NORTH DAKOTA
State Water Commission
and
Office of the State Engineer

BIENNIAL REPORT
for the period July 1, 2001 to June 30, 2003

Governor John Hoeven
Chairman

Dale L. Frink, P.E.
Secretary and State Engineer

North Dakota State Water Commission

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December 1, 2003

The Honorable John Hoeven
Governor of North Dakota
State Capitol
Bismarck, ND 58505

RE: 2001-2003 Biennial Report

Dear Governor Hoeven:

It is with great pride in the State Water Commission and the Office of the State Engineer that we present our Biennial Report for July 1, 2001, through June 30, 2003. This report highlights the events and activities of the State Water Commission and the State Engineer for your information and consideration.

Respectfully submitted,

Dale L. Frink
Secretary and State Engineer

DLF:pf
Enclosure

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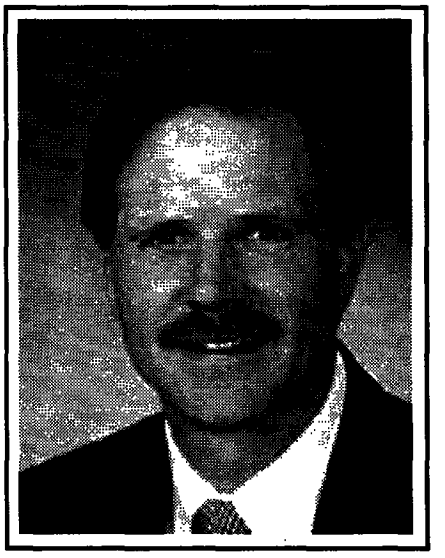
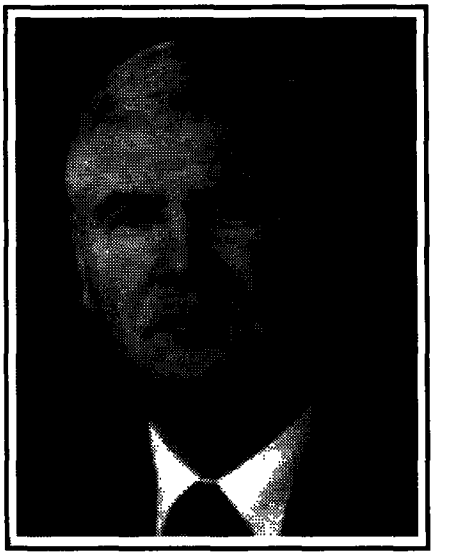
NORTH DAKOTA STATE WATER COMMISSION



GOVERNOR JOHN HOEVEN
Chairman



DALE L. FRINK, P.E.
Secretary & State Engineer

Mission

The mission of the State Water Commission and the State Engineer is to improve the quality of life and strengthen the economy of North Dakota by managing the water resources of the state for the benefit of its people.

Agency Goals

- To regulate the use of water resources for the future welfare and prosperity of the people of North Dakota.
- To develop water resources for the future welfare and prosperity of the people of North Dakota.
- To educate the public regarding the nature and occurrence of North Dakota's water resources.

Organization

The State Water Commission consists of the Governor as chairman, the Commissioner of Agriculture as an ex-officio member, and seven members who are appointed by the Governor to serve terms of six years each. The terms of office for appointees are arranged such that two terms and not more than three terms shall expire on the first day of July of each odd numbered year. The Commission appoints a Secretary-State Engineer as its executive officer, who employs a staff as needed to carry out the aims of the Commission.

The State Water Commission is located primarily in the State Office Building near the State Capitol in Bismarck, North Dakota. In addition, the Commission has a field office in West Fargo.

History and Mandates

The State Water Commission was created by legislative action in 1937, as a result of the drought of the 1930s, for the specific purpose of fostering and promoting water resources development throughout the state.

The Office of State Engineer was created in 1905 to regulate and administer matters concerning allocation of the state's water and related land resources in compliance with article XI, § 3 of the North Dakota Constitution, which declares all waters to be property of the state for public use. In 1937, additional duties were added to this office when the State Engineer was designated chief engineer to the Commission. Subsequently, in the years following, the State Engineer was assigned responsibilities for regulation of drainage, control of dikes and dams, and management of development in floodplains.

Agency Policies

The State Water Commission and the State Engineer have developed procedures and policies based upon the comprehensive legislation contained in Title 61 of the ND Century Code to:

- Administer the water laws of the state.
- Prepare and maintain a comprehensive plan for future growth and development, and to direct project development in accordance with that plan.
- Conduct studies to determine availability and occurrence of the ground and surface waters of the

state for the purposes of allocation and management.

• Assist local entities of government in the development and construction of water resource projects.

• Assist local entities of government in management and maintenance of water resource projects.

• Assist in the organization of various legal entities through which water resource projects can be sponsored and operated.

• Prepare and maintain a statewide communications plan which identifies communication deficiencies with regard to water resources management and to assist in water information/education programs to overcome these deficiencies.

• Coordinate activities of federal, state, and local entities in water resources development.

• Represent the interests of the state in water resources matters in national, state, and international forums.

Many of the policies in effect have evolved as a result of the agency's financial participation in project development along with local government sponsors. The amount of financial participation varies with the project's purpose.

The Contract Fund is the primary source of funds for assistance to local sponsors and is controlled by the Commission.

Principal Agency Activities

• Develop Missouri River water in ways that will secure North Dakota's share of Missouri River flows for our current and future needs, as reflected in comprehensive water management planning documents and the Pick-Sloan Plan.

• Implement plans for the distribution of Missouri River water through regional water supply systems such as the Southwest Pipeline project, the Northwest Area Water Supply project, and potential Eastern Dakota Water Supply.

• Manage and develop North Dakota's water resources to facilitate economic development and improve quality of life for current and future generations.

• Promote and provide water supplies needed for the expansion and diversification of North Dakota's agricultural industry.

• Work to implement all aspects of the Dakota Water Resources Act of 2000 to provide a reliable source of good-quality water throughout North Dakota in return for the sacrifices made under the Pick-Sloan Plan.

• Complete detailed studies and research that more precisely define the nature and occurrence of water to optimize its conservation and development throughout the state.

• Maintain a water project inventory and water management plan to promote efficiency in meeting North Dakota's future water development and funding needs.

• Refine legislation and policies for administering the Water Development Trust Fund and the Resources Trust Fund through which critical water facilities can be constructed.

• Work with the federal government to implement the state's three-pronged approach (including an outlet to the Sheyenne River, infrastructure protection, and upper-basin management) to solving the Devils Lake area flooding problems.

• Develop policies and initiatives that will stimulate progress toward developing flood control measures along the Sheyenne, Pembina, and Red Rivers, and Devils Lake.

• Pursue cooperative efforts with neighboring states and provinces to plan for beneficial water management of shared water resources.

• Cooperate with agencies that have regulatory authority over North Dakota's waters to protect and enhance the quality of North Dakota's water resources and related ecosystems.

• Enforce weather modification standards, conduct research, and supervise operational cloud seeding programs for hail suppression and rainfall enhancement.

• Provide water education for North Dakota's teachers, youth, and general public.

• Promote expanded development of North Dakota's water-based recreation resources, especially the Missouri River, Lake Oahe, Lake Sakakawea, and Devils Lake.

• Collect water resource data for the purpose of identifying the location, condition, and temporal changes of the water resources of the state.

• Disseminate water resource information to the general public, businesses, and government agencies.

• Manage the water resource database so that it is available and accessible to interested parties.

• Manage state water resources within the framework of North Dakota Century Code.

2001 Water Resources Legislation

House Bill 1023 was the Commission's appropriation bill. It addressed several issues:

1. It appropriated the Water Development Trust and Resource Trust Fund money to the Commission. It also transferred $9.7 million from the Water Development Trust Fund to the General Fund, and then appropriated $9.7 million from the General Fund to the Commission for agency operations.

2. It extended by two years the authority to issue bonds for the Grand Forks, Wahpeton, and Grafton flood control projects, and Devils Lake and Dakota Water Resource Act projects.

3. It allows the Commission to sell its existing shop and land and use the revenue from the sale to acquire land and construct a new maintenance facility.

4. It recognized the priorities developed by the Commission for the statewide water development program for the 2001-03 biennium and authorizes the Commission to fund these projects with Resources Trust Fund money and Water Development Trust Fund money by issuing bonds up to $20 million, or by using a combination of these sources.

5. House Bill 1171 and House Bill 1396 failed, but their provisions were incorporated into House Bill 1023. House Bill 1171 directed the Commission to develop a plan and estimate of costs to supplement the water resources of eastern North Dakota. House Bill 1396 was the bill authorizing the Commission to cost-share on water quality projects to control nonpoint source pollution. House Bill 1023 authorizes the Commission to spend up to $200,000 for this purpose.

6. It authorizes the Commission to use up to $5.5 million to cost-share on a flood control channel and levy project for Fargo. The cost-share cannot exceed 50 percent of the city's share of the project. Before the Commission may provide funds or issue bonds for the Fargo project, all applicable permits must be issued, the Southeast Cass County Water Resource District must approve the project, and a public hearing must be held.

House Bill 1151 allows the State to construct a Devils Lake outlet without federal funding. It also authorizes the Commission to use quick take authority to acquire land needed to construct a Devils Lake outlet to either the Sheyenne River or to Stump Lake. Additionally, the bill authorizes the Commission to use a design-build process instead of the traditional design-bid-build process if the Commission determines the design-build process is advantageous to the State.

House Bill 1158 increased the bond limit for financing Southwest Pipeline Project construction from $15 million to $25 million.

House Bill 1284 amended N.D.C.C. § 61-05-13, 61-06-01, and 61-10-31 relating to organization, government, and boundaries of irrigation districts.

Senate Bill 2128 provides that members of the Commission who have a personal interest in a matter before the Commission will not violate state law, provided they disclose the interest to the Commission and do not participate or vote on the particular matter.

Senate Bill 2182 amended N.D.C.C. § 61-04-22 relating to prescriptive water rights. It reinstates the opportunity for a person who has used or attempted to appropriate water from any source for a beneficial purpose for 20 years before July 1, 1963, to apply to the State Engineer for a water permit. The user must file an application with the State Engineer by December 31, 2001. If the State Engineer finds that the application substantiates the claim and it is approved, a perfected permit will be issued with a priority date relating back to the date when the first step was taken to appropriate the water in the quantity stated in the application.

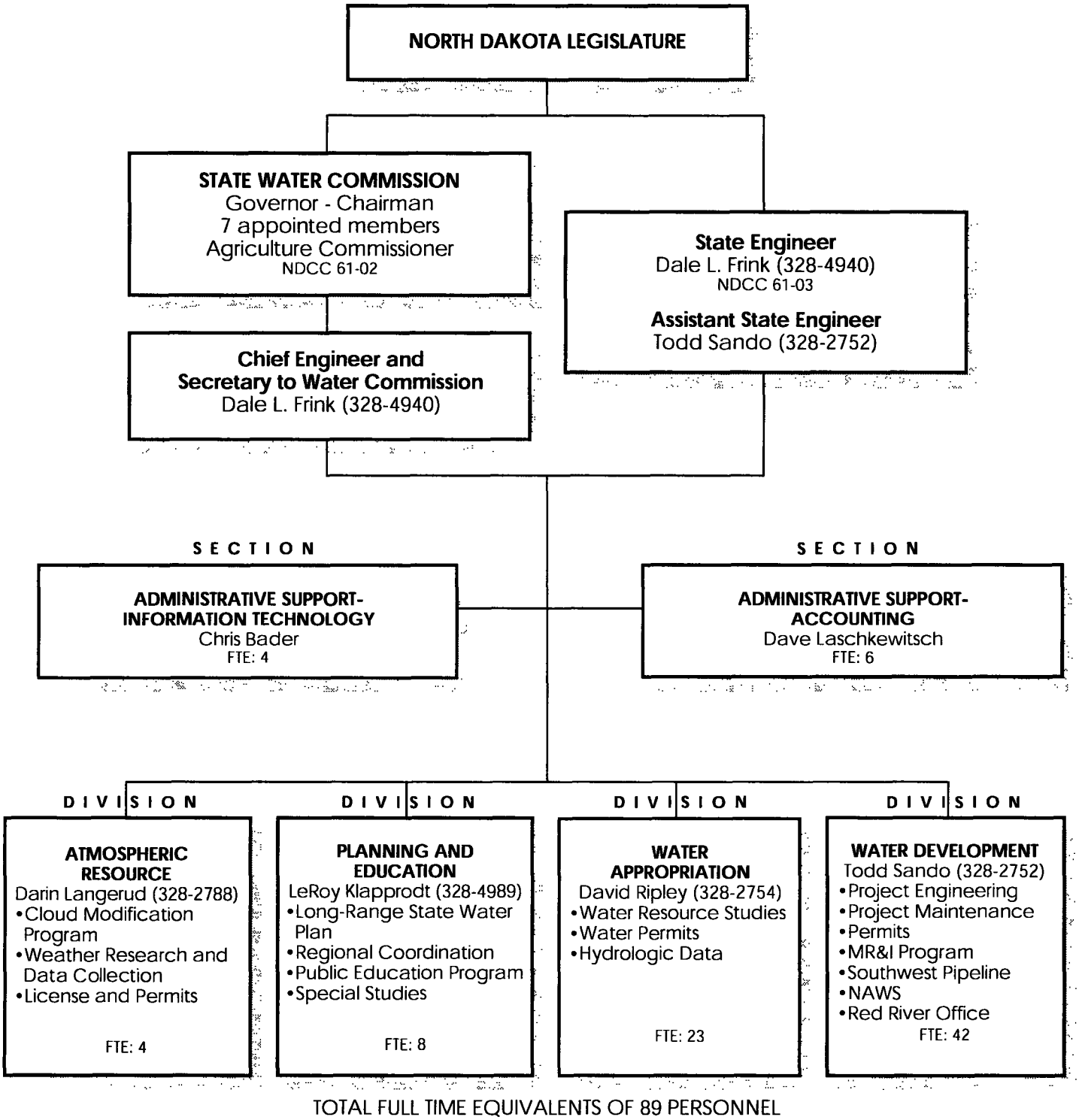
Senate Bill 2256 extended the Water Commission's authority to issue bonds as provided in chapter 61-02.1 for construction of an outlet from Devils Lake effective through June 30, 2003.

Senate Bill 2264 extended the Water Commission's authority to issue bonds as provided in chapter 61-02.1 for construction of a flood control or reduction project in Grand Forks effective through June 30, 2003.

Senate Bill 2285 provides an $800,000 appropriation from the Water Development Trust Fund to the Commission to assume jurisdiction over and administer the Section 404 program of the Clean Water Act. The appropriation will be available when the State Engineer certifies to the Governor that the State Engineer has designed a program to effectively assume the 404 program and the Commission is ready to assume those responsibilities.

Senate Concurrent Resolution 4046 directs the Legislative Council to study issues related to the Missouri River in North Dakota.

North Dakota State Water Commission
Organizational Chart



TOTAL FULL TIME EQUIVALENTS OF 89 PERSONNEL

June 30, 2003

State Water Commission Employees as of June 30, 2003

ADMINISTRATIVE SERVICES DIVISION
State Engineer: Dale L. Frink
Administrative Assistant: Sharon Locken
Accounting Manager: David Laschkewitsch
Accounting Budget Specialists: Kay Koch, Lorna Wohnoutka
Legal Assistant: Rosemary Pedersen
Records Center Technician: Karen Heinert
IT Manager: Christopher Bader
IT Coordinators: Michael Hove, Paul Moen
GIS Specialist: Rodney Bassler
Human Resources: *LeNor Dollinger*

ATMOSPHERIC RESOURCE BOARD
Division Director: Darin Langerud
Business Manager: LeNor Dollinger
Environmental Scientist: Aaron Gilstad
Administrative Assistant: Dawn Feist

WATER APPROPRIATION DIVISION
Division Director: David Ripley
Administrative Secretary: Marlene Backman
Hydrologist Managers: Royce Cline, Jon Patch, William Schuh, Robert Shaver
Hydrologists: Rex Honeyman, Kevin Krogstad, Scott Parkin, Steve Pusc, Alan Wanek
Water Resource Engineer: Robert White, Karen Goff
Water Resource Program Manager: James MacArthur
Engineering Technicians: Kelvin Kunz, Albert Lachenmeier, Merlyn Skaley, Jeffrey Berger
Chemist: Garvin Muri
Laboratory Technician: Mary Beth Osborn
Rotary Drill Operator: Gary Calheim
Equipment Operator: James Leuwer

PLANNING AND EDUCATION DIVISION
Division Director: LeRoy Klapprodt
Information Processing Specialist: Dawn Schock
Water Resource Education Program Manager: Bill Sharff
Water Resource Planners: Michael Noone, Linda Weispfenning
Natural Resources Economist: Patrick Fridgen
Research Analyst: Larry Knudtson
Graphic Artist: Brenda Hove

WATER DEVELOPMENT DIVISION
Division Director/Asst. State Engineer: Todd Sando
Administrative Secretary: Cindy Graff
Water Resource Engineer Managers: Bradley Benson, Jason Boyle, Bruce Engelhardt, J. Tim Fay, Randy Gjestvang, Jeffery Mattern, Craig Odenbach, Ronald Swanson
Water Resource Engineers: Dwight Comfort, Timothy Freije, James Landenberger, James Lindseth, John Paczkowski, Julie Prescott, Shandi Teltschik
Engineering Technicians: Daniel Bahm, Robert Bucholz, Theodore DeWall, Tom Engberg, Edward Gall, Leland Krein, Kurt Kunz, John Edwards
Water Resource Project Managers: Darron Nichols, Daniel Sauter
Water Resource Program Administrator: Jeffrey Klein
Planner: Bruce Lange
Account Technician: Winston Enyart
Grants/Contract Officer: Carolyn Merbach
Southwest Pipeline & Northwest Area Water Supply
Water Resource Engineer Manager: James Lennington
Water Resource Engineer: Daniel Farrell
Realty Officer: Roger Kolling
Engineering Technician: Allen Balliet, Perry Weiner

Water Commission Members as of June 30, 2003

NAME	POSITION	APPOINTED	TERM ENDS
John Hoeven	Governor-Chairman		
Roger Johnson	Department of Agriculture		
Jack Olin	Member from Dickinson	July 1, 2001	June 30, 2003
Harley Swenson	Member from Bismarck	July 1, 2001	June 30, 2003
Charles "Mac" Halcrow	Member from Drayton	May 1, 2001	June 30, 2005
Larry Hanson	Member from Williston	July 1, 2001	June 30, 2005
Curtis Hofstad	Member from Starkweather	July 1, 2001	June 30, 2005
Elmer Hillesland	Member from Grand Forks	July 1, 2001	June 30, 2007
Robert Thompson	Member from Page	July 1, 2001	June 30, 2007

Water Commission Meetings
July 1, 2001 through June 30, 2003

DATE		LOCATION
July 18, 2001	(conference call)	Bismarck
August 16, 2001		Bismarck
October 23, 2001		Bismarck
December 7, 2001		Bismarck
February 20, 2002		Bismarck
May 1, 2002		Bismarck
August 15, 2002		Devils Lake
October 10, 2002		Bismarck
November 14, 2002	(conference call)	Bismarck
December 6, 2002		Bismarck
March 5, 2003		Bismarck
April 22, 2003	(conference call)	Bismarck
June 12, 2003		Bismarck

Administrative Services Division

The Administrative Services Division provides the overall direction of agency powers and duties as described in the state water laws. The activities include both the State Engineer's and the Water Commission's operations, as well as accounting, information technology, records, and support services for all agency programs.

