

# STRATEGIC PLAN

STATE WATER COMMISSION & OFFICE OF THE STATE ENGINEER



NORTH  
**Dakota** | State Water Commission  
Be Legendary.™

2019  
2021



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## A MESSAGE FROM THE STATE ENGINEER

*We are pleased to present the North Dakota State Water Commission and Office of the State Engineer's 2019–2021 Strategic Plan. This new plan was completed with a refocused approach – including an agency-wide effort to re-evaluate our goals, and strategic initiatives.*

*Our strategic planning process began by asking ourselves if our existing goals and objectives were an accurate reflection of where the state and agency's priorities had evolved. After careful consideration, it was determined that a re-evaluation of goals was warranted. By going through this process, we are ensuring that we are achieving the standards expected by the people of North Dakota, and that we are contributing to an overall reinvention of government.*

*Within this document, you will find newly established goals and strategic initiatives, which together, provide a targeted approach to high-quality delivery of services. In addition, the agency's key projects and programs are outlined, along with defined tasks and actions that our divisions and management need to take to achieve desired outcomes.*

*In having this plan at our disposal, the agency will be better equipped to document the progress it is making in the management of North Dakota's water resources. To measure our progress, we will continue to voluntarily publish agency biennial reports, which outline our activities for each biennium – providing an accurate measure of goal achievement. By publishing this plan, I believe we are continuing the tradition of setting a high standard for ourselves that can be monitored by all interests in the water community.*

Sincerely,

Garland Erbele, P.E.  
State Engineer  
Chief Engineer–Secretary



# 2019-2021 STRATEGIC PLAN

WATER COMMISSION AND OFFICE OF THE STATE ENGINEER

The following agency Vision, Mission, Philosophy and Values, Goals, and Strategic Initiatives make up our Strategic Plan.

These elements collectively provide direction, and clearly articulate where the agency will prioritize its efforts during the 2019-2021, and future biennia.





# OUR VISION

Present and future generations of North Dakotans will enjoy an adequate supply of good quality water for people, agriculture, industry, and fish and wildlife; Missouri River water will be put to beneficial use through its distribution across the state to meet ever increasing water supply and quality needs; and successful management and development of North Dakota's water resources will ensure health, safety, and prosperity, and balance the needs of generations to come.



# OUR MISSION

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.



# PHILOSOPHY & VALUES

In the delivery of services to the citizens of North Dakota, we, the employees of the State Water Commission and the Office of the State Engineer, value fairness, objectivity, accountability, responsiveness, and credibility. We pledge to use professional and scientific methods to maintain only the highest of standards in the delivery of services to our constituents.

# GOALS & STRATEGIC INITIATIVES

## GOAL 1

Promote development and investment in water resource projects.

### STRATEGIC INITIATIVES

Biennially develop a comprehensive Water Development Plan which includes an inventory of prioritized water projects to facilitate investment in the state's highest water development priorities.

Implement the Economic Analysis and Life Cycle Cost Analysis processes to support the efficient allocation of state funds.

Administer the cost-share program to provide financial support to political subdivisions for locally led projects that protect public safety, enhance quality of life, and promote economic development.

Continue design, construction, and operation of the Southwest Pipeline and Northwest Area Water Supply projects.

Implement and manage the Drought Disaster Livestock Water Supply Assistance Program to mitigate drought-related impacts to the state's livestock industry.

## GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state's water resources.

### STRATEGIC INITIATIVES

Continue research and deployment of advanced technologies such as Airborne Electromagnetic (AEM) surveys, Pushing REmote SENSors (PRESENS), and an unmanned aerial vehicle (UAV) for data collection efforts.

Utilize agency-hosted Light Detection and Ranging (LIDAR), aerial imagery, flood control structure database information, and the new approximate flood risk map to promote National Flood Insurance Program participation and best floodplain management practices, and develop a publically accessible web-based platform.

Use internet-based platforms to implement, grow, and improve the water education program through cooperative efforts with other agencies, universities, and the educational community.

Continue development and deployment of innovative IT infrastructure to address complex water resource management initiatives - while continuing support of existing IT development platforms.

## GOAL 3

Continue our strong commitment to sustainable water management.

### STRATEGIC INITIATIVES

Provide regulatory and permitting oversight to water construction features, i.e. flood control facilities, water retention structures, and assessed drains.

Maintain a strong water right permitting process that provides for the orderly development of water resources in the state.

Provide hydrologic and hydraulic technical support to agency functions and the public to enhance public safety, quality of life, and economic development.

Utilize state-of-the-art technologies to provide hail suppression and rainfall enhancement cloud seeding services to participating counties.

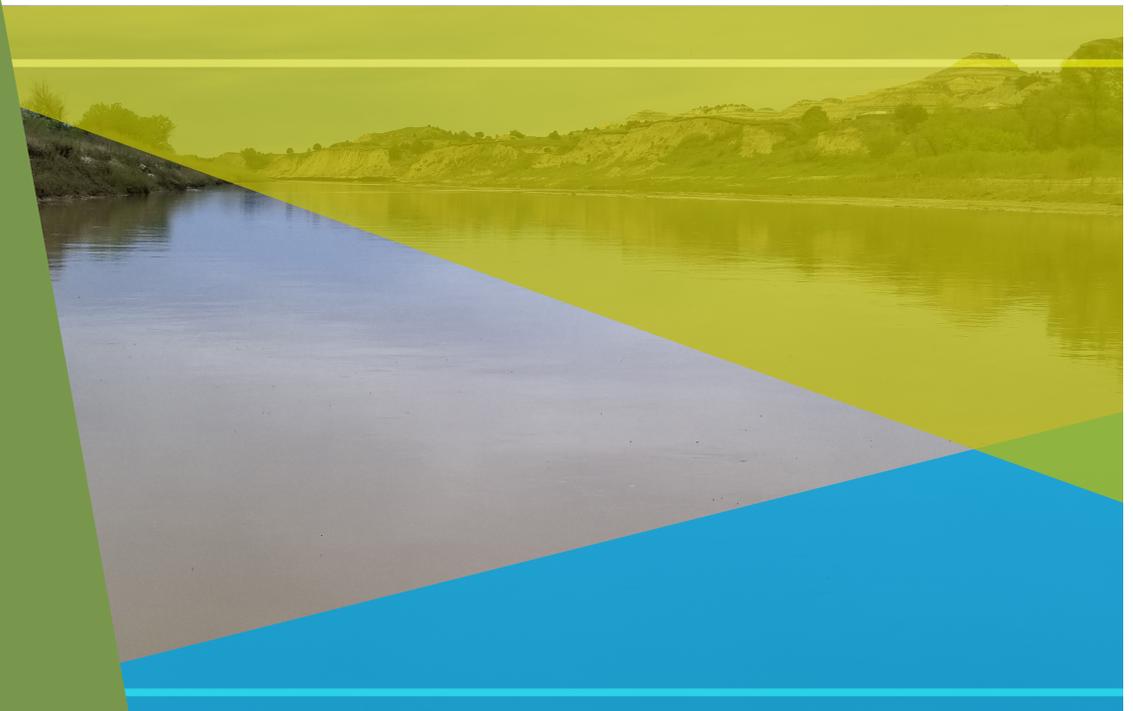
Increase the public's understanding and awareness of state sovereign lands and the management of regulated activities.



# OPERATIONAL OVERVIEW AND ACTION PLANS

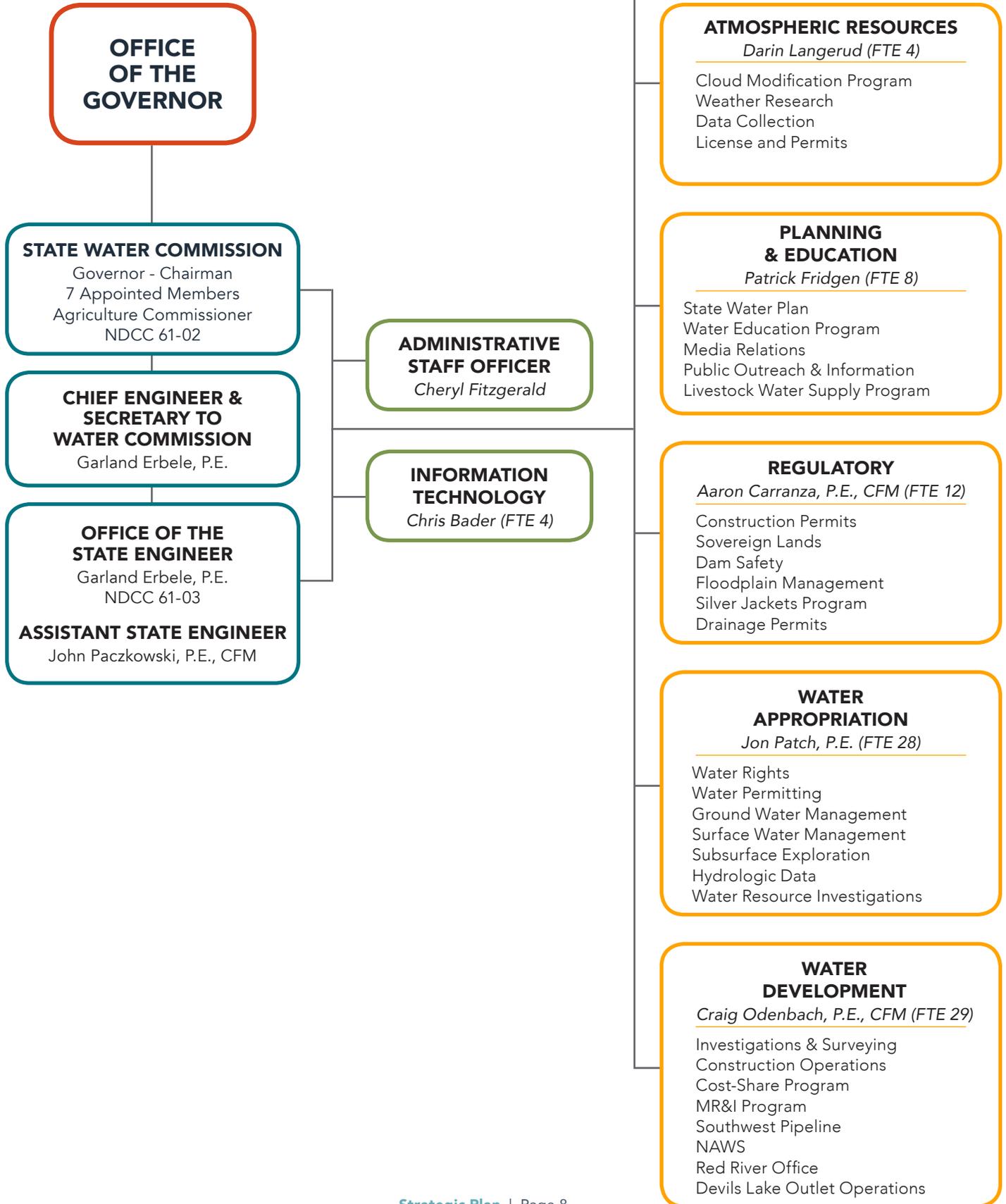
While the State Water Commission and the Office of the State Engineer are separate state agencies with different directives, many of their responsibilities are entwined and overlap at several levels. For that reason, the activities of these two agencies have been merged into one operational overview.

