UTAH DEPARTMENT of ENVIRONMENTAL QUALITY

UTAH STATEWIDE NONPOINT SOURCE POLLUTION MANAGEMENT PLAN

Prepared by

The Division of Water Quality in cooperation with the Utah Water Quality Task Force

May 2018

Utah Department of Environmental Quality
Division of Water Quality
195 North 1950 West
Salt Lake City, UT 84116

CONTENTS

List of Tables

List of Figures

APPENDICIES

Acronyms

AFO	Animal feeding Operation
ARDL	Agricultural Resource Development Loan
AWQMS	Ambient Water Quality Monitoring System
BACI	Before-After-Control-Impact
BAER	Burned Area Emergency Response
BLM	Bureau of Land Management
BMP	Best Management Practice
BRF	Blue Ribbon Fisheries
BRFAC	Blue Ribbon Fisheries Advisory Council
CAFO	Concentrated Animal Feeding Operation
CRMP	Coordinated Resource Management Plan
CRP	Conservation Reserve Program
CTA	Conservation Technical Assistance
CWA	Clean Water Act
CWP	Cooperative Water Program
DEQ	Department of Environmental Quality
DNR	Division of Natural Resources
DOGM	Division of Oil Gas and Mining
DWQ	Division of Water Quality
DWSP	Drinking Water Source Protection
ECS	Environmental Control Supervisor
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentive Program
FWQG	Forest Water Quality Guidelines
GIP	Grazing Improvement Program
GIS	Geographic Information System
GRP	Grassland Reserve Program
GRTS	Grant Reporting and Tracking System
HEL	Highly Erodible Lands
HUC	Hydrologic Unit Code
I&E	Information and Education
IPM	Integrated Pest Management
NF	National Forest
NMP	Nutrient Management Plan
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resource Conservation Service
NWQA	National water Quality Assessment
NWQI	National Water Quality Initiative
PBR	Permit-By-Rule
PIP	Project Implementation Plan
QAPP	Quality Assurance Project Plan
RCO	Riparian Corridor Overlay
RDCC	Resource Development Coordinating Committee
SAP	Sampling Analysis Plan
SDWA	Safe Drinking Water Act
SITLA	School and Institutional Trust Lands Administration
SMZ	Streamside Management Zone
SRF	State Revolving Funds
SWCP	Soil and Water Conservation Practices
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
TSS	Total Suspended Solids
UACD	Utah Association of Conservation Districts
UCASE	Utah's Comprehensive Assessment of Stream Ecosystem

UCES	Utah Certification of Environmental Stewardship
UDAF	Utah Department of Agriculture and Food
UDEQ	Utah Department of Environmental Quality
UDOT	Utah Department of Transportation
UDWQ	Utah Division of Water Quality
UDWR	Utah Division of Wildlife Resources
UGS	Utah Geologic Survey
UIC	Underground Injection Control
UPCD	Utah Partners for Conservation and Development
USDA	United States Department of Agriculture
USGS	United States Geological Survey
USU	Utah State University
UWW	Utah Water Watch
WMU	Watershed Management Unit
WQI	Water Quality Initiative
WRP	Wetlands Reserve Program

CHAPTER 1

1.0 EXECUTIVE SUMMARY

In accordance with Section 319 (b)(1) of the Clean Water Act, the Governor of each state shall develop a management program with the purpose of reducing nonpoint source pollution from navigable waters within the state. The State of Utah has delegated the management of the Statewide Nonpoint Source Program to the Division of Water Quality within the Department of Environmental Quality. This document identifies the approach that will be used to manage nonpoint source pollution in surface water and groundwater throughout the state of Utah. This plan contains long-term objectives and tasks that will help improve Utah's Nonpoint Source Program, as well as annual milestones to determine program effectiveness. This document has been developed with the participation of various State, Federal, Local, and private entities that have a vested interest in the protection and restoration of water quality throughout the state.

The State of Utah uses a watershed approach to manage nonpoint source (NPS) pollution throughout the state. This approach is highlighted throughout this document. The watershed approach consists of 8 elements. These elements include:

Element 1- Establishment of Watershed Management Units
Element 2- Organization of Stakeholder Involvement
Element 3- Watershed Approach Planning Cycle
Element 4- Strategic Monitoring Approach
Element 5- Watershed Management Unit Assessment
Element 6- Prioritization, Quantification and Targeting of Resources
Element 7- Development of Watershed Plans
Element 8- Development of Implementation Plans

By utilizing these elements in watershed planning and with the development of Total Maximum Daily Loads (TMDLs), local watershed groups can become more efficient in their collaboration with other agencies, identifying problem areas, and determining how and where Best Management Practices (BMPs) can be implemented to reduce NPS pollution.

This plan will highlight the programs that help protect the waters of the state from NPS pollution. Many agencies are currently working to help reduce NPS pollution throughout the state by implementing BMPs, providing technical and financial assistance, and participating in local watershed groups. This document will help agencies better coordinate their efforts and make the State NPS Program more effective and efficient.

The State NPS Management Plan was developed by the Utah Water Quality Task Force, which addresses a wide variety of water quality issues throughout the state. Additional detail regarding the Water Quality Task Force is found in section 3.3 of this document.

CHAPTER 2

2.0 INTRODUCTION, BACKGROUND AND APPROACH

2.1 Introduction/ Background

Nonpoint source pollution is pollution that results from diffuse sources in contrast to pollutants which enter waterways from point sources such as pipes or other man-made conveyances. NPS pollution can include a variety of contaminants such as excessive amounts of sediments, nutrients, pesticides, bacteria, organics and heavy metals that enter surface waters or leach into groundwater. Some common sources of NPS pollution include urban streets and parking lots, agricultural lands and operations, and construction sites.

Since 1990, Section 319 funds in the State of Utah have been directed to over 300 locally sponsored projects promoting voluntary NPS pollution control. These have included on-the-ground watershed/stream restoration projects, information and education projects, ground water investigations, and providing technical assistance to landowners to implement best management practices.

The Department of Environmental Quality (DEQ) has been designated as the lead agency to manage the water pollution control programs established by state statute and provisions of the Federal Clean Water Act in Utah. The Statewide NPS Management Plan was last updated in 2013, since then additional improvements have been instituted to improve the efficiency and effectiveness of the program. The Division of Water Quality continues to use a holistic watershed approach that has been fundamental in guiding the State's NPS Program.

This document is the most recent version of the Statewide NPS Management Plan and reflects all of the improvements made in the administration and delivery of the program, including additional sections on abandoned mines, storm water management, hydrologic modification, information and education strategies, and the targeted basin approach that allocates the majority of the state's NPS funding to a specific watershed unit on a rotating basis to focus limited technical and financial resources on high priority water quality concerns.

One of the purposes of this document is to describe how the Watershed Approach has been integrated into the NPS Program and the progress that has been made in making this transition. Another is to clearly show the relationship of the Utah Watershed Approach to the TMDL program.

The Watershed Approach is a logical step in the evolution of water resource management. Watershed management is a means of using existing regulatory and voluntary programs more efficiently and effectively to protect, enhance, and restore the state's aquatic resources. It establishes a framework to integrate existing programs statewide and coordinate their management activities geographically.

Utah's Watershed Approach is based on a core set of programs established under the authority and precedence of the Clean Water Act (CWA), Safe Drinking Water Act (SDWA) and Utah law, including, but not limited to the:

- CWA §319 Nonpoint Source Management Program
- CWA §106 Monitoring Program
- §104(b)3 Special Studies Related to TMDL Development and NPDES Program
- CWA §303 (d) and 303(e) Total Maximum Daily Load (TMDL) Program
- CWA §305 (b) Assessment and Reporting
- CWA §314 Clean Lakes Program
- CWA §402 National Pollutant Discharge Elimination System (NPDES) Permit and Compliance Program
- CWA §402(p) Storm Water Permitting Program

- State Revolving Fund (SRF) Program
- Municipal Wastewater Pollution Prevention Program
- Ground Water Program
- SDWA Source Water Protection Program
- Environmental Stewardship Program
- State Animal Feeding Operation (AFO) Program

2.2 Objectives, Tasks, and Annual Milestones for Utah's NPS Management Program

The overall goal of the Utah Nonpoint Source Program is to:

Protect, restore, and enhance the waters of the State of Utah through the reduction of nonpoint source pollution sources by means of voluntary implementation of best management practices.

The State of Utah organizes the Statewide NPS program on a watershed basis. State Water Plans, County Land Use and Resource Management Plans, and other geographically based resource plans are particularly appropriate for the integration into the NPS program and for coordinating water quality protection and improvement efforts.

To evaluate and improve the Statewide NPS program, the State of Utah has developed long term goals and annual milestones. These goals and milestones will serve as a road map through the next five years and will help foster trust between partner agencies and the citizens of Utah, making better use of environmental information to tailor local solutions to address local water quality problems.

Objective 1: Environmental Protection:
The mission of the NPS Management Program and the Watershed Approach is to effectively achieve Utah's environmental protection goals set forth in Utah Administrative Code R317-2 "Standards of Quality for Waters of the State" as (1) to conserve waters of the state; (2) to protect, maintain, and improve the quality of waters of the state for public water supplies, species protection and propagation, and for other designated beneficial uses; and (3) to provide for the prevention, abatement, and control of new or existing sources of polluted runoff. In the mission of the Division of Water Quality it also states that the goals mentioned above should be a focal point while giving reasonable consideration to the economic impacts that a given water quality action may have. To achieve these goals, the Division of Water Quality in conjunction with local, state and federal partners identify, prioritize and work to restore the most serious water quality problems in the state; protect those waters known to be of the highest quality; and control excess pollutants.

Over the past 20 years Utah has developed TMDLs for a majority of the waterbodies that have been identified as impaired on the 303(d) list of impaired waterbodies. The Division of Water Quality continues to develop TMDLs for priority water bodies listed as impaired across the state. The following tasks will be conducted to assist with the development of new TMDLs as well as evaluate progress in achieving water quality goals in existing TMDLs. (All tasks are numbered sequentially for easier reference). More specific goals, objectives and milestones will be developed in TMDL based watershed plans to protect high quality waters and restore impaired beneficial uses.

Task 1: Prepare TMDL plans for priority 303(d) listed waters by 2022. (Ongoing)

Task 2: Implement a targeted basin funding approach to enhance the efficiency and effectiveness of BMP implementation. (Ongoing)

Task 3: Develop waterbody priorities and schedules for TMDL development within each watershed management unit. (Annually)

Task 4: Develop TMDL studies for impaired waterbodies and submit for approval to the Utah Water Quality Board and the Environmental Protection Agency (EPA) Region 8 according to the priority schedule developed under task 3. (Annually)

Task 5: Conduct a summary assessment of Utah's 10 major hydrologic basins every two years. (i.e. 305(b) Report)

Task 6: Integrate the 9 key watershed planning elements into TMDL Implementation Plans as appropriate. (Ongoing)

Task 7: Enhance ground water protection efforts by developing a guidance document regarding septic systems in drinking water zones. (By 2020)

Task 8: Continue to implement the urban/stormwater runoff and abandoned mine plans included in the appendices of this document. These components focus on education components, demonstration projects, and evaluation of best management practices. Implementation projects associated with these plans began in 2014 and will continue as further needs are identified.

Task 9: Incorporate biological and physical data and information to evaluate environmental conditions, identify water quality impairments, evaluate BMP effectiveness, prioritize restoration strategies, and promote the protection of environmental quality (ongoing).

Task 10: Solicit NPS project proposals, rank, prioritize for funding, and notify recipients by June 30th annually. (Ongoing)

Task 11: Identify waterbodies that are at risk of being listed on the State's 303(d) list of impaired waterbodies, and take action to protect these waterbodies by implementing the appropriate BMPs where appropriate.

Annual Milestones

- Number of TMDLs completed.
- Number of TMDLs initiated during the state fiscal year.
- Number of nine element watershed based plans developed.
- Number of nine element watershed based plans initiated during the state fiscal year.
- Number of projects dedicated to the protection of threatened waterbodies identified in Utah's 303(d) list.
- Number of projects focused on groundwater protection throughout the state.

Objective 2: Improve Program Efficiency and Effectiveness through Reporting and Evaluation:

The primary objective of the NPS program is to effectively control and reduce nonpoint source pollution. The complex and dispersed nature of nonpoint source pollution requires continual evaluation of the program including programmatic elements and specific project results. By accomplishing all of the tasks below, the State of Utah will be able to maintain a high degree of effectiveness and efficiency required by the public, policy makers and partner agencies.

Task 12: Review water quality assessment data, the 303 (d) list, and land use inventories with local steering committees to help set work priorities within each basin and to promote locally led implementation activities (ongoing).

Task 13: Ensure annual progress reports for all 319 funded projects are submitted and entered into EPA's Grants Reporting and Tracking System (GRTS) by December 31st of every year. (Annually)

Task 14: Prepare and submit to EPA by January 31st each year, the Annual NPS Progress Report to update performance/progress as specified in the Terms and Conditions of each annual grant, and post on DWQ's website. (Annually)

Task 15: Conduct a comprehensive NPS program review preceding the update of the NPS Management Plan. (Every Five Years)

Task 16: Review the list of best management practices associated with the NPS Program and update as necessary. (Every 5 years minimum)

Task 17: Conduct a final review at the closeout of each 319 project within 90 days of final payment to ensure compliance with all 319 requirements. The finding of this review will be included in the final project report. (Ongoing)

Task 18: Project sponsors will work with DWQ to produce a summary of measured environmental results for each project suitable for submission to EPA as a "success story" within five years of project funding.

Annual Milestones

- Total number of stream miles restored (Annually)
- Total estimated load reductions (P,N,TSS) reduced in project areas (Annually)
- Number of final project reports submitted (Annually)
- Number of 319 grants currently open during the fiscal year
- Amount of unexpended funds in each open 319 grant
- Number of success stories showing the environmental benefits of completed NPS projects submitted to EPA for approval

Objective 3: Improve Public Participation and Understanding of NPS Issues:
Since the NPS program relies on voluntary participation and public involvement, local action is a key element for reducing nonpoint source pollution. By keeping the public informed and involved in decisions regarding the waterbodies they use and recreate on, the State of Utah aims to foster local stewardship and a desire to become more involved in the improvement and protection of those waters. Through implementing the following tasks the state of Utah will keep the public informed and involved in water quality issues throughout the state.

Task 19: Maintain and enhance the Utah Environmental Interactive online mapping application. (Ongoing)

Task 20: A public involvement process will be carried out with the development of all watershed/TMDL plans. The process includes initial scoping, data/results review, source identification, allocation of responsibility, development of goals, prioritization, review of draft plan, and adoption of the final plan. (Ongoing)

Task 21: Information and education projects will continue to be funded using State NPS and Section 319 funds. Projects are selected, reviewed and funded each year according to specific I&E criteria. Projects include statewide activities and projects specific to priority categories. (Ongoing)

Task 22: Review and revise the Information and Education component of the Statewide NPS Program to ensure close integration with the Watershed Approach and TMDL development and implementation. (Every five years)

Task 23: Maintain a 'public friendly' website to share relevant NPS Water Quality information such as success stories, annual program reports, the statewide NPS Management Plan, and Fact Sheets. (Ongoing)

Task 24: Continue to support an effective volunteer monitoring program to assist with data collection and promote public understanding of water quality goals and concerns. (Ongoing)

Task 25: Develop an interactive project map. This map will show the locations NPS projects that have been implemented around the state. When a project is selected from the map details about the project can be found (2019)

Annual Milestones

- Number of participants involved in the Statewide Volunteer Monitoring Program
- Number of I&E projects implemented with Section 319 and State NPS Funding
- Updates made to the State NPS Program Website

Objective 4: Improve Data Collection and Management:
Management of Utah's NPS program will improve through the efficient collection, storage, analysis, and assessment of data to support informed decision making and planning. Improved data collection, quality assurance and quality control will help define the environmental benefits achieved through the implementation of watershed plans and best management practices throughout the state.

Task 26: Incorporate as part of the DWQ annual monitoring program, data needs related to the NPS Program including BMP effectiveness, watershed assessment/reporting, watershed planning and TMDL implementation. Review and update the Division's Monitoring Strategy. (Annually)

Task 27: Assure that all NPS projects implementing watershed based plans develop Sampling Analysis Plans (SAPs) to document project results and water quality improvements by

gathering pre and post project data. The development of these SAPs will help determine project effectiveness. (Ongoing)

Task 28: In cooperation with the DWQ Monitoring Section, develop a Statewide SAP highlighting where NPS project implementation effectiveness monitoring will be conducted, what parameters will be collected, and the frequency of the monitoring. (Annually)

Task 29: Continue to provide water quality sampling training to NPS program partners, including volunteer monitors, to ensure data quality objectives. (Ongoing)

Task 30: Develop, update and improve project monitoring guidance/standards for all grant recipients and project sponsors. (Ongoing)

Task 31: Continue maintenance of a public website to provide ready access to water quality data through the Ambient Water Quality Monitoring System (AWQMS) (Ongoing)

Task 32: Upload all water quality data collected by the Utah Division of Water Quality to the EPA WQX database (Ongoing/Quarterly).

Annual Milestones

- Track updates made to enhance NPS monitoring in the Division of Water Quality's annual monitoring strategy.
- Number of SAPs developed.
- Completion of a Statewide NPS Monitoring SAP
- Track status and updates of AWQMS database.
- Report on water quality data uploaded to the EPA WQX database

Objective 5: Improve Coordination of Governmental and Private Sectors:
Multiple agencies and organizations are working to reduce the impacts of NPS pollution throughout the state. While the objectives of each agency or organization may differ, coordinating and leveraging funding and resources from multiple partners will help ensure the efficient use of limited funding. The following tasks will verify that all agencies engaged in implementing NPS projects and watershed planning throughout the state continue to work together to strengthen each other's programs and promote watershed health.

Task 33: Provide technical assistance and education in the formation and support of TMDL/Watershed advisory committees. (Ongoing)

Task 34: Foster program integration and interagency technical and financial assistance through active support and participation on statewide partnership committees including: The Water Quality Task Force, the State Technical Advisory Committee, the Utah Conservation Commission, and other committees that express interest in actively participating in the state NPS program. (Ongoing)

Task 35: Revisit and update the Water Quality Task Force Charter identifying the responsibilities of the Task Force, and what agencies and decision making entities should be included in the Task Force. Other participating entities will be invited as needed.(2022)

Task 36: Annually, hold program coordination meetings with NPS Program Partners. Review monitoring efforts, implementation activities, and priorities related to NPS pollution control. (Ongoing)

Task 37: Ensure federal consistency with the NPS Management Plan by conducting an annual BMP audit with federal land management agencies. (Ongoing)

Task 38: Encourage participation of relevant agencies on the Water Quality Task Force to strengthen relationships and add diversity. (Ongoing)

Task 39: Inform local, county, and State leaders and legislators of the accomplishments of the State NPS program. This could include presentations given by state and local watershed coordinators, and participation of NPS tours that currently take place throughout the state (Ongoing).

Task 40: Focus on improving and protecting water quality on public and private forests by improving forest health, decreasing catastrophic wildfire, and controlling invasive species (Ongoing).

Task 41: Update the Utah NPS interagency MOU. This document highlights how various agencies will control NPS pollution on the lands they manage and with private interest groups that they interact with. (2022)

Annual Milestones

- Hold annual NPS Management Program coordination meetings
- Conduct annual consistency reviews with state and federal agencies
- Number of Water Quality Task Force meetings held during the fiscal year
- Amount of funding used to leverage 319 funding throughout the state. This funding can include program funding from UDAF, UDEQ, UDWR, USDA, and other state, federal, and local agencies

2.3 Implementing the Watershed Management Approach

Implementation of the Utah Watershed Approach began in 1994 with the start of a five year rotation of intensive monitoring surveys. In 2010, the State of Utah increased the number of years in the rotation to six due to an increase in the number of monitoring sites, the types of monitoring including physical and biological analyses, as well as the intensity of monitoring efforts. In conjunction with the intensive monitoring surveys, the state has instituted a targeted basin funding cycle, which prioritizes nonpoint source funding to the targeted basin(s) for that year for the purpose of implementing TMDLs and watershed plans. Targeted funding is expected to better provide measurable environmental results by concentrating implementation efforts in high priority areas where water quality benefits are most likely to be realized. This document includes a statewide schedule of the watershed planning, implementation, and reporting phases. The schedule's purpose is to provide agencies and local watershed stakeholders information they need to be involved in the Watershed Management Approach. As the Watershed Management Approach has progressed and evolved, several potential funding partners have expressed interest in coordinating their resources with the targeted basin funding cycle, thus improving the overall effectiveness of individual programs.

Coordination and integration must extend beyond local, state, and federal agencies to include all stakeholders involved in water quality management. The Watershed Management Approach is based on addressing a waterbody and its surrounding watershed as a whole. Coordinating all water quality programs fosters more innovative, responsive, and cost-effective solutions to water quality concerns. The integrated Utah Watershed Approach is based on the eight elements listed below:

Organizational Steps:

Element 1- The Establishment of Watershed Management Units
Element 2- The Organization of Stakeholder Involvement
Element 3- A Watershed Approach Planning Cycle

Management Plan Tasks:

Element 4- A Strategic Monitoring Approach

Element 5- A Watershed Management Unit Assessment
Element 6- The Prioritization, Quantification and Targeting of Resources
Element 7- The Development of Watershed Plans
Element 8- The Development of an Implementation Plan

Each of these elements is discussed in detail in Chapter 3.

2.4 Integration of EPA's Requirements for the development of the Statewide Nonpoint Source Program and TMDL Development

NPS Requirements: States must review and, as appropriate, revise nonpoint source management programs to reflect eight key components as follows:

1. The state program contains explicit short- and long-term goals, objectives and strategies to restore and protect surface and ground water, as appropriate.

2. The state strengthens its working partnerships and linkages to appropriate state, interstate, tribal, regional, and local entities (including conservation districts), private sector groups, citizens groups, and federal agencies.

3. The state uses a combination of statewide programs and on-the-ground projects to achieve water quality benefits; efforts are well integrated with other relevant state and federal programs.

4. The state program describes how resources will be allocated between (a) abating known water quality impairments from NPS pollution and (b) protecting threatened and high quality waters from significant threats caused by present and future NPS impacts.

5. The state program identifies waters and watersheds impaired by NPS pollution as well as priority unimpaired waters for protection. The state establishes a process to assign priority and to progressively address identified watersheds by conducting more detailed watershed assessments, developing watershed-based plans and implementing the plans.

6. The state implements all program components required by section 319(b) of the Clean Water Act, and establishes strategic approaches and adaptive management to achieve and maintain water quality standards as expeditiously as practicable. The state reviews and upgrades program components as appropriate. The state program includes a mix of regulatory, non-regulatory, financial and technical assistance, as needed.