Budget and fiscal control work is accomplished within the provisions of statutory law and principles or rules of that law. Agency accounting consists of keeping adequate financial records, preparation of financial statements and reports, project or program cost accounting, preparation of budgets, and proper control of various funds appropriated by the state legislature.

A considerable portion of time is spent in coordination of water resource programs with federal agencies and other state and local entities. The division works with contracts and agreements necessary to carry out investigations, planning, and cooperation with various other agencies in water resources development. A close liaison is maintained with irrigation districts, water resource districts, and the Garrison Diversion Conservancy District.

The State Engineer serves as North Dakota's representative on various boards and associations. Presently the State Engineer is the United States Co-chairman of the International Souris River Board, board of directors member of the Missouri River Basin Association, executive council member of the Western States Water Council, member of the National Water Resource Association, board of directors ex officio member of the North Dakota Water Users Association, board of directors member of the North Dakota Water Education Foundation, member of the Association of Western State Engineers, and state representative to the Red River Basin Commission.

Legal Actions

The State is involved in several legal actions that impact the State Water Commission and the State Engineer.

In 1999, approximately 90 landowners in the Devils Lake area brought a lawsuit against the state and several water resource districts, claiming damages from the high level of Devils Lake. The landowners allege the state and local water resource districts are responsible for the flooding, as a result of their participation in various drainage and water control projects. In November of 1999, the court, in response to motions filed by the defendants in July 1999, issued an order dismissing the plaintiffs' tort claims against the state, leaving only the inverse condemnation claim. (The tort claims remain against the water district defendants.) The court further ordered the plaintiffs to amend their complaint to provide legal descriptions of the property allegedly taken, the interest held by each plaintiff, and the nature and amount of the damage suffered by each plaintiff. Plaintiffs' Amended Complaint was filed on December 9, 1999. On April 12, 2000, the plaintiffs filed a motion for class certification, seeking certification of the class as including those private fee

owners of property adjacent to or within the floodplain of Devils Lake at or above elevation 1426 having suffered property damage due to the rising lake water. The plaintiffs also sought class certification for the purpose of determining the ordinary high water level of Devils Lake, and the liability of the defendants for elevating the surface of Devils Lake above the ordinary high water level. On September 19, 2000, the plaintiffs' motion for class certification was denied. The order was not appealed. The parties have been engaged in discovery efforts since March, 2001.

In 2002, the Commission was forced to condemn land for the Northwest Area Water Supply (NAWS) project. A number of landowners appealed the condemnation, challenging the compensation award. One case went to trial after efforts to negotiate a compromise failed, and the jury awarded $50,000 for consequential damages to the property; the plaintiffs were asking $150,000.

In Manitoba v. Norton, Manitoba asserts that the U.S. Bureau of Reclamation violated NEPA by failing to prepare an environmental impact statement for the NAWS Project. Manitoba is concerned that the project will bring Missouri River basin biota to, and harm the environment of, the Hudson Bay basin. North Dakota intervened in the lawsuit to protect the state's interests. North Dakota as well as the Bureau of Reclamation have filed motions to dismiss the case on procedural grounds.

North Dakota v. Ubbelohde challenges the manner in which the Corps of Engineers manages the Missouri River. It also seeks an order requiring that the Corps issue a revised Master Manual, which is the document that governs the management of the river. The Master Manual has been under review for over 14 years. The District Court granted the State's request for an order preventing the Corps from reducing lake levels during the spring 2002 fish spawn. The Corps appealed the District Court's decision to the 8th Circuit Court of Appeals. The 8th Circuit Court agreed with the state that the Corps' river management decisions are reviewable. It disagreed with the state about the propriety of the District Court's injunction. It overturned the injunction primarily on the grounds that the state did not prove the likelihood of success on the merits, finding that the 1944 Flood Control Act requires that the Corps give priority to navigation. The state has filed a petition for rehearing with the 8th Circuit asking it to reconsider its decision and clarify certain issues. The petition is pending before the court. The claim regarding the Corps failure to adopt a new manual is moving forward at the district court level. The case, along with several others challenging the manner in which the Corps operates the Missouri River, has been transferred by the Judicial Panel on Multidistrict Litigation to the U.S. District Court in Minnesota.

Water Permit No. 4298 - An adjacent tenant objected to a portion of Water Permit No. 4298 and requested a hearing. The tenant was concerned about the effect the appropriation of water by others from the Guelph/Ellendale aquifer would have on his domestic water supply. Because the tenant had raised the same issue and the State Engineer has issued final decisions regarding it on three previous occasions, the administrative law judge, at the request of the State Engineer, dismissed the claim. The administrative law judge agreed with the State Engineer that his claim was barred by res judicata and collateral estoppel, which are doctrines that support the finality of judgments by prohibiting relitigation of claims or issues that were raised or could have been raised in a prior action between the same parties or their privies, and which were resolved by final decisions of an administrative agency.

In additional actions, the State Engineer issued administrative orders regarding excess fill placed below the ordinary high watermark, illegal water wells and water use, and orders canceling water permits for nonuse.

Information Technology Section

The State Water Commission utilizes information technology in almost all aspects of water resource management. The primary responsibility of the IT section is to provide the technology support required to fulfill the array of agency functions.

Over the past decade, the agency has developed considerable technology infrastructure for data storage and analysis required to meet the agency's water resource management responsibilities. However, the increasing demands associated with water management has resulted in changes in both the type of data collection efforts and the types of tools required to perform the necessary analysis. The agency has had to make significant changes to it's IT infrastructure including enhancements to data storage, desktop computing, production equipment, and training for agency staff as a result of the changing data and analysis requirements.

The agency's IT infrastructure was redesigned during the 2001-2003 biennium to build a framework to meet the challenges that are anticipated over the next decade and beyond. With increasing emphasis on spatial relationships, geographic information

systems (GIS) and related technologies will play a expanded role in managing North Dakota's water resources.

A GIS position was added to the IT section in August 2001 to begin the process of building the agency's GIS infrastructure. The State Water Commission has worked closely with the State GIS Technical Committee and Information Technology Department to build infrastructure necessary to accommodate GIS needs throughout the state. During the 2001-2003 biennium, the State Water Commission processed much of the base data now available on the State GIS Hub.

The agency's GIS infrastructure was effectively completed in January, 2003. Initial efforts focused on groundwater and atmospheric data management programs. Preliminary tools that provide very basic integration of the data with the GIS infrastructure have been completed. Internal integration, web based mapping services are now completed for these areas and are available via the agency web site (http://www.swc.state.nd.us/mapservices.html). Currently, work is progressing on integrating appropriation permits, irrigation, annual use, dams, drains, and other retention structures data into the system. A more extensive "tool-base" is in development.

Related to the GIS infrastructure, information including paper maps and aerial photographs are being assimilated into the system. These include approximately 2,800 Government Land Office plat maps representing the original statewide government survey of North Dakota and more than 20,000 color infrared aerial photographs owned by the agency. This data will eventually become publicly available via the State GIS Hub.

Atmospheric Resource Board

The Atmospheric Resource Board (ARB) is a quasi-judicial, quasi-legislative advisory and rule-making board under the supervision of the State Water Commission. ARB staff are co-located with the SWC, and function as a division of the Commission.

The primary function of the ARB is to ensure the safety of the public concerning the effects of planned weather modification operations (cloud seeding). This is in part accomplished through the licensing, permitting, and record keeping of all such operations. Research to assess and improve cloud seeding technology is also mandated by law. ARB's rules and regulations governing cloud seeding are periodically reviewed and updated to ensure environmental and public safety, and that the operational techniques remain at the forefront of the technology. Rules and regulations promulgated by the ARB define the qualifications, procedures, and conditions required for the issuance of licenses and permits.

The Atmospheric Resource Board is comprised of ten members. Seven are appointed by the Governor; the others are ex-officio and include the State Engineer, the Director of the State Aeronautics Commission, and a representative of the Environmental Section of the Department of Health.

North Dakota Cloud Modification Program

The North Dakota Cloud Modification Program (NDCMP) served six western counties during the 2001-2003 biennium. These were Bowman, McKenzie, Mountrail, part of Slope, Ward, and Williams. At the conclusion of the biennium, the project target area covered 6.7 million acres of western North Dakota.

The NDCMP has two goals: the suppression of damaging hail, and the enhancement of rainfall. Hail suppression, however, continues to be the primary motivation of the sponsoring counties.

Suitable clouds over two multi-county operational districts were treated during June, July, and August of each summer of the biennium. Eight twin-engine aircraft operated by Weather Modification, Inc., of Fargo, were deployed under contract to the ARB and participating counties. Operations were directed by project meteorologists from radar operations centers based in Bowman and Stanley, North Dakota.

The most recent evaluations of the program indicate a 45 percent reduction in crop-hail losses, a six percent increase in wheat yields, a 10 percent increase in rainfall, and a total economic benefit to cost ratio of 40 to 1 in the target counties.

WDMP Spells Cloud Seeding Research

In 2002, Congress provided $2,000,000 for the Weather Damage Modification Program (WDMP), which is intended to provide the means for states to conduct research and evaluation efforts of cloud seeding. The program is administered by the U.S. Bureau of Reclamation and requires a 50 percent cost-share match for research activities. Current expenditures for cloud seeding operations can be counted toward the matching requirement. This is the first federal funding of cloud seeding research since the National Oceanic and Atmospheric Administration's Atmospheric Modification Program ended in 1994.

North Dakota's research has been focused on three topics: cloud seeding impacts on rainfall; the potential enhancements of the operational use of the NEXRAD Doppler radar systems; and atmospheric measurements of cloud condensation nuclei, which determine in large part the types of clouds that form over North Dakota. These initial studies will assess the current capability of the program and lay the groundwork for follow-up studies in subsequent years.

In addition to the research funding approved by Congress in 2002, another $2 million was approved by Congress for the WDMP for 2003. ARB recently submitted its proposal to the Bureau of Reclamation for 2003 funding. The request proposes numerical computer modeling of the potential for hygroscopic seeding in North Dakota to increase rainfall and reduce hail damage. Hygroscopic seeding, which uses microscopic salt particles, has demonstrated significant rainfall increases from convective clouds in experiments conducted in Thailand, South Africa, and Mexico. If modeling indicates potential for hygroscopic seeding in North Dakota the next step would likely involve a seeding demonstration experiment.

Environmental Study for Montana Buffer Zone

During the biennium, ARB submitted an application to the Montana Department of Natural Resources and Conservation (MDNRC) for a permit to seed clouds over Montana, upwind of North Dakota target counties. According to Montana law, an Environmental Impact Statement (EIS) is required as part of the permit application. The EIS would be conducted by the Montana Department of Natural Resources and Conservation with the costs billed back to the applicant. Montana DNRC estimated costs for the EIS to be approximately $140,000. Before an EIS is conducted, however, other requirements must be fulfilled. ARB has been issued a license to operate in Montana, but to this point has been unable to satisfy MDNRC requirements for proof of financial responsibility. MDNRC administrative rules require up to $10 million in liability insurance or surety bond "for the effects of weather modification." Though MDNRC has the authority to accept "other reasonable alternatives," it has rejected the first two proposals from ARB. Unless and until this issue can be resolved, the prospect of acquiring a buffer zone in eastern Montana will be stalled.

Operations and Safeguards Panel Report

In January of 2003, ARB convened a panel of experts in weather modification, radar meteorology, numerical modeling, weather forecasting, and law to review the operations and safeguards procedures of the NDCMP. The panel was chaired by Dr. Harold Orville, Distinguished Professor Emeritus of Meteorology, South Dakota School of Mines and Technology. Dr. Orville has more than 40 years of experience in the field of weather modification and has published more than 80 papers in refereed scientific journals. Panel members included: Ms. Denise Banaszewski, Attorney, Stokes Lawrence P.S., Seattle, Washington; Dr. James Heimbach Jr., Professor Emeritus of Atmospheric Sciences, University of North Carolina at Asheville; Mr. Leon Osborne, Professor of Atmospheric Sciences, University of North Dakota; Dr. Paul Smith, Professor Emeritus of Meteorology, South Dakota School of Mines and Technology; and Dr. William Woodley, President, Woodley Weather Consultants.

During the two-day meeting, ARB staff presented information on all aspects of the NDCMP, and answered questions from the panel. The panel's final report was delivered to ARB on March 10, 2003. Some of the more important recommendations and findings of the panel included:

- Conversion of paper-based recordkeeping to an electronic equivalent.
- Prepare a contemporary operational weather forecasting manual to identify data resources and ensure quality control.
- Analyze past seeding cases to better determine the effectiveness of operations.
- Collaborate with other states interested in hygroscopic seeding for hail suppression and/or rain enhancement.
- Overwhelming evidence suggests that dry ice and silver iodide seeding pose no environmental problems.
- Evidence suggests cloud seeding does not cause drastic effects downwind of target areas, rather, effects are relatively small. A study to better quantify downwind effects of the NDCMP should be undertaken.
- Continue to utilize NDCMP safeguards procedures.

Much of this work is already underway and will continue into the 2003-05 biennium.

Electronic Recordkeeping Systems Developed and Deployed

As required by law, detailed records are kept for every flight conducted by NDCMP seeding aircraft. One of the recommendations of the Operations and Safeguards committee, which conducted a thorough review of the NDCMP earlier this year, was a transition from paper records to a system utilizing a digital format.

Two such systems have been in development since the spring of 2003. The first system uses a Palm Pilot personal digital assistant wirelessly interfaced with a GPS. It was field tested by two NDCMP seeding aircraft during the 2003 project. The system collects location information from the GPS at a prescribed time interval during flight in addition to storing data input by the pilot crew. Flight data can then be uploaded to the ARB database in Bismarck via standard telephone line. During the testing phase, modifications were made in response to software operation and user input. The current timetable for full deployment is June of 2004.

In addition to the aircraft system, a new meteorological recordkeeping system was developed and deployed in time for the 2003 NDCMP. Meteorological and operational records are entered through a user interface developed in-house. These data are then uploaded directly to the ARB database in Bismarck on a daily basis.

Both systems provide better data organization and accessibility for real-time operational use by NDCMP pilots and meteorologists. Additionally, project information will be more readily accessible for post-analysis, project evaluations, and requests from the public.

Student Intern Programs Continue

ARB continued funding the field presence of intern copilots from the University of North Dakota's John D. Odegaard School of Aerospace Sciences during the last biennium. Since the board's inception in 1975, approximately 300 intern pilots have logged more than 20,000 hours of flight time in the conduct of cloud seeding operations in North Dakota's skies. In addition to recording the time, location, duration, and meteorological conditions during all seeding and reconnaissance missions, the pilots are fully qualified to fly the aircraft, providing an additional safety margin.

A total of 18 pilot interns were engaged in NDCMP operations during the biennium. All were trained at UND for a full academic year prior to their participation. After completion of a season as an intern pilot, the interns meet ARB experience requirements for project pilots-in-command (PIC). The relationship between ARB and UND is the only one of its kind in the United States and provides a significant percentage of qualified cloud seeding pilots for projects elsewhere in the U.S. and around the world.

Funding for the pilot intern program was cut for the 2003-05 biennium in order to meet the 95 percent budget required by the Governor. Extenuating circumstances regarding the Fair Labor Standards Act and proper reimbursement practices under internship programs were also involved. In prior years a stipend of $32.50 per day was paid to help defray cost of living expenses. Due to the cuts, intern pilots participated in the 2003 NDCMP as volunteers. The primary motivation of the interns has always been flight time and experience, however, if lack of funding causes hardship and reduces participation in the program, funding will have to be reconsidered.