Outlined in the following pages are the projects and programs that were the primary focus of our strategic planning process. It should be noted that this is by no means a comprehensive inventory of all efforts pursued by the State Water Commission and the Office of the State Engineer. Rather, it is simply a collection of those efforts that were deemed appropriate to include in our strategic planning process. Further, the projects and programs identified here have been separated by the divisions that are primarily responsible for their management. However, in several instances, many of our projects and programs require staff contributions from multiple divisions.



# ORGANIZATIONAL CHART

TOTAL FULL TIME EQUIVALENTS OF 93 PERSONNEL



# AGENCY DIVISIONS & KEY PROJECTS OR PROGRAMS

## ADMINISTRATION - Dave Laschkewitsch, Director

Administration & Support Services

## ATMOSPHERIC RESOURCES - Darin Langerud, Director

ARB Cooperative Observer Network

Atmospheric Research Program

North Dakota Cloud Modification Project

## WATER APPROPRIATION - Jon Patch, Director

Community Water Supply Studies

Water Resource Data  
Information Dissemination

Water Resource-Related  
Economic Development

Water Resource Investigations & Monitoring

Water Resource Research

Water Rights Administration & Processing

Water Use Appropriation & Permitting

## WATER DEVELOPMENT - Craig Odenbach, Director

Cost-Share Program

Design & Construction

Devils Lake Flood Control  
Investigations

Municipal, Rural & Industrial  
Water Supply Program

Northwest Area Water Supply

Southwest Pipeline Project

## PLANNING & EDUCATION - Patrick Fridgen, Director

State Water Development Plan

Water Education

Watershed Planning & Coordination

Drought Disaster Livestock  
Water Assistance Program

## REGULATORY - Aaron Carranza, Director

Dam Safety Program

Engineering & Permitting

Floodplain Management

Silver Jackets Program

Sovereign Land Management





# ADMINISTRATION & SUPPORT SERVICES

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state’s water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Provide umbrella administrative and technology services that support the projects and programs of the agency.

## PROJECT/PROGRAM OVERVIEW

The Administrative Services Division provides the overall direction of agency powers and duties as described in the state’s water laws. The activities include both the State Engineer and State Water Commission’s operations, as well as accounting, information technology (IT), human resources, records management, legal support, and support services for all agency projects and 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 and program cost accounting, preparation of budgets, responding to audit requests and recommendations, and proper control of various funds appropriated by the Legislature.

Human Resources works as a business partner with and for each division in developing, implementing, and supporting workforce programs that seek to recruit, develop, and retain a qualified, diverse, and engaged workforce.

The division also works on contracts and agreements that are necessary to carry out investigations, planning, and cooperation with various other agencies in water resources management.

IT supports general agency business operations in areas related to workflow management and office automation. IT also supports and enhances agency data collection and management functions, and broader engineering and scientific functions.

## ASSUMPTIONS AND OBSTACLES

Maintaining and improving existing agency programs and services will require continued funding for agency operations and project development.

ACTION PLAN	TASKS	TARGET DATES
	Prepare and submit the agency’s budget.....	Sept. 2020
	Coordinate the timing of agency bonding.....	As Needed
	Coordinate development of agency testimony for legislative appropriations hearings.....	Dec. 2020
	Maintain accounting records, and provide information technology and records management services.....	Ongoing
	Bill federal, state, and local entities for their share of project costs.....	Ongoing
	Provide legal support, including research and contract development.....	Ongoing
	Maintain an agency IT strategic plan, and coordinate agency IT efforts with external and statewide initiatives.....	Ongoing
	Support, maintain, and evolve agency IT infrastructure.....	Ongoing

# ARB COOPERATIVE OBSERVER NETWORK

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state's water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Make high-resolution precipitation and hail data available to county, state, and federal agencies, private organizations, and the public.
- › Provide the database online for download or review.
- › Increase online reporting and produce value-added products that will be useful to a larger audience.
- › Expand snowfall measurements in critical areas to assist with spring flood forecasting.



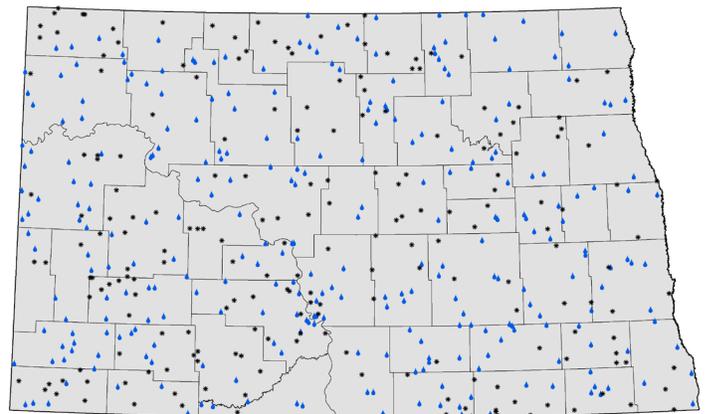
## PROJECT/PROGRAM OVERVIEW

The Atmospheric Resource Board's Cooperative Observer Network (ARBCON) has collected growing season rainfall and hail data from volunteer observers statewide since 1977. Current participation ranges between 500 and 550 observers annually, making it one of the highest density precipitation observation networks in the United States. In all, more than five million daily precipitation observations, over 410,000 snowfall observations, and over 13,000 hail observations have been reported.

## ASSUMPTIONS AND OBSTACLES

Continuation and expansion of existing statewide precipitation observations will require continued funding for agency operations and equipment.

### 2018 ARBCON OBSERVERS



\* Year-Round    💧 Summer Only

## ACTION PLAN

### TASKS

### TARGET DATES

Manage the program for daily observation of rainfall, hail, and snow, including data entry, quality control, and Geographic Information System (GIS) mapping.....	Ongoing
Produce growing season map products and manage volunteer renewal for following years.....	Fall, Annually
Recruit new volunteers.....	Ongoing
Mail reporting instructions, reporting cards, and rain gauges to volunteer observers.....	March, Annually
Expand the online reporting program.....	Ongoing, Annually
Expand snowfall measurements in critical areas.....	Winter, Annually
Develop a mobile application for data reporting and dissemination.....	Spring, 2019



# ATMOSPHERIC RESEARCH PROGRAM

## AGENCY GOALS SATISFIED

### GOAL 2

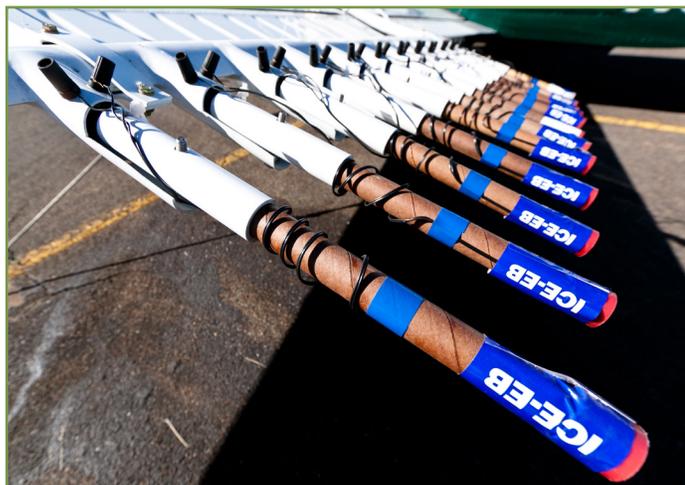
Utilize technology and education to increase our understanding for the improved management of the state's water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Better quantify the physical processes of rainfall and hail formation.
- › Improve operational application of cloud seeding technologies.
- › Better quantify seeding effects through development and application of improved evaluation techniques.



## PROJECT/PROGRAM OVERVIEW

North Dakota has a long history of research in weather modification. Since the mid-1980s, eight field research programs have been conducted in the state, most recently through focused campaigns in 2008, 2010, and 2012. Historically, the Bureau of Reclamation and the National Oceanic and Atmospheric Administration have provided program funding. Currently, program funding is being provided by the state.

## ASSUMPTIONS AND OBSTACLES

Funding is the primary obstacle for the Atmospheric Research Program.



## ACTION PLAN

### TASKS

### TARGET DATES

Develop methodologies using new technologies to evaluate and enhance North Dakota's operational cloud seeding program.....	Fall, 2019
Collaborate with other states and organizations/institutions doing similar research to improve and enhance North Dakota's program.....	Ongoing
Receive North Dakota State University economic study on the effects of cloud seeding on agricultural production.....	Spring, 2019
Receive North Dakota State University study on the effects of cloud seeding on summer rainfall .....	Summer, 2019



# COMMUNITY WATER SUPPLY STUDIES

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state's water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Conduct water supply studies.



## PROJECT/PROGRAM OVERVIEW

Rural water entities and municipalities in need of help with their water supply can access agency staff for interpretation of existing data. These are usually cooperative studies with partial funding from the entity. Cooperators can also apply for cost-share assistance from the State Water Commission for water supply studies. Rural water entities and municipalities use the reports of the water resource studies to help with their decisions regarding water supply concerns and options.