7. The state manages and implements its NPS management program efficiently and effectively, including financial management.

8. The state reviews and evaluates its nonpoint source management program using environmental and functional measures of success, and revises its NPS management program at least every five years.

TMDL Requirements: A TMDL is a measure of how much of a given pollutant a waterbody (or reach of a stream) can assimilate without exceeding its water quality standards or impairing a beneficial use.

The list below summarizes the eight components for meeting the minimum requirements of a TMDL.

1. Application of TMDLs results in maintaining and attaining water quality standards.

2. TMDLs have a quantified target or endpoint

3. TMDLs include a quantified pollutant reduction target

4. TMDLs must consider all significant sources of the stressor of concern.
5. TMDLs are supported by an appropriate level of technical analysis.
6. TMDLs must contain a margin of safety and consider seasonality.
7. TMDLs apportion responsibility for taking actions.
8. TMDLs involve some level of public involvement or review.

The Utah Watershed Approach provides the state and its local and federal partners with the capability to meet all eight of EPA's guidelines for NPS and TMDLs. Also, in accordance with section 319 of the Clean Water Act, all statewide management plans developed by the State of Utah must be subject to public comment for of a period of 90 days before it is submitted to EPA for approval.

Table 1 below displays the relationship of the Utah Watershed Approach and the 8 key components that should be integrated into all statewide NPS management programs, as requested by EPA. The numbers in the second column reference the brief descriptions of EPA requirements given above, and show where they were incorporated into the statewide management plan. A more detailed explanation of how these eight elements were met can also be found in Appendix I of this plan.

Table 1. Utah Watershed Elements	**EPA NPS Requirements**
Introduction, Background and Approach	1,2,3,4,5,6,7,8
1. Watershed Management Units	5
2. Stakeholder Involvement	2,3
3. Planning Cycle	5,6,7
4. Strategic Data Collection	5,6
5. Watershed Assessment	4,5,6
6. Prioritize and Target	2,3,4,5
7. Watershed Plans	2,4,5
8. Implementation	2,3,6

CHAPTER 3

3.0 THE WATERSHED APPROACH TO NPS MANAGEMENT

3.1 Implementing a Watershed Approach for the Control of Nonpoint Source Pollution

The essence of Utah's Watershed Approach is better coordination and integration of the state's existing management programs to improve protection for Utah's surface and ground water resources. Better coordination and integration extend beyond local, state, and federal agencies to include all stakeholders involved in protecting and improving water quality. Coordinating all water quality programs fosters more innovative, responsive, and cost-effective solutions to water quality problems. The statewide watershed approach has accelerated improvements in Utah's water quality as a result of increased coordination and sharing of resources.

Watershed Approach — A Definition: A means of managing existing regulatory and non-regulatory programs more efficiently and effectively to protect, enhance, and restore the state's aquatic resources. Statewide watershed management, more aptly referred to as an approach, establishes a framework to integrate existing programs statewide and coordinate their management activities geographically. The integrated approach contains eight elements which are discussed below and illustrated in Figure 1.

Figure 1. Elements of the Watershed Planning Cycle.

3.2 Watershed Element 1: Watershed Management Units

The first structural element of the Utah Watershed Approach is the geographically defined management area. The State of Utah uses ten *Watershed Management Units* (WMUs) which have been delineated to provide a spatial focus for managing water quality. These management units have been defined with the intent of improving coordination among programs operating within them and to encourage a sense of ownership among the resident stakeholders. Figure 2 contains a map of the ten WMUs.

Management decisions must be tailored to specific geographic locations, the scale of which often varies based on the problem and the type of management decision. Geographically defined management units ranging in scale from small, specific sites to large regions are therefore needed. The state has defined a

hierarchical system of watersheds, some larger and others smaller than the Watershed Management Units, that provide the needed flexibility to account for local culture and water quality conditions.

Criteria for Delineating Watershed Management Units: Principally, three geographic elements are used for water quality studies: surface water drainages or watersheds, ground water aquifers with associated recharge areas, and ecoregions.

Population distribution, administrative boundaries, and past and ongoing work by other agencies and stakeholders has also been considered in setting the WMU boundaries.

Surface Water: Utah's major rivers, streams, and lakes serve as the basic units for assessing surface water quality conditions. These waterbodies have been divided into segments using Hydrologic Unit Codes established by United States Geological Survey (USGS), facilitating site-specific work.

As mentioned above, DWQ has established a hierarchy of watershed units defined solely by hydrologic factors. First-level watersheds are based on the three major drainage basins in the state: (1) a small area draining to the Pacific Ocean via the Snake and Columbia rivers; (2) drainage to the Gulf of California by way of the Colorado River System; and (3) drainage to the closed Great Basin. Ten second level watersheds have been defined consisting of large river systems or areas of internal drainage, or segments of them within the three first level watersheds. These ten second level watersheds are comprised of 44 third-level watersheds which are a consolidation of the U.S. Geological Survey's (USGS) sixty-eight Hydrologic Unit Code (HUC 8 digit) areas. The very small areas along state boundaries were combined into an adjacent larger unit where practical.

Ground Water Units: Interaction between ground water and surface water occurs in each of the ten WMUs at ground water recharge and discharge locations. Ground water projects (including source water protection tasks) will be integrated into an individual watershed project when possible and appropriate. The projects will be coordinated among adjacent watersheds as needed to protect aquifers.

Three general aquifer types occur in Utah. Quaternary basin-fill aquifers of the Basin and Range Province are the most prevalent aquifer type and provide 85% of total ground water withdrawals. These aquifers consist of unconsolidated gravel, sand, silt, and clay. Alluvial valley fill aquifers are the second type, and, account for 10% of ground water withdrawals. Alluvial valley-fill aquifers occur along stream courses in the eastern and south-central part of the State, the most extensive being the Tertiary aquifers of the Uinta Basin. The third aquifer type includes the Jurassic and Triassic sandstone aquifers of the Colorado Plateau and the transition area between the Basin and Range and the Colorado Plateau. These aquifers account for 5% of ground water withdrawals and are found in the Sevier, Cedar Beaver, West Colorado, Southeast Colorado, and Lower Colorado Watershed management Units.

Thirty-seven areas of ground water development have been recognized in Utah and reports of their status have been published annually by the Division of Water Rights and USGS for several years. Only Ground Water Unit 21 (Juab Valley) is split between two WMUs. These ground water pumping areas plus their recharge zones will serve as interim ground water planning units until more data are gathered. The Division of Drinking Water's source protection program has identified wells and springs that supply water for culinary purposes, and source protection zones have been mapped throughout the state, identifying areas that contribute water from the surface to a given well or spring.

Ecoregions: Ecoregions are collections of similar ecosystems that represent a larger planning area for addressing related natural resource issues, including water quality management. An appropriate ecosystem management perspective requires that a local to regional perspective be adopted.

Another concept important to proper ecosystem management is site capability and what role an individual site plays in biotic communities, habitats, and landscapes. Knowing the capacity of a site to support plants, animals, and other organisms and how the site responds to manipulation and disturbance is key. Figure 3 shows the various ecoregions used in the development of the Watershed Management Units.

Maintaining water quality is a critical function of ecosystem management. Altering any of its elements impacts the others in complex and often unexpected ways. Water quality management using a Watershed Approach is compatible with ecosystem management because it considers all natural resources in a holistic manner.

Figure 2. Map of Utah Watershed Management Units

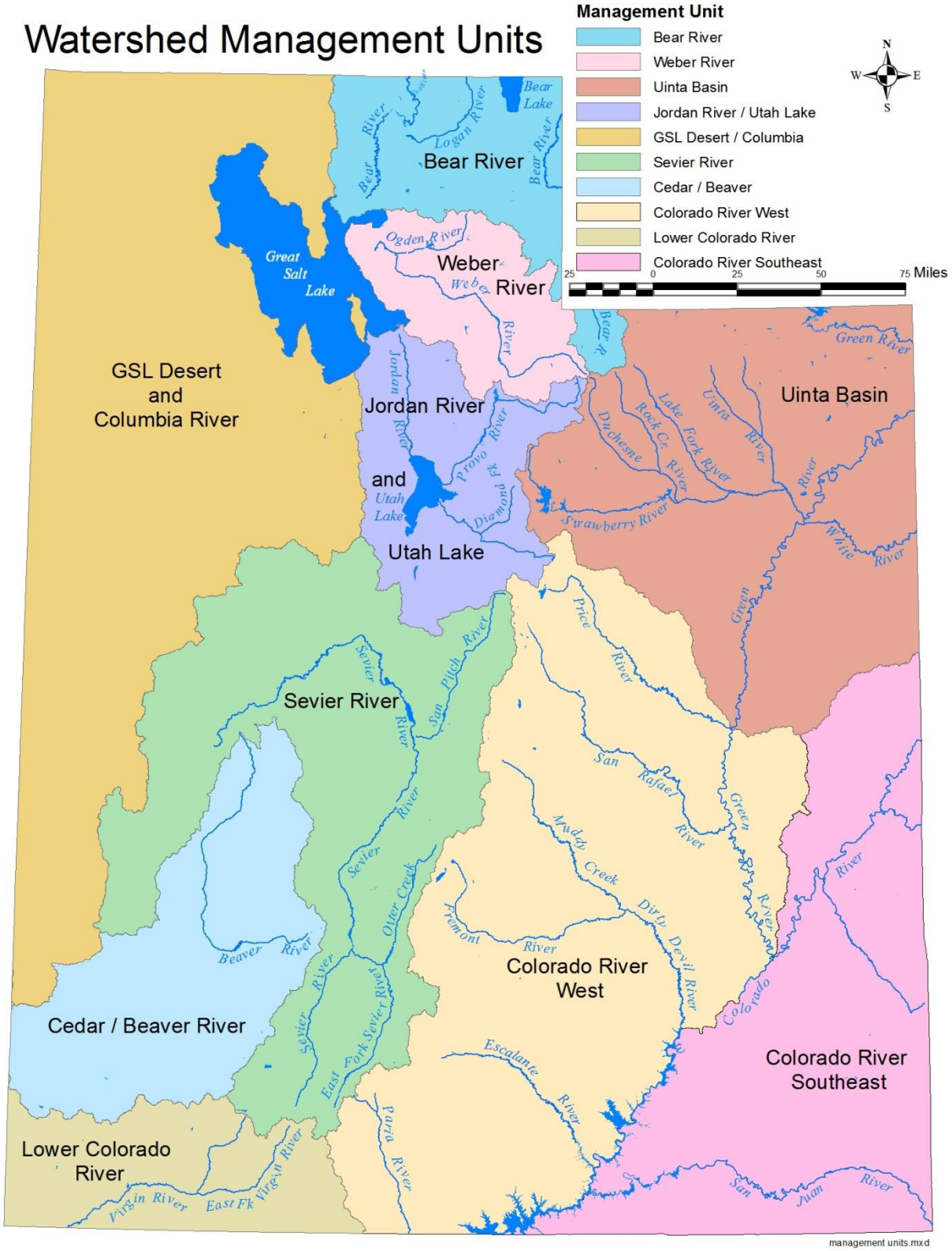
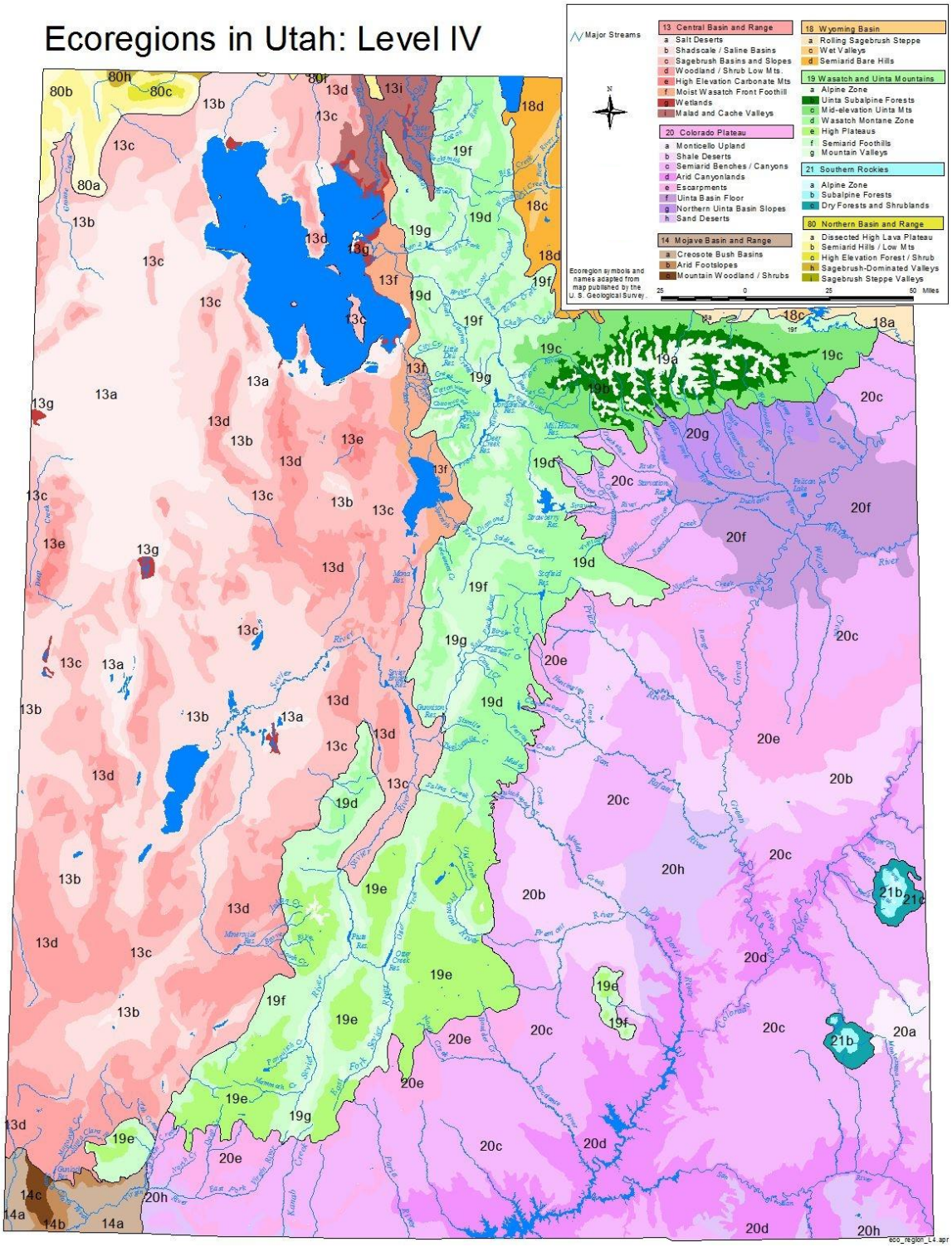


Figure 3. Ecoregions of Utah



3.3 Watershed Element 2: Organization and Stakeholder Involvement

A stakeholder can be anyone representing a public interest group; or other entities affected by point and nonpoint sources (including industries, landowners, and wastewater treatment owners and operators); as well as interested governmental units with public responsibilities but who are not directly responsible for TMDL development such as local governments and various State, Tribal, and Federal agencies.

The long-term success of the Utah Watershed Approach will depend equally on coordination between government and private agencies as well as organizations, private citizens, and other stakeholders. As illustrated in the figure below, involvement and coordination of work by stakeholders should occur at three levels: statewide, regional watershed management units, and the local level.

Statewide

The governor has designated the Department of Environmental Quality (DEQ) as the lead agency to manage the water quality pollution control program set up by state statute and to carry out provisions of the Clean Water Act in Utah. This responsibility is carried out within the Division of Water Quality (DWQ) under the supervision of the Utah Water Quality Board. Membership on this Board represents a cross section of Utah's water quality community, including industry, municipalities, public health, special service districts, environmental interests, agriculture and the public at large.

Utah Conservation Districts have a prominent role in the management of agricultural NPS pollution throughout the state. Conservation Districts are political subdivisions of state government with statutory authority to devise and implement measures to prevent soil erosion, flood or sediment damage, nonpoint source water pollution, or other degradations of a watershed or of property affecting a watershed on state and private lands (Utah Code 17D-3-103). Conservation Districts provide local leadership to identify resource needs and assist property owners/managers obtain the resources to address those needs.

Local Conservation Districts will sponsor individual 319 projects, oversee implementation, and have significant involvement in local watershed and steering/advisory committees. The Department of Agriculture and Food will provide technical assistance to the districts to help them implement the NPS project work they are actively involved in. Local watershed coordinators will often provide the majority of the technical assistance required to implement water quality projects.

It may also be effective for state or local entities to assume the responsibility of administering the NPS program in a given watershed if it is dominated by urban land uses, public lands, or has other unique characteristics. Other entities may include, but are not limited to, counties, local watershed groups, state agencies, and municipalities. These entities must have the capacity to properly administer NPS funding, and must adhere to all funding guidelines.

Currently the NPS Pollution Control program is coordinated through the Utah Water Quality Task Force, which is currently a 21-member organization consisting of a staff work group, and subcommittees as needed. This task force was previously known as the Nonpoint Source Task Force, but after some discussion it was decided that the group addresses not only nonpoint source pollution, but a wide variety of water quality issues throughout the state. As the Utah Watershed Approach has matured, the Water Quality Task Force has been restructured to fully service the needs of the state. However, it may be helpful to solicit representation from additional agencies and local watershed steering committees to increase the Task Force's effectiveness.

Other similar groups now exist and need to be closely integrated into the watershed approach. These include the Natural Resource Conservation Service (NRCS) Environmental Quality Incentive Program (EQIP) State Technical Advisory Committee, Utah Partners for Conservation and Development (UPCD) and other specialized groups such as the Forest Stewardship Coordinating Committee and the State Animal Feeding Operation (AFO)/ Concentrated Animal Feeding Operation (CAFO) Committee. Integration of these or other existing groups is recommended where program missions allow thus avoiding duplication of effort.

The nine (9) current Water Quality Task Force functions outlined in their Charter (see Appendix B) are listed below. The charter was last updated in 2015, and will continue to be updated in conjunction with the revision of the State NPS Management Plan.

1. Serve as a coordinating body for the review and direction of federal, state and local NPS management programs to assure that these programs are implemented consistent with the Utah Nonpoint Source Management Plan (approved by EPA in 2013 and as amended or revised);

2. Promote and foster better alignment of relevant programs to assure efficient and effective watershed management efforts that improve water quality, in addition to other benefits;

3. Provide a forum for the exchange of information on activities which reduce nonpoint source pollution;

4. Provide a forum for discussing and implementing project monitoring (before and after)

5. Provide a common storage area for all data collected

6. Provide a forum for discussion and recommended resolutions to program conflicts;

7. Work with partner agencies to coordinate the prioritization of watersheds for nonpoint source activities. Prioritization criteria should include local involvement (e.g. locally led watershed committees), effective use of partnerships, and evidence of leveraged sources of funding;

8. Establish and implement a process for field inspections of nonpoint source mitigation activities on public and private lands to ensure that best management practices are installed and functioning as designed to protect water quality; and

9. Serve as a coordinating body for outreach and education to increase public awareness regarding nonpoint source pollution management.

Watershed Management Unit Structure at the Basin or Sub-Watershed Level

While the planning and work to complete the Watershed Approach will occur within local watershed groups, the Utah Division of Water Quality has provided State and Local Watershed Coordinators to help guide the process, and verify that these local groups are being utilized to their full potential.

State Watershed Coordinators- State Watershed Coordinators are technically environmental scientists that are employed by the Utah Division of Water Quality. They have been assigned to oversee water quality in designated watershed management units in the State. The main responsibilities of the state coordinators includes developing monitoring strategies to collect data that can be used to develop TMDLs, Watershed plans, or determine impacts of other water quality concerns. They are also responsible for the development of these plans. These coordinators oversee the implementation of these plans, and manage the local watershed coordinators who have been assigned to work in each of their respective watersheds.

Local Watershed Coordinators- While local watershed coordinator positions are funded by the Division of Water Quality, they are employed by the Utah Department of Agriculture and Food. Local Watershed coordinators are tasked with facilitating meetings for the local watershed groups. They serve as contacts with private landowners, and are able to encourage local landowners to implement NPS related projects. They provide technical assistance during the project planning process, and are also responsible for documenting the environmental benefits of all the projects they implement. Without local watershed coordinators it would be difficult to gain the trust and respect of the community and residents of each watershed.

The majority of the participants of local watershed groups should come from existing regional groups or organizations, augmented as needed to represent all stakeholders, as well as professional staff from participating agencies.

In some instances it may simplify the planning process to develop steering and technical advisory committees. In this instance the technical advisory committee, which consists of resource professionals, will gather and evaluate technical information regarding the water quality impairments. The technical advisory committee will then present the findings of this data to the steering committee which consists of local leaders and decision makers that will decide how to proceed with planning and watershed management responsibilities.

Where possible, DWQ should use an existing local or regional board or council for watershed planning or water quality activities. Committee structures will be modified as necessary to accommodate development of TMDLs by the state on a watershed scale.

WMU Local Watershed Groups:

DWQ encourages local watershed groups or steering committees to take the lead role in the watershed planning process. The objective of using local leadership in the watershed approach is to foster local grass roots involvement. These watershed groups provide the mechanism for programs, agencies, and other stakeholders to collaborate in developing management strategies. Collaborative work within the committees will promote the development of more specific and locally acceptable solutions to water quality concerns. DWQ believes that local leadership is critical for effective coordination and local ownership of any water quality management plan. The chairperson of local watershed groups could also be a member of the State Water Quality Task Force if requested.

The local watershed groups should include representatives from landowners, resource agencies, county commissions, conservation districts, environmental groups, municipalities, industry, drinking water utilities (surface or groundwater), and other appropriate organizations which are significantly involved with the planning area. These representatives should have authority to make decisions for the agency or group they represent. It may also be beneficial to have interagency personnel with multi-disciplinary skills such as watershed specialists, soil scientists, biological experts, and other relevant natural resource specialists who are currently involved in watershed protection activities participate in these watershed groups. By including various individuals with a wide array of natural resource expertise the watershed groups can realize a comprehensive and coordinated approach to holistic resource management planning. The scope and detail of each TMDL or watershed plan will depend on the magnitude of the concerns, complexity of the watershed, availability of resources and will be negotiated between DWQ and the local watershed group. Tasks for local watershed groups would include the following:

- Provide a forum for integration of local, state and federal agency activities to address impaired waterbodies
- Request technical and financial support
- Encourage involvement with neighboring watersheds
- Establish consistency of purpose and operation among sub-watersheds
- Include considerations for enhancing protection of drinking water source protection areas, both groundwater and surface, as appropriate
- Hold agency and public review forums
- Develop management strategies to reach TMDL endpoints developed by the Division of Water Quality
- Identify and set priorities and target water quality concerns (By HUCs, sub-watersheds, stream segments, etc.)
- Define long and short range management strategies, including goals and objectives
- Select sub-watershed water quality management strategies within the scope of 303 (d) listed waters

- Select and schedule the final management approach
- Revise the plan in consideration of public and agency comment
- Facilitate implementation of the Watershed plan and in procuring funding
- Review Total Maximum Daily Loads
- Identify priority issues
- Recommend quantified pollution reductions and allocate responsibilities
- Assist with development of plan management strategies
- Write Watershed Plan
- Prepare 319 project proposals and Project Implementation Plans (PIPs) and implement the TMDL plan according to allocation of responsibilities
- Review monitoring sites to determine if they reflect watershed conditions

The Division of Water Quality and local watershed groups may choose to use contractual agreements, joint work plans, or memoranda of understanding to build support and assistance from participating agencies and private contractors as needed. Some agencies may utilize an Interagency Personnel Agreement to provide staff to assist the watershed group or another agency in planning and implementation activities.

