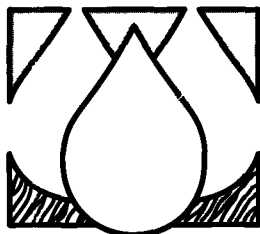




# 1999 State Water Management Plan

TD201.N9 NOR

North Dakota State Water Commission



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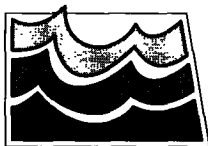
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## North Dakota State Water Commission

June 1999

Dear Friends,

The need for water has always been a priority in this state. From the early settlement of the Native Americans, to Lewis and Clark, to the Dustbowl, until the present, water is the thread that has woven decades of families, tribes and cultures together. As North Dakota moves toward the next century, water will be no less significant. This 1999 State Water Management Plan lays the foundation for future water management in North Dakota.

The state's municipal, rural, and industrial water supply needs are continually increasing. Water for agriculture and the state's fair claim to Missouri River water remain significant priorities. An increased awareness of environmental quality issues will continue to demand a balance of economic growth and long-term environmental health.

This plan is an admirable representation of the current state of the water management and the state's vision for the 21<sup>st</sup> Century.

Sincerely,

David A. Sprynczynatyk  
State Engineer

# Introduction

**W**ater is the bond of past, present, and future generations of North Dakotans. It has shaped the geographical settlement of the state's cities, the welfare of its inhabitants, and the livelihood of the state's economy.

John Wesley Powell stated at the 1889 North Dakota Constitutional Convention, "Years will come of abundance, and years will come of disaster, and between the two the people will prosper and be unprosperous and the thing to do is look the question square in the face and provide for this and for all years."

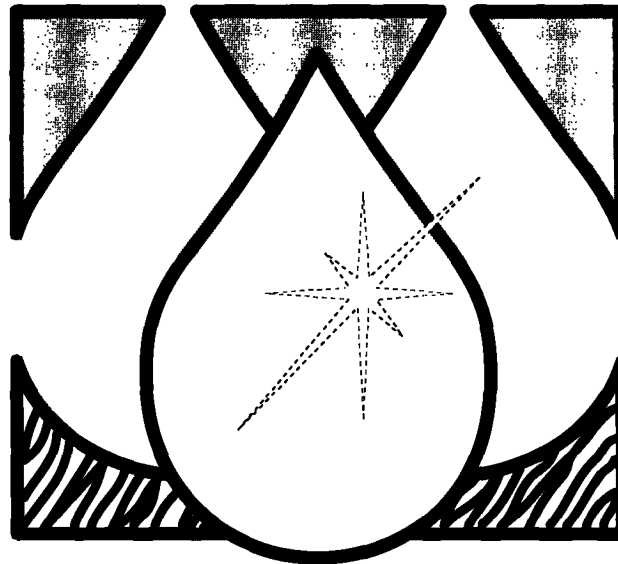
The union of people, water, and land has always run as a constant thread through the state's historical backdrop. It is this thread that will determine much of North Dakota's future economic and social successes. Water is North Dakota's most precious natural resource and water planning for future generations has become increasingly more vital.

The economic future of North Dakota businesses, the future growth of the cities and towns, and the diversification of agriculture begin with one common theme—wise management of the state's water.

## The 1999 State Water Management Plan

The State Water Commission is required by virtue of the North Dakota Century Code, Section 61-01-26 and Section 61-

02-14, to complete the State Water Management Plan. The North Dakota Legislative Assembly has explicitly expressed a need for "comprehensive, coordinated, and well-balanced short- and long-term plans and programs. . . [with responsibility for the] optimal protection, management, and wise utilization of all the water resources in the state."



Moreover, implementation frameworks and associated recommendations are consistent with the 55<sup>th</sup> North Dakota Legislative Assembly Session Laws, Chapter 25, Section 9, which reads:

***The legislative assembly finds that there is a critical need to develop a comprehensive statewide water development program. The state water commission shall develop and implement a comprehensive statewide water development program. The commission shall***

***design the program to serve the long-term water resource needs of the state and its people and to protect the state's current usage of, and the state's claim to, its proper share of Missouri River water.***

The objectives of the 1999 State Water Management Plan are to develop a comprehensive vision for water management for the 21<sup>st</sup> century; to illustrate how North Dakota water resources are currently managed and the responsibilities associated with that management; and to identify changes that should occur to improve water management.

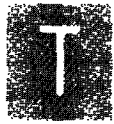
The means used to meet these objectives are explained in the planning methodology section. The North Dakota water resources section provides background on the state's water resources and sets the stage for the vision for the 21<sup>st</sup> century, which contains a view of the future water management in each basin of the state. The goals and objectives reflect the public's expectations for future water management. The following sections of water development project needs and water policies and recommendations contain more detailed information regarding water development and management needs.

Special topics, such as atmospheric resources and floodplain management, are covered just before the plan's conclusion.

The Appendix contains detailed information on water project needs, water resource programs, and State Water Commission policies.



# Planning Methodology



The 1999 State Water Management Plan addresses a myriad of water-related management issues and provides a long-term vision for the future of water development. The compilation of information and interests necessary to accurately inventory and plan for future water needs requires a cooperative effort between state, federal, and local interests and the input and expertise of water stakeholders.

The State Water Commission sought and received the full support of the North Dakota water community, including the North Dakota Water Users Association, North Dakota Water Resource Districts, and the North Dakota Water Coalition.

This plan documents contemporary water resource needs across North Dakota and is a guide for water management in the 21<sup>st</sup> century. Planning for water development is a dynamic process, subject to a variety of influences. A water plan must remain flexible to adjust for unexpected changes, yet provide a clear overall picture of what citizens of the state want the future to look like.

The public involvement process used in this plan was designed to gather a broad spectrum of information that represents water-related interest groups and the general public. The vision for the future described in this plan describes droughts to floods, conservation values to development values, and, most important, the anticipated water needs of present and future generations. Water policy recommendations are made to encourage improvements in the constantly evolving way water is managed in North Dakota.

## Public Involvement

Emphasis was placed on subjecting water management decisions and regulatory policies to greater public review. Previous planning efforts relied on the input of Citizens Advisory Boards appointed by the NDSWC Chairman and from nominations received from the Water Resource Boards and other organizations. In the 1999 planning process, boards were replaced by a streamlined and open process. Three rounds of eight public meetings were held in the major population centers to solicit public concerns.

In addition to public meetings, a 17-question survey randomly sent to 2,500 North Dakotans was used to gather opinions. The State Water Commission received approximately a 20 percent return rate. A second survey was sent to water resource district members. It focused on issues related to local water management.

A special effort in the process enlisted the opinions of non-governmental organizations, such as agricultural, energy, tribal, and environmental interests. Input was also gathered directly from other state and federal natural resource agencies. Additional information was solicited from larger regional or statewide project managers, such as Garrison Diversion, Southwest Pipeline project, and Northwest Area Supply project. A third-party technical oversight committee reviewed the public input process to ensure adequate representation for all applicable stakeholders.

Technical data from the State Water Commission and the public input process served as the main data collection methods. North Dakota Water Users Association, North Dakota Water Resource Districts, and the North Dakota Water Coalition provided supplementary information and comments.

### Summary of Public Input

METHOD	TYPE OF RESULT
2,500 Random Public Surveys	General water management information.
24 Public Meetings	General concerns regarding water management, floodplain management issues, project needs and policies.
67 Water Management Board Surveys	Local-oriented water management information.
Federal Agency Committee Input	Federal water agency concerns.
State Agency Committee Input	State coordination improvements.
Non-governmental Organization Committee Input	Special interest concerns.
Major Project Committee Input	Specific project information.
Technical Oversight Committee Review	Review of planning and public input process.

# North Dakota Water Resources



Like most western states, North Dakota faces a variety of water quantity and quality issues.

The ability to supply an adequate quantity of high quality water for all beneficial uses is vital in determining the economic, social, and environmental future of North Dakota.

The following section outlines the state's water resources, the quality of surface and ground water, and present water use trends.

## Surface Water Resources

North Dakota is separated into two major drainage basins by a continental divide running from the northwest through the central and southeastern part of the state. The northeastern portion of the state falls generally within the Hudson Bay drainage, while the southwestern part is drained by the Missouri River to the Gulf of Mexico.

There are five major hydrologic sub-divisions in North Dakota: the Missouri River Basin, the James River Basin, the Red River Basin, the Devils Lake Basin, and the Souris River Basin.

The Missouri River drainage system in North Dakota includes the major sub-basins of the Missouri and James Rivers. The area is characterized by a combination of glaciated terrain, with badlands and landforms of eroded, soft, sedimentary bedrock in the southwest.

The Hudson Bay drainage includes the Souris and Red River systems in addition to the large Devils Lake Basin. Glacial landforms and lake plains characterize this region of the state.

Flow in all streams is seasonally variable. Runoff is greatest in early spring as a result of snowmelt water and spring rainfall. Many smaller streams experience little or no flow for extended periods during the summer months. Dramatic flow variations in river discharges are caused by climatic conditions, precipitation amounts, evaporation rates, and snow pack conditions.

There are 131 man-made reservoirs and 89 natural lakes monitored in the state for water quality and quantity. In addition, many smaller impoundments exist that are not included for planning purposes because of either limited quality or quantity monitoring data. Reservoirs comprise about 82 percent of North Dakota's total lake/reservoir surface acres, accounting for an areal surface area of 538,555 acres. Of these, 480,731 acres or 73 percent of the state's entire lake and reservoir acres are contained within the two mainstem Missouri River reservoirs- Lake Sakakawea and Lake Oahe. The remaining 129 reservoirs share 57,824 acres, with an average surface area of 448 acres.

Under normal conditions, the 89 natural lakes in North Dakota cover 121,542 acres, with approximately 75,000 acres or 62 percent attributed to Devils Lake. During the current wet cycle, many lakes throughout the state have swelled. Most notably, Devils Lake has grown to approximately 124,000 acres. The remaining 88 lakes average 535 acres, with the majority being smaller than 200 acres.

There are 54,373 miles of rivers and streams in the state, based on the Environmental Protection Agency's River Reach File. The files are derived from U.S.

Geological Survey 1:100,000 scale Digital Line Graphs (DLG) data. Due to the detail of new maps and analysis techniques, total river mile measurements have increased significantly from estimates made in previous years.

## Ground Water Resources

Ground water underlies the land surface throughout the state. Ground water generally occurs in two major types of rock - unconsolidated deposits and bedrock. Unconsolidated deposits are loose beds of gravel, sand, silt, or clay of glacial origin. Bedrock consists primarily of shale and sandstone.

Aquifers in unconsolidated deposits (called glacial drift aquifers) are the result of glacial outwash deposits. These aquifers are generally more productive to wells than aquifers found in the underlying bedrock. Bedrock aquifers underlie the entire state and tend to be more continuous and widespread than aquifers in the unconsolidated deposits. It is estimated that 60 million acre-feet of water are stored in the major unconsolidated aquifers in the state. The amount of water available in the major bedrock aquifers is estimated to be approximately 435 million acre-feet.

## Atmospheric Water Resources

Mean annual precipitation ranges from a maximum of just over 20 inches in the southeastern corner of the state to just under 13 inches in the extreme northwestern corner. This distribution results in generally adequate moisture for dry land farming in the east, but less reliable

supplies in the semi-arid west. Precipitation is largely dependent upon an adequate supply of airborne moisture, both visible (clouds) and invisible (water vapor). The primary atmospheric water source for North Dakota is the warm, humid air over the Gulf of Mexico. While westerly flow from the Pacific Ocean does initially move atmospheric moisture towards the state, the repeated lifting and cooling of the air as it passes over the mountains causes much of the moisture to precipitate from the air before it reaches the plains. Moisture from the Gulf of Mexico faces no such impediments.

The capacity of the atmosphere to hold moisture is largely governed by its

temperature. Warm summertime air can hold enough moisture to allow a thunderstorm to generate several inches of rainfall in a few minutes, whereas cold arctic air from the Canadian Prairies can scarcely support any precipitation. The warm season accounts for three-quarters of the state's total annual precipitation.

Depending on the season, the total water contained in the atmosphere above the state ranges from about 350,000 acre-feet in the winter to 5.5 million acre-feet in the summer. A vast majority of the water passes through the state, borne by winds aloft. On any given day, nature converts a small fraction of the available water to clouds and/or precipitation.

## Water Quality

Water quality in North Dakota is primarily the responsibility of the North Dakota Department of Health. The State Water Commission and other natural resource agencies work cooperatively with the Department of Health to maintain, monitor, and plan for adequate supplies of high quality water.

The Department of Health, as required by the federal Clean Water Act, reports water quality conditions in North Dakota. Water quality information used in the state water management planning process was compiled from the 1998 305b State Water Quality Assessment Report, the 1998 303d Total Maximum Daily Load List, and the 1999 North Dakota Unified Watershed Assessment.

### SURFACE WATER RESOURCES

North Dakota reports that 71 percent of its surveyed rivers and streams have good water quality that fully supports aquatic life uses. Good conditions, however, are threatened in most of these streams. Of the surveyed streams, 67 percent fully support swimming. Siltation, nutrients, pathogens, oxygen-depleting wastes, and habitat alterations impair aquatic life use support in 29 percent of the surveyed rivers and impair swimming in over 32 percent.

In lakes, 96 percent of the surveyed acres have good water quality that fully supports aquatic life uses, and more than 84 percent of the surveyed acres fully support swimming. Siltation, nutrients, and oxygen-depleting substances are the most widespread pollutants in North Dakota's lakes.

The leading sources of pollution in rivers and lakes are agricultural activities (including nonirrigated crop production, pasture land, and confined animal operations), urban runoff/storm sewers, and habitat modification. Natural conditions also prevent some waters from fully supporting designated uses.

### Water Resource Facts

TOPIC	VALUE
State Population <sup>1</sup> .....	638,800
State Surface Area (square miles) .....	70,665
Total Miles of Rivers and Streams <sup>2</sup> .....	54,373
Total Miles of Rivers and Streams by Stream Class <sup>3</sup>	
Class I, IA, and II Streams .....	5,483
Class III Streams .....	48,890
Total Miles of Rivers and Streams by Basin	
Red River (including Devils Lake) .....	11,881
Souris River .....	3,645
Missouri River (including Lake Sakakawea) .....	36,094
James River .....	2,753
Border Miles of Shared Rivers and Streams <sup>4</sup> .....	427
Total Number of Lakes and Reservoirs <sup>5</sup> .....	220
Number of Natural Lakes .....	89
Number of Man-made Lakes .....	131
Total Acres of Lakes and Reservoirs .....	660,097
Acres of Natural Lakes .....	121,542
Acres of Man-made Reservoirs <sup>6</sup> .....	538,555
Acres of Wetlands <sup>7</sup> .....	2,490,000

1 Based on the 1990 census

2 Total miles based on the U.S. EPA RF3 file.

3 Stream classes are defined in the State Water Quality Standards (ND Department of Health, 1991)

In general, Classes I, IA, and II streams are perennial, while Class III streams are intermittent or ephemeral

4 Includes the Bois de Sioux River and the Red River of the North

5 Number includes only the lakes and reservoirs which are publicly-owned and are in the WBS

6 Estimates based on surface acreage at full pool elevation

7 Estimate provided by Dahl, T.E., Wetlands - Losses in the United States: 1780s to 1980s, Washington, D.C., U.S. Fish and Wildlife Service Report to Congress, 1990.

**GROUND-WATER RESOURCES**

Water quality of the state's aquifers varies greatly and is marginal in many areas. Water in the unconsolidated aquifers is generally less mineralized than water in deeper bedrock aquifers, which is typically more saline.

North Dakota has not identified widespread ground-water contamination, although some naturally-occurring compounds may make the quality of ground water undesirable in a few aquifers. Where human-induced ground-water contamination has occurred, the impacts have been attributed primarily to petroleum storage facilities, agricultural storage facilities, feedlots, poorly-designed wells, abandoned wells, wastewater treatment lagoons, landfills, septic systems, and the underground injection of waste. Assessment and protection of ground water continue through ambient ground-water quality monitoring activities, the implementation of wellhead protection projects, the Comprehensive Ground Water Protection Program, and the development of a State Management Plan for Pesticides.

Of the 234 communities with municipal distribution systems relying on ground water as a water supply, nine communities exceeded primary water quality standards and 199 exceeded secondary water quality standards in 1993. Seven of the nine communities having water exceeding the recommended primary standards are located in the southwestern portion of the state and now receive high quality Missouri River water from Southwest Pipeline project.

**PROGRAMS TO ACCESS WATER QUALITY**

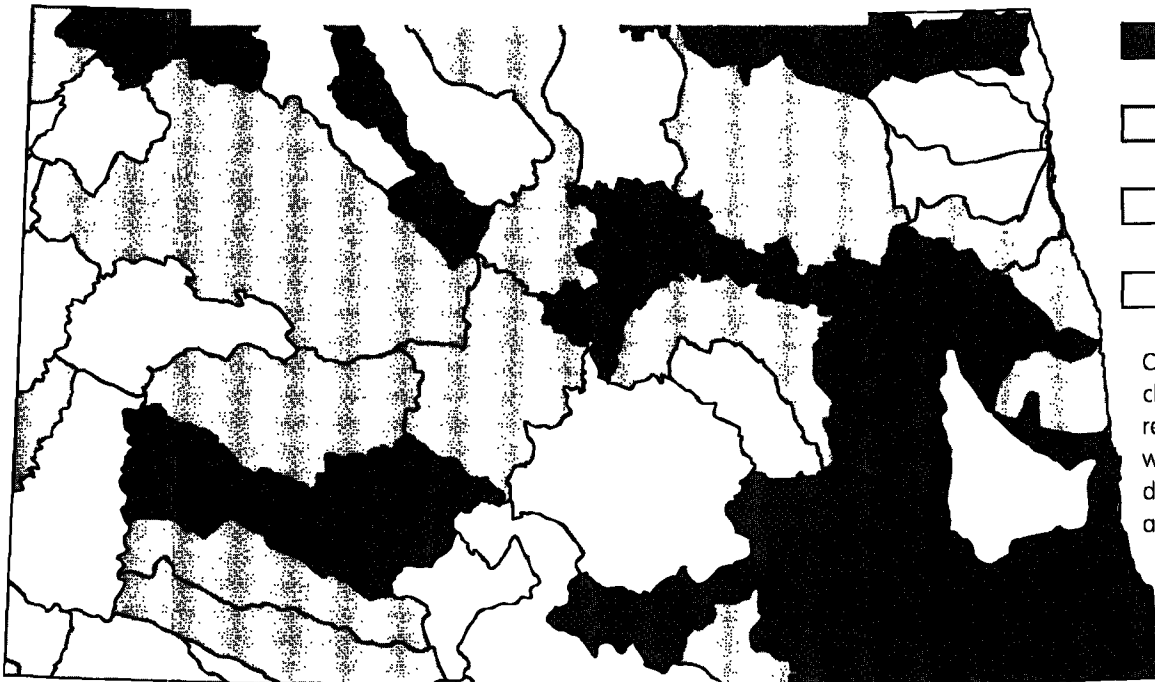
The ND Department of Health monitors physical and chemical parameters (such as dissolved oxygen, pH, total dissolved solids, nutrients, and toxic metals), toxic contaminants in fish, whole effluent toxicity, and fish and macroinvertebrate community structure. North Dakota's ambient water quality monitoring network consists of 27 sampling sites on 15 rivers and streams.

Individual Use Support in North Dakota's Rivers and Lakes





DESIGNATED USE <sup>1</sup>	Total Miles/Acres Surveyed	GOOD Fully Supporting	GOOD Supporting, But Threatened	FAIR Partially Supporting	POOR Not Supporting	POOR Not Attainable
RIVERS and STREAMS (Total Miles: 53,989) <sup>2</sup>						
Aquatic Life	11,902	9%	62%	26%	3%	0%
Fish Consumption	498	0%	0%	100%	0%	0%
Recreation	8,896	16%	51%	30%	2%	0%
LAKES (Total Acres: 650,380)						
Aquatic Life	631,228	23%	73%	4%	0%	0%
Fish Consumption	494,389	0%	0%	100%	0%	0%
Recreation	625,591	22%	63%	16%	0%	0%

<sup>1</sup> A subset of North Dakota's designated uses. Refer to State Water Quality Assessment Report for full description  
<sup>2</sup> Includes nonperennial streams that dry up and do not flow all year. Source: ND Department of Health

North Dakota 1998 Watershed Restoration Priorities



LEGEND

-  Category I Watersheds - High Priority
-  Category I Watersheds - Medium Priority
-  Category I Watersheds - Low Priority
-  Category IV Watersheds

Category I watersheds are classified as in need of restoration. Category IV watersheds have insufficient data to make a restoration assessment.

Source: North Dakota 1998 Unified Watershed Assessment Hydrologic Unit, North Dakota Department of Health



## Current Water Use

Water in North Dakota is used in a variety of ways. While the traditional uses of "mining, irrigating, and manufacturing" found in the North Dakota Constitution in Article XI, Section 3 still remain prevalent, new diverse uses and needs are continually being created. Yet, recent current water use remains near the past 10-year average. The increase in diverted water is attributable to periodic increases in need for energy generation and multiple uses. Additional increases documented for irrigation development and larger municipal areas has been offset by the wetter than average climate, reducing irrigation needs.

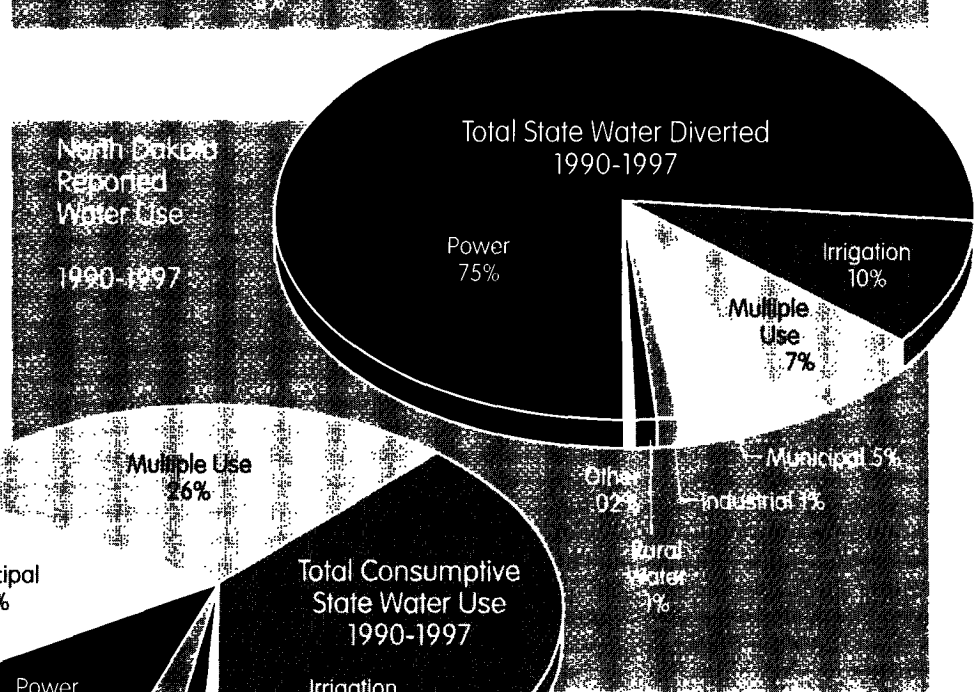
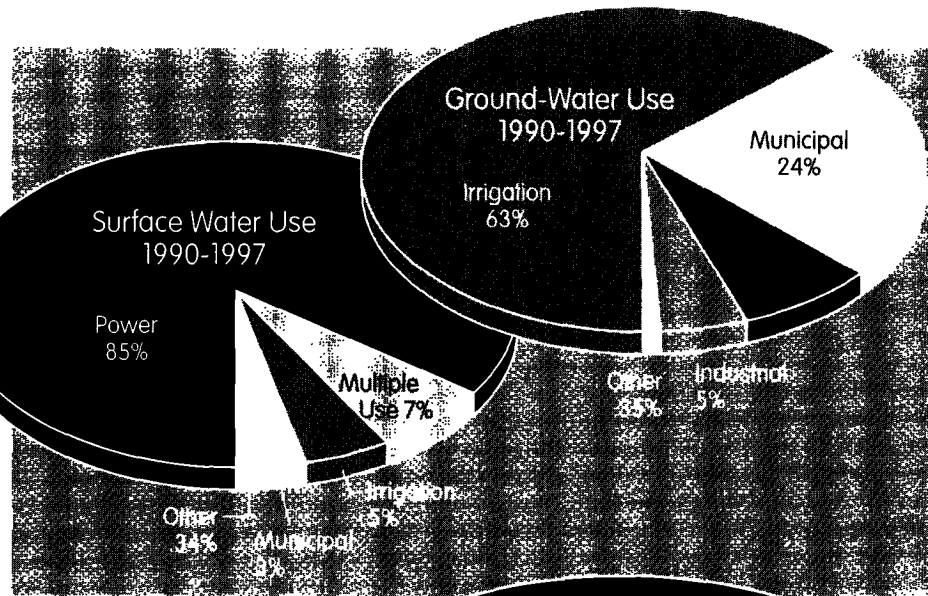
Water use is reported to the State Water Commission on an annual basis and is one of many factors used in determining future appropriations. Use is documented based on type of use and its source. On average, North Dakota diverts 1,300,000 acre-feet annually from both ground-water and surface water sources.

### GROUND WATER USE

Ground-water use is accounted for primarily by irrigation and municipal, rural and industrial uses. It serves as the primary domestic water source for areas not served by Missouri River water. Ninety-four percent of the 365 incorporated communities in the state rely on ground water from private wells, municipal distribution systems, or rural water systems. Moreover, ground water is virtually the sole source of water used for domestic purposes by farm families and residents of small communities with no public distribution system. Irrigation accounts for over 60 percent of ground-water use.

### SURFACE WATER USE

Power generation accounts for 85 percent of surface water use, of which 97 percent is non-consumptive. Nearly 100 percent of



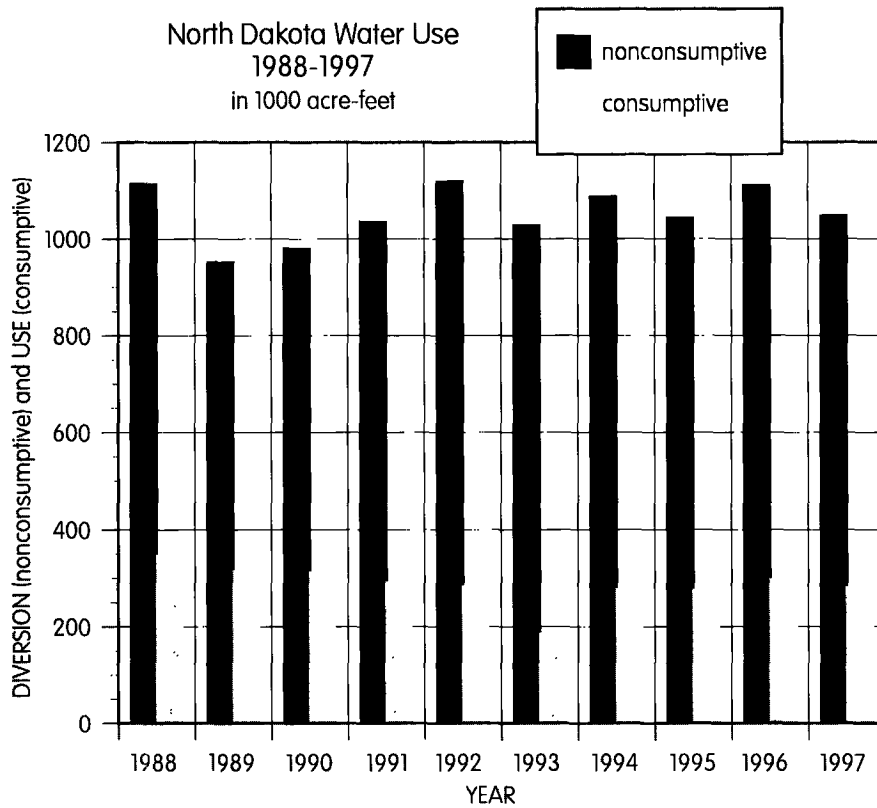
of total water used for irrigation.

Approximately 40 percent of the state's population and industry relies on surface water to meet their water needs.

### TOTAL WATER DIVERTED

Total water diverted, including consumptive and non-consumptive uses, is primarily used for power, agriculture, and MR&I demands. Multiple use categories may include recreational, MR&I, flood control, fish and wildlife, or any number of miscellaneous uses.

the water used for thermoelectric and coal gasification purposes is obtained from Lake Sakakawea and the Missouri River. Surface water supplies almost 60 percent



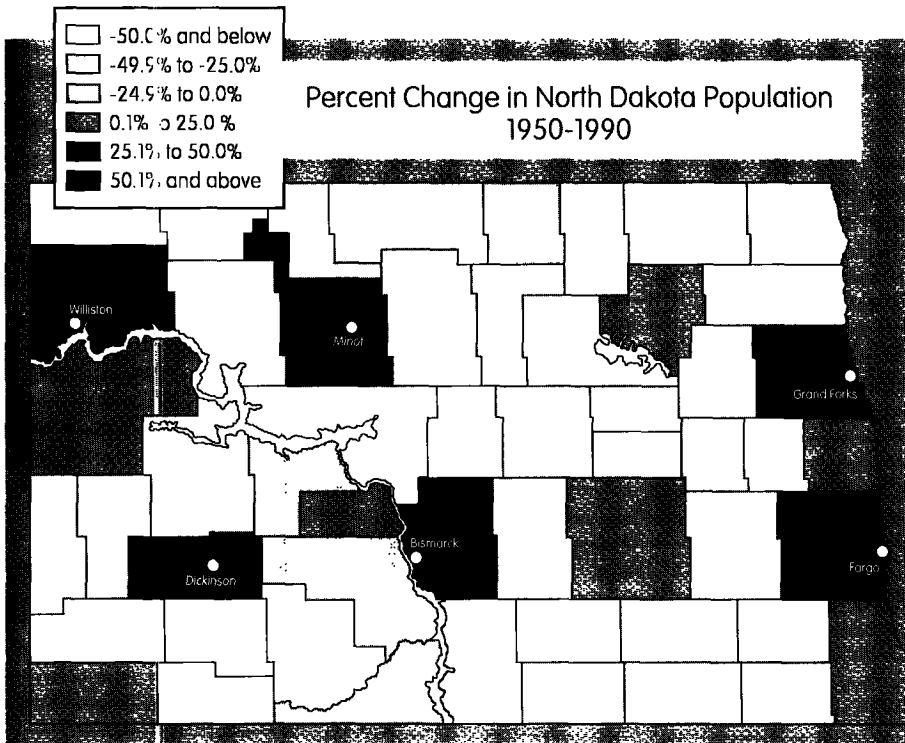
Power generation accounts for over 75 percent of the total reported water use. In terms of total consumptive water use, however, power generation accounts for only 12 percent. Irrigation accounts for 40 percent and MR&I needs comprise nearly 30 percent of the consumptive water needs in the state.

## Future Water Needs

Future water needs and trends are based on current and historical water use, demographic patterns, and current economic situations. For planning purposes, use and trends are broadly analyzed and categorized into four areas: Municipal, Rural, and Industrial; Agriculture; Energy; and Other.

### MUNICIPAL, RURAL, INDUSTRIAL

North Dakota's changing population distribution has dramatic implications for the appropriation of water. Since 1950, urban growth centers, such as Fargo, Grand Forks, Bismarck, Minot, and Dickinson, increased in population by 81.6 percent, while rural areas lost 37.7



### Water Use Planning Categories

CATEGORY	USES INCLUDE
Municipal, Rural, .. Industrial (MR&I)	Domestic, municipal, commercial, industrial, domestic rural, medical, institutional.
Agricultural .....	Irrigation and stock.
Energy .....	Almost exclusively non-consumptive; includes hydropower, gas, oil, and coal.
Other .....	Recreation, fish and wildlife, flood control, and other misc.

percent. Census estimates in 1987 revealed for the first time that more North Dakotans live in urban than in rural areas. Demographics point to a continuation of this trend.

The North Dakota Census Data Center estimates only seven counties (three urban counties, three predominantly reservation counties, and one energy related county) will increase in population from 1995-2010. All other counties, 46 of 53, are predicted to lose an average of 14 percent of their 1995 population during the same time period. The total state population is expected to decrease by approximately 6 percent.

As urban areas continue to grow, especially in the eastern section of the state, water supply must be carefully planned for and managed. The Red River accounts for only 6 percent of the annual flow of surface water in the state, while the basin contains more than 30 percent of the total population.

Domestic water use demands in urban areas are continuing to grow and could result in future conflicts over naturally occurring supplies. Certain areas also suffer from limited supplies of ground water. Urban areas along the Missouri River and the Southwest Pipeline water supply project are positively situated to meet the future water needs. Areas north of the Missouri River stand to have significant improvement in the quality and quantity of water with the implementation of the Northwest Area Water Supply project.

In addition to the urban growth centers, surrounding non-urban commuter cities are increasing in population and serving as bedroom communities for larger cities. The 1990 census revealed commuter rates from surrounding counties into Bismarck, Fargo, and Grand Forks to be more than 56 percent in some areas. The water supply needs for these areas will continue to grow and

could be overshadowed by higher profile water problems in urban areas.

Lorna Aldrich et al. in *Rural Development Perspectives*, vol. 12, no. 3, page 26, notes a similar phenomenon in Nebraska:

*"Although it was expected that some small communities would face reduced [water] needs in the future, many communities were, in fact, low and middle-income 'neighborhoods' for distant employment centers and, as such, would have continuing needs for services. The consequential potential strain on state and local financial sources, even supplemented with federal grants and loans, means the state must develop strategies for providing adequate services at low cost to prevent future health and safety problems."*

General industrial water demands are consistent with changing population trends. With the exception of agricultural processing facilities, industrial water growth is expected to increase around larger urban areas and remain low in the rural areas. Agricultural processing, however, represents a significant demand in certain rural areas. Raw water needs and their geographic distribution relating to future agricultural processing is complex and speculative, but is important to the future economic growth of the state.

Additional future water supply concerns exist on Native American reservations because of increasing populations. Native American reservation populations have grown from approximately 21,000 to over 36,000 since 1990. The average age of the population is 23 with 43 percent under the age of 20. Currently, adequate infrastructure does not exist to meet the needs of growing populations.

Demand for improved municipal, rural, and industrial water supply is expected to remain strong in response to more restrictive water quality standards and continued agricultural processing.

## AGRICULTURE

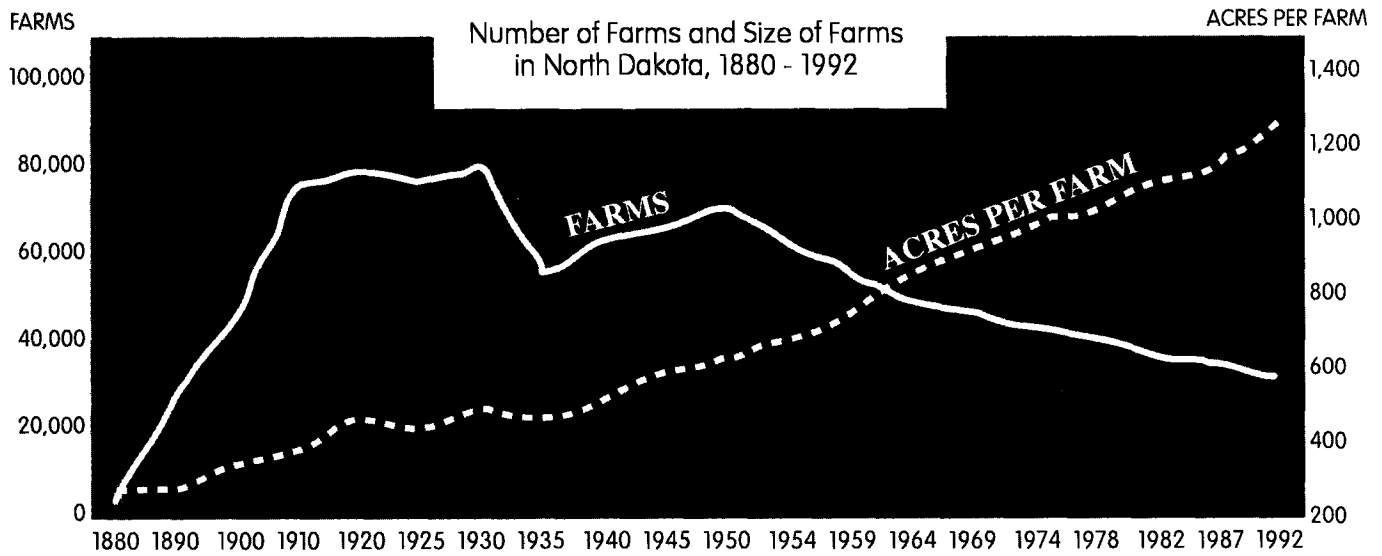
Agriculture is the top economic sector in North Dakota. Irrigated agriculture is the largest consumptive water user in the state and represents the greatest opportunity for economic growth. In 1996, the state produced more than \$4 billion in farm commodities. The industry employs 24 percent of the state's workforce and controls 90 percent of the land-use. Nationally, the state ranks as the largest producer of wheat and sunflowers and near the top for the production of vegetables, feedgrains, and soybeans. Geographically, five counties adjacent to the Red River account for 24.8 percent of the total receipts from agricultural sales. The nature of agriculture, however, is changing. The size of farms has been steadily increasing since 1880 and the number of farms has been decreasing since 1950.

Fifty years ago the state had nearly 70,000 farms averaging 625 acres. In 1992, the number of farms had dropped to 31,123 with an average size of 1,267 acres. The largest reduction in the number of farms is in the Red River basin. Increases in farm size are most prevalent in the Red River basin and in the northern counties adjacent to Lake Sakakawea. Even with

Top Counties in Agricultural Sales

COUNTY	% OF STATE'S TOTAL RECEIPTS	IN MILLIONS OF DOLLARS
Cass	5.9%	160.8
Walsh	5.0%	137.8
Grand Forks	4.9%	133.6
Richland	4.8%	130.8
Pembina	4.2%	114.2

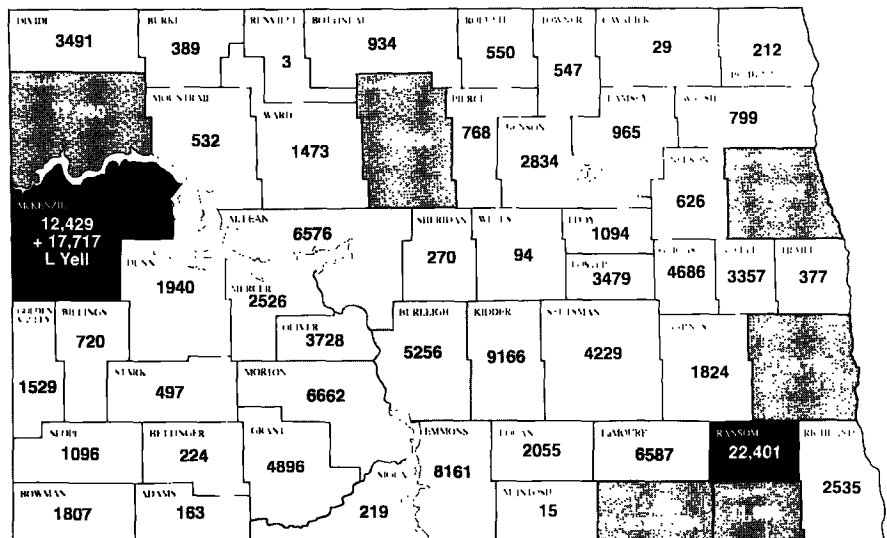
Source: U.S. Department of Agriculture, 1992 Data.



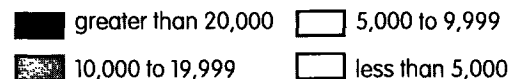
#### Average Population Age Between Counties with Smallest and Largest % of Ag Employment

COUNTY	% OF AG EMPLOYMENT	AVERAGE POP. AGE
Burleigh	2.6	33.5
Cass	2.7	32.4
Grand Forks	3.1	30.5
Ward	3.9	32.4
Kidder	41.4	39.4
Billings	41.5	34.9
Grant	52.9	40.2
Slope	63.6	36.4

Source: 1998 ND State Data Center and 1992 Census of Agriculture



1996 Reported Acres Irrigated By County



consolidation, the industry recorded a 16.1 percent increase in production of principal crops and a 37 percent increase in cash receipts.

The consolidation of farms is coupled with an aging farm population. The average farm operator age in North Dakota is 50 years old. In a recent random survey conducted by the State Water Commission,

respondents ranked "declining rural populations" and "loss of the family farm," as two of the three greatest challenges facing the state. However, younger populations in the 20- to 35-year age group are geographically urban and

less focused on maintaining the family farm.

Now agricultural processing facilities may raise the income potential of the family farm. Several major and many smaller facilities have been constructed in the Red



River basin during the past ten years, increasing farm market potential and demands on water use.

In addition, the number of acres irrigated increased by 15 percent from the mid-1980s. Irrigation in the 1990s has accounted for 40 percent of statewide consumptive water use. In 1997, North Dakota ranked last among the 17 western states in terms of total irrigation. Since 1990, irrigation has diverted an average of over 150,000 acre-feet of water annually. The total number of acres irrigated, however, remains less than 1 percent of the total acres harvested.

Increased demand for irrigated lands and large agricultural processing facilities, however, are placing greater strain on limited water resources in the eastern section of the state.

### ENERGY

Water use for energy generation has been stable and consistent during the past decade. Although energy generation is the largest user of water, accounting for 76 percent of total use, it is largely non-consumptive. According to North Dakota Public Service Commission estimates, future demand for water is not likely to increase. Demand in the future may, conversely, slightly decrease due to increased efficiency in hydroelectric energy generation.

### FISH, WILDLIFE, & RECREATION

Water uses, such as fish and wildlife and recreation, are generally a part of larger multiple use projects, such as reservoirs or small dams. Although independent uses exist, they are generally small and account for less than 1 percent of the total water use.

Demand for water for fish and wildlife could increase in the future through the introduction of minimum stream flow or instream flow permits. The state does not have the legal authority to issue permits for minimum stream flows. Any change in regulatory authority would require modification to current legislative statutes. The permits would be intended to maintain a minimum water flow in a stream to protect crucial habitat and other purposes. A multi-agency task force is currently studying the necessity and viability of establishing minimum flows.

Although the legal authority to grant minimum stream flows does not exist, flows in certain rivers are managed to maintain flow levels of senior or proprietary users. Along the Souris River and James River, for example, the state must maintain water levels adequate to satisfy senior water permits for several national wildlife refuges. Other stream flow management occurs along the Little Missouri River. Under the authority of the Little Missouri Scenic River Act issued by the North Dakota State Legislature, the river must maintain a free-flowing natural condition.

Recreation dams provide many of the water recreation opportunities across the state. Small dams constructed by the North Dakota Department of Game and Fish and the U.S. Fish and Wildlife Service for waterfowl habitat provide an abundance of outdoor recreational and ecotourism opportunities throughout the state.

Water Use for Energy Generation

YEAR	SURFACE WATER (acre-feet)	GROUND WATER (acre-feet)	TOTAL
1990	922,284	136	922,420
1991	957,304	37	957,341
1992	1,038,620	31	1,038,651
1993	984,290	0	984,290
1994	1,034,032	0	1,034,032
1995	975,260	0	975,260
1996	1,040,263	0	1,040,263
1997	976,687	0	976,687

# Vision for the 21st Century

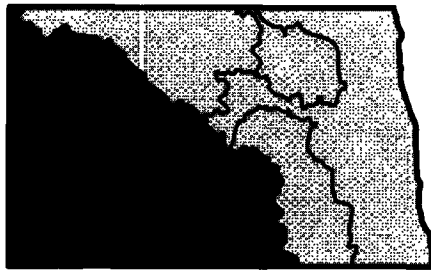
*It is the vision of water management for the 21<sup>st</sup> Century that North Dakota will enjoy an adequate supply of quality water. Water resource management will ensure health, safety, and prosperity; and balance the water needs for present and future generations.*

**N**orth Dakota's vision of water management for the 21<sup>st</sup> century provides a long-term direction for water development and the State Water Commission. It is reflective of current water trends and builds on the successes and opportunities available to the state. In order to achieve the vision, the state must address several critical water development issues, including developing Missouri River water, developing adequate water supplies for eastern North Dakota, financing future water development, and balancing the public interest and the public trust.

The state's water management mission is "Stewardship of North Dakota's water resources."

Following the Garrison Diversion Reformulation Act of 1986, the State of North Dakota was assigned 1.9 million acre-feet of the original 3.1 million acre-feet permitted for the Garrison Diversion Project. The State's permit is based on 1986 estimations of approximately 1.5 million acre-feet for potential irrigation, 36,000 acre-feet for MR&I, 200,000 acre-feet for recreation, and 231,000 other requirements. These Missouri River diversion plans represent the broad state goals for the development of Missouri River water.

