary goal of North Dakota Water will be to communicate to people about water. North Dakota Water will educate, inform, and make North Dakota citizens aware of the importance of water for agriculture, business, economic well-being, recreation, wildlife, municipal and rural growth, and for quality of life. The objectives of North Dakota Water will be:

- 1) To publish a magazine focusing on the importance of water in the lives of North Dakota citizens.

- 2) To educate and inform students, teachers, farmers, decision-makers, business and private interests, and the general public about the importance of water issues, including water supply, water distribution, water quality, wetlands and water use.

- 3) To promote the protection, development and management of North Dakota's water resources.

Mr. Dwyer said that a statewide water coalition, along with a monthly water publication, would achieve significant progress for developing an understanding and awareness of critical water issues among statewide organizations and the people of North Dakota.

**DEVILS LAKE STABILIZATION -
PROJECT UPDATE
(SWC Project No. 1712)**

Secretary Sprynczynatyk provided background information and a status report on the Devils Lake Stabilization Project. An

appropriation of \$300,000 was made in 1992 to the Corps of Engineers along with directive language to initiate the feasibility study for the stabilization of Devils Lake, including an inlet to the lake and an outlet from it. The Assistant Secretary of the Army has directed the St. Paul District to proceed with the feasibility study for the stabilization of Devils Lake. The State Water Commission and the Corps of Engineers are negotiating an agreement for Phase I of a three-phase study. Phase I is estimated to cost \$60,000 and will include a review of the hydrologic data and determine the frequency analysis for the lake.

On February 4, 1992, the State Water Commission authorized the State Engineer to provide a letter of intent to the Corps of Engineers to proceed with the feasibility study for the Devils Lake Basin. The letter of intent provided the assurances that the State Water Commission understood the financial requirements and expressed the intent to become the local sponsor or find an appropriate local sponsor from the Devils Lake Basin. The main requirement of the local sponsor is to provide 50 percent of the total cost. Secretary Sprynczynatyk stated that \$500,000 has been earmarked from the Resources Trust Fund for this purpose.


Rick LaFleur, Co-Chairman of the Devils Lake Preservation Coalition, provided comments to the group about the project. He expressed concern regarding integrating into a plan that will stabilize and retain Devils Lake as a regional area of economic development. He said we must consider and compare what it would cost to create a resource for economic development versus that of saving an existing resource, resulting in a tremendous difference in costs.

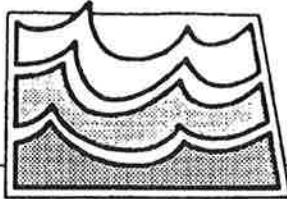
Mr. LaFleur said it is important to understand how the Sioux Tribe views the lake as a part of their culture. The Tribe is very interested in preserving and maintaining the lake. Mr. LaFleur said he is confident this objective can be accomplished with everyone working together. He expressed appreciation to the State Water Commission and the Garrison Diversion Conservancy District for their efforts in this project.

There being no further business to come before the Boards, it was moved by Commissioner Vogel, seconded by Russ Dushinske, and unanimously carried, that the joint meeting of the State Water Commission and Garrison Diversion Conservancy District adjourn at 5:00 PM.


Edward T. Schafer
Governor-Chairman
ND State Water Commission

SEAL


David A. Sprynczynatyk
State Engineer and
Chief Engineer-Secretary
ND State Water Commission



North Dakota State Water Commission

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Joint Meeting of North Dakota State Water Commission and Garrison Diversion Conservancy District

Meeting To Be Held At
Camp Grafton - Officers Club
Devils Lake, North Dakota

July 1, 1993
1:30 PM, Central Daylight Time

AGENDA

- A. Garrison Diversion Project - Warren Jamison:
 - 1) Status Report
 - 2) Fiscal Year 1994 Budget **
 - 3) Seven-Year Plan **
 - 4) Alternative Conceptual Plan **
 - B. Garrison Diversion MR&I Program - David Sprynczynatyk
 - 1) MR&I Water Supply Program FY '93 Funding **
 - 2) Safe Drinking Water Act **
 - 3) MR&I Water Supply Program FY '94 Funding **
 - C. Northwest Area Water Supply Project - Jim Lennington **
 - D. Biota Transfer Study Update - Dr. Jay Leitch **
 - E. Wetlands Coordination Report - Charon Johnson
 - F. Oakes Test Area Report - Dick Brohl
 - G. Water Coalition Report - Mike Dwyer **
 - H. Devils Lake Stabilization Update - David Sprynczynatyk
- 4:30 PM - Presentation by Devils Lake Preservation Coalition
- I. Adjournment

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** MATERIAL PROVIDED IN BRIEFING FOLDER
ITALICIZED, BOLD-FACED ITEMS REQUIRE SWC ACTION

If auxiliary aids or services such as readers, signers, or Braille material is required, please contact the North Dakota State Water Commission, 900 East Boulevard, Bismarck, North Dakota 58505; or call (701) 224-4940 at least five (5) working days prior to the meeting. TDD phone number is (701) 224-3696.

GOVERNOR EDWARD T. SCHAFER
CHAIRMAN

DAVID A. SPRYNCZYNYATYK, P.E.
SECRETARY & STATE ENGINEER

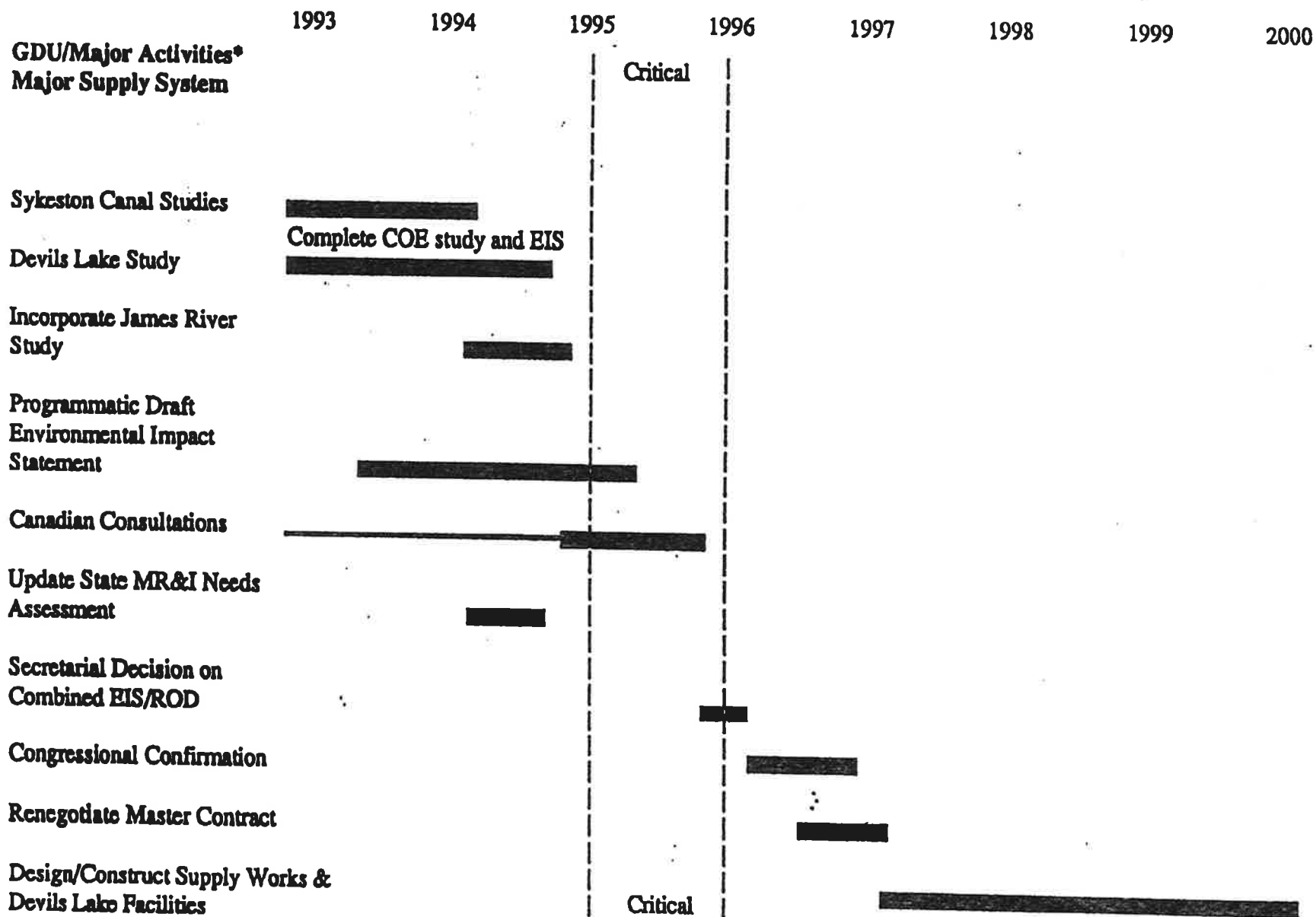
GARRISON DIVERSION UNIT

SEVEN-YEAR PLAN

**Third Draft
May 10, 1993**

SYNOPSIS

The plan that follows swings around a critical set of decisions that flow from a programmatic EIS on the Project. We are urging that document be started as soon as possible. The document would serve to pull together the technical alternatives for connecting the McClusky and New Rockford Canals, stabilizing Devils Lake, and delivery of water to the Sheyenne River and to communities in the Red River Valley. Previous work on the James River facilities could also be included, thus, bringing together a decision on the major water supply features of the Project. The following gant chart depicts the major activities and milestones. The most critical period illustrated is that following publication of the Draft EIS until Congressional acceptance is gained. Much work needs to be done to prepare for that time.



*Continue to develop Irrigated Acreage Delivery System.

Draft 2/23/93

Revised 5/10/93

GOAL

By the year 2000, deliver water to eastern North Dakota, including the James River, Sheyenne River, Red River, and Devils Lake.

OBJECTIVES

1. Complete the Central Supply Works.
 - a. Complete a connecting link between the McClusky and New Rockford canals.
 - b. Develop project components consistent with the 1986 Reformulation Act, the Statement of Principles, the 1909 Boundary Waters Treaty, the National Environment Policy Act (NEPA).
2. Provide water for municipal, rural, and industrial water users in North Dakota.
3. Provide mitigation and enhancement of fish and wildlife.
4. Enhance water-based recreation.
5. Provide Missouri River water for irrigated agriculture.

Draft 2/23/93

Revised 5/10/93

Objective #1: Complete major supply works/connecting link.

The Sykeston Canal study conducted by the Bureau is scheduled for completion by March 1994. A draft report should be available for review by December 1993.

A draft of the State Special Study of Alternative Connections between McClusky and New Rockford Canals will be transmitted to the Bureau of Reclamation for their scoping meeting records. A copy will also be transmitted to the JTC for comment and evaluation. By separate transmittal, the draft will also be sent to the national environmental organizations and a meeting requested to get their thoughts on starting the EIS this fall. This would be preparatory to a transmittal to the Secretary with a similar request.

If the Secretary can be convinced to start the EIS process in October 1993, all reasonable alternatives could be considered and a draft EIS, which includes the Bureau's preferred alternative, could be available for review in April 1995.

The "preferred alternative" could be the basis for further consultation with Canada to assure compliance with the requirements of the 1909 Boundary Waters Treaty. Six months is a reasonable time frame for this effort, assuming ongoing discussions continue with Manitobans through the JTC. Additional channels of communications need to be assessed and developed.

The Corps of Engineers' study and environmental analysis of Devils Lake could easily dovetail with the Bureau's environmental work and permit the Secretary to have all the information needed for a comprehensive decision in the summer of 1995. A joint EIS may be a reasonable approach to completing the Devils Lake study. A Record of Decision regarding the principal supply works and the Devils Lake program could be issued by June 1995, thus, setting the stage for introducing any technical corrections to the Reformulation Act that might be needed (including adjustments in the authorized ceiling for MR&I funding). With passage of amendments to the Act, renegotiation of the Master Contract could begin in earnest.

If the negotiations were completed by the end of 1996, the Bureau could proceed immediately with the final design and construction of the connecting link and related facilities.

