2017 Montana Nonpoint Source Management Plan

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Cover photos (clockwise from upper left): Tryan Project, Prickly Pear Creek, Lewis and Clark County Water Quality Protection District; Broadwater Conservation District's "Stream Team" students in Deep Creek; Irrigated fields in Broadwater County; Trask Lakes, Beaverhead-Deerlodge National Forest.

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NONPOINT SOURCE MANAGEMENT PLAN OVERVIEW

This 2017 Nonpoint Source Management Plan (Plan) describes Montana's Nonpoint Source Management Program, which is focused on protecting water quality from nonpoint sources of pollution throughout the state. The Montana Department of Environmental Quality (DEQ) expects this Plan to be useful, informative, and most of all a tool for positive change in protecting and improving water quality.

WHAT IS NONPOINT SOURCE POLLUTION?

Nonpoint source (NPS) pollution comes from a variety of land-use activities and is typically transported via runoff or subsurface percolation to streams (rivers or creeks), lakes, reservoirs, wetlands, and groundwater. NPS pollution can also come from pollutants that erode or otherwise directly enter surface waters including those that are aerially transported. Common nonpoint pollutants include sediment, nutrients (nitrogen and phosphorus), temperature changes, metals, pesticides, pathogens, and salinity. Point source pollution is distinctively different from nonpoint source pollution in that point source pollution, as defined under the federal Clean Water Act (CWA), includes those pollutants that enter surface water via any discernible, confined and discrete conveyance. Agricultural stormwater discharges and return flows from irrigated agriculture are considered nonpoint sources by definition under the CWA.

NPS pollution is the largest contributor of water quality problems on a statewide basis when compared to point sources of pollution (Montana Department of Environmental Quality, 2016).

NONPOINT SOURCE MANAGEMENT AUTHORITY

The 1972 federal Clean Water Act (CWA) established a national framework for protecting and improving water quality. Implementation of the CWA in the early decades resulted in considerable national water quality improvements through improved treatment requirements for point sources such as industrial and municipal wastewater discharges. Section 208 of the CWA directed states to develop "Areawide Waste Treatment Management Plans" to address nonpoint source of pollution. In Montana, the DEQ protects water quality from these point source discharges via the Montana Pollutant Discharge Elimination System (MPDES) and acts as the planning agency for nonpoint sources.

Following early successes in controlling point source pollution, Section 319 amendments were made to the CWA in 1987, requiring that states develop plans for controlling nonpoint sources of water pollution. Section 319 also provides cost-share grants to states for a wide variety of NPS control activities contingent upon EPA approval of a state's NPS Management Plan.

As authorized by the state legislature and directed by the governor, the Montana Department of Environmental Quality (DEQ) is the agency responsible for identifying and developing necessary water quality protection and improvement programs in Montana. As such, DEQ is the lead agency over Montana's NPS Management Program and for updating this Plan on a five year basis. This Plan is an update to the 2012 NPS Management Plan, reflecting improvements in many of Montana's NPS Management Program activities.

GOAL OF THE NONPOINT SOURCE PROGRAM

The goal of Montana's NPS Management Program is to protect and restore water quality from the harmful effects of nonpoint source pollution. This Plan helps accomplish this goal by:

- Informing Montana citizens about the sources of NPS pollution and effects on water quality and identifying actions that citizens can take to reduce NPS pollution (**Appendix A - Best Management Practices**).
- Identifying how NPS pollution is being addressed by local, state and federal programs as well as other partners such as watershed groups.
- Describing how the Department of Environmental Quality will continue to work with program partners and provide statewide leadership toward implementing this Plan.
- Identifying strategies, programs and resources for protecting and restoring water quality affected by NPS pollution.

The twenty-year vision of the NPS Management Program is that Montana's citizens understand the consequences of nonpoint source pollution and are addressing concerns in a proactive manner. Watershed groups around the state are actively engaging local landowners and partners to address nonpoint source pollution in socially acceptable and economically beneficial projects and programs. Montana's riparian areas, floodplains and wetlands are healthy and managed in ways that protect our creeks, streams, rivers, ponds and lakes. Montana's indigenous fish and other aquatic life are sustainable through generations by well-managed and citizen-supported natural resource programs and conservation.

The program goal and information contained within this Plan are consistent with the required NPS Management Program objectives defined within EPA's Nonpoint Source Program and Grants Guidelines for States and Territories (US Environmental Protection Agency April 12, 2013). These EPA objectives are contained within **Appendix B**, along with a cross-walk on where each objective is addressed within this Plan.

IMPLEMENTING THE NPS MANAGEMENT PLAN

In Montana, NPS pollution is primarily addressed via application of voluntary management practices pursued by landowners and other citizens within the state. The approaches and resources described in this Plan are the state's primary vehicle for engaging Montana's citizens in implementing voluntary management practices, and fostering stewardship of our water resources.

Although DEQ is the lead agency for the state's NPS Management Program, many other agencies, entities, and individuals play critical roles in the implementation of this Plan. Through communication, collaboration, and shared resources, we can work together to effectively protect and restore water quality from the effects of NPS pollution.

1.0 MONTANA'S NPS POLLUTION MANAGEMENT PROGRAM FRAMEWORK

Montana's Nonpoint Source Pollution Management Program is housed within the state's water quality management program in the Water Quality Division at the Montana Department of Environmental Quality (DEQ). The goal of this program is to protect and restore water quality from the harmful effects of nonpoint source pollution. This is best achieved through a process that integrates water quality standards, monitoring and assessment, development and implementation of total maximum daily loads (TMDLs), and the voluntary implementation of best management actions outlined in Watershed Restoration Plans. Throughout this process DEQ seeks to involve all stakeholders through communication, cooperation, common goals, and consensus. Using this approach, DEQ, watershed groups, conservation districts, agencies, tribes, academia, and non-governmental organizations can work together to effectively increase public understanding and participation in NPS pollution reduction.

1.1 THE WATER QUALITY MANAGEMENT PROCESS

A schematic of DEQ's water quality management planning process is shown in **Figure 1-1.** This process follows the outline and requirements of the Montana Water Quality Act (MCA Ref 75-5-701 thru 704) as well as Clean Water Act Sections 303(d) and 319.

To implement the process steps defined in Figure 1.1, DEQ's NPS Management Program integrates with multiple other programs within the Water Quality Division. These programs include water quality standards development, monitoring and assessment, information management, TMDL development, and TMDL implementation.

Achieving and protecting clean water begins with identifying water quality indicators and establishing water quality standards for those indicators. The next step is monitoring and assessing state waters to determine if they meet the established standards. The results of these efforts are reported every 2 years in DEQ's Water Quality Integrated Report (IR). For those waters not meeting standards, total maximum daily loads (TMDLs) are developed, followed by implementation of best management practices (BMPs) for nonpoint sources, and potentially, point-source permit wasteload allocations. The outcomes of these activities are monitored, assessed, and used to identify appropriate adjustments to activities, processes, or programs based on lessons learned.