## Missouri River Basin Water Resources

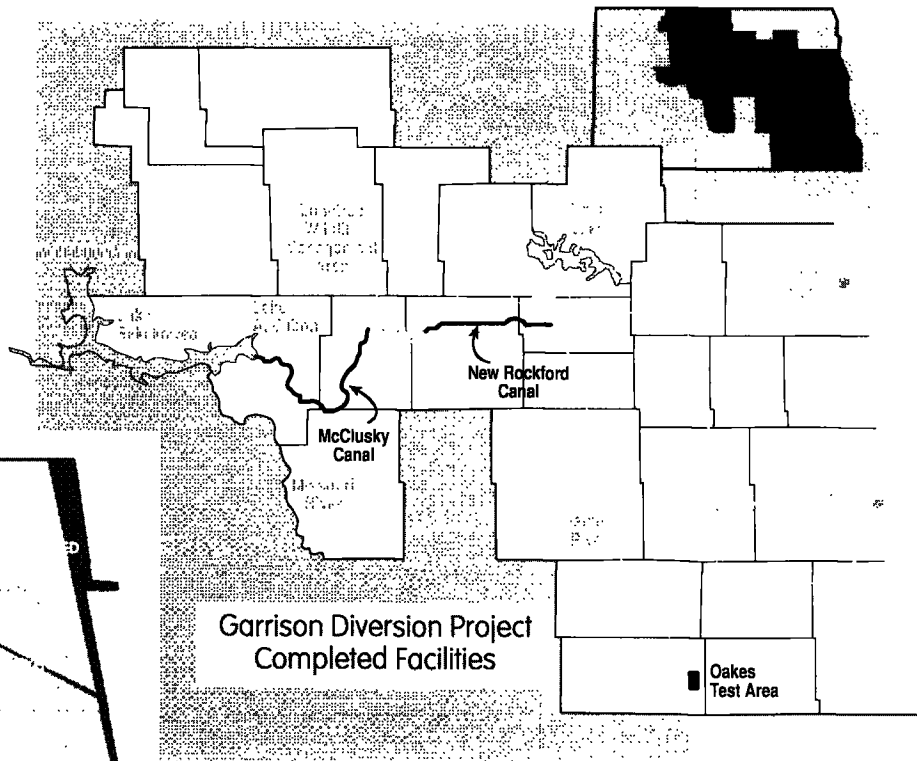
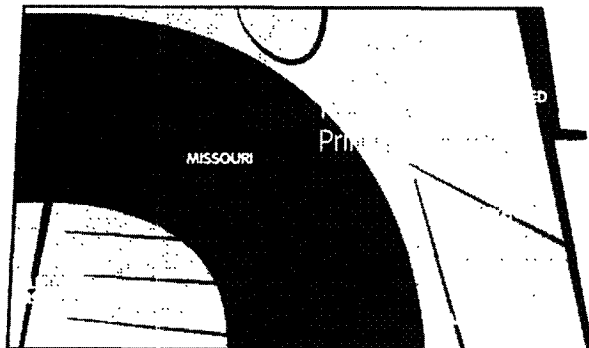


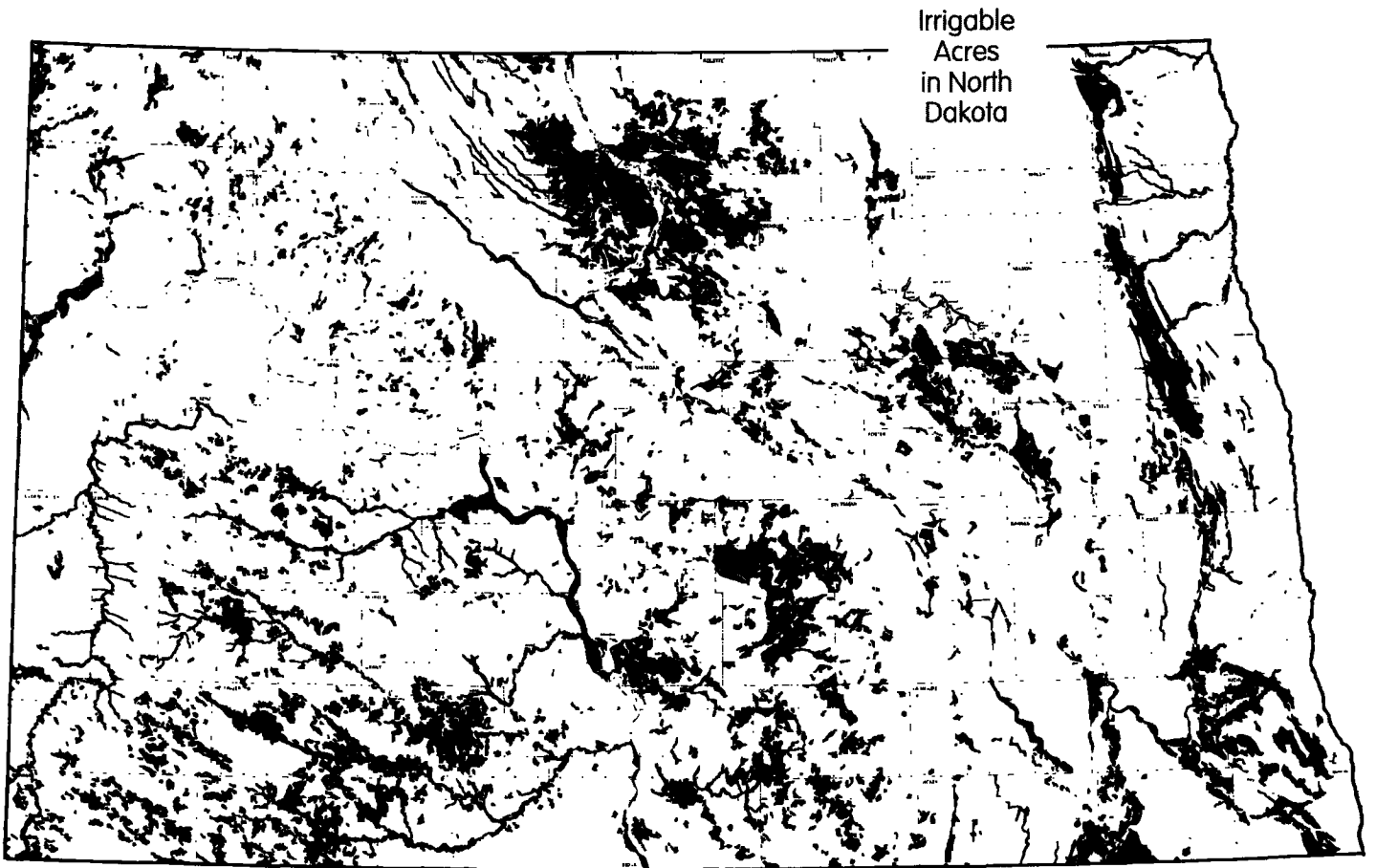
The North Dakota State Legislature has expressed the desire to develop the state's fair claim to Missouri River water. Nearly 96 percent of North Dakota's surface water is located in the Missouri River and its reservoirs. Lake Sakakawea and Lake Oahe account for approximately 97 percent of all available water storage. The

largest use of Missouri River water today is for energy production, of which roughly 96 percent is nonconsumptive. Total annual North Dakota consumptive water use from the Missouri River accounts for slightly over 1 percent of the annual flow of the river as it leaves North Dakota.

## WATER DEVELOPMENT OPPORTUNITIES

The greatest opportunities for the development of Missouri River water are irrigation and municipal, industrial, and rural water supply.





**Irrigation**

Federal support for the development of North Dakota irrigation has declined with the numerous reauthorizations of the Garrison Diversion project. Originally planned to irrigate 1.2 million acres, the 1999 version of the project, if approved, would retain authority for only 77,000 acres of irrigated land.

Despite reductions in irrigated land associated with the Garrison Diversion project, the number of irrigated acres in North Dakota has continued to grow. The state has significant potential for new irrigation development in 6.1 million acres of irrigable soils. Without a supply project, many of these areas do not have an adequate source of water. The State of North Dakota, local entities, and private business have provided much of the needed capital and infrastructure requirements in those areas that have developed.

The potential for irrigation exists at a number of sites. Many of the identified

areas for irrigation are being studied for implementation.

Additional irrigation potential exists along the banks of Lake Sakakawea and on the Standing Rock Sioux and Fort Berthold Reservations. Raw water from the Southwest Pipeline project could supply a small amount of water for irrigation.

Each successful irrigation project, in a state ranked last among the 17 western states in terms of total irrigation, will provide economic opportunities. An important element to the success of these projects will be access to federal power. Project pumping power, provided through the original Pick-Sloan project, is necessary to

**Identified Missouri River Irrigation Potential**

PROJECT NAME	NUMBER OF IRRIGABLE ACRES	CONSUMPTIVE USE (Acre-Feet)
Horsehead Flats	46,200	92,400
Elk/Charbon	4,555	9,110
Mountrail County	28,555	57,110
Nesson Valley	7,569	15,138
Oliver/Mercer County	NA	NA
Cartwright/Charboneau	6,000	12,000
Charlson/McKenzie County	5,000	10,000
Little Muddy	15,000	30,000
Tobacco Gardens	3,800	7,600
McKenzie County	32,000	64,000
Fort Clark	1,400	2,800
<b>TOTAL</b>	<b>148,679</b>	<b>297,358</b>

further ensure the success of future irrigation projects.

**Municipal, Rural and Industrial Water (MR&I)**

The need for Missouri River water for MR&I water uses has grown since 1980. Much of the growth can be attributed to increases in population in the communities along the Missouri River and the development of the Southwest Pipeline water supply project. With the addition of the Missouri West Water System and the Northwest Area Water Supply Project (NAWS), Missouri River water will be supplied to much of western North Dakota and to more than 95,000 people.

The most important aspect of all MR&I projects is that the people of North Dakota have a consistent and safe water supply.

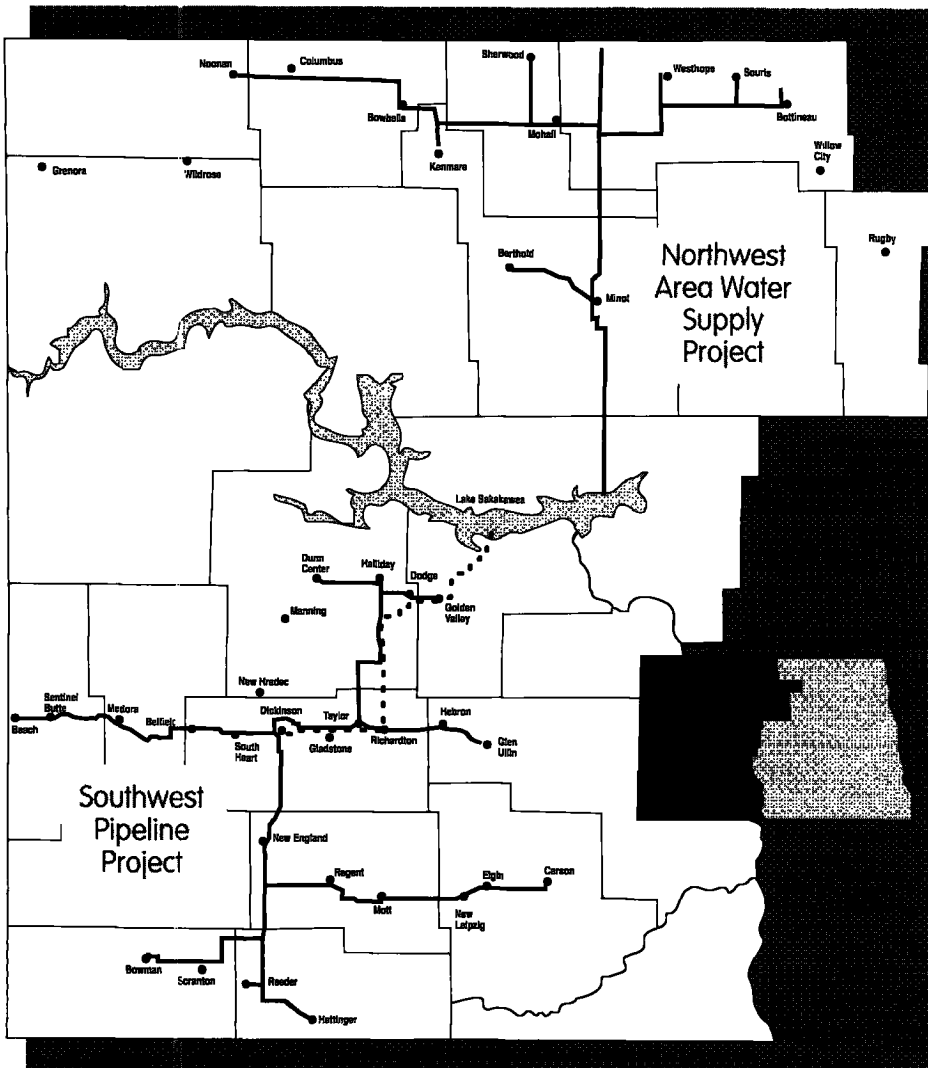
Rural communities in southwestern North Dakota had water supplies on the verge of being classified as undrinkable by the U.S. Environmental Protection Agency. As a result of the Southwest Pipeline and the MR&I program, those towns now have high quality water.

The Southwest Pipeline is permitted for 17,100 acre-feet of water per year, with a design capacity to distribute 18,688 acre-feet. The pipeline, funded through a combination of federal, state, and local funding, currently brings water from the Missouri River to approximately 27,000 people in southwest North Dakota.

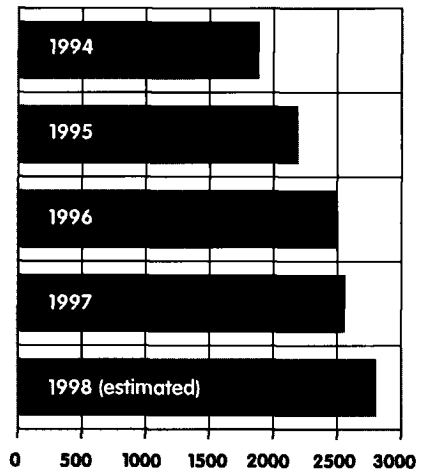
Currently, the project accounts for just

under 3,000 acre-feet of annual use, while construction continues. Some of the capacity may be used to serve another 3,000 people in South Dakota through a cooperative effort to pipe water more than 160 miles for rural water use and livestock watering.

The remaining water in the Southwest Pipeline could be used for small processing facilities or small plot irrigation. A potato plant, consistent in size and



Southwest Pipeline Project  
Total Water Use (in acre-feet)  
1994-1998



Note: Total Water includes Treated and Raw Water.

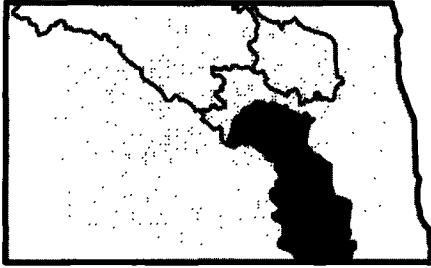
development to others in the state, could more than double current water use.

The development of the NAWS project in northwestern North Dakota will significantly increase the MR&I use of Missouri River water. The pipeline project is designed to deliver over 12,000 acre-feet of water to towns such as Minot, Bowbells, Mohall, and Bottineau. The project is scheduled to begin construction in 1999.

Critical issues with the NAWS project are the Boundary Waters Treaty Act of 1909 and the inter-basin transfer of water.



# James River Basin Water Resources



The James River basin, located in east-central North Dakota, is defined by a poor to moderate drainage system, with 56 percent of the basin not contributing flows to the James River. Countless wetlands store water in the noncontributing portions of the mostly agricultural basin.

Periodic flooding of agricultural lands causes substantial reductions in crop, hay, and pastureland production. Several communities are severely affected by periodic flood events.

## WATER DEVELOPMENT OPPORTUNITIES

The greatest opportunities for the development of the James River basin are municipal, industrial, and rural water supply, flood reduction, and the continued development of efficient irrigation systems.

### Municipal, Rural, Industrial Water

Water for municipal and rural uses has risen significantly since 1980. The development of rural water systems financed through the Municipal, Rural, and Industrial water supply program has shifted use from individual wells to local or regional water systems.

The James River basin is characterized by significant ground-water resources, including the Spiritwood Aquifer. The State Water Commission estimates that approximately 11 million acre-feet of water is available from the Spiritwood Aquifer in North Dakota. Water from the Spiritwood

Aquifer is generally high in sodium bicarbonate and considered very hard.

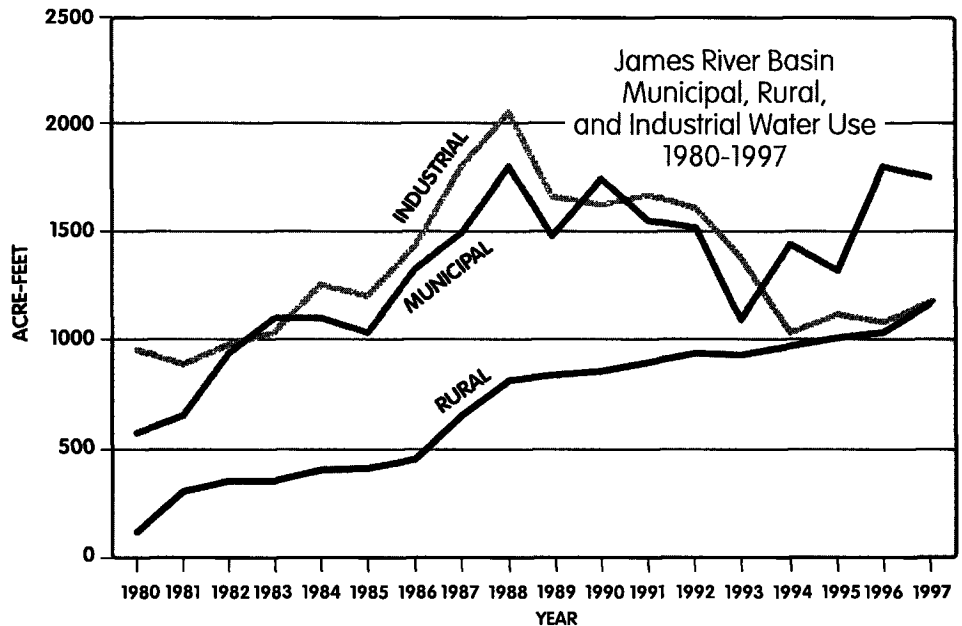
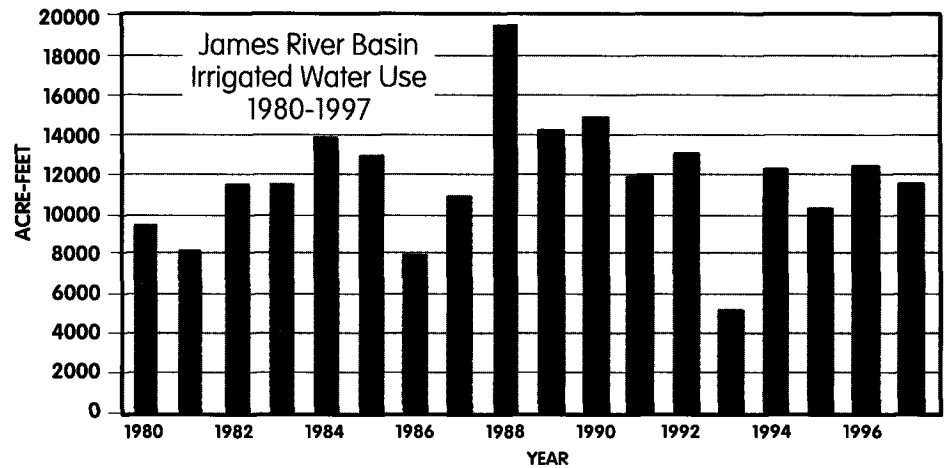
Surface water supplies in the James River are nearly fully appropriated insofar as providing a dependable supply during normal base flows. The quality of surface and ground-water supplies limits future municipal, rural, and industrial water use.

Eleven MR&I projects are identified for the 2001-2011 timeframe. All projects are structural improvements to current systems designed to significantly improve the quality of available water. No large expansion in water use is expected from the improvement projects.

## Irrigation

Irrigation exists throughout the James River basin, with concentrations of large-scale irrigation in Dickey County and the Oakes Test Area. Basin irrigation diversions have averaged 11,851 acre-feet since 1980, with yearly water use ranging from a high of over 19,000 acre-feet to a low of 5,000 acre-feet. Value-added potato processing in 1999 generated a market for 11,000 acres of irrigated potatoes throughout the region.

The Oakes Test Area, constructed as part of the Garrison Diversion Unit, is used to predict impacts from development of the Garrison Diversion Unit and to develop



best management practices for irrigated agriculture. Irrigation deliveries to the area began in 1988. The acreage irrigated annually from 1988 to 1996 has varied from 563 acres to 3,537 acres. The interim water supply has been diverted from a combination of Jamestown Reservoir storage, excess James River flows, and artificial recharge. Irrigated crops in the Oakes Test Area are predominantly corn, potatoes, and dry beans. Current indications from research have shed promising light on developing high-value crops and minimizing associated environmental impacts.

Proposed deauthorization of irrigated areas associated with the Dakota Water Resources Act of 1999 could have a significant impact on the short-term irrigation potential of the basin. If approved, the Act will deauthorize 57,885 acres of proposed irrigation, comprised of 20,935 acres at New Rockford, 13,350 acres at LaMoure, 4,000 acres at West Oakes Extension, and 19,600 acres at West Oakes.

The Act proposes retaining authorization for the existing 5,000-acre Oakes Test Area and 1,200 acres of canal-side irrigation along the New Rockford Canal, provided the users at New Rockford repay the full investment costs. Current legislation prohibits any new federally funded irrigation development authorized under the Act in the Hudson Bay, Devils Lake, or James River drainage basins.

The deauthorization of federally funded irrigated acreage in the basin may have a detrimental short-term effect. However, state and private industry partnerships for the production of high value crops will likely drive the long-term development of irrigated agriculture in the area.

The potential for new irrigation from the James River and Pipestem Creek are severely limited. Current appropriations are not expected to significantly expand. Potential ground water exists in a number

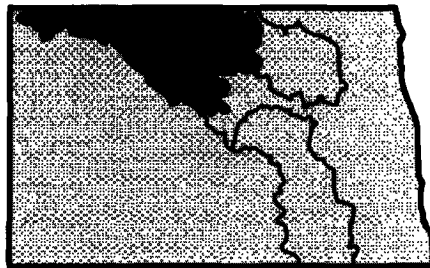
of areas. However, use is limited by water quantity and quality constraints.

### **Flood Control**

A poor drainage system and numerous wetland areas characterize the James River basin. Regional topography and a "wet" climatic cycle contribute to severe localized flooding problems. Much has been done to address flooding issues in the basin. The construction of the Jamestown Dam and reservoir, the Pipestem Dam, and numerous smaller impoundments has significantly reduced agricultural and municipal flooding.

The development of smaller impoundment structures proposed in the planning process will reduce localized flooding. Additional flood reduction can be achieved through changes in agricultural land use practices. The adoption of best management practices and other techniques are potential low fiscal cost alternatives to structural rural flood control. Future cooperative partnerships could address many of the basin's agricultural flooding and environmental quality issues. However, during periods of extreme flooding or drought, neither structural nor management practices will eliminate flood damages.

## **Souris River Basin Water Resources**



The Souris River, originating in Saskatchewan, forms a 357-mile "loop" through North Dakota before re-entering

Canada west of the Turtle Mountains. The basin is characterized by a long history of flooding and variable water quantity and quality. Since the development of the Alameda and Rafferty dams in the 1980s, flooding along the mainstem of the Souris River has been significantly reduced. However, flooding along many of the main tributaries has caused extensive damages.

The basin is plagued by marginal water quality. The development of new water supplies for Minot and other rural water systems is an identified priority for the state. As of 1998, 32 of the basin's 59 communities exceeded secondary water quality standards. More stringent water quality standards associated with the Clean Water Act will place additional pressure on communities and rural water systems to comply with federal regulatory standards. The Northwest Area Water Supply Project, slated to begin construction in 1999, will address many of the basin's municipal and domestic water quality needs.

### **WATER DEVELOPMENT OPPORTUNITIES**

The greatest opportunities for water development in Souris River basin are municipal, rural, and industrial water supply and enhanced floodplain management.

#### ***Municipal, Rural, Industrial Water***

The city of Minot, the principal urban area in the basin, has increased in population at a variable rate of 2 to 6 percent per decade since 1950. Coupled with increasing agricultural and industrial water demands, the city and surrounding region must plan for future reliable sources of quality water.

The Minot and Sindre aquifers provide the main supply of water for Minot and surrounding rural water systems. The two resources supply about eight million gallons per day. The construction of flood control works for the Souris River has reduced recharge of the aquifers as a result from flooding of the floodplain. A prolonged drought period could threaten the recharge capacity of the current aquifer system.

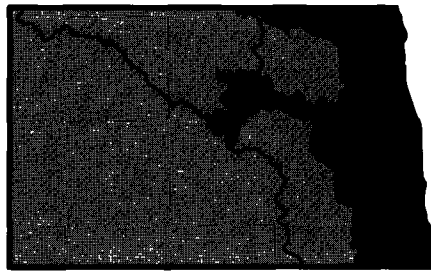
The development of the NAWs project would supply the 125,000-person region with a consistent source of high quality water from the Missouri River. The pipeline project is designed to deliver over 12,000 acre-feet of water per year to towns such as Minot, Bowbells, Mohall, and Bottineau. Construction is scheduled to begin in 1999. NAWs will supply water to 15 communities and seven rural water systems, accounting for 81,000 people, or nearly 65 percent of the basin's total population. Project costs are shared by the MR&I program at a rate of 65 percent and by local sponsors at 35 percent.

**Floodplain Management**

Comprehensive floodplain management is a high priority for the Souris River basin. The construction of Alameda and Rafferty dams in Saskatchewan, Canada, addresses a majority of flooding problems along the mainstem of the Souris River. Flooding along smaller tributaries and coulees, however, remains a serious problem. Rural areas, in most cases, are only regulated by minimum floodplain management standards established under the National Flood Insurance Program. Not all counties in the basin are currently enrolled in the program. As a result, persons residing in some flood prone rural areas do not qualify for flood insurance. In addition, increasing development, outside the extraterritorial jurisdiction of adjacent cities, is increasing flood risk along several coulees. Growing urban areas may inherit previously developed areas that do not comply to current floodplain management standards and represent a high damage risk.

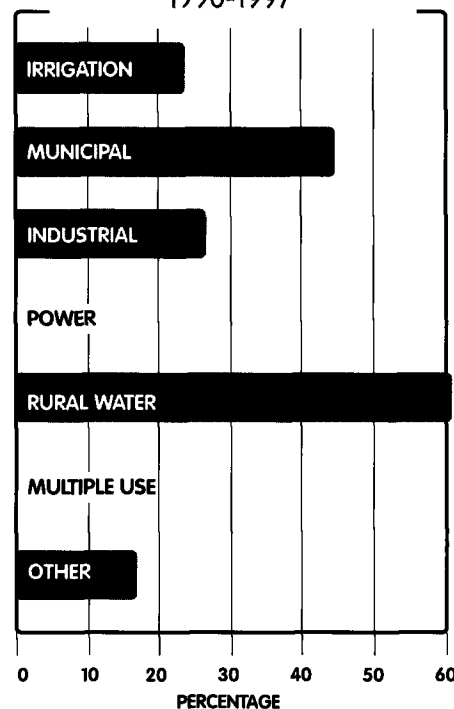
Enrollment in the National Flood Insurance Program of all areas subject to excessive flooding will allow residents of the basin to indemnify against future flood losses. In addition, improvements in county comprehensive planning could reduce future flood-related damages to developing rural areas positioned outside, but adjacent to, urban jurisdictional limits.

**Red River Basin Water Resources**



Over 30 percent of the total population of North Dakota is in the Red River basin. Fargo and Grand Forks, including their urban areas, are two of the fastest growing communities in the state since 1950. The basin accounts for 60 percent of rural water use and 44 percent of municipal consumptive use in the state. Total water use in the basin has grown steadily since 1975. Surface water diversions have risen steadily, while ground-water use has dramatically risen.

Percentage of State Consumptive Water Use Attributable to the Red River Basin 1990-1997



**WATER DEVELOPMENT OPPORTUNITIES**

The greatest opportunities for the development and management of Red River basin are irrigation, and municipal, industrial, and rural water supply.

**Water Supply to Eastern North Dakota**

Increased population growth, agricultural processing, and irrigation have increased water use in the Red River basin by approximately 30 percent since 1980. Municipal water for Fargo and Grand Forks and others comes from surface water sources. Conversely, eastern rural water systems obtain water from ground-water sources.

Surface and ground-water supplies fluctuate based on climatic conditions. Although rates of increase and decrease in aquifers occurs at slower rates than surface water, extended periods of drought and flooding will have an effect on some aquifer water levels. Moreover, during periods of prolonged severe drought, water levels may drop quicker than normal due to increases in use.

Providing municipal and rural water systems with consistent quantity water for emergency drought management, as well as for sustained basic use, is a priority for North Dakota. The development of additional water supplies could provide potential for the introduction of expanded industrial and agricultural processing.

The Dakota Water Resources Act of 1999 calls for \$200 million in federal MR&I funding to supply Missouri River water to eastern North Dakota. Although the Act does not specify an amount to be diverted, it is estimated to have a peak requirement of approximately 200 cubic feet per second (cfs). The diversion would be used to deliver water primarily during the drought-prone summer months. Assuming a nine-month operation at full capacity, approximately 108,000 acre-feet would be diverted, which would account for only

one-half of 1 percent of the mean annual discharge of the Missouri River as it leaves the state. The Dakota Water Resources Act of 1999 is being considered by Congress and has yet to be approved as of May 1999.

### **Basin Water Management**

The Red River basin has a variety of water management issues, including flooding, limited water supply, scattered water quality problems, and susceptibility to prolonged drought. In addition, the basin is divided politically by North Dakota, South Dakota, Minnesota, and the province of Manitoba, Canada. Three different water rights systems, prior appropriation, riparian, and Canadian, determine use and management strategies. Unfortunately, neither a single state nor province can solve the water issues that plague the Red River basin. It will require a cooperative effort among all provincial, state, local, and federal entities to develop long-term water management strategies and implementation processes.

Coordination and cooperation among all states and provinces involved are critical to the ability of the basin to address its water management issues. The State Water Commission supports an integrated transboundary watershed approach to addressing water management issues in the Red River basin. Additionally, international water-related organizations, such as the Red River Basin Board and The International Coalition, demonstrate locally-driven initiatives dedicated to holistic basin management. Solutions to Red River flooding issues must focus on an integrated management approach.

The Dakota Water Resources Act of 1999 calls for the introduction of treated Missouri River water into the basin to meet the growing surface water supply needs of eastern North Dakota. This need, according to population estimates and trends, is likely to continue to grow

and only add pressure to "create" new sources of water.

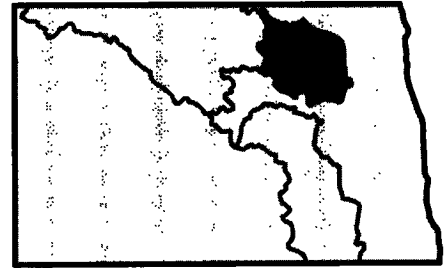
Water conservation measures and planning for areas where critical supply problems both currently exist or may occur in the near future, could provide a short-term solution for accommodating a drought period. However, water conservation does not provide a long-term solution for water supply needs for a growing area.

Regardless, coordination with neighboring states and provinces is crucial to reassessing the long standing issues of interbasin transfer and water quality.

Opportunities exist through proposed International Joint Commission transboundary watershed boards, to assist border states in the incorporation of a comprehensive cumulative effects assessment process for determining the impact of specific projects on the entire watershed. Under the transboundary watershed approach, local, state, federal, and provincial projects could all be subjected to an integrated watershed-level cumulative impact assessment. This type of approach would also be consistent with the recommendations of the June 1998 report from the Western Water Policy Review Advisory Commission.

Although a bold step, the advantages of transboundary water management outweigh the numerous negative administrative and regulatory difficulties. The funding and participation for cooperative transboundary water management is of additional concern. Significant funds would be required to, for example, construct a point-in-time baseline incorporating relevant issues by which to measure and address the biophysical and human aspects of a watershed. Long-term funding must be secured to justify a significant fiscal and time commitment from border states. Additional questions regarding requirements and limits in responsibilities, participation, and representation must be clearly addressed.

## **Devils Lake Basin Water Resources**



The Devils Lake basin is located in northeastern North Dakota and covers approximately 3,814 square miles. Since European settlement, the basin has been a non-contributing portion of the Red River of the North drainage area and is characterized by lowland depressions, wetlands, and small lakes connected by a poorly defined drainage system. Six primary coulees drain water into an upper chain of lakes. The lakes are connected to Devils Lake by the Mauvais Coulee and the Channel A flood control diversion. The Devils Lake basin is divided into nine smaller sub-basins.

Although the Devils Lake basin is considered a closed basin, geological evidence suggests that the lake has reached its spill elevation of 1459 msl several times during the last 10,000 years. The natural overflow of water from Devils Lake to the Sheyenne River has occurred on several occasions. Evidence also suggests that the level of Devils Lake naturally varies widely due to changes in short- and long-term climatic cycles. During the 130-year period of record, the lake has been as low as 1400.9 msl in 1940 and exceeded 1447 on June 7, 1999, at which time the lake was still rising toward its summer peak.

From 1993 to June 1999, the lake has risen more than 24 feet to its highest recorded elevation and covers approximately 124,000 acres. The National Weather Service forecasts water levels for 1999 up to 1448, increasing the lake to 129,300 acres. Extensive flooding has



inundated over 70,000 acres of deeded land, affected nearly 300 buildings, and caused substantial damage to local infrastructure. The flooding, although severe and devastating to the local social and economic structure, is part of a cyclical weather pattern. The state and basin must develop long-term water development planning to reduce damages associated with shifting flood and drought conditions.

The Devils Lake basin faces a number of challenges. In addition to flooding issues, the basin contains vast acreages of prime farmland and is a prime breeding ground for numerous birds and other wildlife. The challenge, however, is to manage the waters of the Devils Lake basin, while balancing the economic and biological values of the area. Ultimately this includes, stabilizing the level of Devils Lake and providing optimum benefits for agriculture, wildlife and fisheries, outdoor recreation, and economic development.

## **WATER DEVELOPMENT OPPORTUNITIES**

The greatest opportunities for water development and management in the Devils Lake basin are the completion and implementation of a comprehensive basin water management plan and the construction of infrastructure to stabilize lake levels.

### ***Basin Water Management***

Since 1993, water management in Devils Lake has centered on flood damage reduction. The rising lake level has created an emergency situation. State, federal, and local officials adopted a three-part plan to reduce flood-related damages in the area—an active upper basin water storage program, infrastructure protection, and an emergency outlet to the Sheyenne River.

Although emergency damage reduction planning has helped the region, only long-term basinwide plans will address the needs of the area after the flood has

subsided. Local stakeholders in the basin have established the basic framework for the development of basin and sub-basin management plans. The Devils Lake Basin Water Management Plan, published January 1995, lists objectives of better water management in four areas: agriculture, wildlife and fisheries, recreation, and economic development. The Devils Lake Basin Joint Water Resource Board, the local entity charged with regional water management, has developed a series of sub-basin advisory boards to assist in local planning efforts. The sub-basin boards, based on the nine hydrologic sub-basins of the region, gather grassroots information to develop recommendations for improved sub-basin management.

The local organizational structure for the development of long-term water management planning for the basin is well established. Unfortunately, the emergency flooding situation has dictated planning processes primarily focused on flooding problems and less on long-term water supply and quality issues.

Water development planning in Devils Lake must balance environmental quality with economic viability. Developing innovative wetland trading and banking pilot projects, emphasizing best management practices, investigating polycropping options, and developing riparian and other buffer zones along waterways could have positive impacts on both future flooding and prolonged drought situations.

Additionally, changes in agricultural practices could result in improved surface and ground-water quality. Future rural zoning and local floodplain management regulations could significantly reduce damages from future flood events. A permanent program could be developed to compensate landowners who hold runoff water on their land in those years with forecasted flood conditions. This program could be modeled after the emergency Available Storage Acreage Program, but would require long-term

contracts and funding. The Available Storage Acreage Program provides for short-term water storage in the upper basin of Devils Lake. Conversely, during prolonged drought conditions the program would allow temporary drainage of wet areas to contribute additional water to the lake.

The current flooding of Devils Lake will eventually subside and long-term viability issues will need to be comprehensively addressed. Local participation in long-term planning is critical to the success of water management in the Devils Lake basin. Long-term strategic and short-term works plans should be developed while participation and awareness of water issues is high. Most importantly, the basin must develop measurable criteria and objectives for assessing the progress of long-term planning.

### ***Stabilization of Devils Lake***

In many respects, the Devils Lake basin has been at the forefront of water management in the state. Water level fluctuations have plagued the area since its initial settlement. Until unprecedented flooding began in 1993, the focus of local planning efforts had been on stabilizing the level of Devils Lake and managing water for agricultural and biological purposes. Stabilization has been a goal of the region and the state since early statehood. Under the Pick-Sloan Plan, water was to be diverted from the Missouri River to supplement low lake levels and improve water quality by reducing high concentrations of total dissolved solids. Geologic evidence supports the need to develop an outlet structure to protect against high water levels.

Stabilization of the lake has raised many concerns, including the effectiveness of an outlet/inlet, water quality impacts downstream and in the lake, and the potential transfer of non-native biota in the Red River of the North basin. Additional concerns from Canada with regard to compliance with the water quality

requirements set forth in the 1909 Boundary Waters Treaty Act have delayed completion of the project.

Since 1993, rising lake levels and extensive flood damages have pushed the development of an outlet to the forefront. The 1998 Energy and Water Development Appropriations Act contains \$5 million to initiate construction of an outlet from Devils Lake to the Sheyenne River. The project, however, must successfully complete economic and environmental analyses, provide Congressional updates, and consult with the International Joint Commission. The Act clearly prevents the use of funds to implement an inlet or diversion of Missouri River water into Devils Lake. Additionally, the 1999 North Dakota Legislature approved funding mechanisms for the development of a Devils Lake Emergency Outlet.

Although the development of an outlet from Devils Lake will address the short-term flooding situation, only the construction of a complementary water source

would provide the region full development of the lake as a resource. The stabilization of Devils Lake is crucial to any long-term water management scenario for the region.

## Funding for Future Water Development

Water development in North Dakota will not move forward without adequate fiscal resources to support it. As the cost of new projects rise and the money available at federal and state levels decrease, funding mechanisms for water development must also change. North Dakota must explore future alternatives for funding water development in a fair and equitable manner and consistent with its vision of water management.

### FEDERAL FUNDING FOR WATER DEVELOPMENT

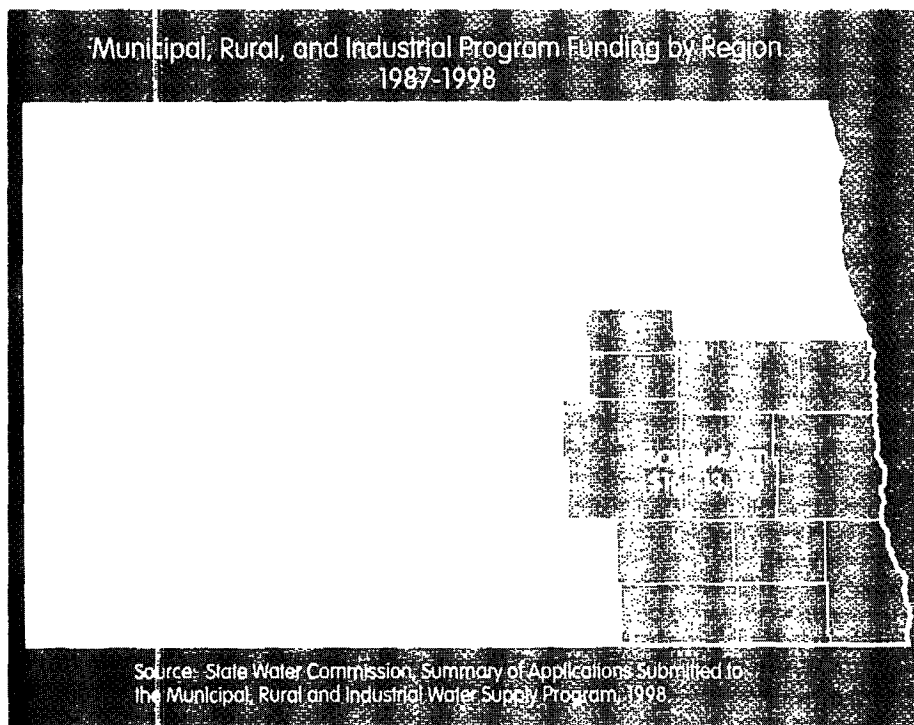
The federal government provides a myriad of water-related funds to North Dakota.

Most federal funding is allocated through the Municipal, Rural, and Industrial water supply program. Funds are disbursed to the Garrison Diversion Conservancy District and allocated through a joint powers agreement with the State Water Commission. The total budget for the program is \$200 million, of which only \$53 million remain. If enacted, the Dakota Water Resources Act would provide an additional \$300 million in funds for continued MR&I development.

The U.S. Army Corps of Engineers and the Natural Resource Conservation Service regularly provide technical and funding assistance to resolve water management issues such as flood control at Grand Forks and Devils Lake. The U.S. Geological Survey and Environmental Protection Agency provide important aid in monitoring and research efforts.

### STATE FUNDING FOR WATER DEVELOPMENT

North Dakota funds for water development are authorized by the state legislature as part of the State Water Commission Contract Fund. Monies for the fund are allocated from the State General Fund, the Resources Trust Fund, bonding authority, and other means. Monies allocated to the Contract Fund are not generally disbursed as line items, however, budgets are submitted with expected costs for known



BIENNIIUM	FUNDS ALLOCATED
1987-1989 .....	\$2.6 million
1989-1991 .....	\$7.5 million
1991-1993 .....	\$9.0 million
1993-1995 .....	\$6.6 million
1995-1997 .....	\$7.7 million
1997-1999 .....	\$6.2 million

project needs and allowances for general project needs.

**Cost-Share Funding and Policy**

The State Water Commission cost-share program is funded with monies allocated to the State Water Commission contract fund. In recent years, much of the fund, excluding bonding, has been financed by a percentage of oil extraction tax revenues. The North Dakota Constitution provides for funds to be held in the Resources Trust Fund for water development and energy conservation.

The Resources Trust Fund originally received 10 percent of the oil extraction tax revenues. This allocation was changed to 20 percent by the 1997 Legislative Assembly. The State Water Commission allocates monies available for cost-share based on estimates of potential oil tax revenues generated. The distribution of contract funding, therefore, is always subject to a potential budget shortfall near the end of the fiscal biennium due to less than expected oil production revenues.

The State Water Commission will cost-

share with political subdivisions, including, but not limited to, water resource districts, irrigation districts, and municipalities to meet local water development needs. In some cases, private industry water supply systems are supported.

**FUTURE FUNDING FOR WATER DEVELOPMENT**

The federal funding that North Dakota depends heavily on for the development of water supply infrastructure may be reduced in the future. Federal budgets often fluctuate and programs could feel the weight of budget cuts.

If federal funding does cease, the state must fund water development using other revenue sources. Many local counties do not have the tax base or the economic resources to adequately meet the current cost-share requirements necessary to fulfill their water needs. North Dakota must explore future alternatives for funding water development in a fair and equitable manner.

New combinations of funding mechanisms need to be explored or implemented to at least partially meet future water demands. The State Water Commission noted in 1994 that, "If federal funding allocations were to be reduced or eliminated, the state will be severely challenged. . .to provide revenue to fully implement all projects and programs required to manage and develop the state's water resources."

This year, North Dakota's 56th Legislative Assembly set a landmark in water management and water development, with the passage of Senate Bill 2188. The new law not only recognizes the state's critical water needs, but creates a framework and the means for addressing those needs well into the 21<sup>st</sup> century. Based on information from this planning process, SB 2188 addressed implementation of specific projects in the 1999-2001 biennium, and clearly stated North Dakota's intent to meet identified water needs in future bienniums. The

**Current State and Local Funding for Water Development**

LOCAL FUNDING SPONSOR	FUNDING SOURCES
Water Resource Districts (WRD)	Power to accept funds from federal, state, public, or private sources and borrow money for projects. WRDs can issue improvement warrants, revenue bonds, and special assessments, and to levy general taxes (up to 4 mills). WRDs can combine to form Joint WRD Boards for larger, regional projects and levy an additional two mills.
Irrigation Districts	Districts can finance for works through the issuance of bonds, warrants, water fees, or user charges. Bonds, warrants, and contracts are payable from special assessments on real property of the district, water charges, sale of water, or a combination of all three.
Garrison Diversion Conservancy District (GDCD)	The GDCD has the authority to levy one mill annually within the district to pay expenses and accumulate funds for district purposes.
Weather Modification Authorities	Local weather modification authorities may certify annually to the board of county commissioners a tax of up to 7 mills to be used only for weather modification activities in conjunction with the state.
Southwest Water Authority	The authority has the power to levy taxes not to exceed one mill for payment of expenses and for accumulation of a fund to pay obligations incurred by the district for the Southwest Pipeline. In 1997, Series A and Series B bonds were issued to fund construction during the 1997-1999 biennium. These revenue bonds are backed by oil extraction tax proceeds.
Northwest Area Water Supply Advisory Committee	The State Water Commission may provide for the issuance of bonds to finance the costs of the project.
Municipalities	A city has broad authority to finance water projects. It may borrow money on the credit of the corporation and may also issue bonds.

Legislature's commitment is further depicted with the establishment of a special Water Development Trust Fund. This fund will finance water projects with money from the state's tobacco settlement. The total amount of bonds authorized for construction during the 1999-2001 biennium is \$84.8 million. (See page 103 in the Appendix.)

**Increased Local Funding**

Cooperation among federal, state, and local governments and the private sector is typically necessary to finance water management projects and programs. Cooperation is fostered by each entity's interest in water management and the need to pool financial resources.

The progress of projects and programs, however, is driven by local commitment. Local water management funds usually originate through county or city government actions which are initiated by the project or program's proponents. Local cost-share can be raised through one or a combination of: property taxes (mill levy), special assessments, user fees, revenue bonds, city sales taxes, other fees, and donations.

Reductions in federal or state funds will shift an increased fiscal burden of small and medium size water development projects to local communities.

**Bonding**

Bonding has been used successfully to finance many recent large water development projects. Three types of bonds are used: general obligation bonds, revenue bonds, and moral obligation bonds.

General obligation bonds are backed by the full faith and credit and general taxing power of the state. Although these bonds have a more favorable interest rate, constitutional and statutory limits exist on the amount of debt issuing governmental entities may incur. The North Dakota Constitution provides that the state may issue or guarantee the payment of bonds,

provided that issues in excess of \$2 million are secured by first mortgages upon real estate or upon real and personal property of state-owned utilities, enterprises, or industries.

Revenue bonds, however, are backed by a claim on the revenue to be generated by the project.

Moral obligation bonds must initially be approved by the Legislature and require biennial appropriation from subsequent legislative assemblies to make the bond payments.

Changes in the current bonding authority may provide for additional funds and flexible financing alternatives.

**Prioritization of State Water Commission Cost-Share Policies**

The State Water Commission does not prioritize projects for cost-share unless there are insufficient funds to fulfill competing applications. Competing projects must be the same in time. Under these circumstances, water supply projects are the highest priority. No explicit policy exists for ranking the remainder of applications.