Multi-state Lead Task Forces

Where watersheds overlap state boundaries it may be beneficial to establish a task force made up of representatives from each state to address the water quality issues identified in that watershed. The State of Utah currently has active multi-state task forces in several watersheds including the Bear River and Colorado River watersheds. The task forces in these watersheds have partnered on monitoring efforts, TMDL development, and quarterly meetings to discuss water quality issues in those watersheds.

3.4 Watershed Element 3: Watershed Approach Planning Cycle

The Watershed Approach Planning cycle was developed to improve the Statewide NPS Program. The planning cycle helps coordinate watershed planning and TMDL development efforts with intensive basin-wide monitoring conducted by the Division of Water Quality and helps target funding that can be used to implement those plans. Table 2 shows an example schedule of the watershed approach planning cycle.
The three components of the Utah Watershed Approach planning cycle are:

1. Strategic monitoring: This includes increased monitoring at the watershed level to assist with the development of TMDLs and watershed planning. Local watershed groups should help determine where monitoring sites for the intensive monitoring run should be located. The overall monitoring schedule and locations should be identified in a Sampling Analysis Plan (SAP) submitted to the Division of Water Quality. Increased monitoring should also take place at the project level. Understanding project effectiveness will help future planning efforts and assist with project reporting and the development of success stories.

2. Development of watershed plans: Local Watershed groups should help lead in the development of these watershed plans. These plans will identify the source of nonpoint source pollutants associated with the water quality impairments. Once these sources have been identified an implementation plan should be developed to determine what BMPs should be installed and the cost of implementing the plan.

3. Funding: Once the Implementation plan has been written and the location and types of best management practices that need to be installed have been determined, funding will be needed to implement the plan. Identifying, years in advance, where financial assistance is required allows participating agencies to plan where and when their resources are needed, and how they can better leverage their funding with funding from other agencies.

Table 2. The Watershed Approach Planning Cycle

Task	Year 1 *	Year 2	Year 3	Year 4 $	Year 5	Year 6	Year 7 *	Year 8	Year 9	Year 10 $	Year 11	Year 12	Year 13 *
Intensive monitoring													
Development of Watershed Plans													
Development of PIPs													
Project monitoring													
Project Planning													
Project Implementation													
Final Project Reporting													

***** *Indicates Year of Intensive monitoring*

$ *indicates year the basin will receive Targeted Basin Funding*

3.5 Watershed Element 4: Strategic Data Collection

Well-structured strategic data collection plans are key to the success of the watershed approach. Participating agencies and programs will develop a coordinated strategic monitoring plan for each watershed management unit. Local watershed groups will have an opportunity for input into the intensive surveys developed for that area. The plan will address the distribution of monitoring resources between targeted and programmatic monitoring needs.

Monitoring Objectives

The widespread nature of nonpoint source pollution coupled with increasingly rigorous requirements for documenting project effectiveness creates a significant challenge from a monitoring perspective. Meeting this challenge has guided DWQ's approach for assessing the effectiveness of restoration efforts state-wide.

Monitoring Design

The need to monitor, document and report on the implementation and effectiveness of Best Management Practices (BMPs) funded under the 319 program is based on the requirement for demonstrating project effectiveness, tracking implementation of plan goals, and quantifying pollutant load reductions as defined in TMDL studies. The majority of 319 projects in Utah address impacts to stream and riparian habitats to restore aquatic life and other beneficial uses. The objective of these projects is to reduce erosion and inputs of nutrients, sediment, bacteria, or other pollutants to streams and rivers, in addition to improving

the quality of the aquatic habitat. Unless restoration is widespread and inclusive of a large portion of a watershed, it is nearly impossible to document positive changes in water quality given the limited resources available. This is one of the main reasons why the Division of Water Quality has decided to implement projects at the watershed scale instead of funding "random acts of conservation" throughout the watershed basin.

One of the monitoring approaches utilized to document project effectiveness involves the direct measure of the aquatic communities affected by restoration utilizing the Utah Comprehensive Assessment of Stream Ecosystems (UCASE) protocols in a Before-After-Control-Impact (BACI) approach. The goal of the UCASE method is to measure the water quality-related chemical, biological, and physical attributes of the stream system. DWQ staff have historically performed UCASE monitoring at many sites where restoration projects were planned and linked them to sites of similar condition not anticipating management or restoration changes (Before-Control) to provide support for NPS restoration success evaluation. However, these efforts were conducted opportunistically rather than part of a comprehensive strategy. With the completion of this document, DWQ staff, and when applicable watershed coordinators, will strategically perform UCASE monitoring at sites that are planned for water quality improvements projects. In coming years, those same sites will be visited again to assess the changes from restoration activities (After-Impact). The BACI design provides statistically rigorous comparisons between the control site(s) with the restored site (impact) to quantify changes in chemical, biological and physical parameters that have occurred since the restoration was conducted. In practice, grab samples of chemical parameters are sufficiently variable that even statistically rigorous approaches like BACI may not demonstrate discrete changes in the chemical composition of surface waters following restoration activities. Measures of biological composition may help demonstrate relatively rapid improvements that result from remediation activities. Biological communities, such as benthic macroinvertebrates, often respond quickly to water quality improvements and since they spend the majority of their life in the water column, are an excellent surrogate measure of physical and chemical integrity. Measures of biological composition are also useful because they directly measure improvements of the biological designated uses the numeric criteria are intended to protect. The magnitude, accuracy, and precision of biological and chemical improvements will be influenced by the relative size of the watershed and restoration activity.

Another approach for monitoring nonpoint source projects on a watershed scale is the establishment of long-term continuous monitoring stations. Depending on the parameters of concern and the nature of restoration activities, these automated stations could measure a variety of constituents, including dissolved oxygen, specific conductivity, pH, temperature, turbidity and flow. Since these sondes collect a limited set of water quality parameters, surrogate measures would be used and additional water chemistry monitoring conducted to develop correlations between the parameters of concern and the surrogate measures. For instance, a simple linear regression developed between continuous turbidity measurements and suspended sediment concentration from discrete grab samples could be used to link changes at long-term monitoring stations and therefore effectiveness of specific projects (USGS 2011). While the installation of long-term stations isn't feasible for the assessment of individual projects they could be used to document the effects of projects implemented as part of a watershed-scale implementation strategy as in the case of continuous riparian habitat restoration.

Given the difficulty of reporting on the effectiveness of BMPs all monitoring sites should be reviewed to determine their effectiveness in documenting changes in water quality resulting from BMP implementation. Too often, the parameters of concern identified in the TMDL and Project Implementation Plans (PIPs) simply cannot be measured on the timescale dictated by reporting requirements, nor given the cost associated with sampling and lab analysis. DWQ staff will work with their EPA counterparts to design monitoring approaches that are appropriate to individual and watershed plans to ensure measurable parameters are selected. As in other tiers, these indicators will be selected each year and integrated into the Annual Monitoring Plan. By integrating these enhancements, the monitoring of implementation activities will be designed on the appropriate scale, both over time and space. UCASE monitoring in a BACI design will address the direct improvements to aquatic habitats and the biological communities that are likely to respond to its improvement. Alternately, the continuous monitoring station approach will more effectively assess the long-term and integrated effects of a number of projects in a watershed area.

Core and Supplemental Indicators

Core and Supplemental indicators for nonpoint source effectiveness monitoring are site specific and depend on the parameters of concern identified in TMDL studies and the monitoring strategies included in individual project Sampling Analysis Plans. As mentioned above, surrogates may be identified and collected for the assessment of watershed PIP effectiveness where appropriate. Table 3 lists potential indicators which may be employed under this program element.

Table 3. Core and Supplemental Indicators

Beneficial Use Assessment Categories				
Aquatic Life & Wildlife	Recreation	Drinking Water	Fish / Shellfish Consumption	Agriculture
Core Indicators				
Dissolved oxygen	Pathogen Indicators (E. coli)	Trace metals	Waterfowl and fish consumption advisories	Trace metals
Temperature	pH	Pathogens		Total dissolved solids
pH		pH		pH
Trace metals		Nitrates		
Condition of benthic macroinvertebrates community				
Periphyton				
Fish				
Supplemental Indicators				
Sediment	Harmful Algal Blooms - Cyanobacteria			
Nutrients (N, P)				
Habitat assessment				

Data Analysis and Assessment

Data analysis for evaluating the effectiveness of nonpoint source projects will vary depending on the type of project and the available data sources. Biological monitoring will provide background condition of the biotic community for both the “Before” and “Control” collection events. Once implemented, projects will be assessed by revisiting the “Control” and “Impact” site. Data will be compared using similar tools described in the biological monitoring component of the targeted assessments. Scores of biological condition can be evaluated for the “Impact” or restoration site (Before vs. After) in conjunction with the “Control” site not receiving treatment (Before vs. After). In this way, changes in the biological condition can quantify the year-to-year variability.

Methods for long-term trend analysis have yet to be developed. However, these sites will likely utilize a combination of continuous monitoring data coupled with water chemistry to establish a relationship between the surrogate measures and chemical parameters of concern linked to PIPs and TMDLs. For example, correlations can be readily established between total dissolved solids collected by grab samples and specific conductance as measured by probe sensors. Continuous monitoring datasets are sufficiently large enough to perform trend analysis with a level of confidence not possible through periodic grab sampling. Developing correlations between probe data and other parameters such as nutrients and sediment prove more difficult than the scenario described above. In these cases, measures for dissolved oxygen, turbidity or other surrogates may need to be evaluated. As mentioned above, specific monitoring

plans will be developed individually for implementation strategies and Sampling Analysis Plans and subsequent reporting documentation will detail specific data analysis for each project.

In the past, chemical data was used exclusively to assess NPS projects and stream health. The State of Utah is beginning to use additional methods to determine the effectiveness of the State's NPS efforts at the watershed and project level. Some of the parameters to be measured include: fish community composition and macroinvertebrate assemblage, channel cross sections which will determine the rate of in-stream erosion at a given site, and "greenline" surveys to determine riparian vegetative health. The State will continue to identify other indicators that contribute evidence towards better evaluating beneficial use support.

Programmatic Evaluation

Nonpoint source monitoring for assessment and project effectiveness monitoring has long been a challenge for states participating in the 319 funding program. Established measures of project success must be evaluated regularly to ensure indicators are applicable and the scale of monitoring activities appropriate to the individual or watershed project area. Since each Project Implementation Plan is unique, DWQ will continuously review its NPS monitoring strategy with EPA to ensure it meets critical 319 program reporting requirements.

Ground Water Monitoring

Utah's anti-degradation policy is intended to maintain and protect current and future beneficial uses of ground and surface water. This policy recognizes that there are some effects to ground water from human activities, and limits those effects to acceptable levels by issuing ground water discharge permits. The DWQ Ground Water Quality Protection Program (UAC R317-6) was promulgated in 1990 to protect ground water quality by issuing permits to facilities that have the potential to discharge pollutants into ground water. The DWQ Ground Water Protection Section administers two primary programs to protect the quality of Utah's ground water resources:

1. The EPA-delegated Underground Injection Control (UIC) Program (UAC R317-7); and,
2. The Utah Ground Water Quality Protection Program (UAC R317-6).

The UIC Program protects underground sources of drinking water by issuing dozens of Class V UIC authorization by rule approvals annually after reviewing information for small-scale injection activities such as storm water dry wells, ground water remediation wells, and domestic underground drain fields. The UIC Program also issues Class V UIC permits for aquifer storage and recovery (ASR) operations to allow municipal water districts to capture spring runoff water and store it in drinking water aquifers for future use. There are currently three permitted Class V ASR facilities; Jordan Valley Water Conservancy District; Brigham City Corporation; and Leamington Town. The UIC Program also issues Class III permits for solution mining operations and has two Class III-permitted facilities (Intrepid Potash, and Magnum Solutions) and one in application review (Pinnacle Potash).

The Ground Water Protection (GWP) Program protects ground water quality by issuing permits to agricultural and industrial waste management units that have the potential to discharge pollutants into ground water. Agricultural waste management units include wastewater lagoons at large concentrated animal feeding operations such as dairies and swine farms, while industrial waste management units include ash disposal facilities and wastewater ponds at coal-fired electrical power plants, and tailings impoundments and heap leach operations associated with ore mining and processing operations for copper, gold, phosphates, oil sands, oil shale, and uranium. The two primary elements of ground water discharge permits are: best available technology (BAT) to minimize subsurface discharges to ground water; and, compliance monitoring to verify the efficacy of BAT.

In addition to administering ground water discharge permits, the GWP Program oversees an average of 10 corrective action projects annually for spills and releases of contaminants to soil and ground water. Although most of these are short term corrective action projects that receive No Further Action letters after completion.

The GWP Program also conducts technical reviews of aquifer classification petitions for approval by the Water Quality Board. Aquifer classifications are intended to be used as a planning tool by local governmental agencies to protect ground water quality from degradation (http://www.waterquality.utah.gov/GroundWater/gwaquiferclass.htm). The Board has approved 12 aquifer classifications throughout the state, including the most recent classification for the principal basin-fill aquifer in the East Shore area of Davis County.

In addition, the DWQ Ground Water Protection Section collaborated with the USGS to develop recharge zone maps in several counties throughout the State including the "Wasatch Front" in the Lower Bear River, Weber River and Jordan/Utah Lake units. Recharge area maps are prepared to assist DWQ and Local County and city officials in protecting recharge areas from potential ground water contaminants related to point and nonpoint sources.

Volunteer Monitoring

The Utah Division of Water Quality (DWQ) has partnered with Utah State University Water Quality Extension to create and implement a statewide volunteer monitoring program. In October 2011, a full time program coordinator was hired with funds from the NPS program. The coordinator works with the DWQ Monitoring and Watershed Protection Sections, local watershed coordinators, and other cooperators to identify data needs and determine how volunteers can help collect water quality data. These efforts resulted in the creation of Utah Water Watch, a tiered volunteer monitoring program that focuses on both lakes and streams.

Utah Water Watch (UWW) is a water quality education and data collection program that seeks to increase awareness about the importance of water quality and promote stewardship of Utah's aquatic resources. UWW is open to individual citizen volunteers of all ages, school groups, community groups and partner organizations that wish to help monitor the water quality in Utah's lakes and streams. UWW will increase the volunteers understanding of watersheds, non-point source pollution, and how their actions on land influence water quality. To do this USU Water Quality Extension has created a website, interactive maps and data displays, training documents, and educational materials associated with UWW.

UWW's mission is to encourage, educate and engage volunteers in monitoring water quality by providing the knowledge, training, and resources needed to examine the health of Utah's lakes and streams. The program is dedicated to the collection of accurate and credible water quality data. Volunteers are taught about watershed science and how to collect biological, chemical and physical data on lakes and streams. This program has three tiers that have different data quality objectives to allow volunteers to advance to their desired level. Tier I is the introductory level that focuses on water quality education and standardized monitoring techniques. The data is to be used for educational purposes, local decision making, and assisting the DWQ with planning for future monitoring. Tier II focuses on collecting water quality data for compliance to determine whether the water body's beneficial use designations are being met. Tier II volunteers will be trained and follow DWQ approved standard operating procedures. Tier III will focus on special monitoring locations or projects identified by advanced volunteers or the DWQ. Both Tier II and III will have an approved QAPP on file with the DWQ. All data collected by volunteers will be available for the public, schools, local water managers and the DWQ.

UWW volunteers will become stewards of their local water bodies by collecting and reporting valuable information. UWW's data will supplement the professional monitoring efforts already undertaken by the DWQ. UWW volunteers will be a resource for water managers and increase the DWQ's interactions with local communities.

Data and Information Management

An adequate data management system is an essential component to transform the environmental data collected into a comprehensive dataset that supports planning processes and promotes stewardship and accountability among stakeholders. The Utah Division of Water Quality (DWQ) coordinates data collection statewide with a number of agencies including the Forest Service and Bureau of Land Management. The DWQ maintains a Quality Assurance Plan that describes data and information management.

https://deq.utah.gov/Compliance/monitoring/water/docs/2014/05May/DWQ_QAPP_5.1.14_Rev0.pdf

The DWQ in conjunction with the Exchange Network developed a data storage solution with the EPA's WQX schema known as the Ambient Water Quality Management System (AWQMS). AWQMS enables participating agencies and volunteer groups to utilize a web-based user interface to submit their data in a consistent method to DWQ to minimize staff time and ensure data quality. AWQMS also offers Quality Assurance / Quality Control screening tools to ensure quality data is submitted to WQX.

Grant Reporting and Tracking system (GRTS)

DWQ uses the GRTS NPS database maintained by EPA to provide current 319 project information for both national and regional elements. The State will continue to support and use the GRTS database pursuant to provisions in the annual Performance Partnership Agreement with EPA and 319 project grant conditions.

3.6 Watershed Element 5: Watershed Assessment

The term watershed assessment is applied generally to several types of analyses that occur throughout a watershed management cycle. In the early stages of the cycle, assessment involves determining water quality conditions, beneficial use support status, and identifying sources and causes of impairments. Quantifying pollutant loads and predictive water quality modeling may be used in the middle stages of the cycle to help establish total maximum daily loads (TMDLs) and management goals. In later phases of the cycle, assessment procedures can be used to evaluate the effectiveness of implemented management strategies.

Assessing biological measures of ecosystem integrity will also help in identifying concerns, setting goals, and evaluating success of implementation efforts. Additional considerations in assessments may include habitat condition and landscape characteristics such as land use. Biological measures such as species diversity and abundance aid in evaluating the relationship between management actions and stream ecosystem health.

Assessments developed as part of the statewide watershed management strategy will include information that will fulfill a broad range of EPA reporting requirements including Sections 303(d), 305(b), 319(b) and 314(a) of the CWA. These reports will strive to make information accessible and comprehensible to a broad range of stakeholders.

In the Standards of Quality for Waters of the State (UAC R317-2), streams and lakes are classified according to the beneficial use of the waters. Each of these classifications has associated water quality standards that define whether or not waters are meeting their designated uses. Waters of the state are assessed against the standards associated with the uses as listed below:

Beneficial Use Classifications for Waters in the State of Utah

Class 1C -- Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water

Class 2A -- Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.

Class 2B -- Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.

Class 3A -- Protected for cold water species of game fish and other cold water aquatic life, including the necessary aquatic organisms in their food chain.

Class 3B -- Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.

Class 3C -- Protected for nongame fish and other aquatic life, including the necessary aquatic organisms in their food chain.

Class 3D -- Protected for waterfowl, shore birds and other water-oriented wildlife not included in Classes 3A, 3B, or 3C, including the necessary aquatic organisms in their food chain.

Class 3E -- Severely habitat-limited waters. Narrative standards will be applied to protect these waters for aquatic wildlife.

Class 4 -- Protected for agricultural uses including irrigation of crops and stock watering.

Class 5 -- The Great Salt Lake.

Class 5A Gilbert Bay
Beneficial Uses -- Protected for frequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

Class 5B Gunnison Bay
Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

Class 5C Bear River Bay
Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

Class 5D Farmington Bay
Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

Class 5E Transitional Waters along the Shoreline of the Great Salt Lake Geographical Boundary
Beneficial Uses -- Protected for infrequent primary and secondary contact recreation, waterfowl, shore birds and other water-oriented wildlife including their necessary food chain.

Point Source Permitting Program: The Utah Pollutant Discharge Elimination System (UPDES) program regulates municipal and industrial discharges, as well as state-wide general permits, federal facilities, biosolids, and industrial pretreatment programs. Currently there are 248 industrial and 67 municipal facility permits administered by the UPDES program, of which 191 are general permits that regulate activities including construction dewatering, coal mines, concentrated animal feeding operations (CAFOs), drinking water treatment plants, and fish hatcheries. There are also over 4,300 storm water discharge UPDES permits that regulate the discharge of pollutants during storm water run-off events to waters of the state from industrial, construction and municipal sites. Specific information on individual permits and requirements of general permits can be found on DWQ's website at: https://deq.utah.gov/legacy/permits/water-quality/index.htm

Monitoring Program: In 2009, the DWQ monitoring section implemented a Tiered Approach to water quality monitoring on a rotating basin schedule. Tier 1 is a probabilistic survey using the UCASE protocol to measure biological, physical and chemical parameters. The first six years (2009-2014), the monitoring design prescribed 50 probabilistic sites be evaluated per year within the scheduled basin (table 4). Starting in 2016, in order to allocate UCASE protocol resources toward other programs, the Tier 1 design shifted to collecting 50 probabilistic locations statewide every two years. Analysis of this data is intended to inform the Tier 2, or Targeted Monitoring strategy which focuses on routine monthly data collection of water chemistry samples to determine if waterbodies are meeting state water quality standards. The schedule of

rotating watersheds for both the Probabilistic and Targeted Tiers is provided in Table 4. The monitoring cycle coincides with the hydrologic year beginning on October 1st through September 30th of the following year.

Table 4. Tiers of Probabilistic Survey

Basin Management Unit	2015		2016		2017		2018		2019		2020		2021		2022	
Jordan R/Utah Lake		P				T	T							P		
Colorado River				P				T	T							P
Sevier/Beaver/West Desert						P				T	T					
Bear River								P				T	T			
Weber River										P				T	T	
Uinta Basin												P				T

P= Probabilistic Survey (one visit Summer/Fall)
T= Targeted Monitoring (12 visits in October-September)

In addition, DWQ has implemented similar strategies for assessing wetlands of the Great Salt Lake, implementing its first Probabilistic Survey of the impounded wetlands in 2012.