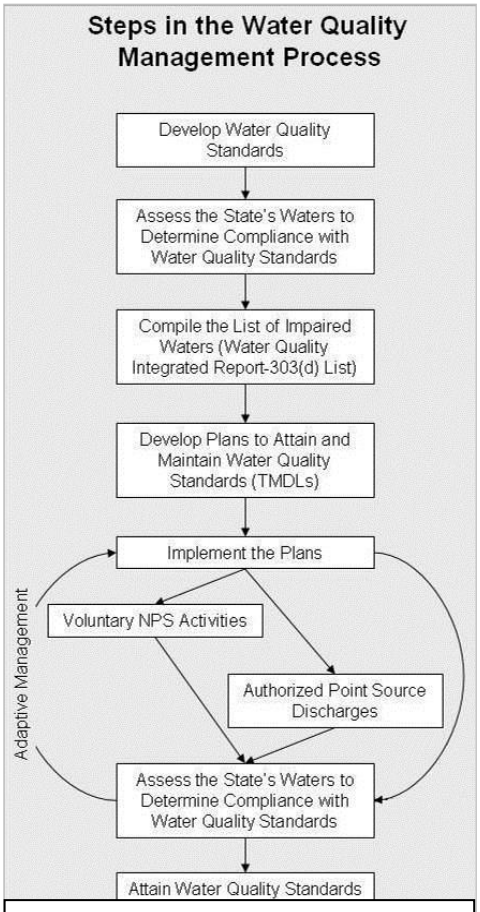


Figure 1-1: Schematic of Montana DEQ's Adaptive Water Quality Management Process

1.2 WATER QUALITY STANDARDS

Water quality standards can be referred to as the foundation for DEQ's NPS and other water quality programs. Montana's water quality standards include a water classification system that designates the beneficial uses for a waterbody, the standards of water quality necessary to ensure that the uses are supported, and a nondegradation policy to protect beneficial uses and existing high quality water. Water quality standards and use classification systems for surface water and groundwater are defined in the Administrative Rules of Montana, Title 17, Chapter 30, Subchapters 6 and 10.

Montana relies primarily on a watershed-based classification system. As a result, all waters of the state are classified and have designated beneficial uses and supporting standards. For most rivers, lakes, and streams "beneficial uses" are those which the waterbody has supported in the past, as well as future beneficial uses that the waterbody should be capable of supporting. Beneficial uses generally include agriculture, aquatic life support, recreation, and drinking water.

Consistent with the Montana Water Quality Act, DEQ works with stakeholders and lawmakers to develop new water quality standards. DEQ also defines point source discharge permit requirements that satisfy water quality standards and nondegradation requirements.

DEQ's water quality standards program provides assistance with interpreting and applying existing standards as well as developing new standards as authorized by legislation. Existing priorities include continued numeric nutrient standards development for large rivers and Flathead Lake, updates to application of nutrient standards to point source dischargers, selenium standards development for Lake Koocanusa, and providing a process to integrate natural background conditions into existing numeric standards.

1.3 MONITORING AND ASSESSMENT

Collecting and evaluating water quality data is an integral part of water quality management. A water quality assessment is a structured decision-making process consisting of (1) planning a water quality evaluation, (2) collecting water quality data, (3) analyzing the data, and (4) reporting the results. Monitoring is essentially step 2 of the assessment process. DEQ supports both internal and external monitoring and assessment efforts to address the many different data needs associated with the NPS Management Program. **Appendix C** provides a summary of monitoring objectives that can be associated with various aspects of DEQ's NPS Management Program, as well as information on monitoring partnerships, volunteer monitoring, and quality assurance and control processes.

In order to determine beneficial use support, DEQ monitors and assesses waterbodies for likely causes and sources of pollution. These activities are often pursued at a watershed scale in support of subsequent TMDL development as discussed in **Section 1.4**. Montana separates causes of pollution into two broad categories: pollutants and non-pollutants. Pollutants typically include measurable constituents in water such as metals, nutrients (nitrogen and phosphorus), toxic chemicals, and sediment. Temperature is also categorized as a pollutant. Non-pollutants generally include descriptive conditions such as flow alteration or loss of riparian, wetland, or instream habitat. As a result of the assessment process, Montana's waterbodies, also referred to as waterbody segments, are assigned varying levels of beneficial use support as follows:

1. **Fully Supporting:** The waterbody meets all of its water quality standards to support designated beneficial uses.
2. **Threatened:** The waterbody currently meets water quality standards but will likely exceed a pollutant limit if current conditions do not change.
3. **Not Fully Supporting (Partial Support):** The waterbody does not meet one or more of its water quality standards and thus one or more beneficial uses are limited. Note that a lake or stream segment might fully support one use, such as agriculture, while only partially supporting another use, such as aquatic life.

Assessed waterbodies that do not meet water quality standards are placed on the state's list of impaired waters. This list identifies each pollution cause that is limiting the waterbody's beneficial uses, and the source. All assessed waters information, including the state's list of impaired waters, is summarized every two years within Montana's Water Quality Integrated Report (IR), which undergoes EPA review and approval consistent with section 303(d) of the CWA. In preparation of the state's Water Quality IR, DEQ solicits data and information from local, state, and federal agencies, volunteer monitors, private entities, non-profit organizations, and individuals with an interest in water quality.

To assist resource managers and members of the public with water quality improvement and protection activities, assessment results for each waterbody segment, also referred to as an assessment unit (AU) are available on the web via DEQ's Clean Water Act Information Center (CWAIC). Note that DEQ often separates larger streams into smaller segments.

In addition to developing and updating assessment methods, DEQ's monitoring and assessment program monitors state surface waters and applies formal assessment methods in order to: identify causes and sources of NPS pollution; track trends in water quality; establish baseline data; evaluate whether or not water quality standards are being attained and beneficial uses are being supported; support standards development; support TMDL development; and to evaluate the success of TMDL implementation. DEQ often uses water quality data collected by others, and in specific circumstances, provides stakeholders with information on monitoring methods, data analysis, and quality assurance to help ensure broad applicability of data collected throughout Montana.

Monitoring and assessment program priorities include supporting standards development, updating and developing assessment methods, monitoring and assessing waterbodies in high priority watersheds, supporting TMDL development, and evaluating the success of TMDL implementation across the state. It is also a priority to expand the current statewide monitoring program focused on baseline monitoring at reference sites, lakes, rivers, and streams across the state using different monitoring designs according to the needs and priorities of the programs using the collected information.

1.4 THE TMDL DEVELOPMENT PROCESS AND WATER QUALITY PLANNING

DEQ is responsible for developing TMDLs consistent with both state and federal requirements. A total maximum daily load (TMDL) is the identification of pollutant loading from all sources established at a level that meets applicable surface water quality standards. TMDLs inherently involve a watershed scale analysis of pollutant loading from both point and nonpoint sources of pollution. Although TMDLs apply to pollutants (**Section 1.3**), the TMDL planning document, also referred to as a Water Quality Implementation Plan (WQIP) typically addresses both pollutant and non-pollutant impairment causes in a watershed.

In practical terms, a TMDL is a plan to attain and maintain water quality standards. The basic steps of the TMDL development process include:

1. Defining measurable targets to represent attainment of water quality standards and to evaluate the waterbody's condition in relation to the standards. This links TMDL development to water quality standards, monitoring and assessment activities identified in **Sections 1.2** and **1.3**.
2. Defining the allowable load rate (which equates to the TMDL).
3. Quantifying the pollutant contributions from significant sources, often relying on collection of water quality monitoring data.
4. Allocating the allowable loading rate among the significant pollutant sources. Most of these allocations apply to nonpoint sources.

In Montana, TMDLs are typically developed for all streams impaired by a certain pollutant, or set of pollutants, within a given watershed. The scale of the watershed is generally based on U.S. Geological Survey Hydrologic Unit Code (HUC – 4th-5th code) boundaries. Although not required, Montana's TMDL documents generally include a conceptual restoration or implementation strategy. This strategy identifies land management practices, such as the best management practices (BMPs) in **Appendix A**, for achieving TMDL allocations.