Since the summer of 1996, ARB has also retained undergraduate students majoring in atmospheric science as intern meteorologists. These students assist NDCMP field meteorologists at radar-equipped operations centers. During the 2001-2003 biennium four additional students excelled in this capacity. Like the intern pilots, intern meteorologists continue to demonstrate their enthusiasm and dedication to the NDCMP and provide a pool of better qualified persons to serve future projects as radar meteorologists.

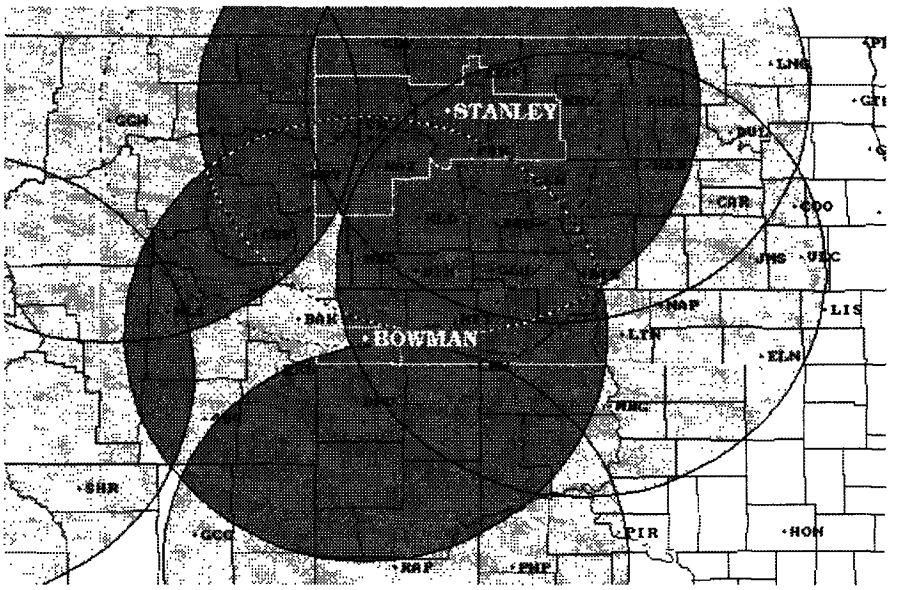
Weather Radars Continue Operations, Savings

Surplus National Weather Service WSR-74C radars, obtained and deployed by ARB during the 1997-1999 biennium, continued to operate at a savings to the project during the last biennium. Radars were deployed in facilities built at the Bowman and Stanley airports. Prior to 1997, radar facilities were leased from a contractor at an annual cost of approximately $35,000 per radar per year. Since that time, ARB-owned radars have operated at less than one-quarter the cost of the leased systems.

In addition to the two operating radars, ARB also obtained another complete system to be used for spare parts. The federal government's surplus parts inventory will be available to ARB at some point in the future when the National Weather Service retires the two remaining WSR-74C radars it still operates. Retirement dates, however, are yet to be determined.

During the last biennium, preventative maintenance and system calibrations were conducted on a weekly basis, keeping unscheduled maintenance to a minimum. Including down time for scheduled and unscheduled maintenance, radars operated better than 98 percent of the time.

The Stanley radar is sited roughly midway between the National Weather Service (NWS) radar at Williston and the Minot Air Force Base radar near Deering, which makes it a good backup if either of the NWS sets should fail.



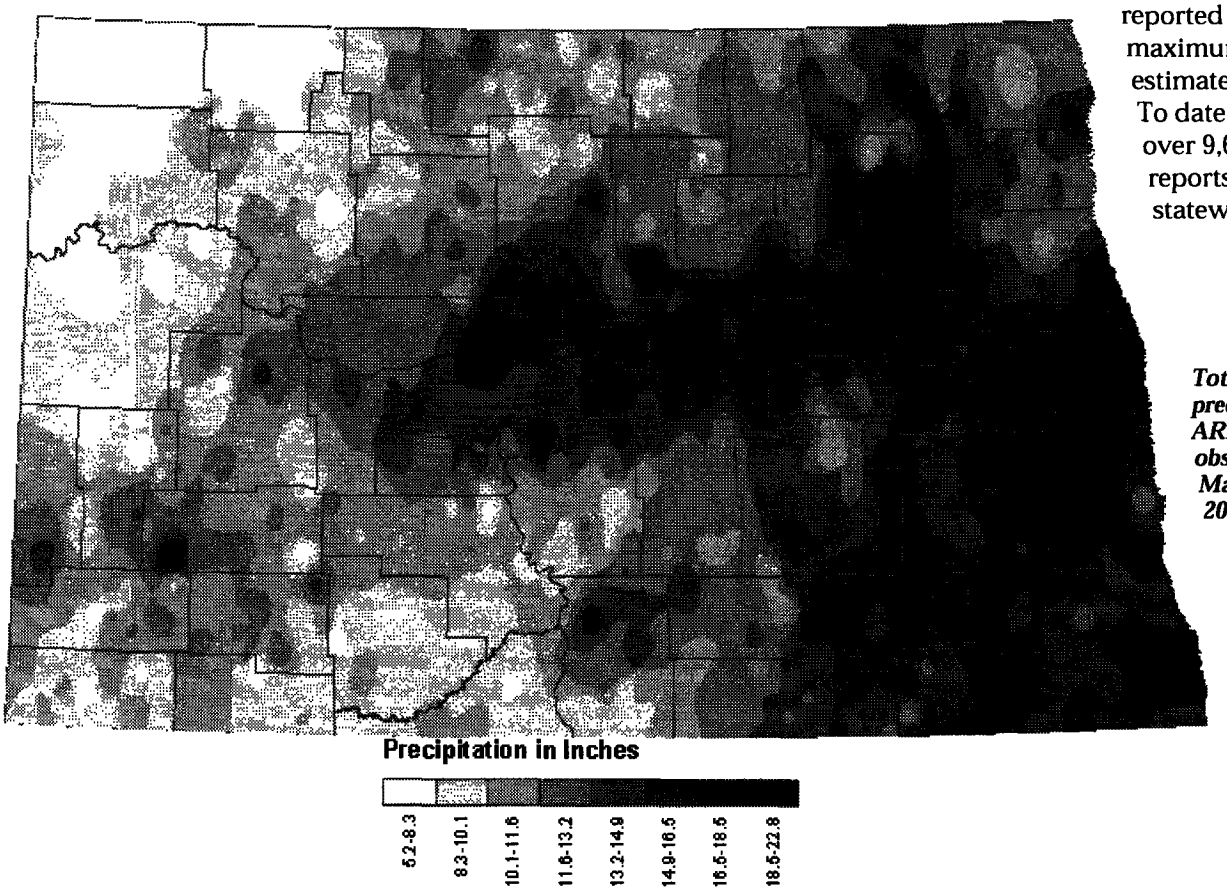
NDCMP radar coverage over western North Dakota, eastern Montana, and northwestern South Dakota. The diamond-shaped area indicates where National Weather Service doppler radars have inferior coverage.

The Bowman radar is sited at the coverage limits of the NWS radars located at Bismarck, Billings, Glasgow, Rapid City, and Williston, and thus provides low atmosphere coverage of southwestern North Dakota, southeastern Montana, and northwestern South Dakota not available from NWS radars.

Statewide Growing Season Precipitation Observations

Again during the last biennium, the ARB operated a statewide growing season (April through September) cooperative observer network (ARBCON) numbering about 800 volunteer observers, building on a database going back to 1977. Every morning each observer recorded the rainfall received in the preceding 24 hours. In the event more than one inch of rain was received in any 24-hour period, observers immediately called in their rainfall report directly to the National Weather Service offices, where the data were used by hydrologists for short-term forecasting, and if necessary, in the issuance of flood watches and warnings. Since the gauge type employed by the network is not suitable for measuring snow, snowfall measurements are not attempted.

If hail is observed, the starting and ending times are reported along with maximum size and an estimate of damage. To date, there are over 9,600 hail reports in the statewide database.



Total reported precipitation from ARBCON observers for May-September 2003 rainfall.

Rain and hail data, as well as monthly and annual precipitation maps can be accessed and downloaded by the public directly, through the ARB web site. A number of state and federal agencies also frequently access the database. The data have proven to be very helpful in the assessment of excess rainfall and attendant flooding as well as drought.

During the biennium, ARB completed a subcontract research agreement with the University of Iowa to complete a baseline comparison study of ARBCON versus the National Weather Service network. ARBCON was chosen by University of Iowa researchers as one of five precipitation networks worldwide to be used as ground truth verification for satellite-based precipitation measurement systems. Results of the comparison show ARBCON observations compare very well with NWS observations with a correlation coefficient better than 0.99.

Interaction with State and National Organizations

The ARB is an active member of many state, national, and international organizations with mutual interests. During the last biennium, ARB staff worked with these groups to forward the goals and objectives of the board.

In North Dakota, ARB has worked toward water supply and weather damage mitigation goals with the ND Water Coalition, ND Weather Modification Association, and the ND Water Education Foundation. Nationally, the ARB has been active in the Weather Modification Association and the North American Interstate Weather Modification Council. The Council effort was successful as Congress appropriated $4 million for the Bureau of Reclamation's Weather Damage Modification Program for fiscal years 2002 and 2003.

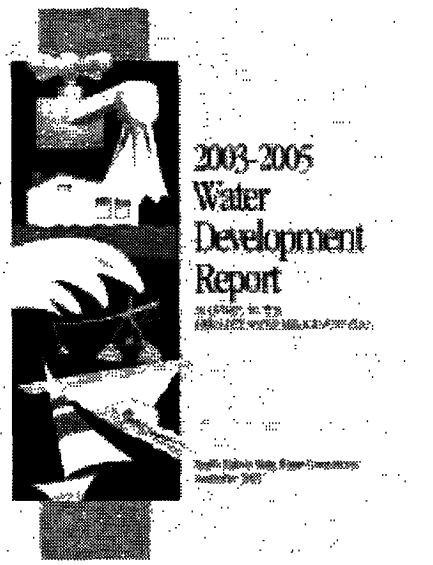
Planning and Education Division

The primary responsibility of the Planning and Education Division is to maintain and update the State Water Management Plan for the State of North Dakota. Division staff also participate in numerous regional, state, and local water resource planning activities; manage the agency's water education programs; manage the Drought Disaster Livestock Water Supply Project Assistance Program; and coordinate the Environmental Protection Agency's Wetlands Protection Project Grant for the State of North Dakota. Specific staff responsibilities include:

- Maintaining a water project inventory and water management plan to promote efficiency in meeting North Dakota's future water development and funding needs;
- Leading or participating in special studies that result in water resource and related land management plans;
- Monitoring water resource issues and determining possible impacts to North Dakota's water management objectives;
- Representing the State Engineer and State Water Commission on regional, national, and international natural resource planning bodies such as the Red River Water Resources Council, the Pembina River Basin Advisory Board, the Red River Basin Institute, Red River Basin Commission, and the Lewis and Clark Advisory Committee, to name a few;
- Providing opportunities for adults and students to increase their understanding about North Dakota's water resources and how these resources are managed;
- Reviewing applications and meeting with applicants to determine eligibility for cost-share under the Drought Disaster Livestock Water Supply Project Assistance Program; and
- Coordinating statewide efforts by various agencies, organizations, or special interests to conserve and enhance North Dakota's wetland resources through the Environmental Protection Agency's wetlands protection grant program.

2003-2005 Water Development Report

In 2002, the Planning and Education Division completed the 2003-2005 Water Development Report (WDR). The purpose of the 2003-2005 WDR is: to serve as a supplement to the 1999 State Water Management Plan (SWMP); to provide up-to-date information regarding North Dakota's current



2003-2005 Water Development Report.

and future water development project needs; to provide current information regarding North Dakota's ability to fund those water development needs; and to serve as a formal request for funding from the Resources Trust Fund during the 2003 Legislative Session.

By virtue of North Dakota Century Code, Section 61-02-14, Powers and Duties of the Commission; and Section 61-02-26, Duties of State Agencies Concerned with Intrastate Use of Disposition of Waters, the Commission is required to develop and maintain a comprehensive water plan for the sound management of North Dakota's water resources.

Devils Lake Basin Water Management Planning Efforts

Planning and Education Division staff played an integral role in assisting the Devils Lake Basin Joint Water Resource Board in their efforts to review and update the Devils Lake Basin Water Management Plan (DLBWMP) - initially completed in 1995. This conceptual plan is a critical component of the state's multi-pronged approach to solving flooding problems of the Devils Lake basin.

The primary objective of the 2002 update of the DLBWMP was to involve local citizenry for their experience and expertise. Through that process, four subject committees (agriculture, economic development, recreation, and wildlife and fisheries) were created to represent the four broad areas of interest in the basin. As part of this process, the Planning and Education Division provided technical planning assistance, as well as staff resources for re-writing and publishing the document and associated website.

During the 2001-2003 biennium, the Extended Storage Acreage Program (ESAP) continued to be administered. Under ESAP, contacts for floodwater retention are arranged for ten-year periods. There are currently eight landowners participating in the ESAP program in the Devils Lake basin. Just under 400 acres are under contract, with available storage of 800 acre-feet annually.

Wetlands Protection Grant Administration

The U.S. Environmental Protection Agency (EPA) funded Wetlands Protection Project Grant program continues to be administered by Planning and Education Division staff for all state and local governmental recipients in North Dakota. The wetlands grant program funds a broad spectrum of projects related to developing, protecting, managing, and enhancing North Dakota's wetland resources.

Under the Fiscal Year (FY) 2001 Wetlands Protection Project Grant cycle, the Planning and Education Division developed contracts for the completion of, and monitored the progress of, four projects:

1. The North Dakota Water Education Foundation conducted regional wetland workshops and demonstration field tours.

2. A private contractor assisted the Commission with the development of 12-digit Hydrologic Unit Maps for the entire Devils Lake Basin, Upper James River, Elm-Maple Rivers, Western Wild Rice River, Pipestem Creek, and James River Headwaters basins.

3. The North Dakota Natural Resources Trust conducted demonstrations of conservation agriculture for preserving wetlands on the property of four drift prairie farmers. This was the second of a five-year Conservation Agriculture Project effort.

4. The North Dakota Department of Health, in cooperation with North Dakota State University, developed an Index of Biological Integrity for vascular plants in the Missouri Coteau region of North Dakota.

Under the FY 2002 Wetlands Protection Project Grant cycle, the Planning and Education Division developed contracts for the completion of, and monitored the progress of two projects:

1. The North Dakota Department of Health project involves their sponsorship of two annual workshops that will bring personnel from state and tribal water quality monitoring and natural resource agencies together with federal agencies, academia, and private wetland conservation groups. The first workshop is designed to develop the framework for a workgroup and to develop specific shared goals relating to wetland assessment methodologies and program development. The second workshop will build upon relationships and experience gained in the first workshop and to develop a framework to continue the workgroup into the future.

2. The University of North Dakota, Earth System Science Institute project relates to the assessment of wetland quality using satellite and remote sensing.

Red River Basin Planning Efforts

In 2002, the Red River Basin Board, the International Coalition, and the Red River Water Resources Council combined into one organization, now known as the Red River Basin Commission (RRBC). Throughout that process, Planning and Education Division staff provided insight and technical support toward the merger process.

Throughout the 2001-2003 biennium, Planning and Education Division staff members also actively contributed to the RRBC's planning and education advancements through involvement on several committees. In recent years, planning staff members have served on the RRBC's Plan Management and Communications Committees, as well as the interim board while the organizations were merging.

The RRBC is regarded as the primary facilitator in advocating and resolving water and land management issues from a basin-wide perspective. The Commission supports efforts that promote basin-wide goals and objectives that result in cooperation and coordination among varied water management organizations and interests.

Red River Valley Water Supply Studies

As directed by the Dakota Water Resources Act, the State Water Commission is assisting in a technical capacity with the completion of a Red River Valley water supply study. The Red River Valley study and Environmental Impact Statement will include a comprehensive analysis of all reasonable alternatives to meet the municipal, rural, and industrial water supply needs of the Red River Valley. All proposed alternatives will be examined equally. As part of this effort, Planning and Education Division and other agency staff provide technical assistance as members of the study technical team. The technical team is responsible for day-to-day operations of the studies or tasks and for the evaluation, analysis, and detailed review of technical material and data developed during the course of the various tasks.

Red River Resources Council

The Red River Resources Council is a quasi-governmental, nonprofit corporation formed to facilitate cooperation and coordination on water management issues in the Red River basin. The Council includes North Dakota, Minnesota, Manitoba, and several federal agencies. The Council still exists as a unique entity, but most activity is in conjunction with the RRBC. Planning Division staff continue to provide administrative support on the Council, and as part of the agency's involvement with the RRBC.

Interagency Project Reviews

Planning and Education Division staff continue to conduct and coordinate interagency environmental reviews involving projects associated with Community Development Block Grants and Loans, highway improvements, airport improvements, dike/levee projects, water storage impoundments, municipal water supply projects, and various federal and state water, land, and wildlife management plans. On average, 17 inter-agency environmental reviews were conducted monthly during the 2001-2003 biennium.

Environmental review comments address compliance requirements involving State Engineer and State Water Commission regulatory responsibilities in issuing permits pertaining to water appropriation, floodplain management, sovereign lands, and the construction of dikes, levees, dams, drains, and water holding ponds. Staff members also provide information concerning the location of wells and benchmarks.