Draft 2/23/93

Revised 5/10/93

Objective #2: Provide water for municipal, rural, and industrial users.

There are 124 applications for assistance and the interest is growing as the implications of safe drinking water standards become known. To date, 16 systems have been completed and others are under construction or nearing completion.

The largest potential municipal customer in the Sheyenne and Red River valleys is Fargo. The State Engineer and the District are proposing to join with the city of Fargo to assess the future water needs of the city, including a realistic assessment of how much of the need can be met through conservation.

A contract was recently awarded to conduct the feasibility grade study of water needs for the Northwest Area Water Supply project. Completion of the study is expected by June 1994. If a feasible plan is identified, authorization could be sought as early as 1995.

The five year plan shows that NAWS would cost \$205,534,000 of which \$154,150,000 would be federal GDU funds. This amount would exceed the remaining ceiling for MR&I. The inclusion of the Fort Bethold Indian Reservation in the project is still pending a response from Chairman Wilkinson (see State Engineer's memo of 4/19/93).

The District has asked the Bureau of Reclamation to determine lost value due to the stretched-out appropriations schedule for the MR&I program. This, coupled with the needs identified after the program began, may be used to request a substantial adjustment for this program.

The Southwest Pipeline Project is about 30 percent complete and will require additional funding in the next few years. The \$200 million authorized for MR&I projects will run out by the year 2000 at the current spending rate. To date, \$47.3 million has been spent or obligated for the SWPP from the MR&I program. To complete the project as originally planned, a total of \$92.7 million in state and federal funds will be necessary.

The State Water Commission will update the 1986 MR&I water needs assessment. This will serve as a base for indexing or raising the existing MR&I ceiling.

A statewide conservation effort shall continue to be examined. The statewide plumbing code will be reviewed to see if it represents an appropriate forum for this effort. Opportunities for the State Water Commission and the C District to promote conservation will be explored.

Draft 2/23/93

Revised 5/10/93

Objective #3: To Provide mitigation and enhancement of fish and wildlife

Wetlands Trust - The Wetlands Trust, established in the 1986 Act, is currently funded from federal and state monies. The state, through joint contributions from the Game and Fish Department, the State Water Commission, and the Conservancy District, continues to make an annual contribution to fulfill the state's requirement. The state has agreed to contribute up to ten percent of the federal contributions, which shall not exceed \$12 million. The governor and the Secretary of Interior have agreed to a schedule for state contributions. By the year 2000, the State will have contributed approximately 50 percent of its required \$1.2 million funding.

Kraft Slough - The completion of acquisition, development and enhancement programs on Kraft Slough by the year 2000, while continuing the policy of willing seller purchases only through 1996, should be feasible. After 1996, a federal advisory committee will determine a reasonable course of action to complete the Kraft Slough NWR.

Completion of Refuge bypasses and achievement of refuge compatibility - Refuge bypasses (Arrowwood, Dakota Lake and Sand Lake) must be completed before water will be allowed to flow down the James River. Likewise, mitigation for past and current impacts must be completed in order to achieve refuge compatibility as required by the 1986 Reformulation Act.

Wildlife Mitigation and Enhancement - Project mitigation and enhancement is currently ahead of project development. The District is dedicated to keeping mitigation and enhancement efforts on pace with project development. To the extent practical, efforts will continue to identify enhancement opportunities.

Devils Lake - To protect the fishing in Devils Lake as well as to enhance it, Devils Lake will need to be stabilized within a desirable range. Studies are under way to determine how best to stabilize the lake, and should be completed by FY 95.

Draft 2/23/93

Revised 5/10/93

Objective #4: To enhance water-based recreation.

The stabilization of Devils Lake is the subject of a Corps of Engineers' study. The feasibility and environmental study will be a concurrent effort which is a departure from standard Bureau procedure. We estimate the completion of that study and the Environmental Impact Statement in about two years. Thus, dovetailing with the Bureau's Sykeston study and environmental studies on the canal connection. The studies should also dovetail with a basin-wide management plan for the Devils Lake watershed being conducted by the State Water Commission.

It would be highly desirable to have one federal decision on Devils Lake by the Secretary of Interior in late 1995. That would set the stage for possible technical amendments to the Reformulation Act in 1995-96.

Of the remaining recreation funds, approximately \$2 million would be used as prudently as possible on remaining projects. Possible adjustments permitting a different allocation of historical costs by the federal government would increase funding allowances for recreation.

Draft 2/23/93

Revised 5/12/93

Objective #5: To provide Missouri River water for irrigated agriculture.

Statement of Purpose: Develop a water supply system for 130,000 acres of irrigation as an integral part of the GDU; to support a sustainable, diversified, vertically integrated, environmentally compatible, agricultural production system, which will enhance and maintain a viable urban and rural economy.

To establish the effectiveness of developing future water use for irrigation as authorized, the following steps are needed:

1. Status report on the OTA by July of this year and schedule completion of the next report by the end of 1995.
2. Pursue research on the comparative uses of water and chemical inputs for the production of food supplies in various regions of the country vs. North Dakota.
3. Document the competition for water and limited supply between human and agricultural uses in traditional high value crop regions.
4. Develop the model to predict the environmental impact of a full 23,660 acres of irrigation in the Oakes area and compare to other agricultural production areas.
5. Develop the model to predict return flows and estimate the potential benefit of conjunctive wetland programs.

To establish that best management practices of agri-chemicals and irrigation will be effective under GDU.

1. Upgrade and promulgate the Best Management Practices manual.
2. Analyze the ag inventory data already collected in order to target areas of need.
3. Make BMP guidelines user friendly.
4. Document success of BMP programs in other areas.

To establish a basis for fair economic analysis of benefits and operation of the irrigation components.

1. Identify promising non-surplus irrigation crop rotations targeted at Oakes and Turtle Lakes areas.
2. Verify economics of producing non-surplus crops in the GDU area.
3. Explore market channels for promising crops and develop processing partnerships.
4. Update inputs for benefit predictions using the latest agri-rotation ideas (local and regional benefits, integrated crop-livestock production).
5. Translate conclusions from similar areas in Canada to North Dakota's potential.
6. Update independent estimates of OM&R costs and repayment ability.
7. Explore development options to reduce OM&R costs.

To establish that irrigation and wetlands management can be done in harmony.

1. Develop sustainable wildlife/irrigation conjunctive use demo programs at Oakes and in Turtle Lake.
2. Complete Canadian Club wetland report.
3. Document Canadian successes.
4. Develop BMP for wildlife management and document cost/benefits of private/public joint ventures for wildlife enhancement.
5. Continue and expand wetland research on de-nitrification and expected return flow water quality impacts.

Oakes Test Area - An extension of the Oakes test program (beyond 1995) for two years is needed to allow for a quality evaluation of irrigation potential in that area. The Conservancy District, the Bureau of Reclamation and North Dakota State University will develop a coordinated strategy for collecting, analyzing, and assembling the data needed to make the case for irrigated agriculture.

An extension of the test program is needed until Missouri River water can be delivered. In the meantime, further data collection

and model development will strengthen the case for the needed water, and assure its proper use when the test area can be expanded in stages.

Turtle Lake - The preliminary plan, or conceptual plan as it is commonly called, will be completed this spring. The Bureau will seek authority to proceed with a feasibility study and environmental analysis that might be handled with a FONSI (Finding of No Significant Impact). This work must be acknowledged and authorized in the FY 94 appropriation bill. If not, it will slip to FY 1995.

The feasibility study and environmental analysis should take no longer than two years, concluding in 1997. If a year is allowed for final designs and contract negotiations, it might be possible to award a construction contract in 1998 and early water deliveries to at least an initial phase by the year 2000.

Other Acreage - Development of the remaining portion of the 113,000 acres will probably need to await results of the Oakes Test Area study and follow the development and evaluation of the program. It should be noted that some acreage has been removed by Native Americans. Early attention should be given to the New Rockford area as soon as resources will permit.

Draft 2/23/93

Revised 5/10/93

ANALYSIS OF INTERRELATIONSHIPS

Programs which are dependent on completion of the principal supply works:

1. Devils Lake stabilization.
2. Municipal water supply to the James, Sheyenne and Red rivers.
3. Development of Oakes Test Area.
4. Development of remaining irrigation acreage.
5. Resolution of Canadian concerns.
6. Renegotiation of Master Contract.

Programs which are independent:

1. Acquisition and development of Kraft Slough and core area.
2. Full operation of Wetlands Trust.
3. Southwest Pipeline Project.
4. Completion of Northwest Area Water Supply.
5. Development of local MR&I programs.
6. Development of local recreational programs.
7. Development of Turtle Lake irrigation, wildlife and recreation unit.
8. Refuge compatibility at Audubon, Arrowwood, Dakota Lake and Sand Lake National Wildlife Refuges.
9. Develop and transfer management of Lonetree Wildlife Management Area.

STRATEGICALLY, THESE SHOULD BE CONSIDERED INTERDEPENDENT.

Draft 2/23/93

Revised 5/10/93

BACKGROUND

The Garrison Diversion Conservancy District was created under North Dakota State law for the purpose of assisting the federal government in developing North Dakota's water rights to the Missouri River. The goal of delivering water to areas of need in the District was to be accomplished by the construction of the Garrison Diversion Unit of the Pick-Sloan Missouri Basin Program. The District consists of an elected Board of Directors from the 26-counties, and a staff working out of the headquarters in Carrington, North Dakota. The direct beneficiaries are the citizens of the 26 counties, but recognizing that the District is a creation of state government, it is, therefore, a part of the North Dakota team dedicated to a continuous effort to improve the quality of life for its citizens.

The District has been collecting taxes to finance its activities from its beginning. For many years, the tax was a modest six-tenths of a mill. In recent years, as the burdens on the District increased in the struggle to get the Project developed, it was necessary to raise that amount to one mill. While the major benefits of the project have not yet been realized, there have been benefits to North Dakota and the economy of the District. First, the taxes collected for the District have stayed in North Dakota, except for a relatively small portion spent in efforts to work with national leaders.

The federal appropriations for study, design, and construction of the project have varied over the years, but the total approaches one-half billion dollars over the last 25 years. While North Dakotans would argue that the federal contributions to date do not adequately compensate the state for its contribution to construction of the main stem Pick-Sloan facilities, those federal dollars must be recognized. In recent years the annual appropriation has averaged \$30 million. Since 1986, a major portion of this amount has been dedicated to the development of municipal, rural, and industrial water supplies. Of the 125 applications from communities seeking to develop their water supplies, 16 projects have actually been completed.

The wildlife and recreation programs have received funding but are not complete. While irrigation was the primary focus of the original project, its potential has yet to be realized. Work proceeds on development of 113,000 acres in a way that makes sense to farmers in North Dakota, and to leaders in Washington. The case to be made for irrigation in North Dakota is a good one but needs more work to convince skeptics.

Project development is proceeding in accordance with the 1986 Reformulation Act. This seven-year development plan has been formulated with that as a backdrop.

**GARRISON DIVERSION UNIT
CONCEPTUAL ALTERNATIVE
DISCUSSION PAPER**

DRAFT

**GARRISON DIVERSION CONSERVANCY DISTRICT
P.O. BOX 140
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GDU CONCEPTUAL ALTERNATIVE DISCUSSION PAPER

1 Introduction

2 This paper will discuss several options for meeting the
3 principal mission of the Garrison Diversion Unit. That mission,
4 as stated in the forward of the Seven-Year Plan, simply put, is
5 the delivery of Missouri River water to the areas of need in the
6 James River, Sheyenne River, Red River, and Devils Lake Basins.
7 The principal option discussed will be the completion of the
8 major supply works through a major pipeline. There is also a
9 discussion of a pipeline option based on a small pipe from the
10 New Rockford Canal to the cities of Grand Forks and Fargo.

11 There is also a discussion of a second rural economic
12 development phase based on a water supply for agricultural use.
13 This would substitute for the conventional irrigation
14 development under existing Bureau of Reclamation procedures and
15 result in a more focused effort to provide job opportunities and
16 economic activity in North Dakota.