DEQ's TMDL priority areas for the next several years are identified in **Appendix D**, which includes criteria Montana uses to prioritize TMDL development as well as a list of completed TMDL documents. The prioritization approach for TMDL development has always been heavily focused in areas of significant stakeholder interest in NPS management. TMDL development priorities will continue to consider stakeholder interests in implementing NPS activities, as well as addressing other point and nonpoint source considerations. (Wolh 2005)Achieving these TMDL priorities will require significant monitoring and assessment support (**Section 1.3)**. Combined, these programs provide the primary means through which DEQ will continue to conduct site-specific and watershed-scale assessments of NPS effects since Montana's streams and lakes are impaired mostly from nonpoint sources.

DEQ's stakeholder participation process during TMDL development includes consulting with watershed advisory groups and appropriate technical personnel as well as providing for public comment on a final draft of each TMDL document. This approach sets the stage for implementing the NPS components of a TMDL via local leadership, as discussed further in **Section 1.5**.

1.5 Implementing TMDLs to Restore Water Quality

DEQ's NPS Management Program focuses on restoring impaired waterbodies by implementing TMDLs. The rationale is that the TMDL documents provide a science-based strategy for identifying pollutant causes of impairment, pollutant sources, and necessary pollutant reductions that will lead to meeting state water quality standards. The TMDL documents also identify land management practices and BMPs that can be applied to sources contributing to both pollutant and non-pollutant causes of impairment.

In Montana, NPS pollution is primarily addressed via application of voluntary management practices pursued by landowners and others. DEQ's longstanding policy has been to support a voluntary program to achieve compliance with water quality standards for most activities that create NPS pollution, recognizing that there are also important regulatory elements related to NPS control in Montana as described in **Section 6**. Although DEQ is the lead agency for the state's NPS Management Program,

many other agencies, entities, and individuals play critical partnership roles as identified in **Appendix E** and further discussed in **Section 5**.

DEQ encourages and supports the efforts of local watershed groups and conservation districts to develop Watershed Restoration Plans (WRPs) that will achieve these objectives. DEQ provides staff support and federal Clean Water Act 319 funding to local watershed efforts that pursue NPS controls and are implementing WRPs. WRPs can be viewed as a locally developed "road map" to meeting water quality standards, complete with identified priority areas and/or activities, resource needs, and timelines for meeting milestones. These plans must be integrated with DEQ's TMDL development efforts wherever possible. Critical steps in developing a WRP include education and outreach, partnership building, watershed characterization, and project identification, prioritization and implementation. **Appendix D** provides a map showing areas of WRP development in Montana.

EPA has identified the elements of a WRP (listed below) necessary for ensuring that realistic plans are developed, and standards can be met:

1. Identification of Pollution Impairment Causes and Sources
2. Estimates of Necessary Load Reductions
3. Identification of Management Measures and Critical Locations
4. Estimates of Technical and Financial Needs to Implement Measures
5. Public Information, Engagement and Involvement Component
6. Implementation Schedule for Management Measures
7. Measurable Milestones for Management Measures
8. Short-Term Criteria for Evaluating Effectiveness
9. Monitoring Component to Evaluate Effectiveness of Management Measures

The Montana Watershed Coordination Council (MWCC, see **Appendix E** and **Section 5.1**) provides significant support to local watershed groups through online information sharing, training workshops, and networking opportunities. MWCC is able to streamline communication and help sustain watershed organizations in Montana. DEQ considers MWCC to be a critical clearinghouse and information hub that plays a lead role in supporting local efforts to build the capacity needed to develop WRPs and sustainable watershed restoration and protection.

Montana has many impaired waterbodies located on lands managed by federal and state agencies. These agencies usually have multiple management objectives, planning processes and land management activities that contribute to TMDL implementation, consistent with many of the WRP elements. DEQ has developed several interagency agreements (e.g., memoranda of understanding) that provide additional mechanisms to inform, coordinate, and cooperate on NPS pollution reduction and TMDL implementation. One main objective of this Plan is to identify practices that should be applied to meet TMDLs on state and federally managed lands in a timely manner.

1.6 TMDL Implementation Evaluation and Adaptive Management

Once the watershed restoration measures have been implemented, DEQ can systematically work with partners such as watershed groups and land management agencies to assess the short- and long-term outcomes and begin to identify collaborative adjustments based on new understandings, monitoring results, and lessons learned (see **Figure 1-2** for details). Assessment of progress and adaptive management should include:

- Information assessment—review and evaluation

- Interagency collaboration and shared results
- Reporting back to stakeholders and others
- Adjustments to the program

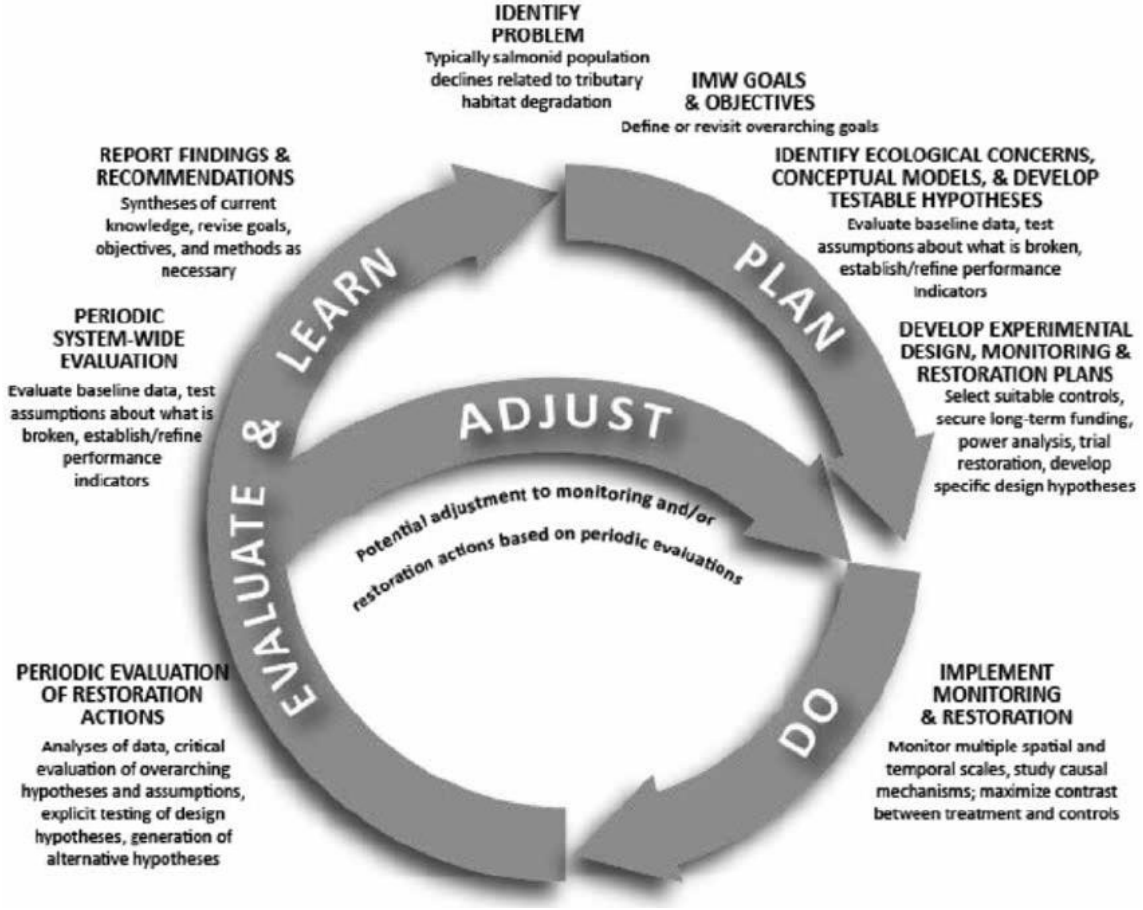


Figure 1-2: Diagram of Adaptive Management Approach for Montana Watershed Restoration Plans

DEQ's NPS Management Program performs TMDL Implementation Evaluations (TIEs) as a key component of adaptive management. TIEs provide important feedback on TMDL implementation progress and are also used to identify success stories or other significant examples of progress. The TIEs satisfy requirements under state law (MCA 75-5-703) by identifying waters where all appropriate management practices are in place and prioritizing those waters for subsequent beneficial use assessments. Working with stakeholders on TIE development provides additional opportunity to define priority locations for further TMDL implementation and also identify situations where WRP and/or TMDL document modifications would be helpful.