Rivers / Streams: Of the 15,688 perennial stream miles assessed in 2016, 21% met all water quality standards and beneficial uses, 47% were impaired for at least one beneficial use, and 32% did not have sufficient information to make a complete assessment (see figure 5). To view specific river and stream impairment listings please refer to the 2016 Integrated Report and 303(d) list found on the DWQ web site at: https://deq.utah.gov/legacy/programs/water-quality/monitoring-reporting/assessment/2016-integrated-report.htm

Lakes / Reservoirs: In 2016, 142 lake assessment units comprising 1,467,223 acres of surface water were assessed by DWQ (see figure 4). Of the lake acreage assessed by DWQ 4% of the total acreage was found to be meeting water quality standards and beneficial uses; 20% of the assessed lake acreage was found impaired for at least one beneficial use, and 76% of the assessed lake acreage did not have sufficient information to make a complete assessment. To view specific lake impairment listings please refer to the 2016 Integrated Report and 303(d) list found on the DWQ web site at the same link provided above.

Public Health/Aquatic Life Impacts: Since 2000, fish tissue samples have been analyzed for mercury from 229 waterways in Utah. The 395 unique monitoring locations sampled included 217 river/stream sites and 178 lake/reservoir sites. Twenty seven of these sites had average concentrations of mercury that exceeded the EPA threshold for safe consumption. An additional 3 waterbodies have consumption advisories for selenium, arsenic, and polychlorinated biphenyls (PCBs) respectively.

A current list of advisories and supporting documentation is provided at the following website: http://fishadvisories.utah.gov/

Wetlands: DWQ is developing a wetland assessment tool for impounded wetlands on the Great Salt Lake to evaluate and establish appropriate water quality standards for these waters. In the future, DWQ will expand the tool to assess other wetlands throughout Utah.

Ground Water: Man-caused pollution along with natural causes has affected water quality in several aquifers throughout Utah resulting in increased concentrations of nitrates and Total Dissolved Solids (TDS). The State ground water quality program uses TDS concentrations to categorize ground water beneficial uses. The lower the TDS concentrations, the greater the beneficial use is considered to be for that water.

Groundwater reservoirs / aquifers function in a way similar to surface water storage reservoirs where the volume of water in storage is determined by the rate of recharge and discharge. When groundwater levels decline, well water levels drop and seep and spring discharges on the valley floors may be reduced. The

opposite is also true when groundwater levels rise. If the groundwater discharge exceeds the recharge over several decades, then depletion occurs. This has occurred in some areas of the Utah.

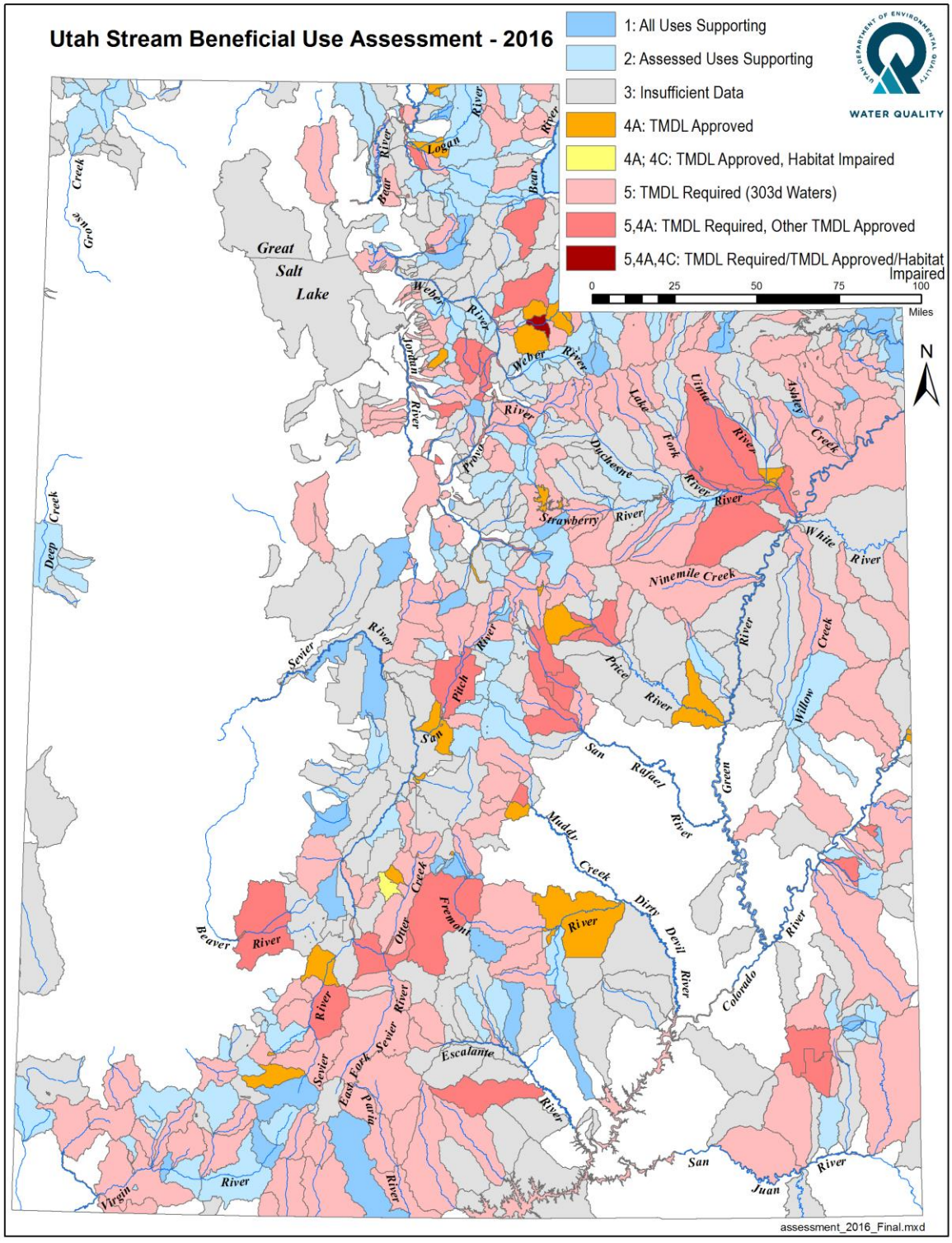


Figure 4. Stream Beneficial Use Assessment 2016

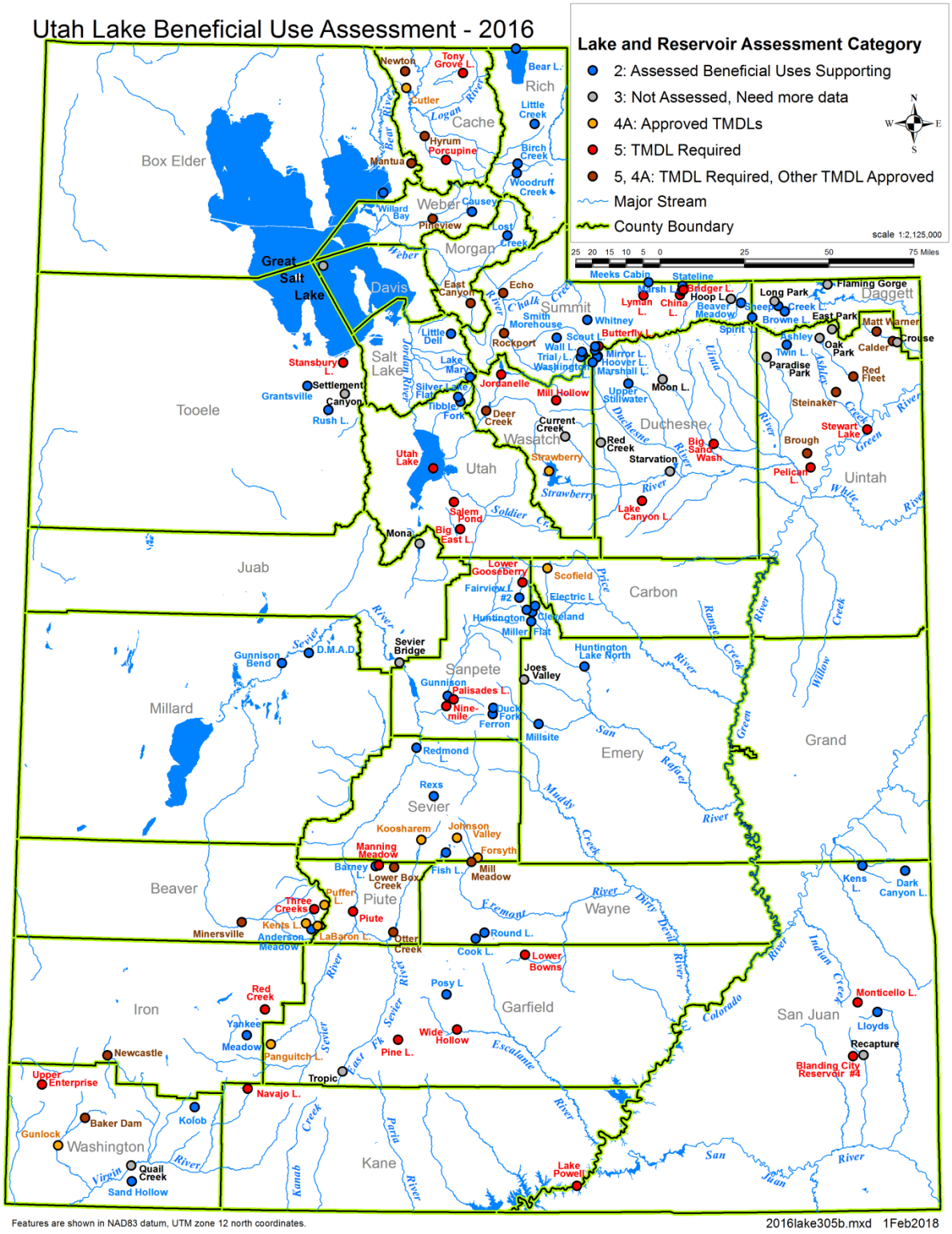


Figure 5. Lake Beneficial Use Assessment

3.7 Watershed Element 6: Prioritization, Quantification (TMDL) & Targeting

Prioritization is the process of ranking watershed resource concerns, identified in the assessment phase, in order of their relative importance to stakeholders. Targeting defines when and where limited resources should be invested to address these priority issues. The purpose of these steps is to ensure that the highest priority risks in a watershed are addressed as soon as possible, given the availability of financial and technical resources.

Assistance with information and education activities in priority watersheds will be provided by local watershed coordinators and other agency partners. These steps allow DWQ and fellow stakeholders to adapt their management strategies and maintain flexibility in deciding which problems to address first. Negotiating sustainable solutions also provides DWQ an opportunity to secure a higher degree of commitment from stakeholders.

To ensure the effectiveness of local watershed groups and steering committees, several steps are required to efficiently target limited resources. Identification of high priority areas and appropriate projects should be directly linked to the implementation requirements of TMDLs and be decided upon in public meetings hosted by local watershed groups. These principles of quantifying water quality goals and public involvement are discussed in more detail below.

Quantification (Assessment and Evaluation): Total maximum daily loads (TMDLs) for a pollutant or stressor are used to establish quantifiable targets in addition to those identified by stakeholders. EPA's TMDL guidance states, "TMDLs can be expressed as mass per unit of time, toxicity, or other appropriate measure." Other measures could include such things as percent reduction of pollutants, application of BMPs on a percentage of priority area within a watershed, a decrease in miles of deteriorated stream banks, etc. Quantification also requires the identification of all major sources of the pollutant or stressor of concern.

Consensus Based Decisions: Effectively targeting the resources of various agencies requires their participation and consensus on priorities within the watershed management unit. Participants are expected to thoroughly review available information and consensus is reached when all parties agree on the path forward. The strengths of this approach lie in the widespread acceptance of the end product. Weaknesses include the potential for the group being unable to reach consensus.

After waters have been prioritized and water quality goals quantified, deciding how best to allocate resources and target them to achieve these goals is the next step. Resources will be directed based on the factors listed below and provide a good building block for the development of a project ranking criteria.

Public Support: This factor includes the amount of public interest, availability of local funding, and the degree of support from other resource agencies needed for project implementation. Public support is a qualitative measure and will be characterized using best professional judgment, surveys, participation in meetings, written contributions/responses to the watershed plan, watershed group support, and contributions of resources from partner agencies. The willingness of landowners to implement the proposed BMPs on their properties is also a critical factor that can be influenced by local opinion.

Manageability: Evaluating manageability includes the feasibility and cost of mitigating water quality problems, size of the watershed, time necessary to correct the problem, opportunity for success, and availability of management tools and technological controls.

Data Availability: Data may be sufficient to assess the water body, but insufficient to fully quantify the sources and solutions for management and remediation. If the problem and its remedy cannot be quantified satisfactorily, then the data gap must be addressed through development of a Sampling Analysis Plan before project implementation.

Funding: Project sponsors should consider the availability of funding and their eligibility to receive these funds, whether there are existing projects already planned in their area by other agencies, and the status of TMDL development efforts. Availability of funding also constrains the availability of technical personnel needed to plan, design, and report on implementation efforts.

Programmatic vs. Watershed Specific Goals: Other federal, state, agency or basin management goals should be considered in addition to watershed specific TMDL defined water quality goals. While the goals of each State or Federal agency may be different, working with other partners can result in positive programmatic results for all involved. For example oftentimes streambank stabilization projects can reduce pollutants from entering the stream, but they can also help improve fishery habitat as well as increasing vegetation for shading of the waterway. Understanding of each agency's programmatic goals can help accomplish watershed specific goals more efficiently.

Current Priorities and Targeted Areas: Water quality priorities and target areas are informed by the 303(d) Integrated Report. This report identifies waterbodies not meeting state water quality standards that are then scheduled for TMDL development as required by Section 303(d) of the Clean Water Act. This report is updated on a regular basis and contains the methods used in assessing beneficial use support, an overall assessment of water quality conditions, threats to water quality, and the list of impaired waters mentioned above, commonly referred to as the "303(d) list". The criteria for establishing the TMDL development schedule is also described in this report, which can be found on the DWQ website at https://deq.utah.gov/legacy/programs/water-quality/monitoring-reporting/assessment/2016-integrated-report.htm.

This report is a key document for guiding the efforts of the Utah Division of Water Quality as well as for characterizing water quality across the nation.

3.8 Watershed Element 7: Development of Watershed Management Plans

Local watershed groups will evaluate the latest Integrated Report, specifically the 303(d) list of impaired waters, and prepare watershed plans containing or supporting the implementation of TMDL defined water quality goals. The Division of Water Quality will provide technical assistance to these committees and help establish an approach for implementing effective management strategies.

In accordance with the requirements of 319 funding, the State of Utah uses incremental funding in watersheds that have developed, and are implementing, watershed management plans. In 2004 EPA published nine essential elements that should be integrated into every watershed plan. Where possible the State of Utah uses the nine key elements of watershed planning during the TMDL development process. By incorporating these elements while developing a TMDL it helps streamline TMDL implementation and watershed planning.

Watershed management plans are essential tools to provide direction in implementing a watershed management approach. The plans document current water quality conditions, growth and development trends, management priorities and goals, and management strategies to achieve those goals. Plans should be updated every five years or as needed to enhance their applicability for planning and to remain current

with updated laws and regulations. Important technical studies are summarized in the document, with detailed information included in separate reference documents.

Production of watershed plans containing TMDLs will be led by local watershed groups. A DWQ Watershed Coordinator, assigned to each watershed management unit, will be responsible for coordinating plan development with assistance from these local committees. Committee membership will include representatives from partner agencies, local leaders, and affected stakeholders.

Watershed management plans that contain TMDLs will be adopted pursuant to Utah's Continuing Planning Process. DWQ will focus on coordinating and implementing the management plans to achieve environmental objectives as efficiently and effectively as possible. Plans will be prepared for approval by the Water Quality Board. All plans will be prepared on a collaborative basis with continuous input and direction from local watershed groups. Much of the public participation process will be conducted by the local watershed groups and will consist of the following actions:

1. Pre-planning scoping meetings
2. Public/agency meeting to review preliminary assessment and draft TMDLs
3. Public meeting and request for comment on draft TMDL study
4. DWQ will post the document on its web page for public access and comment for a minimum of 30 days.

The following nine elements will be incorporated into all watershed implementation plans:

1. **Identification of Causes and Source of Impairment**
   a. Sources of impairment are identified and described.
   b. Pollution loads are attributed to each source and quantified.
   c. Data sources are accurate and verifiable. Assumptions can be reasonably verified.
   d. Watershed-level estimate of necessary pollution control is provided.

2. **Expected Load Reductions**
   a. Load reductions meet environmental goals.
   b. Desired load reductions are quantified for each source of impairment identified in Element 1.
   c. Expected load reductions are estimated for each management measure identified in Element 3.
   d. Data sources and/or modeling processes are accurate and verifiable. Assumptions can be reasonably verified.

3. **Proposed Management Measures**
   a. Specific management measures are identified and rationalized.
   b. Proposed management measures are strategic and feasible for the watershed.
   c. Proposed management measures achieve load reduction goals.
   d. Critical/priority implementation areas have been identified.
   e. The extent of necessary measures is quantified.
   f. An adaptive management process is in place to evaluate effectiveness of management measures.

4. **Technical and Financial Assistance Needs**
   a. Cost estimates reflect all planning and implementation costs.
   b. Cost estimates are provided for each management measure.
   c. All potential Federal, State, Local, and Private funding sources are identified.
   d. Funding is strategically allocated- activities are funded with appropriate sources.
   e. Economic and environmental benefits are discussed and weighed against implementation costs.

5. **Information, Education, and Public Participation Component**
   a. A stakeholder outreach strategy has been developed.
   b. All relevant stakeholders are identified and involved in the outreach process.

c. Public meetings and forums are held to provide information and receive feedback.
d. Education/outreach materials are disseminated.

6. Schedule
a. Implementation schedule includes specific dates and expected accomplishments.
b. Implementation schedule follows a logical sequence.
c. Implementation Schedule covers a reasonable time frame.

7. Milestones
a. Measurable milestones with expected completion dates are identified to evaluate progress.
b. An adaptive approach with interim milestones is used to ensure continual progress of implementation.

8. Load Reduction Evaluation Criteria
a. Proposed criteria effectively measures progress toward load reduction goal.
b. Evaluation criteria are measurable and quantifiable
c. Interim water quality indicator milestones are clearly identified.
d. Criteria include both quantitative measures of implementation progress and pollution reduction and qualitative measures of overall program success such as public involvement and volunteer participation.
e. An adaptive management approach is in place, with thresholds to trigger review and modifications as needed.

9. Monitoring Component
a. Monitoring plan includes an appropriate number of monitoring stations.
b. Monitoring plan has an adequate sampling frequency.
c. Monitoring plan will effectively measure evaluation criteria identified in Element 8.

3.9 Watershed Element 8: Implementation Strategy

Implementation is the culmination of the watershed management unit planning cycle and serves as the catalyst for stakeholders to implement management strategies supported by the assembled information and resources. A specific milestone table for implementation encourages stakeholders to realistically address uncertainties associated with limited information and financial resources.

Consensus reached among stakeholders through the earlier planning steps should reduce the amount of effort and time necessary to translate the watershed management unit plan into specific actions. The watershed plan will include an implementation plan that provides detailed actions and a schedule for carrying out the plan as specified in the 9 elements of a watershed plan.

With assistance from local watershed groups, DWQ and its partners will produce success stories to highlight implementation progress. These success stories will also aid in fulfilling the need for NPS program annual reporting requirements. With the assistance of local project sponsors, NPS Program staff will gather and report on status and effectiveness of 319 funded projects.

The Statewide Targeted Basin Funding Cycle:

To help local watershed groups fulfill all the requirements identified in implementation plans, DWQ has instituted the Targeted Basin Funding Cycle that will provide funding to a specific watershed management unit on a rotating 6 year schedule. This schedule follows the watershed approach planning cycle discussed in element number 3. The targeted basin receives the majority of Section 319 grant funding to implement comprehensive watershed management plans. Providing a set schedule of where and when funding will be provided allows partner agencies to leverage their funding and resources, thus facilitating the implementation of BMPs and potentially increase the amount of funding available to implement the watershed plan. Table 5 identifies the fiscal year each basin will receive funding which will be used to

implement watershed plans developed by the local watershed groups in cooperation with the Division of Water Quality. The Colorado River funding year will include the Colorado West, Colorado South East, and Lower Colorado River Basins. The Bear River funding year will include the Bear River and Great Salt Lake Desert and Columbia River Basins. The Bear River funding year will also include any projects funded on the Great Salt Lake proper.

Table 5. Targeted Basin Priority Funding Year

	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Jordan/Utah Lake **(1)**										
Colorado River **(2)**										
Sevier, Cedar-Beaver **(3)**										
Bear River **(4)**										
Weber River **(5)**										
Uinta Basin **(6)**										

RED cells denote targeted funding beginning in the spring (319) and July (State NPS) of that year

GREEN cells denote targeted monitoring beginning in October of that year

CHAPTER 4

4.0 NPS POLLUTION CONTROL & MANAGEMENT STRATEGIES

The focus of implementation is the installation of appropriate BMPs on impaired waters where TMDLs and/or watershed plans have been developed. This chapter contains an overview of various programs that are being used to address categories of nonpoint source pollution throughout the State. Appendix A is an in-depth overview of BMPs which are currently being used to reduce NPS pollution from these various sources.

4.1 Development and Implementation of TMDLs

A TMDL is a quantitative assessment of the causes, sources and solutions to water quality impairment. A TMDL specifies the amount of pollution that needs to be reduced to meet water quality standards and allocates pollution control or management responsibilities among sources in a watershed. TMDLs apply to both point and nonpoint sources of pollution and establish target loads and load reductions among both for specific pollutants of concern. TMDLs must also consider foreseeable increases in pollutant loads from future growth and changes in land use.

Waste Load Allocations (WLAs) are developed for contributing point source discharges and are incorporated into discharge permits. Load allocations (LAs) are implemented through state and local nonpoint source control programs which rely on a mix of local, state and federal regulations, contractual arrangements, and voluntary measures. TMDLs are reviewed and approved by EPA to ensure the inclusion of eight minimum submission requirements following Utah Water Quality Board approval. Pursuant to recently revised TMDL regulations these required elements may be modified slightly in the future. These eight components are listed in Section 2.4 of this document.

4.2 Financial Assistance

Once a watershed / TMDL implementation plan has been developed, funding is needed to help defray the cost of BMPs for nonpoint sources. The cost to fully implement a watershed plan is often higher than the funds available, so multiple sources of funding must be pursued. While the intent of other funding programs may not be focused solely on the reduction of NPS pollution, there is enough overlap in programmatic and statutory responsibility that leveraging funding has proven to be an effective means of improving overall project effectiveness and in helping each agency achieve their goals. Grant programs commonly used in conjunction with the state NPS program include:

Section 319 Funding- In accordance with Section 319(h) of the Clean Water Act the State of Utah is awarded a grant annually from the Environmental Protection agency for the purpose of reducing NPS pollution throughout the State. This funding is managed by the Utah Division of Water Quality, and is the primary source of funding used in the targeted basin approach. Section 319 funding is used to fund staff specialists to develop TMDLs and watershed plans, as well as locally based coordinators who provide technical support such as project planning and monitoring for NPS related projects. The State of Utah utilizes at least 50% of the section 319 grant to fund on-the-ground projects focused on reducing NPS pollution.