17 As background, it should be understood that the
18 Administration's Task Group (October 1990) recommendation will
19 result in no further construction on any of the major supply
20 facilities, leaving from five to eight years of modest
21 appropriations to expend the remaining MR&I authorization and
22 complete the refuge mitigation. Beyond that, the Administration

1 contemplates only minimal funding to secure and maintain the
2 pumping plants and canals.

3 Administration's Task Group Report on Irrigation - October 1990¹

4 After completion of the major supply works, normal or
5 conventional Bureau of Reclamation development procedures would
6 involve the construction of an irrigation delivery system. Such
7 a system would take the water from the nearest available source
8 and bring it to a point-of-delivery on the corner of the
9 irrigable farm unit acreage. Irrigable acreage is determined by
10 the Bureau of Reclamation based on soil type, drainability,
11 topography, etc. The water would be delivered at approximately
12 40 psi for a typical two center pivot sprinkler system per farm
13 unit. The farmer is then responsible for taking it the rest of
14 the way. The Bureau of Reclamation also does a soil survey to
15 determine the amount of drainage needed and would install such
16 drains, as well as complete whatever mitigation and/or
17 enhancement is needed or appropriate.

18 Under conventional scenarios, these costs would be
19 scheduled for repayment by either the irrigator through water
20 service charges or by the Pick-Sloan Missouri Basin power
21 revenues or declared nonreimbursable. Operation and maintenance
22 costs would be paid by the water users through water service
23 charges. On-farm delivery system costs are paid directly by the
24 farmer.

25 ¹ This report, while developed under a different Administration, was
26 acknowledged and represented as Secretary Babbitt's current position
27 on the Garrison Diversion Unit (House Appropriation Hearings Q &
28 A's).

1 The Department of Interior's Task Group Report estimated
2 the assigned capital costs for irrigation to be \$6,900/acre.
3 Cost estimates for the irrigation in the Turtle Lake area is
4 estimated to range from \$3,500 to \$4,500/acre.

5 The Task Group also speculated that adjustments to the cost
6 allocations envisioned by the Inspector General would make the
7 operation and maintenance costs for the irrigation system
8 prohibitive. The Task Group also observed that the irrigator
9 might also grow surplus crops and, therefore, be forced to pay
10 a penalty of \$60/acre in addition to an estimated \$50/acre
11 operation and maintenance charge. Thus by adding these worst
12 case scenarios together, the Task Group concluded that
13 irrigation, under the Garrison Diversion Unit, was not feasible
14 and no further funding should be permitted for any features
15 which were justified on the basis of irrigation deliveries.
16 These features include the Sykeston Canal, James River delivery
17 system, as well as the farm unit delivery system in each area.
18 The Department of Interior has taken the position that Devils
19 Lake stabilization is not included in the 1986 Reformulation
20 Act. The Task Group does not address a means by which Grand
21 Forks and Fargo would receive Project water.

22 The Interior estimated cost to complete the Project was put
23 at \$1.14 billion without Devils Lake stabilization. Thus the
24 Task Group determined that dropping the irrigation phase of the
25 Project would reduce the anticipated federal funding requirement
26 by \$780 million. But, of course, this would leave North Dakota
27 with 115 miles of canal, two pumping plants, several new and

1 enhanced refuges and wildlife areas, and a partially completed
2 series of critical municipal and rural water systems and no
3 apparent means of serving Grand Forks and Fargo. The sunk
4 capital costs would be in excess of \$400 million. In other
5 words, the Task Group did not have much of a plan for North
6 Dakota.

7 The recommended funding totaled \$357 million for: 1)
8 Continuation of the non-Indian MR&I funding up to the \$200
9 million ceiling, 2) Continuation of the Indian MR&I program up
10 to the ceiling of \$20.5 million. Subsequent authorized indexing
11 would add \$3.67 million, 3) Wetland Trust funding to the \$12
12 million limit (at the time \$8 million of federal costs
13 remained), 4) Indian Irrigation, and 5) General facilities
14 needed to operate and maintain the existing system, wildlife
15 mitigation on and off the refuges and wildlife at Kraft Slough,
16 the Lonetree Wildlife Area, and a small amount for the remaining
17 recreation development.

18 It is clear that the Department of Interior does not want
19 to be involved in any additional irrigation development in the
20 West. When the sponsors of the Central Utah Project (CUP) were
21 faced with a similar circumstance, they accepted the reality and
22 opted the Bureau of Reclamation management and engineering
23 forces out of the irrigation and drainage portion of the
24 project. Considerable savings in the cost of the remaining
25 development is expected. North Dakota does, however, need to
26 have the major supply works completed to be in a similar
27 circumstance. While there may be benefits to opting the Bureau
28 of Reclamation out of construction on the major supply works of

1 the Project, the benefits are not offset by the costs. The
2 Bureau of Reclamation is well equipped to design and construct
3 facilities of the size needed. Federal permits and cooperation
4 will be required in any regard in order to complete the major
5 supply works.

6 Goal (Seven-Year Plan)

7 By the year 2000, deliver water to eastern North Dakota,
8 including the James River, Sheyenne River, Red River, and Devils
9 Lake.

10 Objectives (Seven-Year Plan)

- 11 1. Complete the ~~Central~~ Major² Supply Works.
- 12 A. Complete a connecting link between the McClusky and
13 New Rockford Canals.
- 14 B. Develop Project components consistent with the 1986
15 Reformulation Act, the Statement of Principles, the
16 1909 Boundary Waters Treaty, the National
17 Environmental Policy Act (NEPA).
- 18 2. Provide water for municipal, rural, and industrial water
19 users in North Dakota.
- 20 3. Provide mitigation and enhancement of fish and wildlife.
- 21 4. Enhance water-based recreation.
- 22 5. Provide Missouri River water for ~~irrigated~~ agriculture
23 rural economic development².

24 ² The underlined words are substitutions.

1 Assessing Water Needs

2 Defining North Dakota's water needs in relation to the
3 Garrison Diversion Unit is extremely important. The need is
4 best defined by identifying the highest potential use consistent
5 with the goals and objectives of the State. Certainly a
6 stronger agricultural production and processing industry is
7 consistent with everyone's vision of North Dakota's future. The
8 authorized non-Indian irrigation acreage remaining under the
9 Garrison Diversion Unit is 113,000 acres (rounded). If
10 irrigation waters were applied to these acres under drought
11 conditions, the peak demand would be approximately 22 inches or
12 approximately 207,000 acre-feet (application under average
13 conditions would probably be 13 inches, more or less). There
14 are more opportunities beyond the authorized acreage, if the
15 surface waters are used for groundwater recharge.

16 While the potential for additional use of Missouri River
17 water as a source of water for the artificial recharge of
18 aquifers has not been fully studied or quantified, allowance for
19 such a possibility should be included in future plans. Some of
20 the major aquifers in the state will not be capable of supplying
21 an adequate quantity of water to serve all of the potential
22 demands that may be placed on them to further develop the entire
23 resource base of the area. The use of artificial recharge can
24 be an effective method of increasing the available water supply.
25 For purposes of this paper, an arbitrary amount of 200,000 acre-
26 feet is suggested. Considering the statewide potential
27 represented in over a million acres of irrigable land, this
28 allowance is conservative.

1 MR&I demand was originally estimated (1967) to be 36,000
2 acre-feet (rounded), a sum which could probably be adjusted
3 upward for this discussion.

4 Minimum stream flow or instream uses, as they are called
5 today, were originally estimated at 230,000 acre-feet (rounded).
6 The Devils Lake stabilization maximum probable demand has been
7 estimated at 100,000 acre-feet in a given year.

8 The sum of these potential uses are represented in the
9 following tabulation:

Potential Uses	Acre-Feet
Authorized 113,000 acres (22 in.)	207,000
Groundwater Recharge	200,000
MR&I	36,000
Instream Uses	230,000
Devils Lake Stabilization	100,000
Subtotal	773,000
Conveyance Allowance of 30%	232,000
TOTAL	1,005,000

19 On the other hand, the U.S. Bureau of Reclamation's permit
20 held for the Garrison Diversion Unit totals 1,212,348 acre-feet,
21 and under circumstances discussed, appears to be an appropriate
22 reservation for the Garrison Diversion Unit.

23 In summary, in order to protect the future options for the
24 State of North Dakota, it would be advisable to maintain the

1 capability of diverting and delivering a minimum of 1,000,000
2 acre-feet of water annually.

3 **Phase One - (Full Development) of Major Supply Works**

4 The major supply works consist of repairs needed to restore
5 the McClusky and New Rockford Canals (currently estimated to
6 cost up to \$30 million) and the connecting link between the
7 McClusky and New Rockford Canals. If the connecting link is
8 assumed to be a pipeline (see later discussion) with capital
9 costs of approximately \$200 million, then the total cost of the
10 backbone system would be \$230 million.

11 The James River diversion facilities could consist of a
12 short (450 cfs) feeder canal, the Arrowwood Refuge bypass
13 facilities, and other facilities needed to control flows to the
14 Sand Lake area. This might cost in the order of \$72 million.

15 The Devils Lake stabilization facilities (discussed in more
16 detail later) are sized at 200 cfs and, for purposes of this
17 discussion, are assumed to include a two-way canal from the New
18 Rockford Canal plus a flood outlet extending to the James River.
19 Total cost of these facilities might be as much as \$113 million.

20 Sheyenne River and Red River facilities consist of a 200
21 cfs water treatment plant at the point of entry into the
22 Sheyenne River Basin. The cost of this facility has been
23 estimated at \$40 million.

1 The following table lists the building blocks and costs
2 needed to complete and meet the goal of delivering water to the
3 James River, Devils Lake, Sheyenne River and Red River Basins.

	<u>Millions</u>
5 Connecting Link and Repair of 6 existing Canals	\$ 230.0
7 James River Facilities	72.0
8 Devils Lake Stabilization 9 Facilities	113.0
10 Sheyenne and Red River Treatment 11 and Outlet Facilities	<u>40.0</u>
12	TOTAL \$ 455.0

13 The addition of \$200 million of remaining MR&I funding
14 needed to essentially complete the Southwest Pipeline Project,
15 Northwest Area Water Supply Project, and remaining regional MR&I
16 systems brings the total cost of the basic program to \$655
17 million.

18 Red River Pipeline

19 A pipeline starting at the end of the New Rockford Canal
20 heading eastwardly to the Mayville-Portland area then
21 bifurcating to Grand Forks and Fargo has been discussed. The
22 size of such a system would, of course, have an effect on the
23 costs. A 100 cfs pipeline has been estimated to cost \$490
24 million.

25 The relationship between the size of the pipeline and the
26 cost is curvilinear rather than linear. In other words, a 20

1 percent reduction in the size of the pipe will not result in an
2 equal percentage reduction in costs. In fact, the reduction in
3 cost will be far less. A more detailed analysis of the initial
4 costs and the benefits of a reduction in size would be needed to
5 make decisions other than conceptual direction.

6 The city of Grand Forks would see considerable savings in
7 a total replacement of their existing water supply and treatment
8 system if Missouri River water were piped directly to them.
9 Whether the savings would offset the respected outlay and
10 whether Fargo would realize similar benefits is speculative.

11 Devils Lake Stabilization

12 The Devils Lake Stabilization facilities include an
13 optional flood outlet to the James River (\$15 million). This is
14 considered to be an important, although, costly feature because
15 it would remove the potential for Canadian objection to the
16 program. Pumping costs would be high to lift the waters from
17 the Devils Lake basin over the continental divide and into the
18 James River, but it would seldom be used. The plan envisions a
19 two-way system from the New Rockford Canal to Missouri River
20 water into and out of the West Bay area.

21 The Corp of Engineers' feasibility study, now under
22 development, is an important work necessary to confirm the
23 technical feasibility and the costs of this concept. The Devils
24 Lake program will most certainly involve some sort of basin
25 management program that must be worked out at the local level to
26 assure that the resource is preserved and enhanced to the
27 maximum practicable extent.

1 The Devils Lake Basin's management plan would of necessity
2 respect the anticipated settlement of the Devils Lake Sioux
3 Tribe lawsuit and embrace the goal and objectives of the Sioux
4 nation as expressed by the Tribal Business Council. Effective
5 management of the Basin resource will require a cooperative
6 effort by all parties and will certainly go a long way toward
7 the meeting of the U.S. trust responsibilities to the Devils
8 Lake Sioux Tribe.