TIEs can be effectively performed at the same watershed scale addressed by a TMDL or WRP document. DEQ has completed seven TIEs and is committed to expanding TIE activity to provide feedback to the many watershed groups implementing WRPs and to expand DEQ's education and outreach activity (**Section 8**). To accomplish this goal, DEQ will develop a prioritization approach for future TIE development. This priority approach will include consideration of the number of years since TMDL

completion, the extent to which TMDL implementation is occurring in a watershed, watershed group or other stakeholder interest in receiving feedback on water quality improvement activities, and the availability of data or other information to help evaluate progress and success.

1.7 STATEWIDE NONPOINT SOURCE PROGRAM EMPHASIS ON POLLUTION PREVENTION

Montana values its waterbodies, whether in need of restoration to meet water quality standards or continued protection to maintain an existing high quality. To maintain and protect these waters, the NPS Management Program emphasizes education and outreach efforts through many different forms and venues. These efforts emphasize the importance of high-quality water, pollution prevention, appropriate best management practices, and individual responsibility. The NPS Management Program supports integrated watershed and community education and outreach on NPS pollution prevention. Because Montana is geographically large but has a population of about one million people, coordination and integration of various partners' resources is most effective. Working with the many organizations identified in **Appendix E**, the nonpoint source program is able to leverage technical and financial resources.

Montana laws address water quality protection from an array of potential NPS pollution concerns, such as individual sewage disposal systems (septic systems), forestry practices and pesticide application. Several state and local agencies have delegated authority to address these issues. For example, the Department of Natural Resources & Conservation (DNRC) enforces the Streamside Management Act; the Department of Fish, Wildlife & Parks (FWP) implements the Stream Protection Act; the Department of Agriculture develops and implements regulations and programs regarding the appropriate application of pesticides; and conservation districts administer the Natural Streambed and Land Preservation Act. **Section 6** describes most of the important state regulatory authorities that control NPS pollution. There is an obvious need to coordinate the various elements of NPS pollution control both within DEQ and among other local, state, and federal agencies.

Adaptive management also plays an integral role in pollution prevention by addressing emerging and new potential threats to clean water. Nevertheless, Montana is highly dependent upon individual landowners and "ordinary citizens" using voluntary best management practices (BMPs) to reduce nonpoint source pollution to protect our waterbodies, wetlands and riparian areas. Education and outreach to targeted audiences, providing clear concise information on sources of pollution, BMPs, and examples of successful NPS pollution reduction outcomes are critical to our goal of protecting and restoring water quality.

1.8 PROTECTING HEALTHY WATERSHEDS

DEQ recognizes the importance of protecting high quality waters and preventing impairments in waters currently meeting standards, particularly when new threats emerge or water quality is declining. To help accomplish an enhanced water quality protection approach, the Nonpoint Source Program intends to implement EPA's Healthy Watersheds Initiative in Montana (information can be found on EPA's website). Montana DEQ anticipates identifying and prioritizing state waters worthy of and needing protection in coordination with watershed groups and land management agencies. Specific protection management practices could be incorporated in DEQ-accepted Watershed Restoration Plans and subsequently potentially eligible for NPS Management Program funding **(Section 5).**

Protecting healthy waters where water quality standards are being achieved is already an inherent component of many TMDL restoration activities because:

- Watershed scale TMDL allocations and resulting implementation goals are based on the assumption that land management practices in healthy tributaries will be maintained, and
- Even in healthy tributary watersheds, there is often potential for improved practices that could contribute to the TMDL pollutant reduction goals for a receiving waterbody.

Once a waterbody has been restored to meet water quality standards, DEQ encourages continued water quality improvements to buffer against potential future pollutant loading increases that might occur due to a lapse in voluntary controls or changes in land use. Furthermore, continued NPS reductions in areas upstream of a point source discharge could result in significant economic efficiencies toward meeting water quality standards below the point source discharge.

The NPS Management Plan, through the combined strategies of TMDL implementation and pollution prevention, will meet the NPS Program's goal to protect and restore water quality from the harmful effects of nonpoint sources of pollution.

2.0 MONTANA'S WATER RESOURCES

Montana's water resources are critical to the future of the Treasure State. Waters of adequate quantity and quality are necessary to sustain the state's economies as well as to meet basic biological needs. Nonpoint Source (NPS) pollution is Montana's most pervasive water quality problem, and it must be understood and managed effectively so that all current and future beneficial uses of the state's waters are supported. This section describes Montana's water resources to provide a context for the strategies and recommendations contained within the rest of this Plan. Most of the information for this Section is provided by the State's "Integrated Report" called for under Clean Water Act sections 305(b) and 303(d), and the 2016 Integrated Report is incorporated by reference in this Plan.

2.1 STREAMS AND LAKES

Montana has approximately 69,200 miles of perennial streams; 307,800 miles of intermittent and ephemeral streams; 12,900 miles of ditches and canals; and 846,500 acres of lakes, reservoirs, and more than 2,500,000 acres of wetlands (**Table 2-1**). DEQ is responsible for protecting and addressing water quality concerns for most of the water resources listed in **Table 2-1**. EPA is responsible for working with individual tribes on NPS Management Program development, including developing TMDLs and associated restoration plans for all waters located within tribal lands.

Table 2-1: Montana's Surface Waters based on High Resolution (1:24,000) NHD (Montana Department of Environmental Quality, 2012)

RIVER BASINS	Perennial Streams (Miles)	Intermittent & Ephemeral Streams (Miles)	Ditches & Canals (Miles)	Lakes & Reservoirs* (Acres)
Columbia	20,300	29,900	1,800	271,500
Upper Missouri	17,600	38,300	3,900	110,000
Lower Missouri	17,800	142,300	3,800	417,300
Yellowstone	13,500	97,300	3,400	47,200
Montana Total	**69,200**	**307,800**	**12,900**	**846,000**

** Named waters at least 5 acres in area. Size estimates of all waters derived by DEQ from 1:24,000-scale National Hydrography Dataset (NHD).*

Montana ranks third in the conterminous United States as having the most stream miles, sixth in the number of lakes, and eighth in total lake acreage (Montana Watercourse, 1996). Montana has been called the "Headwaters of the Continent" because it is the only state that sends water to three oceans—Arctic, Atlantic, and Pacific. A few of Montana's most unique water resources include the Yellowstone River, the longest free-flowing river in the lower 48 states; Flathead Lake, the largest natural freshwater lake in the U.S. west of the Mississippi River; the highly productive Missoula Valley Aquifer, a designated sole-source aquifer; and the prairie pothole wetlands of the northern great plains. Waters within national parks and wilderness areas are designated outstanding resource waters (ORW) (no degradation allowed).

The state has three major and two minor river basins (Watercourse 1996) (**Figure 2-1**). The three major river basins are:

- Two tributaries of the Columbia—the Clark Fork and the Kootenai—drain 26 million acre-feet of surface water from a land area totaling 25,125 square miles. This drainage area represents only 17% of the state's land area but accounts for 53% of the annual surface flow.

- The Missouri River and its tributaries drain 56% of the state, across 82,000 square miles, yet only contribute 17% of the annual surface flow (8 million acre-feet).
- The Yellowstone River drains 36,000 square miles (24% of the state) and carries 9.5 million acre-feet (21%) at its confluence with the Missouri River near the Montana–North Dakota border.