## ASSUMPTIONS AND OBSTACLES

In recent biennia, as more communities have tied in to expanding regional water supply systems, the need for individual community water supply studies has declined with the focus shifting to concentrated pumping from the regional supply locations. Limited regional groundwater supplies where additional stress is applied requires investigation, data collection, and increased management to ensure sound scientific decisions are being made on appropriations to protect prior water rights and the public interest.



## ACTION PLAN

### TASKS

### TARGET DATES

Provide interpretation of existing water resource data.....	Ongoing
Conduct studies of potential water resources .....	As Requested
Publish reports on water resource studies .....	As Needed
Provide guidance and/or recommendations with regard to water supply concerns.....	Ongoing
Process appropriate paperwork to establish or maintain water rights .....	Ongoing



# COST-SHARE PROGRAM

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state’s water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › To financially assist federal and state agencies and political subdivisions with eligible projects categorized as rural flood control, water supply, flood control, flood protection, flood acquisitions, dam safety, recreation, studies, irrigation, bank stabilization, dam removal/breach, FEMA levee accreditation, water retention, engineering, and technical assistance.



## PROJECT/PROGRAM OVERVIEW

Beginning in 1943, the North Dakota Legislative Assembly appropriated funds to the State Water Commission for cost-share assistance on existing drain channels. Since then, the State Water Commission Cost-Share Program has significantly evolved, and has now developed into a program that adequately meets the goals of the State Water Commission, and the needs of our constituents.

The State Water Commission Cost-Share Program identifies types of projects that are eligible for cost-share assistance per the agency policy. Currently, as determined by that policy, the State Water Commission cost-shares on several types of projects, and has existing agreements to fund: flood control, irrigation, drainage and diversion channels, ring dikes, flood acquisitions, water supply projects, engineering and other studies, miscellaneous education and research projects, emergency action plans, imagery acquisition, dam safety reconstructions, recreation-based lake facilities, dikes, levees, non-point source pollution, central irrigation system supply lines, rip-rap bank stabilizations, dam removals, and technical assistance projects.

Upon determining a proposed project’s eligibility and approval of funding, an agreement/contract is entered into with the project’s sponsor describing the scope of work, how funds will be disbursed, insurance and indemnification requirements, and other terms as applicable. Request for payments are processed per the terms of the agreement. At the discretion of the State Water Commission, projects are reviewed and/or inspected upon final payment.

## ASSUMPTIONS AND OBSTACLES

The amount of funds available for the Cost-Share Program is dependent on state appropriations and agency budgeting from the contract fund.

ACTION PLAN	TASKS	TARGET DATES
	Review approximately 160 cost-share inquiries and/or applications for cost-share eligibility and assistance .....	Ongoing
	Present eligible project proposals for approval and authorization by the Water Commission based on available funding in each funding purpose category.....	Ongoing
	Develop agreements/contracts for approved and authorized projects .....	Ongoing
	Process requests for payment, monitor agreement/contract compliance, and review or inspect work.....	Ongoing



# DAM SAFETY PROGRAM

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state’s water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Conduct dam inspections in order to identify dams in need of maintenance or repair.
- › Report inspection findings and make recommendations to dam owners.
- › Maintain and update an inventory of all dams in North Dakota.
- › Encourage the development of Emergency Action Plans (EAPs) for high and medium hazard dams, including the development of inundation maps for high hazard dams.
- › Increase awareness of dam safety issues among dam owners and the public.

## PROJECT/PROGRAM OVERVIEW

The purpose of North Dakota’s Dam Safety Program is to minimize the risk to life and property associated with the potential failure of dams in the state. A national dam inspection program took place in 1978-1981 under the direction of the U.S. Army Corps of Engineers, following a series of dam failures across the country in the 1970s. The North Dakota Dam Safety Program, overseen by the Office of the State Engineer, was initiated to continue and build on that inspection program. There are currently about 3,180 dams in North Dakota’s dam inventory. Of these, 48 dams are currently classified as high hazard and 82 are currently classified as medium hazard, meaning that there is the potential for loss of life or significant property damage downstream if one of those dams were to fail.

## ASSUMPTIONS AND OBSTACLES

Federal grants through the Federal Emergency Management Agency and the National Dam Safety Program provide annual funding for training, equipment, and special projects. The availability and timing of these grants is uncertain from year to year. In addition, there is a very limited timeframe in which to complete projects under these grants.



ACTION PLAN	TASKS	TARGET DATES
	Conduct periodic inspections of non-federally owned high hazard and medium hazard dams on a rotational basis, approximately 20 per year	Annually
	Conduct additional dam inspections following spring runoff, as needed during flood events, in response to concerns, or on request	Annually
	Report inspection findings and make recommendations to dam owners	Ongoing
	Maintain and update North Dakota’s dam inventory	Ongoing
	Submit data to the National Inventory of Dams (NID)	As Requested
	Track the status of EAPs for high and medium hazard dams; review and approve EAPs as they are submitted	Ongoing
	Review and update the hazard classification of dams in North Dakota	Ongoing
	Update the North Dakota Dam Design Handbook	December 31, 2021
	Develop a dam maintenance manual for North Dakota	December 31, 2021
Emergency response	As Needed	



# DESIGN & CONSTRUCTION

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state's water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Maintain water resource facilities within the state to ensure public safety, and enhance quality of life, by meeting multiple uses such as flood control, water supply, and recreation opportunities.
- › Work with the United States Geological Survey (USGS) to maintain the network of stream gauges throughout the state, thereby ensuring reliable data necessary for managing North Dakota's water resources.



## PROJECT/PROGRAM OVERVIEW

The Design and Construction Section are involved with assisting dam owners throughout the state in designing repairs and modifications to existing water facilities. The section works with the North Dakota Game and Fish Department (NDGF) to maintain outlet structures and install low-level drawdowns used by NDGF to manage fisheries. The section is also involved in directing emergency actions during major dam incidents.

## ASSUMPTIONS AND OBSTACLES

Weather is the primary obstacle for timely completion of annual construction and repair efforts.



## ACTION PLAN

### TASKS

### TARGET DATES

Assist dam owners with design and repairs of existing water facilities.....	Ongoing
Repair and maintain North Dakota's stream gauge network through cooperative efforts with the USGS .....	Summer, Annually
Conduct general construction projects.....	Summer, Annually
Assist the Dam Safety Program with spring inspections of dams.....	Annually
Emergency Response .....	As Needed



# DEVILS LAKE FLOOD CONTROL

## AGENCY GOALS SATISFIED

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Reduce the risk of flooding in the Devils Lake basin.

## PROJECT/PROGRAM OVERVIEW

2018 marked the 26th year of the historic flooding of Devils Lake. Beginning in 1993, a distinct pattern of increased precipitation over the closed Devils Lake basin resulted in a lake rise of over 31 feet, which inundated over 165,000 acres at the peak of the flood in 2011. That year, the lake rose to a modern day peak elevation of 1454.3 feet, which is less than four feet from the natural overflow elevation of 1458 feet.

In an effort to alleviate the flooding, the State Water Commission completed a 100 cubic feet per second (cfs) emergency outlet from West Devils Lake to the Sheyenne River in 2005. In the spring of 2010, the state increased the West Outlet capacity to 250 cfs, and in 2012, an East Devils Lake outlet with a 350 cfs pumping capacity was completed. The combined capacity of the two outlets is 600 cfs, and together they are capable of removing approximately one foot of water during a full capacity discharge season. As of October 2018, the total volume of water discharged by the outlets was 1.1 million acre-feet.

In addition to the outlet infrastructure, the Tolna Coulee Control Structure was constructed by the U.S. Army Corps of Engineers in 2012. The structure is owned and operated by the State



Water Commission, and is designed to prevent a potentially catastrophic overflow if the lake rises to the natural overflow elevation. Discharge through the structure is controlled by stop logs which are kept approximately one foot below the lake elevation.

In the years since 2011, outlet discharges and lower inflow volumes have resulted in a gradual decline of the lake level and the lake is expected to fall to 1448 feet by the end of 2018. The West and East outlets are designed to operate to minimum elevations of 1445 and 1446 feet respectively and their operation is managed by the Governor and State Water Commission with input from the 17 member Devils Lake Outlet Management Advisory Committee (DLOMAC).

During a meeting of the DLOMAC in April 2018, the committee supported the continued maximum outlet discharge within the established limitations on Sheyenne River water quality and quantity. They also agreed to re-evaluate the outlet operating parameters once a lake level of 1448 feet was reached. The committee will meet again in 2019 and will likely develop a recommendation for how to manage the outlets between a lake elevation of 1448 feet and their minimum intake elevations.

*For a map of the state's emergency Devils Lake outlet projects, see the Map Appendix.*

## ACTION PLAN

TASKS	TARGET DATES
Maintain and operate the Devils Lake emergency outlets .....	Ongoing
Maintain and operate the Tolna Coulee Control Structure .....	Ongoing
Develop discharge monitoring reports for outlet operation .....	As needed
Implement the Outlet Mitigation Plan and respond to damage claims.....	Ongoing



# DROUGHT DISASTER LIVESTOCK WATER ASSISTANCE PROGRAM

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › The Drought Disaster Livestock Water Supply Assistance Program was established by the North Dakota Legislature in 1991 and provides cost-share assistance to livestock producers with water supply shortages caused by drought.



## PROJECT/PROGRAM OVERVIEW

NDAC, Section 89-11 provides the State Water Commission the ability to provide cost-share assistance to livestock producers with water supply shortages caused by drought.

Eligible livestock producers in drought proclamation counties may qualify for 50% cost-share assistance, for up to three projects involving the following items:

- › New water wells;
- › New rural water system connections;
- › New pipeline extensions, pasture taps, and associated works; and
- › Labor, materials, and equipment rentals for work completed to develop new water supply projects.

## ASSUMPTIONS AND OBSTACLES

This program is unique in that it is not administered all of the time. It is only activated when the Governor declares a drought disaster, and the State Water Commission, including the Governor as Chair, activates the program.