9 Capital and Operation Costs for Major Supply Works

10 Repayment of the capital costs, or equivalent amounts, are
11 already anticipated in the power rates for the Pick-Sloan
12 Missouri Basin system.

13 Pumping costs at the Snake Creek Pumping Plant are not
14 included and would vary considerably depending on use. These
15 costs may have to be borne by the State in a biannual
16 appropriation.

17 Operation and maintenance of the major supply works,
18 exclusive of pumping, including the Devils Lake system, the
19 Oakes Test Area, and the Sheyenne River Treatment Plant, will
20 cost approximately \$6 million annually. The majority of these
21 expenses are appropriately assigned as federal nonreimbursable
22 costs. A portion, however, may have to be funded by the State
23 of North Dakota in proportion to the benefits that accrue to the
24 State as additional water uses develop. As the water supply is

1 more fully utilized, the State would assume a greater proportion
2 of the costs.

3 Operation of the Oakes Test Area

4 Operation of the Oakes Test Area, as originally designed
5 and authorized, has never been accomplished. Many cooperating
6 farmers in the area have invested in sprinkler systems which
7 have sat idle because the anticipated water supply has not been
8 realized. The benefits of continuing the research at the 5,000-
9 acre level is of national importance and so promising as to
10 justify the continuation of federal support for an indefinite
11 period. These costs are included in the \$6 million operation
12 and maintenance estimate.

13 Phase One Assessment

14 The total cost of building the major supply works needed in
15 order to provide the opportunity for utilizing the quantity of
16 water discussed is \$655 million.

17 The largest and most sensitive item in the list of
18 facilities is the connecting link between the McClusky and New
19 Rockford Canals, which for purposes of this discussion, is
20 assumed to be twin eight-foot diameter seamless pipes along the
21 shortest practicable route (northern route).

22 The pipelines are the environmentally preferred option.
23 The pipelines should pose no significant threat to the Boundary
24 Waters Treaty if sufficient spill prevention and or containment

1 precautions are taken. The cost estimate is believed to be
2 sufficient to cover such precautions. Of all the alternatives,
3 the pipeline is the least costly to operate.

4 The capital costs of the pipeline are considerably higher
5 than a series of pumping pools designed to provide enhanced
6 biological productivity and higher than any Mid-Dakota
7 alternatives, including wetland mitigation and enhancement
8 costs. These options may be unacceptable to the environmental
9 opponents of the Garrison Diversion Unit. Perhaps extended
10 discussions conducted in good faith would result in an
11 acceptable reservoir or pumping pool design; but, for purpose of
12 this discussion, the pipeline alternative is assumed.

13 The operation and maintenance for the major supply works,
14 while largely a federal cost at the offset, would shift in major
15 ways to the State beneficiaries. The pipeline is so
16 significantly less expensive to maintain than the current Bureau
17 of Reclamation canal designs that this added benefit should be
18 given considerable weight.

19 The comparison of construction and operation and
20 maintenance cost for the alternatives identified in the State
21 Special Study are shown in Table 4.4 taken from the State draft
22 report. Table 6.12, also taken from the same report, shows the
23 comparative environmental impacts.

Table 4.4
ALTERNATIVE COST COMPARISON³

Alternative	Total Project Cost	Construction	Land Acquisition	Wildlife Mitigation	Archaeological and Historical ⁴	Operations and Maintenance Costs
Lonetree Reservoir	\$ 37,352,150	\$ 15,949,000	\$ 307,050	\$ 20,627,100	\$ 469,000	\$ 240,000
Mid Dakota Reservoir (1992) ⁵	49,009,075	39,277,400	411,675	8,736,000	584,000	165,000
Mid Dakota Reservoir (Revised)	50,611,250	42,665,000	462,750	6,883,500	600,000	165,000
Pumping Pools	67,616,100	61,945,300	230,600	4,672,200	768,000	265,000
Sykeston Canal - Northern	61,152,250	60,302,400	122,850	117,000	610,000	450,000
Sykeston Canal - Southern	98,949,250 ⁶	97,315,400 ⁶	465,850	183,000	985,000	500,000
Sykeston Canal - Missouri Basin	168,551,050	171,773,800	831,450	1,018,000	1,747,000	890,000
Northern Pipeline	194,801,200	192,600,000	162,900	105,300	1,933,000	100,000
Southern Pipeline	235,498,125	232,400,000	624,525	132,600	2,341,000	252,000
Southern Contour Pipeline	366,087,000	361,700,000	655,500	97,500	3,634,000	286,000

³ All costs are based on Reclamation procedures for construction, administration, contingencies, overhead, land acquisition, archeological and historical and related items.

⁴ Archaeological and historical costs were calculated as 1% of total project costs plus initial study costs. Previous expenditures on Lonetree Dam were not included in the calculation of these costs for the reservoir alternatives.

⁵ The January 1992 Mid Dakota/Sheyenne Lake Study, by the State of North Dakota, estimated the total cost for this alternative to be \$35 million. This was based on construction by the State of North Dakota, whereas, in this evaluation all costs are based on construction by Reclamation.

⁶ This estimate includes a reduction in construction cost of \$22 million as reported by Reclamation. This is based on using a re-routed canal alignment to more closely follow the natural contours. This reduction has not been verified and requires further evaluation.

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Table 5.12 Summation of Environmental					
Alternative	Wetland acres	Grassland acres	Woodland acres	Landowners Affected	Cultural Resources Predicted Sites
Lonetree Reservoir	5,289	4,795	132	27	44 ⁷
Mid Dakota (1992)	2,240	3,093	65	25	29 ⁷
Mid Dakota (Revised)	1,765	3,093	65	25	29 ⁷
Pumping Pool	1,198	591	49	24	29 ⁷
Sykeston - Northern	30	254	6	10	22
Sykeston - Southern	47	226	2	50	117
Sykeston - Missouri	261	1,745	8	90	152
Northern Pipeline	27	201	3	28	22
Southern Pipeline	34	217	3	47	117
Southern Contour Pipeline	25	301	4	52	117

14 **Second Phase Development**

- 15 1) Development beyond the major supply works would be the
16 responsibility of the State and local authorities.
- 17 2) Irrigation units would only be developed under the
18 following criteria:
- 19 A) Full adoption of Best Management Practices for water,
20 fertilizer, pesticides and cultural practices by
21 recipients of Project waters.
- 22 B) No surplus crops, except those required for Food
23 Security Act consideration plan compliance, would be

24 ⁷ Sites involving canal features of the Project have not been included.

- 1 grown under the irrigation systems funded with State
2 or Federal funds (Crops harvested as forage are not
3 surplus crops for purposes of this criteria). A
4 regime of alfalfa, beans, potatoes and many other
5 vegetable options are very likely.
- 6 C) Conjunctive use of groundwater and surface water be
7 utilized wherever feasible.
- 8 D) High value crops pledged in sufficient acreage to
9 support the processing plants as an integrated part of
10 the development.
- 11 E) The Business Plan for an integrated irrigation and
12 agricultural processing operation will be preceded by
13 a public process similar to the NEPA process in order
14 to determine short- and long-term impacts on the
15 environment.
- 16 F) Water conservation options for municipal, rural, and
17 industrial systems within the vicinity will be
18 completed with public input to determine their
19 viability as an additional water supply.
- 20 G) The total acreage developed by Missouri River waters
21 through the major supply works will not exceed 113,000
22 acres of surface irrigation within the Missouri River
23 drainage.
- 24 H) Opportunities for groundwater recharge beyond the
25 Missouri River Basin could be authorized features of
26 the proposal to be preceded by an appropriate
27 feasibility study, but are limited only by the

- 1 capacity of the major supply works to deliver said
2 waters.
- 3 I) A Garrison Development Trust be established for the
4 purpose of funding Indian and non-Indian development
5 beyond the major supply works through a combination of
6 loans and grants.
- 7 1. The Trust be funded by an annual appropriation
8 equal to five percent of the Bureau of
9 Reclamation's budget or \$35 million annually for
10 the next ten years until the total sum reaches
11 \$320 million in 1995 dollars.
- 12 2. Expenditures from the Trust Fund must be met with
13 a 20 percent match of nonfederal monies.
- 14 3. Interest earned on the unexpended portions of the
15 Trust may be set aside to defray State operation,
16 maintenance, and replacement costs for the major
17 supply works.
- 18 4. A Garrison Rural Economic Development Trust
19 Council be established to manage the funds of the
20 Trust and determine appropriate expenditures.
- 21 5. Expenditures for Indian development shall be
22 limited to those activities on the Fort Totten
23 Indian Reservation. The sum of these
24 expenditures reserved for such purposes shall be

1 \$20 or \$30 million, in accordance with the
2 anticipated lawsuit settlement.

3 J) Pick-Sloan project use power shall be available to
4 deliver Missouri River waters to the edge of the farms
5 or to the groundwater recharge areas.

6 Federal Justification for Continuing

7 Any discussion of the Garrison Diversion Unit must start
8 affirming the basic footings in our argument for completion of
9 the Project. The Garrison Diversion Unit was born during the
10 1944 Flood Control Act, which authorized the construction of the
11 main stem dams and reservoirs. These dams and reservoirs, if
12 proposed today, would not likely survive even the first set of
13 hurdles currently in place for water projects. For example:
14 Garrison-type mitigation for impacts on the lands submerged
15 would require the replacement of lost productivity. In general
16 terms, wetland mitigation results in the purchase of four acres
17 for every one acre impacted in order to replace impacts with
18 equivalent biological productivity. On this basis, 2.0 million
19 acres of agricultural production would be needed to replace the
20 productivity lost from 550,000 acres under the reservoirs.

21 Nevertheless, the dams and reservoirs are in place. Since
22 1952, the benefits accrued from these facilities, according to
23 the Corp of Engineers, total in excess of \$10 billion; a sum
24 that continues to grow each year, but with benefits which are
25 largely realized in the other basin states through flood
26 control, hydropower, and navigation. A major premise to the
27 argument for completion of the Project is that these benefits

1 have accrued, and continue to accrue, but the total cost for the
2 Project facilities has yet to be paid. Completion of the major
3 supply works of the Garrison Diversion Unit should be as much a
4 part of the costs of the main stem facilities as is the cost of
5 the spillway, or power plant, or the mitigation at Jamestown
6 Reservoir now being accomplished by the construction of bypass
7 facilities at Arrowwood National Wildlife Refuge, or the
8 armoring of islands in the Lake Audubon Refuge (a refuge in fact
9 created, without credit, by the dam and now being mitigated
10 through Garrison funding). Another analogy is the development
11 of the Lonetree Wildlife Management Area, a facility that would
12 not be possible without the land acquisition for the Lonetree
13 Dam and Reservoir and the impoundment by the Lonetree cofferdam.

14 Garrison is as much about economic stimulation as it is
15 about water rights. The leadership of this country is
16 attempting to stimulate economic growth and create job
17 opportunities. They have a choice as to where that growth might
18 or should occur. The case for providing the stimulant in North
19 Dakota is strong.

20 Two outstanding reasons why the incentives for growth
21 should be focused in North Dakota are that the infrastructure
22 costs are low and the quality of life is extremely high. In
23 short, completion of this economic stimulus project is eminently
24 logical and good for the country, but it should be pursued on a
25 two-phase approach. One phase for completion of the major water
26 supply facilities by the federal forces and a second phase for
27 rural economic development led by North Dakota.

1 This approach will reduce the federal appropriations
2 required for conventional project development and produce a
3 greater return through more effective economic stimulation.

4 **Time Frame and Additional Studies**

5 The cost estimates included are rough approximations of
6 Bureau of Reclamation costs.

7 More detailed review of the technical requirements of these
8 proposals is required. The Bureau of Reclamation would
9 certainly need to make its own estimates of these costs before
10 agreeing to the terms of any proposal involving construction by
11 their forces. The Conservancy District has asked the Bureau of
12 Reclamation to begin a programmatic EIS, which would provide the
13 basis for more reliable cost estimates of all reasonable
14 alternatives for the major supply works.