State NPS Funding- State NPS funding is acquired from interest generated from State Revolving Fund loans given by the Water Quality Board for water treatment facilities. Individuals, businesses, private entities, associations, and government agencies are eligible to receive these grants. Priority is awarded to projects that address a critical water quality need, will improve human health concerns, and would not be otherwise economically feasible. The Utah Water Quality Board has delegated the management of these funds to the Division of Water Quality. Projects funded with these grants are ranked and reviewed by a committee of state and federal partner agencies. The Water Quality Board allocates $1 million of the interest generated from these loans per year toward NPS projects.

Watershed Restoration Initiative Funding- The Watershed Restoration Initiative focuses on protecting and managing core values that are important for our present and future quality of life: water quality and yield, wildlife, and agriculture. This is accomplished through the Utah Watershed Restoration Initiative, made up from a diverse group of state and federal agencies working together with non-governmental organizations, industry, local elected officials and stakeholders. Locally led teams identify conservation issues and develop plans to address local needs. Through the partnership effort, funding from the Legislature has been successfully leveraged over 7 to 1 in on-the-ground projects. The long-term results from this effort will be measured in the reduced cost of fighting wildfires, reduced soil loss from erosion, improved water quality and yield, improved wildlife populations, reduced risk of additional federal listing of species under the Endangered Species Act, improved agricultural production, and resistance to invasive exotic plant species. This program is managed by the Utah Division of Wildlife Resources.

Blue Ribbon Fisheries Funding- The Blue Ribbon Fisheries Advisory Council (BRFAC), created by Governor Mike Leavitt in 2001, was formally established in 2005 under Executive Order signed by Governor John Huntsman. According to this Executive Order, the BRFAC was created to (1) identify fisheries throughout Utah for designation as Blue Ribbon Fisheries (BRF), (2) make recommendations to Utah Division of Wildlife Resources (UDWR) regarding the enhancement of habitats and recreational settings associated with BRF, (3) make recommendations to UDWR regarding the protection of BRF through collaboration with government agencies and private entities, and (4) make recommendations to UDWR regarding the promotion of BRF among resident and non-resident anglers. While the main purpose of the Blue Ribbon Fisheries funding is to enhance fish habitat, this funding is often used in conjunction with other NPS funding sources focused on stream bank restoration and riparian health.

Habitat Council Funding- During the 1995 general session, the legislature created the Wildlife Habitat Account. This account provides dedicated funds to be used only for the enhancement, preservation, management, acquisition and protection of fish and wildlife habitat and for improving public access for fishing and hunting. The Wildlife Habitat Account generates about $2 million each year for projects. These funds are managed by a council consisting of individuals representing various wildlife interests. Many of these projects help reduce NPS pollution through improvements to the uplands present in the watershed, and improving riparian habitats and wetlands, while focusing on improving wildlife habitat.

Grazing Improvement Program Funding- The Utah Grazing Improvement Program (GIP), which is managed by the Utah Department of Agriculture and Food, expands the number of grazing related projects that rehabilitate our natural resources, increase productivity and protect the landscape for all Utahans. The benefits of the projects funded through the GIP program include increased water quality and quantity, added wildlife and livestock capacity, and better weed control; all of which will strengthen our rural economy.

National Water Quality Initiative Funding- The National Water Quality Initiative will work in priority watersheds to help farmers, ranchers and forest landowners improve water quality and aquatic habitats in impaired streams. With this funding the NRCS will help producers implement conservation and management practices through a systems approach to control and trap nutrient and manure runoff. Qualified producers will receive assistance for installing conservation practices such as cover crops, filter strips and terraces. The projects funded with the WQI will be in watersheds listed on the State's 303(d) list of impaired waterbodies. The NRCS will collaborate with the Utah Division of Water Quality to determine what watersheds in the State are eligible to receive this funding.

Agricultural Resource Development Loans- Projects eligible for ARDL loans include animal waste management, water usage management (irrigation systems), rangeland improvement, on farm energy projects, wind erosion control and disaster mitigation and cleanup. Most of these projects have direct water quality protection or water pollution reduction benefits. The ARDL section also works with the State Revolving Fund (SRF) under the Division of Water Quality to underwrite and book loans to finance projects for eliminating or reducing nonpoint source water pollution on privately owned lands. That program was recently expanded to include grants as well as loans. The loans are now included in the ARDL program with some modifications.

4.3 Information and Education (I&E)

Utah's NPS program relies on voluntary incentive-based actions to protect and improve water quality. To achieve voluntary compliance, an effective information and education program is necessary. NPS efforts in the state will benefit from delivering clear and consistent messages that 1) focus on the benefits of protecting and restoring the many uses that our waters provide and 2) help our citizens understand the connection between their actions and the quality of our waters. The state's NPS program will also benefit by better explaining its role in protecting our waters and by celebrating the many successes that the program has already achieved.

The goals of the Utah NPS I&E Strategy are to:

1. Assure that all Utah citizens understand the importance of protecting Utah's waterbodies;

2. Help Utah citizens understand the connections between their personal actions and land uses on the quality of Utah's waters;

3. Educate and inform Utah citizens on how they can help reduce NPS pollution;

5. Assess the effectiveness and impacts of Utah's NPS outreach and education efforts;

6. Inform Utah citizens, decision makers, and funding sources on Utah's NPS program accomplishments.

Utah's NPS I&E efforts are coordinated through a subcommittee of Utah's Water Quality Task Force. This committee will be guided by the recently revised Utah Nonpoint Source Information and Education Strategy (Appendix C). Utah's I&E program must be sufficiently diverse to reach multiple audiences, including landowners, managers, the general public, decision makers, formal and informal educators, youth, and those involved in providing technical assistance to landowners and managers. The program will provide statewide messaging and programming, but should also function at a local level, helping to address specific NPS concerns in individual watersheds.

Utah's NPS I&E efforts have matured and evolved since the early days of 319 funding in the state. The program has been very effective at reaching agricultural producers, particularly through its AFO/CAFO efforts and through individual watershed projects and work with watershed coordinators. The program has been less effective at demonstrating the value of these efforts to decision makers and to the broader public.

Utah's NPS I&E efforts are increasingly guided by techniques outlined in EPA's national "Getting in Step" program, which have proven to be effective at identifying messages and approaches appropriate for specific target audiences. These techniques, coupled with strategic planning and coordination with partners who have related outreach and educational missions, will provide more consistent and effective statewide messaging. Watershed coordinators and watershed / TMDL coordinating committees throughout the state will continue to take the lead in much of the local programming, but the state's Water Quality Task Force I&E subcommittee must provide support and training to assure that these efforts are as effective as possible.

A high quality and current webpage is at the core of the state's I&E program. The statewide website (https://utahcleanwater.org) already serves as a clearing house for Utah's NPS and watershed protection activities. This site must be promoted, maintained and updated regularly to be current and meaningful. Links to other websites and partners is critical.

The State's I&E subcommittee provides guidance on content and structure. The site currently includes current information about the program, a calendar of important water related events, access to documents about the statewide program and about specific efforts across the state, tips and materials to assist in

developing effective messages, fact sheets, videos and photos demonstrating best practices and successes, and contacts and links with all partners and other effective programs.

Statewide, the NPS I&E efforts will also include the following:

Field days and tours, focused on target different audiences depending on identified needs.

Utah Water Watch, a volunteer monitoring program that engages citizens in monitoring the health of their water bodies and trains them on the importance of clean water.

Public meetings will continue to be a critical component of all locally led watershed efforts.

Trainings and workshops will continue to be offered on specific topics for different audiences such as nutrient management, educator training, best management practices and monitoring. In place of a statewide NPS conference, those involved in NPS management and protection will be encouraged to participate in one of several high quality water focused conferences in Utah.

PR campaigns will be coordinated at a state and local level, depending on the story. Press releases will be sent to local newspapers and radio stations to publicize news stories and announcements about watershed planning and key local activities.

Posters and brochures will continue to be produced to highlight specific events or successes. Desktop publishing allows materials to be revised and adapted easily for specific watersheds and approaches and printed at relatively low costs.

Other Media will be considered following a review by the I&E subcommittee. We will either revamp the statewide Utah Watershed Review to reach a broader audience, or develop a new approach such as an electronic newsletter and/or inserts into partner newsletters. An alternative or additional approach may include social media approaches. For example, Facebook pages developed by institutions are increasingly used to reach their audiences with timely information and to create a broader sense of community.

4.4 Agriculture

Responsible farm and ranchland owners are ideal stewards of the environment. Utah farmland accounts for much of the state's privately owned open space, providing residents and visitors spectacular panoramas and food and fiber products that enhance Utah's local economy.

However, agricultural practices can have negative impacts on water quality if producers do not follow best management practices. If not properly managed, agricultural activities can be sources of sediment, nutrients, salinity, pesticides, and pathogenic bacteria. Agricultural operations that discharge pollutants into waters of the state are defined as nonpoint sources, except for Concentrated Animal Feeding Operations (CAFOs). By definition of the Clean Water Act, a CAFO is a point source and is subject to National Pollutant Elimination System (NPDES) permit requirements.

A partnership of agricultural agencies and livestock producer groups work together to protect water quality, while helping to sustain the agricultural industry. Agricultural programs rely heavily on the Natural Resources Conservation Service, USU Cooperative Extension Service, Utah Department of Agriculture and Food, local Conservation Districts, and others to plan, engineer, and implement BMPs.

The Utah Conservation Commission (UCC) is responsible for implementing the Utah Agriculture Certificate of Environmental Stewardship (ACES) program. ACES helps agricultural producers, of all sizes, evaluate their entire operation and make management decisions that sustain agricultural viability, protect natural resources, support environmentally responsible agricultural production practices, and promote positive public opinion. The program divides agriculture into 4 sectors; Farmstead, Animal Feeding Operations, Grazing, and Cropping. Producers may become certified in one or all sectors depending on their induvial operation. The first step towards certification is, either contact your local conservation

district planner or go online to Utah Department of Agriculture and Food website (https://ag.utah.gov/conservation-environmental.html) and obtain a workbook(s) relevant to your operation. Workbook(s) were designed in a simple question format with short explanations clarifying the questions or the UCC practice reference. This type of format is used to encourage interaction between producers and planners, and requires documentation to verify compliance. Each question has a place for the producer to initial when they have fulfilled the requirement and also a place for the planner to initial when the planner has verified the completion of the requirement. Any documentation or records required to show compliance are held by the producer and will be available for review upon request. If the producer has questions or needs help understanding and meeting the requirements, they should contact their local conservation planner who will provide additional resources. Once the producer has completed all the requirements in the workbook(s), they need to contact their local conservation planner who will meet with the producer and do an on farm audit and verify completion. Next the producer will fill out the application form found in the back of workbook(s) and send the form to The Utah Department of Agriculture and Food (UDAF) Environmental Quality manager. Upon receipt of the application the Environmental Quality manger will contact the producer and arrange a time for the third party audit. Once the audit is completed and certification has been verified, the application will be submitted to the Utah Conservation Commission (UCC) for approval. Upon UCC approval, the producer will pay the appropriate fee and be an ACES certified operation. Certifications last for five (5) years and can be renewed for another five (5) years. The renewal process requires a review of all records documenting compliance, onsite audit, certification application provided to the UCC and appropriate fees paid.

The ACES process ensures farmers and ranchers are making decisions that balance production and environmental needs. Measures aimed at protecting water quality and other environmental factors means that ACES farmers are committed to farming and ranching practices that protect Utah's natural resources.

4.5 Urban Runoff

Urban areas are responsible for a small, but locally significant percentage of NPS pollution in Utah. Utah is a highly urbanized state with a large percentage of the population living in developed communities. As Utah becomes more urbanized, the impact to receiving waters from the quantity and quality of stormwater becomes more apparent. Urban runoff presents an acute water quality concern due to the wide array of toxic and pathogenic pollutants it can contain, and the large number of children and sensitive individuals who live and recreate near its receiving waters.

Stormwater runoff is regulated under Municipal Separate Storm Sewer System permits (MS4s) which include six required elements: Public Education; Public Involvement; Construction; Post Construction; Illicit Discharge Detection and Elimination; and Good Housekeeping. Recently the permitting program has emphasized reporting stormwater discharges to TMDL impaired waters, measuring effectiveness of stormwater BMPs, enacting local stormwater enforcement programs, and written standard operating procedures to specifically address implementation practices.

By March 1, 2019, the program shall include a process which requires the evaluation of an LID approach for new development or redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale.

By March 1, 2019, new development or redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale must manage rainfall on-site, and prevent the off-site discharge of the precipitation from all rainfall events less than or equal to the 90th percentile rainfall event. This objective must be accomplished by the use of practices that are designed, constructed, and maintained to infiltrate, evapotranspire and/or harvest and reuse rainwater.

Local zoning ordinances can provide an important tool for controlling pollution in urban areas. Utah's stormwater management program will assist local governments in implementing control ordinances. The

program will be carried on through local associations of governments (multi-county planning organizations) and designated water quality management agencies. The Division of Water Quality has recently completed the Statewide Storm Water Management Plan which can be found in appendix E of this plan.

4.6 Hydrologic Modification

Definition: Hydrologic modification occurs whenever human activities significantly change the hydrologic function or the pollutant release regime of rivers, lakes, and ground water systems.

There are three types of activities that fall into this category:

- Alterations to the flow regime, capacity or circulation pattern of waterbody: e.g. diversions to and from a stream, reservoir sluicing, ground water recharge or withdrawal.

- Near or in-stream changes that alter the function and stability of a stream channel or its flood plain: e.g. channel realignment, grade control, in-stream structures, stream crossings, bank stabilization, and gravel extraction.

- Modification of floodplain areas: e.g. flood control structures and practices, riparian/floodplain modification, and wetland drainage.

Alteration of streams, waterways, and lakes often results in unintended and unnecessary water quality impacts. Unless the entire flow regime is considered, along with long-term effects, changes at any one point may result in downstream impacts. Through continuing education of resource managers, enforcement personnel and contactors, many of these problems will be reduced or eliminated.

Management Plan Addendum: A Nonpoint Source Management Plan for Hydrologic Modifications was prepared by the State and approved by EPA as an appendix to the State Nonpoint Source Pollution Management Plan. The scope and intent of this plan remains current and is considered a part of this program update by reference (See Appendix G).

4.7 Mining

Mining has figured prominently in Utah history beginning shortly after the first permanent settlement in 1847. At first mining was limited to utilitarian minerals, primarily coal and iron. Gold and silver discoveries in the 1860's initiated a metal mining boom that made the state a mineral exporter. Gold, silver, and lead were the principal products until about 1905, when copper assumed a lead role based on new techniques for recovering copper from low grade ores. Most of the early mining was underground. The depression put an end to many of the older era mining operations. Following World War II, Utah mining expanded into non-metallics including potash, phosphate, salt and uranium. Newer generation mines primarily use surface mining techniques, although small underground operations still exist. In 2012 the State of Utah completed a management plan to address NPS pollution from abandoned mines. This plan identifies a broad range of best management practices that can be implemented to reduce runoff from abandoned mines. This plan was most recently updated in 2018 in conjunction with the updating of the State NPS Management Plan . This entire Abandoned Mine Plan can be found in Appendix F.

4.8 Road Construction and Maintenance

The Utah Department of Transportation (UDOT) is responsible for approximately 6,000 miles of state and interstate highways. Construction and maintenance activities can be a source of non-point source pollution if control measures are not implemented. As a standard part of construction and maintenance projects, UDOT requires best management practices (BMPs) for erosion control, sediment and other pollutants from being discharged off the project site.

Best management practices are described in UDOT standard specification 01355 for environmental compliance, standard specification 01571 for temporary environmental controls, UDOT standard drawings for erosion and sediment control, UDOT's Erosion and Sediment Control Field Guide and UDOT's Environmental Control Supervisor (ECS) training program. This comprehensive approach along with efforts led by the Water Quality Task Force will help to minimize the discharge of pollutants from roads to Utah's water ways.

4.9 Silviculture

Utah's forests and woodland communities vary widely according to soil, climate and topography, with availability of water being the primary determining factor. Utah woodlands generally begin at elevations of 4,500 feet where pinyon-juniper combinations join mountain mahogany, Gambel oak, and maple. As elevation and precipitation increase, other species begin to appear such as ponderosa and lodgepole pines, aspen, Engelmann and blue spruces, subalpine and white firs, and other species.

The total forested area of Utah covers almost 18 million acres (about 33% of the State). Private landowners maintain stewardship over approximately 2.7 million acres or 17% of the state's total forested lands. Although relatively small in acreage, these private forest lands overlay many of the state's most valuable watershed, wildlife, and recreation areas, and form critical fringe and connectivity zones throughout larger tracts of public forest. The largest concentration of private timberland lies in the northern half of Utah where counties with over 50,000 acres of private timberland include Summit, Wasatch, Morgan, Duchesne and Cache.

Approximately 4 million acres (22%) of Utah's forested lands are considered commercially viable timberlands capable of producing crops of wood products. Eighty-three percent of these commercial stands are managed by public agencies with approximately 650,000 acres under the administration of private landowners. Aspen is by far the most prevalent commercial species in the state, comprising 62% of Utah's private timberlands. Douglas-fir, ponderosa pine, Engelmann spruce, subalpine fir and lodgepole pine make up the remaining 38%.

Risks of Improper Forest Management

Without adequate controls such as the Forest Water Quality Guidelines (FWQG), unmanaged forestry operations can degrade the water quality in waterbodies that receive drainage from forest lands. Sediment can increase due to erosion (primarily from forest roads), stream temperatures can increase due to the removal of riparian vegetation and shade, dissolved oxygen can be reduced due to slash and organic debris accumulation, and concentrations of pesticides and herbicides can increase. Forest Water Quality Guidelines, when properly applied, are generally very effective in preventing these problems. Presently, none of the waterbodies identified on Utah's 303(d) list of impaired water bodies have been listed as a result of improper forest management.

Overview of Forest Water Quality Guidelines BMP's

The Division of Forestry, Fire, and State Lands has developed a user's guide for Utah's Forest Water Quality Guidelines (appendix H) that includes checklists for success, and photographs of both good and bad practices, for each of the general classes of FWQG's. These classes include:

Pre-harvest Planning- Proper planning is an essential part of timber harvesting. A pre-harvest plan using FWQG's removes forest products efficiently, promotes sustainable forest growth, and protects water quality. Examples from this checklist include: developing a forest management plan, developing a legally binding contract that specifies site rehabilitation and the use of FWQG's, carefully planning road layout that follows the natural contour of the land and minimizes the number of cuts, fills, and stream crossings, and carefully locating drainage structures and stream crossings.

Streamside Management Zone (SMZ)- Trees and vegetation within the SMZ serve as a natural filter to keep sediment out of a stream, reduce soil erosion, and act as a buffer to protect the stream from degradation caused by nearby activities. The SMZ is an area where activities should be closely managed in order to protect water quality and other values. Examples from this checklist include: designating the SMZ

using recommended distances, leaving sufficient trees to provide streambank stabilization, shade, and a future source of large woody debris. It also identifies the importance of maintaining sufficient ground cover to trap sediment before it can enter a watercourse, and identifies the importance of avoiding the use of heavy equipment in the SMZ to minimize ground disturbance.

Roads, Skid Trails, Landings & Stream Crossings- Road erosion is a primary cause of stream sedimentation associated with timber harvesting. Mass movement associated with road construction also causes sedimentation. Water quality of streams and lakes can be protected by careful planning, designing and proper construction of roads after they have been appropriately located. Proper planning can be helpful to a landowner by reducing the number, width and length of roads, decreasing the amount of maintenance required, limiting the visual and physical impact to the land, and saving landowners money.

Timber Harvesting- With proper precautions, timber harvesting in sensitive areas can be done without significantly impacting water quality. Winter harvesting should be considered when sites are susceptible to soil erosion and compaction hazards, high water tables, or wetlands. Slash management is required to ensure adequate reforestation, nutrient cycling, soil stabilization, fire hazard reduction, insect & disease reduction and recreation & aesthetics. Including the FWQG's within a timber sale contract can help protect the property and ensure availability of forest resources for future generations.

Site Preparation, Regeneration & Revegetation- In most cases, site preparation is necessary to reduce logging debris, or to control other vegetation prior to planting. Revegetation may include regeneration, but should also address the need for soil stabilization on sites such as landings, skid trails, roads, and SMZs. Examples from this checklist include: disposing and treating slash with fire and/or other mechanical means, retaining a sufficient number of healthy trees with adequate crowns and good form for seed trees, retaining stocking levels suited to the moisture conditions of the site (dry sites may require retention of additional trees), and revegetating roads, skid trails and landings as soon as practical.

Chemical Management- The use of chemicals during forestry activities can have considerable benefits for controlling insects and disease, controlling noxious weeds, and preparing sites for planting by controlling competing vegetation. In some cases, the use of chemicals is nearly unavoidable, such as the use of petrochemicals and antifreeze in vehicles and machinery. However, most chemicals have a potential impact on water quality if they are misused, misapplied, or spilled. Examples from this checklist include: following all label instructions, have a plan to follow in case of a spill, applying chemicals only during appropriate weather and season (especially windy conditions), and considering chemical site preparation instead of mechanical where possible to reduce sedimentation.

Forested Wetlands- Wetlands are nature's natural filter for streams and water supplies. Forestry operations are compatible with the management of wetlands when done properly and in a sensitive manner. Examples from this checklist include: identifying, locating, and marking wetlands prior to the start of operations, avoiding locating roads, trails, and landings in wetlands, utilizing low ground pressure equipment, avoiding the operation of equipment in open water, and conducting harvest activities when the ground is frozen.

Prescribed Fire- Using prescribed fire can be a very effective and relatively inexpensive means for site preparation and slash disposal, but cannot be applied on all sites or during certain weather conditions due to risk of fire escape, smoke, and other limitations. Examples from this checklist include: preparing a burn plan written by a certified professional, ensuring the control of a fire at all times, and preparing a contingency plan to identify appropriate actions to be taken if a fire exceeds these control parameters.

Current Issues

Insects: Utah's forests have been undergoing large-scale outbreaks of bark beetles throughout the state. While bark beetles are a natural part of the forest ecosystem, forests are being stressed as a result of warmer temperatures, drought, and fire suppression that all act together to produce overstocked stands of trees all competing for limited resources. As a result, trees are losing their effectiveness in naturally expelling bark beetles. Under favorable conditions coniferous trees are able to use resin (pitch) to

physically push beetles out as they attempt to burrow under the tree bark. In addition, warmer winter temperatures allow bark beetles to overwinter and build up their populations.