The State Water Commission could impose specific and limited filing dates for state funding assistance without legislative changes. Implementing such a policy change would likely increase competition between applicants for available funds. Additional study would be required to

**Past Finance Reform Efforts**

EFFORT AND DATE	PROVISIONS OF REFORM	ACTION
Water Resource Development Study (1979)	HB 1074 was recommended—a bill to raise the Commission's bonding limit from \$3 million to \$20 million, with possibility of an issue in excess of \$20 million where specifically authorized by the legislature.	Bill failed to meet legislative approval.
Water Sales Tax (1981)	Prior to 1981, a tax of 3 percent was levied on the gross receipts from all sales at retail, for the "furnishing or service of steam, gas, water, or communication services." There were no statutory provisions which would exempt sales of water from the state sales tax. As a result, the legislature recommended an exemption for all sales of water.	Approved an exemption for all water sales.
Governor's Water Strategy Task Force (1991)	The task force recommended a 0.25 percent increase in the state's sales tax, a 7.5 percent surcharge on individual income tax liability, and a 5 percent surcharge on corporate income tax liability. The revenue generated by the taxes would be placed in the resources trust fund and made available for appropriation by the legislature for constructing water-related projects, including rural water systems. The tax increases would have been effective for taxable years beginning after December 1, 1991, and expire on December 31, 1999. Initiated Measure No. 4, creating a 1/2 cent sales tax, was placed on the 1992 General Election Ballot.	The measure was defeated.

determine the economic impacts of priority system changes.

Multitudes of alternative priority systems exist. Health and safety issues could be used as a rationale for moving flood control projects to a higher priority. This would be consistent with the objectives of the State Water Commission. Water development funding allocations could be based on a combination of fiscal capacity and urgency of need, rather than on set funding amounts.

An alternative prioritization could be formed based on the highest economic return for water. It is based on the concept that water should be paid for as a commodity rather than as a free staple. Water and projects that affect use must have an economic rationality, be assessed on their potential impact on markets, and generate new public wealth. The commodification of water is a growing trend throughout the world and in western appropriation states.

### **Partnering**

As federal funds decrease, there is a greater need to develop cooperative partnerships. Cost-sharing between federal, state, and local entities is commonplace for many projects. This trend will likely continue to grow. The private sector, although active in irrigation and other selected arenas, has not always been a significant participant in providing general water supply and water quality improvements. In order to meet increasing financial costs, however, private investors may need to take additional responsibility for large water infrastructure developments.

A potential barrier to public/private partnerships is the requirement of a local public sponsor for state cost-sharing eligibility. Many private entities may view the local public sponsorship as adding to the development and administrative costs of a project. The state views the local sponsorship as necessary for providing public funds consistent with the public

interest of the county and the state.

### **State Revolving Fund Programs**

The North Dakota Municipal Bond Bank and the State Department of Health administer two State Revolving Funds for the purpose of financing the construction and improvement of waste water treatment systems and drinking water systems owned by political subdivisions of the State of North Dakota. Qualifying political subdivisions receive a below market subsidized interest rate on loans.

The Clean Water State Revolving Fund Program provides low interest loans to fund conventional wastewater and non-point source pollution needs. It is funded by 80 percent federal dollars and 20 percent state match through the sale of bonds. The fund has loaned \$82 million for construction or upgrades of wastewater systems. When fully funded, about \$110 million will be available for loans.

The Drinking Water State Revolving Fund Program provides low interest loans to fund improvements to drinking water systems. It is funded by 80 percent federal dollars and 20 percent state match through the sale of bonds. The fund has received approval for \$30 million in loans and may receive an additional \$78 million by the year 2003.

This type of funding program could be adapted to address other water development needs such as water supply, flood control, and snagging and clearing projects. It could provide a mechanism for local entities to use when sufficient cost-share is not available from other resources and the project must be implemented to address a serious problem.

## **Balance Public Interest and Public Trust**

The State Water Commission and the State Engineer have the responsibility to manage

water in the public interest and act as a steward to water held in the public trust. As recognized in the Vision Statement, the state must balance the water needs of present and future generations.

North Dakota was the first state to recognize the public trust doctrine in water rights. The public trust is based on the principle that water is held in trust for the beneficial use of all citizens of the state.

In *United Plainsmen V. State Water Conservation Commission*, the North Dakota Supreme Court based the public trust doctrine on the fact that the state constitution expressed state ownership of all streams and natural watercourses, and several statutes declared a strong state interest in water resources policies.

The court held that in order for the State Engineer to allocate water held in the public trust, the he/she must consider the effects of the water allocation on the present water supply and future needs of the state, consistent with his or her duties as resource allocator and consistent with the public interest.

The decision reflected doubts and inadequacies in the statutory public interest review process in considering all relevant factors and issues. The determining factors for measuring the public interest were ambiguous at the time of the case and later clarified through legislative statute.

The State Water Commission and State Engineer seek to balance the public interest and the public trust in all water management decisions. Additionally, the Commission and State Engineer recognize the importance of maintaining the state's environmental quality, while developing adequate water supplies to meet future demands.

The State Water Management Plan is considered an expression on the state's public interest and in balance with its public trust obligations.

# Goals and Objectives

**T**he purpose of the goals and objectives is to assist in the long-term planning of water management. They represent measurable items upon which to gauge the progress toward the state's vision of the future. The broadly-stated goals and the more specific objectives represent the sentiment and input gathered through the public involvement process. Although the number of goals and objectives may be great, they accurately represent the unmet needs of the state. The goals are not prioritized, but are arranged alphabetically by water management topic.

## ATMOSPHERIC RESOURCE GOAL:

To ensure safe and effective atmospheric resource management programs.

### OBJECTIVES:

- Ensure all cloud seeding projects are conducted in a scientifically-sound and environmentally-safe manner.
- Ensure that adequate records are kept of all cloud seeding operations.
- Evaluate the impacts of cloud seeding on precipitation patterns and the environment.
- Continue public information/education regarding our atmosphere and how it works, and the capabilities and limitations of cloud seeding.
- Define hail climatology for North Dakota.
- Continue and improve the statewide growing season precipitation reporting network.
- Continue the dissemination of project weather radar and precipitation data via the Internet.
- Conduct basic storm research in cooperation with universities and federal agencies.

## ECONOMIC DEVELOPMENT GOAL:

To maintain and enhance economic opportunities.

### OBJECTIVES:

- Develop water resources to support a broad economic base.
- Develop and maintain a consistent quantity and quality of water for domestic, agricultural, recreational, wildlife, and industrial uses.

- Implement the Dakota Water Resources Act to meet water supply needs of people throughout North Dakota.
- Complete the Southwest Pipeline and Northwest Area Water Supply, and other water distribution systems.
- Promote the value and functions of wetlands associated with enhanced recreational opportunities, such as hunting and ecotourism.
- Coordinate floodplain management development with communities and counties.

## ENERGY GOAL:

To maintain an adequate water supply for energy production.

### OBJECTIVES:

- Encourage efficient hydroelectric power generation at Garrison Dam.
- Encourage most efficient use of water in coal-fired power plants.

## ENVIRONMENTAL QUALITY GOAL:

To perpetuate and enhance environmental quality through sound management.

### OBJECTIVES:

- Provide incentives through voluntary education programs to encourage private landowners to maintain or enhance environmental quality.
- Encourage best land management practices.
- Eliminate point and non-point source pollution that adversely impacts natural ecosystems.
- Encourage the maintenance of adequate wildlife populations.
- Promote the value and functions of wetlands.
- Explore the desirability and options for establishing wetland trading mechanisms.

## FLOOD MITIGATION GOAL:

To reduce or eliminate flood damages.

### OBJECTIVES:

- Refine floodplain management regulations to help reduce future flood losses.

- Enhance public information/education programs on floodplain management.
- Improve educational/training opportunities for floodplain managers.
- Encourage a balance of structural and non-structural techniques for efficiently reducing flood damages.
- Encourage the implementation of land treatment methods to help control runoff during spring snowmelts.
- Assist in the development of new floodplain maps and revisions to older maps.
- Assist communities with technical evaluations of potential floodplain development.
- Encourage enrollment in the National Flood Insurance Program of all communities and counties.
- Encourage consistent disclosure information concerning the geographic location of the floodway.
- Maintain and improve the existing rain gaging network to aid flood forecasting.
- Continue and/or enlarge the existing stream gaging system, particularly in areas subject to overland flooding and smaller streams, in cooperation with U.S. Geological Survey.
- Refine watershed models and techniques.
- Maintain channel flow capacity of coulees and streams.
- Improve coordination between state agencies and local entities for addressing rural flood control issues.
- Encourage the use of ring dikes for farmstead protection.
- Encourage the recognition of downstream environmental and economic effects of flooding through more comprehensive floodplain management planning.

## IRRIGATION GOAL:

To encourage the development of all viable irrigation.

### OBJECTIVES:

- Satisfy water supply demands for current and future irrigation to support growth in agriculture industry.
- Assist in the development and application of technology to increase the efficiency of agricultural water conveyance systems.
- Implement the Dakota Water Resources Act to meet water supply needs of people throughout North Dakota.
- Encourage reuse, reclamation, and conservation of water.
- Support research to determine how, when, and at what rates water can be applied to various soil types and crops to arrive at long-term, cost-effective, efficient use of water.
- Encourage completion of digital format detailed soil surveys.
- Encourage the use of GIS technology and a high-tech agriculture approach in identifying new areas of potential development.
- Continue public information/education programs on irrigation opportunities.

## WATER SUPPLY GOAL:

To meet projected water supply demands for all purposes.

### OBJECTIVES:

- Develop water supplies to meet all beneficial uses.
- Implement the Dakota Water Resources Act to meet water supply needs of people throughout North Dakota.
- Develop sufficient quantities of Missouri River water to provide a viable source to meet North Dakota's future demands.
- Assist in the development of self-supporting municipal and rural water systems, including the Southwest Pipeline, Northwest Area Water Supply, and other water supply systems.
- Develop emergency management plans for drought mitigation and assistance.
- Develop small dams where appropriate to retain water for use during periods of scarcity.
- Encourage the reuse, reclamation, and conservation of water.
- Evaluate quality and quantity of surface and ground-water resources and provide public inventories of water availability.
- Negotiate Native American water rights when requested by the tribes.
- Explore desirability and options for establishing in-stream flows on major streams.
- Water supply development should recognize long-term sustainable use of available resources.

## WATER QUALITY GOAL:

To maintain and enhance the quality of all the state's waters.

### OBJECTIVES:

- Encourage best land management practices.
- Increase monitoring of water quality to detect pollution sources.
- Assist the Department of Health in monitoring water quality and wellhead protection.
- Promote the value and functions of wetlands.
- Support development of riparian buffer zones where applicable.
- Complete the Southwest Pipeline, Northwest Area Water Supply, and other water supply systems.
- Encourage research, best management practices, and high-tech agricultural practices for the application of agricultural chemicals and fertilizers.
- Encourage the consideration of water quality in floodplain management and emergency planning.
- Coordinate with and assist all North Dakota agencies in the protection of water quality in the state.
- Explore the funding options for a state-operated Clean Water Act, Section 404 permitting process.
- Coordinate with federal, state, and local entities to reduce high sediment loads on the Missouri River and other river systems.
- Coordinate bank stabilization efforts on public lands.



# Water Development Project Needs

**T**he water development project needs for North Dakota are steadily increasing. While many projects are constructed through the State Water Commission's general contract fund, a few larger statewide or regional projects require more substantial funding acquired primarily through bonding authorities, general fund allocations, or other large-scale financing methods. Often, statewide or regional projects are completed in phases requiring consistent multi-year funding allocations from the state. The following sections represent the

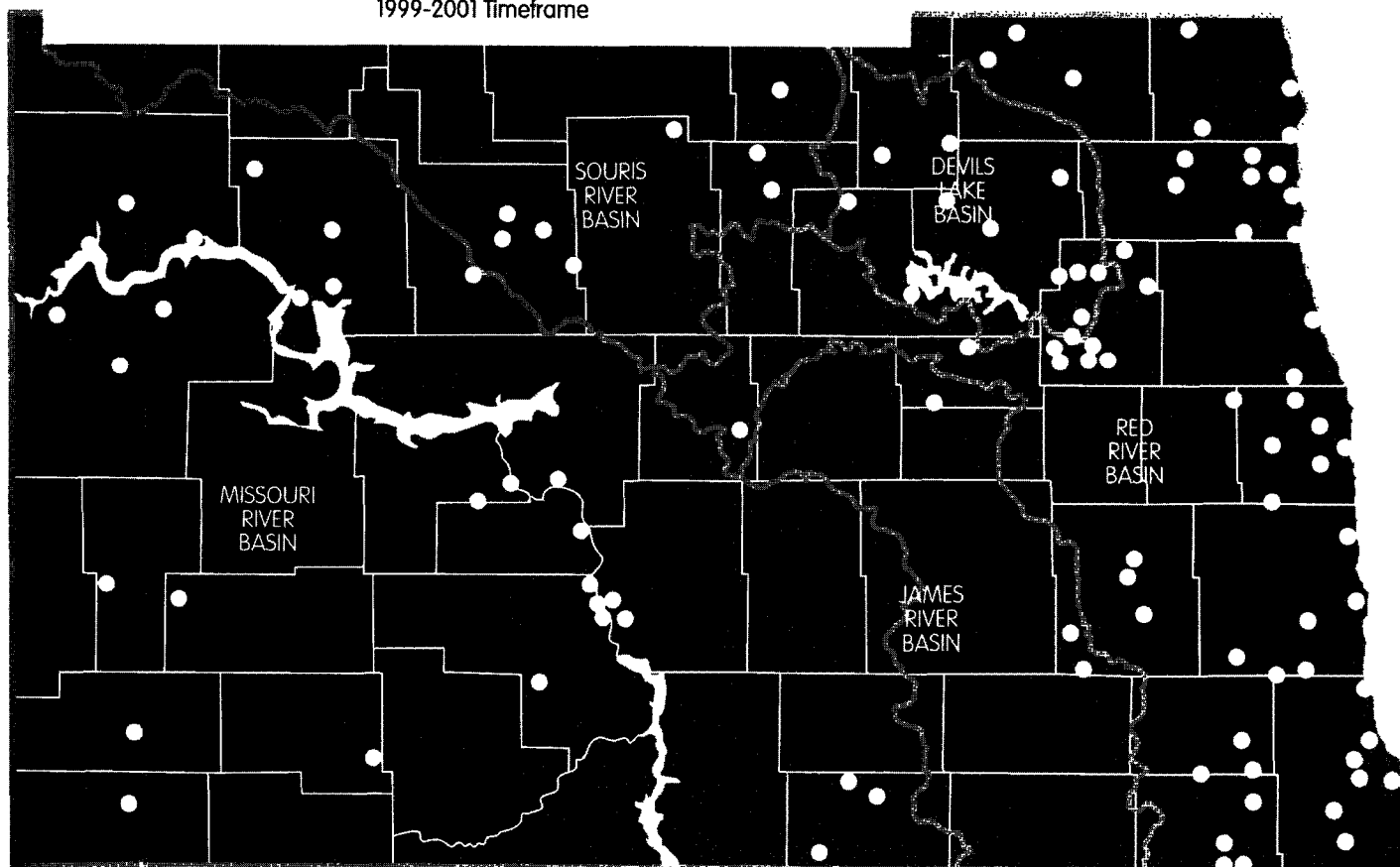
short- and long-term water development funding needs for the state. All listed projects are consistent with the goals and objectives of the State Water Management Plan and are organized by appropriate watershed.

The identification of potential projects and water resource management needs evolved from the input provided by local water resources boards, regional joint boards, cities, counties, mayors, and individual citizens. All water resource board members, public water supply

managers, Indian nations, cities, and applicable government agencies were requested to submit potential water development projects in March and August of 1998. Approximate timetables for funding were established through a collaborative process with project sponsors and other stakeholders. In addition, three rounds of eight public meetings were held in major population centers to solicit public concerns and potential projects. All meetings were announced through general press releases and direct correspondence to all water resource board members, city mayors, and applicable government agencies.

Location of State Water Management Plan Proposed Projects

1999-2001 Timeframe



A special effort in the process enlisted the opinions of non-governmental organizations, such as agricultural, energy, tribal, and environmental interests. Additional information was solicited from larger regional or statewide project managers, such as Garrison Conservancy District, Southwest Pipeline project, and Northwest Area Water Supply project. North Dakota Water Users Association, North Dakota Water Resource Districts, and the North Dakota Water Coalition provided supplementary information and comments.

All potential projects are categorized by timeframe. Initial projections for completion were based on the sponsors' expectations for starting and completing the projects as determined by the present stage of project development. Timeframes for implementation are: 1999-2001; 2001-2011; and Beyond 2011.

Projects were placed in appropriate timeframes based on the following criteria:

- Status of initial studies;
- Status of applicable environmental and feasibility studies;
- Status of project design;
- Status of necessary permits; and
- Status of funding.

Timeframes help to define the urgency of present and future funding needs. Regardless of classification, any project could be constructed in the immediate timeframe.

The ability of local project sponsors to meet applicable cost-share requirements and the limited availability of funds from the State Water Commission serve as the primary barriers for all projects. Any individual project could be constructed regardless of the timeframe listed in the State Water Plan. However, the ability of most projects to maneuver through the applicable regulatory processes and to secure necessary project financing, limits the likelihood that projects listed in later timeframes will be constructed ahead of projections.

## Comprehensive Project Inventory

A comprehensive project inventory is found in the Appendix. All projects are listed by river basin and timeframe. Maps are provided for projects listed in the 1999-2001 timeframe showing approximate geographic location.

RIVER BASIN	APPENDIX PAGE NO.
Devils Lake Basin .....	50
Red River Basin .....	52
Missouri River Basin .....	61
James River Basin .....	66
Souris River Basin .....	67

## Statewide/Regional Projects

The funding needs for statewide or regional projects are summarized in the table on pages 28 and 29. All project costs are displayed by biennium including expected state, local, and federal shares. Project costs, although based on current information at the time of publication, are dynamic and subject to change. Project elements and costs requiring specific state or federal appropriations are expected to evolve throughout the state and federal authorization processes.

### THE DAKOTA WATER RESOURCES ACT OF 1999 (DWRA)

When approved by Congress and the President, North Dakota will partner with local communities to meet the non-federal match associated with specific aspects of the Dakota Water Resources Act. The Act includes several important components vital to meeting the state's current and future needs. Some of the components of the project include:

### **Water Supply to Eastern North Dakota**

An important and critical component of the Dakota Water Resources Act of 1999 is providing a municipal, rural, and industrial water supply to eastern North Dakota. An alternative being considered involves the construction of a water treatment plant to address biota concerns and a pipeline to connect the New Rockford and McClusky canals. Additionally, the New Rockford Canal would be extended to the Sheyenne River. The alternative would supply approximately 200 cfs of Missouri River water to the Sheyenne River for use downstream. The project is estimated to cost \$168 million and is currently being evaluated to determine all relevant issues.

### **Southwest Pipeline Project**

The project is a regional water supply system diverting water from Lake Sakakawea to southwestern North Dakota. The State Water Commission was authorized by the 1983 Legislature to construct and operate the Southwest Pipeline project. Construction began in 1986, and in October of 1991 the project began service to Dickinson. Subsequent progress has served other cities and rural service areas. In 1991, the Legislature created the Southwest Water Authority, a political subdivision whose board of directors is elected on a county basis, to operate and manage the project.

The project currently delivers high quality Missouri River water to approximately 27,000 persons. Cities and other entities connected to the system include: Assumption Abbey, Belfield, Dickinson, Dodge, Dunn Center, Gladstone, Glen Ullin, Golden Valley, Halliday, Hebron, Hettinger, Manning, Mott, New England, New Hradec, Reeder, Regent, Richardton, Sacred Heart Monastery, South Heart, and Taylor.

The remaining components of the project will be implemented over the next eight years at a total cost of \$79,275,000, with completion of the project in 2007. Phases include Mott-Elgin (implementation 1999-

2001); Bowman-Scranton (implementation 2001-2003); Medora-Beach (implementation 2003-2005); Little Missouri, Oliver, Mercer, North Dunn (implementation 2005-2007).

Funding sources include: USDA Rural Development Grant and Loan Program, State Water Commission bonding authority, appropriation from the Resources Trust Fund, special funds appropriated by the State Legislature from the Resources Trust Fund and the State General Fund, and new MR&I program funds anticipated from the Dakota Water Resources Act of 1999.

#### ***Northwest Area Water Supply Project (NAWS)***

The project is a regional water supply system proposed for northwestern and north central North Dakota utilizing Missouri River water. The current project configuration includes 15 cities, and three existing and four proposed rural water systems. The total population served is approximately 63,000, with the potential to deliver water to nearly 81,000 people. The total population of the project area is about 125,000. The project will provide reliable, safe water from the Missouri River for domestic, industrial, and rural use.

In 1991, the Legislature passed a bill requiring the State Water Commission to pursue a project to supply and distribute water to the region and granting the authority to construct, operate, and manage the project. The Act also created the NAWS Advisory Committee to work with the State Water Commission in developing the project. The Committee consists of residents and representatives of the cities, counties and rural water systems in the area.

Under current plans, a water intake will be located on either Lake Sakakawea or Lake Audubon, based on the results of ongoing water quality studies. Due to biota transfer concerns, raw lake water

will be pretreated with ozone, followed by a chloramine residual, at a facility constructed in conjunction with a booster pump station near the City of Max. Pretreated water will be pumped over the continental divide for final treatment at Minot. The distribution system will consist of approximately 400 miles of pipeline, ranging from 42 inches to 4 inches in diameter. The pipeline will be located adjacent to existing major and secondary roads in the area.

The project will be implemented over a period of 10 to 11 years at a total cost of \$115 million. The two phases of the project (Phase I- Rugby Water Treatment Plant and Phase II- Minot) will be funded with a portion of the remaining \$53.2 million in federal funds appropriated to the existing MR&I program. The remainder of the project will be funded through MR&I program funds anticipated from the Dakota Water Resources Act of 1999.

#### ***Other Municipal, Rural, and Industrial (MR&I) Projects***

The Garrison Diversion Municipal, Rural and Industrial Water Supply Program was authorized by the U.S. Congress on May 12, 1986, through the Garrison Diversion Reformulation Act of 1986. This Act authorized \$200 million of federal grant funds for the planning and construction of water supply and treatment facilities to serve municipal, rural, and industrial water needs across North Dakota. Federal grant funds received through fiscal year 1998 were \$146.8 million. Projects funded under the MR&I program have been funded using an approximate 65 percent federal grant and 35 percent nonfederal cost-share. The operation, maintenance, and replacement costs for water systems constructed under the program is 100 percent nonfederal costs.

The remaining \$53.2 million in current program funds will be used to complete the following projects: portions of Benson Rural Water, Rugby, and Minot phases of

the Northwest Area Water Supply, Pierce Rural Water, and Ransom Sargent Regional Water System. Projects funded by current MR&I monies have been placed in the 1999-2001 timeframe for implementation.

The listing of potential projects contains 144 potential MR&I projects. These potential projects were compiled from current MR&I project lists and through direct contact with all communities. Current MR&I project lists are not exhaustive and do not contain all communities with water supply and treatment problems. All public water supply system managers were contacted to identify their present and future water supply and treatment needs.

In addition to traditional MR&I projects, potential planning and design activities were identified. Many communities have been unable to identify water supply and treatment problems due to a lack of funding. Currently, MR&I funds do not fund planning activities. Identified planning proposals were included in the General Projects category for possible state funding and included in the 1999-2001 timeframe.

In addition to meeting water supply demands, municipalities face a great deal of financial burden to meet other water-related infrastructure needs including repair, improvement, and expansion of water supply systems and stormwater management projects.

Some cities submitted infrastructure-type projects for inclusion as a potential project. A total of 61 infrastructure-type projects totaling \$36 million were submitted to be included in the plan. These types of projects have not received State Water Commission cost-share in the past and are not included in the project list of identified needs for this reason.

#### ***Other Features***

The DWRA contains components that require no additional funding through the

Potential Statewide or Regional Projects — State Funding Needs

DAKOTA WATER RESOURCE ACT (in millions of dollars)

	Water to Eastern North Dakota	Southwest Pipeline Project	Northwest Area Water Supply Project	Other MR&I
<b>1999-2001 TIMEFRAME</b>				
Local	—	0.0	8.2	25.5
State	—	6.0	0.0 <sup>2</sup>	0.0
Federal	—	11.5 <sup>5</sup>	14.8	39.9
Total	—	17.5	23.0	65.4
<b>2001-2003 TIMEFRAME</b>				
Local	Undetermined <sup>6</sup>	0.5	8.7	17.7
State	0.0	1.7	0.0	0.0
Federal	17.0	12.5	16.3	32.8
Total	17.0	14.7	25.0	50.5
<b>2003-2005 TIMEFRAME</b>				
Local	Undetermined <sup>6</sup>	1.0	11.8	17.7
State	0.0	5.0	0.0	0.0
Federal	6.0	11.4	21.8	32.8
Total	6.0	17.4	33.6	50.5
<b>2005-2007 TIMEFRAME</b>				
Local	Undetermined <sup>6</sup>	1.0	5.8	17.7
State	0.0	9.5	0.0	0.0
Federal	84.0	19.5	10.9	32.8
Total	84.0	30.0	16.7	50.5
<b>2007-2009 TIMEFRAME</b>				
Local	Undetermined <sup>6</sup>	—	3.7	17.7
State	0.0	—	0.0	0.0
Federal	59.0	—	7.0	32.8
Total	59.0	—	10.7	50.5
<b>2009-2011 TIMEFRAME</b>				
Local	Undetermined <sup>6</sup>	—	1.7	17.7
State	0.0	—	0.0	0.0
Federal	2.0	—	3.3	32.8
Total	2.0	—	5.0	50.5
<b>Beyond 2011 TIMEFRAME</b>				
Local	Undetermined <sup>6</sup>	—	8.7	130.2
State	0.0	—	0.0	241.2 <sup>8</sup>
Federal	0.0	—	16.3	0.0
Total	Undetermined <sup>6</sup>	—	25.0	371.4
<b>GRAND TOTALS</b>				
Local	Undetermined <sup>6</sup>	2.5	48.6	244.2
State	0.0	22.2	0.0	241.2
Federal	168.0	54.9 <sup>5</sup>	90.4	203.9
Total	168.0	79.6	139.0	689.3

OTHER POTENTIAL PROJECTS (in millions of dollars)

Grand Forks Flood Control <sup>1</sup>	Devlis Lake Outlet <sup>1</sup>	General Projects	State TOTAL
25.0	0.0	31.7	
25.0 (0) <sup>3</sup>	17.5 (0) <sup>4</sup>	25.9	74.4 (31.9)
38.5	32.5	39.8	
88.5	50.0	97.4	
35.7	0.0	24.0	
27.0 (7.8) <sup>3</sup>	0.0 (3.0) <sup>4</sup>	18.4	47.1 (30.9)
62.9 <sup>7</sup>	0.0	5.5	
125.6 (7.8)	0.0 (3.0)	47.9	
0.0	0.0	24.0	
0.0 (7.8)	0.0 (3.0)	18.4	23.4 (34.2)
0.0	0.0	5.5	
0.0 (7.8)	0.0 (3.0)	47.9	
0.0	0.0	24.0	
0.0 (7.8)	0.0 (3.0)	18.4	27.9 (38.7)
0.0	0.0	5.5	
0.0 (7.8)	0.0 (3.0)	47.9	
0.0	0.0	24.0	
0.0 (7.8)	0.0 (3.0)	18.4	18.4 (29.2)
0.0	0.0	5.5	
0.0 (7.8)	0.0 (3.0)	47.9	
0.0	0.0	24.0	
0.0 (7.8)	0.0 (3.0)	18.4	18.4 (29.2)
0.0	0.0	5.5	
0.0 (7.8)	0.0 (3.0)	47.9	
0.0	0.0	196.2	
0.0 (58.5)	0.0 (15.0)	138.0	379.2 (452.7)
0.0	0.0	25.8	
0.0 (58.5)	0.0 (15.0)	360.0	
60.7	0.0	347.9	
52.0 (97.5)	17.5 (30)	255.9	588.8 (646.8)
101.4	32.5	93.1	
214.1 (259.6)	50.0 (62.5)	696.9	

FOOTNOTES:

1 - The cost in parenthesis ( ) reflects a bonding financing option.

2 - An option being considered is the State Water Commission will bond the local cost-share with local repayment to State Water Commission, resulting in no real cost to the Commission.

3 - State total cost-share of \$52 million will be bonded, requiring a loan repayment estimated at \$3.9 million per year; repayment beginning in 2001.

4 - The total state cost-share of \$17.5 million, which includes mitigation costs, will be bonded, requiring a loan repayment estimated at \$1.5 million per year; the split between state and local is not determined.

5 - Assuming Perkins County Water System payment to State Water Commission of \$4.5 million.

6 - The local cost is not determined at this time and will be determined after project configuration is complete.

7 - Components of the Grand Forks Flood Control Project involve Water Treatment Plant improvement. Those federal costs are reflected in the "Other MR&I" column because of potential cost-share using Garrison Diversion MR&I funds. Other projects, such as Greenway, are listed in "General Projects."

8 - The anticipated \$345 million in federal cost-share, including SWPP and NAWS, has been used in the previous bienniums; the remaining cost-share for projects has been identified as a potential state cost-share.

State Water Commission 1999-2001 budget request:

1. Increased funding for the MR&I projects on Indian lands.
2. Oakes Test Area remains a feature of the revised plan.
3. Additional provision allowing for ground-water recharge and establishing augmented stream flows in the Sheyenne and Red River basins.
4. A focus on wildlife protection issues.
5. Funding for recreation projects including a wetlands interpretive center.
6. Four Bears Bridge.

#### **DEVILS LAKE OUTLET**

The purpose of the emergency outlet is to provide flood relief to the area surrounding Devils Lake by diverting water into the Sheyenne River. Devils Lake began a steady rise in 1993 and has risen approximately 24 feet as of June 1999. The volume of water in Devils Lake has nearly tripled, inundating over 80,000 acres since 1993, much of it deeded farm or ranch land.

As of June 1999, the lake has reached an elevation of 1447 feet msl and has a surface area of 124,000 acres. Based on current precipitation and moisture levels, the National Weather Service is predicting the lake to increase to 1447.5 - 1448.5 msl in 1999. Damages are estimated at an average of \$25 million for each additional foot rise in lake elevation. At 1446.6 feet msl, water started to trickle through its natural outlet from Devils Lake into Stump Lake.

The emergency outlet alternative to address flooding problems is a buried pipeline/open channel from the west end of Devils Lake to the Sheyenne River, generally following the Peterson Coulee.

The U.S. Army Corps of Engineers, in cooperation with the State Water Commission and others, has developed the preliminary engineering and construction plans. The cost of the outlet is estimated at about \$100 million, including mitigation costs. The non-federal cost-share is 35 percent. Non-federal costs are anticipated to be partially bonded, with repayment over a 20-year period.

The project is designed to pump a maximum of 300 cubic feet per second (cfs) to the Sheyenne River. This could remove up to 120,000 acre-feet of water annually, or approximately one foot. The design precludes the emergency outlet from being used as an inlet. The average operating cost is estimated at \$1.25 million per year.

In addition to the emergency outlet, the U.S. Army Corps of Engineers is currently completing the city of Devils Lake's levee system. The enhanced levee system will provide protection to 1450 feet msl, although further increases may be necessary.

#### **GRAND FORKS FLOOD CONTROL**

The proposed project will provide protection from a future flood event greater than the magnitude of the 1997 flood for the cities of Grand Forks, ND/East Grand Forks, MN. The project consists of a levee system that will be constructed on both sides of the Red River. The total cost is estimated at \$343 million of which \$112.7 million is proposed to be cost-shared by the City of Grand Forks and the State of North Dakota. The total cost includes portions of the water treatment facilities costs that are required because of the levee alignment.

Completion of the project is anticipated for 2004. Costs associated with the water treatment plant are reflected as a general or "Other MR&I" project because of potential MR&I cost-sharing. Other projects, such as the proposed greenway, are considered general projects.

#### **GENERAL PROJECTS**

The State Water Commission provides support for many general water projects through its contract fund appropriation. Typically, these are relatively small projects cost-shared with local entities and other partners. The types of projects include flood control, channel improvements, drainage, water supply, recreation, supplemental funding for weather modification operations, and irrigation development.

Agency knowledge and experience allowed refinement of funding requirements by the timeframe. Reasonable project start dates were determined by the present stage of the proposal (planning level, status of required permits, funding package status, and pre-construction activities).

The total cost of the general projects necessary to fulfill the identified need for the 1999-2001 biennium is \$97.4 million. The state contribution would be \$25.9 million, assuming current federal and local-cost-share requirements. Due to limited funds and requirements for local cost-share, only \$11.7 million is expected to be funded from the State Water Commission contract fund for the 1999-2001 biennium.

#### **Other Water Management Related Projects**

There are several programs that are administered by the ND State Department of Health, including such programs as: Non-point Source Pollution Management Program; Wellhead Protection; Storm Water Management; Clean Lakes Program; and River and Stream Monitoring and Assessment Program. These programs do not involve State Water Commission cost-share. Specific projects associated with these programs are not identified or included in the list of potential projects.

The Non-point Source Pollution Management Program has been ongoing in North Dakota since 1987, due to congressional reauthorization of the Clean Water Act when provisions to control non-point source pollution were included in Section 319. Since its inception, Section 319 funding has supported over 30 local projects throughout the state. Projects are designed to promote voluntary control of non-point source pollution. Non-point source pollution consists of various contaminants that are delivered to surface water by runoff or to ground-water aquifers by infiltration.

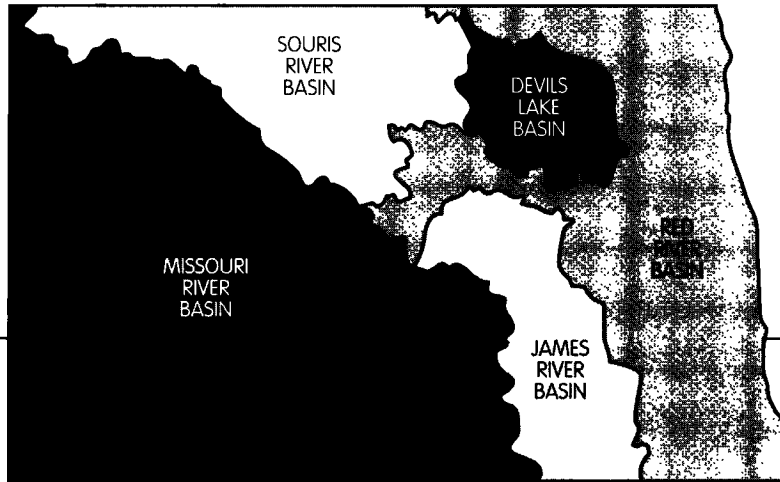
Watershed projects currently ongoing include: Bowman-Haley Watershed Project, Renwick Watershed/Icelandic Aquifer Project- Phase II, Goodman Creek Watershed Project, Antelope Creek

Watershed Project, Bisbee-Big Coulee Dam Watershed Project, Mulberry Creek/Mt. Carmel Reservoir Water Quality Project, Red River Riparian Project- Phase II, Lake LaMoure Watershed Monitoring/Assessment Plan - Phase II, Pipestem Creek Watershed Project, Beaver Creek Water Project, Sheyenne River Water Quality Project, and the Mirror Lake Watershed Project. In addition, several educational projects designed to disseminate information are also ongoing.

## Indian Water Needs

The total Indian water needs have not been identified at this time. The needs will likely be federally funded and not included in the state and local funding requirements.

The state will continue to work with Indian Tribes to ensure coordination, cooperation, and mutual consent on water resource projects and programs.



Potential General Projects by River Basin 1999-2001

RIVER BASIN	NO. OF PROJECTS	LOCAL	STATE	FEDERAL	TOTAL
Devils Lake	11	\$ 1,042,169	\$ 2,326,056	\$ 26,000	\$ 3,394,225
Red River	63	\$ 17,654,408	\$ 14,594,536	\$ 21,916,000	\$ 54,164,944
Souris River	6	\$ 1,278,000	\$ 597,000	\$ 0	\$ 1,875,000
James River	3	\$ 94,800	\$ 63,200	\$ 0	\$ 158,000
Missouri River	23	\$ 11,663,150	\$ 7,714,850	\$ 17,235,000	\$ 36,613,000
Statewide Data Collection & Studies	1	\$ 0	\$ 630,000	\$ 630,000	\$ 1,260,000
Total 1999-2001	107	\$ 31,732,527	\$ 25,925,642	\$ 39,807,000	\$ 97,465,169
Total 2001-2011	107	\$ 119,977,500	\$ 92,100,000	\$ 27,375,500	\$ 239,453,000
Total Beyond 2011	97	\$ 196,201,500	\$ 137,977,500	\$ 25,845,000	\$ 360,024,000

\* State Water Commission 1999-2001 budget request for general projects is \$11.7 million, resulting in a potential unmet need of \$14.2 million.



# Water Policies and Recommendations

**W**ater in North Dakota is managed through an extensive set of rules, policies, and programs administered at federal, state, and local levels. The State Engineer identified a need to inventory all applicable federal and state programs that affect water management. Additionally, an inventory and review of all State Water Commission (SWC) internal policies was conducted.

All programs and policies were reviewed through the public involvement process and subsequent comment periods. Public involvement input, a needs analysis, and interagency comments were used to generate future study recommendations for State Water Commission internal policies.

An inventory of federal programs and funding that affect water management in North Dakota can be found in the Appendix on page 69. An inventory of North Dakota natural resource programs that affect the management of water is in the Appendix on page 86. State Water Commission internal operating policies are detailed in the Appendix on page 93.

## Recommendations for Future Study

The following recommendations are an analysis of potential policy and regulatory changes. All of the recommendations require future study and are intended to serve as an initial starting point to addressing long-term water management

issues. They are listed in an effort to improve development, management, conservation, and optimum use of all water resources of the state in the public interest. They are divided into broad categories and presented here as submitted.

### GENERAL RECOMMENDATIONS

#### **WATER SUPPLY BANK**

It is recognized that the sale or lease of water is important to the efficient management of the state's water resources. Further study into the use of a State Water Supply Bank is encouraged.

**SWC COMMENT:** As the state approaches the situation where little or no water is available in some areas for new appropriations, a Water Supply Bank affords an efficient mechanism for the sale or lease of water. Currently, several state models, such as Idaho and California, exist for the development of a like program.

By aggregating water available for lease, rental pools operating under the authority of the State Water Commission Water Supply Bank could supply the water needs of many potential users. The State Water Commission should consider rules and regulations governing the sale or lease of water through a Water Supply Bank. Although this issue has been addressed by the legislature in the past, no action was taken. Public surveys conducted by the State Water Commission indicate a moderate level of support for a water supply bank program. Legal issues involved with the creation of a Water Supply Bank need to be addressed.

#### **RECHARGE**

It is recommended that artificial or managed recharge of aquifers be considered as a water management technique for aquifers that have a need for additional water because of current or potential development.

**SWC COMMENT:** Aquifer recharge of aquifers using surplus surface water may be a desirable water management technique for enhancing ground-water availability in some areas. Aquifers with properties suitable for artificial recharge and a source of surplus water should be identified and evaluated. A pilot artificial recharge project should be operated to determine technical and economic feasibility. The state has explored, on a limited basis in the James River basin, the development of an artificial recharge program.

#### **CLIMATE VARIABILITY**

It is recommended that climate variability be considered in planning for and in the management of the state's water resources. Specifically, the state should develop comprehensive flooding and drought mitigation plans.

**SWC COMMENT:** Regional climate changes are uncertain, however, climate variability should be expected and planned for by the public and its agencies. Possible consequences of regional climate change are important to recognize in a comprehensive planning process. For example, winter snowpack may significantly affect the water resources available for agriculture, power generation, forestry, and fisheries. The State Water Commission should develop a basic drought and

flood mitigation program. Programs should be developed in partnership with appropriate federal and local entities. Even though uncertainties are considerable, the State Water Commission should put in place policies and procedures that could provide for flexibility.

#### ***WATER CONSERVATION PLANNING***

It is recommended that the State Water Commission develop a statewide water conservation action plan. The development of the plan should be conducted in conjunction with state drought mitigation planning efforts.

**SWC COMMENT:** North Dakota is currently faced with critical water areas with limited availability for new appropriations. The development of comprehensive water conservation strategies and possible cooperative funding efforts with university research facilities and private industry could significantly increase the amount of water available for beneficial use. Additionally, water conservation guidelines and planning are an integral part in the development of drought mitigation plans.

#### ***INSTREAM FLOW***

It is recommended that the State Water Commission explore the designation of waters in the state for instream flow purposes, insofar as those flows do not impede current appropriations or severely constrict the beneficial development of future water resources.

**SWC COMMENT:** Instream flows protect many non-consumptive uses such as fish and wildlife habitat, aquatic life, recreation, aesthetic beauty, transportation, navigation, hydropower and water quality. Many of these uses have direct effects on the economy while others represent intangible values. The State Engineer does not have the authority to directly establish minimum stream flow rights through the appropriation process due to the necessity of works or construction of works required by North Dakota Administrative Code 89-03-01-07. The State Engineer and

State Water Commission could establish a baseline stream flow to protect the integrity of the state's water pursuant to North Dakota Century Code 61-02-14 (1) a, and under the public trust doctrine. However, due to the implied references to prior appropriations in such cases, the authority for such action may be limited.

The State Water Commission could support efforts to obtain storage to improve and maintain instream flows when in the public interest. The NDCC could be expanded to enable the State Water Commission to transfer acquired water rights to instream flow water rights. The transfer of such rights should be on a voluntary basis and transferred from current appropriations. The development of new rights specifically for the development of minimum stream flows is unlikely. The state does, to a very limited extent, preserve natural flow levels on the Little Missouri River, NDCC 61-29 and 61-29-06 as parts of the Little Missouri State Scenic River Act.

Prior to legislative changes, the potential benefits and impacts, as well as possible implementation strategies, should be explored.

#### **MANAGEMENT RECOMMENDATIONS**

The focus of the management policies is an improvement in the practices, procedures, and laws relating to existing water and other resource administration and programs. The purpose of the policies is achievement of greater administrative efficiency.

#### ***WATERSHED MANAGEMENT***

It is recommended that where practical, the water needs of a geographic area be satisfied by a legal entity having the authority and responsibility to address all water needs in a comprehensive manner.

**SWC COMMENT:** Under present law, the boundaries of irrigation districts, water resource boards, and joint boards, need not coincide. Since holistic, coordinated planning is often difficult, the possibility exists for good faith actions to have adverse impacts or be at cross purposes with the aims of other management entities.

Water is more a local and regional resource than a national resource, and water policy should, therefore, not be separated from its actual working contexts. Approaching water resources regionally by way of drainage areas or river basins, the settings in which water occurs naturally, has been the historic response to this problem. The difficulty here has been that although water occurs hydrologically in definable geographic units, within them its management is invariably subject to fragmented political jurisdictions. Efforts to deal with water geographically typically encounter strong resistance from bureaucracies that are functionally organized for different uses. While conceptually appealing, most of the attempts at water management by river basin have been failures, because society is not hydrologically organized. Human interests, efforts, and organizations tend to follow other lines—legal or political boundaries, historical, economic, or service areas. In considering the best spatial arrangements for water policy, the fact that water planning regions do not have any particular social or political validity should be borne in mind. Often there is an urgent need to define water regions as something other than river basins. The concept of "problem-sheds," where small areas with common water problems are aggregated into larger regions, may be more workable and effective.

Special multi-county joint water boards, based on county boundaries, should be encouraged statewide and have the authority to own and operate storage, diversion, and delivery systems to provide

the total water needs of large geographic parts of the state (e.g., river basins, single or multi-county areas). It should have authority to levy taxes on all property benefited by a program or project and to bond and contract for project construction. Water could be supplied for irrigation, domestic, municipal, industrial, recreation, and other purposes. Such districts could also sponsor ground-water recharge projects, distributing the costs over the affected area. They could also integrate the use of the surface and ground-water resources of a river basin for more efficient use of the total resource.

Multi-county joint boards do exist in some areas of the state. Many, however, are only single-issue oriented and do not comprehensively manage a wide variety of water issues. An expansion of duties would be required to holistically manage regional and local water management concerns.

#### **RESEARCH PROGRAM**

It is recommended the State Water Commission encourage and/or conduct research on important water resource topics through a cooperative effort with the state's universities and institutions of higher learning.

SWC COMMENT: While water programs in North Dakota can incorporate information from research in other states, more research dealing with specific problems in North Dakota is needed. Possible topics include:

- Water use efficiency;
- Enhanced monitoring programs for water use;
- Ongoing surface and ground-water relationship studies, specifically with regard to the timing and spatial distribution of pumping and recharge efforts;
- Ongoing ground-water flow models;
- Ongoing cooperatively developed system operation modeling techniques for North Dakota river basins;

- Flooding and drought;
- Water development funding;
- Wetland storage capacity and economic/environmental valuation;
- Water quality protection; and
- Precipitation processes, efficiencies, and modification potential.

Studies could be distributed as a yearly publication of North Dakota water-related research.

#### **FUNDING PROGRAM ALTERNATIVES**

It is recommended that the State Water Commission explore alternative funding opportunities for meeting the future water development needs of the state.

SWC COMMENT: The State Water Commission's Contract Fund, State General Fund, and Resources Trust Fund allocations are mechanisms for partially achieving the goals of this policy. These funds rely on the appropriations from the state's general fund, revenues from the Resources Trust Fund, or other specially-dedicated funds. These funds have provided financial assistance for more than 100 water development, conservation, or system rehabilitation projects and studies. They have not been funded with sufficient monies to provide for optimum development of water and related resources of the state.

The federal funding that North Dakota depends on for the development of water supply infrastructure is often unpredictable and difficult to secure. Future federal budgets for water development will likely shrink and some programs will expire due to budget reductions. If federal funding does cease, the state must fund water development using its own revenue sources, including the Resources Trust Fund. Not all counties have the tax base or the economic resources to adequately meet the cost-share requirements necessary to fulfill their water needs. Like many states currently facing equity funding for education, North Dakota could be confronted with equity funding for water

development. Such a funding scheme would impair the abilities of the other counties to meet their growing infrastructure requirements.

The state must find additional sources of revenue. Additional funds could be generated through a statewide water use tax. A statewide water tax would charge users based on consumptive use. Although such a tax does not entirely solve issues of equity funding, it would spread the burden of water development over the entire state, rather than placing it on the resource extractions of western counties.

The State Water Commission could additionally lend the proceeds from the sale of revenue bonds to a local water project sponsor or sponsors. The issuance of revenue bonds does not constitute a general obligation of the State of North Dakota or the State Water Commission. The language creating the above funds and accounts should not be overly restrictive, providing for the expenditure of monies for more than development. Money should be made available for projects that would conserve or restore the state's water and related resources.

The State Water Commission could re-engineer the basic cost-sharing guidelines. Current strategies are based on a first come-first served basis. Additionally, projects are eligible for funding at any State Water Commission meeting. Unexpected budget shortfalls and lower energy-related revenues for the Resources Trust Fund could result in needed projects developed late in a biennial cycle left with severely limited or no cost-share opportunities. The development of a quarterly, every six months, biennial cycle of cost-share funding would increase competition for funds between projects and increase the efficient use of state funds. Other alternatives include the establishment of a preset percentage of funds determined each biennium for allocation to functional areas, such as flood control, water supply,

and others. This system would prevent any one type of project from using a disproportional percentage of state resources.