15 Similarly the Corp of Engineers' work on the Devils Lake
16 Stabilization program is needed in order to obtain reliable
17 federal estimates for those facilities.

18 The Draft Environmental Impact Statement, including a
19 preferred alternative for completing the major supply works,
20 could also include a programmatic discussion of the phase two
21 rural economic development initiative. Given the many parties
22 likely to have interests in the proposal and the likely public
23 input, the normal Bureau procedures would probably not allow
24 such a Draft EIS before 1996 (hopefully early 1996). After a
25 six-month period of explanation and consultation with the
26 appropriate Canadian counterparts, the proposal would be ready

1 for introduction as federal legislation as early as the fall of
2 1996.

3 North Dakota would, in the meantime, need to address its
4 responsibilities. The 1995 State legislature would be
5 appropriately timed to deal with the required State issues. In
6 the meantime, the Garrison Overview Committee needs to begin
7 consideration of the proposal.

8 In order to firm up on the MR&I requirements for the Red
9 River Valley communities, a current assessment done in
10 cooperation with the communities is needed. Approximately one
11 year from the initial start on the study should be sufficient
12 time.

13 Funding to continue the preconstruction planning on the
14 Turtle Lake Area has been requested. Assuming continued success
15 with this effort over the next two to three years, the Turtle
16 Lake Business Plan could be ready for approval and the start of
17 construction on the initial development as early as 1997. The
18 13,700-acre unit would be an ideal size for the initial phase
19 two demonstration.

20 This area represents the win-win objective in planning.
21 With continued support and success, recreation, wildlife, and
22 agriculture could all become winners, but most of all, the
23 community of Turtle Lake.

24 **Phase Two Assessment**

25 This concept is in an early stage of development and
26 certainly leaves many details to be worked out and perhaps other

1 thoughts to be incorporated. Notable among them is the
2 mechanism for generating the State and local funding
3 requirements. The benefit is that the federal investment is
4 reduced from a conservative \$1.2 billion for conventional
5 development of the Reformulation project with Devils Lake
6 Stabilization, to \$655 million for the major supply works. An
7 additional \$300 million in matching funds for development beyond
8 the supply works is focused on rural economic development and
9 job opportunities in a broader context, yet, does not abandon
10 irrigation so long as it integrates part of the enhanced
11 agricultural industry of the future. This phase results in an
12 additional federal benefit through reduced surplus crop payments
13 as farmers are led to more diverse high-value nonsurplus crops.

14 The concept is patterned after Title II of the
15 Reformulation Projects Authorization and Adjustment Act of 1992
16 (PL 102-575) for the Central Utah Project, Bonneville Unit. As
17 was the case in the CUP legislation, much work is needed to
18 clear up the details of the additional funding requirements for
19 the Project. Many of the estimates included in this paper are
20 subject to change and important details on some of the lesser
21 cost items are totally excluded, but the round numbers should be
22 sufficient for a preliminary discussion and appraisal of the
23 concept.

24 A nonfederal approach to development beyond the major
25 supply works is the key to success. It will involve new
26 partnerships in the public and private sectors in order to be
27 successful.

1 The programmatic EIS, which we have requested, will take
2 approximately two years to develop into Draft stage and is
3 needed in order to refine the cost estimates and to work out
4 agreements and other necessary details to support completion of
5 the major supply works and develop the proposal discussed
6 herein. The Draft EIS is also needed as a means for obtaining
7 consultation with Canada. During the next two years, all
8 available resources would need to be working cooperatively to
9 build a diverse base of support among all interested parties
10 regionally, as well as nationally.

11 The incentives and the basic tools are there. Under the
12 second phase development, responsibility is fixed at the State
13 and local level.

JOINT RESOLUTION NO. 93-7-461

To Encourage the Comprehensive Evaluation of all Possible Options for the Completion of the Principle Water Delivery System of the Garrison Diversion Unit

WHEREAS, the delivery of Missouri River water to the Sheyenne River, the James River, and Devils Lake is critically important to the future of North Dakota; and

WHEREAS, continued development of the Garrison Diversion Unit is an essential component of the water delivery system; and

WHEREAS, the completion of the delivery system has been indefinitely delayed because of controversy concerning the connection between the McClusky Canal and the New Rockford Canal; and

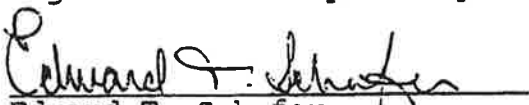
WHEREAS, many interests believe that additional options should be developed concerning the completion of the principle water delivery system; and

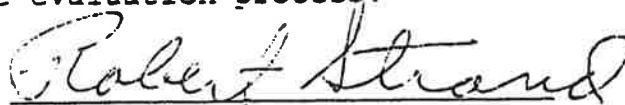
WHEREAS, the Garrison Diversion Conservancy District has prepared a "seven year plan" and "discussion paper" which address the several options for completing the principle water delivery system and the other key features of the Garrison Diversion Unit; and

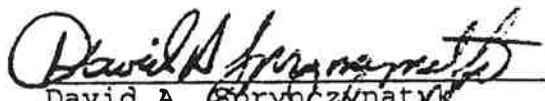
WHEREAS, other state organizations and agencies should now participate in the continued analysis of the options for completing the principle water delivery system.

NOW, THEREFORE, BE IT RESOLVED that the North Dakota State Water Commission and the Board of Directors of the Garrison Diversion Conservancy District at a joint meeting on July 1, 1993 in Devils Lake, North Dakota, encourage the comprehensive evaluation of all possible options for the completion of the principle water delivery system of the Garrison Diversion Unit; and

BE IT FURTHER RESOLVED that the State Water Commission and the Board of Directors of the Garrison Diversion Conservancy District also encourage all interested public and private organizations to participate in the evaluation process.


Edward T. Schafer
Governor-Chairman
State Water Commission


Robert Strand
Chairman, Garrison Diversion
Conservancy District


David A. Spryoczynaty
State Engineer and
Chief Engineer-Secretary


Warren L. Janson
Manager, Garrison Diversion
Conservancy District

July 1, 1993



North Dakota State Water Commission

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MEMORANDUM

TO: Governor Edward T. Schafer
State Water Commission Members

FROM: *David* David A. Sprynczynatyk, State Engineer

SUBJECT: Safe Drinking Water Act

DATE: June 14, 1993

The Safe Drinking Water Act (SDWA) was originally passed by the United States Congress in 1974, and gave the Environmental Protection Agency (EPA) the responsibility, among other things, to set drinking water standards for public water systems. The State of North Dakota applied for and obtained primacy (the authority to implement and enforce the SDWA) in 1978. The state agency responsible for implementation and enforcement of the SDWA is the Department of Health and Consolidated Laboratories, Division of Municipal Facilities (Health Department).

In 1986, Congress amended the SDWA and established specific deadlines for EPA to set new drinking water standards. The amendments, among other things, required EPA to set enforceable maximum contaminant levels (MCL) for 83 specific contaminants found in drinking water; to establish new filtration and disinfection criteria for public water systems that utilize surface water supplies; and set requirements for all remaining public water systems to provide disinfection.

In addition to setting standards for 83 contaminants, the SDWA mandated that EPA set standards for an additional 25 contaminants every three years thereafter. The number of regulated contaminants may reach 150 by the year 2000. Attached is the most current schedule for new regulations under the SDWA.

The following 12 major rule packages have been or will be promulgated by EPA to meet the congressional mandates of the 1986 amendments.

- Fluoride - MCL relaxed (13 community water systems, however, remain in violation).
- Lead Ban - establishes lead limits for potable water plumbing materials.

GOVERNOR EDWARD T. SCHAFER
CHAIRMAN

DAVID A. SPRYNCZYNATYK, P.E.
SECRETARY & STATE ENGINEER

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- Phase I (volatile organic chemicals) - initial monitoring complete (no MCL violations), repeat monitoring integrated into the Phase II/V rules.
- Public Notification - required only if there is a violation (i.e., monitoring/reporting, treatment technique, MCL, etc).
- Total Coliform Rule - new bacteriological monitoring/reporting and MCL requirements established, compliance determined on an ongoing basis through monthly or quarterly sampling.
- Surface Water Treatment Rule - new filtration and disinfection monitoring/reporting and treatment technique requirements established, new monitoring/reporting begins July 1993, surface water plants in the process of being individually evaluated.
- Phase II/V - revamps/expands current inorganic and organic chemical monitoring/reporting and MCL requirements, initial monitoring underway.
- Lead Copper Rule - initial monitoring completed for medium- and large-sized systems (two medium-sized systems exceeded the action levels), initial monitoring for small-sized systems (approximately 3,300 population) begins July 1, 1993.

The following additional rules have not yet been proposed or finalized:

- Phase III (radionuclides).
- Phase VI-A/B (disinfection/disinfection byproducts and approximately 13 additional contaminants).
- Sulfate.
- Arsenic.
- Groundwater disinfection.

The EPA sets drinking water standards as follows:

- The EPA publishes proposed regulations in the Federal Register for comments. Final regulations are then published taking comments received into account. The regulations generally become effective 18 months after being finalized. In some instances, public water systems may be required to address portions of the regulations prior to the effective date.
- The Health Department must adopt drinking water regulations as stringent as the federal drinking water regulations.
- The Health Department is responsible for implementation and enforcement of the regulations.

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The varying effective dates and compliance time-frames under the SDWA regulations make it difficult to determine noncompliance, if any, for all public water systems. The construction season in North Dakota also is a factor affecting how a water system can plan, design, bid, and construct projects in a time-frame that will correspond to available funding.

Since North Dakota has the responsibility for implementation and enforcement of the SDWA, the Health Department has some flexibility in determining the manner and time-frame that a public water system must comply with the SDWA regulations. If EPA believes a violation is not being addressed in a timely and appropriate manner, it has the authority to fine a water system up to \$25,000 per day for noncompliance with the SDWA.

The Health Department is presently evaluating the impacts of the surface water treatment rule on systems that use surface water sources. To assess compliance, reports based on a Health Department developed protocol have been requested of 31 water supply systems that use surface water in the state. To date, 6 reports have been approved, 14 others are under review, and 11 have yet been received. Two other surface water systems will be part of new rural water systems that are under construction. Until these reports are prepared and reviewed for compliance, it is not possible to determine compliance status on the cost of corrective actions.

Since 1987, the Municipal, Rural, and Industrial (MR&I) water supply program has provided grant funding primarily for construction of new water systems and existing systems with water quantity problems and not water quality problems. Currently, the funding needs of water systems is estimated at \$400 million. This figure does not include costs for addressing the requirement of the SDWA. The MR&I program, however, is only one potential funding source for addressing these problems.

Through FY '93, the MR&I program will receive \$82 million of the \$200 million federal authorization. The \$118 million balance will not be able to solve the water problems that are currently being addressed, but the funding will be utilized in the most effective way possible. Top priority projects are given an indication in July of each year if federal funding will be available in the coming fiscal year for that project. The MR&I program also does not have provisions for emergency funding of projects to solve water quantity and quality problems. A realistic time-frame for a MR&I project to be developed is three years. This timing is dependent on the project's priority points which are based on the quantity and/or quality problems of the water system, availability of federal and nonfederal funding, and when the process began in the federal fiscal year.

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Currently there is no estimate nor a definite time-frame when final compliance of the SDWA can be obtained by North Dakota public water systems. The 1991 Legislative Assembly, through Concurrent Resolution No. 3022, requested the Legislative Council to study the effects of compliance with the federal SDWA on North Dakota and its communities. The Natural Resources Committee was assigned the resolution. The committee recommended that North Dakota retain primacy for administration and enforcement of the SDWA. They also recommended Senate Concurrent Resolution No. 4008 to urge Congress to moderate enforcement of the SDWA.

Attached is a summary of the SDWA prepared for the Northwest Area Water Supply project. As can be seen, the SDWA regulations are very detailed and complex. Considering the limited funding available, the State Water Commission has taken the position to deal with projects that address SDWA regulations as the problem comes up. The problem of enforcing the SDWA regulations and correcting compliance problems shows the importance and need for establishing a fund for water development in North Dakota.