Missouri River Management

As part of multiple lawsuits that were filed by the State of North Dakota against the U.S. Army Corps of Engineers regarding their management of the Missouri River system, the Planning and Education Division provided technical assistance and coordinated research to strengthen the state's position in those efforts. In order to provide insight as to how North Dakota's economy would be impacted by negative impacts to the recreational fishery on Lake Sakakawea, the Planning Division coordinated a Phase I study that was conducted by three natural resource economists in the spring of 2003.

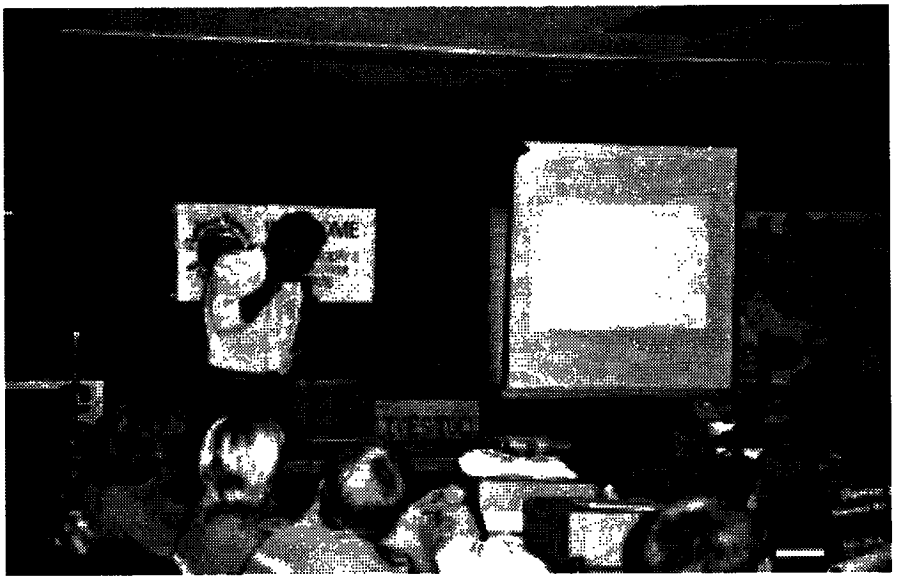
The Planning Division also continued to provide support toward the U.S. Army Corps' ongoing revision of the Missouri River Master Water Control Manual. Staff members also provided technical support in developing the Missouri River corridor concept plan.

Pembina River Basin Water Management Plan

Division staff continued to participate on the Pembina River Basin Advisory Board as technical advisors, during the 2001-2003 biennium. With the "Framework for a Pembina River Basin Management Plan" completed, division staff members have continued to provide support to assist in the execution of the Board's planning goals and objectives.

Project WET

The North Dakota Project WET (Water Education for Teachers) program began in 1984 and became the pattern for a National WET program that now involves 49 states and several foreign countries. Growth of the national program has provided new education tools that have enhanced student learning experiences. Division staff have been active in building the national program, and in addition, have expanded North Dakota's program with the innovative *Explore Your Watershed* extension of WET.



Bruce Engelhardt, State Water Commission, gives a presentation on Missouri River basin issues at the Project WET Summer Institute.

National WET program materials and new materials developed by division staff for North Dakota are aimed toward preschool, daycare, grades K-12 students, and formal educators, pre-service teachers, youth group leaders (i.e. Boy Scouts and 4H), natural resources education specialists, and other non-formal K-12 educators.

The *Explore Your Watershed* program promotes an interdisciplinary approach requiring significant staff coordination with specialists from several facets of public school education and natural resource management. *Explore Your Watershed* has expanded the traditional teacher workshop offerings with water festivals, intensive teacher institutes, and special youth and community programs.

Graduate credit and non-credit offerings were made available throughout the biennium. Training during the biennium reached 347 K-12 teachers, 12,780 K-12 students, 46 pre-service teachers, 2,180 community members, and 47 non-formal teachers and natural resource managers.

North Dakota Water Magazine - Oxbow & Primer

Since 1993, various water interests in North Dakota have pooled resources through the North Dakota Water Education Foundation to publish a magazine titled *North Dakota Water*. This magazine provides a broad spectrum of high quality information about the state's water resources to the widest possible audience. Over the course of the 2001-2003 biennium, average monthly distribution of the magazine was approximately 11,000. Readers include the general public, local, state, and federal agencies, and elected officials.

The Planning and Education Division develops the State Water Commission's contribution— a two-page section called *The Oxbow* and a feature page titled *The Water Primer*. The former is designed to inform readers about the State Water Commission's projects and programs as well as local, state, and national water management issues. The latter highlights interesting or little known facts about water and related land resources.

Drought Disaster Livestock Water Supply Project Assistance Program

In an effort to support North Dakota's agricultural producers during recent years of drought, the State Water Commission reinstated the Drought Disaster Livestock Water Supply Assistance Program in August, 2002. The livestock watering program provides cost-share assistance to producers living in, and adjacent to, those counties identified by the Governor as "drought emergency areas."

During the 2001-2003 biennium, the Planning and Education Division, which manages the program, recommended 120 applicants for cost-share assistance to construct emergency livestock water supplies. Of those 120 approvals, 57 producers completed their projects and were reinbursed $97,154, for an average assistance amount $1,704 per producer. Under this program, 50 percent of eligible costs can be reimbursed, with a maximum amount of $3,500 per producer.

Other Governmental and Non-governmental Organization Involvement

The Planning and Education Division also participated, to varying degrees, on several other governmental and non-governmental organizations, providing input from the State Engineer's and State Water Commission's perspectives. During the previous biennium, staff were involved with the Army Corps-sponsored Fargo-Moorhead and Upstream Feasibility Study, Grand Forks/East Grand Forks Greenway Alliance, Little Missouri State Recreation River Committee, Devils Lake Outlet Advisory Committee, the Governor's Lewis and Clark Advisory Committee, Friends of Lake Sakakawea, and the State Stewardship Coordinating Committee.

Water Appropriation Division

The Water Appropriation Division is responsible for the appropriation and management of the state's water resources in accordance with the Doctrine of Prior Appropriation to serve the needs of present and succeeding generations of North Dakota citizens. The following principal activities fulfill these responsibilities:

- Identify the availability and chemical quality of the state's water resources.
- Assist municipalities and other public entities in developing solutions to particular water supply problems.
- Assess the impacts of existing water supply development on ground-water levels, streamflow, and chemical quality of water for purposes of future allocation and management.
- Collect, store, and disseminate data on streamflow, ground-water and lake levels, water quality, and water use.
- Carry out the administrative procedures required for water permit applications, water permits, and water rights.
- Conduct analyses and provide recommended decisions to the State Engineer on water permit applications.
- Develop and maintain a system for the storage and retrieval of water permit records.
- Monitor through annual water use reports, the utilization of each conditional and perfected water permit, and maintain a permanent record.
- Participate in committees and task forces pertaining to water quantity and/or quality issues as required.

Major Activities (2001-2003)

The program for collecting water resource data involves several aspects of the water resource spectrum. The major components of the program are the collection of samples for water quality analyses from surface and ground waters, the collection of water-level data from surface and ground waters, water use data from surface and ground waters, and flows from surface waters.

During the biennium 3,830 water samples were analyzed for chemical constituents. These samples were collected from streams at gage stations, selected observation wells and production wells, and selected surface water bodies. These data are used to determine the suitability of the chemical quality for beneficial use, to interpret areal hydrology, and to assess changes in the quality resulting from the stresses of both man-induced processes like pumping, and natural processes caused by climatic variations.

Over 3,500 wells and surface water bodies are measured for water levels. These are predominantly observation wells, but some lakes, sloughs and production wells are measured. These data reflect the changes in the surface and ground waters resulting from natural variations and pumping for beneficial use. These data are essential for making decisions on water permit applications and overall water management, present and future.

The agency supports the operation of 43 streamflow gages as a part of the cooperative program with the U.S. Geological Survey (USGS). The cost of these gages is shared equally by the State Water Commission and the USGS. Additionally, at about 20 sites distributed around the state, stream or spring flows are measured for specific studies.

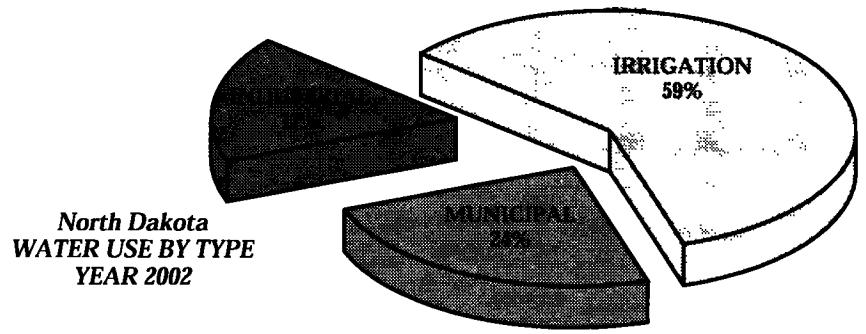
Water use information is submitted annually by holders of more than 2,850 water permits. Approximately 600 additional permits have the associated water use estimated based upon evaporative losses from reservoirs. This information is essential for evaluating the impacts of withdrawals authorized by water permits on ground-water levels and streamflow, and making decisions on water permit applications. The pie chart on page 17 shows the relative volume of use by the major categories in 2002.

The bar graphs on page 17 show the trend for the last 11 years for each of the three major categories of use (irrigation, municipal, and industrial).

Water permit applications for the 2001-2003 biennium and a summary of the actions taken on them are listed in the table on page 17.

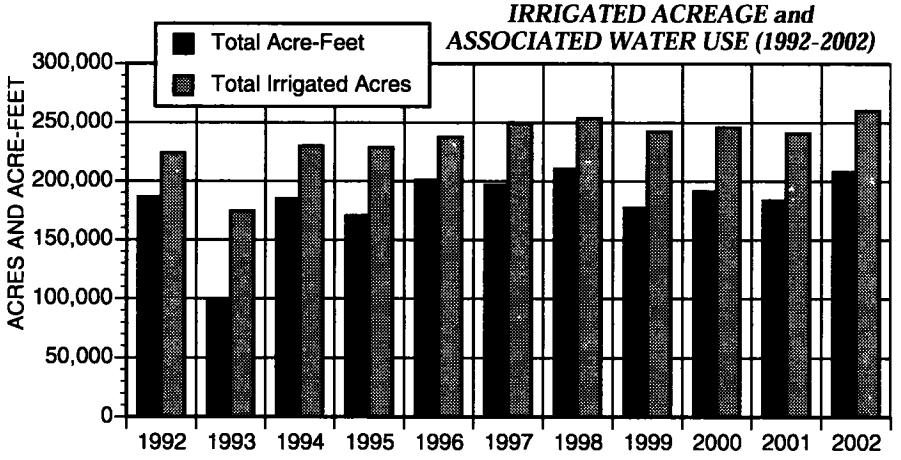
There were 156 conditional water permits perfected during the biennium. These water permits had been approved earlier, and had been fully developed. After being inspected, reports on these inspections were written and the permits were perfected.

The Northeastern Irrigation District, located in Grand Forks County, was created in early 2002. The area covered by this district is about 4,750 acres. All of the acreage covered by the Northeastern Irrigation District is currently irrigated with wells pumping ground water from the Inkster and Elk Valley aquifers.

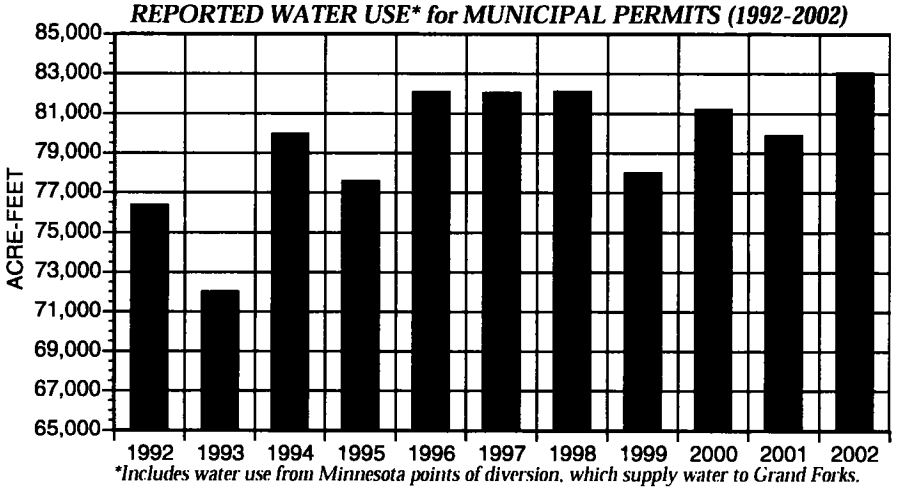


North Dakota
WATER USE BY TYPE
YEAR 2002

IRRIGATED ACREAGE and ASSOCIATED WATER USE (1992-2002)

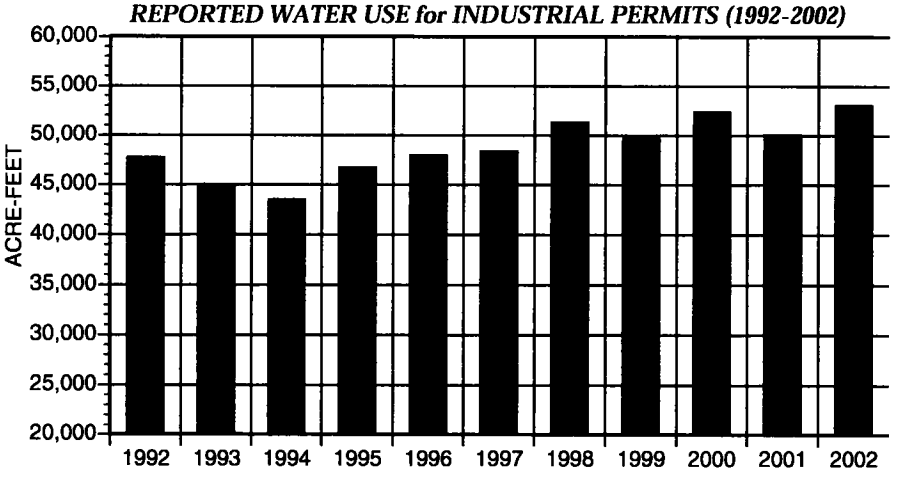


REPORTED WATER USE for MUNICIPAL PERMITS (1992-2002)*



**Includes water use from Minnesota points of diversion, which supply water to Grand Forks.*

REPORTED WATER USE for INDUSTRIAL PERMITS (1992-2002)



Water Permit Summary July 1, 2001-June 30, 2003

WATER USE	ACRE-FEET
Irrigation	
Applications filed: 74	
Acres requested: 21,318	
Acres granted*: 6,139	
Water granted*	9,385
Ground water	5,925
(4,307 acres)	
Surface water	3,460
(1,832 acres)	
Flood Control	
Applications filed: 1	
Water granted	32
Storage granted	162
Industrial	
Applications filed: 24	
Water granted*	6,694
Livestock	
Applications filed: 1	
Water granted	7
Storage granted	46
Municipal	
Applications filed: 4	
Water granted*	886
Recreation, Fish, and Wildlife	
Applications filed: 28	
Storage granted*	24,845
Annual use granted*	3,549
Rural Domestic	
Applications filed: 2	
Water granted	325

TOTAL Applications Filed: 134

TOTAL Water Granted ... 20,878

**Includes backlog—permits applied for in previous bienniums.*

The Big Bend Irrigation District, located along the Missouri River in Oliver County, was also created in early 2002. The area covered by this district is about 4,500 acres. Almost half of the acreage covered by the Big Bend Irrigation District is currently irrigated with water from the Missouri River.

The Horsehead Irrigation District was created in 2003. The land is located beginning seven miles south of the Emmons/Burleigh County line and sporadically along the Missouri River south to the North Dakota/South Dakota state line just north of Pollock, South Dakota. There are another six quarters of land that are located southwest of Linton, North Dakota. This land is irrigated with ground water from the Strasburg aquifer. There are about 8,000 acres included in the district that were at one time irrigated with water from Lake Oahe. Because of low lake levels, a large percentage of the land now relies on ground water to supply water for irrigation.

During the 2001-2003 biennium, the division was involved in the following studies that are in progress:

• A surface- and ground-water sampling plan was designed for Camp Grafton South, Eddy County. This plan called for major sampling of surface water bodies and the Cherry Lake aquifer. The samples were analyzed for pesticides, inorganic contaminants, munitions and explosives, diesel, and fuel oil contaminants. The sampling was completed in 2001 and a report (SWC Water Resource Investigation No. 37) was completed and submitted to the North Dakota National Guard in 2002. A supplemental report in the form of a memorandum will be provided to the National Guard in the fall of 2003. A plan for the next major sampling of Camp Grafton South will be written in 2005, and the next major sampling will be undertaken in 2006. The latest sampling, and all ongoing samplings are part of an ongoing monitoring and sampling process, which began in 1991, and is reevaluated and repeated approximately every five years, with some supplemental sampling in interim years.

• The State Water Commission, the University of Leeds (United Kingdom), and the Energy and Environmental Research Center of the University of North Dakota are engaged in a joint project investigating the sources of sulfate in the Elk Valley aquifer, Grand Forks County. Two sets of wells were constructed and aquifer matrix materials were sampled to determine sulfate distribution and sources. Sampling of the first set, consisting of six nests of wells, has been completed and wells were decommissioned in 2002. Sampling of the second set, constructed in the fall of 2001 and consisting of three nests of wells placed in the deep aquifer and the underlying silt, till, and shale, is still ongoing. One supplemental report, identifying sources and processes controlling chloride concentrations in the aquifer, and drainage rates in the underlying till and shale, has been written and was under review as of June 30, 2003. The report on sulfate sources will be completed in 2004.