ACTION PLAN	TASKS	TARGET DATES
	Provide public outreach and education related to program activation and requirements.....	Ongoing
	Process new cost-share applications.....	Ongoing
	Process payments for completed projects.....	Ongoing
	Conduct inspections for compliance of completed projects.....	Ongoing



# ENGINEERING & PERMITTING

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state’s water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Regulate the safe construction, modification, and design of dams, dikes, and other water resource facilities.
- › Review engineering designs for compliance with the current state of civil engineering practice.
- › Facilitate water resources management regulations through the construction and drainage permitting processes.
- › Serve as the administrative remedy for Water Resource District (WRD) decisions on drainage, dam, and dike complaints.
- › Educate, as well as communicate and cooperate with the general public including permit applicants, political subdivisions, and other state and federal agencies regarding construction and drainage permitting processes.
- › Provide technical assistance and determinations to local water resource managers, engineers, attorneys, and members of the public.

## PROJECT/PROGRAM OVERVIEW

As authorized by NDCC 61-03 and 61-16.1, the State Engineer has been responsible for regulating the construction of dams, dikes, and other water resource facilities since approximately 1935. Since 1957, NDCC 61-32 has authorized the State Engineer to regulate drainage. The State Engineer coordinates these activities with county and regional WRDs across the state.

In addition to these permitting processes, the Engineering and Permitting Program provides technical assistance to WRDs and members of the public, through stream crossing determinations in accordance with NDCC 24-03-08; Watercourse determinations in accordance with NDCC 61-01-06; and processing public appeals of WRD decisions. The Engineering and Permitting Program also serves as a source of information to the public, handles easement releases for abandoned dams, participates in training workshops, represents the State Engineer on various interagency committees, and provides agency review of Public Service Commission permitting activities and U.S. Army Corps of Engineers’ Section 404 permits.

## ASSUMPTIONS AND OBSTACLES

Regulation of water resource control structures and water management requires a diligent, trained, and experienced engineering staff knowledgeable of the constantly changing state of engineering practices and technologies utilized to implement engineering design and construction activities.



ACTION PLAN	TASKS	TARGET DATES
	Process all construction and drainage permit applications in a timely manner.....	Annually
	Provide technical assistance to WRDs as requested .....	Ongoing
	Address all incoming WRD decision appeals in a timely manner.....	Annually
	Digitally map all permitted assessment drains and dams that are currently in the agency’s database .....	Annually
	Provide all stream crossing and watercourse determinations in a timely manner .....	Annually
	Review all incoming Public Service Commission permitting activities and U.S. Army Corps of Engineers’ Section 404 permits .....	Annually



# FLOODPLAIN MANAGEMENT

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state’s water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Fulfill the responsibilities of the Federal Emergency Management Agency’s (FEMA) Community Assistance Program - State Support Services Element (CAP-SSSE) and Risk Mapping and Assessment Planning (MAP) program.
- › Guide development of the floodplains of the state, in accordance with legislative direction.
- › Reduce flood damages through sound floodplain management.
- › Ensure, as far as practicable, that channels and floodways are kept free and clear of interference or obstructions.
- › Provide state coordination and assistance to communities with floodplain management activities.
- › Encourage communities to adopt, administer, and enforce sound floodplain management ordinances.
- › Coordinate federal, state, and local floodplain management activities in the state.

## PROJECT/PROGRAM OVERVIEW

Through the FEMA CAP-SSSE and Risk MAP programs, the state is able to accomplish these program objectives as outlined in the North Dakota Floodplain Management Act of 1981, which adopted the National Flood Insurance Program (NFIP) by reference in NDCC 61-16.2. This chapter was amended in 1999 and again in 2003 by the North Dakota Legislature, which broadened and refined the duties of the State Engineer.

The federal CAP-SSSE is designed to provide technical assistance to communities participating in the NFIP and to evaluate their performance in implementing NFIP management activities. In exchange for enforcing the floodplain development regulations, federal flood insurance is available for property located within participating communities. Flood Insurance Rate Maps (FIRMs) are key resources to regulating floodplains. These documents are created and updated through the Risk MAP program. FEMA provides partnership funding to states for their role in the CAP-SSSE and Risk MAP programs.

## ASSUMPTIONS AND OBSTACLES

Successful management of the state’s floodplain and flood prone areas will continue to require active participation and enrollment of cities, counties, townships, and tribes in the NFIP.



## ACTION PLAN

### TASKS

### TARGET DATES

Monitor community floodplain management compliance by assessing a minimum of 20 participating communities on a rotational basis .....	September 30, Annually
Provide technical assistance regarding the NFIP, 100% of the time it’s requested .....	As Needed/Ongoing
Process 100% of the requests for a State Engineer’s floodway review.....	As Needed/Ongoing
Coordinate floodplain management training workshops and participate in related training opportunities .....	September 30, annually
Manage the selection and study process of community candidates for initial and revised flood hazard identification relative to the NFIP .....	Ongoing



# INVESTIGATIONS

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state’s water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Conduct preliminary engineering, hydrologic, and hydraulic studies for public entities.
- › Provide technical support to the agency through engineering, surveying, and GIS services.

## PROJECT/PROGRAM OVERVIEW

The Investigations Section is responsible for the preliminary engineering of surface water projects throughout the state. These projects are feasibility level assessments related to flood control, irrigation, dam safety, drainage and other water-related issues. These efforts generally include collecting both topographic and water surface elevation data throughout the state, GIS analysis, and the development of hydrologic and hydraulic models. The Water Commission may enter into formal agreements with public entities, such as a state agency, county, or municipality, for an investigation.

The Investigations Section creates and reviews hydrologic and hydraulic models as needed to support agency functions. Technical assistance also includes reviewing reports and studies, creating tools for GIS analysis, maintaining a lake gage monitoring network of several closed basin lakes in the state, and providing emergency response for flooding and dam safety issues.

The survey crew collects survey data statewide for a variety of purposes, maintains a survey database, collects snow samples, and assists in archiving historic notes, plats, surveys, and photos. Technical assistance is also provided for special issues such as Mouse (Souris) River international activities, including the Souris River Plan of Study, the proposed statewide Probable Maximum Precipitation (PMP) study, various U.S. Army Corps of Engineers Section 22 studies, Silver Jackets projects, and Missouri River activities, including participating on the Missouri River Recovery Implementation Committee.

## ASSUMPTIONS AND OBSTACLES

The purpose of the section is quite broad, which presents challenges and opportunities. Keeping up with technology and evolving with the needs of the agency is a constant challenge.



ACTION PLAN	TASKS	TARGET DATES
	Provide technical review of water management issues.....	As Needed
	Continue to represent the State of North Dakota as part of the Missouri River Recovery Implementation Committee (MRRIC).....	Ongoing
	Manage government survey information .....	Ongoing
	Conduct water resource investigations .....	As Needed
	Provide technical support in response to flooding and other disasters .....	As Needed
	Provide technical support to various agency sections and divisions .....	As Needed
	Develop GIS tools utilizing open source programs.....	Ongoing



# MUNICIPAL, RURAL, & INDUSTRIAL WATER SUPPLY PROGRAM

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

## PROJECT/PROGRAM OBJECTIVES

- › Coordinate alternative funding solutions for water supply and water treatment projects to help water users in cities and rural water areas obtain an adequate supply of quality water for municipal, rural, and industrial purposes.
- › Provide planning and technical assistance to water supply systems to promote wise use of water resources throughout the state.



*For a map of North Dakota's rural and regional water systems, see the Map Appendix.*

## PROJECT/PROGRAM OVERVIEW

The Municipal, Rural, and Industrial (MR&I) water supply program is one source of federal funding used for public water systems. North Dakota's MR&I program was originally established by the 1986 Garrison Diversion Reformulation Act. At that time, Congress authorized \$200 million in the form of a maximum grant of 75 percent. The state has since received the original \$200 million from the 1986 Act. Later, the Dakota Water Resources Act of 2000 added an additional \$200 million for the MR&I program, which is indexed to \$305 million, of which the state has received \$180 million. Funding used for the MR&I program is provided through the U.S. Bureau of Reclamation (BOR). The Garrison Diversion Conservancy District (GDCCD) signed a cooperative agreement with the BOR to receive the federal funding. Further, the State Water Commission and GDCCD signed a joint powers agreement to administer the program based on a memorandum of understanding.

Because of North Dakota's MR&I program, cities, regional and rural water systems have received assistance throughout the state. As a result of this added assistance, there are 32 regional water systems in North Dakota, providing quality drinking water to cities and rural users. Currently, all or parts of North Dakota's 53 counties are served by regional water systems.

## ASSUMPTIONS AND OBSTACLES

Adequate federal funding must be received in a manner that does not impede progress.

ACTION PLAN	TASKS	TARGET DATES
	Implement a five-year plan for MR&I project funding requests .....	Ongoing
	Participate in meetings with communities and rural water districts to provide technical and planning assistance .....	Ongoing
	Provide MR&I budget estimates for project development .....	Ongoing
	Coordinate meetings with various funding entities to discuss projects .....	Ongoing
	Work with North Dakota's Congressional Delegation to increase federal MR&I appropriations.....	Ongoing
	Coordinate with the GDCCD in the prioritization and allocation of MR&I funds.....	Ongoing



# NORTH DAKOTA CLOUD MODIFICATION PROJECT

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state’s water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Reduce hail damage in the North Dakota Cloud Modification Project (NDCMP) target area.
- › Enhance summer rainfall from thunderstorms in the NDCMP target area.



## PROJECT/PROGRAM OVERVIEW

The NDCMP is a long-running cloud seeding program with the dual purposes of hail suppression and rainfall enhancement. The target area covers 11,554 square miles, in seven western North Dakota counties during the months of June, July, and August. Counties partner with the state through the Atmospheric Resource Board (ARB), employing contractors that provide the aircraft, pilots, seeding equipment, and radar maintenance services. The ARB owns and operates two radar systems and employs the meteorologists to coordinate seeding operations. In addition, the program offers two intern programs; one for students studying meteorology, and another for pilots studying at the University of North Dakota’s J.D. Odegard School for Aerospace Sciences.

Evaluations of the NDCMP indicate that the program reduces hail damage to crops by 45 percent, increases wheat yields by 5.9 percent, and increases rainfall between 5 and 10 percent. A 2009 economic study estimates the NDCMP increases the value of agricultural production by \$12 million to \$19.7 million annually, producing a benefit to cost ratio of 12-20 to 1.

## ASSUMPTIONS AND OBSTACLES

The project assumes continued participation by western North Dakota counties and cost-sharing of one-third of project costs, by the state.