DAS:JNM:dm/237-3

SAFE DRINKING WATER ACT (SDWA)*

<u>REGULATION</u>	<u>PROPOSED</u>	<u>FINAL**</u>	<u>EFFECTIVE***</u>
National Interim Primary Drinking Water Regulations (NIPDWR)		12/24/75	06/24/77
NIPDWR Amend. No. 1 - Radionuclides		07/09/77	06/24/77
NIPDWR Amend. No. 2 - THM's		11/29/79	VARIES
NIPDWR Amend. No. 3 - Sodium & Corrosion		08/27/80	02/27/82
National Secondary Drinking Water Regulations		07/19/79	01/10/81
Fluoride	11/84	04/86	10/87
Lead Ban (SDWA 1417)	06/86	06/86	06/86
Phase I Volatile Organic Contaminants (VOC's)	11/85	07/87	01/89
Public Notification	04/87	10/87	04/89
Total Coliform Rule	11/87	06/89	12/90
Surface Water Treatment Rule	11/87	06/89	VARIES
Lead/Copper Rule	08/88	06/91	VARIES
Phase II - 38 Synthetic Organic Chemicals (SOC's) and Inorganic Chemicals (IC's)	05/89	07/91	07/92
Phase V - 24 Contaminants	07/90	07/92	(01/94)
Phase III - Radionuclide Rule	07/91	(04/93)	(10/94)
Phase VIa - Disinfection/Disinfection By-Products Rule w/interim enhanced Surface Water Treatment Rule	(12/93)	(06/96)	(12/97)
Phase VIb - 25 Contaminants	(06/93)	(06/95)	(12/96)
Sulfate Rule	(10/93)	(12/94)	(05/96)
Arsenic Rule	(09/94)	(09/96)	(03/98)
Ground Water Disinfection Rule	(08/94)	(08/96)	(02/98)
Enhanced Surface Water Treatment Rule	(06/97)	(12/98)	(06/2000)

* As of April, 1993

** All dates after April 1993 are estimated

SDWA Regulated Contaminants*

Contaminants	MCLG (mg/L)	MCLG (mg/L)	Contaminants	MCLG (mg/L)	MCL (mg/L)
Fluoride	4.0	4.0	Heptachlor epoxide	zero	.0002
Phase I			Nitrate	1	1
Trichloroethylene	zero	0.005	Aldicarb sulfoxide	0.001	0.002
Carbon Tetrachloride	zero	0.005	Aldicarb sulfone	0.001	0.002
1,1,1-Trichloroethane	0.2	0.2			
1,2-Dichloroethane	zero	0.005	Lead and Copper		
Vinyl chloride	zero	0.002	Lead	zero	TT ¹
Benzene	zero	0.005	Copper	1.3	TT ²
p-Dichlorobenzene	0.075	0.075			
1,1-Dichloroethylene	0.007	0.007	Phase V		
			Dichloromethane	zero	0.005
Coliform & Surface Water Treatment			(1,2,4-) Trichlorobenzene	0.07	0.07
Total Coliforms	zero	1/100 ml	Hexachlorobenzene	zero	0.001
Turbidity	N/A		Antimony	zero	0.006
Giardia Lamblia	zero	TT	Nickel	0.1	0.1
Viruses	zero	TT	Thallium	0.0005	0.002
Standard plate count	N/A	TT	Beryllium	0.004	0.004
Legionella	N/A	TT	Cyanide	0.2	0.2
			Endrin	0.002	0.002
Phase II			Dalapon	0.2	0.2
Tetrachloroethylene	zero	0.005	Diquat	0.1	0.1
Chlorobenzene	0.1	0.1	Endothall	0.1	0.1
trans-1,2-Dichloroethylene	0.1	0.1	Glyphosate	0.7	0.7
cis-1,2-Dichloroethylene	0.07	0.07	Adipates (diethylphenyladipate)	0.5	0.5
p-Dichloroethylene	0.6	0.6	Diethylhexyl Adipate	0.4	0.4
Barium	2	2	2,3,7,8-TCDD (Dioxin)	zero	3x10 ⁶
Cadmium	0.005	0.005	1,1,2-Trichloroethane	0.003	0.005
Chromium (total)	0.1	0.1	Vydate	0.2	0.2
Mercury (inorganic)	0.002	0.002	Simazine	0.004	0.004
Nitrate	10	10	PAHs (benzo(a)pyrene)	zero	0.0002
Selenium	0.05	0.05	Phthalates		
Asbestos	7MFL	7MFL	Diethylhexylphthalate	zero	0.004
Lindane	0.0002	0.0002	Picloram	0.5	0.5
Methoxychlor	0.04	0.04	Dinoseb	0.007	0.007
Toxaphene	zero	0.003	Hexachlorocycloperadiene	0.05	0.05
2,4-D	0.07	0.07			
Silvex 2,4,5-TP	0.05	0.05	Radionuclides (proposed)		
Aldicarb	0.001	0.000	Radium 226	zero	20 pCi/L
Chlordane	zero	0.002	Radium 228	zero	20 pCi/L
Carbufuran	0.04	0.04	Beta particle and proton radioactivity	zero	4 mrem/yr
Alechlor	zero	0.002	Uranium	zero	0.02
Epichlorohydrin	zero	TT	Gross alpha particle activity	zero	15 pCi/L
Toluene	1	1	Radon	zero	300 pCi/L
PCBs	zero	0.0005			
Atrazine	0.0003	0.003	Sulfate (proposed)		
Acrylamide	zero	TT	Sulfate	400/500	400/500
Dibromochloropropane (DBCP)	zero	0.0002			
1,2-Dichloropropane	zero	0.005	Arsenic (Interim)	0.05	0.05
Pentachlorophenol	zero	0.001	(Anticipated)		0.001
Ethylene dibromide (EDB)	zero	0.00005			
Xylene (total)	10	10	Disinfection By-Products		
Ethylbenzene	0.7	0.7	Total Trihalomethanes (Interim)		0.10
Styrene	0.1	0.1			
Heptachlor	zero	0.0004			

*Action level = 0.015 mg/l.

*Action level = 1.3 mg/l.

TT = Treatment technique requirement

*As of April, 1993



North Dakota State Water Commission

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MEMORANDUM

TO: Governor Edward T. Schafer
State Water Commission Members

FROM: *Dave* David A. Sprynczynatyk, State Engineer

SUBJECT: Northwest Area Water Supply (NAWS) Project

DATE: June 15, 1993

On October 1, 1992, the Garrison Conservancy District approved \$533,000 of funds for the prefinal design of the Northwest Area Water Supply (NAWS) system. It was further agreed that the State Water Commission would oversee the development of the prefinal design. On December 24, 1992, the engineering team of Houston Engineering, Fargo; American Engineering, Bismarck; and James Montgomery, Boise, Idaho, was selected to complete the prefinal design. In February 1993, work on the prefinal design commenced.

The prefinal design of NAWS is expected to be completed by July 1, 1994. The goal of the prefinal design is to move the project to a point where final design can begin. The prefinal design will concentrate on identifying user needs, the execution of water service agreements with communities and rural water associations, and preparation of drawings and design reports defining the selected project configuration. To get the prefinal design phase off to a successful start, a series of 10 meetings were held the week of March 22-26, 1993, in a ten-county area in northwest North Dakota.

To better define the scope of the project, communities and rural water associations interested in the project were asked to enter into NAWS Agreements of Intent to Purchase Water with the State Water Commission. These agreements, which included a commitment fee, state that the community or rural water association will consider entering into a water service agreement with the State Water Commission at the conclusion of the prefinal design. Only those communities and rural water associations signing agreements will be included in the prefinal design. As of June 8, 1993, the State Water Commission has received NAWS Agreements of Intent to Purchase Water from 40 communities and 8 rural water associations. The population represented by these communities and rural water associations is estimated at 90,000 people. The total population within the nine-county area identified in the 1988 NAWS study is estimated at 120,128 according to the 1990 census. Excluding Rugby, which is in Pierce County, the population under agreements represents approximately three-quarters (72.5%) of the total. This percentage could increase somewhat with the potential development of the rural water associations.

GOVERNOR EDWARD T. SCHAFFER
CHAIRMAN

DAVID A. SPRYNCZYNATYK, P.E.
SECRETARY & STATE ENGINEER

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Work on the prefinal design is proceeding on schedule. Currently, the engineering team is updating the water needs of those communities signing agreements, drafting an Environmental Assessment, and formulating project design criteria based in part on population projections for the project area. The design criteria (daily and peak consumption) will be used in determining the size of project facilities.

Background Information:

The citizens of northwestern North Dakota have endured problems with their water supply for many years. The idea of diverting water from the Missouri River to western North Dakota began to evolve in the late 1950s, with the construction of Garrison Dam. In the late 1970s and early 1980s, a study was undertaken to determine the feasibility of supplying water to southwestern North Dakota from Lake Sakakawea. This study eventually led to construction of the Southwest Pipeline Project.

The Garrison Diversion Municipal, Rural, and Industrial (MR&I) water supply program was authorized in 1986 through the Garrison Diversion Reformulation Act. This act authorized \$200 million for development of water supply facilities throughout the state.

Another part of the Garrison Diversion Reformulation Act was a promise to the Three Affiliated Tribes of the Fort Berthold Indian reservation of development of a reservation-wide water supply system to meet their needs. A study of reservation water needs was completed which estimated the cost of a reservation-wide MR&I system at between \$50 and \$60 million. Reclamation was successful in gaining appropriation of approximately \$8 million for some components of this system.

An agreement between the State Water Commission and the Garrison Diversion Conservancy District for joint exercise of governmental powers provides a method through which the Commission and the Conservancy District can cooperatively develop a process for submitting proposals to the Secretary of Interior for funding of MR&I water system projects. On the basis of this agreement, the Northwest Area Water Supply study was initiated in November 1987, which culminated in a report dated November 1988.

In 1988 the NAWS project sponsors and the tribes recognized the potential benefits of cooperating in development of an integrated system to meet the needs of the NAWS project area and the reservation. Integrating the systems would result in substantial cost savings due to the elimination of redundant facilities and the economies of scale.

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The 1991 North Dakota Legislative Assembly passed into law a bill creating the NAWS Advisory Committee made up of representatives of communities, rural water associations, water managers, and rural citizens throughout the NAWS project area. In 1991, legislation was introduced in Congress by Senator Kent Conrad authorizing construction of an integrated regional water supply system to be called the Na chiin Hunn-Dakota Project.

In the early months of 1992, tribal representatives decided that pursuit of an integrated project might jeopardize \$50 million in compensation the tribe was seeking under Joint Tribal Advisory Committee legislation. Further efforts to preserve tribal support of the integrated project have been unsuccessful. On April 19, 1993, a letter (copy attached) was sent to the tribal chairman asking if the Three Affiliated Tribes were interested in joining with the state in developing the project. To date, we have not received a response to the letter.

In the fall of 1992, the NAWS Advisory Committee adopted a motion requesting that the State Water Commission and Conservancy District approve funding for a "prefinal" design of a non-integrated project. This request was subsequently approved by the State Water Commission and the Conservancy District.

The goal of the prefinal design is to move the project to a point where final design will begin. The prefinal design will concentrate on identifying user needs, the execution of water service contract with communities and rural water associations, and the preparation of drawings and design reports of the selected project configuration. Upon completion of the prefinal design contract, the next step will be final design and construction based upon specifications prepared by the engineering team.

Work on the prefinal design commenced in February 1993, and is expected to be complete with a final report ready on July 1, 1994.

The Role of Science in Environmental Problem Solving

David R. Givers¹ and Jay A. Leitch²

Prologue

Science has been called upon to help resolve a long-standing transboundary water transfer issue -- the Garrison Diversion Unit and biota transfer. However, to avert any potential misunderstanding about the ability of science to unquestionably resolve issues, the proper role of science in society needs to be addressed. This paper, first, highlights the role of science in social problem solving, then describes the role in light of the potential interbasin transfer of undesirable biota.