The two minor river basins are:

- The Little Missouri River, in the southeast corner of the state, drains just 2% of the land area in Montana.
- The St. Mary's River flows north toward the Arctic Ocean from Glacier National Park, draining 2% of the water from 1% of Montana's land area.

Figure 2-1: Montana's Major and Minor River Basins

These five river basins are divided into 16 major sub-basins, which are further divided into about 90 watershed planning areas. Many of the state's water pollution control programs have adopted a watershed approach for managing streams and lakes, so that an entire drainage area is assessed for the potential effects on water quality. DEQ's Water Quality Division (WQD) uses the watershed approach to guide water quality planning, protection, and restoration activities. Managing water resources from a watershed perspective presents challenges because few administrative boundaries fall entirely within a watershed. This underscores the need for collaboration among the various public and private entities within a watershed to protect and restore water resources, particularly in the case of NPS pollution.

2.2 WETLANDS, RIPARIAN AREAS, AND FLOODPLAINS

Wetlands, riparian areas, and floodplains play critical roles in protecting water quality. A discussion of each follows.

2.2.1 Wetlands

Wetlands are transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. This transitional area can sometime be difficult to define because there is a diversity of wetland types, and the distinction between wet and dry environments lies along a continuum (**Figure 2-2**). Wetlands are typically defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Certain wetlands also fall under the jurisdiction of the Clean Water Act (CWA). All wetlands, regardless of their jurisdictional status, perform a range of vital functions (e.g., aquatic habitat, flood control, groundwater recharge, and pollutant attenuation); yet only jurisdictional wetlands are afforded federal protection under the CWA. Ecological or functional wetlands can perform the same range of functions and pollution control, yet may not meet all of the criteria in the above definition.

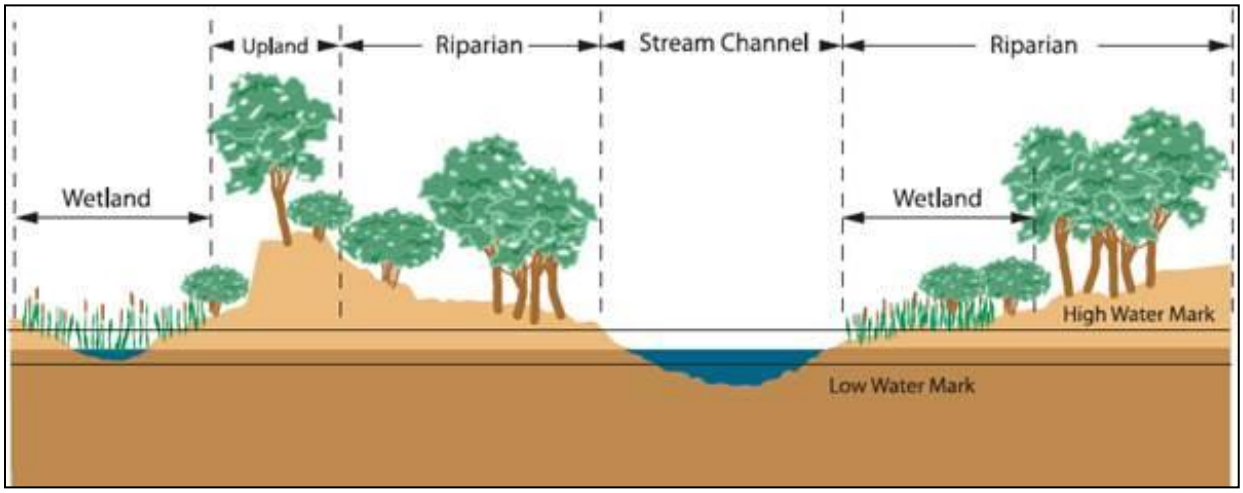


Figure 2-2: Relationship between Wetlands, Uplands, Riparian Areas, and the Stream Channel

Wetlands support, maintain and improve the quality and quantity of water entering our streams, rivers, and lakes. Therefore it is important to protect and restore wetlands to maintain the functions they provide in a watershed. Natural wetlands provide chemical and biological processes that take more time to develop in artificial or constructed wetlands; therefore it is important to protect and maintain the existing functions of natural wetlands. Although wetlands can capture pollutants, natural wetlands should not be used to treat nonpoint source pollutants, as it may negatively impact their condition and impair their ability to function properly. Artificial wetlands or constructed wetlands can be an effective tool for capturing and preventing nonpoint source pollution from entering streams, lakes, and natural wetlands; however, these constructed wetlands should be managed and maintained so that they can continue to effectively capture pollutants.

In Montana, the state and federal agencies involved in wetland regulatory programs are the Montana Department of Environmental Quality (DEQ), the United States Environmental Protection Agency (EPA), the United States Army Corps of Engineers (USACE) and the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS). The USACE regulates the dredging or placement of fill material into jurisdictional wetlands through the CWA §404 permitting program. DEQ is responsible for certifying that the actions permitted under CWA §404 will comply with state water quality standards through CWA §401 certification. The CWA §404 permitting process (dredge and fill permits) only applies to CWA jurisdictional wetlands as described above. The DEQ and EPA regulate the point source discharge of pollutants to a wetland through the Montana Pollutant Discharge Elimination System (MPDES) and the National Pollutant Discharge Elimination System (NPDES). The NRCS, through the Farm Bill "Swamp buster" provisions, maintains the integrity of wetlands located on private agricultural lands by ensuring that all producers enrolled in Farm Bill programs comply with current wetland regulations.

2.2.2 Riparian Areas

Montana has a tremendous variety of riparian areas, ranging from cottonwood galleries and willow forests to high-altitude fens. Riparian areas are typically vegetated zones along a waterbody through which energy, materials, and water pass. Riparian areas characteristically have a high water table and are subject to periodic flooding and influence from the adjacent waterbody. Not all areas within a riparian zone will necessarily have the characteristics to be classified as wetlands. Similar to wetlands, definitions for riparian area can vary. For uniform identification, classification, and mapping, the U.S. Fish and Wildlife Service define riparian areas as: "plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic waterbodies" (i.e., rivers, streams, and lakes, or drainage ways). Riparian areas have one or both of the following characteristics:

1. Distinctly different vegetative species than adjacent areas.
2. Species similar to adjacent areas but exhibiting more vigorous or robust growth forms.

Riparian areas are usually transitional areas between waterbodies and upland habitat and generally perform similar functions to wetlands (pollutant filtration, shoreline stabilization, wildlife habitat, etc.). In order to maintain their function, riparian areas must be protected from over-grazing, cropping, urban development, and rip-rapping (i.e., bank and shore stabilization using rock, concrete, or rubble).

*Riparian buffers are one of **the most effective** best management practices (BMPs) for preventing NPS pollution.*

The State of Montana established the Streamside Management Zone (SMZ) law in 1991, which protects riparian areas during commercial timber harvest. This law limits timber harvest within a 50 or 100 foot buffer of streams, depending on slope and stream class, to maintain intact riparian areas and adjacent wetlands.

2.2.3 Floodplains

Floodplains are the areas adjacent to streams, and sometimes lakes and reservoirs, which are subject to periodic flooding. Often they are defined by whether they would be inundated during a flood with a given probability of occurrence, such as a 100-year flood, which has a 1% chance of happening in any given year. Floodplain management can have a profound effect upon NPS pollution. Floodplains that are adequately vegetated are better able to withstand the erosive forces of floodwaters. The wider the floodplain, the more easily floodwaters are able to dissipate energy that would otherwise erode banks and add sediment to streams.