*For a map of the North Dakota Cloud Modification Project, see the Map Appendix.*

## ACTION PLAN

TASKS	TARGET DATES
Hold planning meetings with participating NDCMP counties .....	January, Annually
Public notice and comment period for NDCMP permitting .....	March, Annually
Hire NDCMP field personnel .....	May, Annually
Conduct pre-project ground school .....	May, Annually
Conduct NDCMP operations .....	June-August, Annually
Conduct data analysis and final reporting to participating counties .....	Winter, Annually
Report cloud seeding activities to the National Oceanic and Atmospheric Administration .....	Spring & Fall, Annually



# NORTHWEST AREA WATER SUPPLY

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

## PROJECT/PROGRAM OBJECTIVES

- › Finish construction of the pretreated water delivery system to Minot, and distribution infrastructure to Bottineau.

## PROJECT/PROGRAM OVERVIEW

North Dakota Century Code (NDCC), Section 61-24.6 declares necessary the pursuit of a project "...that would supply and distribute water to the people of northwestern North Dakota through a pipeline transmission and delivery system..." NDCC 61-24.6 authorizes the State Water Commission to construct, operate, and manage a project to deliver water throughout northwestern North Dakota.

The Water Commission began construction on the Northwest Area Water Supply (NAWS) project in April of 2002. The project is currently serving Berthold, Kenmare, Burlington, West River Water District, Upper Souris Water District, Mohall, Sherwood, All Seasons Water District, and Minot (also serves North Prairie Water District and Minot Air Force Base). NAWS is getting water supplied through an interim water supply agreement with Minot.

Litigation with the Province of Manitoba has been resolved, and the injunction the project had been under since April 2005 was vacated in August 2017 – clearing the path for completion of the project. The foundation for moving the project forward was initiated in the 2017-2019 biennium in the form of upgrades at



the Minot Water Treatment Plant and the design of the biota water treatment plant at Max, half of the remaining distribution pipeline to Bottineau, and the intake facility at the Snake Creek Pumping Plant.

Portions of the remaining distribution to get desperately needed relief to the Bottineau area will be under contract by the beginning of the 2019-2021 biennium. The biota water treatment plant and intake modifications to the Snake Creek Pumping Plant will be ready to bid early in the biennium. There is equal emphasis to get Missouri River water to Minot, as well as deliver relief to the Bottineau region, which is currently facing water shortages.

When complete, the project is designed to provide up to 27 million gallons of combined Missouri River and groundwater per day to tens of thousands citizens in northwest North Dakota.

## ASSUMPTIONS AND OBSTACLES

Adequate federal and state funding must be received in a manner that does not impede progress.

*For a map of the NAWS project, see the Map Appendix.*

ACTION PLAN	TASKS	TARGET DATES
	Complete design and initiate construction on a biota treatment plant, intake, and remaining contracts to move water from Lake Sakakawea to Minot .....	Fall 2019
	Complete design work and begin construction to move potable water to the Bottineau service area .....	Summer 2019
	Develop plans and manuals as required by SEIS and ROD commitments .....	Summer 2020



# SILVER JACKETS PROGRAM

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state’s water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

ing (LiDAR) data for the James, Mouse, Missouri, and Red River basins.

- › Coordinate with select Silver Jacket agencies for support and funding for a statewide Probable Maximum Precipitation (PMP) analysis.

## PROJECT/PROGRAM OBJECTIVES

- › Educate state agencies, county water boards, and communities on the Silver Jackets Program.
- › Assist communities with FEMA’s levee recertification requirement or Provisionally Accredited Levee (PAL) program.
- › Assist communities with project requests in support of flood control or long term flood mitigation projects through the State Water Commission and other federal or state agencies as appropriate.
- › Assist communities with flood related Emergency Operation Plans as necessary and requested.
- › Assist in educating counties and communities on the importance of maintaining current Hazard Mitigation Plans as related to flooding.
- › Coordinate with Silver Jacket charter agencies to discuss state flood-related priorities, recommendations, efforts, and improve communication.
- › Coordinate with Silver Jacket charter agencies for the collection, processing, and posting of Light Detection and Rang-

## PROJECT/PROGRAM OVERVIEW

North Dakota’s Silver Jackets Program was initiated in January 2010 (in response to the extensive flooding of 2009) with the intent to identify comprehensive, long-term flood solutions through a collaborative, interagency effort between state and federal authorities. A Silver Jackets charter was completed and signed between the State Water Commission, North Dakota Division of Emergency Services, FEMA Region VIII, and the U.S. Army Corps of Engineers (St Paul and Omaha districts) in May 2010, and recently updated in 2014, with the addition of the National Weather Service, US Geological Survey, ND Geological Survey, U.S. Fish and Wildlife Service, and the Natural Resources Conservation Service. The Corps of Engineers initiated the Silver Jackets concept through a partnership with FEMA in 2005, with a goal of establishing Silver Jackets teams in at least one state in each Corps division, and ultimately one in each state.

## ASSUMPTIONS AND OBSTACLES

The potential for flooding in North Dakota will continue annually due to both rain and spring snow melt events. The need for local, state, and federal coordination in support of comprehensive long-term flood control and mitigation efforts must continue throughout the state to ensure success. Continued funding of this program is critical to its existence.

ACTION PLAN	TASKS	TARGET DATES
	Promote awareness of North Dakota’s Silver Jackets Program.....	Ongoing/As Needed
	Assist communities with FEMA’s levee recertification requirement.....	Ongoing/As Needed
	Assist communities with flood control and long-term flood mitigation project requests.....	Ongoing/As Needed
	Assist selected counties and communities with Flood Emergency Operation Plan development and maintenance.....	Ongoing/As Needed
	Coordinate with Silver Jackets Program charter agencies .....	Ongoing/As Needed
	Collect, process, and post LiDAR annually, as funding permits.....	Ongoing/As Needed
	Establish a PMP steering committee and select a firm to conduct analysis.....	2019-2021



# SOUTHWEST PIPELINE PROJECT

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

## PROJECT/PROGRAM OBJECTIVES

- › Continue construction to expand the intake, raw water transmission, and treated water distribution to meet the growing needs in southwest North Dakota, and to continue construction of projects to optimize the operation of the Southwest Pipeline Project.



*For a map of North Dakota's Southwest Pipeline Project, see the Map Appendix*

## PROJECT/PROGRAM OVERVIEW

The Southwest Pipeline Project (SWPP) is a regional water supply system that draws water from Lake Sakakawea, and serves approximately 56,000 people in southwest North Dakota, including 33 communities and over 7,100 rural hookups.

NDCC, Section 61-24.3 stipulates that the SWPP "...be established and constructed, to provide for the supplementation of the water resources of a portion of the area of North Dakota south and west of the Missouri River with water supplies from the Missouri River for multiple purposes, including domestic, rural, and municipal uses." NDCC 61-24.3 authorizes the State Water Commission to construct, operate, and maintain the project. In 1996, the State Water Commission transferred the Operation and Maintenance of the project to the Southwest Water Authority.

The State Water Commission began construction of the Southwest Pipeline Project in 1986. After more than 30 years of construction, the geographical area originally envisioned for the project has access to quality water. The passage of time and growth in the area necessitates expansion of the intake, raw water transmission, treatment and distribution capacity.

Private contractors are constructing the project according to designs developed by the State Water Commission's engineering contractor. The State Water Commission oversees the design and construction of the project. The project's repayment to the State is in the form of an annual capital repayment, funded through the user fees collected from project customers, and continues in perpetuity.

## ASSUMPTIONS AND OBSTACLES

Adequate state and federal funding must be received in a manner that does not impede progress.

## ACTION PLAN

TASKS	TARGET DATES
Bid 2nd Davis Buttes and Belfied Tanks .....	Summer 2019
Bid blow off upgrades contract .....	Summer 2019
Bid the Supplemental Intake Pump Station Building .....	Summer 2020
Bid rural distribution expansion projects.....	Summer 2020



# SOVEREIGN LAND MANAGEMENT

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state's water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Determine the navigability or non-navigability of the state's lakes and streams.
- › Delineate the ordinary high water mark (OHWM) of the state's navigable waters.
- › Regulate the construction of any projects located partially or entirely on sovereign lands.
- › Coordinate with other local, state, and federal agencies, and the public on sovereign lands management and related issues.
- › Interact with other local, state, and federal agencies and the public to inform and educate the people of North Dakota on sovereign lands management and related issues.



## PROJECT/PROGRAM OVERVIEW

The State Engineer is responsible for administering the state's non-hydrocarbon related mineral interests in North Dakota's sovereign land under NDCC 61-33. The State Engineer is responsible for determining which waterbodies are navigable in fact, and therefore sovereign to the State of North Dakota. The State Engineer is also responsible for delineating the OHWM of the state's navigable waters.

Any projects located partially or entirely on sovereign land require authorization from the State Engineer in the form of a Sovereign Land Permit prior to construction. The State Engineer is responsible for the day-to-day management of the state's sovereign land. This may include the preparation and execution of agreements with city, county, state, or federal entities for the management of specific parcels of sovereign land, and enforcement of state code relative to sovereign land.

## ASSUMPTIONS AND OBSTACLES

Effective management of North Dakota's sovereign lands, held in trust for all North Dakotans, requires a thorough and consistent review and consideration of all project applications. Management decisions strive to allow for innovative and conscientious use and development of the state's sovereign lands, without jeopardizing their natural and aesthetic values, and the public's current and future use and enjoyment. Enforcement and management of state sovereign lands will require continued cooperation with the North Dakota Game and Fish Department, county and city managing partners, and the Attorney General's Office.

ACTION PLAN	TASKS	TARGET DATES
	Process all incoming sovereign land permit applications.....	Ongoing
	Determine navigability or non-navigability of specific water bodies when the question arises .....	As Needed
	Conduct OHWM delineations for specific locations as necessary .....	Ongoing
	Provide technical assistance to other local, state, and federal agencies and the public as requested.....	Ongoing



# STATE WATER DEVELOPMENT PLAN

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state’s water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Develop a new 2021 Water Development Plan by January 2021.