#### **PLANNING PROGRAM**

It is recommended that water management plans be prepared for the individual river basins.

SWC COMMENT: Comprehensive planning is necessary to minimize conflicts between competing water uses and to ensure optimal protection of all beneficial uses of water. Detailed water management plans should be prepared for river basins and aquifers within the state to evaluate the specific interrelationship between ground and surface water and provide for the orderly protection and development of the state's water resources. Each basin water management plan should become a component of the State Water Management Plan.

These plans may contain state protected river designations and recommendations concerning other aspects of water use. The positions and policies contained in an approved plan should be the state's official position on water use in the affected areas. The plans also assure that the state's interests will be considered in federal management agency decisions.

#### **LAKE, RESERVOIR, AND AQUIFER MANAGEMENT**

It is encouraged that the State Water Commission explore, in partnership with the Department of Health, coordinated management plans for use and water quality protection for lakes, reservoirs, and aquifers in the state.

SWC COMMENT: North Dakota is a land of numerous lakes, reservoirs and aquifers. Many have experienced declining water quality, surface crowding, and physical damage. Coordinated management plans for surface and subsurface use, relative to public safety, and water quality protection can address these problems.

Each lake, reservoir, and aquifer system has its own set of needs and constraints that must be considered. County and city government, the local public, land managers, and user groups of the lake, reservoir, and aquifer, must be involved in plan development and implementation. Where federal or private entities have regulatory control over water storage and releases, these entities are encouraged to cooperate in the development of use and water quality management plans.

#### **STATE PROTECTED RIVER SYSTEM**

It is encouraged that North Dakota study a state protected river system maintained to meet the desires of the citizens of North Dakota and appropriate on a case-by-case basis. The system could provide for the protection of the unique features that exist on various rivers within the state, and could provide the necessary authority and funding to protect such rivers and related lands for recreational, scenic, and natural values.

SWC COMMENT: North Dakotans have expressed a desire to retain some rivers or river reaches in a free-flowing condition. The authority to designate "protected rivers" could derive from the state's power to regulate the beds of navigable streams and the waters within the state. The state does preserve, to a limited degree, natural flow levels on the Little Missouri River, (NDCC 61-29 and 61-29-06) as part of the Little Missouri State Scenic River Act. A comprehensive inventory, compiled through a partnership with other natural resource agencies, is needed to assist in the determination of possible river protection.

Because of the comprehensive scope of state water planning, the State Water Commission encourages the federal government to work within the state water planning process rather than independently pursuing federal protection of waters within North Dakota. Federal protection adds another layer of bureaucracy to water planning and limits planning flexibility.

State water planning provides a means for ensuring coordinated water planning by both federal and state governments.

#### **FEDERAL AND TRIBAL WATER RIGHTS**

North Dakota supports negotiated rather than litigated settlements to Indian reserved water rights disputes.

SWC COMMENT: Indians and Indian tribes possess vested rights to water sufficient to provide a homeland. The federal government holds a "trust" responsibility for Indian tribes. The trust is recognition of the indigenous nations' and tribes' inherent sovereignty within the context of a wider national government. The trust responsibility requires that the federal government protect the tribes' continued enjoyment of their existing *Winters* rights.

The Supreme Court's opinion in the 1908 case, *Winters v. United States* (207 U.S. 564, 1908), remains the foundation of Indian water rights. The existence of these rights dates at least from the creation of the reservation. However, the Court also establishes a standard upon which tribal water rights reserved for agricultural purposes may be quantified, based on the amount of water needed to irrigate all "practically irrigable acreage" on the reservation.

The State of North Dakota is open to cooperative negotiations and the development of mutually agreeable timetables for completion. Any future negotiations should include all applicable federal agencies, the state, tribes, and local governments. The federal government has the responsibility for ensuring a successful conclusion of any processes, including providing information and technical assistance to tribes, providing federal negotiating teams to represent one federal voice, seeking approval of agreements, fully funding the federal share, and ensuring that the settlements are implemented.

### ***WATER MEASUREMENT***

It is recommended that the State Water Commission, through a cooperative effort with other state and federal agencies, improve the existing stream gaging program and enhance in the most efficient manner the system to meet present and future water planning and management needs.

SWC COMMENT: Despite their importance, many gaging stations have been abandoned due to rising maintenance costs and reductions in U.S. Geological Survey funding. It is recommended that the existing stream gaging program be reviewed and enhanced in the most efficient manner to meet water planning and management needs. Many ground-water systems have not been fully studied. Further assessment studies are recommended to better understand and evaluate the state's ground-water resources. The State Water Commission must continue to be actively involved in water use measurement and reporting.

### ***COST-SHARING FOR REMOTE SENSING***

It is recommended that the State Water Commission, through a cooperative effort with other state and federal agencies, develop cost-share policies for the development of remote sensing.

SWC COMMENT: The development of technology-based information systems is vital to the decision-making abilities of the State Water Commission and other natural resource agencies. Improved digital data, combined with satellite-based survey techniques, provide accurate landscape information at a scale useable for proactive policy development and decision-making. The development of remote sensing is especially important in areas of smaller elevation change like the

Red River, James River, and Devils Lake basins. The development of digital elevation models and other technology-based systems is essential to addressing the state's growing floodplain management issues.

### ***COST-SHARE FOR URBAN FLOOD CONTROL AND STORMWATER MANAGEMENT***

It is recommended that the State Water Commission, through a cooperative effort with local interests and other state agencies, develop a cost-share policy for the continued improvement and development of new urban flood control structures and systems. Funding should be limited to planning phases.

SWC COMMENT: The State Water Commission is active in the development of rural flood control. However, assistance for urban areas for the improvement and development of new urban flood control systems is not available. The development of Phase II National Pollutant Discharge Elimination System (an EPA program) stormwater run-off permits will likely result in needed improvements for some urban water management systems. The State Water Commission should participate in the planning and development of these systems to ensure adequate incorporation of proactive floodplain management. Needed planning coordination could help to reduce flooding mitigation costs, future damages to vital water supplies, and ensure long-term surface and ground-water quality protection.

### ***POLICY FOR THE UNAVOIDABLE LOSS OF AN EXISTING HABITAT BASE***

It is recommended that the State Water Commission study the development of a policy for the unavoidable loss of existing habitat base associated with the construction and operation of state-funded water development projects.

SWC COMMENT: The State Water Commission and the State Engineer are dedicated to ensuring the long-term environmental quality of the state's natural resources. A policy for the unavoidable loss of existing wildlife habitat due to the construction of state-funded water development could contribute to the overall environmental quality of the state. The adoption of such a policy could be developed under the auspices of the State Engineer's public trust obligations. Further research is needed to determine the applicable costs and benefits to the state and the legalities and jurisdictional responsibilities involved with the policy.

### ***DEVELOPMENT OF BASELINE MODEL FOR ADDRESSING CUMULATIVE IMPACT ASSESSMENTS***

It is encouraged that the State Water Commission explore the potential for the development of a comprehensive cumulative impact model to assist decision-making in water management issues.

SWC COMMENT: The State Water Commission recognizes the benefits of a comprehensive cumulative impact model. The development of a baseline model from which to measure future applicable impacts would be a long-term development project. A development plan would be needed to assess relevant impacts and specific geographic impact areas. Comprehensive assessment protocols would also need to be developed. Data needed for input into the model would likely require considerable staff time for development and additional funding sources. Most importantly, an original workable model would likely have to be developed. Currently, the availability of an existing comprehensive impact model that would fit the needs of North Dakota is limited.

# Special Topics

**N**orth Dakota has a variety of special issues or topics that have a significant impact on water management. From educational and water management programs, like the Atmospheric Resource Board and Project WET, to current "hot" topics such as floodplain management, drought, and technology, these special topics are highlighted to demonstrate their individual significance.

## Atmospheric Resources

The Atmospheric Resources Board is a division of the State Water Commission. Its mission is to conduct quality atmospheric management programs throughout North Dakota, and be a national leader in the application of atmospheric modification technology.

### THE CURRENT PROGRAM

Since the publication of the 1992 State Water Management Plan, the Board has contributed to national thunderstorm research, upgraded weather modification program elements, and greatly increased warm-season rain and hail data collection efforts.

### *Thunderstorm Research*

The North Dakota Tracer Experiment, a cooperative thunderstorm research program sponsored by the State of North Dakota, the National Oceanic and Atmospheric Administration, and the National Science Foundation, was conducted during the summer of 1993. The program probed clouds with instrumented aircraft and Doppler radars, and tracked the movements and dispersions of several atmospheric tracers released in and near subject clouds to learn more about storm

transport and mixing mechanisms. As of 1998, over 100 formal papers and presentations had resulted from this research effort, which provide insight into storm development, evolution, transport, and precipitation development.

### *Improved Seeding Agents*

For years, clouds have been seeded using burning flares that produced tiny silver iodide particles. These particles are shaped very much like ice, and thus cause supercooled liquid water to freeze upon contact. While this process was effective, it was relatively slow, because freezing, which begins the precipitation development process in even summertime North Dakota clouds, did not occur until contact between a silver iodide particle and a supercooled cloud droplet occurred.

A new formulation that combined silver iodide and simple salt (sodium chloride) was developed and subsequently adopted by North Dakota programs. Because the tiny amount of salt attracts water, each silver iodide particle forms its own droplet—so there is no wait for a chance collision between particle and droplet, and freezing occurs much sooner. This makes seeding take effect much faster, and makes correct targeting easier.

Cloud seeding is also conducted by burning a solution of acetone, silver iodide, and salt-producing additives in generators mounted on aircraft wing-tips. In 1997, the fast-acting seeding solution introduced in 1984 was changed to another solution of similar formulation, but which contained only 25 percent of the salt-producing additives. Testing of this formulation verified that it

was also fast-acting. Benefits were lower cost (less additives) and significantly fewer cloud seeding generator problems. Better overall performance and cost-effectiveness resulted.

### *Transition to Newer Aircraft for Operational Cloud Seeding*

For safety reasons, twin engine aircraft have always been employed to seed clouds in the North Dakota Cloud Modification Program. For years, the aircraft of contractor choice was the Piper Turbo Twin Comanche, a reliable light twin with economy and speed. However, as the Twin Comanches aged (most were built in the 1960s), parts became increasingly difficult to obtain, and the contractor began to phase them out in favor of a newer sister aircraft, the Piper Seneca II.

Like its predecessor, the Seneca II is a twin-engine aircraft. However, they have a greater rate of climb, a roomier cabin, and of course, parts are readily available. While this change has increased project costs, proper maintenance poses fewer difficulties, and fewer flights are missed for mechanical reasons. In addition, the Seneca II's faster rate of climb gets the aircraft to seeding altitude faster.

### *State Deploys Radars*

Since the creation of the Atmospheric Resource Board in 1975, field radars deployed for weather modification purposes were leased from a commercial contractor for the summer project. However, in 1996, the board obtained a radar surplus by the National Weather Service and redeployed it in Bowman in time for the 1997 season, with the help of the Bowman County Airport Authority and the local weather modification authorities.

The purchase was accomplished at the same approximate cost as leasing a radar for a year. The system is essentially the same as those previously leased, except the antenna is enclosed by a radar dome (radome), which allows continuous operation, even in high winds, and the antenna itself is larger, providing a narrower, more precise beam and greater sensitivity.

In 1997, the board obtained a second radar, also surplus by the National Weather Service, and redeployed it in Stanley, with the help of the Mountrail County Weather Modification Authority. A two-story, wood-frame building was constructed to house the radar and support the antenna. Acquisition and set-up of the radar cost only a few thousand dollars more than leasing a radar for a year.

The Bowman Radar was operated in the 1997 cloud modification project, and both radars were operated during the 1998 project. Computer-based data acquisition systems were added to each radar and Thunderstorm Identification, Tracking, Analysis, and Nowcasting (TITAN) software provided extensive data recording and archival.

Storm histories and forecast tracks became available to the radar operators in real time. Parameters such as radar-estimated precipitation and vertically-integrated liquid were also displayed in real-time, affording a greatly improved grasp of the storm character.

In addition, data could be played back after seeding missions and pilots could examine the structure of the storms they had been seeding and in turn share their observations with the project meteorologists. In short, the TITAN system is vastly superior to any used previously.

#### ***Rainfall Data Mapping***

Since 1976, the board has collected growing season rain and hail data statewide, through a cooperative network

of approximately 800 observers. In 1996, these data were entered in the Water Commission's database, and in 1997, were made available to the public via the Internet.

In addition, statewide maps for each month and season are now also posted on the Web page, usually within a month after the month or season ends.

#### ***Digital Aircraft Tracking***

Proper record keeping of cloud seeding activities has always been of paramount concern to the board. Over the years, part of this effort has included the production of flight maps that show all seeding events. Until 1998, the co-pilot, using navigation fixes from conventional means always drew these maps in flight.

In 1998, the two project cloud-top seeding aircraft were equipped with data systems that recorded GPS position data and seeding events throughout the flight. This provides more accurate position data than ever before, and will allow more precise correlation between aircraft and observed radar echoes to be established, very important if effective targeting of the seeding agent is to be confirmed.

### **A VISION FOR ATMOSPHERIC RESOURCE MANAGEMENT**

The vision of the Atmospheric Resource Board is to continue its groundbreaking research and to provide the greatest service possible to participating counties. The Board is studying possible hygroscopic seeding options, compete digital aircraft track recording, and a variety of program enhancements.

#### ***Explore Possible Hygroscopic Seeding***

Cloud seeding in North Dakota presently employs materials intended to accelerate precipitation formation through the early formation of ice. This technique, called glaciogenic (ice-making) seeding, has received widespread attention through the

years, and is by far the most commonly used. Another technique called hygroscopic seeding has recently shown considerable promise.

Hygroscopic seeding does not try to increase ice in the cloud, but instead attempts to increase the sizes of the tiny droplets that comprise the cloud as it forms. The early presence of larger cloud droplets enables the coalescence process, which can produce precipitation much more quickly. Recent hygroscopic seeding trials in Texas and Mexico have been very encouraging, and the technology should be considered for application in North Dakota as well.

#### ***Compete Digital Aircraft Track Recording***

Unlike the cloud-top seeding aircraft, the Piper Seneca II seeding aircraft presently employed to seed from cloud base do not presently record their position or seeding events by computer. This should be done as soon as possible, for reasons previously mentioned. Radio telemetry of the aircraft positions to the operations radar are also possible and should be considered as well.

#### ***Evaluation of Rainfall and Hail Climatology***

The board has been collecting rainfall and hail data across the state since 1976. These data comprise the most comprehensive growing season (April - September) large area rainfall climatology in existence. A detailed analysis of North Dakota's growing season precipitation climatology would be in order. In addition, the data set may afford an opportunity to assess any extra-area impacts on precipitation patterns that may result from the existing operational cloud seeding efforts.

#### ***Additional Physical Research***

While much progress was made through recent thunderstorm research programs (1989, 1993), unanswered questions remain. As is often the case, the answer to one question may lead to several new questions. The origin of hail embryos and



the subsequent development of hail are two matters that must be more fully explored. Verification of targeting techniques, storm response to seeding, and quantification of changes in precipitation, both rain and hail, are others.

#### ***Review Seeding Suspension Criteria***

Criteria under which cloud seeding would be suspended were developed by the board prior to 1980, and formally reviewed by a committee of experts in 1984. While no instances in which seeding failed to be suspended (when it ought to have been) are known, much has been learned about thunderstorms since that time. In addition, observational technologies have advanced considerably as well. With this in mind, the suspension criteria need to be reviewed, and if necessary, revised.

#### ***Revisit Seeding Conceptual Model***

The most recent scientific reexamination of the conceptual model employed in designing and conducting the North Dakota Cloud Modification Project was completed in 1995, and was published in the *Journal of Applied Meteorology* in 1997. This exercise, while productive, involved only scientists engaged in the North Dakota research program. A "committee of experts" comprised largely of scientists uninvolved with the North Dakota efforts could provide fresh perspective. In addition, the conceptual model should be expanded to include the potential for seeding with hygroscopic materials intended to enable and accelerate the coalescence precipitation formation process.

#### ***Assess Environmental and Extra-area Effects of Cloud Seeding***

A rainfall database sufficient for assessing the long-term effects on rainfall in and near project areas now exists.

In addition, the possible long-term impacts of cloud seeding agents upon the environment should be assessed, if detectable.

## **Project WET**

Project WET, a national water science and water education program, originated in North Dakota in 1984 through the State Water Commission public planning processes.

Project WET (Water Education for Teachers) is a supplemental and interdisciplinary water education program for kindergarten through 12th grade formal and non-formal teachers, pre-service teachers and K-12 students. Project WET can also include any adult working in conjunction with K-12 students.

Traditional educational opportunities for formal K-12 public and private school teachers include credit and non-credit workshops, institutes, instructional courses and inservice sessions.

During the 1997-1999 biennium, it is anticipated that over 400 teachers will receive Project WET educational services through 16 programs. During this period, over 230 preservice teachers at North Dakota universities will receive Project WET educational services.

Additionally, while continuing traditional educational opportunities to K-12 formal educators in public and private schools, Project WET *Explore Your Watershed* has enhanced and expanded its outreach efforts to non-formal educators such as scout and 4-H leaders, resource agency educators, science center educators, home educators, environmental learning center educators and state park interpreters. The increasing need to provide water science and water education opportunities to these groups has been met through intensive summer outdoor courses, credit and non-credit workshops, and inservice sessions.

During the 1997-1999 biennium, it is anticipated that 45 non-formal educators will receive Project WET educational services through four programs.

Major new educational initiatives have been developed and implemented directly to K-12 students. These initiatives are in response to the many local, state, and federal agencies and organizations that are increasing the environmental literacy of K-12 students through Project WET water education programs. These students receive Project WET *Explore Your Watershed* educational opportunities through regular classroom participation and special educational events such as youth camps, youth water festivals and celebrations, community water or environmental awareness events, and community water action or service projects. During the 1997-1999 biennium, it is anticipated that over 7,500 K-12 students will receive Project WET educational services directly through 51 educational programs. Also, during this period over 400 families (adults/ K-12 students) will receive Project WET educational services through four educational programs.

Total Project WET services to K-12 formal and non-formal teachers, preservice teachers, K-12 students, and adults/families during the 1997-1999 biennium were provided to over 9,800 individuals through 75 educational programs. Project WET also served 365 teachers indirectly through their attendance at Project WET educational programs for K-12 students.

Project WET will also be involved in 34 additional educational events during the 1997-1999 biennium to include booths, exhibits, presentations and water/environmental educational meetings.

Potentially a total of an additional 10,550 K-12 students could receive Project WET educational activities through formal and non-formal teachers who attended the twenty Project WET programs during the biennium for their groups. Project WET will continue to meet the challenging and changing needs of North Dakota's educators and students as it continues to chart new educational opportunities.

## Water Management Technology

The last 50 years of technological innovation has had a profound impact on the resources available to assist in the management of water. From computerized permitting systems to Geographic Information Systems to Geographic Positioning Systems, the tools used to collect, analyze, and distribute water-related information have changed dramatically.

### COMPUTERIZED DATABASES

The State Water Commission organizes all permits on a state-of-the-art relational database. Technology is used in every aspect of the permitting system from the application, processing, and maintenance to the dissemination of raw and polished data. The system allows registered users to enter information or to gather specific queries or searches. Any user can search for an single permit or a series of permits by permit number, applicant name, county, aquifer, basin, use type, or by township. The information gathered from the databases allows the State Water Commission to produce annual water use reports, surface and ground-water assessments, and a variety of other water resource analysis. In addition to permitting databases, the commission also maintains the North Dakota Rain Gauge Network. The Network, operated through the North Dakota Atmospheric Resource Board, consists of over 800 volunteer observers statewide who record rainfall and hailfall from April 1 through September 30. This extensive network has been in place since 1977. All of the databases are available for public access through the State Water Commission's Internet home page: <http://www.swc.state.nd.us>

### GEOGRAPHIC INFORMATION SYSTEMS (GIS)

The State Water Commission maintains hundreds of digital coverages used to analyze spatial water-related data. GIS is a primary decision-making tool in the permitting process, the analysis of

drainage basins, and contributes to our understanding of land and hydrologic relationships. Additionally, GIS has been used as a tool for locating potential illegal drainage and in the determinations of contributing sub-basins in the Devils Lake basin. GIS has been used by the State Water Commission to analyze information to assist local communities affected by the flooding. The State Water Commission, in partnership with various federal agencies, has been able to compile a vast number of coverages for analysis to assist in future water management decision-making. With current software, the State Water Commission is able to create three-dimensional images of a watershed or basin. GIS allows for a precise focus of critical water management areas.

### GROUND WATER AND SURFACE WATER MODELING

The State Water Commission uses available technology, such as the HEC models, to develop powerful and accurate models of the state's surface water and ground-water systems. These models assist in the permitting process by allowing hydrologists and engineers to determine the amount of water available for beneficial use during different scenarios, such as drought or flooding. Hydrologists are able to combine climate data, water use data, reported water level data, and geographic data and use them collectively as a predictive decision-making tool. The use of flow models, combined with professional expertise, helps to ensure that water is allocated in such a manner than it is available to meet the needs of all North Dakotans.

### GEOGRAPHIC POSITIONING SYSTEMS (GPS)

One of the newest tools available to the State Water Commission is GPS. The technology uses satellites to triangulate the exact location and elevation of a particular point or set of points. The device is used to locate wells, determine the exact size of storage sites, the capacity of reservoirs, and to construct field-checked topo-

graphic maps. GPS has been actively used to determine the water storage potential of an individual site in the upper basin of Devils Lake requesting payments through the Available Storage Acreage Program. The new GPS system has proven to be cost-effective, time-saving, and more accurate than traditional surveying methods.

## Present and Future Weather Cycles

Water supply is critical to the environmental, social, and economic well-being of the state. Unfortunately, amounts of atmospheric precipitation vary geographically across the state, as well as, chronologically throughout history.

Weather cycles are repeatable patterns found to occur naturally within the atmosphere. These patterns include diurnal, synoptic, planetary, seasonal, and climatic. The duration of any weather cycles is difficult to assess due to the lack of available data or limited recorded history.

Climatic indicators focus on two important factors:

- Precipitation (winter snowfall and spring snowmelt conditions; summer thunderstorms; spring/fall rain)
- Evaporation (total sunshine; boundary layer water vapor)

Current climate conditions indicate that North Dakota is in a wet phase of the climate cycle. This cycle is apparent throughout central North America and current research suggests that the cycle may be of a long duration. Leon Osborne of the University of North Dakota suggests that the current wet phase is the result of two cycles of 60 and 180 years. Historical data obtained from Devils Lake indicates that the two cycles are coming into phase with each other.

Wet cycles increase the potential for both random and episodic flood events. Random events result from chance occurrences of wet winters or brief heavy thunderstorms. Episodic events include persistent annual flooding due to peaks in climatic weather cycles.

Dry conditions, eventually resulting in drought, are considered cumulative events. The drought experienced in the 1930s was the culmination of 10-15 years of progressively drier conditions. Even with a significant wet cycle, some localized areas are currently faced with limited availability for new appropriations. The development of comprehensive water conservation strategies to plan for prolonged drought conditions could increase or at least maintain the amount of water available for beneficial use.

Osborne suggests that several conditions must be met in order to cope with long-term climate cycles. These include:

- Acceptance that there are times when nature provides no (easy) solutions.
- Consider that in some situations drastic change will be required.
- Develop visionary (long-term) strategic plans.
- Develop better scientific methods for prediction of timing and intensity of climate variability.

## Floodplain Management

Flooding in North Dakota can occur in any given year and in every watershed in the state. At its most basic level, flooding is the result of two possibly overlapping circumstances. The first is an isolated atmospheric event. This involves large amounts of rainfall over a short duration. This "flash flooding" is often localized spatially and, although potentially destructive, lasts only a short time.

The second is the result of winter snowfall and spring thaw. During the winter season,

snow accumulates across an entire river watershed. Although some moisture is lost during the winter through sublimation and mid-winter thaws, snow is generally retained until spring. During the spring thaw, snow can melt within a short period of time, sending months of precipitation through a watershed within a few days time.

In general, the magnitude of flooding is dependent on the amount of moisture stored in a watershed and the rate at which it is released through the melting process. North Dakota flooding, however, is affected by more than precipitation, melting, and localized flash flooding. There is a set of geographical conditions that exist throughout the state that act as constant precursors to spring flooding. The magnitude of any particular flood is based on the interaction of variable environmental factors with these constant geographical conditions.

In the 33-year period from 1965 through 1998, 20 Presidential Flood Disasters have been declared in North Dakota. Flooding creates adverse impacts such as damaging buildings, inundating farmland, destroying possessions, and compromising the integrity of structures.

Planning for such events and implementing mitigation measures is fairly common. Building codes, land-use regulations and other measures are often adopted to minimize potential losses. However, planning and other non-structural approaches to prevent future flood damages can and should be improved. Unanticipated damages also slow the recovery process by raising costs and complicating remedial action plans.

Furthermore, failure to accommodate recurrent flood impacts into the planning and flood prevention process only serves to perpetuate the problems. Inevitably, disasters lead to damages, and then repairs merely recreate the status quo.

## THE FLOOD HAZARD

The occurrence of a flood event usually elicits a response to alleviate losses and return communities as quickly as possible to pre-disaster conditions. It is rare to find long-term strategic planning designed to mitigate the many facets of the flood hazard, even among the state's larger communities. In part, this is because large floods are often low-probability events that do not rank highly amongst the many issues that people face on a day-to-day basis.

In addition, the state and federal governments have implemented emergency action plans to facilitate the immediate relief of flood victims, which tend to work against the development of comprehensive disaster planning.

Also, it should be noted that some events are relatively unpredictable, at least in time if not in space, thus compromising effective planning while promoting a simple response mode. However, despite these characteristics, the opportunities for evaluating probable impacts of a given event and for planning accordingly are considerable.

Some progress has been made, particularly with the National Flood Insurance Program and its associated zoning regulations and floodproofing requirements that place restrictions on new development. The intent is to minimize reliance on flood control structures and to force floodplain residents to insure against individual losses, thus reducing the need for community-based relief. Nevertheless, state and local entities cannot solely rely on federal standards to manage the local and regional flooding problems.

Flood concerns have historically been regarded as economic issues associated primarily with direct damages. In essence, the underlying philosophy has been one of costs versus benefits, while focusing attention on short-term economic variables, rather than consideration of the

total range of impacts, including indirect and intangible losses. Additionally, there has been overwhelming interest in relief and rehabilitation efforts and a prevailing desire to get things "back to normal" as soon as possible.

Thus, the first step is usually to facilitate recovery from the flood and to meet the immediate demands of flood victims. The second step is to plan for the next event, thereby initiating a continuing cycle of disaster-relief-repair-disaster. Ultimately, the flood risk and vulnerability do not change.

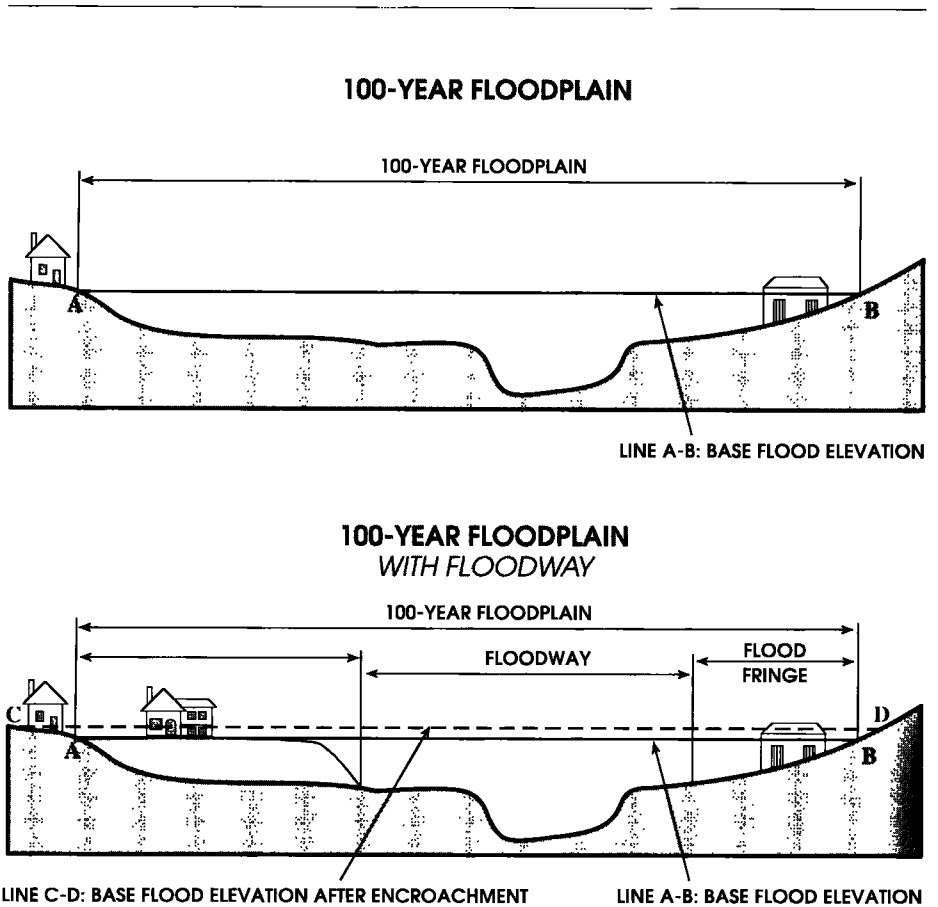
Of course, communities can and do learn from some events, but these tend to be the exceptions rather than the rule.

In addition to economic devastation, the environmental impacts of flooding can be quite wide-ranging, from the dispersion of low-level household wastes into the fluvial system to contamination of community water supplies and wildlife habitats with extremely toxic substances.

On the other hand, flood preparedness activities, such as forecasting and warning systems, can help to avoid some of these impacts. Indeed, actions undertaken prior to the event will have repercussions on the level of damages accruing from the flood. Effective remedial actions, such as sandbagging, can significantly reduce losses, and with planning, prevent some of these secondary environmental impacts.

During the post-flood phase, or clean-up stage, many other impacts can become apparent. The volume of the debris to be collected, the extent to which public utilities such as water supply systems and sewage operations have been damaged, and the quantity of agricultural and industrial pollutants entering fluvial systems might present pressing problems.

These problems should be incorporated into long-term restoration and reconstruction programs to eliminate unacceptable



impacts from subsequent flooding.

Currently, there is a tendency to re-analyze the economics of redevelopment in the aftermath of an event, and rebuild with future losses in mind, assuming the provisions of the NFIP are met. Economics and environmental concerns related to the flood hazard, therefore, set the stage for the assessment of redeveloping and modifying floodplain management regulations.

Specifically, recurring losses and negative intrusions could be avoided, or at least minimized, by identifying, measuring, and interpreting the magnitude and significance of impacts associated with flooding through long-term strategic planning. Nonetheless, the disaster-relief-repair-disaster cycle must be broken.

### 1999 FLOODPLAIN MANAGEMENT POLICY CHANGES

In the wake of the 1997 floods, Governor Edward Schafer, in his 1998 State of the State Address, identified the need to refine the state's floodplain management policies and consider possible statutory changes for the 1999 legislative session.

The State Water Commission, as part of the 1999 State Water Management Plan, held flood specific public input meetings and discussions with citizens and various local, state, and federal officials to determine potential changes.

House Bill 1167 was drafted at the request of the State Engineer and included recommended policy changes. The bill was passed by the legislature and signed by the Governor on April 9, 1999.

## ***Changes Requiring Legislation***

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### **Issue One**

#### ***Description of the Problem***

In North Dakota, 66 communities have mapped floodways, but few have the fiscal resources to dedicate full-time staff to review technical documents associated with development in the regulatory floodway. The lack of technical personnel experienced in hydrologic modeling is a barrier to many communities who must determine the accuracy of techniques used to demonstrate the impact of future development on a regulatory floodway.

#### ***Program Change***

The State Engineer will review all technical documentation associated with development proposed in regulatory floodways. The authority of the State Engineer is to review technical documentation to ensure it is in compliance with state and federal regulation. The State Engineer may grant an exception to communities with the technical hydrologic expertise to determine legal compliance.

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### **Issue Two**

#### ***Description of the Problem***

The State of North Dakota, by virtue of the Floodplain Management Act of 1981, adopted the National Flood Insurance Program (NFIP) as minimum floodplain management standards. According to the NFIP minimum standards, new and substantially improved structures built in the identified floodplain are required to be constructed to the 100-year floodplain or base flood elevation. Building to minimum NFIP standards today, however, does not necessarily ensure homes and businesses protection from future flooding during 100-year flood events or even smaller events.

Allowable encroachment through continued development in the flood fringe can raise the 100-year flood elevation within certain reaches of a river or stream. New structures built to comply with current standards may be subject to future flooding due to continued development within the flood fringe.

In addition, the mapping of the 100-year flood elevation is not an exact science. The magnitude of a particular flood is expressed in terms of its recurrence interval. For example, a probability of one in a hundred is called a 100-year flood. This designation is a statistical analysis of the past stream flow record at a given location. The interval is computed by dividing the number of times a particular height flood has occurred over the time period of record keeping. Unfortunately for North Dakota, the period of

record for documenting floods is, for predictive purposes, small. In other words, as the period of record increases the accuracy of the modeling techniques and floodplain maps will improve based on successive efforts.

A built-in buffer to account for localized conditions and continued future development in the 100-year floodplain is needed to ensure the health and safety of people and property. A freeboard buffer would allow structures built in the flood fringe of the floodplain to remain dry in a 100-year flood event. Additional benefits may include lower floodplain insurance premiums for consumers or even removal of the mandatory purchase of flood insurance requirements mandated by lenders.

#### ***Program Change***

The legislature established a level of one-foot over the 100-year flood elevation (base flood elevation) as the new minimum state standard for new structures built in the floodplain. This requirement exceeds minimum NFIP standards. The one-foot increase does not raise the elevation level of the floodway or prevent future development in the mapped floodplain.

New structures are required to build the lowest floor or floodproof one foot above the 100-year flood elevation. Buildings currently built to the 100-year or base flood would not be affected by the change. The change would affect only new or substantially improved structures. Communities may set community standards that would be honored by the state. Those standards may be lower than the recommended one-foot increase, but must be set prior to August 1, 2000. Areas granted a residential floodproof exception under the NFIP, are subject only to the regulations established under federal law.

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### **Issue Three**

#### ***Description of the Problem***

Prior to the 1999-2001 legislative session, state statutes did not require county subdivision plats to show the identified 100-year floodplain. The statutory requirements existed for cities. The inclusion of the identified 100-year floodplain on county subdivision maps greatly improves the efficiency of rural communities in their permitting of floodplain development and garners greater protection for developers and potential property owners. The 100-year floodplain, designated by a numerical elevation, indicates the location of any hazard areas. With this information lacking, community floodplain administrators must require future lot owners to individually provide this information in order to build. Documented cases exist of subdivided lands in rural areas that experienced difficulty by all parties in marketing, purchasing, and financing of lots.

Any costs associated with determining the numerical elevation of the flood hazard will likely be incurred by the developer and passed along as part of the purchase price to the consumer.

*Program Change*

The 1999-2001 legislature has determined that new county subdivision plats will delineate by topographic elevation the boundary of the identified 100-year floodplain. The provision does not apply to lands currently under the extraterritorial zoning authority of cities. In addition, unmapped areas enrolled in the NFIP are not affected because there is no designated floodplain.

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Issue Four

*Description of the Problem*

Disasters, such as the 1997 floods, have shown a need to coordinate the efforts of local public services to ensure the health and safety of all citizens. The statutory language should reflect the need for this broadened coordination. Current statutory language for county, city, and township comprehensive plans require the need to "secure safety from fire, flood, and other dangers." Consideration of coordinated disaster efforts and an expanded scope of issues considered in rural planning development activities would save time and fiscal resources for local communities.

*Program Change*

Comprehensive plans adopted by zoning authorities will consider "emergency management" as defined in NDCC 37-17.1-04 (4). "Emergency management," as defined, provides for the development and maintenance of an effective capability to mitigate, prepare for, respond to and recover from, known and unforeseen hazards or situations, caused by an act of nature or man, which may threaten, injure, damage, or destroy lives, property, or our environment.

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Issue Five

*Description of the Problem*

All persons should have the opportunity to indemnify themselves from future flood losses through the purchase of flood insurance. Every county in North Dakota declared flood disasters and received flood damage recovery money in the last four years. Although many of the damages are agriculturally-related, many are

to rural farmsteads and out-buildings. Currently, 42 of 53 counties, are enrolled in the National Flood Insurance Program.

Flood maps are not required for enrollment in the NFIP. It is unlikely that FEMA would develop detailed mapping for low density rural areas. The purchase of flood insurance in areas where no map exists is voluntary.

Under normal conditions, it takes a county approximately six weeks to enroll in the NFIP. Once enrolled, persons residing in that county may purchase flood insurance, but must wait 30 days before coverage is effective. Enrollment of all counties in the NFIP allows all rural citizens of the state to indemnify themselves within a reasonable amount of time. For example, if a person residing in a county not enrolled in the NFIP perceives an upcoming flood risk to their property, the enrollment time of the county plus the individual sign-up period would equal nearly ten weeks (Six weeks for the county to enroll plus the individual enrollment period). Once the county is enrolled in the program, insurance coverage could take effect within 30 days.

Local responsibilities for enrollment in the program include the adoption of minimum NFIP standards and the designation of a local floodplain manager. The manager may share responsibilities with other local governmental duties.

*Program Change*

All counties that have residential, commercial, or industrial structures in areas subject to excessive flooding as determined by the State Engineer will participate in the National Flood Insurance Program.

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Issue Six

*Description of the Problem*

State law currently charges the State Engineer with establishing the base flood elevation for rivers and watercourses. Language should be adopted to extend this authority to include lakes. This would better define the base flood elevation for lakes where development may be affected.

*Program Change*

State Engineer may establish a base flood elevation for lakes.

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## *Changes Not Requiring Legislation*

Several issues have been identified that require no additional legislative authority. Most could be administered through changes in State Water Commission policy.

### Issue One

#### *Description of the Problem*

Many floodplain managers in the state, especially in rural areas, share floodplain management responsibilities with a variety of additional local government functions. Many lack adequate training and have requested the state provide additional workshops and educational opportunities.

#### *Potential Program Change*

The state would provide additional training and certification for floodplain managers. Additionally, training would account for differences between urban and rural floodplain issues and management.

### Issue Two

#### *Description of the Problem*

The development of riparian zones in critical flood prone areas has proven to be a beneficial method of reducing flood losses in some areas. Project successes have been forged with the Red River Riparian Project and in the City of Mott.

#### *Potential Program Change*

The state would consider a cost-share for riparian buffers zones in critical areas. Funding should be limited to encourage the extensive use of partnerships.

### Issue Three

#### *Description of the Problem*

There is a need in rural areas and on the development fringe in urban areas for accurate floodplain mapping. Currently, FEMA takes an average of 5 1/2 years to complete a study with an accompanying floodplain map. Federal funding allocations and a low national ranking of need may contribute to a longer development period.

#### *Potential Program Change*

The state would consider a program, in cooperation with FEMA, to develop new maps and revise older floodplain maps. Mapping could be done with a local, state, and federal cost-share. A cost-share of funds for mapping would reduce the mapping development period and provide a better quality map.

# Conclusion

**W**ater development in North Dakota is at a crossroads. The state faces new needs and government must adjust its "ways of doing business" to fit those developing needs. The shifting population distribution,

changes in agriculture, and possible reductions of federal water development funding will continue to direct change in the state well into the 21<sup>st</sup> Century. The state has the responsibility to address the public interest now, while planning for its

future. As William Jennings Bryan wrote,

***"Destiny is no matter of chance.  
It's a matter of choice:  
It is not a thing to be waited for,  
it is a thing to be achieved."***

# Appendix



# Comprehensive Project Inventory

The following tables represent a comprehensive list of "all" potential projects that can be used by the state and local decision-makers as a short- and long-term schedule of the potential projects addressing the state's future water management needs. The information is presented in implementation timeframes and reflects "all" project needs for each basin. The location of projects in the early timeframes are depicted on the river basin maps.

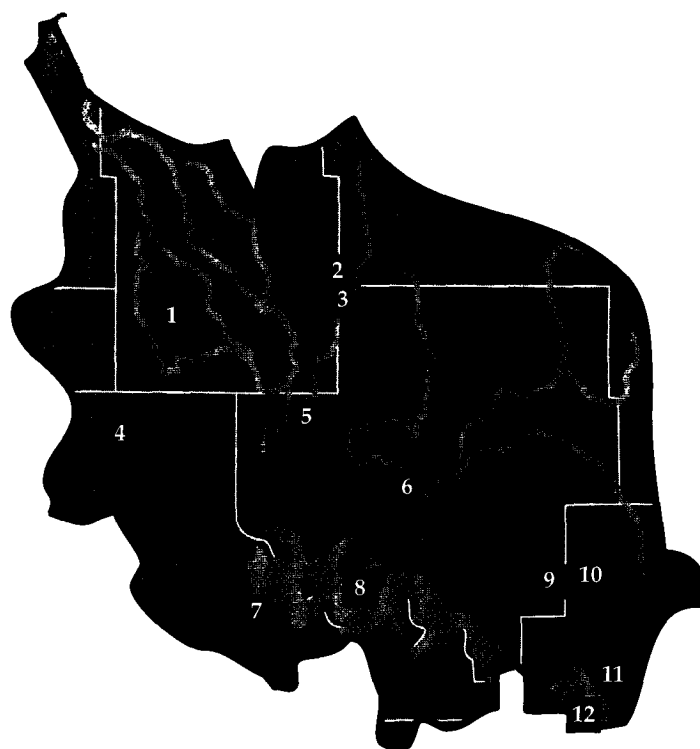
With the exception of four Municipal, Rural, and Industrial projects and MR&I

planning proposals, it should be noted that all of the MR&I projects have been placed in the 2001-2011 timeframe. The Dakota Water Resources Act monies will not be sufficient to fund all of the projects. Therefore, the state will need to address funding approximately \$241 million of the cost. The costs will most likely be incurred in the Beyond 2011 timeframe. However, because of the imminent needs of all of the MR&I projects, it could not be determined which projects would be deferred into the Beyond 2011 timeframe. Therefore, all MR&I projects remain in the 2001-2011 timeframe, with the exception

of the few projects placed in the 1999-2001 timeframe.

The potential project's costs are based upon the best information available at the time. Consequently, the cost of a project may change after further study.

All potential projects have been placed in their respective major river basins in which they occur. The remaining potential projects in the 2001-2011 timeframe and the Beyond 2011 timeframe are listed only in the tables.



**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
1999-2001 TIMEFRAME  
DEVILS LAKE BASIN**

MAP NO.	PROJECT NAME	COST	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
4	Benson Rural Water Phase I <sup>1</sup>	Benson	3,385,000	0	6,288,000	9,673,000
5	Chain Lakes Improvements - Duck Road	Ramsey	16,000	11,000	0	27,000
7	Devils Lake Emergency Outlet - Peterson Coulee	Benson/Ramsey/Towner/ Cavalier/Nelson	0	17,500,000 <sup>2</sup>	32,500,000	50,000,000
7	Devils Lake Emergency Outlet - Peterson Coulee - Operations	Benson/Ramsey/ Cavalier/Towner/Nelson	625,000	625,000	0	1,250,000
8	Devils Lake Flood Related Programs/Studies	multi-county	0	1,500,000	0	1,500,000
9	Lakota/Bartlett Twp. County Flood Control	Nelson/Ramsey	12,000	8,000	0	20,000
2	Langdon Rural Water Utility - Phase IV - Munich to Cando - Planning <sup>3</sup>	Cavalier/Towner	103,500	34,500	0	138,000
3	Langdon Rural Water Utility - Phase IV - Rural Distribution - Planning <sup>3</sup>	Cavalier/Towner/Ramsey	130,781	43,594	0	174,375
1	Langdon Rural Water Utility - Phase IV - Munich to All Seasons - Planning <sup>3</sup>	Cavalier/Towner	52,388	17,462	0	69,850
6	Morrison Lake Control Structure	Ramsey	30,000	20,000	0	50,000
11	Northeast Watercourse in Stump Lake	Nelson	18,000	12,000	0	30,000
10	Northwest City of Lakota - Flood Control	Nelson	4,500	4,500	26,000	35,000
12	Stump Lake Discharge to Shyenne River - Study	Nelson	50,000	50,000	0	100,000

<sup>1</sup> The \$53.2 million remaining to be appropriated by Congress to the Garrison Diversion Municipal, Rural, and Industrial Water Supply Program will be used to fund the project.

<sup>2</sup> The project's \$17.5 million state cost-share will be bonded over a 20-year period, costing \$1.5 million per year.

<sup>3</sup> The State Water Commission has not funded this type of project in the past; federal dollars are not available from the Garrison Diversion MR&I Program.