Development in a floodplain can prevent a floodplain from functioning properly to dissipate excess stream energy. This can lead to excessive bank erosion and/or damage to infrastructure and personal property. Consider that anything located in a floodplain will one day be flooded.

This means houses, buildings, livestock, wells, or other objects in a floodplain will be flooded with a certain degree of frequency **(Figure 2-3**). If feedlots, barns, houses, and businesses are located in a floodplain, their contents can contribute pollution during a flood.

Figure 2-3: East Gallatin May 24, 2008 Flooding

In Montana floodplain management is directed through federal, state, and local laws. Federal agencies involved in floodplain management and/or floodplain development include:

- Federal Emergency Management Agency
- United States Army Corps of Engineers
- United States Geological Survey
- Natural Resources Conservation Service
- NOAA/National Weather Service

At the state level, the Department of Natural Resources & Conservation (DNRC) Floodplain Management Program has statutory responsibilities to delineate and designate floodplains and floodways, and provides technical assistance to local floodplain administrators. DNRC ensures communities have regulatory authority, and establishes minimum state regulatory requirements. Local governments are charged with adopting land-use regulations that meet or exceed the minimum federal and state standards. Local floodplain administrators implement locally adopted floodplain ordinances, which are necessary for obtaining federal flood insurance and federal financial assistance following a flood event.

2.3 GROUNDWATER

Groundwater is a critical source of drinking water and irrigation water for many of Montana's rural communities. Montana state law defines all groundwater as State Waters, regardless of its connection to surface water (75-5-103(34), MCA). Montana's groundwater resources include alluvial aquifers and deep aquifers. **Table 2-2**, adapted in part from information in Montana Watercourse 1996, describes some of the general characteristics of these two aquifer types.

Table 2-2: Montana's Groundwater Resources

Alluvial Aquifers	Deep Aquifers
Found in valley bottoms.	Underlying all of Montana.
Composed of stream-deposited cobbles, gravel, sand, silt, and clay.	Composed of fractured bedrock, porous stone (e.g., sandstone/siltstone), gravel, or coal.
Recharged by precipitation and streamflow.	Recharged by deep percolation of surface water.
Productivity and water level often fluctuates seasonally and in direct response to surface water management activities.	Productivity and water level may or may not be affected by seasonal changes but are nearly always affected by long-term changes in surface water management and groundwater withdrawals.
Source of most of the groundwater used by Montanans.	Important source of groundwater for some agricultural and industrial operations and for drinking water in many rural areas.
Once polluted, they are difficult, but usually not impossible, to clean up.	Once polluted, they are often impossible to clean up.

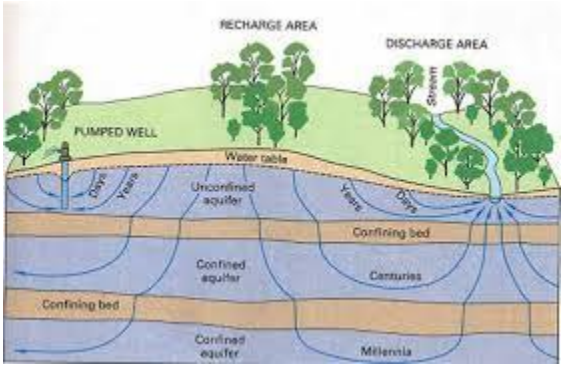


Figure 2-4. Groundwater schematic

Groundwater frequently comes in contact with surface water (**Figure 2-4)**, and sustains baseflow for many streams throughout the state. In any given stream, there are typically some sections where stream water is leaving the stream and entering groundwater (called a "losing stream reach"), and other sections where groundwater is entering the stream (gaining stream reach). Groundwater (even in deep aquifers) is mobile. Rates of travel are highly variable, ranging from a few inches per year to hundreds of feet per day.

NPS pollution can enter groundwater via infiltration/ percolation or through sub-surface flow (**Figure 2-4**). This pollution may ultimately reach surface water, although not all pollutants that enter groundwater will ultimately reach surface water due to natural attenuation. Thus, groundwater pollution does not always result in surface water pollution, or in many cases the amount of pollution entering groundwater will be significantly diminished before reaching interconnected surface water.

Common sources of NPS pollution in groundwater include:

- Improper application of fertilizer or pesticides
- Areas of livestock confinement
- Individual household septic systems
- Groundwater recharge from contaminated surface waters
- Oil, gas, and mineral extraction

Appendix F provides additional information on Montana's approach to groundwater management. This appendix provides information on NPS and other management activities that protect or remediate groundwater resources and provide protection for interconnected surface waters.

3.0 MONTANA'S NPS POLLUTION CONTROL STRATEGY

Montana's strategy for addressing NPS pollution includes protecting clean water through appropriate management practices, also referred to as best management practices (BMPs), and statewide education and outreach activities. For surface waters that are not meeting standards the strategy is to restore those waters by developing and implementing science-based, locally-supported watershed restoration plans.

In the case of impaired waters, simply applying BMPs may be insufficient to restore all beneficial uses. The Water Quality Improvement Plans (WQIPs) and associated TMDLs identify the wasteload allocations (point-source pollutant loads) and load allocations (NPS pollutant loads) necessary to meet water quality standards. The NPS load allocations are expected to be met by applying reasonable land, soil, and water conservation practices identified in the WQIPs/TMDLs and Watershed Restoration Plans.

Montana's water quality programs are integrated to ensure success at the program level and to achieve overall water quality protection and restoration goals. The Nonpoint Source Program has, and continues to rely on, DEQ and other agency programs to achieve its goals of attaining and maintaining water quality standards. **Section 6** discusses programs that provide regulatory protection for activities that can generate nonpoint source pollution.

Best Management Practices

Best Management Practices (BMPs) can be implemented to reduce nonpoint source pollution and improve water quality. BMPs are designed and implemented for a specific purpose and include management methods as well as actual physical structures. In the case of water quality, BMPs are practices designed to protect or improve the physical, chemical, or biological characteristics of surface water and groundwater resources. BMPs are often chosen and applied on a site-specific basis. Consideration must be given to factors such as the desired level of improvement, the cost and availability of materials, long-term maintenance needs, the acceptable level of risk, and the unique physical characteristics of the land and water.

BMPs can be applied to nonpoint sources to achieve "reasonable land, soil, and water conservation practices." The Administrative Rules of Montana (ARM) define these as "methods, measures, or practices that protect present and reasonably anticipated beneficial uses. These practices include structural and nonstructural controls and operation and maintenance procedures. Appropriate practices may be applied before, during, or after pollution-producing activities." Note that these practices "protect present and reasonably anticipated beneficial uses." The TMDL process is designed to provide guidance to implement all reasonable land, soil, and water conservation practices.

See **Appendix A** for a description of BMPs supported by DEQ to address water quality for various land uses in Montana. See **Appendix E** for a list of partners and resources that may be able to provide additional information on BMPs.

The goal of Montana's NPS Management Program is to protect and restore water quality from the harmful effects of nonpoint source pollution.

NPS Management Program Goal

The goal of Montana's NPS Management Program is to protect and restore water quality from the harmful effects of nonpoint source pollution. **Section 7** presents the long-term and interim outcomes established to track progress toward meeting this goal. Further, **Section 8** lays out short-term actions (5-year) and related milestones, determined to be necessary to achieve the stated outcomes. This section articulates specific strategies for addressing the impacts of different land uses and sources of water quality impairment. In order to implement these strategies and accomplish the goal of the NPS Management Program, DEQ will use the following principles:

- Support local conservation activities and organizations
- Complete comprehensive assessments through the TMDL development process
- Improve collaboration with other programs, agencies, and organizations
- Improve the connection between planning and implementation
- Use adaptive management to achieve program goals

3.1 SPECIFIC STRATEGIES BY LAND USE

DEQ has identified the seven major land uses that contribute significantly to NPS pollution and water quality impairment: agriculture, forestry, hydrologic modification, mining and industry, recreation, transportation, and urban and suburban development. These land uses result in the named sources of impairment (e.g., grazing in riparian or shoreline zones) in Montana's 2016 Water Quality Integrated Report and completed TMDL documents.