• The Minnesota portion of field measurement for a project involving several agencies in Minnesota and North Dakota, investigating denitrification in seven aquifers located in the two states, is near completion. The project was funded through an EPA Section 319 grant for both states. The SWC and UND are currently taking grain matrix samples on all sites. Annual reports (memoranda) of progress have been provided by UND to the State Health Department and the SWC. A first major report on the Elk Valley aquifer site was submitted to a journal for review (by UND). Reports on the other sites are in progress. Monitoring of the three North Dakota sites (Elk Valley aquifer, Warwick aquifer, and Kidder County aquifer) were extended for three more years.

• A ground-water study of nitrate contamination in the Karlsruhe aquifer in McHenry County has been in progress since December 2000. This is a 5-year study with extensive instrumentation involving multi-port samples. The study incorporated a UND student majoring in geology and the Department of Health. Annual reports were completed for 2001 and 2002 sample years, and will be provided in 2003 and 2004, pending a final report to be completed in 2005.

• A study of denitrification in the Karlsruhe aquifer in McHenry County has been initiated by the SWC and Health Department, in cooperation with the Geology Department of UND. It consists of two projects conducted by two graduate students working under Dr. Scott Korom. The first project involves placement of an apparatus for measuring denitrification in the Karlsruhe aquifer. Placement was completed in June 2003, and measurements were initiated shortly thereafter. A report on results is expected in December of 2004. Measurements may continue beyond that time. The second project involves sampling for, and measurement of nitrogen isotope tracers to determine the distribution of denitrification over the extent of the aquifer. Samples will be taken from multi-port samplers at four sites in fall, winter, and spring 2003-04. A final report is expected by December of 2004.

• A ground-water study of the southern half of Richland County is in progress. The study is in a preliminary phase involving the acquisition of basic hydrogeologic data for the study area.

• The International Souris River Board (ISRB) assigned the Natural Flow Methods Committee (NFMC) to examine methods to determine the diversion of natural flow at the Sherwood Crossing by Rafferty and Alameda Reservoirs, and to recommend a preferred method to the ISRB.

In 2000, the Co-Chairs of the ISRB formed a task force to review the 1999 flooding in the portion of the Souris River Basin downstream of the Saskatchewan/North Dakota border and report their findings to the Co-Chairs. The task force was also to review the operations of the Rafferty and Alameda reservoirs, and the refuge reservoirs in North Dakota according to the flood operation plan established under the 1989 Canada-United States Agreement for Water Supply and Flood Control in the Souris Basin. The final version of the post-flood report incorporating all comments is scheduled for distribution to the ISRB and the U.S. Fish and Wildlife Service by September 30, 2003.

At the June 2, 1994 meeting of the International Souris River Board of Control (Board), the Board was unable to reach agreement on the interpretation of Paragraph 1(a)(i) of Annex B of the 1989 Canada/United States Agreement. As a result, the Board sent the International Joint Commission (IJC) a letter asking them to recommend a course of action for the Board, by September 30, 1994. The IJC asked the governments for direction. Representatives of the governments met in Minneapolis on February 7, 1995, to begin discussions for interpreting the agreement. The representatives reached an agreement to establish terms of reference and agreed to establish steering and technical committees. The State of North Dakota was represented on the committees and has been actively involved in the negotiations regarding the new language. In 2001 the Board received notice from the IJC that indicated the Interim Measures as modified in 1992 have been accepted.

• A ground-water study of the Streeter aquifer is in the report-writing phase. The Streeter aquifer is located in Logan and Kidder Counties. The study incorporates a digital ground-water model analysis of the Streeter aquifer to provide a basis for actions taken on pending water permit applications in the study area.

• A digital ground-water flow-modeling investigation was undertaken to provide an initial assessment of the capability of the Spiritwood aquifer near Warwick to support the current and future water supply needs of the City of Devils Lake. This study provided the basis for the City to determine the need for a more comprehensive study to further define the volume of water that may be withdrawn annually. The study was a cooperative investigation with the City of Devils Lake with the SWC being the lead cooperator. The City of Devils Lake and the SWC shared the cost of the project equally.

• A focused sampling regime of the major public water supplies from ground-water in Grand Forks County was continued during the 2001-2003 biennium. The four major public water supplies (Grand Forks-Traill Rural Water, Tri-county Rural Water, Agassiz Rural Water, and the City of Larimore) obtain their water from the Inkster and Elk Valley aquifers. Twenty-three wells were sampled three to four times per year for the in-depth monitoring program, which began several years ago, and to detect any seasonal or long-term trends with respect to water quality changes. To this point in time, there does not appear to be significant water quality changes in these aquifers.

• Monitoring of the Forest River Colony artificial recharge project was continued during the 2001-2003 biennium. The project involves pumping water from the Forest River during high flow times in the spring into a basin overlying the Inkster aquifer. Water is withdrawn later in the season for irrigation purposes. Without artificial recharge the aquifer would not be able to support the number of acres being irrigated. Mandatory sampling and water level monitoring protocols are given to the permit holder each year before artificial recharge begins.

• A cooperative study with the Minnesota Department of Natural Resources to describe the extent of the Wahpeton Buried Valley Aquifer System (WBVAS) is in the report-writing phase. The WBVAS is located in Richland County, North Dakota, and Wilkin County, Minnesota. The aquifer is the source of water that serves the needs of Wahpeton, North Dakota and Breckenridge, Minnesota, as well as many farms and rural households in both states. It is also the water supply for the Min-Dak Farmers Cooperative sugar beet and yeast processing plants, and the backup supply for the corn wet milling plant operated by Cargill, Inc. The results of the study will serve as a basis for the future management of the aquifer.

The following reports were published during the 2001-2003 biennium:

• An investigation of the Bottineau water supply was completed in 2002, and compiled in North Dakota Ground-Water Studies No. 109, "A Hydrogeologic

Analysis to Determine the Sustained Yield of the Bottineau Municipal Well Field and All Seasons Rural Water Systems I and II, Bottineau County, North Dakota." Objectives of this investigation were to determine: 1) the occurrence and movement of ground water in the unnamed aquifer that currently provides the water supply for Bottineau, 2) aquifer geometry and hydraulic continuity, 3) aquifer hydraulic parameters and well yields, and 4) aquifer water quality. Occurrence and movement of ground water and aquifer geometry/hydraulic continuity were determined by evaluating test-drilling data, water-level data, and pumping-test data. Aquifer hydraulic properties were determined using standard analytical methods applied to pumping-test data. The study concluded an annual sustained ground-water withdrawal of 530 acre-feet was possible, with 355 acre-feet from the Bottineau aquifer and 175 acre-feet from the All Seasons Systems I and II areas, which draws water from the Souris Aquifer. The maximum pumping rate is 990 gallons per minute. A Phase III study was recommended to identify and develop additional sources of ground-water.

- The report, "Water Supply investigation for the City of Park River, Fordville aquifer, Walsh County, North Dakota," was published in 2002. The Fordville aquifer was investigated and modeled with a digital ground-water flow model. The Fordville aquifer is a relatively thin, coarse-grained, surficial aquifer with a complicated depositional history. The study indicates additional sustained yields of 400 to 600 additional acre-feet. During times of long-term drought, however, a climatic lowering of the water table may reduce the yields of existing wells.

- A report published in 2002 describes the ground-water availability and quality of the Trenton aquifer between Buford and Trenton, North Dakota. This report addresses the potential for ground-water development to provide local planners with a generalized hydrogeologic report that describes the yield capability and water quality in the Trenton aquifer. Test holes and observation wells were completed in the aquifer evaluation area to determine aquifer geometry. Water samples were collected from observation wells for chemical analysis. Results of this study were compiled in North Dakota State Water Commission Water-Resource Investigation No. 36, "The Yield Capability and Quality of Ground Water in the Trenton Aquifer Between Buford and Trenton, North Dakota." Emphasis was placed on the presentation of ground-water data on easily readable maps.

- A report, "Water quality evaluations for the North Dakota National Guard Camp Grafton (South Unit), Eddy County, North Dakota: 2001 sampling," was completed and submitted to the North Dakota National Guard in 2002. This study found that there was no evidence of degradation of ground water or surface water on the Camp Grafton South facility through any management practices or any other form of human impact. The study did show, however, persistently high levels of arsenic from natural sources that need to be managed carefully.

With the large volume of water resource data collected by the agency, management of that data is essential for its efficient use. These management efforts involve processes related to the collection, storage, analysis, and dissemination of a wide range of data which include well inventory information, water levels, water chemistry analyses, water permits, water use, dams, drains, and precipitation. Because of the unique nature of much of the data, the SWC has developed the necessary data management tools internally.

The architecture of the SWC's data management structure has evolved into a distributed client-server model that can easily be extended to incorporate new functionality to meet the changing business requirements of the agency. More than six years ago, the agency extended the functionality of this system to include seamless integration with the Internet to provide external access to the data managed by the agency. These services, which are available at http://www.swc.state.nd.us/dataresources.html/, are now accessed by other state and federal agencies, as well as the private sector. During the last biennium, the Water Commission has expanded this architecture even further to include integration with the state GIS hub, which was discussed in the Information Technology Section of this report.

The Water Appropriation Division represents the State Engineer and the State Water Commission on state, regional and national natural resource organizations. Members of the division have provided soils or ground or surface

water assistance in meetings or reviews pertaining to: Section 319 Task Force; Working Committee of the State Pesticide in Ground Water Protection Plan; Technical Committee of the State Pesticide in Ground Water Protection Plan; Energy & Environmental Research Center Red River Water Management Consortium: North Dakota Board of Water Well Contractors; Midwest Ground-water Conference; North Dakota State University Remote Sensing Project for Quantifying Crop and Other Vegetative Cover; North Dakota Water Resources Research Institute; North Dakota Department of Health Water Quality Rules Changes; and North Dakota Public Service Commission Mining Plans.

Economic development is a major state initiative. In most instances water is needed to serve new enterprises. Information is provided to the Department of Commerce and local economic development organizations regarding the availability and chemical quality of the water to serve a proposed enterprise. The agency also provided information to Department of Commerce clients on immediate and long-term regulatory issues, which helps in defining capital requirements.

Water Development Division

The Water Development Division provides technical review and guidance in water management project design and in regulating project construction. The division staff has several responsibilities:

- Preparing engineering and feasibility reports and designs for the construction, maintenance, and major repair of water resource projects;
- Reviewing and making recommendations on permit applications for drains, dikes, dams, and sovereign lands;
- Providing technical assistance to water resource district boards;
- Inspecting and reporting on the safety of dams;
- Assisting communities in practicing floodplain management through the National Flood Insurance Program;
- Providing joint coordination of the Municipal, Rural, and Industrial Water Supply program;
- Managing the design, construction, and operation of the Southwest Pipeline Project; and
- Managing the design and construction of the Northwest Water Supply Project (NAWS).

The Water Development Division is divided into six sections: 1) Regulatory; 2) Investigations; 3) Design and Construction; 4) Municipal, Rural, and Industrial water supply; 5) Red River Office (located in West Fargo); and 6) Southwest Pipeline Project and NAWS. The following is a summary of the biennial activities of each of these sections.

Regulatory

The Regulatory Section processed 170 applications for permits to construct or modify dams, dikes, diversion ditches, or other water control facilities. The section also processed 39 permits to drain, 35 sovereign land permits, 110 wetland creations, and 322 wetland restorations. Additionally, the engineering staff provided assistance with the environmental reviews coordinated by the Planning Division, addressed several appeals of water resource district decisions and various complaints from around the state. Staff members also represented the agency on various interagency committees, including the U.S. Army Corps of Engineers Interagency Coordinating Meetings, the NRCS Interagency Watershed Committee, the NRCS State Technical Committee, and the Natural Resources Trust.

During the 2001-2003 biennium, staffing changes provided additional business and finance expertise to the section. The agency's general project cost-share program was centralized and one position was specifically set aside for the management of that program. Duties include the initial processing of the requests, developing recommendations to the State Engineer and the State Water Commission, preparing agreements, processing payments, and general tracking of various ongoing projects.

The Regulatory Section is also responsible for coordination of the National Flood Insurance Program. Two positions are funded partially through the Federal Emergency Management Agency's (FEMA) Community Assistance Program (CAP) and the Flood Mitigation Assistance Program (FMAP). Through CAP, the floodplain management staff assists 290 communities with the administration of their floodplain management responsibilities. Each commu-

nity designates an individual as an administrator to oversee floodplain development. The State Water Commission staff works closely with those individuals to provide technical assistance. The State Water Commission staff visits the communities directly, and also conducts periodic training workshops. The FMAP provides federal and state cost-share for community flood mitigation planning, and subsequent acquisitions projects. The floodplain management staff within the Regulatory Section also completed 1,887 floodplain determinations for home mortgages under a cooperative agreement with the Bank of North Dakota.

During the 2001 biennium, the Regulatory Section developed a mapping plan that prioritizes future flood insurance study and flood hazard mapping needs for the state. This plan was developed in cooperation with FEMA as an initial step in their map modernization initiative. During the 2003 legislative session, legislation was adopted, making changes to Chapter 61-16.2 of the North Dakota Century Code, which addresses floodplain management. Changes included more stringent requirements for elevating structures in the floodplain and other general housekeeping changes. The Regulatory Section was directly involved in drafting this legislation.

The Regulatory Section was directly involved in other legislation as well. House Bill 1148 made changes to the permitting threshold for dams, dikes, and other devices. The Regulatory Section assisted with drafting this legislation and with preparing testimony for several other bills.

Investigations

The Investigations Section concentrated on the flooding problems at Devils Lake, Missouri River issues, and the Tongue River dam study.

Devils Lake - Significant flooding has occurred throughout the Devils Lake Basin since 1993. The level of Devils Lake rose over 24 feet from an elevation of 1423.24 feet msl on July 1, 1993 to 1448.04 feet msl on August 9, 2001. At the end of biennium (June 30, 2003) the elevation of Devils Lake was 1447.33 feet above mean sea level. State Water Commission staff spent a large amount of time providing technical assistance to local officials, working with the Corps of Engineers to develop a permanent outlet, developing a state emergency outlet during the 2001-2003 biennium, and working with the Devils Lake Joint Water Resource Board on in-basin water management.

Commission staff worked extensively with the U.S. Army Corps of Engineers on many aspects of an emergency outlet from Devils Lake. The staff assisted the Corps in the development of the Environmental Impact Statement (EIS), which was finalized in April 2003. Unfortunately, the estimated cost of the Corps outlet as described in the final EIS, had increased to $186.5 million.

Investigation Section staff administered a contract with Bartlett and West/Boyle Engineering to design an outlet from the Round Lake portion of Devils Lake to the Sheyenne River. The design is essentially complete and an initial contract to grade the Round Lake pump station site was let in the fall of 2002. Staff also did all of the necessary work to obtain all necessary permits for the state outlet.

Missouri River - The Investigations Section provided technical review for the ongoing Corps of Engineers' Missouri River Master Manual revision. The section also reviewed and developed comments on the Corps' Annual Operating Plans (AOP) for the Missouri River. The AOPs were critical to the state during the past biennium as the Missouri River basin has been in a drought since 2000. The Investigation Section also provided technical support to the Attorney General's Office on the many lawsuits that occurred concerning the operation of the Missouri River.

Tongue River - The Tongue River is located in Cavalier and Pembina Counties in the northeast corner of the state. There is a system of ten dams on the river upstream of Cavalier, North Dakota, with Renwick Dam being the largest and most downstream. The basin above Renwick Dam is approximately 150 sq. miles. The State Water Commission entered into a contract with the Natural Resource Conservation Service (NRCS) to conduct an investigation to evaluate the effects of a possible breach of the three major dams (Renwick Dam, Senator Young Dam, and Olsen Dam) on the Tongue River. After a site visit to the basin and out of concern for the possibility of sequential dam breaches, the NRCS decided that it would be necessary to expand the study to include analysis of all ten dams associated with the Tongue River. The Investigation Section, in conjunction with the Dam Safety Program, agreed to collect comprehensive and detailed survey data of the area and create hydrologic and hydraulic models to perform these analyses.

The Investigation Survey crew collected extensive survey data including over 100 stream cross-sections in steep topography covered with heavy brush and trees, numerous overland topography areas, several bridges, and a five-foot band around Renwick Reservoir. Investigation Section engineers then created a HEC-HMS model to analyze the hydrologic response of the basin. This model was calibrated to a storm that occurred in June 2002, for which the SWC obtained rain gage and stream gage data and had aerial video

footage. Also, a full application of a probable maximum precipitation storm was performed on the basin. In addition to the HMS model, a HEC-RAS model will be developed during the 2003-2005 biennium to analyze the hydraulic response of the basin by the Investigation Section and Dam Safety engineers. HMS output hydrographs from appropriate rain events will be used as flow input for the HEC-RAS model.

The results from this study will provide the NRCS with valuable data that will enable them to make decisions concerning dam renovations. We will also be able to provide Pembina County with current survey information so they may update their emergency response and flood plans.

Design and Construction

During the 2001-2003 biennium, the State Water Commission's construction crew conducted repairs and modifications to water resource structures throughout the state. The majority of the work was associated with repairs or modifications to dams. The work by the construction crew included maintenance to United States Geological Survey (USGS) gaging sites throughout North Dakota. This summary also includes a list of dams inspected by the Dam Safety section of the Water Commission.