Science as a Component of Society

An important first step in problem solving is problem identification. Social problem solving, often involving contentious parties, requires participants to agree on problem definition. Barriers to social problem solving may occur because parties do not agree on problem definition such as whether or not the problem even exists, what the nature of the problem is, and whether or not the problem, perceived or real, actually matters (Trudgill 1990). Under these circumstances, policy makers may turn to science to help to identify and to define problems in the expectation of clarifying and resolving conflicts.

There are two ways in which science and the scientific method commonly serve society and policy makers. (1) Science may produce specific, objective or factual information on technical problems (a descriptive process) or, (2) Techniques developed through academic study can be used to define problems and provide a framework or a rationalized method for choosing solutions or

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furnish a method for weighting decisions (a decision-making process). Decision-framing techniques include methods such as:

- the nominal group process is used to generate agreement on problem definition and agreement on approaches to solutions (Delbecq et al. 1986, Leitch and Leistriz 1984),
- economic decision frameworks such as benefit-cost analysis, internal rate of return, or potential Pareto improvement are used to rank policy options after policy goals have been defined (Tietenberg 1992),
- risk assessment is the process leading to scientific judgement and is separate from policy judgement or risk management (National Research Council 1983), and
- weighted-factor analysis assigns relative numeric values to each component of a complex problem and derives a single-measure value to compare project alternatives. Multi-objective decision making process is one example of this type (Chankong and Haines 1983). Frequently used in water allocation and development, the multi-objective process is based on systems science and engineering disciplines, incorporates utility theory from economic science, and derives a weighted objective function to evaluate decisions (Givers 1989).

Science does offer useful tools for non-technical choice making. It provides methods for problem identification and definition as well as being the best source of objective data generation to describe systems and conditions. Science can not usually provide single-measure outcome values, but rather, it provides statistical ranges of values or probabilistic confidence

intervals. Single-valued choices (policy decisions) are reserved to the policy arena.

Scientists are often asked to serve as advisors to government and non-governmental organizations. An advisory role is a step removed from the scientific method. Science advisors are asked to interpret science, render advice, and perhaps to shape policy objectives. The assumption is that the scientist can render opinions rationally and dispassionately, but there is no evidence that this is so (Trudgill 1990, Bundy 1966).

Studies of scientific advising leave in tatters the notion that it is possible, in practice, to restrict the advisory process to technical issues or that the subjective values are irrelevant to decision making (Jasanoff 1990, page 230).

This does not imply that scientists should be categorically prohibited from rendering advice and expert opinion any more than business managers, farmers, or ordained ministers be intentionally excluded from participating in policy formulation. Rather, scientists acting in an advisory role are not practicing science in that role. A scientist's opinion on social policy is distinct from his or her knowledge of a discipline and that knowledge does not automatically confer wisdom to make social choices.

Limits of Science

What science can do is provide techniques for organizing problem-solving exercises and methods for testing the validity of hypotheses and the credibility of data sets. Science can be used to narrow the range of policy options available "beyond a reasonable doubt." The role of science in social problem solving is vital but limited. Democratically-organized societies have established an hierarchical relationship of science to social decision making. Final decisions, choosing amongst the range of options defined or developed through research and science-based recommendations, rest with policy managers and elected officials.

Science is only one component of society, so it can not

organize or direct social policy. The building block of all science-based decision making is research (Figure 1). Research is divided into basic and applied science. The former is conducted primarily by academics. A second group of scientists, called pracademics, work to move the fundamental research closer to practical or more commonly useful applications of the underlying science. This is an important distinction. Basic science often does not have immediate applicability either for commercialization of goods and services or for policy formulation and administration. Pracademic applications can help move basic research into product development and the social policy arena.

Ecosystem Science and Environmental Decision Making

Ecosystem science (ecology) may be considered a nascent science. The earliest recognized usage of the term ecosystem was in 1869 by the German biologist Ernst Haeckel. Specific discoveries and writings and theoretical constructs followed. The number of scientists pursuing ecological studies increased in North America, which led to the founding of the Ecological Society of America in 1914 (Burgess 1977).

Science and knowledge are cumulative and subject to change, as each generation makes its contributions. Early students of ecology such as George Perkins Marsh (1874) established a framework of thinking which focused on the interaction of natural resource systems and the relation of humans to the natural environment. This paradigm, or conceptual way of thinking, remains, but our knowledge of specifics has obviously increased as have modifications to ecological theory.

Ecosystem modeling is of more recent vintage and only came of age after the proliferation of computer-based technology. Wetlands delineation is also a recent development. One of the first science-based wetlands classification schemes was developed by Cowardin et al. as recently as 1979. Similarly, interbasin

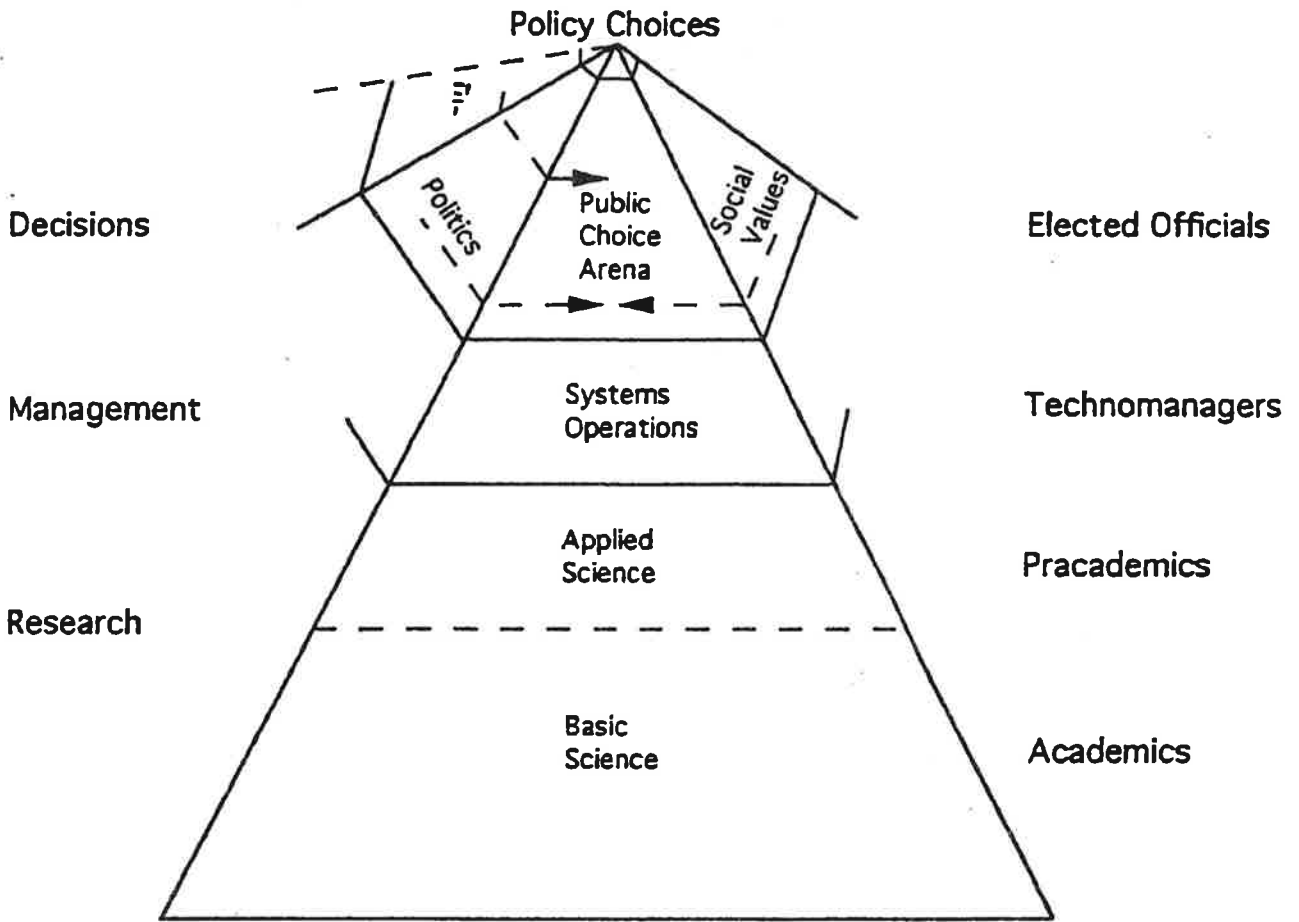


Figure 1. The Role of Science in Public Policy Choices.

water transfer biota studies are a recent scientific endeavor (Padmanabhan et al. 1992).

Ecological knowledge has expanded through data collection, hypothesis testing, and modeling. Science typically relies on modeling to test theory and to make predictions. Models are simplifications of complex real systems. Models can provide a generalized but accurate description of the behavior of systems and components. The purpose of using a model is to develop theory which has predictive value.

Ecological simulation is in an early stage of development. It is not possible at this time to construct a model that incorporates all the important environmental variables and allows them to interact in unison as they do in real systems (Swartzman and Kaluzny 1987). The goal of modeling is to provide generalizable conclusions from specificity, precise assessment of specific components of the system, and realistic representation of existing conditions. No existing ecological model can provide all three simultaneously (Swartzman and Kaluzny 1987, Levins 1966).

Given the comparatively recent contributions of ecological science to the understanding of ecological structure and functions and given the limitations of models describing ecosystems, neither scientists nor decision makers should promise more or expect more than science can deliver. Society, nonetheless, does not wait for scientists to refine models and theories -- decisions must and will be made.

Science has been used in wetlands delineation in an attempt to resolve differences of opinion, but controversy remains.

In fact, much of the controversy over the 1989 manual stems not from a lack of specific scientific definition, but from confusion over its application and interpretation and a lapse of communication both among federal agencies and between headquarters and field officers of the involved agencies. These problems will not be overcome by a scientific study. A scientific study would not address the issues of jurisdictional impact, wetland management, or administrative issues (such as monitoring, compliance, and enforcement) that

are inextricably tied to the manual and the source of many of its implementation problems. (Collins 1992, page 7).

A similar situation exists with respect to biota transfer and Garrison Diversion. "In this case, participants in the dispute have differing perceptions of what constitutes an acceptable risk . . . the judgement of what level of risk is acceptable or tolerable remains largely irreducible to scientific proof. Attitudes toward what constitutes an acceptable level of risk are subjective (Feldman 1991, page 100)."

Thus scientists and policy makers have found themselves involved in situations that require careful definition of the role each can fulfill. Science may have been called upon to render judgements in cases where it can not easily provide answers because the science is new and the evidence is only beginning to be accumulated or, where scientific evidence is available, it is not the role of science to resolve disputes or to make social policy decisions.

Ecosystem modeling is only one step in the problem solving process and it is not even the first step (Chechile 1991, Trudgill 1990, National Research Council 1986). A recommended outline for solving environmental problems is to involve scientists from the beginning, treat projects as experiments, publish information, set proper boundaries on projects, use natural-history information, be aware of interactions, be alert for possible cumulative effects, plan for heterogeneity in space and time, and prepare for uncertainty and think probabilistically (National Research Council 1986).

Science and Biota Transfer

Biota transfer was identified by the North Dakota Governor's Oversight Committee as the main concern in an ongoing water transfer controversy between North Dakota and Canada. Several researchable "scientific" issues were identified by the

Interbasin Biota Transfer Study Program Technical Advisory Team (IBTSP-TAT) (Leitch and Grosz 1988):

- efficacy of fish screens and filtration technology,
- role if any of underground return flows,
- distribution and life cycles of specific biota and pathogens identified as important to Canadian concerns, and
- transfer potential via municipal and industrial water and from failure of Garrison Diversion Unit (GDU) operational systems.

Scientists began working to provide information to resolve these issues in 1988. TAT has issued five rounds of Requests for Proposals (RFPs) inviting the scientific communities in Canada and the United States to conduct research to provide answers to researchable issues.

For example, fisheries scientists, making routine observations, noted that rainbow smelt (*Osmerus mordax*) were not present in the Hudson Bay Drainage Basin. Consequently, the smelt was identified as a species with potential to damage or disrupt Canadian fisheries if Garrison Diversion transfer occurred (IJC 1977).