Each land use is discussed in the following sections. Section 3.2 discusses three additional stressors affecting water quality and NPS pollution in Montana. These are aquatic invasive species, pollutant loading via atmospheric deposition, and the effects that climate change can have on water quality.

3.1.1 Agriculture

Farming and ranching are essential parts of Montana's culture, economy, and environment. Some of the oldest farms and ranches in Montana date back to the mid-1800's. Agriculture is Montana's leading industry, with an estimated $4.6 billion dollar impact on the economy (**Table 3-1**); $1.5 billion greater than the next leading industry, travel (2015, USDA National Agricultural Statistics Service).

Table 3-1. Value of Sales By Commodity Group

Commodity Group	Value of Sales	U. S. Rank
Grains, oilseeds, dry beans, and dry peas	$1,787,162,000	17th
Cattle and Calves	$1,783,908,000	11th
Other crops and hay	$403,251,000	14th
Hogs and pigs	$54,091,000	23rd
Milk from cows	$44,671,000	38th
Vegetables, melons, potatoes and sweet potatoes	$33,199,000	38th
Sheep, goats, wool, mohair, and milk not from cows	$31,233,000	10th
Nursery, greenhouse, floriculture and sod	$28,566,000	43rd

Horses, ponies, mules, burros, and donkeys	$22,824,000	18th
Fruit, tree nuts, and berries	$3,658,000	43rd
Aquaculture	$3,172,000	43rd
Cut Christmas trees and short rotation woody crops	$160,000	42nd

(Source: USDA, NASS, 2012 Census of Agriculture)

Farming and ranching are essential parts of Montana's culture, economy, and environment. Farmers and ranchers are the primary day-to-day stewards of millions of acres of public and private lands in Montana. Without their support, thousands of streams, lakes, and wetlands, along with much of Montana's groundwater resources, cannot—and will not—be protected from NPS pollution. Montana supports voluntary implementation of site-specific BMPs as an effective method of addressing NPS pollution from agriculture-related sources. Montana also recognizes that water quality protection conditions in grazing leases, permits, and funding agreements can be an effective method of encouraging people to implement BMPs.

Nonpoint source pollution from agricultural practices alters water quality in many of Montana's lakes, streams, wetlands, and groundwater aquifers. It can impair the usefulness of state waters for human consumption, fish and wildlife production, irrigation, recreation, and industrial processing. Common pollutants associated with agricultural operations include sediment, nitrogen, phosphorus, salinity, and pathogens. Certain agricultural practices can also lead to significant changes in water temperature, a loss of riparian and aquatic habitat, and other serious problems. In Montana, state waters are a shared resource among all citizens. Care must be taken to effectively balance agricultural uses with the needs of other beneficial uses, such as drinking water, fish and wildlife production, and recreation.

Strategy

The Montana NPS Management Program will focus on four strategies to promote, facilitate, and create reductions in NPS pollution from agricultural sources.

Strategy 1: Improve communication on NPS pollution issues among Montana's agricultural community.

Farmers, ranchers, educators, agencies, and consumers alike should be familiar with, and feel comfortable discussing, NPS pollution issues as frequently as necessary. The NPS Management Program will encourage open participation in efforts to reduce and prevent NPS pollution.

- Face-to-face communication. The program will encourage, support, and facilitate face-to-face meetings. Farmers, ranchers, state and federal agency staff, trade organization representatives, and other members of the agricultural community will meet in person to help build relationships of trust and understanding of one another's needs and interests.
- Clear, user-friendly information. Federal, state, and local governments will provide farmers, ranchers, and others with clear and concise information about water quality laws, permitting

requirements, cost-share opportunities, TMDLs, conservation initiatives, and other policies and programs.
- Mutual respect. Government agencies, agricultural producers, trade organizations, and environmentalists will work to improve mutual respect, support, and cooperation.
- Continuing education. Agency staff, educators, and watershed group members will continually seek new methods and opportunities to discuss NPS pollution with farmers and ranchers, and farmers and ranchers will provide feedback on agency and watershed group activities.

Strategy 2: Connect agricultural producers with the technical and financial resources necessary to reduce nonpoint source pollution from farming and livestock operations.
Local, state, and federal government agencies, private consultants, and nonprofit organizations will work with ranchers, farmers, and rural communities to identify and supply relevant information, processes, technology, and financial incentives for addressing nonpoint source pollution.

Strategy 3: Evaluation and adaptive management.
Montana's NPS Management Program will evaluate the success of NPS pollution reduction programs and projects. Open communication and adaptive management will facilitate continual improvement in the tools and resources used to address NPS pollution from agricultural sources.

Strategy 4: Maintain existing programs that address contamination of groundwater from improper application of pesticides.
The Montana Department of Agriculture (DOA) and the Montana Department of Environmental Quality (DEQ) will continue to work together to implement established programs for preventing, monitoring, and remediating pesticide pollution in groundwater. The DOA Agricultural Services Bureau will review pesticide registrations, train and license applicators and dealers, provide technical and compliance assistance to applicators and landowners (using enforcement authority when necessary), and provide opportunities for waste pesticide disposal and pesticide container recycling. The Agricultural Services Bureau will also continue to monitor groundwater throughout the state in order to detect and quantify contamination from pesticides. The DEQ, Water Quality Planning Bureau, Standards and Modeling Section will develop and maintain water quality standards for individual pesticides, and the DEQ Groundwater Remediation Program will provide oversight and remediation of sites known to be contaminated with pesticides.

3.1.2 Forestry

Forest lands cover 22.5 million acres in Montana, nearly a quarter of the state's total lands. These forests are divided about equally between forests east and west of the Continental Divide. For forestry and forestry-related activities, the NPS Management Program relies on a combination of regulatory and voluntary approaches.

Montana's forests provide valuable uses, such as wood products, fish and wildlife habitat, outdoor recreation, grazing, and aesthetic value. They also hold the headwaters for many streams and rivers that provide drinking water throughout the state. The state's largest forest-land holder is the U.S. Forest Service, followed by non-industrial private land owners (**Figure 3-1**). The majority of timber harvested

comes from private lands (both industrial and non-industrial). “Currently, Montana’s forest products industry is one of the largest components of manufacturing in the state and employs roughly 7,700 workers earning about $335 million in compensation annually.” (Morgan et al. 2015). The forest products industry accounts for approximately 32% of the total manufacturing jobs in Montana, which contribute $1.1 billion in labor earnings and $14 billion in sales to the state’s economy (Montana Wood Products Association, 2015). In 2014, forest lands produced approximately $600 million in wood and paper products (Morgan et al., 2015).