Sweetbriar Dam (SWC Project #642) - The Water Commission bid a project for repairs and modifications to the spillway inlet at Sweetbriar Dam. The project was bid through the North Dakota Department of Transportation, as a part of the reconstruction of I-94 in the vicinity of the dam. The work at the dam included removing damaged concrete from the spillway and replacing the damaged section with reinforced concrete. The construction of a new low-level drawdown system was also part of the project. Even though the project was bid during the 2001-2003 biennium, the work will not be started until the 2003-2005 biennium.

North Lemmon Lake Dam (SWC Project #543) - North Lemmon Lake is located in southwestern North Dakota in Adams County. The work at North Lemmon Lake Dam involved the construction of a new low-level drawdown system. Low-level drawdown systems are used by the North Dakota Game and Fish Department to improve the water quality within a fishery. A typical low-level consists of a pipe extending into the reservoir and a valve to regulate the flow through the pipe. Water quality is improved in a fishery by removing a portion of the water located at the lowest portions of a reservoir through the low-level drawdown.

DAM SAFETY FORMAL INSPECTIONS

Name of Dam	County	Hazard
Square Butte Creek #4	Oliver	Medium
Square Butte Creek #5	Oliver	High
Cottonwood Creek Dam #3	LaMoure	Medium
Fort Ransom Dam	Ransom	Low
Ueland Dam	Griggs	Low
Tolna Dam No. 1	Nelson	Medium
Upper Turtle River #9	Grand Forks	High
Herzog Dam	Pembina	Medium
Drayton Dam	Pembina	Medium
Sweetbriar Creek Dam	Morton	Medium
Daub Dam	Oliver	Medium
Crown Butte Dam	Morton	Medium
Queen City Dam	Stark	Medium
Arnegard Dam	McKenzie	Low
Blacktail Dam	Williams	Medium
Kota Ray Dam	Williams	Low
Sheep Creek Dam	Grant	Low
Froelich Dam	Sioux	Low
Clausen Springs Dam	Barnes	High
Jamestown Ice House Dam	Stutsman	Low
Wyard Dam	Foster	Low
Sykeston Dam	Wells	Medium
Fargo 12th Ave. N. Dam	Cass	Low
Midtown Dam	Cass	Low
Bylin Dam	Walsh	High
Drayton Dam	Pembina	Medium
Bourbanis Dam	Cavalier	Medium
Olga Dam	Cavalier	Low
Armourdale Dam	Towner	Low
Daub Dam	Oliver	Medium
Sweetbriar Creek Dam	Morton	Medium
Crown Butte Dam	Morton	Medium
Epping Dam	Williams	Medium
Northgate Dam #2	Burke	Medium
McGregor Dam	Williams	High

The work entailed the installation of a control valve near the right abutment of the dam. The valve was placed in a 48-inch diameter corrugated metal pipe riser, with the valve located approximately six feet below the control elevation of the reservoir. A trench was excavated from the valve intake into the reservoir. Approximately 400 feet of 12-inch diameter high density polyethylene pipe (HDPE) was attached

DAM SAFETY SITE VISITS

Name	County	Hazard
Appert Lake Dam	Emmons	Low
Raymond Meyer	Grant	Low
Tony Kobilansky #2	Grant	Low
Lisbon Dam	Ransom	Medium
Sather Dam	McKenzie	Medium
Arnegard Dam	McKenzie	Low
Blacktail Dam	Williams	Medium
Kota Ray Dam	Williams	Low
Smishek Lake Dam	Burke	Low
White Earth Dam	Mountrail	Medium
Silver Creek Dam	Nelson	Low
Grand Forks Riverside Pk.	Grand Forks	Medium
Grand Forks County #1	Grand Forks	Low
Niagara RR Dam #1	Grand Forks	Low
Niagara Twp. Dam #2	Grand Forks	Low
Pembina City Dam	Pembina	Medium
Golden Lake Dam	Steele	Low
Elm River Detention Dam #3	Cass	Medium
Marmarth Levees	Slope	Low
McVille Railroad Dam	Nelson	Medium
Green Lake Outlet Control	McIntosh	Low
Ashley Emergency Dike	McIntosh	Low
Hoskins Lake Dam	McIntosh	Low
Sweetbriar Creek Dam	Morton	Medium
Crown Butte Dam	Morton	Medium
Hildebrandt Dam	Logan	Low
Hansen Marsh #1840	Ramsey	Low
Snyder Lake #1944	Towner	Low
Brumba Pool #1939	Towner	Low
Rock Lake #1935	Towner	Low
Bullinger #1931	Dunn	Low
Epping Dam	Williams	Medium
McGregor Dam	Williams	High
Baukol-Noonan Dam #1	Divide	Low
Des Lacs Dam 2 #1705	Ward	Low
Hiddenwood Lake #1694	Ward	Low
Long Lake #1808, #1809	Burleigh	Low

Name	County	Hazard
Friedt Dam #1915	Hettinger	Low
Jackman Coulee #1954	Burleigh	Low
Jackman Coulee #1955	Burleigh	High
Gall Dam #1916	Sioux	Low
Nygren Dam #1887	Morton	Low
Dead Colt Creek Dam	Ransom	Medium
Charles Wallace #1917	Adams	Low
Fargo Dam #2	Cass	Low
Fargo Dam #3	Cass	Low
Christine Dam	Richland	Low
Upper Turtle River #9	Grand Forks	High
Lake Georgeson #1946	Grand Forks	Low
Big Coulee Dam	Towner	Medium
Fish Creek Dam	Morton	Low
Grand Forks Country Club	Grand Forks	Low
Drayton Dam	Pembina	Medium
Strawberry Lake Dam	McLean	Low
Pheasant Lake	Dickey	Medium
LaMoure City Dam	LaMoure	Low
Jerry Stromstad #1956	Divide	Low
Dickinson Dam	Stark	High
Devils Lake Roads	Ramsey	High
Warwick Dam	Eddy	Low
New Rockford Dam #2	Eddy	Low
Raleigh Dam	Grant	Medium
Surrey Lagoons	Ward	Low
Mount Carmel Dam	Cavalier	Medium
Tolna Dam No. 1	Nelson	Medium
Des Lacs City Dam	Ward	Low
Velva Sportsman Dam	Ward	Low
Antler Creek Dam	Bottineau	Low
Lake Metigoshe	Bottineau	Low
Wakopa Dam	Rolette	Low
Garrison Dam	McLean	High
Square Butte Creek Dam #6	Morton	High
Nelson-Landers Dam	Ward	Low
Long Creek Dam	Divide	Low

to the valve intake and extended into the reservoir. The first 30 feet of pipe was placed in the excavated trench and backfilled.

A section of HDPE, approximately 500 feet in length, was used to transmit the water from the reservoir to the downstream channel. A trench was excavated from the outlet of the valve to the downstream channel. The pipe was connected to the valve outlet, placed in the trench, and backfilled.

Smishek Dam (SWC Project #575) - The Water Commission's construction crew performed repairs to the spillway at Smishek Dam, located in northcentral North Dakota, in Burke County. The spillway is a grass-lined channel, which had been eroding. The spillway is also used to access cabins along the reservoir. A concrete slab was placed through the spillway. The slab armored the spillway, reducing the potential for erosion and provided for easy access through the spillway for the cabin owners.

Wakopa Dam (SWC Project #319) – Wakopa Dam is located in northcentral North Dakota in Rolette County, and is owned by the North Dakota Game and Fish Department. The Water Commission was involved in an emergency at Wakopa Dam during the 2001 construction season. Heavy spring runoff overtopped the embankment, resulting in severe erosion of the downstream face.

The work in 2001 involved excavation of an emergency spillway in the left abutment to allow for the drawdown of the reservoir. The second phase of the project, performed during the 2001-2003 biennium, entailed repairing the downstream erosion, and construction of an emergency spillway in the right abutment.

Green Lake Dam (SWC Project #1435) - Green Lake Dam is located in southeastern North Dakota, in McIntosh County. The project involved repairing the dike located at the south side of the lake. Repairs involved placing fill on the downstream face of the dike, and widening the top-width of the dam to 12 feet. Rock riprap was placed on the upstream face of the embankment to protect the embankment from erosion. Topsoil was spread on the newly placed fill and reseeded. The McIntosh County Water Resource District hired a local contractor to construct a fence around the perimeter of the dike to prevent cattle from grazing on the dike.

Dead Colt Creek Dam (SWC #1671) - The Water Commission's construction crew started repairs to the low-level drawdown system at Dead Colt Creek Dam during the 2002 construction season. The low-level at the dam consists of a heavy gate at the floor of the concrete drop inlet. The drop inlet is approximately 40 feet high. The gate is raised and lowered by a wheel and threaded shaft system. The operating wheel is located at the top of the drop inlet. Due to corrosion, the guides for the shaft had dislodged from the concrete and jammed the gate, making the system inoperable. In addition, efforts to raise the gate resulted in the shaft becoming bent. Therefore the work consisted of reattaching the stem guides with corrosion resistant bolts and installing a new shaft. The repairs were finished during the 2003 construction season.

Big Coulee Dam (SWC #1418) - Big Coulee Dam is located in the northcentral portion of the state, in Towner County near the City of Bisbee. The Water Commission had been aware of a sinkhole located along the wall of the concrete chute spillway near the downstream toe of the embankment, and was monitoring the size of the sinkhole during regular inspections at the dam. The presence of a sinkhole is sometimes an indicator of the removal of subsurface material, which can ultimately become a potential threat to the integrity of the dam.

The spring inspection of 2002 revealed that the sinkhole greatly expanded in size, necessitating an investigation to determine the cause of the sinkhole and make the required repairs. The Water Commission entered into an agreement with the North Dakota Game and Fish Department and the City of Bisbee to conduct a site investigation in an attempt to discover the cause of the sinkhole and make the necessary repairs. The cost to conduct the investigation and make the repairs was estimated at $20,000.

The engineers at the Water Commission came to the conclusion that the most likely reason for the formation of the sinkhole was the failure of the drainage system used to remove seepage from beneath the floor of the concrete chute spillway. The investigation revealed that the drain system had failed and caused the removal of embankment material, resulting in the sinkhole. In order to make the repairs, areas adjacent to the chute sidewalls were excavated, and the damaged portions of the drainage system were replaced.

Sheep Creek Dam (SWC #1358) – The Water Commission entered into an agreement with the Game and Fish Department, and the Grant County Water Resource District to construct a new low-level drawdown system at Sheep Creek Dam. Sheep Creek Dam is located approximately five miles south of Elgin, North Dakota, in Grant County.

The existing low-level drawdown consisted of a 12-inch diameter pipe extending into the reservoir and through the embankment. The control valve for the existing system was located at the downstream toe of the dam. This design was common in the late 1960s and 1970s when the dam was constructed. However, this design results in the pipe extending through the embankment to be pressurized. The pressurized condition, combined with the age of the pipe, in many instances approaching 40 years, presents conditions that could result in a potential threat to the embankment. If the pipe should start leaking due to corrosion, there is a potential for the removal of embankment material, which may lead to a catastrophic failure of the embankment. Therefore, the Water Commission has been working over the last 20 years to modify the design of these low-level drawdown systems.

The first step in the construction was to open the existing low-level outlet in order to lower the reservoir approximately seven feet. The lower level assisted in the construction by reducing the costs associated with water control. Once construction started, the first step was to hire an outside contractor to cut a hole in the concrete drop inlet. The valve for the new low-level was attached at this location. The next step was to attach approximately 250 feet of 12-inch diameter pipe to the valve, position the pipe into position in the reservoir, fill it with water, and allow it to sink to the bottom of the reservoir. The existing low-level was taken out of service by filling the entire length of pipe with a sand/cement grout.

The Commission assisted the District by extending the boat ramp at the site. The District determined this would be a good time to extend the ramp due to the lower reservoir levels. Extending the ramp resulted in a minimal increase to the overall project cost.

LaMoure Dam (SWC #485) - The SWC was involved with making modifications and repairs to LaMoure Dam during the 2002 construction season. The dam is located on the James River and used by the USGS as a primary gaging station. The repairs to the structure date back to 1991 and 1992, when the Commission performed major repairs to both abutments of the dam. The final repairs and modifications to the dam were delayed due to high water conditions starting in 1993 and continuing through 2001. The lower flows on the James River allowed the remaining work to start on the dam during the 2001-2003 biennium.

The remaining work to the dam involves the placement of a concrete cap on the existing rubble/masonry dam. The concrete cap performs two principal functions: 1) the cap will stabilize the structure; and 2) a low-flow measuring section is incorporated into the design which will greatly assist the USGS in obtaining accurate river flow data during periods of low flow. The work completed during the 2002 construction season resulted in the placement of a concrete cap on 60 feet of the dam. The total length of the dam is 90 feet. The plan is to complete the remaining work during the 2003 construction season.

USGS (Various Locations) - The North Dakota Water Commission's construction crew repaired several USGS gaging stations throughout North Dakota. The work involved the installation of staff gages, protecting structures with instrumentation from flooding, and repairing sheet pile control sections.

In addition to the regular work performed for the USGS, the Commission's construction crew assisted USGS staff in constructing a new gage house along the Missouri River. The new gage house is located on the east bank of the river, near the Bismarck Water Treatment Plant.

Mt. Carmel Dam Incident (SWC #1435) - In late March, 2003 the Water Commission was notified of a partial failure of the spillway at Mt. Carmel Dam, located approximately ten miles north of Langdon, North Dakota. In response to the emergency at the dam, Water Commission staff traveled to the site to assess the situation and coordinated the actions necessary to stabilize the embankment.

Upon reaching the site, flow was observed exiting from beneath the concrete chute spillway. The flow under the chute removed embankment material from beneath the chute and at the toe of the dam. The decision was made to mobilize local contractors in order to take emergency actions in an effort to prevent further erosion of the embankment. The Water Commission's construction crew was also on-site assisting in the emergency repairs.

The first step to stabilize the embankment was to construct an earthen cofferdam upstream of the spillway inlet. At the same time, steps were taken to expose an old spillway pipe that had previously been closed off and buried in 1995. By opening the pipe, the water

Mount Carmel Dam, showing erosion of the embankment.

surface elevation of the reservoir was lowered, reducing the threat to the embankment. The final step of the emergency actions was to drive a steel sheet pile cofferdam upstream of the concrete chute inlet. The steel sheet pile cofferdam would in effect take the concrete chute spillway out of service, thereby allowing time for permanent repairs to be made. The steel sheet pile cofferdam was constructed by Swingen's Construction out of Grand Forks. The total cost of the emergency repairs at Mt. Carmel Dam was approximately $125,000.

Municipal, Rural & Industrial Water Supply

In Federal Fiscal Years (FFYs) 2002, and 2003, the Garrison Diversion Municipal, Rural, and Industrial (MR&I) water supply program received $11.5 million in federal grant funds for the development of water supply facilities in the state. The State Water Commission also advanced $15 million to address water supply efforts statewide.

Projects that were allocated funds during FFYs 2002 and 2003 included the Northwest Area Water Supply, Ransom-Sargent Water Users, All Seasons Water Users, Ramsey Rural Water, McKenzie Rural Water, McLean-Sheridan Rural Water, Langdon Rural Water, Tri-County Rural Water, North Central Rural Water Consortium, and South Central Regional Rural Water. This brought the total received from the federal government to $184.8 million since the program was authorized in 1986.

A total of 142 applicants have requested assistance through the MR&I program. Of these, 45 projects have been approved for MR&I funding by the Garrison Diversion Conservancy District and the State Water Commission.

Since the program began, 42 projects have been completed, including: Abercrombie, Agassiz Water Users, All Seasons Rural Water Phase I, Cavalier, Carson, Crown Butte, Elgin, Englevale, Fargo, Garrison Rural Water, Grandin, Glenfield, Gwinner, Hankinson, Kindred, Langdon, Langdon Rural Water, McLean-Sheridan Rural Water, Minto, Missouri West Water Phases I and II, New Town, North Valley Water Association, Ramsey Rural Water, Riverview Heights, Riverside Park Dam, Rugby Phase I, Stanley, Tolna, Tri-County Rural Water Users, Burleigh Water Users, Dickey Rural Water, Dunn Center, Edgeley, Gackle, Grand Forks Water Treatment, Grand Prairie Estates, Hebron, Marion, Neche, Walhalla, Fingal, and Ransom-Sargent Rural Water.

Nine additional projects were in design and/or construction phases at the end of the biennium, including: Northwest Area Water Supply, Southwest Pipeline Project, Langdon Rural Water, McKenzie Rural Water, Ramsey County Rural Water, Rugby Phase II, Tri-County Rural Water, and All-Seasons Water System IV and V.

The total estimated cost of the 142 projects is $852 million. This cost includes $145 million for the Northwest Area Water Supply Project, and $150 million for the Southwest Pipeline Project.