Large watershed-scale wildfires: The combination of unhealthy forests and very effective wildfire prevention for several decades, have allowed hazardous levels of woody fuel to accumulate. When wildfires occur, they are often very hot and difficult to control and have resulted in an increase of both the number and affected acreage of the fires. As fire intensity increases, fires that would normally burn on the forest soil surface move up into the crowns of the trees and kill them. Soil temperatures can get hot enough to bake the soils and kill roots of shrubs that normally would resprout. Large acreages of intensive fire also encourage invasive species like cheatgrass to become established, competing with native species for the limited resources, and often increasing the fire frequency of an area.

Forest Action Plan

The Division of Forestry, Fire & State Lands recently completed a comprehensive assessment of Utah's forestlands and developed strategies for addressing the issues. This Utah Statewide Forest Resource Assessment and Strategy Guide (now called the Forest Action Plan) provides a comprehensive analysis of the forest-related conditions, trends, threats and opportunities within Utah and will be used to guide the Division's planning efforts and project work. The analysis resulted in the development of five priority areas across the state. These priority areas are named for their geographic location. They are, from north to south, Wasatch, Uinta, Sevier-Skyline, La Sal and Cedar.

4.10 On-Site Waste Water Disposal Systems

The Division of Water Quality works with the local health departments statewide to implement an on-site wastewater disposal protection program. On-site waste water disposal systems are used by about 10% percent of Utah' population. There are an estimated 45,000 systems in place today. They are the only alternative for sewage treatment for residents in most rural areas and in some urban areas. The proportion of homes using on-site systems is decreasing because most population growth is occurring in sewered communities and as small towns grow they build sewer systems.

Ongoing program activities include technical assistance to local health departments, periodic review and revisions of program rules, review and approval of large systems (>5,000 gallons per day), and ground water studies to determine local septic tank density recommendations and support for local aquifer classification studies. Local health departments administer the program pursuant to state and local rules governing systems less than 5,000 gallons per day (gpd) while the State reviews and approves systems according to state rules for systems greater than 5,000 gpd.

On-site systems treat waste waters reasonably well and pose little environmental threat when properly operated and maintained. Factors that affect the acceptability and functionality of on-site systems include population density, proximity to sensitive aquifers, soil type, and depth to saturated soil. Systems located in fine grained or saturated soils may fail and allow waste water to surface before adequate treatment occurs. Extremely porous soils may also provide inadequate treatment because of minimal contact with the substrate and ground water pollution may result. Impacts include contamination with pathogenic organisms, nutrient and organic enrichment, and in some instances, toxicants. These pollutants can impact both surface and groundwater (groundwater impacts are discussed in another section).

Surface water quality impacts specifically related to on-site waste water systems are difficult to separate from other sources. However, streams and lakes are potentially impacted from this source in areas of heavy concentration of septic systems with the most significant impacts being associated with the potential eutrophication of lakes.

Improper installation and maintenance is a major cause of contamination resulting from on-site waste water systems. The State of Utah has several information and education programs focusing on these issues. These efforts include trainings, seminars, and literature, which are distributed throughout the state, typically by local health department programs.

Wastewater treatment plants can support proper maintenance of septic systems by including septage receiving stations. Septage receiving facilities are critical to support proper operation and maintenance of on-site systems as they provide for proper disposal of pumped septage.

4.11 Atmospheric Deposition

Concern over atmospheric acid deposition to the waters of Utah led to the formation of the Acid Deposition Technical Advisory Committee in 1986. Its task was to determine if acid deposition was occurring, to identify sensitive waters in the state and possible sources of acid generating pollutants in Utah. Waters at high elevations in the Uinta, Wasatch and Boulder mountain ranges were deemed to be susceptible because of low Acid Neutralizing Capacities (ANC). Six additional areas were identified as having potential for low ANC characteristics. These were Raft River, Deep Creek, Tushar, Thousand Lake, La Sal, and Pine Valley mountains.

It was concluded that although several areas were susceptible to acid precipitation because of low buffering capacities, at the time none were actually affected by acid deposition. It appears that wind-borne alkaline dust from the Great Salt Lake Desert region is counteracting acidification. A study of ion chemistry of Wasatch Mountain snow found that winter precipitation was not very acidic with a mean pH of 6.4 (Arens, 2010). Similar studies of snowpack chemistry in the Front Range of the Colorado Rocky Mountains found a mean pH of 5.3 (Williams, 2007). Snowpack chemistry in the Wasatch Mountains was dominated by concentrations of chloride, sodium, sulfate calcium and magnesium. The Great Salt Lake and dry lake beds of western Utah were likely sources of these ions. Concentrations of chloride and sodium were an order of magnitude greater than that found in snow at other locations in western North America and approached the highest recorded in the literature. Concentrations of nitrate and ammonium were also lower than expected (Arens, 2010).

4.12 Federal Consistency with State NPS Management Program

Interaction and input is provided to USDA programs via membership on the NRCS State Technical Committee. Federal programs targeted for review include CRP, EQIP, and the Water Quality Initiative Program. Input is provided on development of project selection criteria and ranking of projects. Annual program coordination meetings are held each year with the Forest Service and BLM to review programs, policies, monitoring plans and special projects. DWQ also works with partner agencies to collect water quality samples in various areas around the state. DWQ trains the individuals collecting those samples to verify that they adhere to all QA/QC requirements when collecting those samples. Additionally, a Federal Consistency review tour is conducted every year where various state and federal agencies visit projects that have been implemented by various governmental agencies.

The most important aspect of DWQ's coordination and interaction with federal agencies occurs at the local watershed level. Federal agencies participate in the Watershed Approach to inform TMDL development and establish priorities for NPS implementation. Expanded efforts are needed to strengthen relationships with federal land managers to establish a consistent review process for federal projects within impaired or threatened watersheds. As TMDL and watershed plans are developed for impaired waters, these plans will be developed cooperatively with federal land managers thus assuring consistency between the NPS Management Program and federal plans and projects. Special attention will be given to correcting NPS problems related to hydrologic modification and habitat modification. Participation of federal land management agencies on local watershed groups and assistance in the development and implementation of TMDL plans is critical. Their participation will be the most effective mechanism to assure that federal activities are consistent with the NPS Management Program. The Department of Environmental Quality has a Memorandum of Understanding with both the Forest Service and Bureau of Land Management that should be reviewed and revised often to include the development of TMDLs and use of the watershed approach in NPS management to assure federal consistency with NPS pollution management measures contained in individual TMDL and watershed plans. This MOU can be found in Appendix K.

4.13 High-Quality Waters and Priority Watersheds

High-quality waters (designated by rule) and priority watersheds require special attention due to their identified need for protection and/or restoration. High quality waters, alternatively referred to as Category I or Outstanding Resource Waters, require extra protection to maintain their existing pristine condition. Priority watersheds are targeted for restoration due to their impaired status on the 303(d) list. These areas will be a focus for NPS control efforts.

High-Quality Waters: The State of Utah identifies high-quality waters that require a higher standard of protection. These waters are also known as 'Category I' or 'Outstanding Resource Waters' and are governed by the following policies found in Rule U.A.C. R317-2-3, Antidegradation Policy:

3.1 Waters whose existing quality is better than the established standards for the designated uses will be maintained at high quality unless it is determined by the Board, after appropriate intergovernmental coordination and public participation in concert with the Utah continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. However, existing in stream water uses shall be maintained and protected. No water quality degradation is allowable which would interfere with or become injurious to existing in stream water uses. In those cases where potential water quality impairment associated with a thermal discharge is involved, the antidegradation policy and implementing method shall be consistent with Section 316 of the Federal Clean Water Act.

3.2 Waters of high quality which have been determined by the Committee to be of exceptional recreational or ecological significance or have been determined to be a State or National resource requiring protection, shall be maintained at existing high quality through designations, by the Committee after public hearing, as High Quality Waters - Category I. New point source discharges of wastewater, treated or otherwise, are prohibited in such segments after the effective date of designation. Protection of such segments from pathogens in diffuse, underground sources is covered in R317-5 and R317-7 and the Regulations for Individual Wastewater Disposal Systems (R317-501 through R317-515). Other diffuse sources (nonpoint sources) of wastes shall be controlled to the extent feasible through implementation of best management practices or regulatory programs.

The Utah continuing planning process, cited above, can be briefly described as: 1) Classify waters according to existing beneficial uses and adopt water quality standards protective of those uses; 2) Assess quality (beneficial use support) of State's waters; 3) Identify waters not achieving Water Quality Standards; 4) Develop and implement TMDLs on priority waters; 5) Implement point and nonpoint source pollution control programs to maintain and restore beneficial use designations; and 6) Monitor and report restoration of beneficial uses for impaired waters.

Projects such as, but not limited to, construction of dams or roads will be considered where pollution will result only during the actual construction activity, and where best management practices will be employed to minimize pollution effects.

It is intended that best management practices shall be used for new developments in these segments and that existing operations shall adopt BMPs as soon as practicable. Every reasonable effort will be made to promote and encourage the adoption of BMPs to protect waterbodies that are potentially at risk. In some cases, cost-share may be provided and enforcement may be necessary. BMPs used in these segments must be protective of water quality at its current level as evidenced by implementation of BMPs described in appendix A of this plan as well as others adopted by reference to this plan.

Stream segments meeting these criteria are included in Appendix D

The State of Utah recognizes that it is often more effective to protect waterbodies that are at risk of becoming impaired than it is to restore waterbodies that have already failed to meet their beneficial uses.

If watershed groups determine that high quality waters are at risk of being impaired due to increased development, recreational activities, or agricultural use, further analysis may be required to determine if additional action is necessary. If a waterbody is at risk of being listed on the state's 303(d) list of impaired waters, local watershed groups should make protecting this waterbody a priority, and target NPS funding toward projects that will further protect this water body and prevent it from any further degradation.

4.15 Ground Water NPS Management Program

Utah's ground water quality protection program is based on coordination between agencies and programs to solve existing problems and to avoid possible future contamination. This document briefly describes the NPS program relationship to ground water management.

The Division of Water Rights within the Department of Natural Resources has authority over ground water withdrawals and monitors water yields and levels of aquifers. Ground Water quality is also considered in regulating the amount and location of pumping.

Utah Philosophy - Long and Short Term Goals for Protecting Ground Water: Utah regards all ground water as a vital natural resource that is essential to the overall welfare of the state. Utah's philosophy is based on the Governor's Executive Order "Utah's Ground Water Policy" which states that the quality of the state's ground water resources will be protected to a degree commensurate with current and probable future uses. Ground water used for human consumption, as present and future drinking water sources, will be given highest priority.

The main program elements are listed below:

1. Management of Ground Water Resources

    a. Ground water quality standards were adopted as part of Utah's Ground Water Quality Protection Regulations. These regulations include provisions for ground water standards, classification, permitting for discharges, corrective action, monitoring and enforcement.

    b. The Division of Water Quality works cooperatively with the U.S. Geological Survey and Utah Geological Survey on hydrologic mapping programs. The programs focus on aquifer classifications of ground water quality, recharge area mapping, modeling of withdrawal scenarios and prediction of effects from surface uses.

    c. DWQ has evaluated pesticide/herbicide sales facilities for the presence of ground water contamination.

    d. Coordination of ground water programs is accomplished through the Ground Water Coordinating Council and coordination with the NPS Task Force.

2. Source Control

    a. Facilities that may discharge pollutants to ground water are required to obtain ground water discharge permits.

    b. Underground injection control (UIC) is regulated by the Ground Water Protection Section of the Division of Water Quality.

    c. Regulation of landfills including ground water quality protection is administered by the Division of Solid and Hazardous Wastes.

    d. Periodic inspections of facilities with ground water discharge permits identify potential problems and alert management to the need for good housekeeping practices.

3. Recharge Area Protection

    a. Through cooperative mapping efforts, the U.S. Geological Survey has delineated recharge areas in priority areas of Utah. These areas are described and provided to local officials for their consideration in developing local ordinances and land use policies.

4. State Technical Assistance

    a. Ground Water Protection staff continues to work with local officials to assist them in protecting sources of culinary water.

    b. As time allows, staff have participated in public and school education programs on preventing ground water contamination.

5. Contamination Response

    a. The ground water quality protection regulations encourage immediate action to address spills.

Prioritization of Ground Water and Aquifers: Ground water protection regulations employ a "Differential Protection Approach" to protect the present and probable future beneficial uses of ground water in Utah. The three main regulatory concepts are: to preserve ground water quality; to prevent ground water contamination rather than clean up after the fact; and, to provide protection based on existing levels of ground water quality. The five significant administrative components are: ground water quality standards; ground water classification; ground water protection levels; ground water classification procedures; and a ground water discharge permit system.

An aquifer is prioritized according to its relative importance to society and its ambient quality. The administration of the program and expenditure of resources take into account that prioritization. A complete inventory and compilation of the ground water resources in Utah has not been completed although a number of government agencies are now investing resources toward the effort.

Utah Hydrologic Ground Water Units: Three general aquifer types occur in Utah. Quaternary basin-fill aquifers of the Basin and Range Province are the most prevalent aquifer type and provide 85% of total ground water withdrawals. These aquifers consist of unconsolidated gravel, sand, silt, and clay. Alluvial valley fill aquifers are the second type, and, account for 10% of ground water withdrawals. Alluvial valley-fill aquifers occur along stream courses in the eastern and south-central part of the State, the most extensive being the Tertiary aquifers of the Uinta Basin. The third aquifer type includes the Jurassic and Triassic sandstone aquifers of the Colorado Plateau and the transition area between the Basin and Range and the Colorado Plateau. These aquifers account for 5% of ground water withdrawals and are found in the Sevier, Cedar Beaver, West Colorado, Southeast Colorado, and Lower Colorado Watershed management Units.

Aquifer vulnerability to pollution depends on the permeability of the soil; the presence of confining beds that restrict the vertical movement of contaminants; and the rate, direction of movement, and pressure gradient of ground water in the underlying aquifer. Shallow clay or shale beds may prevent surface contaminants from reaching underlying aquifers.

In establishing watershed priorities for ground water, a contamination vulnerability component will be considered. NPS pollution sources over critical groundwater recharge areas will also be considered in rating priority designations.

Several other factors will be considered for determining priority among the ground water aquifers and development areas. These are:

1. Extent of contamination
2. Location of sources relative to ground water used in drinking water
3. Size of population at risk
4. Risk posed to human health and/or the environment
5. High priority contaminants in localized areas of state
6. Hydrologic sensitivity to contamination
7. Findings of the State's ground water protection strategy or other pertinent reports

The Utah NPS Pollution Management Plan recognizes that ground water research, planning, assessments, demonstration programs, enforcement efforts, technical assistance, and education, information and training tasks are important components to the overall program.

Categories of NPS Pollutants to Ground Water: Ground water quality depends on both natural and man-altered conditions. The primary focus for ground water management is with man-made threats. These include chemicals of many kinds and uses, including synthetic organic compounds; fertilizers; pesticides; wastes from mineral and petroleum exploration, production, transportation, storage, and use; and human and animal wastes. Land use activities that may pollute ground water include solid waste facilities, on-site waste treatment systems (septic tanks and soil absorption systems), surface impoundments, urban runoff, oil and gas exploration and production, hazardous wastes, mining and agriculture. Several of these sources are classified as nonpoint in origin.

Drinking Water Source Protection Program: The State of Utah implemented the Drinking Water Source Protection program in 1993, with the establishment of the Drinking Water Source Protection (DWSP) for Ground Water Sources program. This program, which is currently governed by U.A.C. R309-600, requires public water systems to establish a program to protect their ground water sources from accidental contamination. Typically, these plans offer guidance to systems and the public on how to reduce the risk of accidental contamination through best management practices. Occasionally, these plans may include the implementation of local ordinances that control what activities may take place within source protection areas.

The 1996 amendments to the Federal Safe Drinking Water Act added the requirement that all drinking water sources, including surface water sources, must be covered by a "Source Water Assessment", which identifies presumed or possible threats to drinking water sources, and evaluates the susceptibility of a source to accidental contamination. In Utah, this amendment was implemented by adding a requirement that public water systems must also develop a plan to protect surface water sources. This program is governed by U.A.C. R309-605, Drinking Water Source Protection for Surface Water Sources. Similarly to the ground water program, these plans for surface water sources offer guidance to systems and the public on how to reduce the risk of accidental contamination through best management practices. Typically they do not include efforts to establish ordinances, due to the size of most watersheds and the number of different jurisdictions included in watershed areas.

Additional work has been conducted within the Division of Drinking water to assess the susceptibility of sources that serve "transient non-community drinking water systems", which are typically systems such as campgrounds, restaurants, rest stops, and the like, that serve a transient population.

Taken together, these three elements (DWSP for ground water sources, DWSP for surface water sources, and assessments for transient systems) provide a statewide assessment of the vulnerability of drinking water sources, and identify the geographic areas that provide water to a well, spring or intake.

Authorities: Authorities for protection of drinking water sources typically reside at, and are implemented at, the local level. Examples of such authorities include the following:

County: At the current time (2018), the following counties have some version of ground water drinking water source protection enacted as part of the county code: Box Elder, Cache, Emery, Iron, Summit, Washington, Kane, Grand, Duchesne, Tooele, Millard, Salt Lake, Davis, Wasatch, Utah and Weber Counties. Local requirements vary from county to county, but typically include restrictions on placing

"uncontrolled potential contamination sources" or "pollution sources" in proximity to a well or spring, at least within the 100 foot area around the well or spring, and also the 250 day travel time zone (zone 2, as defined in UAC R309-600).

Municipal: Local governments have enacted ground water drinking water source protection as part of the local code. Local requirements vary, but typically include restrictions on placing "uncontrolled potential contamination sources" or "pollution sources" in proximity to a well or spring.

State Statutes: Utah Code Ann., 10-8-15-Utah Municipal Code – **Waterworks- Construction-Extraterritorial jurisdiction.** This statute gives incorporated municipalities throughout the state the authority to protect their drinking water sources from accidental contamination. For cities of the first class, that authority extends to the entire watershed; for smaller municipalities the authority is more limited. The language of this statute is crafted to refer to surface water sources, but has been interpreted by the Attorney General's Office to apply to ground water sources as well.

Utah Code Ann., 19-4-113-Utah Environmental Code-Safe Drinking Water Act- **Water source protection ordinance required.** This statute establishes a requirement that all counties of the first and second class must establish ordinances protecting the 100 foot area around the well or spring, and also the 250 day travel time zone (zone 2, as defined in UAC R309-600). The statute also conveys authority to municipalities within the same counties to establish their own ordinances using the same requirements and definitions.

Geographic Information System Coverage: The Division of Drinking Water has established a geographic database for all active public drinking water sources in the state. This coverage is available to all agencies managing land use, either by request, through DEQ's GIS system, or through DEQ's Interactive web-based map. The GIS coverage offers the ability to quickly identify watersheds and groundwater contribution areas that contribute to public water supplies. The coverage offers the ability to prioritize pollution control efforts in areas that offer the benefit of protecting drinking water supplies, in addition to all other accrued benefits.

Leverage, Benefits, and Program Coordination: The Division of Drinking Water is eager to integrate Drinking Water Source Protection with other efforts to protect groundwater and surface water from nonpoint source pollution. Conceivably, the DWSP program could be used to prioritize management efforts. Ordinances may be used to provide additional authorities. GIS coverage may help with watershed level planning. Since drinking water concerns are typically local, and resources to replace damaged and contaminated sources are quite limited, all these tools have the potential to increase the ability of local shareholders to address local needs, and should be encouraged and utilized fully.

4.16 U.S. Department of Agriculture (USDA) Conservation Programs

There are a variety of USDA programs available to assist agencies, organizations and individuals with their conservation needs, the following assistance programs are the principal programs available. Funding of the various programs is dependent upon appropriations from Congress. Locally led Conservation groups are encouraged to contact the State Offices of the appropriate agency for more specific information about each program. Link for more USDA information: www.nrcs.usda.gov

Conservation Technical Assistance (CTA)

Contact: USDA, Natural Resources Conservation Service

The purpose of the program is to assist land-users, communities, units of state and local government, and other Federal agencies in planning and implementing conservation systems.

The CTA Program provides land users with proven conservation technology and the delivery system needed to achieve the benefits of a healthy and productive landscape. The primary purposes of the CTA Program are to: Solve soil, water quality, water conservation, air quality, and agricultural waste management problems; Enhance the quality of fish and wildlife habitat; Improve the long term

sustainability of working lands; and Assist others in facilitating changes in land use as needed for natural resource protection and sustainability.

More information can be found at the link below. http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/technical/cta

Environmental Quality Incentives Program (EQIP)

Contact: USDA, Natural Resources Conservation Service

The Environmental Quality Incentives Program (EQIP) is a voluntary program that provides financial and technical assistance to agricultural producers through contracts up to a maximum term of ten years in length. These contracts provide financial assistance to help plan and implement conservation practices that address natural resource concerns and for opportunities to improve soil, water, plant, animal, air and related resources on agricultural land and non-industrial private forestland. In addition, a purpose of EQIP is to help producers meet Federal, State, Tribal and local environmental regulations.

NRCS works with the producer to develop a plan of operations that identifies the appropriate conservation practice or measures needed to address identified natural resource concerns and implements them according to a plan of operations developed in conjunction with the producer. The practices are subject to NRCS technical standards adapted for local conditions.

Information about **how to apply for assistance** through EQIP is available online.
Each State's EQIP page includes application ranking criteria, priority resource concerns, lists of eligible practices, payment rates, information about where you can submit applications, eligibility requirements and other program requirements.

Applications for EQIP are accepted on a continuous basis, however, NRCS establishes application "cut-off" or submission deadline dates for evaluation and ranking of eligible applications. To obtain an EQIP application, visit or contact your local NRCS field office.

Watershed Surveys and Planning

Contact: USDA, Natural Resources Conservation Service

The purpose of this program authorized under the Watershed and Flood Prevention Act, P.L. 83-566, is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries.

Types of surveys and plans include watershed plans, river basin surveys and studies, flood hazard analyses, and flood plain management assistance. The focus of these plans is to identify solutions that use land treatment and nonstructural measures to solve resource problems.

Watershed Operations - Small Watershed Program and Flood Prevention Program (WF 08 or FP 03)

Contact: USDA, Natural Resources Conservation Service

The Small Watershed Program works through local government sponsors and helps participants solve natural resource and related economic problems on a watershed basis. Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.