## PROJECT/PROGRAM OVERVIEW

By virtue of North Dakota Century Code, Section 61-02-14, Powers and Duties of the State Water Commission; Section 61-02-26, Duties of State Agencies Concerned with Intrastate Use or Disposition of Waters; and Section 61-02-01.3, Comprehensive Water Development Plan, the State Water Commission is required to develop and maintain a comprehensive Water Development Plan. The most recent Water Development Plan was completed in December 2018. Water Development plans are revised, updated, and published on a biennial basis to assist with

agency budgeting efforts, and to provide updated project and funding information during Legislative Assemblies. Starting with the 2019 Water Development Plan, potential project sponsors were asked to forecast funding needs for several biennia – as far as ten years into the future, rather than for just the upcoming biennium.

In addition to forecasts from project sponsors, the State Water Commission partnered with the North Dakota League of Cities and the North Dakota Rural Water Systems Association to survey water supply systems about their aging infrastructure challenges. Commission staff incorporated the results of the surveys into the 2019 Water Development Plan in the form of longer-term (10-, 20-, and 50-year) water supply infrastructure needs for planning and budgeting purposes.

## ASSUMPTIONS AND OBSTACLES

Active participation and accurate input from local water managers and project sponsors regarding project funding needs will be critical to accurate budget development, and successful statewide water planning efforts. Forecasting funding needs beyond a ten-year planning horizon presents a number of challenges, particularly for small communities with limited or non-existent budgets, frequent staff turnover, and unsettled debt. In addition, water development needs continue to emerge even after planning deadlines have past.



ACTION PLAN	TASKS	TARGET DATES
	Contact local water managers to request updated water project/program information, including funding timeframes for the 2021-2023 biennium and beyond .....	Jan. 2020
	Work with Water Commission Subcommittees to assign priorities to inventoried projects .....	May 2020
	Develop a preliminary project inventory for the 2021-2023 Commissioner-hosted basin meetings.....	June 2020
	Process project information for use in State Water Commission budget development .....	Aug. 2020
	Develop a final 2021 Water Development Plan .....	Dec. 2020
	Present the 2021 Water Development Plan to the Legislative Assembly .....	Jan. 2021



# WATER EDUCATION

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state's water resources.

## PROJECT/PROGRAM OBJECTIVES

- › Develop, promote, and provide opportunities statewide to K-12 formal and non-formal educators and students to expand their knowledge and understanding of water resources by:
  - › Maintaining availability of indoor and outdoor water education programs and training resources through printed media and online resources;
  - › Acquiring and distributing a balanced inventory of water resource information, education tools, services, programs, and resource materials through a variety of mediums;
  - › Conducting institutes, workshops, in-service and pre-service educational opportunities; and
  - › Conducting and supporting classroom events, youth camps, water festivals, and community events.

## PROJECT/PROGRAM OVERVIEW

The North Dakota Water Education Program is a balanced, supplemental, and interdisciplinary water science and education program for formal and non-formal K-12 educators and students. The program facilitates and promotes learning, awareness, appreciation, knowledge, and exploration to promote stewardship of North Dakota's water resources. Project WET (Water Education for Teachers) curriculum guides and resource materials assist in helping youth learn how to think, and not just what to think, while providing means for teachers and students to grasp fundamental concepts related to water resources, watersheds, and the environment. Through a variety of programs, educators and students obtain skills for acquiring and applying knowledge, and to evaluate the results of their actions toward North Dakota's water resources.

## ASSUMPTIONS AND OBSTACLES

Continued funding through the Environmental Protection Agency's (EPA) Section 319 Grant is critical to the success and continuation of the North Dakota Water Education Program.



ACTION PLAN	TASKS	TARGET DATES
	Maintain Project WET classroom-ready teaching aids and service contracts in support of water resource education efforts.....	As Needed
	Provide in-service and pre-service credit and non-credit educational programs for K-12 educators and resource personnel .....	Ongoing
	Provide varying educational programs/events for K-12 students, communities and the general public statewide.....	Ongoing
	Recruit and maintain a Project WET facilitator network by providing leadership training and development opportunities .....	March 2020
	Provide support to the Keep North Dakota Clean water education poster contest.....	March 2020
	Complete all Section 319 EPA grant development and reporting requirements .....	Ongoing
	Complete one Project WET Watershed Institute.....	Summer 2020



# WATER RESOURCE DATA INFORMATION DISSEMINATION

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state's water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Maintain quality water resource data.
- › Develop and maintain databases for retrieval of data.
- › Maintain trained staff to interpret data.
- › Develop and maintain web-based integration for access to data.

## PROJECT/PROGRAM OVERVIEW

Significant volumes of data are contained in the State Water Commission's Water Resources Information Management Systems (WRIMS). Private individuals and private enterprise, as well as local, county, state, federal, and international entities routinely make use of various portions of these data sets. Staff facilitate the ability of interested parties to access data of interest to them. A web-based interactive interface is available to allow for direct access to the data on the part of the interested parties. Additionally, numerous interpretive reports are available for various water resources in the state.

## ASSUMPTIONS AND OBSTACLES

The continuation of the in-house and online retrieval system will depend on the ability of the State Water Commission to maintain internal data management infrastructure.



Permit Number --- 222B			
Permit Information			
Permit Holder:	BUFORD-TRENTON IRRIGATION DISTRICT	Priority Date:	1941-02-10
	TRENTON, ND	Use Type:	Irrigation
		Status Code:	Perfected
Requested Acre-Feet:	44000	Approved Acre-Feet:	44000
Requested Acres:	22000	Approved Acres:	10535
Requested Rate:	108000	Approved Rate:	108000
Requested Storage:	0	Approved Storage:	0



## ACTION PLAN

### TASKS

### TARGET DATES

Anticipate uses for which the data would be needed.....	Ongoing
Educate staff on the use of WRIMS as improvements are implemented.....	As Needed
Communicate with interested parties to determine their informational needs.....	As Requested
Create unique programs in order to satisfy requests of an unanticipated nature.....	As Requested
Image and store well drilling completion reports.....	Ongoing



# WATER RESOURCE INVESTIGATIONS & MONITORING

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state's water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Collect water resource data.
- › Organize and store water resource data.
- › Evaluate water-resource data and future data needs.



## PROJECT/PROGRAM OVERVIEW

Water resource data pertaining to water levels, water quality, and well information are collected on an ongoing basis. The data are stored in a web accessible database. The database currently contains about 1.5 million water level measurements, 35,000 site locations, 68,000 water quality analyses, and 25,000 sites with lithological descriptions. Additional data acquisition sites are implemented as needed through time. Aquifer parameters and properties are evaluated through an aquifer-testing program.

Airborne Electromagnetic (AEM) surveying combined with borehole geophysical data collection has increased efficiency and understanding of hydrogeological systems. Continued development of a low-cost, rapidly deployable, small-footprint, real-time data collection device dubbed PRESENS (Pushing REmote SENSors), is also a priority.

## ASSUMPTIONS AND OBSTACLES

Due to federal budget constraints, State Water Commission cost-share has increased to support the United States Geological Survey (USGS) Cooperative Water Resource Monitoring Program. This may continue in the future.

## ACTION PLAN

TASKS	TARGET DATES
Install test holes and plug obsolete observation wells .....	Apr.-Dec., Annually
Install 125-175 monitoring wells.....	Apr.-Dec., Annually
Install 20-30 staff gauges, and monitor water levels and flows .....	Apr.-May, Annually
Measure 25,000-30,000 water levels in wells and surface water bodies .....	Apr.-Dec., Annually
Collect data from 80-100 continuous water level recorders .....	Jan.-Dec., Annually
Upgrade and install 250 monitoring locations with PRESENS devices .....	Dec., 2020
Collect 1,500-2,000 samples from wells and surface-water bodies.....	Apr.-Dec., Annually
Analyze samples for various chemical constituents .....	Apr.-Jan., Annually
Repair and maintain 3,500-4,000 measurement and sampling locations.....	Apr.-Dec., Annually
Enter data into database.....	Ongoing
Coordinate with the USGS Cooperative Water Resource Monitoring Program to continue funding support for approximately 50 surface water gage sites, 85 observation wells monitored monthly, 25 observation wells monitored real-time, and 150 water quality analyses collected from co-op monitoring network.....	Ongoing, Annually
Conduct aquifer tests - 1 or 2 per year.....	As Requested/Needed
Conduct AEM geophysical surveys - 1 or 2 per year .....	As Requested/Needed



# WATER RESOURCE-RELATED ECONOMIC DEVELOPMENT

## AGENCY GOALS SATISFIED

### GOAL 1

Promote development and investment in water resource projects.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Identify and evaluate potential water supplies for economic development.
- › Support programs to encourage water-using industries.
- › Support programs to encourage irrigation.



## PROJECT/PROGRAM OVERVIEW

Water utilization is a key ingredient in many potential opportunities for economic development. Numerous studies and reports have documented potential water supplies for economic development. Additionally, existing reports and/or water resource data are interpreted by staff in the form of short reports to aid industries in determining the viability of various water resources with respect to their water needs in their consideration of locating in North Dakota.

The State Water Commission, in conjunction with the Bank of North Dakota, provides cost-share for new irrigation under the auspices of the Agricultural Partnership in Assisting Community Expansion (AgPACE) program. The State Water Commission also provides support for irrigation through its cost-share program.

## ASSUMPTIONS AND OBSTACLES

There is a limited amount of ground water of a quality suitable for irrigation and industry. The one significant water resource in the state, the Missouri River, is not located where many potential water users want to locate.



ACTION PLAN	TASKS	TARGET DATES
	Produce "synopsis" reports on water supplies for interested entities.....	As Requested
	Produce or provide water resource interpretive reports .....	Ongoing/As Requested
	Administer the AgPACE program.....	Ongoing
	Support the North Dakota Irrigation Association's efforts to expand irrigation development.....	Ongoing



# WATER RESOURCE RESEARCH

## AGENCY GOALS SATISFIED

### GOAL 2

Utilize technology and education to increase our understanding for the improved management of the state's water resources.

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Support research into water resources of the state.
- › Conduct studies of the nature and occurrence of water in order to optimize its conservation and development throughout the state.



## PROJECT/PROGRAM OVERVIEW

Water resource research involvement falls into three categories. The first is where the State Water Commission provides monetary support for water resource-related research, which is generally conducted by the United States Geological Survey (USGS) or universities. The second category is where the State Water Commission enters into a cooperative study, again generally with university researchers or the USGS. The third category is when the entire study is conducted by the State Water Commission.