Given the initial absence of smelt in the basin, science could not predict they would be observed in Lake Winnipeg on September 26, 1990, as was the case (Campbell et al. 1992). Given the presence of smelt in Lake Winnipeg, scientists can not yet predict that a viable or competitive population will result. An invader may fail to reproduce and extend its range in this new ecosystem or it may invade and survive with no net change on the existing fishery (Moyle et al. 1987). Definitive answers to these questions await further study. However, scientists may eventually be able to infer an outcome and perhaps, through expert judgement, assign a probability or likelihood of the impact within a range of outcomes.

The limits of science are obvious in this example. As noted above, finding answers to researchable issues may not necessarily

provide an indisputable base from which decision makers can formulate policy. However, science can narrow the framework within which decisions can be made.

Another example of a researchable concern is the effectiveness of mechanical filters and screens on biota transfer. Phase one, laboratory and bench testing, is complete (Turner and Hefta 1990). Test of the hypothesis (direct filtration combined with disinfection removes pathogens) showed that pilot-scale modeling was warranted and follow-on research continued in RFP rounds four and five of the five year study plan. Scale-up of equipment and economic feasibility would be the next phase assuming the researchable hypothesis is not subsequently rejected.

Research, based on the use of models to replicate real world conditions, holds the potential for identifying biota transfer problems and potential solutions. However, no definitive conclusions can be drawn at this juncture.

Conclusion: Role of Science in Social Problem Solving

Science has much to offer, but one must conclude that science alone can not resolve the issue of interbasin biota transfer, or most all other social choice issues. Science can provide a less subjective, broader defensible base for decision making. It can present information (descriptive science or data collection and hypotheses testing) that is held to be true "beyond a reasonable doubt." Yet doubt is never entirely and absolutely absent.

Leitch and Givers (1991) state that resource management policy sits firmly upon a three-legged stool comprised of science, economics, and political decisions. All three are equally important and necessary cornerstones to policy. Technical know-how, supplied by science, is necessary to implement sound management goals (the knowledge facet of policy) and policy initiatives must be economically viable to be

sustainable. The third leg is comprised of policy decisions developed in the political arena.

Science and the scientific method should be thought of as tools or means to an end available to tool users. Science, through application of its tools, can only offer a solution within a range of values, or probabilities. The end users of these tools are policy makers elected to serve society. Science can provide policy makers with decision-making tools to weight the various factors involved in problem solving.

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Proposal

for a

Statewide Water Coalition

and for a

monthly

North Dakota Water Magazine

Executive Summary

There is a critical need for the development of a statewide water coalition to address North Dakota's water supply and water distribution requirements. There is also a need to develop a regular communication tool for informing North Dakota decision-makers and the general public concerning water issues, including water supply, water distribution, water quality, wetlands, and water use.

The primary goal of a statewide water coalition is to address North Dakota's water supply and water distribution issues. The objectives of the North Dakota Water Coalition will be as follows:

1. Implement the flagship initiatives of the North Dakota Vision 2000 Report concerning water infrastructure to secure and enhance North Dakota's future economic well-being and quality of life.
2. Develop and maintain statewide organization support for a statewide water supply and water distribution system.
3. Establish a mechanism for the exchange of information, discussion, and ideas among organizations concerning water supply and water distribution issues and projects, and provide information and education concerning these matters to federal, state, and local decision-makers.

In connection with this effort, there is a serious need to provide concise and timely information to policy and decision-makers, and the general public, concerning water issues and projects in North Dakota. A monthly water magazine, titled *North Dakota Water*, will meet this need and demand in the most efficient and effective manner.

The primary goal of *North Dakota Water* will be to communicate to people about water. *North Dakota Water* will educate, inform, and make North Dakota citizens aware of the importance of water for agriculture, for business, for economic well-being, for recreation, for wildlife, for municipal and rural growth, and for quality of life. The objectives of *North Dakota Water* will be:

1. To publish a magazine focusing on the importance of water in the lives of North Dakota citizens.
2. To educate and inform students, teachers, farmers, decision-makers, business and private interests, and the general public about the importance of water issues, including water supply, water distribution, water quality, wetlands, and water use.
3. To promote the protection, development, and management of North Dakota's water resources.

A statewide water coalition, along with a monthly water publication, would achieve significant progress for developing understanding and awareness of critical water issues among statewide organizations and the people of North Dakota.

North Dakota Water Coalition

A. Introduction and Objectives: This is a proposal to establish a statewide water coalition of organizations and entities called the North Dakota Water Coalition.

The primary goal of a statewide water coalition is to address North Dakota's water supply and water distribution issues. The objectives are as follows:

1. Implement the flagship initiatives of the North Dakota Vision 2000 Report concerning water infrastructure to secure and enhance North Dakota's future economic well-being and quality of life.
2. Develop and maintain statewide organization support for a statewide water supply and water distribution system.
3. Establish a mechanism for the exchange of information, discussion, and ideas among organizations concerning water supply and water distribution issues and projects, and provide information and education concerning these matters to federal, state, and local decision-makers.

While the North Dakota Water Coalition is intended to become self-sustaining, initial funding in the estimated amount of \$38,000 each year for a two year period must be identified.

B. Background. In 1984, an organization called the Garrison Diversion Action Council was formed. A number of statewide organizations participated in that effort, directed toward providing support for the Garrison Diversion Project in North Dakota. Although effective and active for a short period of time, the Garrison Diversion Action Council eventually discontinued.

In 1988, another effort was undertaken to establish a coalition of local, regional and statewide entities to address the need to complete the Garrison Diversion water distribution system. This informal organization was called the Garrison Coalition. However, the participants agreed that a statewide water coalition to address all of North Dakota's water distribution and water supply issues was necessary. As a result, the North Dakota Water Coalition was organized in the spring of 1993.

C. Project Staff. The North Dakota Water Coalition will require a public information director to achieve the objectives of the North Dakota Water Coalition. This staff person will provide direct communication concerning water supply and water distribution issues, and will facilitate the providing of information, discussion of ideas, and the building of consensus among those organizations and entities which become a part of the North Dakota Water Coalition.

North Dakota Water

A. Introduction and Objectives: This is a cooperative proposal to publish a monthly water magazine titled *North Dakota Water*.

The primary goal of *North Dakota Water* is to communicate to people about water. The objectives are as follows:

1. To publish a magazine focusing on the importance of water in the lives of North Dakota citizens.
2. To educate and inform students, teachers, farmers, political decision-makers, business and private interests, and the general public about the importance of water supply, water distribution, water quality, wetlands and water use.
3. To promote the protection, development, and management of North Dakota's water resources.

North Dakota Water will not initially be self-supporting. Therefore, initial funding in the estimated amount of \$92,000 each year for a two-year period must be found.

B. Project Description: *North Dakota Water* will be a high-quality, monthly publication designed to inform the reader of water issues, policies, and developments affecting North Dakota. The mission of the publication is to educate North Dakota decision-makers and citizens about the importance of water, including use, conservation, management and development. This magazine will provide participating organizations an opportunity to develop an effective and efficient channel of communications concerning water issues and projects. It is anticipated that *North Dakota Water* will become the "voice" of water in the state.

C. Potential audiences: The primary audience may be described as selected federal, state, and local officials, and all water-related organizations and groups. The secondary audience may be described as the general public, particularly age groups in the 25-54 range. Mailing lists are available for these various audiences, representing approximately 3,500 + contacts (see "North Dakota Water-Target audience"). This figure is expected to increase as water issues evolve.

D. Competition: While not "competitive" in the retail sense of the word, all water publications vie for limited readership. As stated elsewhere in this plan, our intention is to create a single publication that will be the written communication tool for water. The editorial contents will bring into sharp focus water issues in the state, presenting them in a concise and easily understood format. The real competition is to escape the junk mail syndrome by producing a magazine that will be recognized as the leader in water-related news and information in North Dakota.

North Dakota Water

(continued)

E. Editorial policy and board: Contents of the magazine shall be presented in a manner consistent with commonly accepted journalistic practices. The magazine shall neither endorse nor advocate political or partisan positions. The contents must be presented objectively. Editorial opinions (Ed-Ops) shall be permitted, but limited to one per issue. Editorial policy shall be determined by a board, which shall include one appointee each from sponsor organizations and agencies. Appointees shall be knowledgeable of water issues in North Dakota and shall possess the authority to make decisions concerning magazine content.

F. Publication details

1. The magazine shall be titled "*North Dakota Water*".
2. The magazine shall be published on a monthly basis, 10 publications each year, consisting of 16 to 24 pages of material.
3. Initially, no advertising will be included, but will be considered in the future.
4. Subscriptions for the magazine will be determined once the magazine has been established.
5. The format shall consist of a high quality magazine, with a glossy finish cover, and a graphics combination of color and black and white photos, and line art and other graphic embellishments.
6. The magazine shall be published by the North Dakota Water Education Foundation. The editorial office shall be located in Bismarck.
7. A publication schedule shall be planned 12 months in advance. Each issue may include a portion dedicated to newsbriefs or other short items of information.

North Dakota Water

Target audience

The target audience for *North Dakota Water* shall initially include the following:

1. North Dakota Legislators (150)
2. North Dakota County Commissioners (250)
3. North Dakota County Auditors (50)
4. North Dakota City Auditors (300)
5. North Dakota Mayors (300)
6. North Dakota Water Managers (300)
7. North Dakota Media, including all newspapers, radio and television stations (100)
8. North Dakota Educational Institutions, including colleges, universities, secondary and elementary schools, both public and private (300)
9. North Dakota State Water Commission members and staff (15)
10. Garrison Diversion Conservancy District Board of Directors (30)
11. North Dakota Water Users members (1,000)
12. Selected conservation organization leaders (50)
13. Selected congressional staff (50)
14. Selected state and federal government positions (100)
15. North Dakota Rural Water Systems Association (200)
16. The International Coalition leadership (50)
17. Selected western water leaders (100)
18. North Dakota Water Quality People (50)
19. North Dakota Extension Service People (100)
20. North Dakota Water Coalition Membership
21. Interested general public - future subscribers

TOTAL 3,495

Sponsors and partners

A. Sponsors and Partners:

1. City of Minot
2. North Dakota Water Users Association
3. Garrison Diversion Conservancy District
4. North Dakota State Water Commission

B. Prospective Sponsors and Partners:

1. Statewide organizations (GNDA, ND RECs and others)
2. North Dakota Water Resource Districts Association
3. North Dakota Rural Water Systems Association
4. North Dakota Weather Modification Association
5. Southwest Water Authority/West River Joint Water Board
6. Red River Joint Water Resource Board
7. Souris River -- Northwest Joint Water Board
8. Devils Lake Coalition/Devils Lake Joint Board
9. State, Regional or National Foundations
10. North Dakota Department of Economic Development and Finance
11. North Dakota Health Department

Conclusion

Water is North Dakota's future. The Vision 2000 Report included water infrastructure as one of its flagship initiatives, recognizing that economic development and jobs for North Dakota's young people is dependent significantly on availability of water. In 1990 the voters of North Dakota established the Resources Trust Fund as a Constitutional Trust Fund, setting aside a permanent dedicated fund to address North Dakota's water requirements. The Southwest Pipeline Project is delivering water to the city of Dickinson, eliminating the need to recycle lagoon water for municipal use. The Garrison Diversion Project needs a connecting link between the McClusky Canal and the New Rockford Canal to deliver water to eastern North Dakota, including stabilization of Devils Lake, water for the Sheyenne and Red Rivers for municipal and industrial use, and water for the James River for multiple uses. Devils Lake, which provides a \$30 to 40 million annual economic base for that region, is dangerously near fish kill levels. The Northwest Area Water Supply (NAWS) system is in the preliminary design phase, and will provide a much-needed water supply for all of northwest North Dakota. The Safe Drinking Water Act imposes significant requirements on public water supplies to meet water quality standards. Many rural water systems and communities in North Dakota do not meet these requirements, and either cannot meet them or must spend extraordinary amounts of money to meet the requirements.

A statewide water coalition to address North Dakota's water supply and water distribution issues, and an informative monthly water magazine focusing on the importance of water for the lives of North Dakota citizens, would enable tremendous progress to be achieved in understanding and addressing water issues in North Dakota for the benefit of future generations.