Watershed Rehabilitation

Contact: USDA, Natural Resources Conservation Service

The Watershed Rehab Program was authorized under Section 14 of the Watershed Protection and Flood Prevention Act, 16 U.S.C. 1012, as amended by Section 313 of Public Law 106-472. This section authorizes NRCS to provide technical assistance and financial assistance to local project Sponsors for rehabilitation of aging dams constructed under the Watershed Protection and Flood Prevention Act (Public Law 83-566), Flood Control Act of 1944 (Public Law 78-534), the Pilot Watershed Program, and the Resource Conservation and Development (RC&D) Program. NRCS will cost-share up to 65 percent of the installation cost and 100 percent of the engineering costs to upgrade eligible dams that do not meet current engineering and performance criteria.

National Water Quality Initiative (NWQI)

Contact: USDA, Natural Resources Conservation Service

The National Water Quality Initiative will work in priority watersheds to help farmers, ranchers and forest landowners improve water quality and aquatic habitats in impaired streams. With this funding the NRCS will help producers implement conservation and management practices through a systems approach to control and trap nutrient and manure runoff. Qualified producers will receive assistance for installing conservation practices such as cover crops, filter strips and terraces. The projects funded with the WQI will be in watersheds listed on the State's 303(d) list of impaired waterbodies. The NRCS will collaborate with the Utah Division of Water Quality to determine what watersheds in the State are eligible to receive this funding.

For a full list of programs available through USDA go to http://www.ut.nrcs.usda.gov/programs/

Regional Conservation Partnership Program (RCPP)

Contact: USDA, Natural Resources Conservation Service

The Regional Conservation Partnership Program (RCPP) promotes coordination between NRCS and its partners to deliver conservation assistance to producers and landowners. NRCS provides assistance to producers through partnership agreements and through program contracts or easement agreements.

RCPP combines the authorities of four former conservation programs – the Agricultural Water Enhancement Program, the Chesapeake Bay Watershed Program, the Cooperative Conservation Partnership Initiative and the Great Lakes Basin Program. Assistance is delivered in accordance with the rules of EQIP, CSP, ACEP and HFRP; and in certain areas the Watershed Operations and Flood Prevention Program.

More information is available at the following national link below:
https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/farmbill/?cid=stelprdb1242525

4.17 Energy Development

Impacts to surface water quality from energy development are characterized by three major actions: ground disturbance, water use (withdrawal of water for operations), and discharge of water used in energy operations. Ground disturbance activities can result in erosion from runoff during storm events and degrade surface water by contributing sediment, salts, and chemicals into receiving streams. These waters may degrade the receiving streams due to high salinity, sediment, temperature, and depleted oxygen concentrations. Additionally, an event such as a spill or blowout may result in hydrocarbon or produced water releases to a drainage.

The industry's impact on the Colorado River Basin, where the primary NPS concern is salt from sediment, is unknown. The question of whether industry's impact could negate the past successes and hinder potential future salinity reduction efforts of the Colorado River Salinity Control Forum, needs to be

investigated. Monitoring of both surface and ground water systems are warranted throughout the duration of energy development operations. Monitoring plans have been developed for large federal Environmental Impact Statement (EIS) project areas such as Greater Natural Buttes and Gasco.

Oil and gas development should utilize the Bureau of Land Management's (BLM's) best management practices (BMPs) standards and specifications. Additional BMPs can be found at the International Stormwater BMP Database (http://www.bmpdatabase.org/). This should aid in preventing runoff from the pads and roads entering into surface waters. The operator must obtain a permit from the Utah Division of Oil Gas and Mining (UDOGM) for fee and state mineral projects. The oil and gas industry is required to collect and transport produced wastewater to approved disposal facilities such as evaporation ponds (permitted by UDOGM), or injection wells under the Underground Injection Control (UIC) program. DWQ is proposing that development and road construction activities associated with energy growth now obtain a Stormwater Permit, similar to the program Wyoming DEQ has put in place. Current Utah policies and regulations prohibit the discharge of produced water into receiving streams.

Suggested BMPs are outlined in the BLM's *The Gold Book, Fourth Edition – Revised 2007* (https://www.blm.gov/bmp/GoldBook_Draft_v12.pdf) and are summarized below:

- During the onsite inspection, determine appropriate BMPs needed to mitigate for proposed activity.
- To reduce areas of soil disturbance, the surface management agency may allow mowing or brush beating of vegetation for parts of the well location or access road where excavation is not necessary.
- To reduce erosion and soil loss, it may be appropriate to divert storm water away from the well location with ditches, berms, or water bars above the cut slopes and to trap well location runoff and sediments on or near the location through the use of sediment fences or water retention ponds.
- Construct proper drainage and drainage structures to allow passage of aquatic species in perennial steams and accommodate a 10-year flood without development of a static head and serious velocity damage from a 25-year flood. Low water crossings are effective in preventing debris buildup.
- Obtain a Storm Water Permit to properly handle storm water runoff from construction activities via diversion berms, silt fencing, mats/mulches, riprap, or vegetative stabilization.
- Disposal of produced waste water by subsurface re-injection, lined evaporation ponds, or transporting to an approved disposal facility.
- Proper site selection – avoid steep slopes, riparian areas, wetlands, and areas subject to severe soil movement or erosion.
- Avoid constructing reserve pits in areas of shallow ground water or natural watercourses, which may require the use of a semi or closed-loop drilling system.
- Reclaim pits and well sites back to original topography, re-spread topsoil and revegetate with native seed. To ensure the stability of freshly topsoiled slopes during revegetation, the application of mulch or other sediment control measures may be appropriate.

Using GIS to calculate sediment yield is discussed in BLM's Resource Notes No. 66, *Estimating Watershed Runoff and Sediment Yield Using a GIS Interface to Curve Number and MUSLE Models*. These estimates, provided in tabular and map format, can be used to locate and design sediment yield control methods that include the building of structures such as dams and spreaders, the digging of pits, contour plowing, and revegetation. (http://www.blm.gov/nstc/resourcenotes/rn66.html)

CHAPTER 5

5.0 ROLES AND RESPONSIBILITIES OF DWQ PROGRAMS, UTAH STATE DIVISIONS, AND OTHER STAKEHOLDERS

Agency roles and responsibilities are outlined below for implementing the Watershed Approach. The expertise that each agency provides remains constant while the amount of resources devoted to implementing the Watershed Approach will vary from year to year depending on competing priorities and available funding. Examples are provided on how agencies will fulfill their responsibilities within each watershed management unit cycle, the information that they produce in developing a TMDL or watershed plan (as described in Chapter 2), and how they can help implement specific watershed management plan activities.

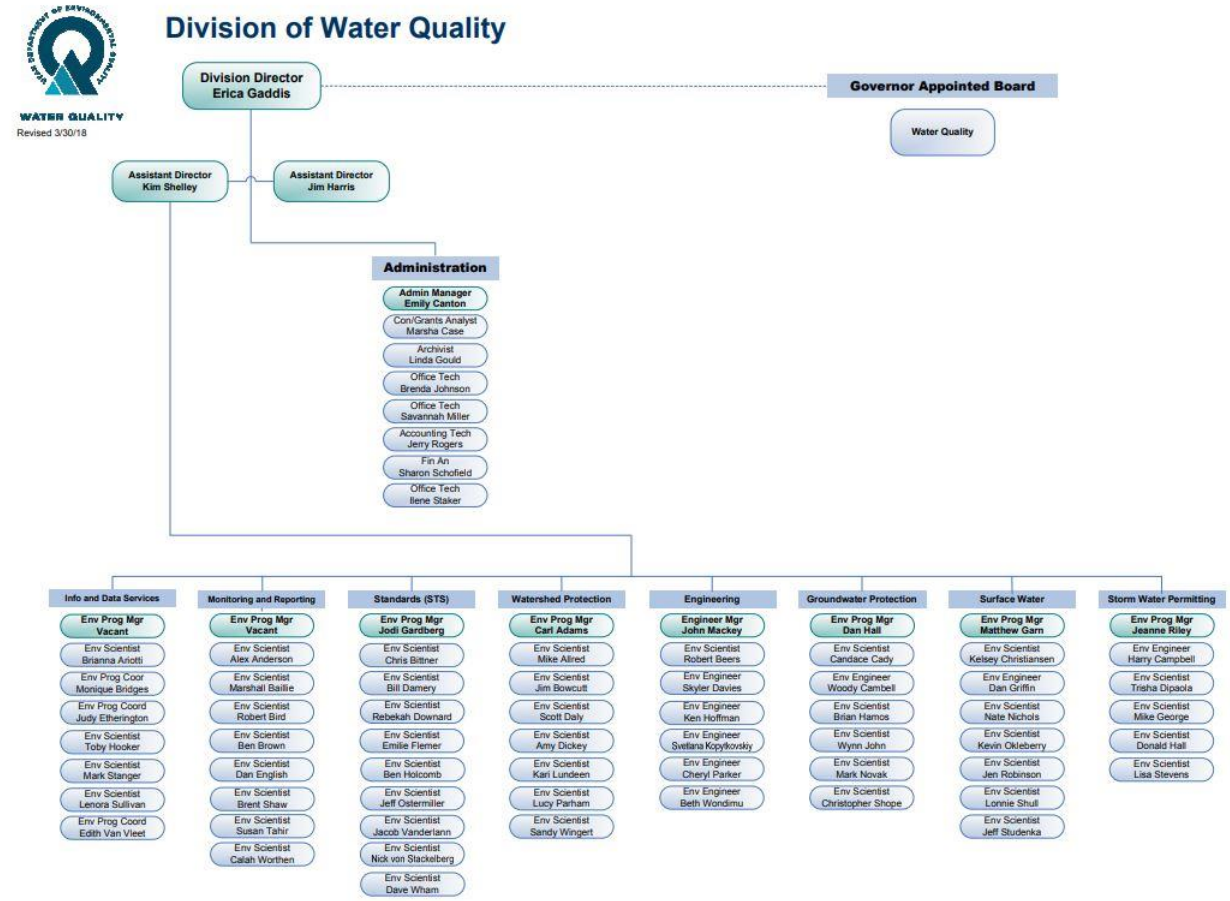
Division of Water Quality: The Governor of the State of Utah has designated the Division of Water Quality as the lead agency to manage the Statewide Nonpoint Source Pollution Control program. As the program lead, the Division is tasked with developing watershed management plans and keeping them current and relevant. The Division also co-chairs the Utah Water Quality Task Force with the Utah Department of Agriculture and Food. The Task Force brings partners from multiple agencies together to help address a variety of water quality issues throughout the state.

The Utah Division of Water Quality manages federal funding in accordance with Section 319 of the Clean Water Act to control and abate NPS pollution. This entails the solicitation of proposals, prioritizing proposals and awarding grants based on their benefit to water quality. Final reports and success stories are submitted once projects have been completed, and those grants are then closed out. In addition to the Section 319 NPS funding, the Utah Water Quality Board has allocated one million dollars per year in State NPS funds to assist with projects focused on reducing NPS pollution.

Other critical functions of the Division of Water Quality include: conducting a continuing planning process as required by Section 303(e) of the Clean Water Act; performing specific investigations; working cooperatively with other government agencies; establishing water quality standards; classifying waters; regulation of discharges; reviewing treatment process plans; and issuing permits for the construction of treatment plants, underground injection wells, and discharges to surface and ground water.

DWQ is organized into sections including: Engineering; Surface Water; Watershed Protection; Standards; Storm Water Permitting; Monitoring and Reporting; Information and Data Services; and the Groundwater Protection. Each section has distinct but occasionally overlapping responsibilities and programs such that particular problems may involve personnel from other branches or even other DEQ divisions in some cases. The Statewide NPS program is currently being managed by the Watershed Protection Section.

Figure 6- Utah Division of Water Quality Organizational Flow Chart



The Utah Department of Agriculture and Food: The Utah Department of Agriculture and Food (UDAF) is responsible for the promotion of agriculture and agricultural products, establishment of standards and inspection of those products, and administration of state conservation programs coordinated through the Utah Conservation Commission. As authorized under Utah Code Ann., Title 4, Chapter 18, the Utah Conservation Commission functions to coordinate conservation programs and the 38 locally led Conservation Districts throughout the state. The Commission is chaired by the Commissioner of UDAF and consists of seven Conservation District supervisors, the President of the Utah Association of Conservation Districts, the Chair and Vice Chair of the State Grazing Advisory Board, and representatives from USU Extension, Utah Department of Natural Resources, Utah Division of Water Quality, Utah School and Institutional Trust Lands and Utah Weed Supervisors Association.

Conservation Districts are political subdivisions of the state and are given responsibility to conduct investigations and implement measures to prevent soil erosion, floodwater or sediment damage, nonpoint source water pollution, or other degradation of a watershed.

UDAF is also responsible for the regulation of pesticides, herbicides, and fertilizers through enforcement of the Utah Pesticide Control Act Utah Code Ann., Title 4-Chapter 14, FIFRA, and the Utah Fertilizer Act Utah Code Ann., Title 4-Chapter 13. UDAF certifies applicators and registers pesticides. Pesticides must be registered with UDAF when distributed in the state. Use may be restricted if they present an unreasonable risk to human health and the environment. Under the Utah Fertilizer Act, UDAF requires registration, labeling, and verification of performance claims for commercial fertilizers.

UDAF developed a pesticide State Management Plan (SMP) to prevent contamination of ground and surface waters. The SMP provides a framework for management of restricted pesticides and includes elements to be incorporated in pesticide-specific management plans to prevent water contamination from nonpoint sources of pesticides.

Roles that UDAF may play in implementing the Watershed Approach include:

- Assist with integrating agriculture focused 319 watershed projects
- Help in organizing new CRMP watershed projects
- Make ARDL low interest loans available for BMPs with water quality benefits as appropriate
- Assist Conservation Districts in providing input to watershed management unit plans
- Coordinate ground water sampling program with watershed management unit strategic data plan

Utah Association of Conservation Districts: The UACD represents, educates, and provides support services for Utah's 38 conservation districts. State agencies such as the Department of Agriculture and Food and the Department of Environmental Quality often contract with UACD to administer a portion of state appropriated conservation program funding used for administrative and technical staff support and for NPS project implementation. State programs are often delivered at the field-level under the oversight of the respective Conservation Districts.

Utah Department of Natural Resources: The Department of Natural Resources (DNR) includes state agencies that manage, regulate, and investigate natural resources of the state including waters, state lands, geology, mineral resources, and wildlife. The Utah Natural Resources Act Utah Code Ann., 79-2-201, created this Department and its administrative divisions including:

- Division of Water Rights
- Division of Water Resources
- Division of Oil, Gas and Mining
- Division of Wildlife Resources
- Utah Geological Survey
- Division of Parks and Recreation
- Division of Forestry, Fire and State Lands

Each of the above agencies, with the exception of the Division of Water Rights and Division of Forestry, Fire and State Lands, has a division policy board that is appointed by the governor and confirmed by the Senate. The policy board is the policy making body for its respective division. Generally, the boards are authorized to initiate investigations, enter into contracts and agreements, enforce regulations and work cooperatively with other state, federal and local government agencies.

Except for the Division of Water Rights, the chief administrative officers of each division are appointed by the Executive Director of the Department with the concurrence of the board having policy authority for the division.

Following are descriptions of the six divisions involved in protecting water quality:

Division of Water Rights: The Division of Water Rights, established in Utah Code Ann., 73-2-1.1 regulates the exploration and development of ground water, surface water and geothermal water. All waters of the state are declared to be property of the public. The right to make beneficial use of water is based on the date of application for a water right; later applicants may not interfere with earlier water rights. In order to perfect the water right, the applicant must provide proof that the water has been developed and placed in beneficial use according to the application.

The Division of Water Rights Administrative Rule for Water Well Drillers UAR 655-4 describes the requirements for water well drillers in Utah. Drillers must be licensed, operators registered, and wells and drilling practices conform to minimum standards. Minimum construction standards address requirements

for development, completion, and abandonment of water wells. Any water well including monitoring wells greater than 30 feet deep must file written notice and the well must be drilled by a licensed driller. Public water supply wells must be reviewed and approved by the Department of Environmental Quality, Division of Drinking Water before construction begins.

Because water quality is affected by water quantity, the Division of Water Rights has a significant role in protecting water quality. Reduced stream flow results in higher concentrations of pollutants such as salts, nutrients and metals that are always present due to both natural sources and anthropogenic causes such as irrigation return flows and permitted discharges. As flows decline due to lack of precipitation and runoff or from increased diversions, the ability for streams to assimilate these pollutants and still meet water quality standards also declines. Pumping in excess of aquifer recharge rates can also result in a deterioration of water quality. The Division of Water Rights is placing increased emphasis on limiting or eliminating aquifer over drafting statewide. The Division of Water Rights also has extensive records of water wells that help assess water availability and water quality.

Issues under the purview of Water Rights including ground and surface water withdrawal are increasingly having an impact on water quality as development pressures increase. Water Rights can take a leading role on these issues and have a significant impact on protecting and improving water quality. Water Rights primacy over water right allocations will not be impacted or included within the Watershed Approach. However, there are several important opportunities for collaboration on aspects of Water Rights allocations. These opportunities include:

- Consideration of when a water quality designated use is being negatively impacted by water use. That is, is the water use an approved water use? Can a solution be negotiated through the watershed committees before the issue is litigated?

- Ground water/surface water interactions can be more comprehensively assessed. Water Rights can provide outreach, information, and expertise in considering issues related to ground water over drafts.

The Division of Water Resources: The Division of Water Resources and Board of Water Resources were established in Utah Code Ann., 73-10-1, creating two revolving construction loan funds and a dam safety grant fund. The mission of the Division of Water Resources is to "plan, conserve, develop, and protect Utah's water resources." The Division's programs and activities are centered on the following goals:

1. Protect Utah's rights to develop and use its entitlement to interstate waters.
2. Provide technical and financial assistance to encourage the highest beneficial uses of water consistent with economic, social, and environmental considerations.
3. Identify future water needs and implement water management, conservation and development strategies.

These goals relate directly to the Division's statewide and river basin planning activities. The following data collection activities and planning processes could benefit from efforts to reduce and control nonpoint sources of pollution.

State Water Plan and River Basin Plans – The Division of Water Resources is charged with developing a State Water Plan. The latest edition was published in 2001 and contains a thorough discussion of water quantity and quality issues. In addition to the statewide water plan, the Division of Water Resources produces plans for individual water planning units that provide very useful information on current water use, emerging trends and shifts in water use, and future projections of water demand that can be incorporated into watershed planning efforts.

Water-Related Land Use Program – An important part of the state water planning process is the collection of detailed geographic data on water-related land uses throughout the state. The data on irrigated crop lands is most comprehensive but also includes estimates on the extent of non-irrigated crop lands, developed urban lands, wetlands, and open water. In addition to total acres in each of these

categories, the Division identifies crop type and irrigation method (flood or sprinkle) for the irrigated crop lands. The data is made available to other agencies and the public through the AGRC website.

Water Budgets – The Division of Water Resources also conducts detailed water budgets throughout the state. These are done at the HUC-12 scale and provide detailed estimates of all the water entering, being consumed in, and exiting each area. This data is used by the Division to provide a basic accounting of the available water supply for planning purposes, but is also useful in nonpoint source pollution management efforts.

Division of Oil, Gas and Mining: The Division of Oil, Gas and Mining (DOGM) administers the policies and rules established by the Board of Oil, Gas and Mining. The Board was established under Utah Code Ann., 40-6-1 and consists of seven members appointed by the governor and confirmed by the Senate. The Board includes members from the oil and gas industry, mining industry, private land owners with a mineral or royalty interest, a geologist, and a member knowledgeable in ecological and environmental matters.

The Board is authorized to regulate all operations related to the production of oil and gas including drilling, well spacing, site reclamation and Class II injection wells. The Oil and Gas Conservation General Rules and Regulations set standards for exploration, drilling, and production practices. Standard operational requirements are established for seismic operations, exploration, and production drilling operations and oil and gas well abandonments that are protective of water quality.

EPA funds the regulation of Class II injection wells. DOGM has exclusive jurisdiction over Class II wells for the disposal of produced brines and to improve recovery of oil and gas through pressure maintenance in the reservoir while DWQ regulates other injection wells under the Underground Injection Control program of the Safe Drinking Water Act. Regulations address plugging of nearby wells, monitoring pressure, and periodic reporting of operating data.

The Utah Mined Land Reclamation Act Utah Code Ann., 40-10-1 empowers the Board of Oil, Gas and Mining to facilitate the reclamation of lands affected by mining. Objectives include: (1) to return the land to a stable ecological condition compatible with past, present, and probable future land uses; (2) to minimize present and future environmental degradation caused by mining operations and to meet state and federal regulations regarding air and water quality standards and health and safety criteria; and (3) to minimize or prevent future hazards to public safety and welfare. DOGM requires plugging of drill holes, a post-mining reclamation plan, and a bond to insure that the site is restored to minimum standards set forth in rules adopted by the Board. The focus on reducing or eliminating potential adverse effects on water quality underscores the recognition of the need to eliminate acid mine drainage and pyrite-generated sulfate ground water contamination.

The Coal Mining and Reclamation Act requires that coal mining activities permitted under the Act "minimize the disturbance of the prevailing hydrologic balance at the mine site and in associated off-site areas and to the quantity of water in surface and ground water systems both during and after coal mining operations and during reclamation." In addition, the Act created an expendable trust fund known as the Abandoned Mine Reclamation Trust Fund to finance restoration of land and water resources and the environment previously degraded by adverse effects of coal mining practices.

Division of Wildlife Resources: The Utah Division of Wildlife Resources (UDWR) was established by Utah Code Ann., 23-14-1, with the duty to protect, propagate, manage, conserve and distribute protected wildlife throughout the state. The UDWR is subject to the policy making authorities of the Wildlife Board and the Board of Big Game Control.

The UDWR is authorized to exercise jurisdiction over all wildlife whether on public or private lands and waters. It is unlawful for any person to pollute waters deemed necessary by the Wildlife Board for wildlife purposes.

High quality waters are critical to the maintenance of many wildlife communities. Fisheries and the related biotic community, including wetlands and riparian vegetation, can and have been impacted from pollution sources. Assessments of biotic community health and reviews of stream classification systems made by UDWR will be of great help in protecting aquatic life beneficial uses.

In addition to assessments of community health UDWR partners with land management agencies, non-governmental organizations, and DWQ to address water quality issues on impaired waters in Utah. Using Watershed Restoration Initiative, Habitat Council, and Blue Ribbon Fisheries Advisory Council funds, UDWR is able to leverage funding sources and complete large-scale projects designed to curtail erosion, reduce nutrient inputs, and balance sediment loads.

The UDWR has assembled personnel in each of five management regions to complete large-scale restoration projects. Trained UDWR personnel meet annually to discuss (1) stream restoration training, (2) stream restoration techniques, and (3) project proposal development and submission. This annual meeting is convened to improve the effectiveness of on-the-ground actions through greater planning, address water quality on a broader watershed scale, and time projects in a manner that dovetails with the targeted watershed schedule to maximize project funding.