**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
2001-2011 TIMEFRAME  
DEVILS LAKE BASIN**

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Benson Rural Water Phase II	Benson	3,590,000	0	6,666,000	10,256,000
Cavanaugh Lake Stabilization	Ramsey	13,000	7,000	0	20,000
Devils Lake Emergency Outlet - Peterson Coulee	Benson/Ramsey/Cavalier/ Towner/Nelson	0	15,000,000 <sup>1</sup>	0	15,000,000
Devils Lake Emergency Outlet - Peterson Coulee - Operations <sup>2</sup>	Benson/Ramsey/Cavalier/ Towner/Nelson	6,250,000	6,250,000	0	12,500,000
Devils Lake Water Supply Improvements	Ramsey	2,030,000	0	3,770,000	5,800,000
Gordon Twp. Drain #1	Cavalier	180,000	120,000	0	300,000
Lakota Water Supply Improvements	Nelson	2,030,000	0	3,770,000	5,800,000
Land Management Practices - Devils Lake Basin	Benson/Ramsey/Towner/ Nelson/Rolett/Cavalier/Walsh	250,000	0	750,000	1,000,000
Langdon Rural Water Utility - Phase IV - Langdon to Munich	Cavalier	805,000	0	1,495,000	2,300,000
Langdon Rural Water Utility - Phase IV - Munich to All Seasons - Design/Construction	Cavalier/Towner	464,502	0	862,648	1,327,150
Langdon Rural Water Utility - Phase IV - Munich to Cando - Design/Construction	Cavalier/Towner	917,700	0	1,704,300	2,622,000
Langdon Rural Water Utility - Phase IV - Rural Distribution - Design/Construction	Cavalier/Towner/Ramsey	2,380,219	0	4,420,406	6,800,625
Leeds Water Supply Improvements	Benson	2,030,000	0	3,770,000	5,800,000
Lower Mauvais Coulee - Phase III	Benson/Ramsey	558,000	372,000	0	930,000
Ramsey County Rural Water II	Ramsey/Eddy/Foster	1,155,000	0	2,145,000	3,300,000
Starkweather Coulee Clean-out	Cavalier	150,000	100,000	0	250,000
Starkweather Coulee Improvement	Ramsey/Cavalier	3,000,000	2,000,000	0	5,000,000
Starkweather Coulee - Ramsey Co.	Ramsey	90,000	60,000	0	150,000
Sweetwater Coulee - Phase II	Ramsey	42,000	28,000	0	70,000

1 The project's \$17.5 million state cost-share will be bonded over a 20-year period, costing \$1.5 million per year.

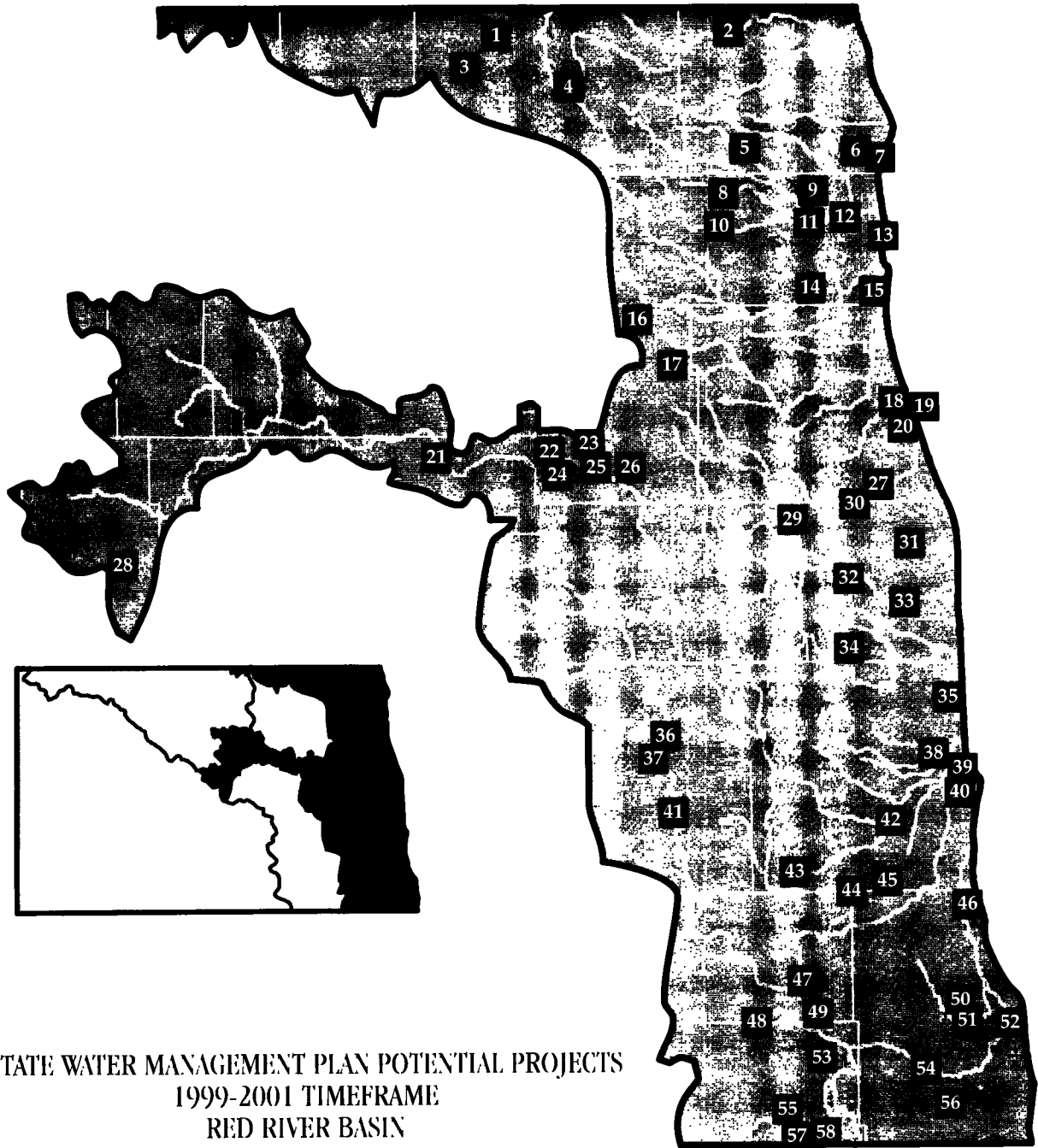
2 Continued operation of the Devils Lake Outlet is dependent upon lake elevation.

**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
Beyond 2011 TIMEFRAME  
DEVILS LAKE BASIN**

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Devils Lake Emergency Outlet - Peterson Coulee	Benson/Ramsey/Towner/ Cavalier/Nelson	0	15,000,000 <sup>1</sup>	0	15,000,000
Devils Lake Emergency Outlet - Peterson Coulee - Operations <sup>2</sup>	Benson/Ramsey/Cavalier/ Towner/Nelson	6,250,000	6,250,000	0	12,500,000
Henderson #2 Drain	Cavalier	72,000	48,000	0	120,000
Nekoma - Billings Drain	Cavalier	48,000	32,000	0	80,000
North Loma #1 Drain	Cavalier	36,000	24,000	0	60,000

1 The project's \$17.5 million state cost-share will be bonded over a 20-year period, costing \$1.5 million per year.

2 Continued operation of the Devils Lake Outlet is dependent upon lake elevation.



MAP NO.	PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
51	Antelope Creek Snagging & Clearing	Richland	131,000	41,000	0	175,000
36	Baldhill Dam - Five Foot Flood Pool Raise	Barnes	1,158,000	1,158,000	9,269,000	11,585,000
57	Brimmond Lubke Dam T-1A Repairs	Sargent	12,500	12,500	0	25,000
5	Cart Creek Snagging & Clearing	Pembina	112,000	38,000	0	150,000
10	Cass Co. Drain #13 Improvements	Cass	1,050,000	700,000	0	1,750,000
15	Cass Co. Drain #35 - Channel Improvements	Cass	60,000	40,000	0	100,000
17	City of Petersburg Flood Control Project	Nelson	15,600	10,000	0	25,000

1999-2001 TIMEFRAME - RED RIVER BASIN (continued)

MAP NO.	PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
27	Cole Creek Channelization	Grand Forks	177,000	118,000	0	295,000
8	Dam #5 - Middle Branch of the Park River	Walsh	175,000	175,000	3,150,000	3,500,000
28	Denhoff Twp. Channel Improvement	Sheridan	N/A	N/A	0	N/A
7	Drayton Dam - Modify Waterway	Pembina	N/A	N/A	0	N/A
7	Drayton Dam - Study	Pembina	62,500	62,500	125,000	250,000
6	Drayton - WTP Advanced Treatment - Planning <sup>1</sup>	Pembina	55,875	18,625	0	74,500
35	Farmstead Ring Dikes - Noble and Wiser Twps - Phase I	Cass	281,250 <sup>2</sup>	93,750	0	375,000
38	Farmstead Ring Dikes - Raymond, Berlin, and Harwood Twps - Phase I	Cass	375,000 <sup>2</sup>	125,000	0	500,000
13	Farmstead Ring Dikes - Walsh Co. Phase I	Walsh	494,250 <sup>2</sup>	164,750	0	659,000
14	Forest River Snagging & Clearing	Walsh	94,000	31,000	0	125,000
11	Grafton Intake Replacement (Park River Intake) - Planning <sup>1</sup>	Walsh	18,750	6,250	0	25,000
11	Grafton - Water Treatment Plant Replacement - Planning <sup>1</sup>	Walsh	93,750	31,250	0	125,000
19	Grand Forks - New Clearwell and Transmission <sup>3</sup>	Grand Forks	5,524,500	1,125,000 <sup>4</sup>	8,170,500 <sup>5</sup>	14,820,000
19	Grand Forks - Temporary Sludge Dewater <sup>3</sup>	Grand Forks	3,495,000	3,495,000 <sup>4</sup>	0	6,990,000
19	Grand Forks Water Plant - Intake and Transmission Line Replacement <sup>3</sup>	Grand Forks	10,930,000	6,800,000 <sup>4</sup>	7,670,000 <sup>5</sup>	25,400,000
19	Grand Forks - Water Treatment Plant Improvements - Planning	Grand Forks	637,500	0	212,500 <sup>5</sup>	850,000
30	Grand Forks-Traill Water Users Distribution Improvements - Planning <sup>1</sup>	Grand Forks	176,400	58,800	0	235,200
30	Grand Forks-Traill Water Users - Expansion - IMG Clearwell - Planning <sup>1</sup>	Grand Forks	24,075	8,025	0	32,100
30	Grand Forks-Traill Water Users - Rural Water System Interconnect - Planning <sup>1</sup>	Grand Forks	8,122	2,708	0	10,830
30	Grand Forks-Traill Water Users - Water Treatment Plant Expansion - Planning <sup>1</sup>	Grand Forks	40,950	13,650	0	54,600
20	Grand Forks/E. Grand Forks Flood Control (Planning/Design/Initial Construction) <sup>6</sup>	Grand Forks	25,000,000	25,000,000 <sup>7</sup>	38,522,038	88,522,038
20	Grand Forks/E. Grand Forks Greenway Project (Planning, Design, Initial Construction)	Grand Forks	250,000	250,000 <sup>4</sup>	500,000	1,000,000
3	Grey Twp. Drain #1	Cavalier	21,000	14,000	0	35,000
33	Hillsboro - Water Treatment Plant Expansion - Planning <sup>1</sup>	Traill	93,750	31,250	0	125,000
10	Homme Dam Safety	Walsh	28,000	28,000	8,244,000	8,300,000
50	Ibsen Twp. Flood Control #97	Richland	72,000	48,000	0	120,000
52	Kidder Dam - Modify Waterway	Richland	90,000 <sup>8</sup>	30,000	0	120,000
46	Kristen Dam - Removal of Channel Obstruction	Richland	140,000 <sup>8</sup>	35,000	0	175,000
56	Lake Elsie Marina	Richland	20,000	20,000	20,000	60,000
4	Langdon - Mt. Carmel Supply Line - Planning <sup>1</sup>	Cavalier	37,567	12,522	0	50,089
4	Langdon Water Treatment Plant Expansion and Improvement - Planning <sup>1</sup>	Cavalier	103,594	34,531	0	138,125
43	Maple River Dam	Cass	8,000,000	8,000,000	0	16,000,000
32	Mayville Advanced Treatment - Planning <sup>1</sup>	Traill	46,875	15,625	0	62,500
49	McLeod Flood Control Project	Ransom/Richland	18,000	12,000	0	30,000

1999-2001 TIMEFRAME - RED RIVER BASIN (continued)

MAP NO.	PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
26	McVile Dam - Study	Nelson	N/A	N/A	0	N/A
37	Mill Dam Repairs - Valley City	Barnes	25,000	25,000	0	50,000
15	Morais River Snagging & Clearing	Walsh	75,000	25,000	0	100,000
16	Nelson Co. Drain #12 (Enterprise and Sarnia Twp.)	Nelson	80,000	80,000	478,000	638,000
58	Nelson Dam Repairs	Sargent	12,500	12,500	0	25,000
39	Overland Flood Protection - North of Fargo (Reed Twp.)	Cass	750,000	750,000	0	1,500,000
39	Overland Flood Protection - South Fargo (Stanley and Pleasant Twp.)	Cass	500,000	500,000	0	1,000,000
12	Park River Snagging and Clearing	Walsh	188,000	62,000	0	250,000
2	Pembina River Snagging & Clearing	Pembina	N/A	N/A	0	N/A
53	Preliminary Engineering of Water Channels, Natural and Legal Drains Study	Sargent	25,000	25,000	0	50,000
48	Ransom-Sargent Rural Water <sup>9</sup>	Ransom/Sargent	7,918,974	0	14,706,666	22,625,640
18	Riverside Park Dam Repairs	Grand Forks	562,500	562,500	0	1,125,000
47	Shenford Flood Control Project	Ransom	48,000	32,000	0	80,000
24	Sheyenne River - Forde Township Snagging and Clearing	Nelson	34,000	11,000	0	45,000
23	Sheyenne River - Peterson Dam (Snagging & Clearing and Lake Restoration)	Nelson	40,000	20,000	0	60,000
41	Sheyenne River Snagging & Clearing - Barnes County	Barnes	67,500	22,500	0	90,000
25	Silver Creek Dam Reconstruction	Nelson	20,000	20,000	130,000	170,000
55	Silver Lake Bifrost Bridge	Sargent	100,000	50,000	0	150,000
29	Steele Co. Drain #13	Steele	54,000	36,000	0	90,000
42	Swan Creek Watershed Improvements - Phase II	Cass	75,000	50,000	0	125,000
22	Tolna Dam Repairs	Nelson	4,700	2,300	0	7,000
34	Trail Co. Drain #57A	Trail	394,000	262,000	0	656,000
31	Trail Co. Drain #627 Improvements	Trail	510,000	340,000	0	850,000
44	Tri-County Flood Control Project #1894 - Study	Cass/Richland/Ransom	80,000	80,000	0	160,000
1	Upper Rush Lake Basin Clean-Out	Cavalier	78,000	52,000	0	130,000
9	Walsh Rural Water Utility Expansion and Water Treatment Plant Improvements - Planning <sup>1</sup>	Walsh	30,000	10,000	0	40,000
21	Warsing Low Level Outlet	Eddy	9,000 <sup>8</sup>	3,000	0	12,000
54	Wild Rice River Snagging & Clearing	Richland	356,000	119,000	0	475,000

- 1 The State Water Commission has not funded this type of project in the past; federal dollars are not available from the Garrison Diversion Municipal, Rural and Industrial Water Supply Program.
- 2 Cost is primarily private landowners.
- 3 A portion of the cost is included in the Grand Forks Flood Control Project.
- 4 State Water Commission has not previously cost-shared this type of project.
- 5 Federal funding sources for this project have not been determined; Garrison Diversion MR&I Water Supply Program funds are not currently available for this timeframe.
- 6 A portion of the cost includes water treatment plant improvements.
- 7 A multi-year project; total state cost-share identified at \$52 million that is assumed to be bonded over a 25-year period, costing \$3.9 million per year.
- 8 Potential cost-share with ND Game and Fish Department.
- 9 The \$53.2 million remaining to be appropriated by Congress to the Garrison Diversion MR&I Water Supply Program will be used to fund the project.

**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
2001-2011 TIMEFRAME  
RED RIVER BASIN**

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Agassiz Water Users Improvements	Grand Forks/Walsh	4,080,300	0	7,577,700	11,658,000
Aliceton Twp. Dam - Ransom	Ransom	65,000	65,000	0	130,000
Aneta South Flood Control	Nelson/Griggs/Steele	36,000	24,000	0	60,000
Arthur Water Supply Improvements	Cass	420,000	0	780,000	1,200,000
Barnes Rural Water Users - Phase I Improvements	Barnes/Cass/Griggs/Stutsman/LaMoure/Ransom	315,000	0	585,000	900,000
Barnes Rural Water Users - Phase II Improvements	Barnes/Cass/Griggs/Stutsman/LaMoure/Ransom	1,702,000	0	3,163,000	4,865,000
Bentrie Twp. Erosion Structure	Grand Forks	90,000	60,000	0	150,000
Binford Water Supply Improvements	Griggs	420,000	0	780,000	1,200,000
Briarwood Water Supply Improvements	Cass	147,000	0	273,000	420,000
Brokke Drain #30 Reconstruction	Traill	18,000	12,000	0	30,000
Buffalo Coulee Improvements	Traill	1,800,000	1,200,000	0	3,000,000
Cart Creek Dams	Pembina	300,000	300,000	0	600,000
Cass Co. Drain #14 Improvements	Cass	1,410,000	940,000	0	2,350,000
Cass Co. Drain #24 Improvements	Cass	300,000	200,000	0	500,000
Cass Co. Drain #25 Improvements	Cass	240,000	160,000	0	400,000
Cass Co. Drain #26 Improvements	Cass	240,000	160,000	0	400,000
Cass Co. Drain #27 Improvements	Cass	1,200,000	800,000	0	2,000,000
Cass Co. Drain #29 Improvements	Cass	600,000	400,000	0	1,000,000
Cass Co. Drain #40 Improvements	Cass	900,000	600,000	0	1,500,000
Cass Co. Drain #41 Improvements	Cass	300,000	200,000	0	500,000
Cass Co. Drain #45 Improvements	Cass	1,200,000	800,000	0	2,000,000
Cass Co. Drain #47 Improvements	Cass	90,000	60,000	0	150,000
Cass Co. Drain #53 Improvements	Cass	600,000	400,000	0	1,000,000
Cass Co. Drain #55 Improvements	Cass	300,000	200,000	0	500,000
Cass County Drain #10 Improvements	Cass	750,000	500,000	0	1,250,000
Cass Rural Water Improvements	Cass	2,030,000	0	3,770,000	5,800,000
Christine Water Supply Improvements	Richland	49,000	0	91,000	140,000
Colfax Watershed Project	Richland	249,000	166,000	931,000	1,346,000
Cooperstown Drain	Griggs	60,000	40,000	0	100,000
Cooperstown Supply Improvements	Griggs	2,030,000	0	3,770,000	5,800,000
Crooked Creek Watershed Improvements	Sargent	1,475,000	750,000	3,000,000	5,225,000
Cypress Creek Drain #2	Cavalier	30,000	20,000	0	50,000

2001-2011 TIMEFRAME - RED RIVER BASIN (continued)

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Cypress Creek Drain #3	Cavalier	21,000	14,000	0	35,000
Cypress Creek Drain #1	Cavalier	150,000	100,000	0	250,000
Dakota Water Users - Distribution Expansion	Cass/Grand Forks/Griggs/Nelson/Steele	630,000	0	1,170,000	1,800,000
Dakota Water Users - System Improvements	Cass/GrandForks/Griggs/Nelson/Steele	402,500	0	747,500	1,150,000
Dam Site #10 - Turtle River Watershed	Grand Forks	225,000	225,000	2,550,000	3,000,000
Dazey Water Supply Improvements	Barnes	420,000	0	780,000	1,200,000
Drain #31 Reconstruction - Walsh Co.	Walsh	435,000	290,000	0	725,000
Drayton Clearwell Replacement	Pembina	175,000	0	325,000	500,000
Drayton Dam Reconstruction	Pembina	1,000,000	1,000,000	0	2,000,000
Drayton - WTP Advanced Treatment - Design/Construction	Pembina	849,000	0	1,576,000	2,425,000
Eastern North Dakota Water Supply (Dakota Water Resources Act)	Barnes/Cass/Grand Forks/Trail/Pembina/Walsh	Undetermined	0	168,000,000	168,000,000
Elliot Water Supply Improvements	Ransom	N/A	0	N/A	N/A
Elm River Channel Improvements	Trail	1,200,000	800,000	0	2,000,000
Elm River Flood Retention	Trail/Cass	500,000	500,000	0	1,000,000
Emerado Water Tower	Grand Forks	11,357	0	21,091	32,448
Enderlin Water Treatment Plant Improvements	Ransom	262,500	0	487,500	750,000
Esmond Water Supply Improvements	Benson	420,000	0	780,000	1,200,000
Fairmount Water Supply Improvements	Richland	70,000	0	130,000	200,000
Farmstead Ring Dikes - Noble and Wisser Twps - Phase II	Cass	281,250 <sup>1</sup>	93,750	0	375,000
Farmstead Ring Dikes - Raymond, Berlin, and Harwood Twps - Phase II	Cass	375,000 <sup>1</sup>	125,000	0	500,000
Farmstead Ring Dikes - Walsh County - Phase II	Walsh	494,250 <sup>1</sup>	164,750	0	659,000
Flood Control Project #14 Reconstruction	Richland	600,000	400,000	0	1,000,000
Forest River Flood Retention	Nelson/Grand Forks/Walsh	1,000,000	1,000,000	0	2,000,000
Fourth Street Dam - Fargo	Cass	1,800,000	1,200,000	1,000,000	4,000,000
Galesburg Water Supply Improvements	Trail	420,000	0	780,000	1,200,000
Gardner Water Supply Improvements	Cass	147,000	0	273,000	420,000
Goodrich Water Supply Improvements	Sheridan	420,000	0	780,000	1,200,000
Goose River Flood Retention	Steele/Grand Forks/Trail	1,000,000	1,000,000	0	2,000,000
Goose River Snagging & Clearing	Nelson/Steele	315,000	105,000	0	420,000
Grafton Flood Control Project	Walsh	2,200,000	2,200,000	13,200,000	17,600,000
Grafton Intake Replacement (Park River) - Design/Construction	Walsh	96,250	0	178,750	275,000



## 2001-2011 TIMEFRAME - RED RIVER BASIN (continued)

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Grafton - Interim Water Treatment Plant Improvements	Walsh	430,995	0	800,420	1,231,415
Grafton - Water Treatment Plant Replacement - Design/Construction	Walsh	3,675,000	0	6,825,000	10,500,000
Grand Forks/E. Grand Forks Flood Control (Multi-year Construction) <sup>2</sup>	Grand Forks	37,712,500	27,000,000 <sup>3</sup>	62,859,462	125,571,962
Grand Fork/E. Grand Forks Greenway Project (Multi-year Construction)	Grand Forks	891,500	891,500 <sup>4</sup>	1,783,000	3,566,000
Grand Forks-Traill Water Users Distribution Improvements - Design/Construction	Grand Forks	1,845,800	0	3,428,000	5,273,800
Grand Forks - Traill Water Users - Expansion - IMG Clearwell - Design/Construction	Grand Forks	363,265	0	674,635	1,037,900
Grand Forks-Traill Water Users - Raw Water Transmission Line	Grand Forks	374,850	0	696,150	1,071,000
Grand Forks-Traill Water Users - Rural Water System Interconnect - Design/Construction	Grand Forks	122,560	0	227,610	350,170
Grand Forks-Traill Water Users - Water Treatment Plant Expansion - Design/Construction	Grand Forks	617,890	0	1,147,510	1,765,400
Grand Forks - Water Reclamation Facility Replacement - Design/Construction <sup>5</sup>	Grand Forks	9,011,500	1,455,000 <sup>4</sup>	14,033,500	24,500,000
Grand Forks - Water Treatment Plant Improvements - Design/Construction	Grand Forks	24,202,500	0	44,947,500	69,150,000
Hankinson Water Supply Improvements	Richland	2,275,000	0	4,225,000	6,500,000
Hannaford Water Supply Improvements	Griggs	49,000	0	91,000	140,000
Harvey Water Supply Improvements	Wells	2,030,000	0	3,770,000	5,800,000
Harwood Water Supply System Improvements	Cass	280,000	0	520,000	800,000
Havana - North Water Supply System	Sargent	147,000	0	273,000	420,000
Havana - South Water Supply System	Sargent	147,000	0	273,000	420,000
Hazenbrook Channel and Erosion Control Structure	Grand Forks	1,200,000	800,000	0	2,000,000
Hillsboro Water Treatment Plant Expansion - Design/Construction	Traill	1,706,250	0	3,168,750	4,875,000
Horace Water Supply Improvements	Cass	2,030,000	0	3,770,000	5,800,000
Lake Ashtabula Restoration	Barnes	100,000	100,000	600,000	800,000
Langdon - Mt. Carmel Supply Line - Design/Construction	Cavalier	859,026	0	1,595,335	2,454,361
Langdon Water Treatment Plant Advanced Treatment	Cavalier	385,000	0	715,000	1,100,000
Langdon Water Treatment Plant Expansion and Improvements - Design/Construction	Cavalier	1,885,406	0	3,501,469	5,386,875
Larimore Water Supply Improvements	Grand Forks	787,500	0	1,462,500	2,250,000
Lateral A - Walsh County	Walsh	120,000	80,000	0	200,000
Lidgerwood Water Supply Improvements	Richland	2,030,000	0	3,770,000	5,800,000
Lisbon Water Supply Improvements	Ransom	245,000	0	455,000	700,000
Lower Sheyenne River Flood Protection (Harwood and Reed Twp.)	Cass	2,500,000	2,500,000	0	5,000,000
Mabel-Dover-Bartley Drain	Griggs	90,000	60,000	0	150,000
Maddock Water Supply Improvements	Benson	2,030,000	0	3,770,000	5,800,000

2001-2011 TIMEFRAME - RED RIVER BASIN (continued)

PROJECT NAME	COUNTY	LOCAL COST (\$)	STATE COST (\$)	FEDERAL COST (\$)	TOTAL COST (\$)
Mayville Advanced Treatment - Design/Construction	Traill	853,125	0	1,584,375	2,437,500
Mayville Intake Improvements	Traill	70,000	0	130,000	200,000
McVile Water Supply Improvements	Nelson	2,030,000	0	3,770,000	5,800,000
Michigan Water Supply Improvements	Nelson	420,000	0	780,000	1,200,000
Minto Water Treatment Plant Improvements	Walsh	87,500	0	162,500	250,000
North Valley Water Assoc. Expansion	Pembina/Cavalier	315,000	0	585,000	900,000
Overland Flood Protection South Fargo - West Fargo (Barnes and Stanley Twp.)	Cass	2,000,000	2,000,000	0	4,000,000
Oxbow Water Supply Improvements	Cass	26,250	0	48,750	75,000
Padden Lake Flood Control	Cavalier	33,000	22,000	0	55,000
Page Water Supply Improvements	Cass	420,000	0	780,000	1,200,000
Park River New Wells	Walsh	780,500	0	1,449,500	2,230,000
Park River Water Treatment Plant Improvements	Walsh	525,000	0	975,000	1,500,000
Pekin Water Supply Improvements	Nelson	420,000	0	780,000	1,200,000
Pembina Water Supply Improvements	Pembina	4,060,000	0	7,540,000	11,600,000
Preston Floodway	Traill	150,000	100,000	0	250,000
Renwick Dam Modification	Pembina	400,000	400,000	0	800,000
Richland Co. Drain #6 Lateral	Richland	120,000	80,000	0	200,000
Richland Co. Drain #72 Lateral B	Richland	45,000	30,000	0	75,000
Rush Lake Management	Cavalier	540,000	360,000	0	900,000
Rust Drain #24 Reconstruction	Traill	24,000	16,000	0	40,000
Selz Water Supply Improvements	Pierce	420,000	0	780,000	1,200,000
Sharon Water Supply Improvements	Steele	420,000	0	780,000	1,200,000
Sheyenne River Bank Stabilization - Barnes	Barnes	328,500	328,500	0	657,000
Sheyenne River Flood Control - Warren and Normanna Twp. (Dike Reconstruction)	Cass	1,000,000	1,000,000	0	2,000,000
Sheyenne River Snagging and Clearing	Cass	750,000	250,000	0	1,000,000
Sheyenne River to Wild Rice River Diversion	Richland	3,750,000	3,750,000	0	7,500,000
South Fork of Pembina River Dam	Cavalier	1,600,000	1,600,000	0	3,200,000
Southeast Water Users Improvements	Richland	2,030,000	0	3,770,000	5,800,000
Southeast Watershed Food Control Project - Richland Co.	Richland	600,000	400,000	0	1,000,000
Southern Pierce County Rural Water Improvements	Pierce	805,000	0	1,495,000	2,300,000
Steele Co. Drain #14	Steele	N/A	N/A	0	N/A
Steele County Drain #2	Steele	N/A	N/A	0	N/A
Steele, Grand Forks and Traill Counties, Drain #4	Steele/Grand Forks/Traill	N/A	N/A	0	N/A

2001-2011 TIMEFRAME - RED RIVER BASIN (continued)

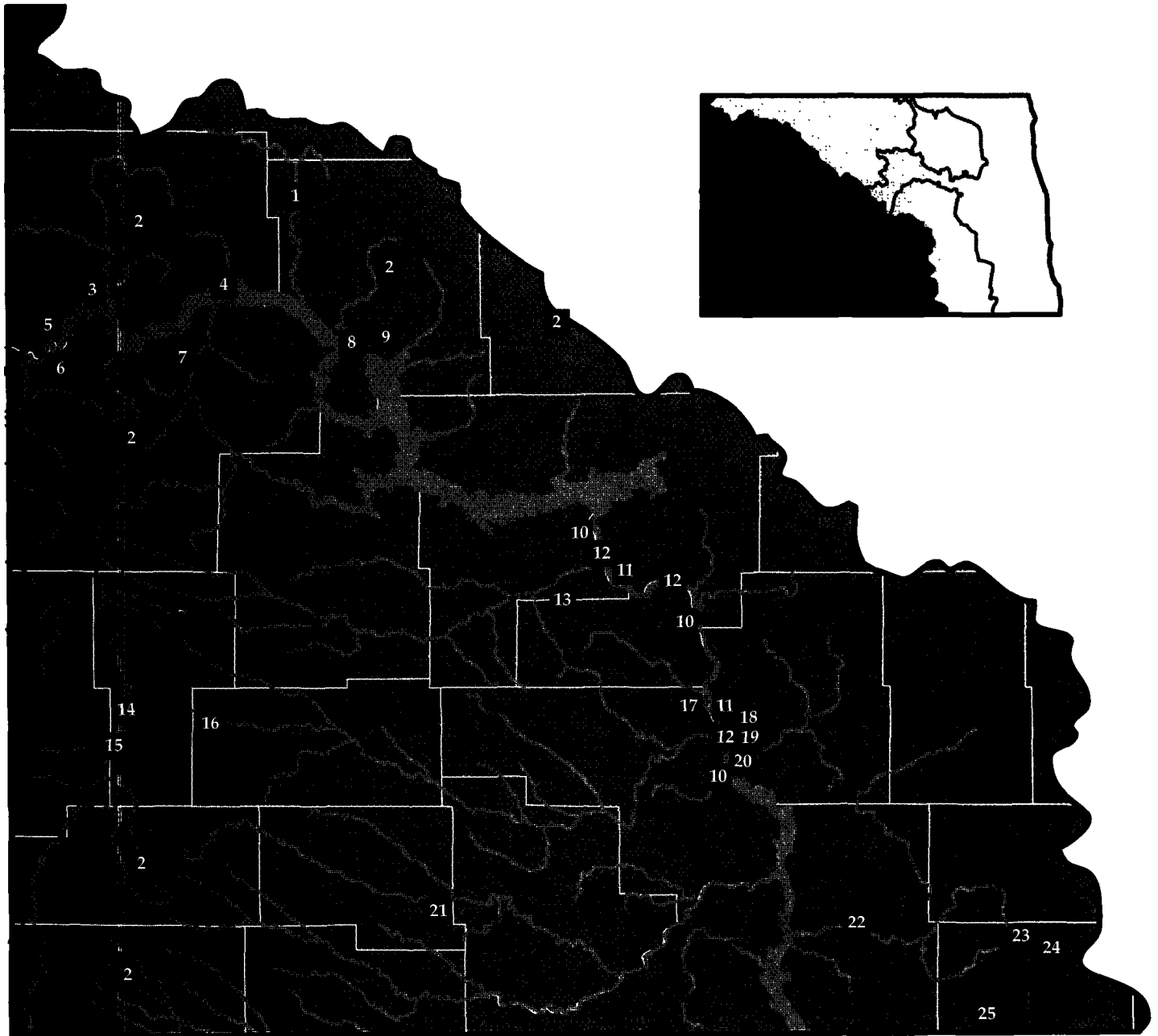
PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Swan Creek Watershed Improvements - Phase III	Cass	500,000	500,000	0	1,000,000
Swan Creek Watershed Improvements - Phase IV	Cass	750,000	500,000	0	1,250,000
Trail Co. Drain #13 Improvements	Trail	120,000	80,000	0	200,000
Trail Co. Drain #28 Improvements	Trail	N/A	N/A	0	N/A
Trail Co. Drain #3420 Reconstruction	Trail	720,000	480,000	0	1,200,000
Trail Co. Drain #38 Improvements	Trail	120,000	80,000	0	200,000
Trail Co. Drain #53 Improvements	Trail	18,000	12,000	0	30,000
Trail Co. Drain Twp. 1-8	Trail	600,000	400,000	0	1,000,000
Trail Co. Drain Twp. 1-5	Trail	60,000	40,000	0	100,000
Trail Co. Drain Twp. 1-7 Improvements	Trail	150,000	100,000	0	250,000
Trail County Rural Water Improvements	Trail	2,030,000	0	3,770,000	5,800,000
Tri-County Flood Control Project #1894	Cass/Ransom/Richland	N/A	N/A	0	N/A
Tri-County Water Users Expansion	Grand Forks/Nelson/Walsh	1,085,000	0	2,015,000	3,100,000
Turtle River Snagging and Bank Stabilization	Grand Forks	281,000	94,000	0	375,000
Upper Maple River Watershed Retention Dams	Barnes	1,200,000	800,000	0	2,000,000
Valley City Water Supply Improvements	Barnes	5,005,000	0	9,295,000	14,300,000
Walcott Water Treatment Plant Improvements	Richland	420,000	0	780,000	1,200,000
Walhalla Twp. Drain #2 and #3	Cavalier/Pembina	78,000	52,000	0	130,000
Walsh Rural Water Utility Expansion and Water Treatment Plant Improvements - Construction	Walsh	624,750	0	1,160,250	1,785,000
Walsh Rural Water Utility Expansion and Water Treatment Plant Improvement - Design	Walsh	96,250	0	178,750	275,000
Waterloo-South Dresden Improvements	Cavalier	60,000	40,000	0	100,000
West Fargo Water Supply Improvements	Cass	2,030,000	0	3,770,000	5,800,000
Wild Rice River Flood Retention	Richland/Sargent	1,000,000	1,000,000	0	2,000,000
Wild River Snagging and Clearing	Cass	150,000	50,000	0	200,000
Wimbledon Water Supply Improvements	Barnes	49,000	0	91,000	140,000
Woodland Park Water Supply - Valley City Area	Barnes	N/A	0	N/A	N/A
Wyndmere Water Supply Improvements	Richland	2,030,000	0	3,770,000	5,800,000

- 1 Cost is primarily private landowners.
- 2 A portion of the cost includes water treatment plant improvements.
- 3 A multi-year project; total state cost-shared identified at \$52 million that is assumed to be bonded over a 25-year period, costing \$3.9 million per year; repayment beginning 2001.
- 4 State Water Commission has not previously cost-shared this type of project.
- 5 A portion of the cost is included in the Grand Forks Flood Control Project.

**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS**  
**Beyond 2011 TIMEFRAME**  
**RED RIVER BASIN**

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Buffalo Creek Channel Improvements	Cass	900,000	600,000	0	1,500,000
Cass Co. Drain #10 Outlet Improvements	Cass	300,000	200,000	0	500,000
Cass Co. Drain #13 Outlet Improvements	Cass	600,000	400,000	0	1,000,000
Cass Co. Drain #40 Outlet Improvements	Cass	600,000	400,000	0	1,000,000
Cass Co. Drain #9 Outlet Improvements	Cass	300,000	200,000	0	500,000
Elm River Flood Retention	Trail/Cass	1,000,000	1,000,000	0	2,000,000
Goose River Dam #145	Steele	3,250,000	3,250,000	0	6,500,000
Grand Forks/E. Grand Forks Flood Control (Multi-year Constr.)	Grand Forks	0	58,500,000 <sup>1</sup>	0	58,500,000
Green Belt - Pembina River	Pembina	N/A	N/A	0	N/A
Hugo Dam	Steele	37,500	37,500	0	75,000
Lynchburg Channel Improvements	Cass	600,000	400,000	0	1,000,000
Maple River Channel Improvements	Cass	900,000	600,000	0	1,500,000
Maple River Debris Removal	Cass	300,000	100,000	0	400,000
Maple River T-114 Dam	Cass	450,000	450,000	0	900,000
Maple River T-132 Dam	Cass	900,000	900,000	0	1,800,000
Milton Dam	Walsh	1,350,000	1,350,000	0	2,700,000
Minto Water Treatment Plant Replacement	Walsh	332,500	0	617,500	950,000
Moellenkamp Dam - Ransom Co.	Ransom	500,000	500,000	0	1,000,000
Norway Township Dam	Trail	101,000	101,000	0	202,000
Pembilier Dam	Cavalier	N/A	N/A	0	N/A
Pembina River Floodway	Pembina	N/A	N/A	0	N/A
Red River Snagging & Clearing	Walsh	750,000	250,000	0	1,000,000
Red Willow Lake Restoration	Griggs	265,000	135,000	0	400,000
Rush River Snagging and Clearing	Cass	113,000	37,000	0	150,000
Shyenne River Flood Retention	Barnes/Cass/Ransom	3,000,000	3,000,000	0	6,000,000
Shyenne River Snagging and Clearing	Cass	750,000	250,000	0	1,000,000
Stream Restoration Project (Red River and major tributaries in northeast part of state)	Cavalier/Pembina/Walsh	200,000	50,000	0	250,000
Tiber-Vesta Dam	Walsh	4,500,000	4,500,000	0	9,000,000
Tongue River Cutoff Channel East Improvements	Pembina	417,000	278,000	0	695,000
Wheatland Channel Improvements	Cass	900,000	600,000	0	1,500,000
Wild Rice River Flood Retention	Richland/Sargent	1,500,000	1,500,000	0	3,000,000
Wild Rice River Snagging and Clearing	Cass	150,000	50,000	0	200,000

<sup>1</sup> State identified total cost-share of \$52 million is assumed to be bonded over a 25-year period, requiring a loan repayment estimated at \$3.9 million per year; repayment beginning in 2001.



**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
1999-2001 TIMEFRAME  
MISSOURI RIVER BASIN**

MAP NO.	PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
2	Atmospheric Water Management Project	Bowman/Slope/McKenzie/ Mountrail/Ward/Williams	880,000	284,000	0	1,164,000
16	Belfield Watershed Project (Heart River)	Stark	85,000	85,000	2,095,000	2,265,000
5	Buford-Trenton Irrigation District Expansion - Phase I	Williams	900,000	600,000 <sup>1</sup>	0	1,500,000
18	Burnt Creek Project	Burleigh	90,000	60,000	0	150,000
6	Elk Charbonneau Irrigation Project	McKenzie	4,430,400	2,953,600 <sup>1</sup>	0	7,384,000
24	Green Lake Watershed Diversion Project - Study	McIntosh/Logan/Emmons	7,500	7,500	0	15,000

## 1999-2001 TIMEFRAME - MISSOURI RIVER BASIN (continued)

MAP NO.	PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
17	Harmon Lake - Dam #6	Morton	300,000	300,000	1,500,000	2,100,000
14	Island Removal - Little Missouri River	Billings	100,000	100,000	0	200,000
19	Jackman Coulee Flood Study - Bismarck	Burleigh	10,000	10,000	0	20,000
22	Linton Flood Control - Spring Creek Diversion	Emmons	50,000	50,000	0	100,000
15	Little Missouri River Bank Stabilization - Medora	Billings	375,000	375,000	0	750,000
7	McKenzie County Rural Water - Planning <sup>2</sup>	McKenzie	300,000	100,000	0	400,000
13	Mercer/Oliver Irrigation Project - Study	Mercer/Oliver	N/A	N/A	0	N/A
12	Missouri River 2020 Initiative - Study McLean/Mercer	Burleigh/Morton/Oliver/ McLean/Mercer	30,000	30,000	0	60,000
20	Missouri River Bank Revegetation - Bismarck Area - Study	Burleigh	N/A	N/A	0	N/A
11	Missouri River Bank Stabilization - Burleigh and McLean County	Burleigh/McLean	0	0	6,700,000	6,700,000
10	Missouri River Bank Stabilization - Morton, Mercer, and Oliver	Morton/Oliver/Mercer	0	0	6,940,000	6,940,000
9	Mountrail County Irrigation Project - Study	Mountrail	50,000	50,000	0	100,000
4	Nesson Valley Irrigation	Williams	3,900,000	2,600,000 <sup>1</sup>	0	6,500,000
8	New Town - Water Treatment Plant Replacement - Planning <sup>2</sup>	Mountrail	56,250	18,750	0	75,000
21	Southwest Pipeline Project (Mott-Elgin) Grant/Morton	Hettinger/Adams/Stark/ Grant/Morton	0	6,000,000	11,500,000 <sup>3</sup>	17,500,000
23	Southwest Wishek Area - Channel Improvement	McIntosh	24,000	16,000	0	40,000
25	Well Protection - Zeeland Aquifer	McIntosh	N/A	N/A	0	N/A
1	White Earth Dam Modification	Mountrail	75,000	75,000	0	150,000
3	Williston Transmission Line Improvements - Phase I <sup>4</sup>	Williams	3,440,000	0	0	3,440,000

<sup>1</sup> State cost-share for this type of project is determined on a case-by-case basis.

<sup>2</sup> The State Water Commission has not funded this type of project in the past; federal dollars are not available from the Garrison Diversion Municipal, Rural and Industrial Program funds.

<sup>3</sup> Garrison Diversion MR&I Program funds are not available; funding sources include loans and grants from the USDA Rural Development Program.

<sup>4</sup> Federal dollars are not available from the Garrison Diversion MR&I Program; Williston will be utilizing the State Revolving Loan Fund to assist in funding the project.

## STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS 2001-2011 TIMEFRAME MISSOURI RIVER BASIN

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Alexander Water Supply Improvements	McKenzie	35,000	0	65,000	100,000
Ashley Water Supply Improvements	McIntosh	2,030,000	0	3,770,000	5,800,000
Auxiliary Pumps and Gravity Drain - Heart River	Morton	37,500	37,500	224,000	299,000
Bank Stabilization - Heart River	Morton	71,000	71,000	426,000	568,000
Benedict Water Supply Improvements	McLean	147,000	0	273,000	420,000
Bismarck - Raw Water Intake Replacement	Burleigh	1,918,000	0	3,562,000	5,480,000
Bismarck - Water Treatment Filter Expansion	Burleigh	1,886,500	0	3,503,500	5,390,000
Bismarck - Water Treatment Recarbonation/Ozone Contact Basin	Burleigh	3,220,000	0	5,980,000	9,200,000
Bismarck - Water Treatment Sludge Dewatering Facility Expansion	Burleigh	4,473,000	0	8,307,000	12,780,000
Bismarck - Water Treatment Softening Expansion - Phase I	Burleigh	1,557,000	0	2,892,500	4,449,500

2001-2011 TIMEFRAME - MISSOURI RIVER BASIN (continued)

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Bismarck - West End Reservoir Expansion/Disinfection Contact Basin	Burleigh	1,869,000	0	3,471,000	5,340,000
Braddock Water Supply Improvements	Emmons	26,250	0	48,750	75,000
Buford - Trenton Irrigation District Expansion - Phase II	Williams	900,000	600,000 <sup>1</sup>	0	1,500,000
Center for the American West Water Supply - Medora	Billings	N/A	0	N/A	N/A
Center - North System Water Supply Improvements	Oliver	73,500		136,500	210,000
Center - South System Water Supply Improvements	Oliver	420,000	0	780,000	1,200,000
Channel Liner - Mandan	Morton	120,000	80,000	0	200,000
Charlson Irrigation Project	McKenzie	12,000,000	8,000,000 <sup>1</sup>	0	20,000,000
City of McKenzie Flood Control Dike	Burleigh	5,000	5,000	0	10,000
Drainage Improvement - West of Williston	Williams	N/A	N/A	0	N/A
Fort Union Trading Post Water Supply Improvements	Williams	35,000	0	65,000	100,000
Garrison Rural Water Improvements	McLean	350,000	0	650,000	1,000,000
Garrison Water Supply Improvements	McLean	3,920,000	0	7,280,000	11,200,000
Hague Water Supply Improvements	Emmons	420,000	0	780,000	1,200,000
Hazelton Water Supply Improvements	Emmons	420,000	0	780,000	1,200,000
Horsehead Irrigation Project	Emmons	35,580,000	23,720,000 <sup>1</sup>	0	59,300,000
Killdeer Water Supply Improvements	Dunn	2,030,000	0	3,770,000	5,800,000
Lake Sakakawea Listate Water Users	Mercer	55,650	0	103,350	159,000
Lehr Water Supply Improvements	Logan	420,000	0	780,000	1,200,000
Lincoln Water Supply Improvements	Burleigh	2,030,000	0	3,770,000	5,800,000
Linton Water Supply Improvements	Emmons	2,030,000	0	3,770,000	5,800,000
Little Missouri Bay Recreation Area Water Supply Improvements	Dunn	315,000	0	585,000	900,000
Long Lake/Long Lake Creek/Goose Lake/North Lake Channel Improvements	Burleigh/Emmons/Logan	N/A	N/A	0	N/A
Mandan Water Supply Improvements	Morton	5,621,000	0	10,439,000	16,060,000
Marmarth Water Supply Improvements	Slope	420,000	0	780,000	1,200,000
McKenzie County Rural Water - Design/Construction	McKenzie	1,260,000	0	2,340,000	3,600,000
McLean - Sheridan Rural Water Improvements	McLean/Sheridan	4,276,650	0	7,942,350	12,219,000
Medina Water Supply Improvements	Stutsman	672,000	0	1,248,000	1,920,000
Mercer Water Supply Improvements	McLean	35,000	0	65,000	100,000
Meyer Dam Repairs	Stark	25,000	25,000	0	50,000
Mott Dam	Hettinger	11,750,000	11,750,000	0	23,500,000
Mountrail Rural Water Users Improvements	Mountrail	3,500,000	0	6,500,000	10,000,000
Napoleon Water Supply Improvements	Logan	119,000	0	221,000	340,000
National Guard - Landfill Coulee Evaluation - Bismarck - Study	Burleigh	N/A	N/A	0	N/A
New Town Water Treatment Plant Replacement - Design/Construction	Mountrail	1,023,750	0	1,901,250	2,925,000
Powers Lake Dam Repairs	Mountrail	100,000	50,000	0	150,000
Powers Lake Water Supply Improvements	Burke	420,000	0	780,000	1,200,000
Rhame Water Supply Improvements	Bowman	420,000	0	780,000	1,200,000
Riverdale Water Supply Improvements	McLean	4,165,000	0	7,735,000	11,900,000

**2001-2011 TIMEFRAME - MISSOURI RIVER BASIN (continued)**

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Robinson Water Supply Improvements	Kidder	147,000	0	273,000	420,000
Ryder Water Supply Improvements	Ward	420,000	0	780,000	1,200,000
Selfridge Water Supply Improvements	Sioux	420,000	0	780,000	1,200,000
Solen Water Supply Improvements	Sioux	147,000	0	273,000	420,000
Southwest Pipeline Project (Bowman-Scranton)	Adams/GoldenValley/Slope	500,000	1,680,000	12,550,000	14,730,000
Southwest Pipeline Project (Little Missouri, Oliver, Mercer, North Dunn)	Billings/Slope/Dunn/Golden Valley/Oliver/Mercer	1,000,000	9,500,000	19,500,000	30,000,000
Southwest Pipeline Project (Medora-Beach)	Golden Valley/Billings	1,005,000	5,000,000	11,400,000	17,405,000
Stanton Water Supply Improvements	Mercer	129,000	0	211,000	340,000
Steele Water Supply Improvements	Kidder	2,030,000	0	3,770,000	5,800,000
Strasburg Water Supply Improvements	Emmons	2,030,000	0	3,770,000	5,800,000
Streeter Water Supply Improvements	Stutsman	420,000	0	780,000	1,200,000
Tuttle Water Supply Improvements	Kidder	420,000	0	780,000	1,200,000
Underwood Water Supply	McLean	624,825	0	1,160,390	1,785,215
Ventura Water Supply Improvements	McIntosh	147,000	0	273,000	420,000
Washburn Water Supply Improvements	McLean	4,060,000	0	7,540,000	11,600,000
Watford City Water Treatment Plant Improvements	McKenzie	600,000	0	900,000	1,500,000
Williams Rural Water Improvements	Williams	910,000	0	1,690,000	2,600,000
Williston Water Treatment Plant - Phase II & III	Williams	8,410,500	0	15,619,500	24,030,000
Wilton Water Supply Improvements	Burleigh	2,030,000	0	3,770,000	5,800,000
Wing Water Supply Improvements	Burleigh	420,000	0	780,000	1,200,000
Wishek Water Supply Improvements	McIntosh	2,030,000	0	3,770,000	5,800,000
Zeeland Water Supply Improvements	McIntosh	84,000	0	156,000	240,000

1 State cost-share for this type of project is determined on a case-by-case basis.

**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
Beyond 2011 TIMEFRAME  
MISSOURI RIVER BASIN**

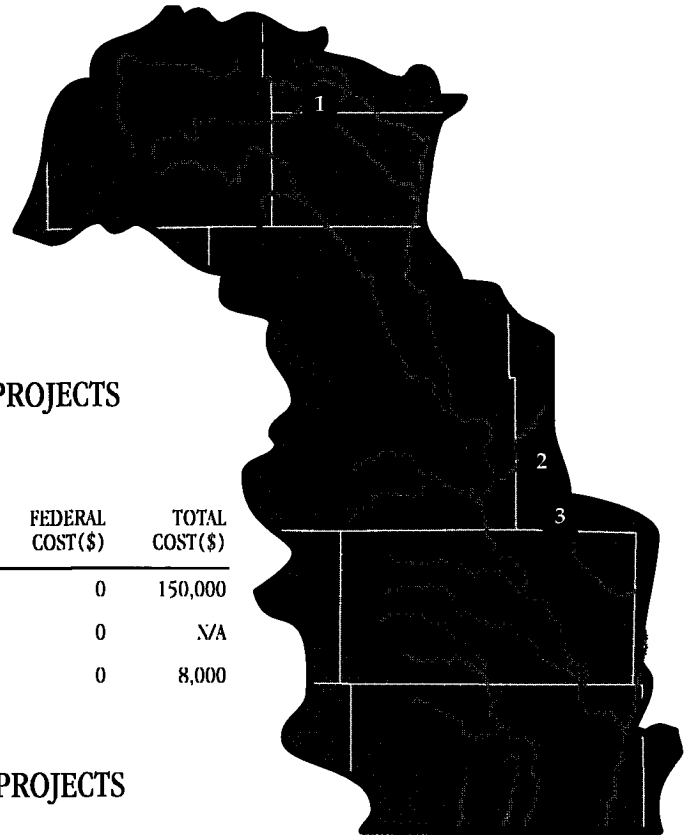
PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Apple Creek Flood Control Dams	Burleigh	100,000	100,000	0	200,000
Beaver Bay Dam	Emmons	2,010,000	990,000	0	3,000,000
Beulah Dry Dams (three dams)	Mercer	350,000	350,000	0	700,000
Bismarck - Water Treatment Pretreatment Expansion	Burleigh	2,534,000	0	4,706,000	7,240,000
Bismarck - Water Treatment Softening Expansion - Phase II	Burleigh	1,442,000	0	2,678,000	4,120,000
Blacktail Dam	Billings	1,333,000	667,000	0	2,000,000
Blacktail Dam Spillway	Williams	273,000	273,000	0	546,000
Brush, Pelican, and Peterson Lake Improvement	McLean	866,000	434,000	1,300,000	2,600,000
Buffalo Creek Dam	Adams	800,000	400,000	0	1,200,000
Burnt Creek Dam	Burleigh	2,010,000	990,000	0	3,000,000
Cannonball Dam	Grant	9,700,000	9,700,000	0	19,400,000



## Beyond 2011 TIMEFRAME - MISSOURI RIVER BASIN (continued)

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Cartwright Charboneau Irrigation Project	McKenzie	8,400,000	5,600,000 <sup>1</sup>	0	14,000,000
Coldwater Lake Shoreline Improvements	McIntosh	N/A	N/A	0	N/A
Danzig Dam Restoration	Morton	N/A	N/A	0	N/A
Emerson Dam	Dunn	7,667,000	3,833,000	0	11,500,000
Fayette Dam	Dunn	2,000,000	1,000,000	0	3,000,000
Green Lake Dredging Project	McIntosh	938,000	462,000	0	1,400,000
Hallstone Creek Dam	Morton	441,000	221,000	0	662,000
Heart River Stabilization Demonstration Project	Morton	18,000	12,000	0	30,000
Hettinger Dam	Adams	5,300,000	5,300,000	0	10,600,000
Hildenbrand Dam Repairs	Logan	67,000	33,000	0	100,000
Jund Dam Repairs	McIntosh	22,000	10,000	0	32,000
Kummer Drain - Williams Co.	Williams	60,000	40,000	0	100,000
Lake Isabel Stabilization	Kidder	21,000	11,000	0	32,000
Lake Williams Recreation Facilities	Kidder	N/A	N/A	0	N/A
Lenhardt Dam	Hettinger	610,000	300,000	0	910,000
Little Muddy Irrigation Project	Williams	12,000,000	8,000,000 <sup>1</sup>	0	20,000,000
Little Muddy Low Level Dam	Williams	N/A	N/A	0	N/A
Louse Lake Dam	Grant	1,867,000	933,000	0	2,800,000
Lower Antelope Creek Dam	Grant	2,200,000	2,200,000	0	4,400,000
McDowell Dam Improvements	Burleigh	241,000	119,000	0	360,000
McKenzie County Long-Term Irrigation Development	McKenzie	57,600,000	38,400,000 <sup>1</sup>	0	96,000,000
Missouri River Channelization - Williston Area Dredging	Williams/McKenzie	12,500,000	0	12,500,000	25,000,000
North Coyote Creek Dam	Dunn	473,000	237,000	0	710,000
Odland Dam Improvements	Golden Valley	664,000	332,000	0	996,000
Otter Creek Dam	Grant	473,000	237,000	0	710,000
Otter Creek Dam	Oliver	1,600,000	1,600,000	0	3,200,000
Paulsen Dam Repairs	Mountrail	10,000	10,000	0	20,000
Plum Creek Dam	Stark	2,000,000	1,000,000	0	3,000,000
Pumpback Reservoir - Fort Berthold Reservation	Mercer	0	0	11,500,000	11,500,000
Spring Lake Dam	Mercer	3,250,000	3,250,000	0	6,500,000
Square Butte Dam	Adams	409,000	205,000	0	614,000
Stanley Erosion Control	Mountrail	6,000	4,000	0	10,000
Thunderhawk Dam	Adams	17,600,000	17,600,000	0	35,200,000
Tobacco Garden Irrigation Project	McKenzie	4,800,000	3,200,000 <sup>1</sup>	0	8,000,000
Tyler Coulee Improvements	Burleigh	240,000	160,000	0	400,000
Upper Antelope Creek Dam	Stark	2,267,000	1,133,000	0	3,400,000
Yellowstone Streambank Stabilization	McKenzie	0	0	545,000	545,000
Zap Flood Control	Mercer	18,000	12,000	0	30,000

<sup>1</sup> State cost-share for this type of project is determined on a case-by-case basis.



**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
1999-2001 TIMEFRAME  
JAMES RIVER BASIN**

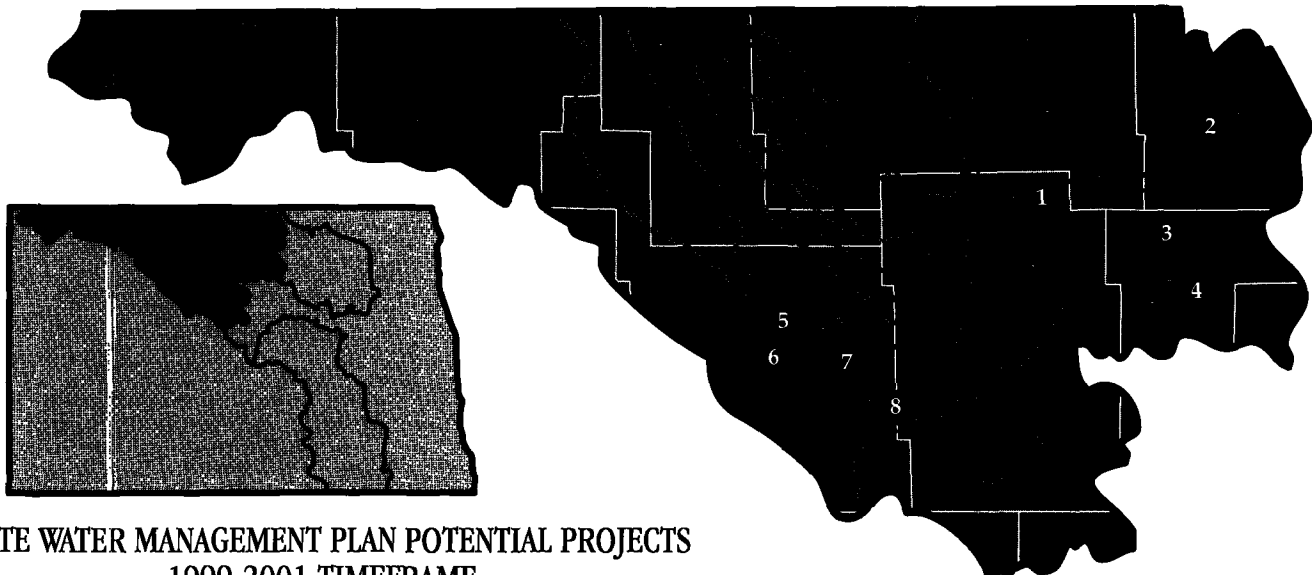
MAP NO.	PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
2	Meadow Lake Water Management	Barnes	90,000	60,000	0	150,000
1	Rocky Run Channel Improvements	Eddy	N/A	N/A	0	N/A
3	Upper Bear Creek Water Management	Barnes	4,800	3,200	0	8,000

**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
2001-2011 TIMEFRAME  
JAMES RIVER BASIN**

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Bowden Water Supply Improvements	Wells	420,000	0	780,000	1,200,000
Carrington Water Supply Improvements	Foster	1,328,000	0	2,464,000	3,792,000
Cathay Water Supply Improvements	Wells	147,000	0	273,000	420,000
Central Plains Water District - Wells County	Wells	280,000	0	520,000	800,000
James River Irrigation Project - Study	Stutsman/LaMoure/Dickey	N/A	N/A	0	N/A
Jamestown Water Supply Improvements	Stutsman	5,617,500	0	10,432,500	16,050,000
Kensal Water Supply Improvements	Stutsman	49,000	0	91,000	140,000
LaMoure Dam - Low Level - LaMoure County	LaMoure	7,500	4,000	11,500	23,000
Ludden Water Supply Improvements	Dickey	147,000	0	273,000	420,000
New Rockford Water Supply Improvements	Eddy	2,030,000	0	3,770,000	5,800,000
Oakes Water Supply Improvements	Dickey	2,030,000	0	3,770,000	5,800,000
Stutsman Rural Water Users Improvements	Stutsman/Foster/Griggs/LaMoure	1,085,000	0	2,015,000	3,100,000
Woodworth Water Supply Improvements	Stutsman	35,000	0	65,000	100,000

**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
Beyond 2011 TIMEFRAME  
JAMES RIVER BASIN**

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Dam Deterioration - James River Basin	Stutsman/LaMoure/Dickey	N/A	N/A	0	N/A
Memorial Park Dam Repairs - LaMoure Co.	LaMoure	33,500	16,500	0	50,000
Pipestem Creek Stabilization	Stutsman	N/A	N/A	N/A	N/A



**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
1999-2001 TIMEFRAME  
SOURIS RIVER BASIN**

MAP NO.	PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
2	All Seasons Water Users - System IV - Expansion Phase III - Planning/Design <sup>1</sup>	Rolette/Towner	315,000	105,000	0	420,000
5	Minot - Northwest Drainage Area	Ward	150,000	100,000	0	250,000
6	Northwest Area Water Supply - Studies	Ward	0	100,000	0	100,000
6	Northwest Area Water Supply - Phase II (Minot 1999-2001)	McLean/Ward	7,000,000	0	13,000,000 <sup>2</sup>	20,000,000
4	Northwest Area Water Supply - Rugby Water Treatment Plant	Pierce	1,205,000	0	1,795,000 <sup>2</sup>	3,000,000
3	Pierce County Rural Water	Pierce	1,572,000	0	2,920,000 <sup>2</sup>	4,492,000
8	Sawyer Highway 52 Crossing	Ward	45,000	30,000	0	75,000
7	Souris River Snagging and Clearing	Ward	750,000	250,000	0	1,000,000
1	Willow Creek Bank Stabilization/Channel Improvement	McHenry	18,000	12,000	0	30,000

1 The State Water Commission has not funded this type of project in the past; federal dollars are not available from the Garrison Diversion Municipal, Rural and Industrial Water Supply Program.

2 The \$53.2 million remaining to be appropriated by Congress to the Garrison Diversion MR&I Water Supply Program will be used to fund the project.

**STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS  
2001-2011 TIMEFRAME  
SOURIS RIVER BASIN**

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
All Seasons Water Users - System I Expansion	Bottineau	525,000	0	975,000	1,500,000
All Seasons Water Users - System I Improvements	Bottineau	315,000	0	585,000	900,000
All Seasons Water Users - System IV Expansion Phase III - Construction	Rolette/Towner	588,000	0	1,092,000	1,680,000
Brooks Addition - Minot Area	Ward	35,000	0	65,000	100,000
Burlington Dams	Ward	1,250,000	1,250,000	0	2,500,000
Crosby Water Supply Improvements	Divide	2,030,000	0	3,770,000	5,800,000
Deering Water Supply Improvements	McHenry	35,000	0	65,000	100,000
Dunseith Water Supply Improvements	Rolette	2,030,000	0	3,770,000	5,800,000
Fortuna Water Supply Improvements	Divide	17,500	0	32,500	50,000
Granville Water Supply Improvements	McHenry	420,000	0	780,000	1,200,000

## 2001-2011 TIMEFRAME - SOURIS RIVER BASIN (continued)

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Lake Metigoshe Restoration	Bottineau	N/A	N/A	0	N/A
Lignite Water Supply Improvements	Burke	420,000	0	780,000	1,200,000
Northwest Area Water Supply (GWP- WTPs)	Williams/Mountrail	1,899,000	0	3,526,000	5,425,000
Northwest Area Water Supply (Kenmare Jct. - Noonan)	Ward/Burks/Divide	1,876,000	0	3,484,000	5,360,000
Northwest Area Water Supply (Minot - ND#5/US#83)	Ward/Renville/Bottineau	6,230,000	0	11,570,000	17,800,000
Northwest Area Water Supply - Minot Water Treatment Plant Expansion	Ward	5,551,000	0	10,309,000	15,860,000
Northwest Area Water Supply (Minot - Berthold)	Ward	1,050,000	0	1,950,000	3,000,000
Northwest Area Water Supply (Mountrail - Writing Rock)	Ward/Burke/Mountrail/Divide/Williams	1,750,000	0	3,250,000	5,000,000
Northwest Area Water Supply (ND#5/US#83 - Bottineau)	Renville/Bottineau	2,695,000	0	5,005,000	7,700,000
Northwest Area Water Supply (ND#5/US#83 - Kenmare Jct)	Bottineau/Ward/Renville	3,150,000	0	5,850,000	9,000,000
Northwest Area Water Supply - Phase II (Minot 2001-2002)	McLean/Ward	7,700,000	0	14,300,000	22,000,000
Portal Water Supply Improvements	Burke	420,000	0	780,000	1,200,000
Puppy Dog Coulee	Ward	1,200,000	800,000	0	2,000,000
Rolette Water Supply Improvements	Rolette	2,030,000	0	3,770,000	5,800,000
Rugby Transmission Line	Pierce/multiple	525,000	0	975,000	1,500,000
Towner Water Supply Improvements	McHenry	81,900	0	152,100	234,000
Upper Basin Storage - Des Lacs	Ward	500,000	500,000	2,900,000	3,900,000
Velva Water Supply Improvements	McHenry	131,250	0	243,750	375,000
Westhope Water Supply	Bottineau	279,160	0	518,440	797,600

## STATE WATER MANAGEMENT PLAN POTENTIAL PROJECTS Beyond 2011 TIMEFRAME SOURIS RIVER BASIN

PROJECT NAME	COUNTY	LOCAL COST(\$)	STATE COST(\$)	FEDERAL COST(\$)	TOTAL COST(\$)
Northwest Area Water Supply - Phase II (Minot 2001-2002)	McLean/Ward	7,700,000	0	14,300,000	22,000,000
Horseshoe Lake Flood Control	Pierce	720,000	480,000	0	1,200,000
Long Creek Dam	Divide	12,500	12,500	0	25,000
Niobee Coulee Dam	Ward	1,072,000	528,000	0	1,600,000
North Tolley Flood Control Study	Renville	N/A	N/A	0	N/A
Northwest Area Water Supply II	Ward/Burke/Mountrail/Divide/Williams	8,750,000	0	16,250,000	25,000,000
Oak Creek Bank Stabilization	McHenry	N/A	N/A	0	N/A
Oak, Wolf, and Willow Creek Floodplain Management Study	Bottineau	N/A	N/A	0	N/A
Ox, Oak, and Willow Creek Flood Control Dams	McHenry	N/A	N/A	0	N/A
Slough South of Crosby - Flood Control Study	Divide	N/A	N/A	0	N/A
Souris River Washout	McHenry	30,000	30,000	0	60,000
Thompson Lake Study	Bottineau	N/A	N/A	0	N/A
Wintering River Flood Control and Bank Erosion Study	McHenry	N/A	N/A	0	N/A
Wolf Creek Flood Control Study	Rolette	N/A	N/A	0	N/A

# Water Resource Programs

## Federal Western Water Resource Programs

The following table describes federal water resource programs in the western United States, and identifies the administering agency(ies), the statutory authorities (cites are presumed to refer to statutes as amended, where appropriate), and congressional committees of jurisdiction for each program or function. It is arranged by topical terms, as determined by the Congressional Research Service specialists involved.

This table underscores the complexity of federal programs affecting water resource development, management, and use in the western U.S. It also illustrates the multiple activities and interests of distinct congressional committees and their interaction with and effects on programs implemented or undertaken by the executive branch. As is seen in the table, a minimum of 12 standing committees in the House and Senate have jurisdiction over various components of federal water resource policy—excluding the extensive responsibilities of the Appropriations Committees in both Chambers, and the direct and indirect activities of the Budget Committees, the House Ways and Means, and the Senate Finance Committees, and the House Government Reform and Oversight, and Senate Governmental Affairs Committees.

In essence, the complex federal executive responsibilities for water resources reflect comparably complex congressional legislative responsibilities, which in turn mirror the multiple and complex ways in

which water resources laws affect social and economic activities.

In organizing this table, a series of “topical” terms were developed under which both the general public and those more familiar with water policy might categorize federal water resource activities. The table is generally organized under the themes of *Water Resources Development/Use*, *Water Quality*, and *Water Rights and Allocation*. Based on the historical evolution of federal water programs and agency functions, the water resources development/use theme includes functions ranging from water supply development, flood control, navigation, and hydropower development, to watershed planning and fisheries management. The water quality theme generally includes pollution prevention and control programs and functions. The water rights and allocation section addresses issues such as federal and tribal water rights and interstate compacts.

Significant overlaps occur both within and among the different topical categories and the larger themes. Cross references are noted in many cases. Further, many activities, especially those related to resource management (fisheries and wetlands in particular) cannot be readily allocated to one or another theme. In dealing with these cross-cutting resource issues, topics are categorized primarily by areas of similar congressional committee jurisdiction. This arrangement is for

convenience only and by no means implies sole jurisdictional responsibility; as the table shows, several committees have various degrees of jurisdiction over both fisheries and wetlands management issues.

Additionally, Congress has established various economic development programs that include water supply and/or treatment projects among the categories of purposes eligible for federal assistance. This table does not include those programs for which water-related activities are not the major focus (e.g., the Economic Development Administration’s Public Works and Development Facilities Program or grants for water quality infrastructure under the Department of Housing and Urban Development’s Community Development Block Grant Program). Also not included are broad environmental remediation or waste management statutes, such as the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) and the Solid Waste Disposal Act.

The committees in the table are generally listed in order of “primary” jurisdictional responsibility in the House, and “predominant” jurisdictional responsibility in the Senate. However, the order in the table should not be presumed to indicate referral order, because in some cases multiple committees are listed when multiple activities authorized under different statutes are carried out by one agency.

## WATER RESOURCES DEVELOPMENT/USE

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
<p>WATER SUPPLY: municipal, industrial, agricultural</p>	<p>The federal government has been involved in developing water supplies for settlement and irrigation in the western United States since the early 1900s; however, most of the nation's water supplies have been developed by local communities under prevailing state water laws.</p> <p>Most major water projects, such as large dams and diversion systems, were constructed by either the Bureau of Reclamation (BuRec) or the U.S. Army Corps of Engineers (Corps). Traditionally, the Corps built and maintained projects primarily intended for flood control, navigation, and power generation, whereas BuRec projects were primarily intended to enhance storage capacity and provide reliable water supplies principally for irrigation, as well as for municipal and industrial use. BuRec operates 343 storage reservoirs and 253 dams, which serve approximately 10 million acres of irrigated land and 30 million people. The Bureau is by far the largest federal water purveyor measured by the amount of water stored and delivered for agricultural, municipal, and industrial uses.</p>	<p>Department of the Interior (DOI): BuRec</p>	<p>Reclamation Act of 1902, as amended, ch. 1093, 32 Stat. 388 (various sections, beginning at 43 U.S.C. 371); Reclamation Projects Act of 1939, ch. 418, 53 Stat. 1187 (43 U.S.C. 485 et seq.); Fish and Wildlife Coordination Act of 1946, ch. 965, 60 Stat. 1080 (16 U.S.C. 661); Rehabilitation and Betterment Act of 1949, ch. 650, 63 Stat. 724 (43 U.S.C. 504); Small Reclamation Projects Act of 1956, ch. 972, 70 Stat. 1044 (43 U.S.C. 422a et seq.); Water Supply Act of 1958, P.L. 85-500, as amended (43 U.S.C. 390b); Reclamation Reform Act of 1982, P.L. 97-293 (43 U.S.C. 390aa et seq.); Reclamation Projects Authorization and Adjustment Act of 1992, P.L. 102-575 (43 U.S.C. 371 note); and scores of individual project authorizations.</p>	<p>House Resources</p> <p>Senate Energy and Natural Resources</p>
<p>WATER SUPPLY: rural and other community programs</p>	<p>The Corps has been given a limited, secondary role in planning for "commercial" water supplies on a cost recovery basis. Its authority under the Water Supply Act of 1958 arises from multi-purpose projects that were initially justified on the basis of transportation, flood control, hydropower, recreation, or fish and wildlife benefits. Nonetheless, at last report, more than 112 Corps' reservoirs stored a significant fraction of municipal and industrial (M&amp;I) water (9.3 million acre-feet) under repayment contracts with local, nonfederal users. Though it is possible to retrofit previously constructed projects to supply M&amp;I users, the planning for such needs is not an explicit responsibility of the Corps. (See Engineer Publication 1165-2.1.)</p> <p>Title 3 of the 1958 Act first authorized the Corps to recommend any economically justified M&amp;I storage space in a new or existing reservoir. The Act's declaration of policy emphasizes the primacy of nonfederal interests. As amended in 1986, the Act continues to require that water supply benefits and costs be equitably allocated among multiple purposes, and repayment by state or local interests be agreed to before construction (at market interest rates over 30 years).</p>	<p>Department of Defense (DOD): Corps</p>	<p>Water Supply Act of 1958, Title 3 of P.L. 85-500, as amended (43 U.S.C. 390b); Water Resources Development Act of 1986, P.L. 85-500, as amended (43 U.S.C. 390(b)).</p>	<p>House Transportation and Infrastructure</p> <p>Senate Environment and Public Works</p>
<p>WATER SUPPLY: rural and other community programs</p>	<p>The U.S. Department of Agriculture (USDA) administers grant and loan programs for water and wastewater projects. Funds are limited to communities of 10,000 or less. Eligible entities include local governments, Indian tribes, and cooperatives.</p> <p>USDA prefers making loans to finance water and waste disposal projects; grants are made only when necessary to reduce average annual charges to a reasonable level. Emergency water assistance grants may also be available to these entities. (See also BuRec, Corps, and USDA Small Watersheds water supply programs, and EPA and HUD programs under water quality infrastructure.)</p>	<p>USDA: Rural Utilities Service (RUS)</p>	<p>Consolidated Farm and Rural Development Act (Section 306), P.L. 87-128, as amended (7 U.S.C. 1926).</p>	<p>House Agriculture (grants and loans)</p> <p>House Banking (loans)</p> <p>Senate Agriculture, Nutrition, and Forestry</p>

## WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
WATER SUPPLY: other irrigation/ irrigated agriculture	USDA has several programs that directly or indirectly support irrigated agriculture; however, these are generally part of larger bureau or agency assistance functions, such as conducting surveys on land use and cropping patterns, and collecting farm and ranch operation statistics.	USDA: Agricultural Research Service (ARS), Economic Research Service (ERS), National Agricultural Statistics Service (NASS), Natural Resources Conservation Service (NRCS). Also, Dept. of Commerce (DOC), Census Bureau, publishes the Census of Agriculture, including irrigation studies.	Agricultural Marketing Act of 1946, 60 Stat. 1087 (7 U.S.C. 1621-1627); National Agricultural Research, Extension, and Teaching Policy Act of 1977, Title XIV of P.L. 95-113 (7 U.S.C. 310 et seq.); and Food, Agriculture, Conservation and Trade Act of 1990, Title XVI-Research, P.L. 101-624 (7 U.S.C. 3103 et seq.)	House Agriculture  Senate Agriculture, Nutrition, and Forestry
FLOOD CONTROL	The Bureau of Indian Affairs manages and operates numerous irrigation projects on tribal reservation lands. After 1907, many of these facilities were constructed by the BuRec. Additionally, Congress has passed approximately 20 Indian water rights settlement acts since the late 1970s, some of which involve federal construction of water projects.  Congress in 1936 declared flood control to be a proper federal activity to improve navigable waters for the general welfare, if benefits exceed costs, and "if the lives and social security of people are otherwise adversely affected." Construction totaling \$25 billion over 50 years for hundreds of flood storage and multiple-purpose reservoirs was a full federal expense (with land and maintenance provided locally). Amendments in 1986 established a local cost-share and 1996 amendments increased the local cost-share to 35% for federally planned projects. Floodplain management (technical services) assistance has been provided secondarily by the Corps since 1960 as a non-construction alternative for flood damage reduction. Further, the Water Resources Development Act of 1974 requires any federal agency planning or designing a flood control project to consider possible non-structural alternatives to prevent or reduce flood damages (33 U.S.C. 701b-11). (See also Corps entry under Dams.)  The USDA Small Watershed Program provides technical and financial assistance to local organizations to plan and install measures to prevent erosion, sedimentation, and flood damage, and to conserve, develop, and use land and water resources. Measures may include a variety of purposes, including municipal or industrial water supply development. Structural measures may include dams levees, canals, pumping plants, and the like.	DOI: Bureau of Indian Affairs (BIA), and BuRec  DOD: Corps  USDA: NRCS	Reclamation Project Act of 1908, ch. 153, 35 Stat. 70; Snyder Act of 1921, ch. 115, 42 Stat. 208 (25 U.S.C. 13); San Juan-Chama Project Act of June 13, 1962, P.L. 85-740 (45 U.S.C. 620 et seq.). Also, see individual Indian water rights settlement acts involving construction, e.g., the Colorado Tie Indian Water Rights Settlement Act of 1988, P.L. 100-585.  Flood Control Act of 1936, ch. 688, 49 Stat. 1570, as amended (33 U.S.C. 701a); and subsequent Water Resources Development Acts.  Watershed Protection and Flood Prevention Act of 1954, ch. 656, 68 Stat. 666, as amended (16 U.S.C. 1001-1006). Often referred to as "P.L. 566."	House Resources  Senate Indian Affairs  Senate Energy and Natural Resources  House Transportation and Infrastructure  Senate Environment and Public Works  House Agriculture  House Transportation and Infrastructure (structures >4000 acre-foot capacity)  Senate Agriculture, Nutrition, and Forestry (structures >2500 and <4000 acre-foot)  Senate Energy and Natural Resources (>4000 acre-foot)

## WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
FLOOD CONTROL	<p>The Flood Control Act of 1936 gave the Corps general jurisdiction over flood control projects, provided that it not interfere with investigations and river improvements carried out by BuRec. The Reclamation Project Act of 1939 authorizes the Secretary of the Interior to allocate multipurpose project costs attributable to flood control as nonreimbursable project costs, and to operate the project for such purposes.</p> <p>The Flood Control Act of 1944 authorized the Secretary of Agriculture to undertake flood prevention and other related purposes in 11 specified projects covering 35 million acres.</p>	DOI: BuRec	Flood Control Act of 1936, ch. 688, 49 Stat. 1570 (33 U.S.C. 701b); Reclamation Project Act of 1939 (Section 9(b)), as amended, ch. 418, 53 Stat. 1187 (43 U.S.C. 485h(b)). See also Section 1(c) of the Flood Control Act of 1944, ch. 665, 58 Stat. 887 (33 U.S.C. 701b-1)	House Resources  Senate Energy and Natural Resources
EMERGENCY FLOOD RESPONSE	<p>Pursuant to general authority, the Corps provides flood and other (declared disaster) assistance at its own projects, or to other public and private entities to prevent or minimize damages, as well as to provide emergency supplies of water and other lifesaving equipment and materials and to repair or restore damaged flood control or coastal protection structures.</p> <p>BuRec is authorized to use money from its emergency fund to finance costs associated with a host of emergencies, including floods.</p>	DOD: Corps	Various flood control and river harbor acts; generally see Emergency Flood Control Work, amendments of June 28, 1955, ch. 194, 69 Stat. 186 (33 U.S.C. 701n); and Act of Aug. 18, 1941, ch. 377, 55 Stat. 650 (33 U.S.C. 701n). (See also Corps entry under Dams, below.)	House Transportation and Infrastructure  Senate Environment and Public Works
EMERGENCY FLOOD RESPONSE	<p>BuRec is authorized to use money from its emergency fund to finance costs associated with a host of emergencies, including floods.</p>	DOI: BuRec	Act of June 26, 1948, ch. 676, 62 Stat. 1052 (43 U.S.C. 502). See also Title IV of the Disaster Relief Act of 1974, P.L. 93-288, 88 Stat. 153 (42 U.S.C. 5171), which authorizes any federal agency to repair, reconstruct, restore, or replace any facility owned by the U.S. which is damaged or destroyed during a major disaster.	House Resources  Senate Energy and Natural Resources
EMERGENCY FLOOD RESPONSE	<p>Emergency Watershed Protection assists in reducing hazards in watersheds damaged by natural disasters. (See also USDA Risk Management and Farm Service Agency programs listed below under "drought response." These programs cover many perils.)</p>	USDA: NRCS	Title IV of the Farm Credit Act of 1978, P.L. 95-334 (16 U.S.C. 2203).	House Agriculture  Senate Agriculture, Nutrition, and Forestry
EMERGENCY FLOOD RESPONSE	<p>Emergency Conservation Program restores damaged farmland by reshaping it and removing debris. Additionally, under the Flood Risk Reduction Program, landowners can receive a lump sum payment instead of annual payments if they farm land with high flood potential and they agree to forego specified farm and disaster payments.</p>	USDA: Farm Service Agency	Title IV of the Farm Credit Act of 1978, P.L. 95-334 (16 U.S.C. 2201 et seq.); and the Federal Agricultural Improvement and Reform Act of 1996, P.L. 104-127 (16 U.S.C. 2201).	House Agriculture  Senate Agriculture, Nutrition, and Forestry
EMERGENCY FLOOD RESPONSE	<p>The Federal Emergency Management (FEMA) provides assistance through grants and loans to victims of natural disasters, including floods. Individuals, nonprofit agencies, and state and local governments may apply for assistance. Federal assistance is provided only when benefits are not available from pre-paid insurance policies or other sources.</p>	FEMA	Robert T. Stafford Disaster Relief and Emergency Assistance Act, P.L. 93-288, as amended by P.L. 100-707 (42 U.S.C. 5170 et seq.).	House Transportation and Infrastructure  Senate Environment and Public Works
DROUGHT RESPONSE	<p>The Corps is authorized to construct wells and transport water to farmers, ranchers, and political subdivisions if water supplies become unavailable in times of drought.</p>	DOD: Corps	Act of Aug. 18, 1941, ch. 377, 55 Stat. 650 (33 U.S.C. 701n(b)).	House Transportation and Infrastructure  Senate Environment and Public Works



## WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
DROUGHT RESPONSE	<p>USDA makes direct payments known as Noninsured Assistance Payments to crop producers who experience a significant crop loss, but are not eligible for federal crop insurance.</p> <p>The Secretary of the Interior has at times been given specific "emergency" authority to undertake construction, management, and conservation activities (including assisting irrigators with purchasing available water) to augment water supplies in times of drought. Additionally, the Emergency Fund Act of 1948 authorized an emergency fund for BuRec to assure continuous operation of its irrigation and power systems." The Act was amended in 1982 to apply to all reclamation project facilities.</p> <p>The Federal Crop Insurance Program is one of three major policy tools the federal government uses as a means of helping crop producers recover from the financial effects of drought and other natural disasters. This program allows farmers to mitigate natural risks by protecting annual crop yields through the purchase of a federally subsidized insurance policy.</p>	<p>USDA: Farm Service Agency</p> <p>DOI: BuRec</p> <p>USDA: Risk Management Agency</p>	<p>The Federal Crop Insurance Act (Section 519), P.L. 96-365, (7 U.S.C. 1501 et seq.), as amended by the Federal Crop Insurance Reform Act of 1994, P.L. 103-354 (7 U.S.C. 1519).</p> <p>Act of June 26, 1948, ch. 676, 62 Stat. 1052 (43 U.S.C. 502); Act of April 7, 1977, P.L. 95-18, as amended (43 U.S.C. 502 note); Reclamation States Emergency Drought Act of 1988, Title IV, subtitle B of P.L. 100-387 (43 U.S.C. 502 note), as amended by Reclamation States Emergency Drought Act of 1991, P.L. 102-250 (43 U.S.C. 2211 et seq.).</p> <p>The Federal Crop Insurance Act, P.L. 96-365 (7 U.S.C. 1501 et seq.), as amended by the Federal Crop Insurance Reform Act of 1994, P.L. 103-354 (Title I of the Federal Crop Insurance and Department of Agriculture Reorganization Act of 1994) (7 U.S.C. 1501 et seq.).</p>	<p>House Agriculture</p> <p>Senate Agriculture, Nutrition, and Forestry</p> <p>House Resources</p> <p>Senate Energy and Natural Resources</p> <p>House Agriculture</p> <p>Senate Agriculture, Nutrition, and Forestry</p>
DAMS, DAM SAFETY	<p>USDA makes low-interest government loans known as emergency disaster (EM) loans to disaster-stricken, family-sized farmers who are unable to obtain credit from commercial sources.</p> <p>Construction: The Reclamation Act of 1902 gave the Secretary of the Interior general authority to construct, operate, and maintain dams and diversion projects principally for irrigation; however, since the 1939 and 1944 Acts, construction of many projects must be authorized by Congress. Municipal and industrial water supply, flood control, recreation, and fish and wildlife mitigation and enhancement also are often associated project purposes. (See BuRec entry under water supply, above.)</p> <p>Construction: The Corps has general authority to plan and construct dams for flood control, navigation and related purposes; however, major construction projects must be authorized by Congress. (See Corps flood control entry, above.)</p> <p>Safety: BuRec routinely examines the safety of its structures through its Safety Evaluation of Existing Dams Program, and makes structural and non-structural modifications to deficient facilities through two other programs. Additionally, BuRec facilitates and guides dam safety programs for other Interior agencies through the Department of the Interior Dam Safety Program. Work may also be performed by BuRec on other federal facilities throughout the United States on a reimbursable basis.</p>	<p>USDA: Farm Service Agency</p> <p>DOI: BuRec</p> <p>DOD: Corps</p> <p>DOI: BuRec</p>	<p>Subtitle C of the Consolidated Farm and Rural Development Act, P.L. 87-128, as amended (7 U.S.C. 1981, et seq.).</p> <p>See generally Reclamation Act of 1902, as amended, ch. 1093, 32 Stat. 388 (43 U.S.C. 371 et seq.); Reclamation Projects Act of 1939, ch. 418, 53 Stat. 1187 (43 U.S.C. 485 et seq.); Flood Control Act of Dec. 22, 1944 (Section 1 (c)), ch. 665, 58 Stat. 887; Act of July 9, 1965, P.L. 89-72 (16 U.S.C. 4601-18); and other authorities listed under the BuRec water supply entry, above.</p> <p>See generally authorities listed under the Corps' flood control entry, above.</p> <p>Reclamation Safety of Dams Act, P.L. 95-578, as amended (43 U.S.C. 506). (See also presidential memorandum dated Oct. 4, 1979.)</p>	<p>House Agriculture</p> <p>Senate Agriculture, Nutrition, and Forestry</p> <p>House Resources</p> <p>Senate Energy and Natural Resources</p> <p>House Agriculture</p> <p>Senate Agriculture, Nutrition, and Forestry</p> <p>House Resources</p> <p>Senate Environment and Public Works</p> <p>House Resources</p> <p>Senate Energy and Natural Resources</p>

## WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
DAMS, DAM SAFETY	<p>Safety: The Corps of Engineers' current dam safety authorities began in 1972, when the infrastructure agency compiled an inventory of approximately 80,000 public and private dams, and made technical assistance available, in cooperation with state inspection and safety officials. Under 1996 amendments, a new interagency Committee on Dam Safety (administered by FEMA) is to improve coordination of state and federal efforts through new authority for implementation plans, inspector training, research, and public awareness, as well as direct funding assistance.</p> <p>The Geological Survey is required to exchange scientific information with other agencies involved in dam safety. This includes data gathered under the Survey's geologic hazards research.</p> <p>The Secretary of the Interior is to classify the condition of dams on Indian lands, establish a dam safety maintenance and repair program BIA, and rehabilitate dams identified as posing a threat.</p>	<p>DOD: Corps; Federal Emergency Management Agency (FEMA)</p> <p>DOI: U.S. Geological Survey (USGS)</p> <p>DOI: BIA</p>	<p>Dam Safety Act of 1972, P.L. 92-367 (33 U.S.C. 467); and subsequent Water Resources Development Acts.</p> <p>The Reclamation Safety of Dams Act of 1978, P.L. 95-578, (43 U.S.C. 506 et seq.).</p> <p>Indian Dam Safety Act of Aug. 23, 1994, P.L. 103-302 (25 U.S.C. 3801 note).</p> <p>Federal Water Power Act of 1920, ch. 285, 41 Stat. 1065, as amended (16 U.S.C. 797(p) and 823(b)); Federal Power Act of 1935, ch. 687, 49 Stat. 839, 847, as amended (16 U.S.C. 797(e)).</p>	<p>House Transportation and Infrastructure</p> <p>Senate Environment and Public Works</p> <p>House Resources</p> <p>Senate Energy and Natural Resources</p> <p>House Resources</p> <p>Senate Indian Affairs</p> <p>House Commerce</p> <p>House Resources</p> <p>Senate Energy and Natural Resources</p> <p>House Resources</p> <p>Senate Energy and Natural Resources</p> <p>House Resources</p> <p>House Commerce</p> <p>Senate Energy and Natural Resources</p>
HYDROPOWER DEVELOPMENT/ SUPPLY: federal and private	<p>Many BuRec multi-purpose dams have associated hydropower facilities. (See BuRec entries under water supply and dams.)</p>	DOI: BuRec	<p>See statutory authorities under BuRec water supply entry, also: Town Sites and Power Development Act of 1906, (Section 5), ch. 1631, 34 Stat. 116 (43 U.S.C. 561, 562, 566, 567).</p>	House Resources <p>Senate Energy and Natural Resources</p>
HYDROPOWER DEVELOPMENT	<p>Power Marketing Administrations (PMAs) were initially created to market electricity generated in excess of irrigation needs at federal multipurpose dams. Four of the five PMAs are funded annually with appropriations, with receipts deposited in the Federal Treasury; the fifth, the Bonneville Power Administration (BPA), has been on a self-financed basis since enactment of the Federal Columbia River Transmission System Act in 1974 (P.L. 93454). Four PMAs (BPA, the Alaska Power Administration (APA), the South Eastern Power Administration (SEPA), and the South Western Power Administration (SWPA)) were transferred from the Dept. of the Interior to the Dept. of Energy (DOE) under the DOE Organization Act of 1977; the last PMA, the Western Area Power Administration (WAPA), was authorized by that Act. The PMAs generally do not own or operate any of the power generation facilities (APA is the exception); however, all but SEPA do own and operate transmission lines. Most of the generation facilities were built and continue to be managed by BuRec and the Corps as part of other multipurpose water projects.</p>	DOE: APA, BPA, SEPA, SWPA, and WAPA	<p>Flood Control Act of 1944 (Section 5), ch. 665, 58 Stat. 890 (16 U.S.C. 825s) authorizes permanent marketing authorities; Bonneville Project Act of 1937, ch. 720, 50 Stat. 731 (16 U.S.C. 832 et seq.); Dept. of Energy Organization Act of 1977 (Section 302(a)(3)); P.L. 95-91 (42 U.S.C. 7152(a)).</p>	House Resources <p>House Commerce</p> <p>Senate Energy and Natural Resources</p>

WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
HYDROPOWER DEVELOPMENT	FERC licenses private hydropower dams and regulates the economic aspects of the electric utility industry at the federal level. (See FERC entry under Dams, Dam Safety, above.)	DOE: FERC	Federal Water Power Act of 1920, ch. 285, 41 Stat. 1065 (16 U.S.C. 797 et seq.).	House Commerce House Resources Senate Energy and Natural Resources
NAVIGATION	Authorizations for the Corp's Civil Works program for navigation rests on the constitutional power of the Congress to regulate interstate commerce. Since the General Survey Act of 1824, and subsequent Rivers and Harbors Acts, the Corps has constructed coastal ports and inland waterways, and has maintained navigable shipping channels. Increasingly, local cost-sharing now applies to most major improvements being authorized—most recently in the Water Resources Development Act of 1996.	DOD: Corps	Various Rivers and Harbors Acts; and, the Water Resources Development Act of 1986, and subsequent amendments; e.g., P.L. 104-303 in 1996. (General authority is derived from the Commerce Clause of the Constitution.)	House Transportation and Infrastructure Senate Environment and Public Works
	The Secretary of the Interior is authorized to allocate BuRec multi-purpose project costs attributable to navigation.	DOI: BuRec	Reclamation Project Act of 1939 (Section 9(c)), ch. 418, 53 Stat. 1187, as amended (43 U.S.C. 485(h)).	House Resources Senate Energy and Natural Resources
WATERSHED PLANNING	The terms watershed and watershed planning have had many connotations over time. The terms are somewhat in vogue now (as they were 30 years ago); however, few federal laws have been enacted that adopt a watershed planning perspective or authorize programmatic activity on a watershed basis. Rather, agencies today are often calling activities that they once placed under other labels watershed activities, and in some cases are expanding interdisciplinary and interagency coordination efforts. For example, several sections of the Clean Water Act relate to watershed management (e.g., section 209 required interstate basin planning and section 208 required areawide water quality planning), but actual watershed planning activities under this Act are limited. Today, however, EPA uses general authorities to promote watershed protection as a comprehensive approach to protecting aquatic resources by addressing a wide range of factors (contaminants, physical conditions, biological characteristics) that affect water quality goals. Additionally, the new Environmental Quality Incentive Program (EQIP) enacted in the 1996 Farm Bill and administered by NRCS, provides cost-sharing assistance to farmers to solve problems that may be prioritized on a watershed basis. Similarly, new "ecosystem restoration" or watershed based activities are also being undertaken by BuRec and the Corps. (See entries on water supply, flood control, emergency flood response, above, and on non-point sources and source water protection under water quality, below.)	Various activities of NRCS, BuRec, Corps, and EPA	General statutory authorities listed under water supply entries, above, and water quality entries, below.	House Agriculture House Resources House Transportation and Infrastructure Senate Agriculture, Nutrition, and Forestry Senate Energy and Natural Resources Senate Environment and Public Works (See specific programs and statutory authorizations below.)
	Congress in 1965 directed the President to establish the Water Resources Council to study and coordinate various federal activities in and affecting the nation's river basins, including development of river basin plans. The 1965 Water Resources Planning Act also created several river basin commissions and authorized financial assistance to states for comprehensive watershed planning. Although the underlying statute for the Water Resources Council and its activities is still on the books, it has not been used or funded since 1983.	Executive Office of the President: Water Resources Council (not funded or used since 1983).	Water Resources Planning Act of 1965, P.L. 89-80 (42 U.S.C. 1962 et seq.).	House Resources Senate Energy and Natural Resources

## WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
WATERSHED PLANNING	<p>The Watershed Surveys and Planning Program is to assist federal, state, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest industries.</p> <p>Additionally, the Secretary of the Army and the Secretary of Agriculture are authorized to conduct joint investigations and surveys of watershed areas for flood prevention and flood control purposes, when authorized to do so by the House Transportation and Infrastructure Committee and the Senate Environment and Public Works Committee.</p> <p>Historical origins of the Flood Control Acts of 1936 and 1944, authorizing the Corps to investigate watersheds and plan for flood control and river improvement, date to 1927 "308 Reports" on comprehensive (multi-purpose) river basin development.</p>	USDA; NRCS	Watershed and Flood Prevention Act of 1954, ch. 656, 68 Stat. 666 (16 U.S.C. 1001-1008).	House Agriculture  Senate Agriculture, Nutrition, and Forestry
	<p>Historical origins of the Flood Control Acts of 1936 and 1944, authorizing the Corps to investigate watersheds and plan for flood control and river improvement, date to 1927 "308 Reports" on comprehensive (multi-purpose) river basin development.</p>	USDA; NRCS, and DOD; Corps	Act of Sept. 5, 1962, P. L. 87-639 (16 U.S.C. 1009).	House Transportation and Infrastructure
	<p>The term "water conservation" has a variety of meanings. Historically, the term may have been used to describe traditional reclamation projects, as they were designed to conserve otherwise "wasted" water for beneficial purposes such as irrigation and municipal and industrial use. More recently, the term has been used to describe activities that would lessen the amount of water used to grow crops or for other purposes and would stretch the available use of limited water supplies. In the latter context, each water and irrigation district receiving water from BuRec projects must develop a water conservation plan and a time schedule for meeting water conservation objectives. For the earlier context, see BuRec entries under supply. (See also Agricultural Research Service research entry.)</p>	DOD; Corps	River and Harbor Act of 1927, chs. 4547, 44 Stat. 1010.	House Transportation and Infrastructure  Senate Environment and Public Works
WATERSHED CONSERVATION	<p>To reduce water demand and wastewater volumes nationwide, plus reduce associated energy demands, the Energy Policy Act of 1992 established maximum water-use standards for plumbing fixtures (faucets, showerheads, toilets, urinals), as well as product marking and labeling requirements. The Act itself specified water efficiency standards for the covered fixtures. The requirements are administered and regulated by DOE, which has the authority to allow state preemption of the federal standards if state requirements are more stringent. DOE is also authorized to establish more stringent standards as technology improves. The Federal Trade Commission (FTC), in the Department of the Treasury (TR), is required to promulgate labeling rules for the plumbing fixtures and products covered by the Act.</p> <p>EPA is required to publish guidelines by August 6, 1998, for water conservation plans for public water systems. States may require public water systems to submit a water conservation plan as a condition for receiving a loan or grant from the drinking water State Revolving Fund. (See drinking water infrastructure, below.)</p>	DOI; BuRec	Reclamation Reform Act of 1982, Title II of P.L. 97-293 (43 U.S.C. 390(j)).	House Resources  Senate Energy and Natural Resources
	<p>To reduce water demand and wastewater volumes nationwide, plus reduce associated energy demands, the Energy Policy Act of 1992 established maximum water-use standards for plumbing fixtures (faucets, showerheads, toilets, urinals), as well as product marking and labeling requirements. The Act itself specified water efficiency standards for the covered fixtures. The requirements are administered and regulated by DOE, which has the authority to allow state preemption of the federal standards if state requirements are more stringent. DOE is also authorized to establish more stringent standards as technology improves. The Federal Trade Commission (FTC), in the Department of the Treasury (TR), is required to promulgate labeling rules for the plumbing fixtures and products covered by the Act.</p>	DOE; Office of Energy Efficiency and Renewable Energy; TR; FTC	Energy Policy and Conservation Act, as amended by the Energy Policy Act of 1992 (Section 123), P.L. 102-486, 123 (42 U.S.C. 6292, 6295).	House Commerce  Senate Commerce, Science, and Transportation
	<p>EPA is required to publish guidelines by August 6, 1998, for water conservation plans for public water systems. States may require public water systems to submit a water conservation plan as a condition for receiving a loan or grant from the drinking water State Revolving Fund. (See drinking water infrastructure, below.)</p>	EPA	Safe Drinking Water Act, P.L. 93-523, as amended by P.L. 104-182 (42 U.S.C. 300f-15).	House Transportation and Infrastructure  Senate Environment and Public Works

## WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
WATERSHED RECLAMATION AND REUSE	Beginning in 1992, BuRec has been authorized to study, plan, and construct reclamation wastewater and reuse projects to augment local area water supplies, including ground-water reclamation and recharge, and desalination projects.	DOI: BuRec	Reclamation Wastewater and Groundwater Study and Facilities Act, Title 16 of P.L. 102-575, as amended by P.L. 104-266 (43 U.S.C. 390h); Act of July 3, 1952, ch. 568, 66 Stat. 328, as amended (42 U.S.C. 1951-1958); Act of Sept. 2, 1958, P.L. 85-883 (42 U.S.C. 1958).	House Resources  Senate Energy and Natural Resources
GROUND-WATER RESEARCH	The Ground-Water Resources Program evaluates the availability of ground water in the nation's major aquifer systems; develops quantitative assessment of ground-flow in major aquifer systems; and evaluates the processes that influence the response of major aquifer systems to pumping, droughts, and other stresses. The Ground-Water Resources Program supplements the USGS Federal-State Cooperative Program, which evaluates water availability on a more local scale. (See general water research entry below.)	DOI: USGS	Water Resources Research Act of 1984 (WRRA), P.L. 104-147, as amended (42 U.S.C. 10301 et seq.); Water Resources Development Act of 1986 (WRDA), P.L. 99-662 (42 U.S.C. 10301 et seq.).  (See also general USGS research authority under water research entry directly below.)	House Science  House Resources (WRRA)  House Transportation and Infrastructure (WRDA)  Senate Commerce  Senate Energy and Natural Resources  Senate Environment and Public Works (WRDA and WRRA)
RESEARCH (generally - see also water quality research below)	The USGS Water Resources Investigations Activity is the primary source of scientific information on the nation's water resources. This is carried out through a number of separate sub-activities and programs such as: Water Resources Supply and Use, Ground-Water Resources, National Water-Quality Assessment, Toxic Substances Hydrology, Hydrologic Research and Development, Flood Hazards and Streamflow Information, Water Data Collection and Management, Federal-State Cooperative Water Program, and the Water Resources Research Act Program of grants for academic research at State Water Resources Research institutes. (See also water quality research below.)	DOI: USGS	The Organic Act of March 3, 1879, which established the Geological Survey, 20 Stat. 394, as amended (43 U.S.C. 31 et seq.); Water Resources Research Act of 1984, as amended by P.L. 104-147 (42 U.S.C. 10301 et seq.).  Note: Under OMB Memorandum 92-01, the USGS has the primary responsibility for coordinating water data activities in the federal government.	House Science  House Resources  Senate Commerce  Senate Energy and Natural Resources  Senate Environment and Public Works
	The Agricultural Research Service (ARS) provides access to agricultural information and develops knowledge and technology to solve research in one of six areas.	USDA: ARS	Food and Agricultural Act of 1977, P.L. 95-113 (7 U.S.C. 1281); Food Security Act of 1985, P.L. 99-198 (7 U.S.C. 3101); Food, Agriculture, Conservation and Trade Act of 1980, P.L. 101-624 (7 U.S.C. 1421 et seq.).	House Agriculture  Senate Agriculture, Nutrition, and Forestry
	The BuRec has general authority to conduct research as part of its overall civil works research and development programs.	DOI: BuRec	See generally: Section 2 of the Reclamation Act of 1902, ch. 1093, 32 Stat. 388 (43 U.S.C. 371 et seq.); and Fact Finders Act of 1924, ch. 4, 43 Stat. 672 (43 U.S.C. 377). Also see BuRec authorities listed under water reclamation and reuse.	House Resources  Senate Energy and Natural Resources

## WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
RESEARCH (generally - see also water quality research below)	The Corps has general authority to conduct research as part of its overall civil works research and development programs.	DOD: Corps	See Corps authorities listed under flood control, dams, etc. The Corps' policy manual (EP 1165-2-1) states "research and development is an integral and essential component in the overall management of Civil Works programs and functions... special authorization is not required."	House Transportation and Infrastructure Senate Environment and Public Works
	The Weather Service Modernization Act charges the Secretary of Commerce with forecasting the weather, issuing storm warnings, weather and flood signals, gauging and reporting on river conditions, reporting temperature and rainfall conditions, distributing meteorological observations, and taking such meteorological observations as necessary to establish and record climatic conditions of the United States.	Department of Commerce (DOC); National Oceanic and Atmospheric Administration (NOAA)/ National Weather Service	Weather Service Modernization Act, P.L. 102-67 (15 U.S.C. 313 et seq.).	House Science Senate Commerce, Science, and Transportation
WILD AND SCENIC RIVERS	The National Wild and Scenic Rivers System preserves designated free-flowing rivers for the benefit and enjoyment of present and future Americans. River segments are classified as being wild, scenic, or recreational, largely depending upon the condition and surroundings of the stream at the time of designation. Rivers may be added to the system either by an Act of Congress, usually following a study by a federal agency, or by nomination by a state with the approval of the Secretary of the Interior. (Fewer than 10% of the federal wild and scenic river designations have been made by the Secretary.) Land areas along designated rivers are generally managed by the predominant federal agency landowner where the majority of lands are federally owned, or one or more states. Federal agencies are directed to cooperate with state and local governments in developing corridor management plans and actual lands use restrictions on private lands are generally governed by local county or other local jurisdictional ordinances. Some recent designations have included language calling for creation of citizen advisory boards or other mechanisms to ensure local participation in the development of management plans.	DOI: National Park Service, Bureau of Land Management, Fish and Wildlife Service, BuRec; USDA: Forest Service; DOD: Corps	National Wild & Scenic Rivers Act of 1968, P.L. 90-542, as amended (16 U.S.C. 1271 et seq.).	House Resources Senate Energy and Natural Resources
FISHERIES MANAGEMENT	The Fish and Wildlife Service (FWS) is the major federal agency involved with freshwater fishery management. Relevant FWS efforts are directed to conserving, restoring, and enhancing priority aquatic ecosystems where there is a federal interest.  Fishery and aquatic habitat activities related to national forests are conducted in separate research and management components. The USDA Forest Service has the responsibility to maintain and improve fishery habitat in national forests and grasslands, consistent with overall multiple-use objectives.	DOI: FWS  USDA: Forest Service	Various sections of Title 16 of the U.S. Code.  Forest and Rangeland Renewable Resources Planning Act of 1974, P.L. 93-378, as amended by the National Forest Management Act of 1976, P.L. 94-588 (16 U.S.C. 1601 et seq.); Multiple-Use Sustained-Yield Act of 1960, P.L. 86-517, as amended (16 U.S.C. 528).	House Resources Senate Environment and Public Works  House Resources House Agriculture Senate Agriculture, Nutrition, and Forestry Senate Energy and Natural Resources Senate Environment and Public Works

## WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
FISHERIES MANAGEMENT	<p>Living aquatic resource questions are encountered by the Corps in the process of planning and constructing projects and programs authorized by Congress. A significant portion of funds expended for living aquatic resources is related to mitigation features to compensate for aquatic resources lost due to construction and operation of the projects.</p>	DOD: Corps	<p>Fish and Wildlife Coordination Act, Act of March 10, 1934, 48 Stat. 401, as amended (16 U.S.C. 661 et seq.); Endangered Species Act of 1973, P.L. 93-205, as amended (16 U.S.C. 1531 et seq.); and the Pacific Northwest Electric Power Planning and Conservation Act, P.L. 96-501 (16 U.S.C. 839 et seq.); Water Resources Development Act of 1986 (WRDA), P.L. 99-662 (42 U.S.C. 10301 et seq.).</p>	<p>House Transportation and Infrastructure  House Resources  Senate Energy and Natural Resources  Senate Environment and Public Works</p>
	<p>BuRec's living aquatic resource programs include management of water projects such as minimum flow evaluations and implementation; water acquisition for flow augmentation; aquatic habitat restoration, mitigation, and enhancement; fish hatchery modifications; adult and juvenile fish passages at various barriers; endangered fish studies; and other miscellaneous aquatic resource and habitat concerns.</p>	DOI: BuRec	<p>Fish and Wildlife Coordination Act, Act of March 10, 1934, 48 Stat. 401, as amended (16 U.S.C. 661 et seq.); Pacific Northwest Electric Power Planning and Conservation Act, P.L. 96-501 (16 U.S.C. 839 et seq.); Endangered Species Act of 1973, P.L. 93-205, as amended (16 U.S.C. 1531 et seq.); Colorado River Storage Project Act, Act of April 11, 1956, 70 Stat. 110 (43 U.S.C. 620g); the Central Valley Project Improvement Act, Title 34 of P.L. 102-575, (106 Stat. 4706); and mitigation provisions of numerous other laws.</p>	<p>House Resources  Senate Energy and Natural Resources</p>
	<p>The Bureau of Land Management (BLM) has specific responsibility for managing all fish habitat on its public lands, including habitat for candidate, threatened, and endangered fishes. Major fishery habitat management objectives are to protect and improve suitable aquatic habitat by coordinating with the management of other resources, implementing specific habitat management and improvement measures, and coordinating with other agencies and organizations with fishery interests.</p>	DOI: BLM	<p>Federal Land Policy and Management Act of 1976, P.L. 94-579, as amended (43 U.S.C. 1701 et seq.); Endangered Species Act of 1973, P.L. 93-205, as amended (16 U.S.C. 1531 et seq.).</p>	<p>House Resources  Senate Energy and Natural Resources  Senate Environment and Public Works</p>
	<p>The National Park Service (NPS) conducts management programs designed to maintain and protect aquatic and marine resources found within the boundaries of NPS units. NPS also works with other governmental organizations to resolve management issues occurring outside park boundaries but affecting park aquatic/marine resources.</p>	DOI: NPS	<p>National Park Service Organic Act of 1916, as amended (16 U.S.C. 1 et seq.); National Environmental Policy Act of 1969, P.L. 91-190, as amended (42 U.S.C. 4321 et seq.); Endangered Species Act of 1973, P.L. 93-205, as amended (16 U.S.C. 1531 et seq.); and individual park enabling acts.</p>	<p>House Resources  Senate Energy and Natural Resources  Senate Environment and Public Works</p>
	<p>The Federal Energy Regulatory Commission (FERC), in licensing nonfederal hydroelectric projects and certifying nonfederal natural gas pipeline projects, is directed to give equal consideration to protection and enhancement of aquatic resources and habitat affected by project construction and operation.</p>	FERC	<p>Title II of the Federal Power Act of 1935, ch. 687, 49 Stat. 839, 847, 863, as amended (16 U.S.C. 797(e)); Endangered Species Act of 1973, P.L. 93-205, as amended (16 U.S.C. 1531 et seq.).</p>	<p>House Resources  House Commerce  Senate Commerce  Senate Environment and Public Works</p>

## WATER RESOURCES DEVELOPMENT/USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
FISHERIES MANAGEMENT	The Bureau of Indian Affairs (BIA) Fish, Wildlife, and Recreation Program is the primary program through which the federal government fulfills its trust responsibilities to Indians in the area of aquatic resources, and through which tribal responsibilities and roles in aquatic resource management are funded. Certain other statutes also affect Indian fisheries.	DOI: BIA	Snyder Act of 1921, ch. 115, 42 Stat. 208, as amended (25 U.S.C. 13); Indian Reorganization Act of 1934, 48 Stat. 984 (25 U.S.C. 461 et seq.); Indian Self-Determination and Education Assistance Act, P.L. 93-638, as amended (25 U.S.C. 450 et seq.); Salmon and Steelhead Conservation and Enhancement Act of 1980, P.L. 96-561 (16 U.S.C. 3301 et seq.); Fishing Sites Act, P.L. 100-581, (25 U.S.C. 476 note); Sustainable Fisheries Act of 1996, P.L. 104-297 (16 U.S.C. 1801).	House Resources Senate Indian Affairs Senate Commerce, Science, and Transportation
AQUACULTURE	Approximately a dozen federal departments and agencies play a role in one or more aspects of marine and/or freshwater aquaculture, with the major programs and resources within three departments. USDA focuses primarily on assisting private aquaculture through financial and/or technical assistance. The departments of Commerce and of the Interior concentrate more extensively on aquaculture activities that provide public benefits (such as propagating and rebuilding wild fish stocks) and on enforcing certain regulatory requirements affecting the industry such as various resource and environmental laws. Federal programs and policies affecting aquaculture are coordinated by a Joint Subcommittee on Aquaculture (JSA), composed of representatives of most of these agencies, which functions as an official subcommittee of the National Science and Technology Council of the White House Office of Science and Technology Policy. The law designates USDA as the permanent administrative chair of the JSA and as the lead agency for coordination and dissemination of aquaculture information.	USDA: Cooperative State Research, Education, Extension Service; ARS; Animal and Plant Health Inspection Service; and others. Other agencies with aquaculture or related responsibilities where water resources might be at issue include: DOI: Fish and Wildlife Service; DOC: NOM; Health and Human Services; DOD: Corps; and EPA.	Aquaculture activities are funded and/or regulated under numerous authorities, but the primary authority articulating federal policy and coordination is the National Aquaculture Act of 1980, P.L. 96-362, as amended (16 U.S.C. 2805 et seq.).	House Agriculture House Commerce House Resources Senate Agriculture, Nutrition, and Forestry Senate Commerce, Science and Transportation Senate Environment and Public Works
TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
POINT SOURCE POLLUTION	The Clean Water Act contains regulatory requirements that apply to industrial and municipal sources that discharge wastewater to the nation's surface waters. EPA establishes national standards, or effluent limitations, applicable to categories of these sources to limit waste discharges. Permits are issued to individual plants and other facilities pursuant to the EPA standards. Indian tribes meeting statutory criteria may be treated as states in standard setting and permitting.	EPA	Clean Water Act (Title III and Sec. 402), P.L. 92-500, as amended (33 U.S.C. 1311-1313, 1342).	House Transportation and Infrastructure Senate Environment and Public Works Senate Commerce, Science, and Transportation

## WATER QUALITY



## WATER QUALITY

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
WATER QUALITY INFRASTRUCTURE: wastewater and/or drinking water treatment	<p>The Clean Water Act contains regulatory requirements specifying that municipal wastewater treatment plants achieve secondary treatment of municipal sewage wastes, or more stringent treatment where necessary to meet local water quality conditions. The Act also authorizes grants to states to capitalize State Water Pollution Control Revolving Funds (SRFs) to assist communities in financing projects needed to comply with the these regulatory requirements. Funds are also available to Indian Tribes and Alaska Native Villages under a set-aside from the SRF appropriation. (See also water supply entries, above.)</p> <p>The drinking water State Revolving Fund program authorizes grants to states to capitalize state loan funds to assist communities in financing projects needed to comply with federal drinking water regulations and standards. EPA is required to set aside a portion of funds to provide grants to the District of Columbia, Indian Tribes, and Trust Territories.</p>	<p>EPA</p> <p>EPA, in cooperation with the Indian Health Service (IHS) in the Department of Health and Human Services (HHS).</p> <p>EPA</p>	<p>Clean Water Act (Title II, Title VI, and Section 518(c)), P.L. 92-500 as amended by P.L. 1004 (33 U.S.C. 1281-1298, 1377, 1381-1387).</p> <p>Safe Drinking Water Act (Section 1452), P.L. 93-523, as amended by P.L. 104-182 (42 U.S.C. 300j-12)</p>	<p>House Transportation and Infrastructure</p> <p>Senate Environment and Public Works</p> <p>House Commerce</p> <p>House Transportation and Infrastructure</p> <p>Senate Environment and Public Works</p>
NONPOINT SOURCE POLLUTION	<p>EPA may provide technical and financial assistance in the form of 50% grants to states for construction, rehabilitation, and improvement of water supply systems (and for source water quality protection programs) to address pollutants in navigable waters for the purpose of making such waters usable by water supply systems.</p> <p>The Indian Health Service (IHS), Department of Health and Human Services (for housing construction funded by the Department of Housing and Urban or HUD, BIA, Indian tribes, and others) funds the provision of sanitation facilities - domestic and community potable water supplies and facilities, drainage facilities, and sewage and waste disposal facilities - to Indian homes and communities.</p> <p>This program requires states, and Indian tribes meeting statutory criteria, to assess nonpoint source-related water quality impairments and to develop and implement management plans. EPA provides technical and financial assistance (grants to states and Indian tribes) for plan implementation.</p> <p>Agricultural programs to control soil erosion from farmed land, caused by wind and water, include technical assistance, cost-sharing assistance, and education for landowners. Supporting activities include a national soil survey, a periodic National Resources Inventory, operation of plant material centers, and a snow survey.</p>	<p>EPA</p> <p>HHS: IHS, in cooperation with HUD and BIA</p> <p>EPA</p> <p>USDA: NRCS (Cost-sharing assistance was previously provided by the Farm Service Agency, but most responsibilities have been transferred to NRCS.)</p>	<p>Title IV of the Safe Drinking Water Act Amendments of 1996, P.L. 104-182 (42 U.S.C. 300j-3c). (This provision did not amend SDWA.)</p> <p>Indian Sanitation Facilities Act of 1959, P.L. 86-121 (42 U.S.C. 2004a); Indian Health Care Improvement Act of 1976, P.L. 94-437, as amended by Indian Health Care Amendments of 1988, P.L. 100-713 (25 U.S.C. 1632).</p> <p>Clean Water Act (Section 319), P.L. 92-500, as amended by P.L. 1004 (33 U.S.C. 1329).</p>	<p>House Transportation and Infrastructure</p> <p>Senate Environment and Public Works</p> <p>House Resources</p> <p>House Commerce</p> <p>Senate Indian Affairs</p> <p>Senate Environment and Public Works</p> <p>House Transportation and Infrastructure</p> <p>Senate Environment and Public Works</p> <p>House Agriculture</p> <p>Senate Agriculture, Nutrition, and Forestry</p>

## WATER QUALITY (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
NONPOINT SOURCE POLLUTION	The Environmental Quality Incentives Program (EQIP) provides farmers with technical and financial assistance under 5- and 10-year contracts to address water, soil, and related natural resource problems; half of the funding is targeted to problems that accompany livestock.	USDA; NRCS	Federal Agriculture Improvements and Reform Act of 1996, P.L. 104-127 (16 U.S.C. 3839).	House Agriculture Senate Agriculture, Nutrition, and Forestry
SOURCE WATER PROTECTION	The Safe Drinking Water Act requires states to establish Source Water Assessment Programs under which states delineate source water areas serving public drinking water systems and assess the susceptibility of source waters to contamination. These assessments support a voluntary Source Water Petition Program which states may adopt, and under which a community water system or local government may submit, a petition to the state requesting assistance in developing a voluntary partnership to address the origins of contaminants in drinking water.	EPA	Safe Drinking Water Act (Sections 1453 and 1454), P.L. 93-523, as amended by P.L. 104-182 (42 U.S.C. 300f-1, 300g-1 and 300g-14).	House Commerce Senate Environment and Public Works
DRINKING WATER QUALITY	EPA may provide technical and financial assistance in the form of 50% grants to states, consistent with nonpoint source management programs established under Section 319 of the Clean Water Act, for source water quality protection programs to address pollutants in navigable waters for the purpose of making such waters usable by water supply systems. (This provision also authorizes grants for constructing and improving water systems; see water quality infrastructure above.)	EPA	Title IV of the Safe Drinking Water Act Amendments of 1996, P.L. 104-182 (42 U.S.C. 300j-3c). (This provision did not amend SDWA.)	House Transportation and Infrastructure Senate Environment and Public Works
GROUND-WATER QUALITY PROTECTION	Public water suppliers are required to meet national drinking water quality regulations that include numeric standards or treatment requirements. Indian tribes meeting statutory criteria may be treated as states under the Safe Drinking Water Act, including for the purpose of enforcing regulations governing public water systems.	EPA	Safe Drinking Water Act (Section 1412), P.L. 93-523, as amended by P.L. 99-339 and P.L. 104-182 (42 U.S.C. 300g-1 and 300j-11).	House Commerce Senate Environment and Public Works
GROUND-WATER QUALITY PROTECTION	The Safe Drinking Water Act (SDWA) includes several programs specifically for protecting underground sources of drinking water: (1) the underground injection control program, which regulates the injection of fluids, including the disposal of industrial wastes in deep underground wells; (2) the sole source aquifer program which permits EPA, on its own or upon petition, to designate an aquifer as a "sole source" if it is the principal water supply (this designation authorizes EPA to review any federally funded projects that may threaten or affect its quality); (3) the sole source aquifer demonstration program; and (4) the wellhead protection program, which required states to submit to EPA, by June 1989, programs for protecting from contamination areas around wells supplying public water systems. States were directed to make every reasonable effort to implement their program within two years of submitting it to EPA. States with approved wellhead programs are eligible for EPA grants or 50% to 90% of costs of plan development and implementation. (See also nonpoint source pollution and source water protection entries.)	EPA	Safe Drinking Water Act (Sections 1424(c), 1427, 1428), P.L. 93-523, as amended by P.L. 99-339 and P.L. 104-182 (42 U.S.C. 300h et seq.).	House Commerce Senate Environment and Public Works
GROUND-WATER QUALITY PROTECTION	The 1996 SDWA amendments authorized EPA to make grants to states for developing and implementing a state program to ensure the coordinated and comprehensive protection of ground-water resources within the state. Grants may not exceed 50% of the costs of implementing the program and may not be used for ground-water remediation projects.	EPA	Safe Drinking Water Act (Section 1429), P.L. 93-523, as amended by P.L. 104-182 (42 U.S.C. 300h-8).	House Commerce Senate Environment and Public Works

## WATER QUALITY (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
RESEARCH	<p>The Clean Water Act authorizes extensive water quality planning, studies, and monitoring under the direction primarily of EPA. The 1987 Clean Water Act amendments included new water quality work concerning Chesapeake Bay, the Great Lakes, Estuary and Clean Lakes Programs, and studies of water pollution problems in aquifers. Many other federal agencies participate in this research including USGS, NOM, and the Corps. (See also general research entry under water supply/quality, above.)</p>	EPA	Clean Water Act Title I and Section 314) P.L. 92-500, as amended by P.L. 100A (33 U.S.C. 1251 1268, 1324).	House Transportation and Infrastructure  House Science  Senate Environment and Public Works
	<p>The Safe Drinking Water Act authorizes drinking water research, studies, and demonstrations related to providing a dependably safe supply of drinking water, including improvements in water testing, purification, and distribution, and improving methods of protecting underground sources of drinking water from contamination. Additionally, EPA is directed to conduct various health effects studies on contaminants in drinking water, including some in cooperation with HHS, USDA, and other federal agencies.</p>	EPA, in cooperation with other federal agencies	Safe Drinking Water Act (Sections 1442 and 1458), P.L. 93-523, as amended (42 U.S.C. 300f-1 and 300f-18).	House Commerce  House Science  Senate Environment and Public Works
WETLANDS	<p>The Clean Water Act established a federal wetland permit program regulating the disposal of dredge and fill material into waters of the United States, including wetlands. Landowners or developers must obtain permits from the Corps to carry out activities involving disposal of dredged or fill materials into wetlands. The EPA can override Corps permit decisions while the Fish and Wildlife Service has a strong advisory role. This is the only Clean Water Act program not administered by EPA, because of the Corps' historical responsibility for protecting navigable waters.</p>	DOD: Corps, with EPA, USDA: NRCS, DOI: FWS, and DOC: NOAA/NMFS	Safe Drinking Water Act (Sections Clean Water Act Section 404), P.L. 92-500, as amended by P.L. 100A (33 U.S.C. 1344); Fish and Wildlife Coordination Act, Act of Mar. 10, 1934, 48 Stat. 401, as amended (16 U.S.C. 661-666c); and the Rivers and Harbors Act of 1899 (Section 10), ch. 425, 30 Stat. 1151, as amended (33 U.S.C. 403 et seq.).	House Transportation and Infrastructure  Senate Environment and Public Works
	<p>The NRCS manages the Swampbuster program, a disincentive program to minimize the conversion of wetlands to agricultural uses.</p>	USDA: NRCS, with several other USDA agencies	Food Security Act of 1985, P.L. 99-198 (16 U.S.C. 3821).	House Agriculture  Senate Agriculture, Nutrition, and Forestry
	<p>The Wetland Reserve, Conservation Reserve, and Water Bank Programs administered by USDA pay farmers to keep agricultural wetlands out of crop production and to restore wetlands that have been converted to crop production.</p>	USDA: NRCS, Farm Service Agency (FSA, Conservation Reserve Program)	Food, Agriculture, Conservation and Trade Act of 1990, P.L. 101-624 (16 U.S.C. 3800 et seq.); Food Security Act of 1985 P.L. 99-198 (16 U.S.C. 3821); and Water Bank Program, P.L. 91-559 (16 U.S.C. 1301).	House Agriculture  Senate Agriculture, Nutrition, and Forestry
	<p>North American Waterfowl Management Plan provides a framework for improving waterfowl habitat.</p>	DOI: FWS	North American Wetlands Conservation Act of 1989, P.L. 101-233 (16 U.S.C. 4401 et seq.); Migratory Bird Hunting Stamp Act of 1934 (16 U.S.C. 718 et seq.).	House Resources  Senate Environment and Public Works

## WATER RIGHTS AND ALLOCATION

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
WATER ALLOCATION	Congress has on rare occasions made allocations of water, at times in response to interstate compacts and international treaties.	DOI	E.g., Colorado River Compact, Act of Aug. 19, 1921, 42 Stat. 171; Boulder Canyon Project Act of December 21, 1928, ch. 42, 45 Stat. 1057 (43 U.S.C. 617 et seq.); and associated interstate compacts and international treaties.	House Judiciary House Resources Senate Judiciary Senate Energy and Natural Resources
INTERSTATE WATER COMPACTS	Congress has granted its consent to many interstate water compacts which address the apportionment of waters of interstate streams, pollution of such waters, or deal with the control of floods and associated problems and has approved associated legislation in response to such compacts.  (For such compacts, the Geological Survey provides administrative support for the federal representative. Also, the Geological Survey collects hydrologic data for 25 interstate compacts.)	DOI: USGS	Various acts providing congressional consent to interstate compacts, e.g. P.L. 81-82, Arkansas River Compact, P.L. 82-231, Yellowstone River Compact, et al.	House Judiciary House Resources House Transportation and Infrastructure Senate Judiciary Senate Energy and Natural Resources Senate Environment and Public Works
TRIBAL WATER RIGHTS	Native Americans may have rights to water derived from treaties, statutes, executive actions, or judicial decrees. Recently, Congress has enacted statutes embodying settlements reached after the input of various concerned parties.	DOI	Re: settlement acts, see for example, Ak-Chin Water Rights Settlement Act, P.L. 95-328, 92 Stat. 409; Southern Arizona Water Rights Settlement Act of Oct. 12, 1982, P.L. 97-293, 96 Stat. 1274; Reclamation Projects Authorization and Adjustment Act, Titles 5, 35, and 37 of P.L. 102-575.	House Resources Senate Indian Affairs Senate Energy and Natural Resources
FEDERAL WATER RIGHTS	Some statutes affect the federal lands and water resources managed by various federal agencies. (See examples below.) National Forest System Lands	DOA: USFS	Organic Administration Act of 1897, Act of June 4, 1897, ch. 2, 30 Stat. 11, (16 U.S.C. 473 and various others) - Note: This is an appropriation act with permanent substantive law change; Rangeland Renewable Resources Planning Act of 1974, P.L. 93-378, 88 Stat. 476 (16 U.S.C. 1600 et seq.), as amended by the National Forest Management Act of 1976, P.L. 94-588, 90 Stat. 2949.	House Resources Senate Energy and Natural Resources
	Bureau of Land Management Lands	DOI: BLM	Federal Land Policy and Management Act of 1976, P.L. 94-579, 90 Stat. 2744 (43 U.S.C. 1701 et seq.) Taylor Grazing Act of 1934, Act of June 28, 1934, ch. 865, 48 Stat. 1269 (43 U.S.C. 315 et seq.).	House Resources Senate Energy and Natural Resources
	National Wildlife Refuges	DOI: Fish and Wildlife Service	National Wildlife Refuge System Administration Act of 1966, P.L. 90-404, 80 Stat. 927 (16 U.S.C. 6684d-6686e).	House Resources Senate Energy and Natural Resources

## WATER RIGHTS AND ALLOCATION (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION*
FEDERAL WATER RIGHTS	National Park Service System Lands	DOI; National Park Service	National Park Service Organic Act of 1916, Act of Aug. 25, 1916, ch. 408, 39 Stat. 535 (16 U.S.C. 1-6); American Antiquities Act, Act of June 8, 1906, ch. 3060, 34 Stat. 225 (16 U.S.C. 431-433); and various acts creating specific NPS units.	House Resources  Senate Energy and Natural Resources
	Some recent wilderness legislation has included specific language regarding federal water rights.	Various agencies	National Wild and Scenic Rivers Act of 1968, P.L. 90-592, 82 Stat. 906, as amended (16 U.S.C. 1271); Wilderness Act of 1964, P.L. 88-577, 78 Stat. 890, as amended (16 U.S.C. 1131).	House Resources  Senate Energy and Natural Resources
RIVER BASINS COMMISSIONS	The Water Resources Planning Act authorized river basins commissions. Some were created but were revoked by a series of executive orders.	Federal agencies having a substantial interest in the work of a commission could serve as a representative.	Water Resources Planning Act of 1965, P.L. 89-80 (42 U.S.C. 1962 et seq.).	House Resources  Senate Energy and Natural Resources

\* Where more than one committee per chamber is listed they are generally listed in order of "primary" jurisdictional responsibility in the House, and "predominant" jurisdictional responsibility in the Senate; however, in some cases multiple committees are listed when multiple activities of an individual agency are authorized under different statutes. Consequently, the order in the table does not always imply referral order. Readers should consider the activity and statutes listed, consult the rules language, and where necessary seek the views of the House and Senate Parliamentarian's Office for a more definitive evaluation.

# North Dakota Water Resource Programs

## WATER RESOURCES DEVELOPMENT AND/OR USE

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	SENIORITY AUTHORITY	COMMITTEE JURISDICTION
WATER SUPPLY: municipal, industrial, agricultural	<p>The North Dakota Department of Health (NDDH) is charged with permitting and monitoring for public water supply systems and facilities.</p> <p>The North Dakota State Water Commission (NDSWC) uses the Municipal, Rural, and Industrial Water Supply Program to provide a consistent supply of affordable and safe water to North Dakota residents. Project funding is 65% federal and 35% local non-federal match. The State Engineer will determine from the preliminary reports, feasibility studies, and other material if the project should be submitted to the State Water Commission and the Garrison Diversion Conservancy Unit for approval funding. The State Water Commission and Garrison Diversion Conservancy Unit administer the MR&amp;I funds under a joint powers agreement and memorandum of understanding.</p>	NDDH	N/A	Natural Resources
	<p>The NDSWC provides additional, but limited cost-sharing for domestic water supply projects with a 50% local cost-share, and agricultural water supply with a 60% local cost-share.</p>	NDSWC	NDAC 89-12-01-02	
WATER SUPPLY: rural and other community programs	<p>The NDDH is charged with permitting and monitoring for public water supply systems and facilities.</p> <p>Water Well Construction and Water Well Pump Installation: maintains that permitting is required for water well construction and for certification of water well contractors.</p> <p>The North Dakota State Water Commission (NDSWC) uses the Municipal, Rural, and Industrial Water Supply Program to provide a consistent supply of affordable and safe water to North Dakota residents. Project funding is 65% federal and 35% local non-federal match. The State Engineer will determine from the preliminary reports, feasibility studies, and other material if the project should be submitted to the State Water Commission and the Garrison Diversion Conservancy Unit for approval funding. The State Water Commission and Garrison Diversion Conservancy Unit administer the MR&amp;I funds under a joint powers agreement and memorandum of understanding.</p>	NDDH	N/A	Natural Resources
	<p>The NDSWC provides additional, but limited cost-sharing for rural water supply project with a 50% local cost-share.</p>	NDSWC, NDDH	NDCC 57-51.1-07, NDCC 61-02-14	
WATER SUPPLY: irrigation, recreation, and fish and wildlife	<p>The NDSWC is charged with permitting and monitoring for irrigation systems.</p> <p>The NDSWC provides additional limited cost-sharing for irrigation and recreation projects with a 60% and 66.6% local cost-share respectively.</p>	NDSWC	N/A	Natural Resources
		NDSWC	NDCC 57-51.1-07, NDCC 61-02-14	

**WATER RESOURCES DEVELOPMENT AND/OR USE (continued)**

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION
FLOOD CONTROL	The NDSWC provides limited cost-sharing for flood control projects with a 50% to 65% local cost-share. Eligible items include rural flood control (i.e. channels) and flood protection (ring dikes, dikes, and levees).	NDSWC	NDCC 57-51.1-07, NDCC 61-02-14	Natural Resources
EMERGENCY FLOOD RESPONSE	Floodplain Management is the responsibility of the NDSWC and is consistent with the policies of the Federal Emergency Management Agency (FEMA).  General emergency response is coordinated by DEM with cooperation from other state agencies.	NDSWC  DEM	N/A	Natural Resources
DROUGHT RESPONSE	General emergency response is coordinated by DEM with cooperation from other state agencies.	DEM, NDSWC	N/A	Natural Resources
DAMS, DAM SAFETY	The NDSWC is responsible for dam safety and may cost-share in the maintenance as a flood control project. This would include up to a 50% cost-share.	NDSWC	NDCC 57-51.1-07, NDCC 61-02-14	Natural Resources
HYDROPOWER DEVELOPMENT/ SUPPLY	Not Complete.	N/A	N/A	N/A
STATE WATER PLANNING	The NDSWC is responsible for the commission and updating of the State Water Management Plan.	NDSWC	NDCC 61-02-01.1	Natural Resources
WATER CONSERVATION	The authority, control, and supervision of all water and wildlife conservation projects and wildlife reservations shall be vested in the State Engineer.	NDSWC	NDCC 61-15-03	N/A
WATER RECLAMATION AND REUSE	Not Complete.	N/A	N/A	N/A
GROUND-WATER RESOURCES	Wellhead Protection Program: The Department of Health, in cooperation with the State Engineer and the State Geologist shall assist in implementing a public water supply wellhead protection program for protection of ground-water resources.  Subsurface Minerals Program and Underground Injection Control Program Class III: The North Dakota Geological Survey, acting for the State Industrial Commission, has authority to permit and regulate the exploration, construction, and operation of an underground waste disposal and storage/retrieval facility. One of the state policies of this program is to prevent the contamination or pollution of subsurface and ground-water sources.	NDDH, NDGS, NDSWC  NDGS, SIC	NDCC 22-33-10  NDCC 38-12, NDAC 43-02-02, NDAC 43-02-02.1	Natural Resources
	The NDSWC is charged with the permitting and monitoring of the state's ground-water resources.	NDSWC	NDCC 61-20-06, 61-04-02	

## WATER RESOURCES DEVELOPMENT AND/OR USE (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION
GROUND-WATER RESEARCH	Ground-water levels are monitored by the U.S. Geological Survey (USGS) through a cooperative program. A total of 35 continuous recording wells are monitored along with 85 wells measured at a six-week interval. The water level data collected is published in an annual data report. The NDSWC also monitors water levels independently in over 3,000 wells. The data is entered into the agency database and the data is accessible to the public through the agency Internet home page. Water quality data for both surface and ground-water sources are also collected and analyzed through the USGS cooperative agreement and published in the annual data reports. Water quality samples are also collected by commission staff and that data is available through the agency database and Internet home page.	NDSWC	N/A	Natural Resources
RESEARCH: general	Not Complete.	N/A	N/A	N/A
WILD AND SCENIC RIVERS	The NDSWC does, to a very limited extent, preserve natural flow levels on the Little Missouri River.	NDSWC	NDCC 61-29-06, NDCC 61-29	Natural Resources

## FISH AND WILDLIFE

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION
FISHERIES MANAGEMENT	Natural Preserves Program: The North Dakota Parks and Recreation Department (NDPRD) program directs identification of sensitive species and plant communities in all landscape settings including deep water habitats, riparian, and wetland areas. The program promotes preservation of natural resources in the state.  General fisheries management is the responsibility of the North Dakota Game and Fish Department (NDG&F).	NDPRD	NDCC 55-11	Natural Resources
AQUACULTURE	Not Complete	NDG&F	N/A	N/A

## WATER QUALITY

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION
WATER QUALITY: management	Standards of Water Quality: The policy of the State of North Dakota is to act in the public interest to protect, maintain, and improve the quality of the waters of the state for continued use as public and private water supplies, propagations of wildlife, fish and aquatic life, and for domestic, agricultural, industrial, recreational, and other legitimate beneficial uses, to require necessary and reasonable treatment of sewage, industrial, or other wastes.	NDH, NDSWC	NDCC 33-16-02	Natural Resources



## WATER QUALITY (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION
WATER QUALITY: management	State Parks and Recreation Natural Preserve Management: Policies preclude the use of chemicals within waters or adjacent to any water supplies, even though some material may be approved for water use.	NDPRD	NDCC 55-11	Natural Resources
	Water Pollution Control Board: The board advises the State Department of Health on development of programs for the prevention and control of pollution of water in the state.	NDDH, NDSWC, NDGS	NDCC 61-28-03	
	Streamside Management Zones: Provide stream shading, soil stabilization, sediment and water filtering effects, and wildlife habitat.	NDFS	N/A	
	Forestry Best Management Practices: Voluntary program intended to serve as a basis for sound management decisions.	NDFS	N/A	
	Certification of Water Treatment Facility Operators, Water Distribution and Storage System Operators, Wastewater Treatment Facility Operators, and Wastewater Collection and Transfer System Operators: Ensures proper certification, associated with water quality.	NDDH	NDCC 33-19-01	
	Revolving Loan Fund: NDDH administers the fund for water quality related projects and as the reserve for Section 319 Non-point Source Management Projects.	NDDH	NDCC 33-35	
POINT SOURCE POLLUTION	Coal Exploration Program: The Geological Survey, acting for the State Industrial Commission (SIC), has the authority to permit and regulate coal exploration in the state. Rule 43-02-01-14 requires that during the plugging of a testhole all cuttings possible must be returned to the testhole. In addition, water bearing sands have to be sealed to permanently confine the water to its original stratum.	NDGS, SIC	NDCC 38-12.1, NDAC 43-02-01-14	Natural Resources
	Stormwater general permits: NDDH has three general permits that cover stormwater discharges; NDR01-0000 covers stormwater discharges associated with mining or extraction activities; NDR02-0000 covers stormwater discharges associated with industrial activities; and NDR03-0000 covers stormwater discharges associated with construction activities. These general permits cover all lands within the jurisdiction of the State of North Dakota.	N/A	N/A	
	Surface Mining and Reclamation Operations: The Public Service Commission (PSC) has the power to "promulgate regulations consistent with the State Geologist, State Department of Health, and the State Engineer for the protection of the quality and quantity of waters affected by surface coal mining operations."	PSC, NDGS, NDDH, NDSWC	NDCC 38-14.1-03, Item 12	
	Project Safesend: Protects water resources from pesticide contamination. Project disposes of banned and unusable pesticides.	NDDA	Unknown	
	Preconstruction Site Review: Any application for a landfill permit must be reviewed by the State Engineer and the State Geologist for site suitability.	NDDH, NDGS, NDSWC	NDCC 23-29-07.6	

## WATER QUALITY (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION
POINT SOURCE POLLUTION	Geothermal Energy Extraction Regulations: Encourages and promotes the safe and proper use of geothermal energy (ground-source heat pumps) in such a manner as to "prevent contamination to surface and subsurface water sources and to avoid creation of secondary hazards of a geologic nature."  Underground Waste Facility: The Geological Survey, acting for the State Industrial Commission, has authority to permit and regulate the exploration, construction, and operation of an underground waste disposal and storage/retrieval facility. One of the stated policies of this program is to prevent the contamination or pollution of surface and ground-water resources.	NDGS  SIC, NDGS	NDCC 38-19  NDCC 23-20.2	Natural Resources
WATER QUALITY INFRASTRUCTURE	Not Complete.	NDDH	N/A	N/A
NON-POINT SOURCE POLLUTION	Chemigation Regulations: The Commissioner of Agriculture has the authority to adopt rules regulating chemigation through irrigation systems to minimize the possibility of chemical, pesticide, fertilizer, or other contamination of irrigation water supply.  North Dakota Water Protection Strategy for Pesticides: The intent of the strategy is to prevent water degradation by pesticides. The goal of the strategy is to promote a degradation prevention policy for waters of the state while promoting the beneficial uses of pesticides.	NDDA, NDSWC  NDDA, NDSWC, NDDH, NDGS, Extension Service	NDCC 4-35.1  NDCC 4-35	Agriculture  Agriculture
SOURCE WATER PROTECTION	Control of Pollution from Certain Livestock Enterprises: Charges the NDDH with preventing degradation of quality of the waters of the state by requiring water pollution control facilities, when necessary, for certain livestock enterprises.	NDDH	NDCC 33-16-03	N/A
DRINKING WATER QUALITY	Public Water Supply System in North Dakota: NDDH is charged with monitoring maximum containment levels, inorganic chemical sampling and monitoring, organic chemical sampling and monitoring, turbidity and disinfectant residual sampling and monitoring, radioactivity sampling and monitoring, and microbiological sampling and monitoring in public water supply systems.	NDDH, NDSWC  NDDH	N/A  NDCC 33-17	N/A  Natural Resources
SURFACE WATER QUALITY PROTECTION	Surface water quality standards and enforcement: NDDH's duties include control of pollution from livestock enterprises, control, prevention and abatement of pollution of surface water, and federally mandated requirements of the Clean Water Act.  North Dakota Pollutant Discharge Elimination System: Regulates pollutant discharge, effluent standards and limitations, water quality standards, and other requirements.	NDDH  NDDH	N/A  NDCC 33-16-01	Natural Resources

## WATER QUALITY (continued)

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION
GROUND-WATER QUALITY PROTECTION	Ground-Water Quality Standards and Enforcement: The NDDH's duties include the development of a geographic targeting system for ground-water monitoring, private and public water well sampling, control of pollution from livestock enterprises, water well contractors and construction, the underground injection control program, the pollutant discharge elimination system, and federally mandated requirements of the Clean Water Act.	NDDH	N/A	Natural Resources
	Ground Water Monitoring Well Construction Requirements: Well monitoring for maintained water quality and associated permit and construction licensing.	NDSWC, NDDH	NDCC 33-18-02, NDCC 61-28.1?	
	Underground Injection Control Program: monitors unauthorized injection, movement of fluid into underground sources of drinking water, plugging and abandonment, the authorization of Class V Underground Injection Wells, Class IV Wells, and Hazardous Waste Injection Wells.	NDDH, NDGS	NDCC 33-25-01	
WATER QUALITY: research	Not Complete.	NDDH, NDSWC	N/A	N/A
WETLANDS	North Dakota State Waterbank Program: This program was created by the 1981 State Legislature. It encourages landowners to conserve wetlands through short-term (5-year and 10-year) renewable leases. Enabling legislation did not provide appropriation of state monies, but allowed the NDDA to solicit from public and private sources.	NDDA, NDSWC	NDCC 61-31	Natural Resources

## WATER RIGHTS AND ALLOCATION

TOPIC	PROGRAM OR FUNCTION DESCRIPTION	DEPARTMENT/AGENCY	STATUTORY AUTHORITY	COMMITTEE JURISDICTION
GROUND-WATER QUALITY PROTECTION	The NDSWC is charged with ground and surface water permitting and allocation.	NDSWC	NDCC 61-04-06.2 and NDAC 89-03-01-01.5 and 89-03-03-04	Natural Resources
TRIBAL WATER RIGHTS	Water rights on tribal lands residing within the State of North Dakota are currently not quantified. Water right permits are, however, required for non-reservations members using water on tribal lands.	Individual Tribes, NDSWC	N/A	N/A
WATER SUPPLY: rural and other community programs	The allocation of water right permits is administered by the NDSWC.	NDSWC	NDCC 61-04	Natural Resources

# State Water Commission Policies

The 1999 State Water Management Plan is a comprehensive vision for water management for the 21<sup>st</sup> century—a vision in which water is used efficiently and is allocated through laws based on the prior appropriation doctrine. Water resource planning involves the widespread participation of North Dakota citizens and will comprehensively illustrate how North Dakota water resources are currently managed and the responsibilities associated with that management.