Red River Office

Located in West Fargo, the Red River office consists of one full-time position. During the 2001-2003 biennium, Red River office personnel coordinated the State Water Commission's activities in eastern North Dakota and provided:

- Technical assistance to the Red River Joint Water Resource District in pursuing flood control projects in the Red River watershed;
- Assistance with reconnaissance level studies of potential dams;

• Assistance to individual water resource boards on 18 drainage problems or other water-related issues;

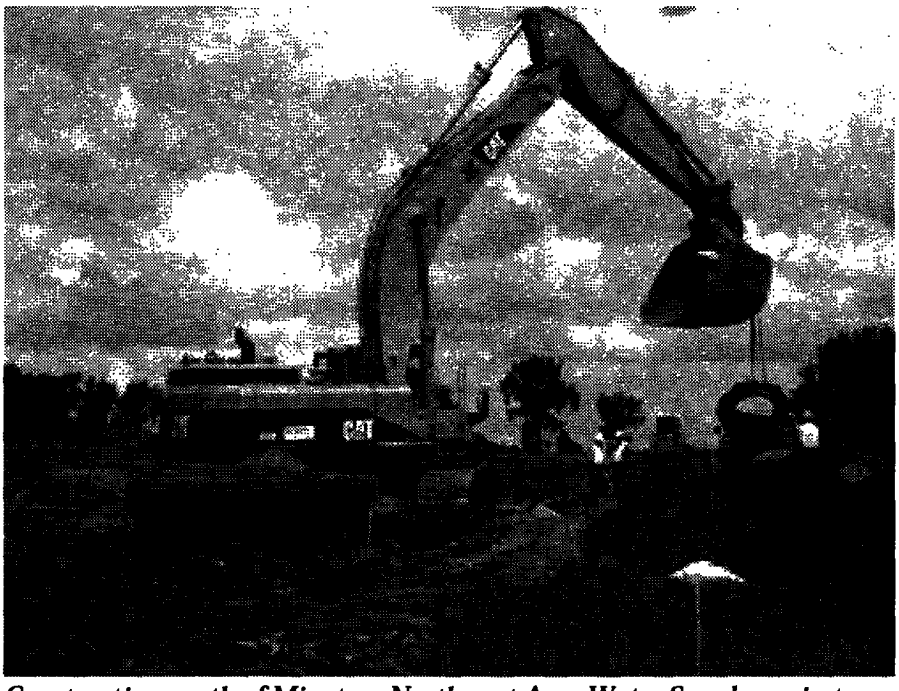
• Inspections on 14 projects that the State Water Commission had approved for cost-sharing;

• Assistance to Richland County Water Resource District for their ring dike program, where nine dikes were constructed.

• Technical assistance on various committees that have been formed as a result of the persistent flood problems in the Red River Basin. These committees include the Flood Damage Reduction and Drainage teams for the Red River Basin Commission, the Umbrella Coordination Team for the U.S. Army Corps of Engineer's Reconnaissance Study, the International Red River Basin Board, the Red River Basin Institute, and various other groups. Personnel have also represented the State Water Commission at meetings of the Red River Joint Water Resource Board, Pembina River Basin Advisory Board, Red River Basin Riparian Advisory Board, and the Sheyenne River Joint Water Resource Board.

Southwest Pipeline Project

At the start of the biennium the Southwest Pipeline Project served as the water supply for Belfield, Carson, Dickinson, Dodge, Dunn Center, Elgin, Gladstone, Glen Ullin, Golden Valley, Halliday, Hebron, Hettinger, Manning, Mott, New England, New Hradec, New Leipzig, Reeder, Regent, Richardton, South Heart, and Taylor, as well as approximately 1,500 rural water customers in seven service areas. Construction on the project continued to expand it as a regional water supply system during the 2001-2003 biennium, with service to Scranton beginning in July 2002. By the end of the biennium, work had begun on the Medora-Beach regional area main transmission pipeline.



Construction south of Minot on Northwest Area Water Supply project.

During the biennium, an additional 395 rural customers were connected to the project. The total population served by the Southwest Pipeline at the end of the biennium was approximately 30,000 people.

Capital repayments from the Southwest Pipeline Project totaled $2,841,499.79 for the biennium. Of this amount, $2,085,458.98 was paid to bondholders, and the balance of $756,040.81 was deposited in the Resources Trust Fund.

Northwest Area Water Supply

In September 2001 the Finding of No Significant Impact (FONSI) for the Northwest Area Water Supply (NAWS) project was issued by the U.S. Department of Interior, Bureau of Reclamation (Reclamation). Plans and specifications for the first pipeline contract were approved by Reclamation in December 2001, and bids were opened at the end of January 2002. Work on the first construction contract began in May 2002. Construction of the pipeline is proceeding from Minot towards the Missouri River. The first contract, for about 9.5 miles of 30-inch and 36-inch diameter pipe, started from the Minot Water Treatment Plant, and was nearly completed by the end of the biennium. The second contract, also for 30-inch and 36-inch pipe, got underway in June 2003. This contract picks up where the other left off, and extends 9.5 miles to ND Highway 23.

Environmental issues continued to be a challenge for the NAWS project during the 2001-2003 biennium. In October 2002, a lawsuit was filed by the Province of Manitoba, claiming that the Department of Interior's granting of a FONSI was in error, and that an Environmental Impact Statement (rather than an Environmental Assessment) should have been conducted. The lawsuit, filed in U.S. District Court in Washington D.C., did not name North Dakota as a defendant, but a motion to intervene filed by the North Dakota Attorney General's Office was granted by the court.

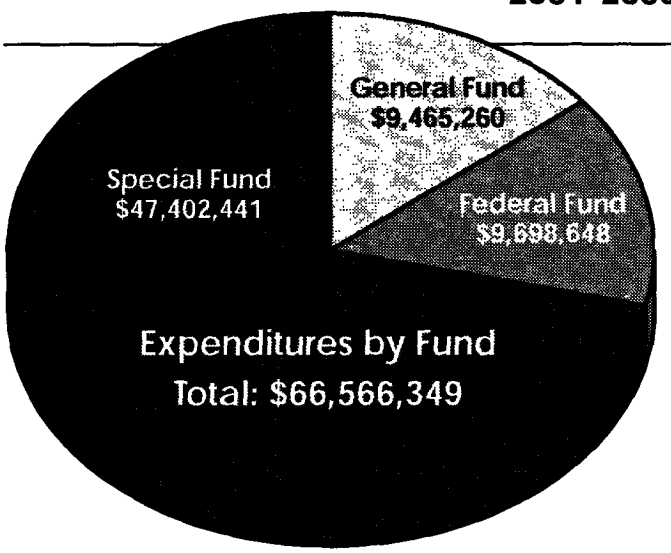
FINANCIAL INFORMATION

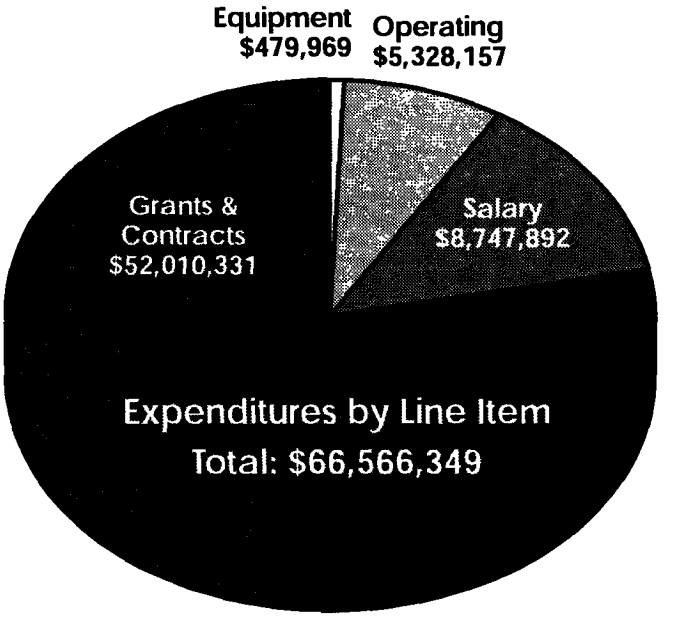
The following pages contain financial information summmarized in various formats. There are pie charts classifying the agency's expenditures by fund and by line item. There is a chart identifying expenditures by division and line item, and there is a detailed listing by object code.

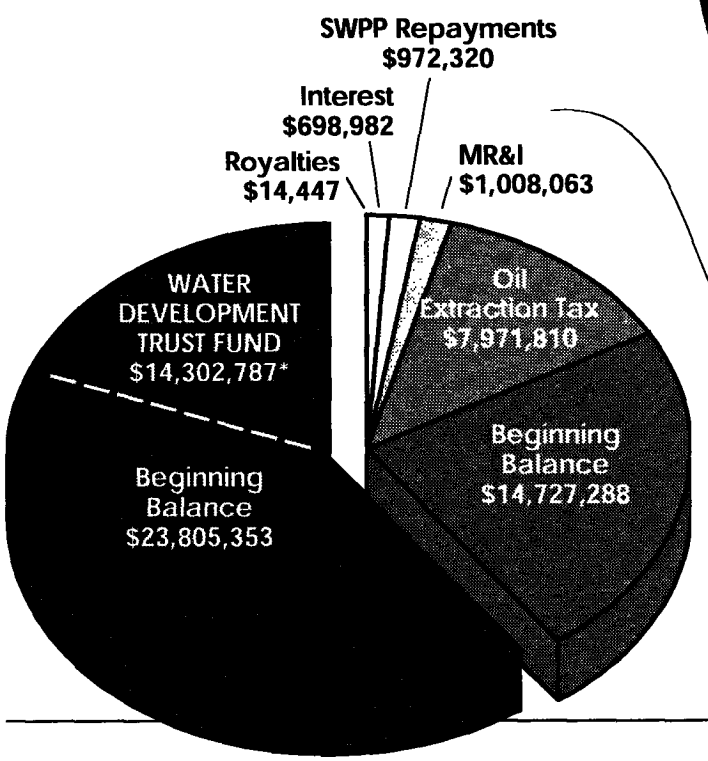
The trust fund revenue pie chart on this page includes both the Resources Trust Fund and Water Development Trust Fund revenue. The Water Development Trust Fund revenue does not include $9,733,820, money transferred to the general fund, or $99,756, money transferred to the North Dakota Department of Health.

And, finally, the remainder of the report addresses project and program obligations, completed projects, object expenditures, long-term debt, and resources available from the agency.

State Water Commission Appropriations
2001-2003 Biennium







RESOURCE TRUST FUND $25,392,910

Trust Fund Revenue
Total: $63,501,050*

**Amount reduced by $9,833,576 because of transfers to the General Fund and the Health Department.*

State Water Commission

Program Budget Expenditures
for Biennial Period Ending June 30, 2003

AGENCY PROGRAM	SALARIES & WAGES	OPERATING EXPENSES	EQUIPMENT	GRANTS & CONTRACTS	PROGRAM TOTALS
ADMINISTRATION					
Budget	$1,406,209	$668,990	$142,833	$977,100	$3,195,132
Expended	$1,285,385	$685,770	$172,099	$0	$2,143,254
Percentage	91%	103%	120%	0%	67%
PLANNING AND EDUCATION					
Budget	$796,639	$194,742	$10,000	$367,000	$1,368,381
Expended	$778,669	$180,955	$9,659	$428,469	$1,397,752
Percentage	98%	93%	97%	117%	102%
WATER APPROPRIATION					
Budget	$2,495,138	$368,403	$68,050	$902,572	$3,834,163
Expended	$2,525,748	$390,140	$54,109	$814,560	$3,784,557
Percentage	101%	106%	80%	90%	99%
WATER DEVELOPMENT					
Budget	$3,183,548	$475,352	$207,117	$20,784,065	$24,650,082
Expended	$3,139,282	$393,693	$201,798	$3,492,094	$7,226,867
Percentage	99%	83%	97%	17%	29%
ATMOSPHERIC RESOURCE					
Budget	$584,040	$468,553	$15,833	$4,404,430	$5,472,856
Expended	$506,091	$425,900	$4,538	$672,919	$1,609,448
Percentage	87%	91%	29%	15%	29%
SOUTHWEST PIPELINE					
Budget	$373,320	$1,447,000	$26,000	$5,350,000	$7,196,320
Expended	$296,472	$1,129,830	$18,169	$2,144,683	$3,589,154
Percentage	79%	78%	70%	40%	50%
NORTHWEST AREA WATER SUPPLY					
Budget	$234,445	$3,862,958	$20,000	$13,614,366	$17,731,769
Expended	$216,245	$2,121,869	$19,597	$6,129,330	$8,487,041
Percentage	92%	55%	98%	45%	48%
STATEWIDE WATER PROJECTS					
Budget				$85,436,398	$85,436,398
Expended				$38,328,276	$38,328,276
Percentage				45%	45%
AGENCY TOTALS					
Budget	**$9,073,339**	**$7,485,998**	**$489,833**	**$131,835,931**	**$148,885,101**
Expended	**$8,747,892**	**$5,328,157**	**$479,969**	**$52,010,331**	**$66,566,349**
Percentage	**96%**	**71%**	**98%**	**39%**	**45%**

State Water Commission - Projects/Grants/Contract Fund - Program Obligations
July 1, 2001 - June 30, 2003

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
	CITY FLOOD CONTROL				
1907-01	Grand Forks	12/07/01	22,400,000	19,900,957	2,499,043
1907-03	Wahpeton	10/23/01	1,307,500	567,449	740,051
1907-04	Grafton	08/16/01	167,000	156,500	10,500
	Fargo($5,500,000)		0	0	0
	Subtotal City Flood Control		23,874,500	20,624,906	3,249,594
	MR&I				
2373-01	Langdon	10/23/01	7,469,147	974,001	6,495,146
2373-02	McKenzie	10/23/01	32,500	0	32,500
2373-03	Ramsey	10/23/01	2,661,353	2,661,353	0
2373-04	Tri-County	10/23/01	4,837,000	318,040	4,518,960
	Subtotal MR&I		15,000,000	3,953,394	11,046,606
	IRRIGATION DEVELOPMENT				
1858	Nesson Valley Irrigation	09/11/97	1,249,540	0	1,249,540
1389	NDSU Williams County Irrigation Research Site	05/01/02	239,500	0	239,500
1857	Elk/Charbon Irrigation District	12/10/99	1,000,000	0	1,000,000
	Irrigation Caucus, Irrigation Reference Guide	07/30/01	13,500	13,500	0
1389	BND AgPace Program	10/23/01	1,000,000	69,585	930,415
	ND Water Ed. Found., Irrigation Research Catalog	07/30/01	5,000	5,000	0
	ND Irrig. Caucus, Irrigation Develop Strategic Plan	10/23/01	75,000	75,000	0
	Sioux Irrigation District - McKenzie County	12/06/02	21,060	0	21,060
	Subtotal Irrigation Development		3,603,600	163,085	3,440,515
	FLOOD CONTROL				
300	Baldhill Dam Flood Pool Raise	04/30/98 & 09/11/00	1,307,516	547,389	760,127
1344/1878	Maple River Flood Control	02/04/92 & 12/00	710,750	212,917	497,833
	Subtotal Flood Control		2,018,266	760,306	1,257,960
	EASTERN DAKOTA WATER SUPPLY				
1912	Eastern Dakota Water Supply		150,000	64,804	85,196
	DEVILS LAKE BASIN DEVELOPMENT				
416-05	Devils Lake Outlet Awareness Manager	12/12/00	36,901	29,448	7,453
416-01	Devils Lake Basin Joint WRD Manager (Ramsey)	12/07/01	60,317	46,260	14,057
416-01	Devils Lake - LEMC (Ramsey)	05/21/97	429	0	429
416-01	Starkweather Coulee Basin Analysis (Ramsey)	07/22/97	1,000	0	1,000
416-02	Devils Lake Levee Raise (Phase II)	03/26/97	66,921	0	66,921
1882-01	Available Storage Acreage Program (Ramsey)(1999)	12/21/98	4,969	4,410	559
1882-02	Devils Lake Emergency Response Plan (Ramsey)	11/29/95	7,986	0	7,986
1882-03	Devils Lake Prairie Wetland Restoration (Ducks Unlimited)	02/23/96	30,000	30,000	0
416-06	Devils Lake Lawsuit Consultant	06/25/99	500,700	539,458	-38,758
416-01	Devils Lake/Twin Lakes Temporary Emergency Outlet	09/11/00	75,000	0	75,000
416-04	Dept. of Interior, USGS, Sheyenne & Red Rivers		8,613	7,510	1,103
416-01	Red River Basin Commission PIRC Funding (100,000)	03/17/03	50,000	0	50,000
416-07	Devils Lake Archaeological Pedestrian Survey Project		8,389	8,389	0
416-07/-01	Devils Lake Outlet ($10,000,000)	02/20/02	1,695,323	1,075,860	619,463
1882-02	Devils Lake Basin Reconnaissance Study	02/20/02	25,000	25,000	0
416-01	E. Devils Lake/Black Slough Outlet Sediment Study (NDGS)	03/21/02	11,500	7,521	3,979
416-01	Devils Lake Feasibility Study	12/06/02	32,516	32,516	0
416-01	City of Devils Lake Levee System ($5,000,000)	12/06/02	4,074,202	0	4,074,202
	Subtotal Devils Lake		6,689,766	1,806,372	4,883,394

State Water Commission - Projects/Grants/Contract Fund - Program Obligations (cont.)
July 1, 2001 - June 30, 2003