Utah Geological Survey (UGS): The Board of the Geological Survey was created by Utah Code Ann., 79-3-301 within the Department of Natural Resources to act as the policymaking body for the Survey. The seven-member UGS Board is appointed by the Governor, and has the power to establish and review UGS policies and make rules. Board members represent a cross-section of the geological industry in Utah and include one member from the public-at-large. An important responsibility is advising the Director of geological trends and needs within the state.

Broadly, the UGS is charged with the responsibility of developing knowledge and understanding of the geology and mineral resources of Utah and the dissemination of that information to interested parties. Their objectives include "survey the geology of the state, including mineral occurrences, energy resources, industrial minerals and rocks, mineral-bearing waters, and surface and groundwater resources, with special reference to their economic contents, values, uses, kind, and availability in order to facilitate their economic uses…and to collect and preserve data pertaining to mineral resource exploration and development programs and construction activities, such as …location of drill holes, location of surface and underground workings….drill logs…including the maintenance of a sample library of cores and cuttings." Because knowledge of the geology of an area is indispensable to the understanding and management of groundwater, information developed by UGS and other state and federal agencies is necessary for the protection of the quality of the water resource.

The Groundwater & Paleontology Program evaluates the quantity and quality of Utah's groundwater resources; and helps identify, protect, and preserve Utah's fossil resources through public outreach programs and through inventory and recovery projects that reconcile preservation and development needs. Some of the groundwater group program's responsibilities include: definition of drinking water source protection zones, recharge area mapping, water resource evaluation, septic tank suitability mapping, and landfill suitability mapping. In addition, they investigate groundwater related geologic hazards and provide assistance to various local and state agencies.

School and Institutional Trust Lands Administration: In 1994 the Legislature passed the School and Institutional Trust Lands Management Act under Utah Code Ann., 53C-1-101, to establish the School and Institutional Trust Lands Administration (SITLA), an independent state agency, to manage all school and institutional trust lands. The legislation created a seven-member Board of Trustees appointed by the governor and confirmed by the Senate. The Board selects a director that carries out the policies of the board and the authorities defined by the legislation.

As a result of this legislation, DNR's Division of State Lands and Forestry was reorganized and renamed. It is now the Division of Forestry, Fire and State Lands. This agency exercises jurisdiction over sovereign lands beneath navigable lakes, streams, and reservoirs. It also provides assistance to owners of private forest land.

SITLA administers about 3.5 million acres which are concentrated in rural areas, primarily as 640-acre (1 square mile) sections although there are blocks larger than 5,000 acres. SITLA is legally obligated to manage trust lands to optimize the financial return consistent with the long-term interests of Utah's schools and 11 other beneficiaries. The Director is required to manage the trust lands so that natural and cultural resource values are protected for the benefit of the trust beneficiaries.

Utah Division of Forestry, Fire & State Lands: The Utah Division of Forestry, Fire & State Lands, through Utah Code Ann., 65A-1-2, provides wildfire protection and forestry technical assistance to non-federal landowners throughout the state. Technical assistance is provided largely through the development and implementation of Forest Stewardship Plans, and by educating private landowners on Utah's Forest Water Quality Guidelines (FWQG). These guidelines are the primary means to ensure that forest management operations do not degrade water quality.

The Utah Forest Practices Act (Utah Code Ann., 65A-8a-104) requires operators (loggers) to register with the Division, and submit a Notice of Intent (NOI) 30 days prior to conducting operations. The NOI allows the Division to contact both the operator and the landowner to provide written copies of the FWQG's, and to allow opportunity for Division foresters to provide technical assistance before, during, and after harvesting. Implementation and effectiveness of the FWQG's are monitored during this process and summarized into a 5-year audit report.

Utah Department of Transportation: The Utah Department of Transportation (UDOT) was established by Utah Code Ann., 72-1-201 and has the responsibility to plan, develop, construct, and maintain state transportation systems that are safe, reliable, environmentally sensitive, and serve the needs of the traveling public, commerce, and industry.

To help control non-point source pollution, UDOT developed a Storm Water Management Plan (SWMP) designed to limit the discharge of pollutants from roadway sources to waters of the state. This plan consists of various best management practices (BMP's) that help to achieve the goals outlined in 40 CFR 122.34(b), Section 402(p)(3)(B) of the Federal Clean Water Act and State of Utah Storm Water Regulations (U.A.C. R317-8-3.9). The SWMP meets the requirements of Utah Pollutant Discharge Elimination System (UPDES) Permit for Phase I and Phase II areas of the state.

Control Measures for Phase I and Phase II Designated Areas and Municipalities
UDOT's SWMP addresses six minimum control measures set forth by the EPA through the State Division of Water Quality. UDOT has developed BMPs for the topics listed below that describe specific activities, procedures, training and other actions that help to prevent and reduce pollution to waters of the state.

- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection and Elimination
- Construction Site Storm Water Runoff Control
- Post Construction Storm Water Management in New Development and Redevelopment
- Pollution Prevention/Good Housekeeping for Municipal Operations

Control Measures for All Other Areas Statewide
For statewide locations other than Phase I and II areas, BMPs have been developed for the topics below that help to prevent and reduce pollution to waters of the state.

- Construction Site Storm Water Runoff Control
- Post Construction Storm Water Management in New Development and Redevelopment
- Pollution Prevention/Good Housekeeping for Municipal Operations

Indian Tribes: Within Utah's boundaries, Indian tribal lands comprise 4.3 percent of the surface and total approximately 2.3 million acres. Reservations in Utah include the Uintah and Ouray Reservation in

northeastern Utah, the Navajo Reservation in southeastern Utah, the Piute Indian reservations in Central Utah and Shivwits reservation near St. George.

The Indian Tribes manage their own environmental protection programs. The EPA recognizes Tribes as sovereign governments and works with the Tribes to implement environmental programs approved and funded by Congress. EPA performs functions including outreach, training, technical assistance, environmental surveys, pilot program grants and regulation development to assist the Tribes in protecting the environment and water quality on tribal lands. In Utah, tribal environmental programs work with the Region 8 EPA office in Denver, except for the Goshute Reservation that is served by Region 9 in San Francisco, and the Navajo Reservation served by Region 6 in Dallas.

Tribes will continue to have primary authority for water quality on tribal lands and are critically important stakeholders in watersheds that contain tribal lands. The Watershed Approach provides an effective means for Tribes to coordinate with resource management agencies and collaborate on complementary objectives.

Utah Division of Water Quality and the Ute Tribe have partnered up during the past few years to address water quality impairment issues due to non-point sources of pollution in the Uintah Basin. This partnership arose from a shared goal of improving water quality of surface waters that flow through Tribal lands. Both partners recognize the need to restore rivers on the watershed scale regardless of land-ownership. The Ute Tribe is an involved stakeholder at both State and Locally led watershed restoration efforts. They have participated in TMDL development and monitoring training. The increased awareness of the need to monitor has led both parties to discuss the development of a MOU to sample surface waters that exist on Tribal land.

U.S. Environmental Protection Agency: EPA was created by Executive Order in 1972, to administer environmental programs in the United States and territories. EPA presently administers major environmental legislation passed by the Congress and subsequent amendments and reauthorizations of the Clean Water Act (CWA); Safe Drinking Water Act (SDWA); RCRA; Comprehensive Environmental Response, Compensation and Liability Act (CERCLA); Federal Insecticide, Fungicide and Rodenticide Act (FIFRA); and Toxic Substances Control Act (TSCA). For most of these programs, EPA delegates primacy to the states for direct day-to-day management while retaining program oversight and involvement.

Administrative management is conducted through 10 regional offices of the EPA. The regional offices oversee a multi-state area that may also include territories and tribal lands. Utah is within Region 8, headquartered in Denver, Colorado which also includes Colorado, Wyoming, Montana, North Dakota and South Dakota.

Funds available through Section 319 of the CWA are managed by the Watershed Team, of the Watershed and Aquifer Protection Unit, Ecosystems Protection Program, Office of Ecosystems Protection and Remediation, EPA Region 8. While most of the 319 Grant is typically dedicated towards surface water quality improvement projects, ground water protection projects may also be funded. Guidelines for States' implementation of nonpoint source programs under Section 319 of the CWA and for the award of Section 319 grants to States to implement these programs was updated in the fall of 2013 and initiated in 2014.

EPA emphasizes use of the watershed approach by requiring the development of watershed based plans that guide the restoration of waters impaired by nonpoint source pollution prior to use of 319 funding in those watersheds. These watershed based plans must include the nine key elements outlined in the 2003 guidance unless they were developed prior to the issuance of the guidelines. The annual EPA 319 grant to the state is required to have a 40% non-federal match and may only be made if EPA determines that satisfactory progress has been made in the preceding year.

U.S. Army Corps of Engineers (USACE): The Corps of Engineers has regulatory authority under Section 404 of the Clean Water Act to oversee the protection of our rivers, lakes, and wetlands. Ecosystem Restoration is one of the primary missions of the Corps Civil Works program. Under various restoration authorities, the Corps works in partnership with local entities to restore significant ecosystem function, structure and dynamic processes that have been degraded. Generally these projects include a 25 to 35

percent local match. Examples of such projects currently in Utah include the Upper Jordan Aquatic Ecosystem Restoration and the Ogden River Aquatic Ecosystem Restoration projects sponsored by Salt Lake County and Ogden City respectively.

Department of Interior (USDI): The USDI includes many agencies that are important participants in efforts to protect surface and ground water quality. These include the USGS, Bureau of Land Management, Bureau of Reclamation, National Park Service, Fish and Wildlife Service and the Bureau of Indian Affairs. Following is a description of the water quality related activities of USDI agencies.

U.S. Geological Survey (USGS): The USGS, the science bureau of the Department of Interior, provides information on the health of the nation's ecosystems and environment, natural hazards, and natural resources including water, biology, energy and natural resources. The USGS has the principal responsibility to provide the hydrologic information and understanding to achieve the best use and management of the Nation's water resources.

The USGS National Water Quality Assessment (NAWQA) Program provides information on water-quality conditions, their trend over time, and how natural features and human activities affect those conditions in major river basins and aquifers. Monitoring data are integrated with geographic information on hydrological characteristics, land use, and other landscape features in models to extend water-quality understanding to unmonitored areas. NAWQA products are provided to local, State, and Tribal stakeholders to aid in the development of local solutions and strategies for managing, protecting, and monitoring water quality in many different hydrologic and land-use settings.

Collaborative efforts to address state and local water-quality issues are facilitated through the USGS Cooperative Water Program (CWP) which provides matching federal-state funding to allow USGS and cooperating agencies to jointly support water-resource investigations and projects. The CWP allows USGS to collaborate with State and local agencies to explore sources of and solutions to mercury contamination in Utah's lakes and streams, occurrence and fate of nutrients and trace-elements in the Great Salt Lake, and to develop a state-wide groundwater quality monitoring program. The USGS also brings their water-resource expertise to bear in support of and in collaboration with other Federal Agencies engaged in water-resource assessments and management.

The USGS Utah Water Science Center will work closely with State and local agencies to efficiently transfer information gathered in their USGS programs and to determine how best to utilize the opportunities provided by the CWP to address current and future local water-quality information needs.

Bureau of Land Management (BLM): The BLM is a federal land management agency with the mission '*to sustain the health, diversity, and productivity of public lands for the use and enjoyment of present and future generations.*' The BLM's multiple-use mission, set forth in the Federal Land Policy and Management Act of 1976, mandates the management of public land resources for a variety of uses, including energy & mineral development, livestock grazing, recreation, and timber harvest, while protecting a wide array of cultural, and historical, and natural resources—including surface and ground water.

In Utah, BLM is responsible for the management of approximately 23 million acres of public lands - or approximately 42% of the State. BLM lands are frequently at the middle to lower elevations of basins throughout Utah, and are often intermingled with or adjacent to other private, state and federally managed lands.

BLM is obligated to comply with federal Clean Water and Safe Drinking Water Acts and to ensure that activities on public lands are compliant with and fully support the designated beneficial uses for surface and groundwater described in the Utah Water Quality Standards (U.A.C. R317-2). To achieve this, BLM coordinates water quality monitoring and assessment efforts with local, state, and federal agencies, affected public land users, adjoining land owners, and other interests.

Bureau of Reclamation (BR): Historically, BR has primarily been responsible for the construction of water control structures in the western states but now manages programs that have direct benefits for water quality. BR's Salinity Control Program provides grants to agricultural water providers to improve irrigation water delivery systems (canals), typically replacing leaky, inefficient open ditches with pressurized piped systems to facilitate on-farm sprinkler systems provided by NRCS. This reduces canal seepage and overwatering thereby reducing saline return flows to surface waters. Through the Utah Department of Agriculture and Food, Reclamation participates with a cost share program providing funding for similar salinity control practices.

National Park Service: The National Park Service manages 2.1 million acres in Utah, about 3.9% of the state, and hosts 9 million visitors per year. National Parks have a dual mandate to preserve natural and cultural resources and to provide for their enjoyment by the public in such a manner that will leave them unimpaired for future generations. There are 13 National Park System Units in Utah. Eight of these contain a large land-base and significant water resources. Four parks have a more limited land-base and water, and one unit has a primarily historic emphasis.

The National Park units occupy a range of positions on the landscape. Some include headwaters where streams and springs arise and flow entirely within the park. More frequently the park units are positioned midway on the watershed, where streams flow into the parks after arising on upstream lands. Park units along the courses of the Colorado and Green Rivers are hundreds of miles from the headwaters of these large rivers and receive many point and nonpoint source pollution inputs. These large rivers and Lake Powell receive heavy motorized and non-motorized recreational use which has resulted in problems such as fuel spills and contamination from human waste.

The National Park Service cooperates with the UDWQ for water quality monitoring through the collection of samples analyzed by the state laboratory, and by using data from other sample sites monitored by UDWQ. Streams and springs in parks generally provide clean water for park resources and visitors and for other uses after they flow from the parks. They support recreational fisheries, swimming, wading and boating, and provide habitat for native fish and other aquatic species.

Activities inside parks can lead to increased bacteria levels from swimmers, improper disposal of human waste, and permitted livestock grazing on lake shores and river corridors. Special studies and intensive monitoring supplement the routine monitoring when concerns arise. Current examples include studies of hydrocarbons in Lake Powell waters, fish tissue mercury in Lake Powell, and *E. coli* in the North Fork of the Virgin River upstream of Zion NP.

U.S. Fish and Wildlife Service (USFWS): The mission of the USFWS is to conserve, protect, and enhance fish, wildlife, plants, and their habitats for the continuing benefit of the American people. The priorities of the USFWS include conservation of lands and resources on National Wildlife Refuges, coordination with partners to achieve landscape conservation, conservation and management of migratory birds, prevent and recover threatened and endangered species, and ensuring the future of conservation through public education.

The USFWS Utah Ecological Services Field Office provides information to other federal and state agencies, industry, and members of the public concerning the conservation of fish and wildlife and their habitat that may be affected by development activities. Staff assess the potential effects of projects to migratory birds, endangered species, and other fish and wildlife. In Utah these projects typically include activities such as agriculture, mining, utility lines, dredge and fill activities, dam and reservoir operations, oil and gas leasing, and highway construction. Staff perform consultations under Section 7 of the Endangered Species Act and work proactively with project proponents to avoid or minimize potential impacts from nonpoint source pollution.

Utah Partners for Fish and Wildlife work with local watershed working groups in focus areas, including the Bear River, Weber River, Great Salt Lake, Grouse Creek, Western Colorado Plateau, Sevier River, and Southeastern Utah. The Partners' activities include riparian, wetland, in-stream, and rangeland restoration in these focus areas. Habitat restoration and enhancement efforts, such as grazing management, riparian

plantings, dike reconstruction, silt removal, and seeding, are focused in areas that may benefit priority species, such as greater sage grouse, Bonneville cutthroat trout, razorback sucker, or long-billed curlew. The Partners program is effective at reducing the potential effects of nonpoint source pollution to USFWS trust species by partnering with numerous private landowners and leveraging habitat restoration and enhancement funds.

U.S. Department of Agriculture (USDA): The USDA includes many agencies that provide information, technical assistance, land management and cost share resources to the agricultural community. Following is a description of the current water-related programs of USDA agencies.

Forest Service (USFS): The Forest Service, an agency of the U.S. Department of Agriculture, manages National Forests lands (NFS) across the country. All or a portion of six National Forests are in Utah. These public lands are managed by staff at Forest Headquarters and Ranger District offices throughout the State, with support from the Intermountain Regional Forester's office in Ogden.

High-quality water is one of the most important natural resources coming from these NFS lands. In addition to providing drinking water and other municipal needs, this water sustains populations of fish and wildlife, affords recreation opportunities, and provides supplies to meet agricultural and industrial needs throughout the State.

Non-point source pollution control is a key component of managing NFS lands for high-quality water. Direct control is accomplished through two primary mechanisms:

- prescription, implementation, and monitoring of BMPs for a myriad of land use and management activities[1], and
- implementation of watershed improvement projects.

Additionally, direct non-point source pollution control may occur after wildfire if Burned Area Emergency Response (BAER) assessments prescribe the implementation of treatments designed to mitigate fire effects.

Indirectly, the Forest Service provides for non-point source pollution control through sustaining or restoring watershed function and resilience so that NFS lands are resistant to catastrophic events such as fire, insects and disease, and a changing climate.

In 2012 the Forest Service implemented a national best management practices program to provide a standard set of core BMPs[2] and a consistent means to track and document the use and effectiveness of BMPs on NFS lands across the country. These core BMPs integrate individual State and NFS regional BMPs under one umbrella. They are general and non-prescriptive and will not change the substance of site-specific BMP prescriptions. Site-specific prescriptions will continue to be based on State of Utah BMPs, the Intermountain Region Soil and Water Conservation Practices (SWCP) handbook, land and resource (LRMP) management plan standard and guidelines specific to each of the six Forests, annual BMP monitoring information, and professional judgment. The national forests in Utah, in addition to their long-standing use of State BMPS, the SWCP handbook, Forest Plan guidance, annual BMP monitoring, and professional judgment, are now using these national core BMPs in project planning, design, and implementation. Implementation and effectiveness monitoring by individual personnel and interdisciplinary teams is a core part of Forest Service best management practices.

In 2012 the Forest Service continued implementation of the Watershed Condition Framework[3]. Forests within Utah began execution of integrated (essential) projects identified in priority watershed restoration action plans written in 2011. These projects are specifically designed to improve or maintain watershed

[1] For example, motorized and non-motorized recreation, leasable and locatable minerals, range management, timber management, special uses permitting, wildlife and fisheries habitat management
[2] http://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf
[3] http://www.fs.fed.us/publications/watershed/

health, including the reduction or elimination of non-point source pollution. In addition to work in these priority watersheds, Forests completed watershed improvement projects in non-priority watersheds. In total, 4, 417 acres of NFS lands in Utah were directly improved. Project types varied but included, among other things, road and trail decommissioning and re-routing, gully control, spring and riparian area fencing, and stream restoration. An additional 129,796 acres were treated to sustain or restore watershed function and resilience. Again, project types varied, but included fuel reduction, aquatic habitat improvement, invasive plant treatment, and forest and rangeland vegetation improvement.

Natural Resources Conservation Service: The NRCS provides technical assistance to landowners, farm and ranch operators and other local governmental units upon request. This includes assistance with development and implementation of BMPs such as pesticide management, soil conservation, irrigation water management, nutrient management and other conservation practices. The NRCS also provides information on soil characteristics such as nutrients and agricultural chemical leaching potentials and erosivity in published soil surveys and in GIS format via the SSURGO database.

NRCS has developed improved methods of fertilizer and pesticide application and management of animal manure so that surface and ground water resources are not contaminated. With hands-on knowledge of specific areas, operators, and practices, the NRCS is able to promote the use of suitable BMPs. NRCS is also a key partner in a variety of watershed projects currently underway in Utah ranging from NPS-related efforts to flood control and wildlife-related priorities. The agency is committed to holistic planning at a landscape level that considers all the natural resources including energy and the human component of conservation planning.

Farm Service Agency (FSA): The mission of the FSA is to stabilize farm income, help farmers conserve land and water resources, provide credit to new or disadvantaged farmers and ranchers, and help farm operations recover from the effects of disaster.

Utah State University Cooperative Extension System (USU-CES): Through its national network of specialists at land grant institutions and network of county agents, USU's Extension Service provides research-based information to the citizens of the state. USU-CES continues to focus on its historical strengths of agriculture education programming, including information and training in animal waste management, pesticide applicator training, irrigation practices, soil fertility and more. Extension programs also address watershed management, ground and surface water quality and quantity, urban land uses, youth programming, K-12 curriculum development, and volunteer water quality monitoring.

State/Federal Coordination

DWQ will work closely with local grassroots watershed groups and federal agencies to promote a locally led approach to water quality management. These activities will include, task sharing, technical team staffing, establishment of common databases, sequential focus on priority watersheds, and individual TMDL and watershed plans for impaired watersheds. To the extent possible, federal agency staff will participate on the watershed management unit Technical Advisory Committees to support the development and implementation of local watershed management plans.

EPA has delegated authority to DWQ to administer CWA water quality programs, and the EPA regional office oversees DWQ's adherence to federal mandates. Additionally, the regional office manages federal grants that partially support DWQ's water quality program. Other forms of EPA assistance include training, program implementation support, and consultation. EPA's emphasis on watershed protection will continue to create opportunities for the regional office to support and facilitate Utah's Watershed Approach, strengthening this partnership. DWQ and EPA Region 8 will remain firmly committed to the Watershed Approach to ensure its success. Agency policies and procedures should reflect this commitment, as should resource allocations to fundamental program elements.

The rationale and other supporting information for grant applications will come from watershed management plans or intermediate background information collected for the watershed management plan. Grant effectiveness will also use environmental objectives and indicators identified in the watershed

management plan. In effect, the watershed management and TMDL plans become the primary means of reporting progress and accomplishments between DWQ and EPA Region 8 in addition to intermediate progress reports on DWQ activities.

To help coordinate nonpoint source abatement efforts the State of Utah developed an MOU with relevant state and federal agencies (See Appendix K). This MOU identifies the lands that are managed, or overseen by each of the participating agencies, and highlights the activities that will take place on these lands. It also highlights the actions that will be taken by each of the participating agencies to reduce NPS pollution around the state. This MOU was last updated in the spring of 2017, and will be updated every 5 years in association with the updating of the State NPS Management plan. The participating agencies in this MOU are:

- The Utah Division of Water Quality
- The Utah Department of Agriculture and Food
- The Utah Division of Forestry, Fire and State Lands
- The Utah Division of Wildlife Resources
- The U.S. National Park Service
- The U.S. Bureau of Land Management
- The U.S. Forest Service