State Water Commission policies are directed toward optimum management and use of the state's water resources. The policies provide a framework within which private enterprise and government entities can develop and propose water resource projects and water management scenarios. Specific water resource projects are identified in the Appendix and organized by defined watershed boundaries. The State Water Commission adopts the following policies for the development, management, conservation, and optimum use of all water resources of the state in the public interest.

## Water Use Policies

A goal of the State Water Management Plan is to secure greater productivity, in both monetary and nonmonetary terms, from available water supplies. Water use policies are concerned with improvement in practices, procedures, and laws relating to existing and potential water use.

### STATE SOVEREIGNTY

It is the policy of North Dakota that the state has sovereignty over decisions

affecting the development and use of its water resources, and that the state opposes any attempt by the federal government, its management agencies, any other state, or any other entity to usurp the state's role in these areas.

#### Comment:

The North Dakota State Water Commission is responsible for the formulation of state water policy through the State Water Management Plan. The state's position on existing and proposed federal policies and actions should be coordinated by the Commission to ensure the state retains its traditional right to control the water resources of the state.

### PUBLIC INTEREST

It is the policy of North Dakota that water be managed with due regard for the public interest as established by state law.

#### Comment:

All waters, North Dakota Century Code (NDCC) 61-01-01 and 61-04.1-01, within the limits of the state from the following sources of water supply belong to the public and are subject to appropriation for beneficial use and the right to the use of these waters for such use must be acquired pursuant to Chapter 61-04:

- Waters on the surface of the earth excluding diffused surface waters but including surface waters whether flowing in well-defined channels or flowing through lakes, ponds, or marshes which constitute integral parts of a stream system, or waters in lakes;

- Waters under the surface of the earth whether such waters flow in defined

subterranean channels or are diffused percolating underground water;

- All residual waters resulting from beneficial use, and all waters artificially drained; and

- All waters, excluding privately owned waters, in areas determined by the State Engineer to be noncontributing drainage areas. A noncontributing drainage area is any area that does not contribute natural flowing surface water to a natural stream or watercourse at an average frequency more often than once in three years over the latest 30-year period.

- The state of North Dakota claims its sovereign right to use the moisture contained in the clouds and atmosphere within the state boundaries. All water derived as a result of weather modification operations shall be considered a part of North Dakota's basic water supply and all statutes, rules, and regulations applying to natural precipitation shall also apply to precipitation resulting from cloud seeding.

Water allocation and management decisions must consider the public interest as established by state law. NDCC 61-04-06 notes that in determining the public interest, the State Engineer shall consider all of the following:

- The benefit to the applicant resulting from the proposed appropriation.

- The effect of the economic activity resulting from the proposed appropriation.

- The effect on fish and game resources and public recreational opportunities.

- The effect of loss of alternate uses of water that might be made within a reasonable time if not precluded or hindered by the proposed appropriation.
- Harm to other persons resulting from the proposed appropriation.
- The intent and ability of the applicant to complete the appropriation.

The State Water Management Plan is an expression of the public interest.

### **BENEFICIAL USE OF WATER**

It is the policy of North Dakota that beneficial uses are dynamic and reflective of the present day needs.

#### **Comment:**

This policy is affirmed by North Dakota Constitution in Article XI, Section 3 and is defined in NDCC 61-04-1.1(1) as "a use of water for a purpose consistent with the best interests of the people of the state." The State Water Commission policies reflect that "beneficial use" includes, but is not limited to, agriculture, recreation, navigation, water quality, hydropower, and human consumption, as well as the traditional uses for mining, irrigating, and manufacturing.

### **TRANSFERABILITY OF USE**

It is the policy of North Dakota that changes in the nature of use of a water right be allowed provided other water rights are not injured and change in use is limited to superior uses.

#### **Comment:**

The demand for water increases every year while the volume of unappropriated water within the state continually decreases. The purpose of allowing transferability of water rights is to provide flexibility in water allocation to meet changing conditions. The ability to react to the variable nature of water is in the public interest.

NDCC 61-04-15 and 61-04-15.1 provide for changes in place of diversion, place of use, and period of use. Provisions are made to protect other water users, the agricultural base of an area, and the public interest. Any conditional or perfected water permit may be assigned only upon approval by the State Engineer. Any conditional or perfected water permit may also be transferred, with the approval of the State Engineer, to any parcel of land owned or leased by the holder of such water permit.

Upon reasonable proof that such assignment or transfer can be made without detriment to existing rights, the State Engineer shall cause the water permit involved to be assigned or simultaneously severed and transferred from such land without losing priority of any right previously established. The decision of the State Engineer shall be final unless some party interested in the same source of water supply shall, within 60 days, bring appropriate action in the district court of the county in which the land is located appealing such decision.

Applications for assignment and transfer shall be in the form required by regulation. The transfer of title to land in any manner whatsoever shall carry with it all rights to the use of water for irrigation of such land. Additionally, the North Dakota Administrative Code 89-03-01-03.1 provides for the transfer of an application to another parcel.

### **WATER MEASUREMENT**

It is the policy of North Dakota that the water resources of the state should be quantified and their uses should be measured.

#### **Comment:**

Planning for the optimum use and management of the state's water resources requires adequate water supply assessment and water use measurement. The State Water Commission participates in the funding of stream gages through a cooperative

program with the U.S. Geological Survey. Through this cooperative program, the agency currently cost-shares the funding of 27 continuous record stream gages, 12 seasonal record gages, three recording stage gages, and one crest stage gage. Through this cooperative program the Commission pays 50 percent of the cost of their operation.

These gages represent only a portion of the gages operated by the USGS; other agencies cost-share the operation of gages through similar cooperative programs, and the benefits of the overall network are shared by all.

The data collected by this network of stream gages is disseminated to the public through the publication of annual data reports by the USGS. Selected data are also available to the public in real time form through the USGS Internet home page.

Some streamflow data are collected independently by State Water Commission personnel. These gaging efforts are often conducted as needed to supplement the data collected through the USGS network. Collected data are available upon request.

Ground-water levels are also monitored by the USGS through the cooperative program. A total of 35 continuous recording wells are monitored along with 85 wells measured at a six-week interval. The water level data collected are published in an annual data report. The Commission also monitors water levels independently in over 3,000 wells. The data are entered into the agency database and the data is accessible to the public through the agency Internet home page.

Water quality data for both surface and ground-water sources are also collected and analyzed through the USGS cooperative agreement and published in the annual data reports. Water quality samples are also collected by Commission staff and that data is available through the agency database and Internet home page.

## **CONJUNCTIVE MANAGEMENT**

It is the policy of North Dakota that where evidence of hydrologic connection exists between ground and surface waters, they are managed conjunctively in recognition of the interconnection.

### **Comment:**

Recharge to the state's aquifers occurs primarily by the infiltration of precipitation and snowmelt. Discharges from the state's aquifers occurs by evapotranspiration, through lakes, streams, and wells. Aquifers store significant quantities of ground water. Depletion of this water in storage during drought allows ground-water appropriations to be sustained while supplies available from surface water may be diminished. Water removal from storage during droughts will be replenished during wet periods. Development of ground water for municipal, irrigation, and other uses captures water primarily by reducing discharge to evaporation and surface water bodies, though some additional recharge may be captured.

The goal of conjunctive management is to protect the holders of prior water rights while allowing for the full development and use of the state's water resources. The approval of new water-use applications and the administration of existing water rights must recognize this relationship.

## **EFFICIENT USE**

It is the policy of North Dakota to promote the efficient use of water in accordance with state law.

### **Comment:**

As water use efficiencies are increased, reduced requirements in one water use sector could provide available water for new demands. State and local planning considers water efficiency techniques, together with legislation or ordinances, that may help conserve water resources for drought periods and increase water supplies for other needed uses. Addition-

ally, the authority, control, and supervision of all water and wildlife conservation projects and wildlife reservations are vested in the State Engineer, NDCC 61-15-03.

## **GROUND-WATER WITHDRAWAL**

It is the policy of North Dakota that average withdrawals from an aquifer should not, if possible, exceed the long-term rate of recharge to that aquifer.

### **Comment:**

Excessive withdrawals of ground water may cause economic, environmental, and social problems nearly anywhere in the state. The state seeks to prevent withdrawal/recharge imbalances to minimize negative impacts.

North Dakota allows full development of the state's underground water resources. The State Engineer, however, can establish reasonable ground-water pumping levels when necessary to protect prior appropriators. It is important that all beneficial uses, including interdependent surface water uses be considered in evaluating the full economic development potential of an aquifer. The State Engineer may prohibit or limit the withdrawal of water from a well if withdrawal would result in unduly affecting prior appropriators. The State Engineer may also allow withdrawals to exceed long-term recharge if a program exists to increase recharge and senior appropriators are protected.

## **WATER QUALITY**

It is the policy of North Dakota to act in the public interest to protect, maintain, and improve the quality of the waters in the state for continued use as public and private water supplies, propagation of wildlife, fish, and aquatic life, and for domestic, agricultural, industrial, recreational, and other legitimate beneficial uses, to require necessary and reasonable treatment of sewage, industrial, or other wastes, and to cooperate with other agencies in the state, agencies

of other states, and the federal government.

### **Comment:**

It is essential that the quality of North Dakota's water resources be protected for public safety and economic stability and growth. The quality of surface and ground water depend in large degree on land-use practices within watersheds. Land managers and local units of government are urged to adequately consider means of reducing nutrient loading, bacterial contamination, and soil erosion and deposition to protect water quality. Local units of government and special use districts participate with the North Dakota Department of Health in the preparation of water quality management plans.

The State Water Commission administers a statewide ambient water quality monitoring network. The citizens of North Dakota are served by cooperative water quality monitoring programs involving appropriate public and private entities, and an information distribution system for all water quality data.

## **Conservation Policies**

The conservation policies focus on wise use and careful planning to accommodate important values. The purpose of the policies is to manage the use of water resources for the benefit of all North Dakota citizens.

## **SPECIES OF CONCERN**

It is the policy of North Dakota that the public interest be considered when decisions are made to maintain sustainable populations of plant and animal species whose existence is threatened by mankind's actions.

### **Comment:**

The state and federal government have identified species of concern and species

that are listed or are candidates for listing as Threatened or Endangered. In most cases, action at the state level can identify management strategies that will ensure sustainable populations of these species. The state engineer considers the public interest in determining its strategies and encourages local leadership to this end.

### **FEDERALLY LISTED SPECIES**

It is the policy of North Dakota to cooperate, insofar as allowed by state law, in efforts to conserve and restore plant and animal species listed by the federal government as Threatened or Endangered.

Comment:

Actions taken by federal agencies under authorities created by the Endangered Species Act do not modify state law. Efforts by the citizens and agencies of the state to achieve federal goals may be constrained by existing state law, particularly the establishment, protection, and preservation of state water rights.

## **Water Management Policies**

### **IRRIGATION DISTRICTS**

It is the policy of North Dakota to encourage the formation of irrigation districts for the benefit of agricultural products.

Comment:

If the State Engineer finds that the formation of the district is advisable and the proposed plan is practicable and economically sound, he shall issue an order establishing the proposed district subject to the approval of the electors of the district at an election called by the State Engineer for that purpose. The order will describe the boundaries of the district and set the time and place for the election, and a copy of the order must be filed with the county auditor of each county in which the proposed district is located.

### **SUSPENSION OF CLOUD SEEDING**

It is the policy of the State Water Commission that counties participating in the North Dakota Cloud Modification Program (NDCMP) can suspend seeding any time they feel that doing so is in the best interest of their county by conveying their wishes to the director of the Atmospheric Resource Board (ARB).

Comment:

Local control is deemed essential by ARB. However, there are other times when the suspension of seeding activities is necessary. To define such conditions, the board in 1984 convened a national panel of experts for a thorough review of the meteorological conditions in which convective (thunderstorm) cloud seeding is considered. The panel reviewed the methodology and decision-making criteria employed in North Dakota, and also the criteria employed at that time for the suspension of seeding. These criteria are primarily based on radar observation of the subject storms, and are intended to avoid seeding of any storms producing extremely heavy precipitation, or very slow moving storms producing more than moderate precipitation. Either of these circumstances may result in flash flooding. These criteria, translated into graphical and tabular form, have been successfully employed within the NDCMP since its inception, and were determined by the panel to provide adequate safeguards.

In addition to concerns about situations in which excessive precipitation might be problematic, the review panel also recommended that tornadic storms not be seeded, and that if a storm being seeded should develop a funnel or tornado, seeding should cease immediately and not resume until at least 30 minutes had elapsed after dissipation of the funnel. This recommendation was made not because of any known link between cloud seeding and tornado genesis, but because of what is *not known* about the possible links between the two, and the potential

for litigation should a seeded tornadic storm result in death or severe injury. This recommendation was also adopted, and is presently operational policy of the board.

Though few thunderstorms in North Dakota become tornadic, those that are usually are also hailstorms. Nevertheless, the suspension of seeding of tornadic (or funnel-bearing) clouds was accepted as a necessary precaution.

## **Permitting Policies**

### **WATER APPROPRIATION**

The State Water Commission shall adhere to the prior appropriation doctrine to allocate water for the beneficial use by the citizens of the state.

Comment:

The State Engineer is statutorily responsible for allocating or appropriating the waters of the State of North Dakota. Chapter 61-04 of the North Dakota Century Code defines the procedures and standards by which the use of the resource is administered. Rules have also been adopted by the State Engineer and are written in Chapters 89-03-01, 89-03-02, and 89-03-03 of the North Dakota Administrative Code.

The first step in obtaining a right to use water of the state is to file a conditional water permit application with the office of the State Engineer. The application form must be submitted along with a map and application fee which varies from \$100 for recreation, livestock, and fish and wildlife use, to \$750 for an industrial use in excess of one cubic foot per second or 724 acre-feet annually. The priority date of the filing is established when a completed application is received by the State Engineer.

Upon receipt of a completed conditional water permit application form, map, and

filing fee, the applicant is instructed to notify by certified mail all recorded title owners of real property and water permit holders within a one-mile radius of the point of diversion, as well as all municipal and public use water facilities in the county in which the proposed point of diversion is located.

If the one-mile radius extends within the geographical boundary of a city, or a rural subdivision where the lots are of 10 acres or less, the notice must be given to the governing body of the respective city or township. If a tract of rural land is owned by more than ten individuals, the notice must be given to the governing body of the township.

The notice provides a description of the application and states that a hearing will be conducted at a date and time to be set and published as a "Notice of Hearing" in the official county newspaper. The notification letters, the list of water permit holders within a one-mile radius of the proposed point of diversion, and the list of municipal and public use water facilities in the county are provided by the State Engineer.

After the applicant has notified all the required parties, he must file an Affidavit of Notice with the State Engineer who then schedules a hearing and publishes a notice of hearing once a week for two consecutive weeks in the official county newspaper. The notice is published at the expense of the applicant.

During the hearing all interested parties have the opportunity to provide oral and/or written testimony concerning the application. After the hearing, the evidence is reviewed and an analysis is conducted on the application. The procedure must comply with the provisions of Chapter 28-32 of the North Dakota Century Code, more commonly known as the Administrative Agencies Practice Act.

Section 61-04-06 identifies the criteria the

State Engineer must consider when evaluating an application for a conditional water permit. This section states that the State Engineer shall issue a permit if he finds that the rights of a prior appropriator will not be unduly affected; the proposed means of diversion or construction are adequate; the proposed use of water is beneficial; and the proposed appropriation is in the public interest.

In determining whether or not an application is in the public interest, the State Engineer must consider six factors: the benefit to the applicant resulting from the proposed appropriation; the effect of the economic activity resulting from the proposed appropriation; the effect on fish and game resources and public recreational opportunities; the effect of loss of alternate uses of water that might be made within a reasonable time if not precluded or hindered by the proposed appropriation; harm to other persons resulting from the proposed appropriation; and the intent and ability of the applicant to complete the appropriation.

If these criteria are met, the State Engineer issues a conditional water permit. This permit reserves a specified volume of water for a specified use and may be subject to conditions that are a part of the permit and intended to protect prior appropriators and the public interest. The conditional permit provides a period of time for the permit holder to put the water to beneficial use, generally ranging from one to three years. If development has not been completed by the expiration of the beneficial use date, the permit holder may request an extension.

A water right is acquired when water is put to the beneficial use authorized by the conditional permit within the terms and limitations of the permit. Once water has been put to beneficial use, the facilities are inspected in order to determine their capacity, safety, and efficiency, and a perfected permit is issued. The perfected permit is documentation of the water right

and is a property right and should be recorded with the county register of deeds.

The perfected permit remains in place indefinitely as long as the terms of the permit are met and water is put to beneficial use. If the permit holder fails to put water to beneficial use for three successive years, the permit may be subject to cancellation.

The rules identified in the North Dakota Administrative Code provide additional definition of the administrative process used in managing the use of the state's water resources. The rules are based upon the statutory requirements of Chapter 61-04. The rules explain how permits may be amended for changes in points of diversion or type of use and how they may be assigned to other parties or transferred to other lands. They explain that an applicant must possess an interest in the property to be irrigated or that which is proposed as the point of diversion, and, if the project will involve an impoundment, the applicant must possess an interest in the property to be inundated.

Several rules apply to water permits issued for projects involving an impoundment. The rules explain that no water right accrues to a permit issued only for flood control purposes. All reservoirs, unless specifically exempted by the State Engineer, must be filled during the first runoff each spring and the permit holder may be required to pass later inflows through the reservoir and downstream. An application for a water permit involving an impoundment storing more than 12 1/2 acre-feet of water must request a quantity of annual use equivalent to the mean annual net (evaporation less precipitation) evaporative loss.

The rules also specify that a water permit can only be issued for projects involving constructed works. Also, permits can only be issued for withdrawal of water from one source. A permit cannot authorize the



withdrawal of water from both a surface and ground-water source, nor can it authorize the withdrawal of water from two different surface water sources.

### **PERMITS FOR DAMS, DIKES, AND OTHER FACILITIES**

Under state statutes, it is the responsibility of the State Engineer to issue permits for dams, dikes, and other facilities constructed by the citizens of the state.

Comment:

The State Engineer is statutorily responsible for administering construction permits in the State of North Dakota. The purpose of these permits is to attempt to ensure public safety. Chapter 61-03, 61-04, and 61-16.1 of the North Dakota Century Code defines the State Engineer's authority and procedures in administering construction permits. Rules have also been adopted by the State Engineer and are written in Chapters 89-08-01, 89-08-02, 89-08-03 and 89-08-04 of the North Dakota Administrative Code.

The first step is to file an *Application/Notification To Construct or Modify Dam, Dike, Ring Dike or Other Water Resource Facility* with the office of State Engineer. The State Engineer will determine if a construction permit is required. If a permit is required, the State Engineer will process the application/notification, which will be approved or denied. If a permit is not required, the State Engineer will notify the applicant that a permit is not required.

The completed application/notification form must be submitted with a map showing the location of the proposed structure along with plans and specifications. Also included must be evidence to establish a property right in the property that will be affected by the construction of the structure. This may include easements or permission documents.

If it is determined a permit is required, the

application and supporting documentation is initially reviewed for completeness. When all necessary information has been obtained and it has been determined that the application is complete, a copy of the application and supporting documents will be forwarded to the water resource district in which the project is located. Within 45 days of receiving the application and supporting documentation the water resource district must review the information and suggest any changes, conditions, or modifications to the State Engineer.

After receiving comments from the water resource district, or at the end of the 45-day comment period, the State Engineer will review the application, supporting documents, comments from the Water Resource District (if provided) and any other pertinent information. The State Engineer will make the final determination to approve or disapprove the construction permit.

The recipient of a permit to construct a dam, dike, or other water resource facility shall commence construction within two years of the permit's approval date. An extension may be requested if the constructed works cannot be started within the two-year time period. A written request for the extension should be sent to the State Engineer at least 60 days before the permit expires and must indicate the reasons for the extension. If the project is not started or an extension is not received by the end of the two-year period, the permit is void.

The State Engineer may grant a temporary permit to construct a dam, dike, or other device pursuant to North Dakota Administrative Code 89-08-02-02(4). A temporary permit shall have a duration of not more than six months, unless extended by the State Engineer.

Receiving an approved construction permit in no way relieves the permittee from any responsibility or liability for

damages from the construction, operation, or failure of the structure or constructed works. By constructing the structure or constructed works, the permit holder acknowledges responsibility for the safety of the structure or constructed works and agrees to any conditions set by the State Engineer.

### **DRAINAGE PERMITS**

It is the policy of the State Engineer to review all drainage projects that require a permit under state statutes.

Comment:

A drain permit is statutorily required to drain a pond, slough, lake, sheetwater, or series thereof, which has a watershed area comprising 80 acres or more. North Dakota Century Code § 61-32 defines the procedures and standards by which a permit is processed. Rules have also been adopted by the State Engineer and are written in Chapters 89-02-01 of the North Dakota Administrative Code.

The first step in obtaining a drain permit is to file an application to the office of the State Engineer. The State Engineer makes a determination if the project is or is not of statewide or interdistrict significance. The State Engineer shall refer the application to the water resource district where the majority of the watershed is found for consideration and approval. The State Engineer may require the applications that propose drainage of statewide or interdistrict significance be returned to the State Engineer for final approval.

Criteria for determining if a drain application is of statewide or interdistrict significance are found in North Dakota Administrative Code 89-02-01-09. These criteria include drainage that may affect property owned by the state or political subdivisions; ponds, sloughs, or lakes which are recognized for fish and wildlife values; drainage of a meandered lake; drainage that would have a substantial affect on another district; and drainage

between two separate watersheds into one watershed. The State Engineer, for good cause, may or may not classify any proposed drainage of statewide or interdistrict significance.

A permit may not be granted until an investigation discloses that the quantity of water drained will not flood or adversely affect downstream lands. If the investigation shows that the drainage will flood or adversely affect downstream lands, the water resource board may not issue a permit until flowage easements are obtained.

The flowage easement must be filed with the register of deeds of the county in which the lands are located. The owner of the lands proposed to be drained shall undertake and agree to pay the cost required in making the investigation.

In the case of an application designated as of statewide or interdistrict significance, the water resource district must follow the guidelines set forth in North Dakota Administrative Code 89-02-01-09.1. If the water resource district denies the application, the board's decision must be forwarded to the office of the State Engineer and the process is final. If the water resource district approves the drainage project, all pertinent information relating to the application must be forwarded to the office of the State Engineer.

The State Engineer will conduct an independent investigation, taking into consideration all information available, and must render a decision within 30 days from receipt of the application from the water resource district.

The recipient of a permit to drain shall commence actual construction within two years of the date the permit is approved. If the project is not commenced within the two-year time, an extension may be requested no later than 60 days before the end of the two-year period. If the project is not started and an extension is not

requested within the two-year period, the permit is void.

The State Engineer may grant an emergency license to drain under North Dakota Administrative Code 89-02-05.1. A license received under this chapter has a duration of not more than six months unless extended as provided. An emergency under this chapter is defined as a situation that if not addressed immediately will cause significant damage to persons or property, which would not occur under normal circumstances. A recipient of a license for emergency drainage does not relieve an applicant from liability for damages resulting from any activity conducted pursuant to the license.

## Water Development Policies

### CONSTRUCTION WORK

It is the policy of the State Water Commission to provide construction work for selected water projects.

Comment:

Construction for projects under \$50,000 is directed by internal guidelines set up by the State Water Commission. In this case, approved projects may be completed by the State Water Commission construction crew with no outside bidding process for the job as a whole. The State Water Commission may perform the initial studies, including conducting preliminary surveys if required, generate cost estimates, create the cost-share agreements, schedule and perform the work, and serve as project manager. Activities of the project manager may include maintaining a record of project costs, directing local sponsors to make payments to suppliers and contractors, and performing the final accounting of the project costs.

In cases where the estimated project cost is greater than \$50,000, the State Water

Commission must collect construction bids for work, following the procedures listed in NDCC Chapter 48-02. The State Water Commission is often involved with construction inspection, and performing the duties of project manager for projects over \$50,000.

### PROJECTS ELIGIBLE FOR COST-SHARE

It is the policy of the State Water Commission that the following items shall be eligible for cost-sharing and that projects are consistent with the public interest to receive cost-share funding from the agency's appropriated Contract Fund.

Comment:

The following projects are eligible for State Water Commission cost-share. The State Water Commission may allow exceptions to the cost-share levels in extraordinary circumstances.

- Rural Flood Control (Channels/Ring Dikes). The State Water Commission will provide cost-sharing for up to 35 percent for channels and up to 25 percent for ring dikes of the eligible items of any cost-sharing application for rural flood control projects. The cost-share per biennium of any one channel project is limited to 5 percent of new funding available to the State Water Commission for general projects, 5 percent may be exceeded at the State Water Commission's discretion if funds remain near the end of the biennium. County and township road crossing work and appropriate costs for engineering work, excluding any land rights work, are eligible for cost-share. A water resource district applying for cost-sharing for a rural assessment-based flood control project must certify that the district has an active and diligent enforcement program for rural flood control regulatory statutes, defined in NDCC 61-32-03 and 61-32-07. If an assessment-based rural flood control project is to be established within two or more districts and financial assistance is

sought from the State Water Commission, each water resource board involved must join in the application for financial assistance. The applicant must also certify that control measures, such as gated structures, culvert sizing, channel sizing, etc., and upstream temporary or permanent storage of water on the land has been duly considered in the design and operation of the proposed rural flood control project. The applicant for cost-sharing must also certify that appropriate permits have been secured from the State Engineer and/or appropriate water resource district. To provide for uniform and best distribution of State Water Commission funds for rural flood control projects, the following types of rural flood control projects shall not be eligible for cost-sharing, except in overriding circumstances:

Removal of sediment, woody vegetation (snagging & clearing), or waterborne debris from artificial rural flood control projects which has been deposited over a number of years and has reduced the hydraulic capacity of the drain, and any other deferred maintenance.

- **Water Supply Projects.** The State Water Commission will provide cost-sharing for up to 50 percent of the eligible items of any cost-sharing application for water supply projects. These projects are commonly associated with dams or similar water retention methods. If sufficient funds are not available for all completing cost-sharing applications, water supply projects for domestic, municipal, and rural uses shall receive highest priority.
- **Flood Control Projects.** The State Water Commission will provide cost-sharing for up to 50 percent of the eligible items of any cost-sharing application for flood control projects.
- **Recreation Projects.** The State Water Commission will provide cost-sharing for up to 33.33 percent of the eligible items of

any cost-sharing application for recreation projects.

- **Snagging and Clearing.** The State Water Commission will provide cost-sharing for up to 25 percent of the eligible items on natural streams of any cost-sharing application for snagging and clearing.
- **Engineering Feasibility Studies.** The State Water Commission will provide cost-sharing for up to 50 percent of the eligible items of any cost-sharing application for engineering feasibility studies. The percentage of funds is limited by the maximum cost-share limits of eligible project categories. The report, study, or the result, or copy thereof, of an engineering feasibility study, which receives cost-sharing from the State Water Commission shall be provided to the State Engineer upon completion.
- **Irrigation.** The State Water Commission will provide cost-sharing for up to 40 percent of the eligible items of any cost-sharing application for irrigation projects.
- **Bank Stabilization.** The State Water Commission will provide cost-sharing for up to 50 percent of the eligible items of any cost-sharing application for bank stabilization projects on public lands.
- **Technical Assistance.** The State Water Commission will provide cost-sharing for up to 50 percent of the eligible items of any cost-sharing application for technical assistance projects. The percentage of funds is limited by the maximum cost-share limits of eligible project categories.

#### **ELIGIBLE ITEMS**

It is the policy of the State Water Commission that the following items shall be eligible for cost-sharing by the State Water Commission:

- **Construction costs.** This includes, but is not limited to, such things as earthwork, concrete, mobilization and demobiliza-

tion, dewatering, materials, seeding, rip-rap, electrical transmission lines, storm and sanitary sewer systems, and other underground utilities and conveyance systems, irrigation supply works, and other items and services provided by the contractor.

- **Engineering.**

#### **NON-ELIGIBLE ITEMS**

It is the policy of the State Water Commission that the following items shall not be eligible for cost-sharing by the State Water Commission:

- **Land acquisition.** Acquisition of property interests in fee or easement for projects shall not be an eligible item for cost-sharing.
- **Administrative and legal expenses.** Expenses of this type incurred in connection with any project shall not be an eligible item for cost-sharing.
- **Maintenance and deferred maintenance.** Maintenance work and deferred maintenance on any project which has previously received cost-sharing assistance from the State Water Commission shall not be an eligible item for cost-sharing, except for maintenance that may be required as a result of an unusual climatological event.

#### **COST-SHARE PROCEDURE AND GENERAL REQUIREMENTS**

It is the policy of the State Water Commission to provide cost-share funding for water development projects. The following requirements are for projects in excess of \$20,000. The State Engineer has the authority to cost-share up to \$20,000 without State Water Commission action.

Comment:

The following are general requirements for State Water Commission and State Engineer cost-share:

**APPLICATION REQUIRED.** The State Water

Commission will not consider any request for cost-sharing for water-related or programs unless an application is first made to the State Engineer. The applicant must be a political subdivision, including, but not limited to, water resource districts, irrigation districts, and municipalities.

**PERMITS.** An application to the State Water Commission for cost-sharing must be accompanied by all necessary permits or based on conditional approval of all permits for the proposed project, including water permits, rural flood control permits, construction permits for dikes or dams, and any other necessary permits from local political subdivisions or state/federal agencies. Upon receiving an application for cost-sharing, the State Engineer will investigate to ensure that all necessary permits for the proposed project from local political subdivisions or state agencies have been obtained.

**CONTENTS OF APPLICATION.** An application for cost-sharing must be in writing, but is not required to be in a prescribed format. The application must include:

- Description and location of the proposed project.
- Purpose of the proposed project.
- Delineation of costs.
- Preliminary designs, if the request is for cost-sharing on the construction of a project.
- Final design, plans and specifications, if available.
- Legal description of land to be acquired by fee title or easement.

The State Engineer may require such additional information as he deems appropriate.

**REVIEW.** Upon receiving an application for cost-sharing, the State Engineer shall

review the application and accompanying information. If the State Engineer is satisfied that the application and proposal meet all requirements of these guidelines, he shall present the application to the State Water Commission at the first Commission meeting after he has completed his review and investigation of the application. The State Engineer's review of the application will include the following items, and any other considerations which the State Engineer deems necessary and appropriate:

- If the application for cost-sharing is for project construction, a field inspection will be made, if deemed necessary by the State Engineer. Previous field inspections made by the State Engineer as part of a permit application may satisfy this requirement.
- Engineering plans and specifications will be reviewed to ensure that such plans and specifications are consistent with the plans and specifications of the State Engineer for such projects.
- If the request is for an investigation, the State Engineer will review the application to ensure that the results of the investigation and study can be utilized for a water-related program or activity.

**NOTICE & APPEARANCE OF THE PROJECT SPONSOR.** The State Engineer shall place any application for cost-sharing on the tentative agenda of the State Water Commission meeting at which the application will be presented. The State Engineer shall give notice to such applicant and project sponsor when the application will be presented to the State Water Commission.

**STATE ENGINEER'S RECOMMENDATION.** The State Engineer will make a recommendation to the State Water Commission on an application for cost-sharing at the first meeting of the Commission when such application for cost-sharing is presented. The State Water Commission

will take the application under advisement, unless the Commission feels that it has sufficient information at the first meeting to make a final determination on such application.

**LITIGATION.** If a project for which an application for cost-sharing has been submitted is the subject of litigation, the application will be deferred until the litigation is resolved. If a project for which the State Water Commission has approved a cost-sharing request becomes the subject of litigation before the funds approved by the State Water Commission have been disbursed, the State Engineer will withhold such funds until the litigation is resolved. If funds have been disbursed and the litigation is resolved against the project, the project sponsor will return to the State Water Commission the cost-sharing funds disbursed that are in excess of the percentage allocated for the eligible items in place.

**ENGINEERING DESIGNS, PLANS AND SPECIFICATIONS.** Engineering designs, plans, and specifications that accompany applications for cost-sharing for the construction of a project must have been developed by a registered professional engineer, and approved by the State Engineer.

**CONTRACTS.** When an application for cost-sharing has been approved by the State Water Commission, the project sponsor, upon awarding of a contract for the construction or other work to be performed, shall file a copy of such contract with the State Engineer before any funds will be disbursed for the project.

**COST-SHARING BY OTHER AGENCIES.** All applications for cost-sharing shall be reviewed to determine if other local or state agencies can participate in the project costs. If so, the State Water Commission will take this into account, and may reduce the percentage of Commission cost-sharing accordingly.

**PARTIAL & FINAL PAYMENTS.** The State Engineer may make partial payment of cost-sharing funds as he deems appropriate. Upon notice by the project sponsor that all work or construction has been completed, the State Engineer may conduct a final field inspection. If the State Engineer is satisfied that construction has been completed in accordance with the designs, plans and specifications for the project, the final payment for cost-sharing as approved by the State Water Commission shall be disbursed to the project sponsor, less any partial payment previously made.

**MAINTENANCE.** Except as otherwise provided, the State Water Commission shall require that the applicant for cost-sharing shall be responsible for maintaining the project.

### **COST-SHARING FOR OPERATIONAL CLOUD SEEDING**

It is the policy of the State Water Commission that weather modification affects the public health, safety, and welfare, and that, properly conducted, weather modification operations can improve water quality and quantity, reduce losses from weather hazards, and provide economic benefits for the people of the state. Therefore, in the public interest, weather modification shall be subject to regulation and control, and research and development shall be encouraged.

Comment:

The State of North Dakota claims its sovereign right to use the moisture contained in the clouds and atmosphere within the state boundaries.

All water derived as a result of weather modification operations shall be considered a part of North Dakota's basic water supply and all statutes, rules, and regula-

tions applying to natural precipitation shall also apply to precipitation resulting from cloud seeding.

To minimize possible adverse effects, weather modification operations shall be carried on with proper safeguards, and accurate information shall be recorded concerning such operations and the benefits obtained therefrom by the people of the state.

The Atmospheric Resource Board provides cost-share funding to counties participating in the North Dakota Cloud Modification Project (NDCMP), an operational cloud seeding program designed to increase rainfall and suppress hail during the growing season. The amount of funding available to any specific county depends upon the following factors:

- Whether or not the county is part of an existing multi-county NDCMP operations area, or adjacent to such an area,
- The tax base of the county,
- The magnitude of the county's mill levy for weather modification (up to seven mills are allowed by law),
- The total cost of the proposed operations,
- The total number and magnitudes of all cost-sharing requests, and
- The total funding available for cost sharing.

There is not a pre-established percentage for cost-sharing. The board considers the above factors, and each season allocates funding in a manner that maximizes the number of counties that are able to conduct viable operational programs.

### **STATE COST-SHARE FOR EXTERNALLY FUNDED COST-SHARED PROJECTS**

It is the policy of the State Water Commission that the state cost-share for externally funded cost-shared projects be up to the same percentage of eligible project costs for the remaining local share. Externally funded refers to federal funds and other external monies not directly provided by the State of North Dakota or the State Water Commission.

Comment:

The state cost-share on an externally funded cost-share project will only be based on the remaining local share and not the total cost of the project.

### **MUNICIPAL, RURAL, AND INDUSTRIAL PROGRAM FUNDS**

It is the policy of the State Water Commission to use the Municipal, Rural, and Industrial water supply program to provide a consistent supply of affordable and safe water to North Dakota residents.

Comment:

Eligibility for program funds are established in NDAC 89-12-01-02. Project funding is 65 percent federal and 35 percent local non-federal match. Eligibility is determined through a set of requirements outlined in the North Dakota Administrative Code. Concurrent to eligibility are requirements for a preliminary report and a feasibility study. The State Engineer will determine from the preliminary reports, feasibility studies, and other material if the project should be submitted to the State Water Commission and the Garrison Diversion Conservancy Unit for approval of funding. The State Water Commission and Garrison Diversion Conservancy Unit administer the MR&I funds under a joint powers agreement and memorandum of understanding.

# Senate Bill 2188

Senate Bill 2188, a comprehensive statewide water development plan, provides \$84.8 million in bonding for water projects. It passed the Senate (45-3) and the House (66-28), which gives it just enough votes to maintain the emergency clause, for immediate implementation.

The bill includes bonding authority in the amount of \$20 million for a Devils Lake outlet to Stump Lake or the Sheyenne River, \$52 million for Grand Forks, \$4.8 million for Grafton, \$3.5 million for Wahpeton, and \$4.5 million for the Southwest Pipeline during the next biennium.

The following is a summary listing of the water project funding and legislated requirements that must be met as a condition to issuing bonds.

## **SOUTHWEST PIPELINE PROJECT**

### ***Authorized Funding***

The State Water Commission (SWC) may issue new bonds for a maximum of \$4.5 million plus the costs of issuance of the bonds, capitalized interest, and reasonably required reserves for continued project construction under authority of SB 2188.

The law includes language stating the assembly's intent that a total of \$6 million is to be provided to the SWC for the Southwest Pipeline Project through a combination of funding sources. Those sources must include payment from the Perkins County rural water system, bonds issued by the SWC, or other available resources.

### ***Requirements***

Bonds may be sold *only* after the State Engineer either certifies to the SWC that Perkins County rural water system will not make payment to the SWC of \$4.5 million or December 31, 1999 whichever occurs first. If Perkins County rural water system makes payment of \$4.5 million after January 1, 2000, the payment must be used to pay principal and interest on any bonds issued for construction or money borrowed on the line of credit made available to the SWC by the legislation. If Perkins County rural water system does not make payment to the SWC, no benefits may accrue to that system.

## **DEVILS LAKE OUTLETS AND GARRISON DIVERSION UNIT (DAKOTA WATER RESOURCES ACT)**

### ***Authorized funding***

SWC may bond not to exceed \$20 million, plus the costs of issuance of the bonds, capitalized interest, and reasonably required reserves for the Devils Lake outlets and the Garrison Diversion Unit. Bond proceeds are appropriated to match, in a ratio no greater than required by the federal government, any federal funds available for the outlet projects.

The SWC *may* require any political subdivision affected by the Devils Lake flooding to participate in the cost of construction of an outlet from Devils Lake to the Sheyenne River and to West Stump Lake by providing matching funds in a percentage of the construction costs determined by the SWC to be reasonable in light of the benefits to be received by the political subdivision in relation to benefits received by all benefitted political

subdivisions. Local matching fund requirement must be determined by the SWC and the affected political subdivision must be informed of their matching fund obligation prior to issuance of bonds.

*Devils Lake Outlets* - Emergency outlet to the Sheyenne River and/or outlet from East Devils Lake to West Stump Lake.

*Garrison Diversion Unit* - The project may include delivery of water to the Northwest Area Water Supply project; Turtle Lake Irrigation District; Nesson-Valley Irrigation District; Elk Charbon Irrigation District; the Williston Irrigation project; the Oakes Irrigation project; other irrigation, municipal, rural, and industrial water supply projects; augmented streamflow and ground-water recharge projects; development of a Red River Valley Water Supply; and delivery of Missouri River water to the Sheyenne River.

### ***Requirements***

#### *Devils Lake Outlets* -

- 1) The United States Congress authorizes construction;
- 2) the SWC or a federal agency has developed a plan addressing damage to basic infrastructure such as roads, culverts, and bridges; riverbank erosion; downstream flooding; and increased water treatment costs caused by or resulting from construction of the outlet;
- 3) the SWC or project sponsor must sign a project cooperation agreement with the U.S. Army Corps of Engineers (COE);
- 4) the outlet from Devils Lake to West Stump Lake must comply with any

- environmental impact statement or National Environmental Policy Act provisions required under federal law;
- 5) no order has been issued by a court enjoining construction of an outlet from Devils Lake to the Sheyenne River or to West Stump Lake; and
  - 6) federal funds have been appropriated.

*Garrison Diversion Unit -*

1) The SWC may only issue bonds to finance the nonfederal cost-share of the Garrison Diversion Unit when the Congress of the United States enacts legislation for the completion of the Garrison Diversion Unit.

**CITY FLOOD CONTROL**

***Authorized Funding***

A total of \$60.3 million is authorized for city flood control projects plus cost of issuance, capitalized interest, and reasonably required reserves.

*Grand Forks* - The SWC may bond for the flood control or reduction project (GF Project) not to exceed forty-five percent of the North Dakota project sponsor's share of nonfederal share of project costs not to exceed \$52 million.

*Wahpeton and Grafton* - The SWC may bond for one-half of the North Dakota project sponsor's share of the nonfederal share of the Wahpeton and Grafton flood control or reduction project costs, not to exceed \$3.5 million for Wahpeton and \$4.8 million for Grafton.

***Requirements***

***All City Flood Control projects -***

- 1) must be authorized by the federal government;
- 2) must be partially funded by the federal government;
- 3) must be designed to provide permanent flood control or reduction;
- 4) the city must have suffered severe damages as a result of the 1997 flood or other recent floods;

***Grand Forks -***

- 1) the city must have suffered catastrophic flood damage requiring evacuation of the major share of its populace;
- 2) the flood control or reduction project must include interstate features and require acquisition of private property to build permanent flood protection systems to comply with federal flood protection standards;
- 3) the city must provide the SWC with written certification (resolution from the city) indicating its commitment to one-half or more of the North Dakota project sponsor's share of the nonfederal share of the cost to construct the GF Project;
- 4) COE must approve the GF Project;
- 5) a project cooperative agreement, which contains provisions acceptable to the State Engineer and approved by the Governor must be entered into by the states of Minnesota and North Dakota or one of the political subdivisions in each state in which the GF Project is to be constructed and the COE;
- 6) the city must approve a financing plan for all amounts of the nonfederal share of the GF Project in excess of the amounts paid by the state (should be an ordinance or resolution);
- 7) no order has been issued by a court enjoining construction of the flood control or reduction project (to be verified by legal counsel);
- 8) the GF Project must be designed to be cost-effective and any impact on residential neighborhoods is minimized in an amount reasonably practicable as determined by the State Engineer and approved by the Governor; and
- 9) the city must pledge certain revenues (as stipulated) from its corporate center project to the water development trust fund as repayment for the GF Project.

***Wahpeton -***

- 1) The city must have received significant

federal funding through federal grants and funds from the COE and Federal Emergency Management Agency (FEMA).

***Grafton -***

- 1) Seventy percent of the land with the boundaries of the city must be located within the 100-year floodplain; and
- 2) the COE must approve the project.

**FUNDING MECHANISMS**

***Water Development Trust Fund***

Part of the landmark nature of Legislature's actions is the creation of the Water Development Trust Fund in HB 1475. This fund is established to facilitate financing of the project costs authorized in SB 2188. HB 1475 allocates 45 percent of the potential monies received by the state pursuant to the 1998 settlement agreement with tobacco product manufacturers, or any successor agreement, and any earnings on these monies, to the Water Development Trust Fund in the state treasury. These funds are to be used in paying for bonds issued as provided in SB 2188 and for other water projects.

Funding for repayment of bonds from other sources listed below is available if there are not sufficient funds available in the Water Development Trust Fund.

In order of priority:

1. Water Development Trust Fund.
2. Transfers to be made and appropriated by the Legislative Assembly from revenues in the Resources Trust Fund other than revenues from state taxes.
3. Appropriations of other available revenues in the then current biennium.
4. From any other revenues the State Water Commission makes available during the then current biennium for that purpose.
5. Transfers to be made and appropriated by the Legislative Assembly from the first available current biennial earnings of the Bank of North Dakota not to exceed \$6.5 million per biennium.

***Bank of North Dakota Line of Credit***

The Bank of North Dakota is directed to extend a line of credit not to exceed \$84.8 million to the SWC for the July 1, 1999 to June 30, 2001 biennium. The line of credit is to provide for interim financing. Advances on the line of credit may be made only when a source of repayment has been identified and determined to be available.

***Payment authority for the Bank of North Dakota Line of Credit***

SB 2188 appropriated \$84.8 million out of the Water Development Trust Fund, to the Bank of North Dakota for the purpose of repaying the line of credit extended to the State Water Commission.

**MANAGEMENT RESPONSIBILITIES**

SB 2188 includes certain management and planning responsibilities.

***Requirements:***

- 1) The State Engineer must report periodically to the budget section, any other interim committee designated by the Legislative Council, and to the ND House of Representatives and the ND Senate standing committees on natural resources and appropriations regarding implementation of the comprehensive statewide water development and state water management plan and the issuance of bond to finance construction of flood control projects, the Southwest Pipeline Project, a Devils Lake outlet, and a statewide water development program during the 1999-2000 interim. The report must include information on the funding sources used to repay any bonds issued under authority of SB 2188.
- 2) The SWC must develop a new comprehensive statewide water development program with priorities based upon expected funds available from the

Water Development Trust Fund for water development projects. In developing the plan, the SWC is to consider the delivery of water for usable purposes a priority for water development projects after the projects listed above are completed.

- 3) The SWC must include in its submission to the Governor for inclusion by the Governor in the biennial executive budget for each year of the respective biennium during the term of any bonds issued as provided in SB 2188, an amount fully sufficient to pay the principal and interest required to be paid in each year of the biennium, if any, from monies from the nongeneral fund sources. Should the Governor not include in the executive budget for any reason the amounts required to be included by SB 2188, the SWC must request independently that the Legislative Assembly amend the executive budget appropriation so as to include the amounts.