## ASSUMPTIONS AND OBSTACLES

Continuing or reformulated research could result from the interpretations that result from these studies. Continued USGS funding for the urban water use study is needed, and a denitrification study is in the early stages of discussion and planning, and is still tentative.



ACTION PLAN	TASKS	TARGET DATES
	Annual review, decisions, and supplemental funding for graduate water resource investigations (North Dakota Water Resources Institute) .....	Annually
	Conduct an evaluation of nitrate contamination and remediation in the Karlsruhe aquifer .....	Annually
	Conduct a cooperative study of urban water use with the USGS and North Dakota State University .....	Through 2019
	Continue assisting NDSU tile drainage projects with monitoring and placement .....	Ongoing
	Conduct airborne electromagnetic surveys of the Spiritwood aquifer and other buried aquifers throughout North Dakota .....	Ongoing
	Conduct investigations and pilot studies of aquifer storage and recovery (ASR) potential in aquifers throughout the state .....	Ongoing
	Conduct investigations of the potential for aquifer reservoiring to maximize the efficiency of beneficial use of the waters of the state through conjunctive management of the surface and ground waters of the state .....	Ongoing
	Continue development and deployment of Pushing Remote SENSors technology .....	Ongoing



# WATER RIGHTS ADMINISTRATION & PROCESSING

## AGENCY GOALS SATISFIED

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Process water permit applications.
- › Maintain meticulous water right records.
- › Perfect conditional water rights.
- › Document permitted water use.

## PROJECT/PROGRAM OVERVIEW

NDCC 61-04-02 requires that all water uses except for domestic, livestock, fish, wildlife, and other recreational uses (unless the aforementioned are greater than 12.5 acre-feet per year) apply for a water permit before putting water to beneficial use. Set procedures are mandated by Century Code and regulations. Staff guide applicants through this process. In addition, records, documents, and a relational database are meticulously maintained. Upon completion of water use development, inspections are conducted to verify the ability of the applicant to put water to beneficial use. Based on the inspection report, a Conditional water permit is perfected and filed with the county recorder’s office as a water right associated

with the land. Annual self-reported water use forms are verified and recorded to document that water is being put to beneficial use and the water right is being maintained.

Beginning July 1, 2014, all temporary permits required an application fee. An online permit application system has been developed, which includes an E-Commerce compliant system for the submission of water permit applications and their associated filing fees.

Beginning January 1, 2015, all water depots selling water to the oil industry were required to have a telemetry system that can communicate with the State Engineer Water Depot Database using the agency Simple Object Access Protocol (SOAP) service. The SOAP data is periodically reviewed and compared with meter readings to help ensure data integrity. Technicians in the Water Appropriations Division periodically inspect water meters at water depots serving the oil industry.

## ASSUMPTIONS AND OBSTACLES

Water use records are dependent on self-reporting of annual water use, which are enforced through fines. Some conditional water permits take long periods of time to resolve water and legal complications.

ACTION PLAN	TASKS	TARGET DATES
	Guide applicants through the water permit application process.....	Ongoing
	Maintain records in each water permit application file.....	Ongoing
	Enter appropriate data into water permit database.....	Ongoing
	Conduct 100-150 inspections of “completed” conditional water permits.....	Annually
	Perfect 75-100 conditional water permits.....	Annually
	Send out requests for annual use reports to permit holders for over 3,500 permits.....	Nov. & Jan., Annually
	Complete the annual water use data collection process.....	May, Annually
	Develop a summary report on annual water use in North Dakota.....	Sept., Annually
	Measure pumping rates to help establish water rights.....	Ongoing
	Maintain water use records to quantify water rights.....	Ongoing
	Monitor telemetry compliance for industrial water depots.....	Ongoing
	Process meter reports from industrial water depots.....	Ongoing
	Inspect all active water depot sites associated with Conditional, Perfected, and Temporary permits.....	Annually
	Maintain and enhance the On-Line Temporary Water Permit Database system for the processing of 800 to 900, temporary water permit applications.....	Annually



# WATER USE APPROPRIATION & PERMITTING

## AGENCY GOALS SATISFIED

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Evaluate water permit applications and recommend decisions to the State Engineer.
- › Authorize the use of “waters of the state” for the benefit of the citizens of North Dakota.
- › Cooperate with agencies that have regulatory authority over North Dakota’s water to protect and enhance the quality and quantity of North Dakota’s water resources.
- › Pursue cooperative efforts with neighboring states and provinces to plan for beneficial water management of shared water resources.

## PROJECT/PROGRAM OVERVIEW

The allocation of water resources for beneficial use can result in competition for often limited resources. Standard operating procedures in accordance with statute and administrative rules allow for the prudent authorization to beneficially use “waters of the state” while protecting prior appropriators and the public interest. Competition may cross political boundaries. Efforts are continually underway to protect prior water rights, while maximizing benefits. In the assessment of the degree to which the state’s water resources can be used beneficially, the rights of prior appropriators and the public interest need to be assessed and protected. Staff prepare recommendations for the State Engineer, with the objective of encouraging beneficial use while protecting prior rights and the public interest.

## ASSUMPTIONS AND OBSTACLES

The source of about half of the total developed fresh water use in North Dakota is from glacial aquifers, and many of them are nearly fully appropriated. North Dakota’s glacial aquifers are relatively thin and shallow, and are known for their complexity. These glacial aquifers are replenished through precipitation and snowmelt percolating their way downward through the overlying sediments and recharge is primarily determined by climatic cycles that are unpredictable.

A conservative approach, especially in aquifers that support large communities and/or regional water systems must be taken to ensure overappropriation does not leave people without a dependable water supply during extended drought cycles. Current and prior development of these aquifers has lowered the water levels to the point that further development for beneficial use is limited. As more of the waters of the state are appropriated through the evaluation of water right applications, the state’s water resources are becoming more fully appropriated. Thus, the process of allocating additional water while protecting prior water rights and the public interest is becoming more difficult and time consuming. Water resource analysis requires a high degree of skill level and time to ensure an ongoing and sustainable water supply for the citizens of the state, and the enterprises and recreational opportunities needed for them to thrive.



ACTION PLAN	TASKS	TARGET DATES
	Gather data on shared resources .....	As Needed
	Discuss possible actions regarding water resources.....	As Needed
	Negotiate management decisions .....	Ongoing
	Conduct water resource investigations.....	As Needed
	Prepare recommended decisions on water right applications, and administration of water rights for the State Engineer.....	Ongoing
	Prepare recommended decisions on temporary authorized water use applications for the State Engineer.....	Ongoing
	Monitor annual water use and enforce water laws and regulations.....	Ongoing
Streamline the water permit application process to improve time efficiency .....	Ongoing	



# WATERSHED PLANNING & COORDINATION

## AGENCY GOALS SATISFIED

### GOAL 3

Continue our strong commitment to sustainable water management.

## PROJECT/PROGRAM OBJECTIVES

- › Provide technical expertise and assistance toward the development and implementation of regional watershed management planning efforts, and studies.

## PROJECT/PROGRAM OVERVIEW

In addition to water management planning efforts at the state level, the State Water Commission believes that it is also beneficial for stakeholders at the local level to guide management of water resources in their respective watersheds. In order for these regional planning and management efforts to proceed and evolve in a productive manner, it is often required that local, state, and federal government officials participate in those planning processes as technical advisors.

In recent years, the State Water Commission has provided technical assistance to the Devils Lake, Upper Sheyenne, Red, Mouse, and Missouri River joint water boards toward the development



of water management plans and projects. Staff have also assisted with the formation of the North Dakota Missouri River Advisory Council, and serve on the Little Missouri River Commission as a voting member. In addition, in the Red River basin, which is the focus of many projects and planning efforts, the Water Commission has an office with a staff engineer in Fargo.

Beyond participating in regional planning and coordination efforts within the state, State Water Commission staff members are also involved with international and national organizations involved in interjurisdictional water management. Examples include the International Joint Commission, the Red River Basin Commission, the International Red River Board, the International Souris River Board, International Souris River Study Board, the International Water Institute, the Red River Retention Authority, the Assiniboine River Basin Initiative, and the Upper Missouri Water Association.

## ASSUMPTIONS AND OBSTACLES

In order for all of the above organizations and planning/coordination efforts to succeed in the future, they will require continued commitment and dedication from all stakeholders involved in those processes.