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
	GENERAL WATER MANAGEMENT				
	Hydrologic Investigations Approved Amount		837,572	0	837,572
747	KBM, Inc		4,345	0	4,345
779	Byron Mankowski (Pump Installation)		1,250	0	1,250
817	Wetch & Sons Drilling		1,660	1,660	0
818	Judi Hintz		11,172	12,112	-940
	KBM, Inc		5,090	5,090	0
862	Wade Bjorgen		4,394	2,907	1,487
956	Interstate Drilling Services, LLP		3,780	3,780	0
956	University of North Dakota		0	3,319	-3,319
989	MVTL (Minnesota Valley Testing Laboratories, Inc.)		25,000	25,115	-115
989	ND Health Dept. Chemistry Division		0	3,294	-3,294
1389	High Value Irrigated Crops Development Task Force		2,000	2,000	0
1395	Dept of Interior, USGS		124,030	123,680	350
1395	Dept of Interior, USGS, investigation of water resources		280,173	280,173	0
1395	Dept of Interior, USGS, Eaton Irrigation Project		12,300	12,300	0
1395	Dept of Interior, USGS, Eaton Irrigation Project		319,645	239,733	79,912
1400	Linda Werner		16,635	7,044	9,591
1690	Mary Lou McDaniel		4,287	4,414	-127
1703	Neil Flaten		2,475	4,106	-1,631
1703	KBM, Inc		6,320	0	6,320
1707	Holland's Consortio, Inc.		706	706	0
1707	Neil Flaten		5,044	3,878	1,166
1714	David Robbins		4,328	3,207	1,121
1760	Monica Vrana		0	1,012	-1,012
1761	Gloria Roth		0	1,288	-1,288
1761	Anton Fergel		0	113	-113
1761	Fran Dobitz		0	1,840	-1,840
1836	Howard Pare		1,685	2,382	-697
1856	Minnesota Valley Testing Laboraties, Inc.		4,450	4,450	0
1856	DataChem Laboratories, Inc., Water Samples Analyses		9,185	9,185	0
1908	University of North Dakota, Study of Denitrification		4,500	4,500	0
779	University of Waterloo		838	518	320
	Subtotal for Hydrologic Investigations Obligations		876,805	763,819	112,986
1896-03	Flood Mitigation Assistance Program (1999) Cass County		35,130	35,130	0
1896-03	Flood Mitigation Assistance Program (2000) City of Fargo		34,674	26,169	8,505
1896-02	Flood Mitigation Assistance Program (2001) Nelson County		1,850	1,850	0
1896-02	Flood Mitigation Assistance Program (2002) Hettinger County		875	0	875
1896-02	Flood Mitigation Assistance Program (2002) Benson County		958	0	958
1896-02	Flood Mitigation Assistance Program (2000) Minnewaukan		512	512	0
1896-02	Flood Mitigation Assistance Program (2000) Grand Forks		925	925	0
1393	Hazard Mitigation (2000) USGS Stream Gaging		6,000	6,000	0
	Subtotal for Flood Mitigation Assistance Program		80,924	70,586	10,338
	General Projects Obligated		5,477,919	1,002,775	4,475,144
	General Projects Completed		1,575,792	1,575,792	0
	Subtotal General Water Management		7,972,207	3,412,972	4,559,235
	SOUTHWEST PIPELINE				
	Subtotal Southwest Pipeline Project		8,444,472	8,029,400	415,072
	WEATHER MODIFICATION				
	Weather Modification	10/23/01	350,000	350,000	0
	NORTHWEST AREA WATER SUPPLY				
237-04	Northwest Area Water Supply	9/13/99 & 12/20/02	334,000	425,922	-91,922
TOTAL PROJECTS/GRANTS/CONTRACT FUND - PROGRAM OBLIGATION			**68,436,811**	**39,591,161**	**28,845,650**

State Water Commission - Projects/Grants/Contract Fund - Project Obligations (cont.)
July 1, 2001 - June 30, 2003

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
	GENERAL PROJECT OBLIGATIONS				
1803	City of Belfield Watershed Project Phase I	12/20/91 & 05/22/01	132,000	96,453	35,547
1315	Twelve Mile & Truax Township Pipeline (Williams)	01/27/97	87,800	0	87,800
1312	Phase I, Rural Ring Dike Project (Walsh County WRD)	08/13/98	155,468	2,636	152,832
1293	Mountrail County Irrigation Project Feasibility Study	06/09/99	2,681	0	2,681
1904	Walhalla Township Drain #3 - (Cavalier/Pembina)	06/09/99	52,490	0	52,490
1905	Walhalla Township Drain #2 - (Cavalier/Pembina)	06/09/99	95,311	0	95,311
1280	Rural Ring Dikes Project Grand Forks County WRD #1	09/13/99	31,216	0	31,216
841	Upper Maple Retention Dam Feasibility Study	11/05/99	20,000	0	20,000
1280	Grand Forks Ring Dikes #2	12/10/99	25,000	0	25,000
1069	Cass County Drain #13	04/10/00	376,998	83,835	293,163
1070	Cass County Drain #14	04/10/00	231,123	54,911	176,212
	Montana EIS for County-Sponsored Cloud Modif. Project	04/10/00	70,000	0	70,000
847	Swan Creek Diversion (Cass County)	07/14/00	70,000	57,310	12,690
1075	Cass County Drain #21	07/14/00	143,629	40,361	103,268
1081	Cass County Drain #29A	07/14/00	341,250	304,067	37,183
1080	Cass County Drain #27	09/11/00	13,214	5,951	7,263
576	BOMMM Missouri River Coord. Resource Mgmt. Program	03/06/01	60,000	13,322	46,678
1905	Cavalier/Pembina Drains 2 & 3 (Manitoba, Canada)	03/06/01	178,525	0	178,525
1117	Grand Forks County Drain #27A	08/16/01	250,000	0	250,000
1591	ND WRD Assoc. (Revision of Handbook)	08/16/01	49,000	20,847	28,153
	GDCD Hydropower Consulting Contract, Tom Weaver	08/16/01	15,000	0	15,000
591	City of Fargo, 12th Ave. North Dam	08/23/01	13,862	0	13,862
1751	City of Bismarck Stormwater Management Plan	09/17/01	11,000	0	11,000
1303	Silver Lake Bank Stabilization Project	09/25/01	19,627	8,787	10,840
1301	Richland County WRD Farmstead Ring Dikes	10/23/01	52,064	46,177	5,887
1859	Section 319 Funding	12/07/01	0	0	0
1296	Pembina County Drain #4	04/18/02	13,719	13,544	175
222	Buford-Trenton Irrigation District Upgrade	05/01/02	24,775	23,785	990
1420	Traill County WRD Drain #9-18-29	05/01/02	236,794	0	236,794
1894	Tri-County Joint WRD Flood Control Study Project	05/01/02	24,640	0	24,640
1271	Rush River WRD CAT Drop Structure Repair	05/29/02	3,595	0	3,595
839	Up. Elm River Watershed Analysis/Channel Improv. Study	06/07/02	15,000	0	15,000
1751-06	Digital Aerial Survey Phase I & II Hydraulic Analysis (Cass)	06/24/02	17,325	0	17,325
1916	Salt Cedar (Williams & McKenzie)	07/12/02	20,000	5,538	14,462
1772	Des Lacs River Upper Basin Feasibility Study	07/23/02	19,183	0	19,183
305	Richland County WRD Feasibility Study Project Phase I	08/15/02	267,430	0	267,430
847	Maple River - Rush River Joint WRD Swan Creek Study	08/15/02	25,000	0	25,000
1077	North Cass WRD/Cass County Drain #24	08/15/02	116,614	0	116,614
1638	Walsh County WRD Alternate Levee System Study	08/15/02	35,000	0	35,000
1751	Red River Flood Ins. Mapping & Hydraulic Analysis (Fargo)	08/15/02	35,646	0	35,646
1851	Drought Disaster Livestock Water Assistance Program	08/15/02	118,866	0	118,866
1918	Southeast Cass WRD/ Improvement District #60	08/15/02	64,750	0	64,750

State Water Commission - Projects/Grants/Contract Fund - Project Obligations (cont.)
July 1, 2001 - June 30, 2003

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
	GENERAL PROJECT OBLIGATIONS (Cont.)				
1271	Leonard Township EWP Reconstruction Project	08/26/02	9,975	2,883	7,092
847	Swan Creek Diversion (Cass County)	12/06/02	58,703	0	58,703
1228	Traill County Drain #6	12/06/02	61,742	0	61,742
1271	Ring Dikes - Maple River WRD	12/06/02	46,874	0	46,874
1271	Ring Dikes - Rush River WRD	12/06/02	46,750	0	46,750
1271	Ring Dikes - Southeast Cass WRD	12/06/02	259,784	0	259,784
1520	Walsh County Drain #30	12/06/02	76,944	0	76,944
1705	Red River Joint WRD Coordinator	12/06/02	18,000	0	18,000
1919	Steele-Traill Drain #17	12/06/02	45,127	0	45,127
(237-03)	Will and Carlson Consulting Contract	12/06/02	35,000	25,441	9,559
492	Lake George Outlet Control Structure Project	01/10/03	18,293	0	18,293
1270	Brookfield Estates Diversion Ditch Extension Project	01/25/03	7,315	0	7,315
1212	Sweet Briar Dam Morton County	03/05/03	25,333	0	25,333
568	Sheyenne River Snagging and Clearing	03/05/03	38,750	22,721	16,029
1066	Cass County Drain #9 Drop Structure	03/05/03	20,939	0	20,939
1232	Traill County Drain #13	03/05/03	250,000	0	250,000
1232	Traill County Drain #27	03/05/03	250,000	0	250,000
1247	Traill County Drain #30 Brokke Drain	03/05/03	169,507	0	169,507
305	Red River Basin Commission Mainstem Modeling Project	03/13/03	12,500	0	12,500
1915	Traill County Drain #58 Construction Project	03/13/03	18,341	0	18,341
1909	USGS Red River Wetland Monitoring & Modeling Project	03/17/03	18,000	0	18,000
492	Lake George Outlet Control Structure Project	04/14/03	1,609	0	1,609
331-1	Hay Creek Flood Insurance and Mapping Project	04/16/03	15,598	0	15,598
1638	Red River & Morais River Agricultural Dikes Survey	04/23/03	15,744	0	15,744
1346	Mount Carmel Dam Incident	04/28/03	120,000	146,807	-26,807
1346	Mount Carmel Dam Incident Consultant	04/28/03	200,000	0	200,000
1392	Shultz, Econ Damage Study (Missouri R. Lawsuits)	05/08/03	10,000	2,400	7,600
1252	Walsh County Drain #31 Project	06/12/03	35,559	0	35,559
1392	NDSU Steven Shultz Econ. Value of Lake Sakakawea Fishing	06/13/03	17,820	16,000	1,820
543	North Lemmon Lake Dam Repair	06/26/03	4,560	0	4,560
828	Homme Dam (Walsh)	11/29/95 & 09/13/99	24,500	9,000	15,500
	TOTAL GENERAL PROJECTS		**5,468,862**	**1,002,776**	**4,466,086**

State Water Commission - Projects/Grants/Contract Fund - Completed Projects
July 1, 2001 - June 30, 2003

SWC PROJ. NO.	NAME	INITIAL APPROVAL	AMOUNT APPROVED	PAYMENTS	BALANCE
	COMPLETED GENERAL PROJECTS				
222	Buford-Trenton Irrigation District Upgrade	05/01/02	16,390	16,390	0
463	East Snowflake Creek Outlet Control Structure (Cavalier)	02/18/02	15,019	7,500	7,519
475	Golden Lake Control Structure Repair Project	02/28/02	3,166	3,166	0
507	Raleigh Dam Bank Stabilization	12/12/02	2,933	2,933	0
557	Gascoyne Lake - Dam Improvement Project	10/21/02	1,000	1,000	0
575	Smishek Lake/Spillway Modification	06/21/02	2,000	1,784	216
576	Missouri River Coordinated Resource Management Prog.	10/19/98	1,756	1,751	5
841	Upper Maple River Watershed Floodwater Retention Study	05/21/02	20,000	19,912	88
849	Herzog Dam Safety Repair Project	04/23/03	370	370	0
1054	Meadow Lake Flood Control (Barnes)	09/02/98	4,825	2,564	2,261
1057	Bottineau Co. Drain #2 Phase 1 Reconstruction (Gessner Dr.)	04/18/02	11,928	11,928	0
1078	North Cass WRD/Cass County Drain #25A	08/15/02	170,252	0	170,252
1086	Cass County Drain #35 Backflow Prevention Structure	12/08/00	33,075	31,643	1,432
1090	Cass County Drain #40 Channel Improvements	08/16/01	94,868	94,868	0
1100	Rosa Lake Drain Sloping Project	09/05/02	15,000	14,561	439
1244	Traill County Drain #27	03/05/03	250,000	0	250,000
1292	Nygren Dam	01/10/02	3,467	2,577	890
1294	Nelson County, Culverts County Road #23	09/20/01	6,117	6,117	0
1294	Nelson & Grand Forks Counties Diversion Ditch Project	09/30/02	14,533	14,393	140
1300	Mouse River Park Slope Stabilization - Renville County	12/08/00	5,314	5,314	0
1301	Richland County WRD Residential Ring Dikes	10/23/01	173,975	28,909	145,066
1301	Richland County Drain #31 Ring Dikes	12/07/01	26,296	22,675	3,621
1301	Richland County WRD Farmstead Ring Dikes	10/23/01	41,736	25,000	16,736
1392	Shultz, Econ Damage Study (Missouri R. Lawsuits)	03/25/03	6,000	6,000	0
1486	Cooperstown Area Drain Project Griggs	07/11/96	5,200	0	5,200
1486	Griggs County Drain #1A (Karnak)	12/06/02	47,335	47,335	0
1520	Walsh County Drain #30	12/06/02	25,520	25,520	0
1625	Burleigh County Purple Loosestrife	12/19/02	1,019	1,019	0
1826	North Dakota Natural Resources Trust	12/07/01	30,288	30,288	0
1842	Richland County WRD Snagging & Clearing	03/11/02	13,985	12,788	1,197
1851	Drought Disaster Livestock Water Assistance Program	08/15/02	81,134	81,134	0
1859	Section 319 Funding	12/07/01	200,000	200,000	0
1865	City of Belfield, Modifications of Belfield Dam	05/01/01	2,000	2,000	0
1900	Richland County Drain #95	08/16/01 - 08/15/02	229,102	229,102	0
1909	Red River Wetland/Watershed Study	11/28/00	8,125	8,125	0
1909	USGS Red River Wetland Monitoring & Modeling Project	08/21/02	17,000	17,000	0
1911	Steele County Drain #4	07/14/00	159,395	123,309	36,086
1280	Upper Turtle River Watershed - Grand Forks County	09/11/00	43,125	25,802	17,323
1293/1917	Northwestern Dairy - Mountrail County	05/22/01	91,240	84,390	6,850
1588-01	Red River Basin Board Needs Assessment		70,000	50,000	20,000
1751-06	Digital Aerial Surveying (Cass)	06/09/99 & 04/10/00	94,500	75,379	19,121
1751-10	City of Minot Flood Study	09/11/00	55,400	50,173	5,227
	Long Lake	05/05/01	1,110	1,110	0
	Red River Basin Board (Face to Face Forums)	08/16/01	20,000	20,000	0
	Red River Basin Board (Overview Analysis)	08/16/01	100,000	100,000	0
	ND WEF Water Magazine	03/05/03	36,000	36,000	0
	ND WEF Tours		5,000	5,000	0
(237-03)	GDCD Will & Carlson Contract	08/16/01	35,000	27,338	7,662
	Section 404/Backstrand	03/12/02	1,625	1,625	0
	TOTAL COMPLETED PROJECTS		**2,293,123**	**1,575,792**	**717,331**

State Water Commission

Object Expenditures
for Biennial Period Ending June 30, 2003

Permanent Salaries	$ 6,529,264
Temporary Salaries and Overtime Salaries	285,575
Fringe Benefits	1,943,956
IT - Data Processing	106,619
IT - Telephone	86,192
Travel	686,343
IT - Software/Supplies	136,339
Utilities	20,393
Postage	29,972
IT - Contractual Services and Repair	63,933
Lease/Rent - Equipment	20,066
Lease/Rent - Bldg/Land	68,134
Professional Development	153,308
Operating Fees and Services	347,180
Repairs	32,991
Professional Services	4,446,726
Insurance	34,960
Office Supplies	23,038
Printing	27,148
Professional Supplies and Materials	315,988
Food and Clothing	1,516
Medical, Dental and Optical	5,287
Building, Grounds, Vehicle Maintenance Supplies	98,997
Miscellaneous Supplies	74,520
Office Equipment and Furniture	45,157
IT - Equipment	197,912
Other Equipment	236,900
Land and Buildings	440,696
Other Capital Payments (Includes Southwest Pipeline Project)	17,802,246
Grants, Benefits, and Claims	32,032,298
Transfers	272,695
TOTAL	**$66,566,349**

State Water Commission

LONG-TERM DEBT

The State Water Commission has issued revenue bonds for the Southwest Pipeline Project and the Northwest Area Water Supply Project. We have also issued bonds for statewide water development projects. The following table shows the State Water Commission's long-term debt as of June 30, 2003:

Water Development Bonds

PROJECT	SERIES	AMOUNT
Southwest Pipeline Project	1997 Series A	$6,340,000
Southwest Pipeline Project	1997 Series B	3,300,970
Southwest Pipeline Project	1999 Series A	989,500
Southwest Pipeline Project	2000 Series A	1,425,000
Southwest Pipeline Project	2000 Series B	396,300
Southwest Pipeline Project	2001 Series A	500,000
Southwest Pipeline Project	2002 Series A	834,228
Northwest Area Water Supply (Rugby)	1998 Series A	1,140,000
Statewide Water Development Projects	2000 Series A	30,185,000

Resources Available from the Agency

Minutes of meetings held may be obtained by writing to:

ND State Water Commission
State Office Building Dept 770
900 East Boulevard Avenue
Bismarck, ND 58505-0850

Or, via the Internet: http://www.swc.state.nd.us/reports/commeet.html

Data available for public use:

- Government Land Office Plats
- Survey Horizontal and Vertical Control
- Various Ground-Water Studies
- Well and Site Location Data
- Lithologic Data
- Water Chemistry Data
- Water Level Data
- Growing Season Rainfall & Hail Data
- Water Permit Data
- Drainage Permit Data
- Stream Flow Data
- Construction Permit Data
- Retention Structure Data
- Digital Map Data

Additional information about the State Water Commission is available on our web site on the Internet at **http://www.swc.state.nd.us/.**