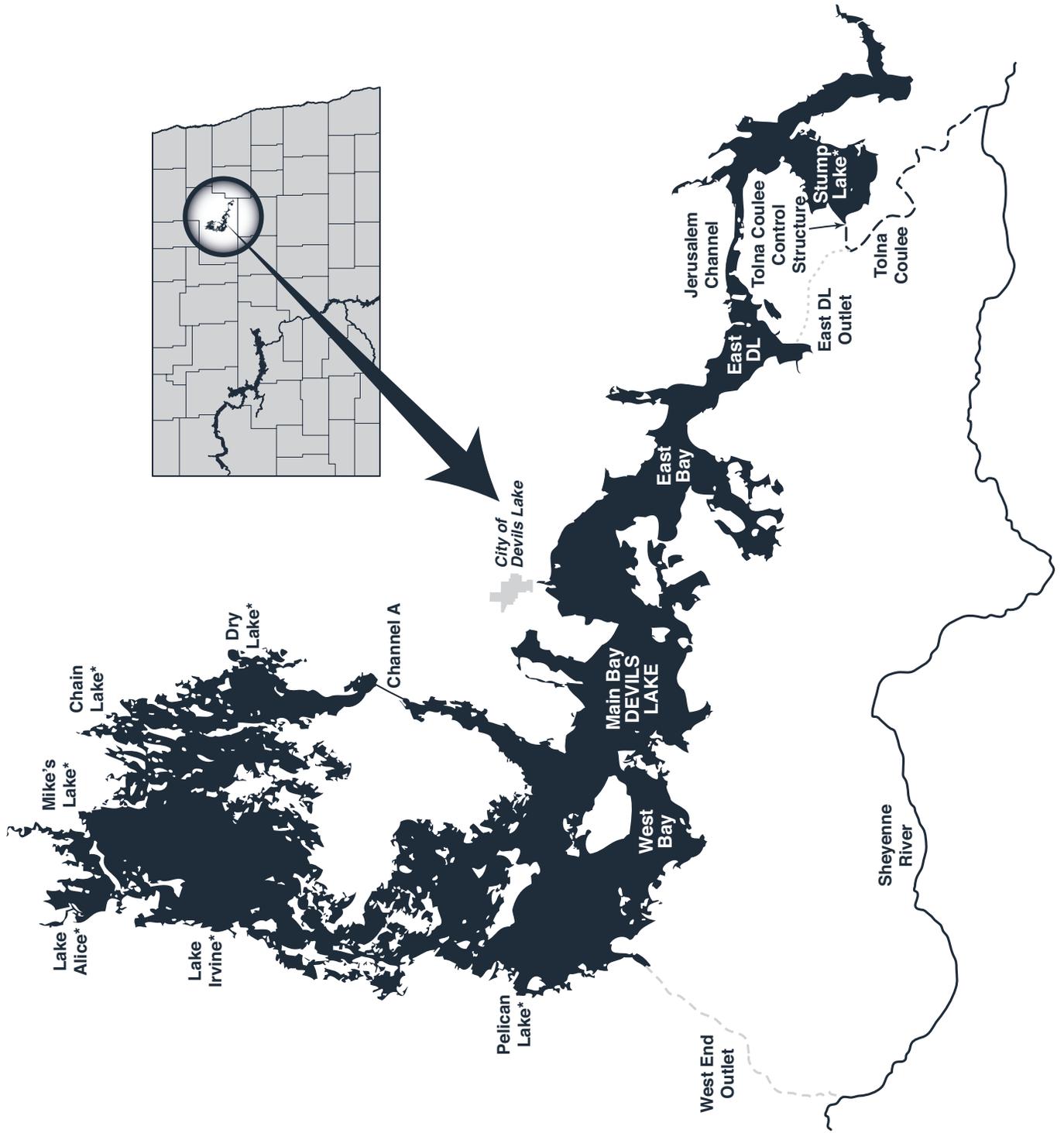
ACTION PLAN	TASKS	TARGET DATES
	Provide technical assistance toward the implementation of watershed management improvement plans .....	Ongoing
Continue to participate as board members and technical advisors for regional, international, and national watershed planning and coordination efforts .....	Ongoing	





# MAP APPENDIX

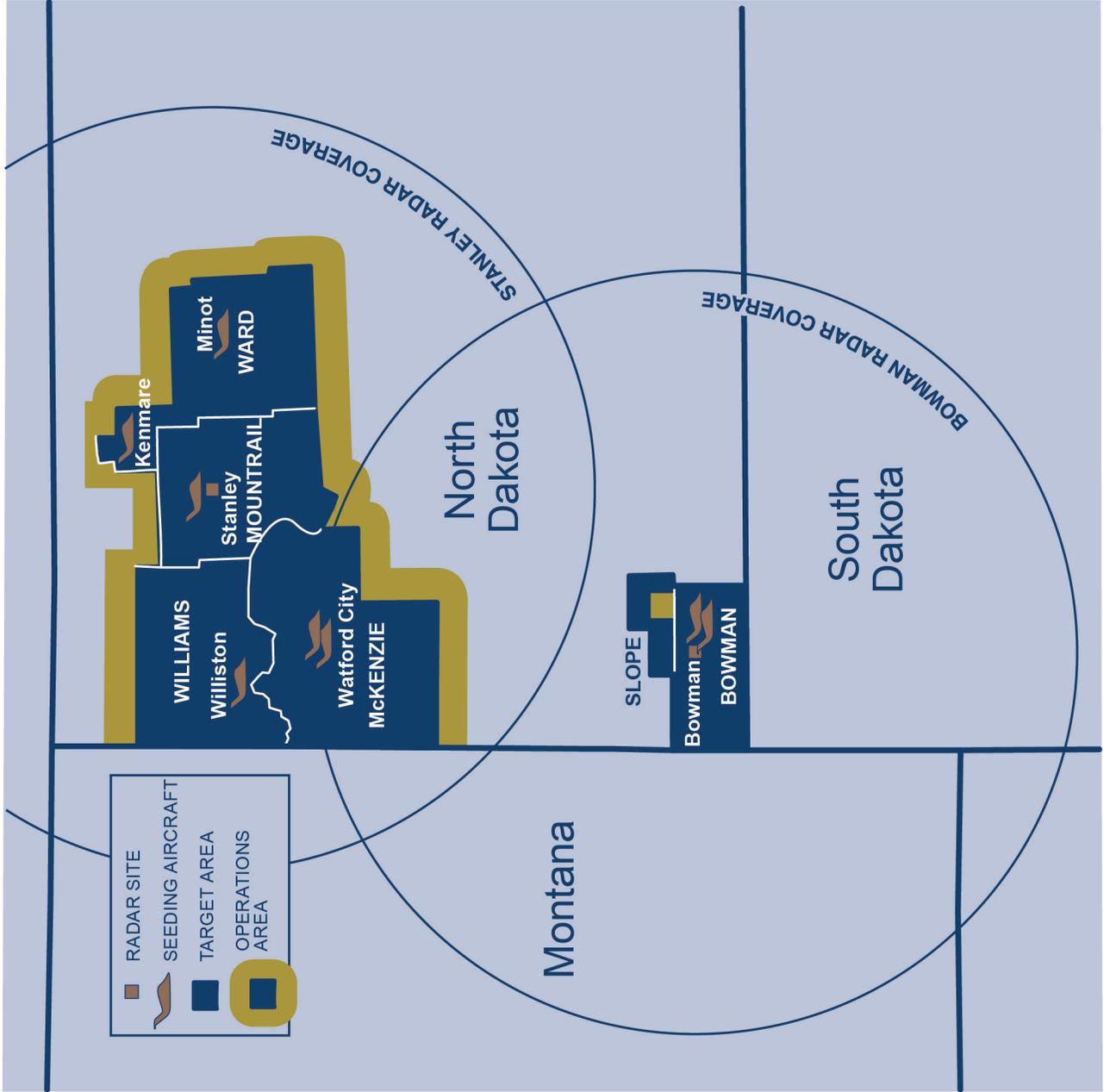
# DEVILS LAKE OUTLETS



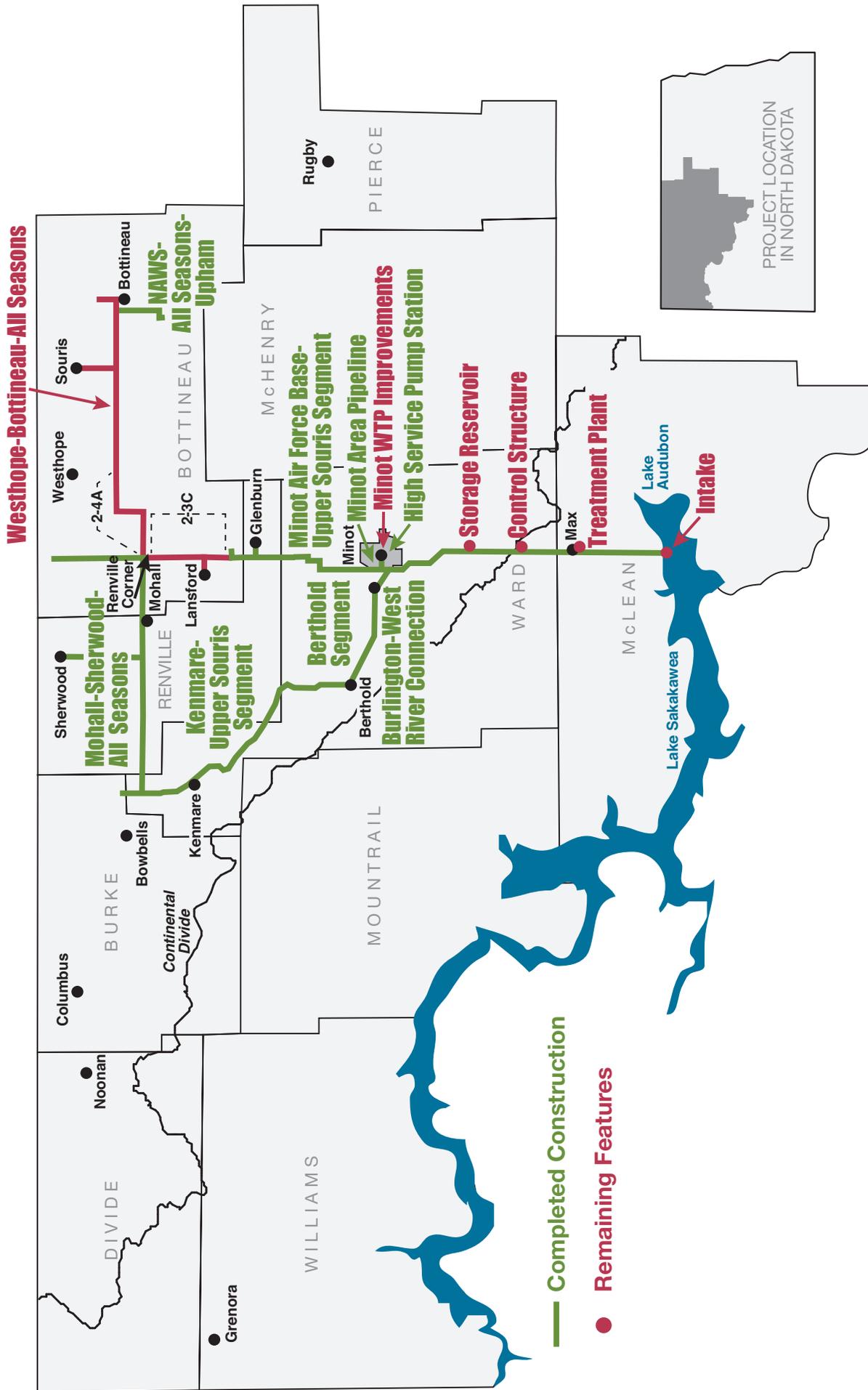




# NORTH DAKOTA CLOUD MODIFICATION PROGRAM



# NORTHWEST AREA WATER SUPPLY











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