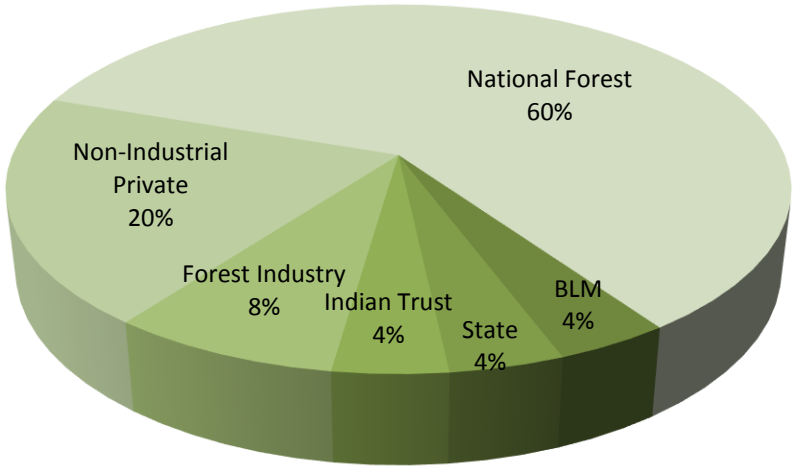


Figure 3-1: Forest Land Ownership in Montana in Year 2015

(Montana Wood Products Association, 2015). The percent of acreages shown do not include federal lands unavailable for timber harvest or “reserved”, such as those in National Parks, wilderness areas, or other special management areas.

Pollution from forestry and silviculture operations can include nutrients, sediment, and temperature (pollutants), or streamside (riparian) habitat alterations and flow alterations (non-pollutants). Almost half (48%) of all forested watersheds contain at least one impaired stream reach or waterbody (Montana Department of Natural Resources and Conservation, 2010). Montana has 157 waterbodies (stream segments or lakes) identified as impaired (at least in part) from forestry-related activities; forest roads and silviculture are the primary sources of impairment.

Forest Road Construction and Use

Unpaved roads are the primary source of sediment in forested watersheds (Sugden and Woods, 2007). Forests roads running adjacent to streams are often called “legacy roads”. These are roads originally built decades ago before modern BMPs were developed. Stream crossings and/or legacy roads can act as a direct source of sediment delivery and may impact the natural functioning of streams by limiting the stream’s capacity to flood at regular occurrence intervals or move across the floodplain. Implementing contemporary BMPs, where roads are properly located, well designed, and well maintained (including keeping stream crossings to a minimum), can dramatically reduce the negative impacts on water quality.

Silvicultural Harvesting in Riparian Areas

Timber harvesting in riparian areas has the potential to adversely affect riparian functions, harming water quality and biological integrity. Riparian functions threatened by indiscriminate streamside harvesting include shading (affecting water temperature), large woody debris recruitment, nutrient cycling, streambank stability, sediment filtration, and flood-flow attenuation. Montana’s Streamside

Management Zone (SMZ) law (77-5-301 et seq. MCA) was passed by the 1991 State Legislature and specifically addresses the protection of these water quality functions within the streamside zones. SMZs have been effective in protecting riparian buffers, and therefore streams, but the effects of historical riparian harvests (e.g., erosion; loss of source for large woody debris) may in some cases be long lasting.

Strategies

Forested lands cover close to 25% of Montana. Therefore, strategies for reducing the effects of NPS pollution from forestry activities must be effectively implemented across forest lands and management agencies. Montana forestry professionals have developed strategies for reducing forestry-related NPS pollution. In addition to these, the U.S. Forest Service has developed a National Best Management Practices (BMP) Program to improve management of water quality consistent with the CWA and state programs. **Appendix A** describes the most commonly used forestry BMPs. **Appendix E** lists partners and resources that may be able to provide additional information on forestry BMPs.

Strategy 1: Maintain and improve Montana's Forestry Best Management Practices program.
The Forestry Division of the Montana Department of Natural Resources & Conservation (DNRC) organizes voluntary forest practices field reviews via an interdisciplinary team that reviews recent forest harvest activities of participating landowners. Since 1990, assessment teams have examined the use of forestry best management practices biennially across four ownership types (state, federal, industrial, and non-industrial private landowner) and have shown that forestry BMPs for new forestry operations are effectively applied across ownership types (Sugden et al., 2012). In 2016, assessments showed forestry BMPs were properly applied 97.5% of the time. On sites where BMPs were inadequately applied, only one site had a major departure, resulting in sediment delivery to a waterbody (Ziesak, 2016).

Strategy 2: Support implementation of best management practices and actions to restore and maintain water quality conditions
Historical forestry practices, such as poorly designed or located roads and removal of stream-side forests, have increased sediment loads and instream temperatures to varying degrees. Waterbodies impaired from past forestry practices can benefit from BMPs that relocate or reconstruct roads with effective drainage and enhanced buffers of woody streamside vegetation.

Strategy 3: Improve collaboration to implement and monitor BMPs.
In order to minimize NPS pollution from forest sources and improve water quality, it is essential that federal, state, and local agencies, as well as private landowners, collaborate to identify and implement BMPs on forested lands. Montana's NPS Management Program supports collaborative forestry BMP through individual implementation and through development and implementation of Habitat Conservation Plans (HCPs) that outline forest-riparian habitat policies and standards for fish and wildlife. These plans can include: reducing sediment delivery from existing roads; monitoring the effectiveness of road BMPs; measuring riparian and canopy cover; identifying the effects of changes in water temperature; and monitoring riparian conditions. DNRC and Weyerhaeuser are currently implementing HCPs in cooperation with the U.S. Fish and Wildlife Service. Individual private landowners have worked to address water quality concerns through cooperative efforts with local, state and federal agencies.

Another form of collaboration is to support and participate in Forest Service interdisciplinary reviews, including BMP implementation and effectiveness monitoring, in watersheds identified as high priority for restoration. Restoration activities typically include reducing the effects of old roads, reducing fire risk, and improving the structure and functioning of riparian areas.

3.1.3 Hydrologic Modification

Dams, reservoirs, stock ponds, diversions, etc. are vital and integral to Montana's economy and way of life. This infrastructure provides water for hydroelectric power, crops and livestock, domestic water supplies, industrial applications, recreational opportunities, and flood protection. However, these structures and practices can have negative consequences on water quality and aquatic life.

Hydrologic modification can be defined as changes in the amount, location, timing, or energy of water in a river or lake. Hydrologic modification consists of four primary activities:

1. **Storage.** Examples include dams, reservoirs, fish and stock ponds.
2. **Water Withdrawal:** For uses such as irrigating crops, stock watering, municipal water supply, and industrial applications.
3. **Transfer.** Diversion of water at an upstream location and later returning flows further downstream; diversion of water from one stream and returning flow to a different stream; inter-basin transfers.
4. **Physical Alterations in Floodplain, Riparian, Wetland, and Channel Structure.** Streambank armoring; filling of wetlands for development and construction; flood control dikes; road and railroad grades; bridges; dams; diversion structures; channelization; dredge/placer mining.

Some of the negative water quality impacts from hydrologic modification include:

- Reduction in riparian vegetation along streams which can lead to increased bank erosion, increased channel migration, increased water temperature and habitat loss
- Increased water temperature from reduced streamflow
- Increased bank erosion rates from water transfers that result in unnaturally high stream flows
- Increased sediment deposition from a lack of stream flushing flows
- Reduction in pollutant dilution capacity

Under Montana's NPS Management Program, hydrologic modification is often identified as a source of elevated pollutant loading consistent with many of the above listed water quality impacts. Hydrologic modification can also be identified as a cause of impairment, often due to late season flow reductions that negatively impact aquatic life habitat. Montana DEQ has identified more than 300 waterbodies or stream segments that are impaired due to some type of flow alteration. Many of these waters are also identified by Montana Department of Fish, Wildlife and Parks (FWP) as being chronically dewatered.

In some instances, hydrologic modifications may actually help protect or benefit beneficial uses, such as fisheries and aquatic life. Seasonal releases below dams provide some of the highest quality fisheries in the state. Subsurface return flows and dam releases can contribute to late season base flow if the return flows are greater than any concurrent irrigation diversions. Dams often reduce flooding impacts and provide hydroelectric power. Furthermore, reservoirs created by dams often provide high quality fishing, boating and other recreational opportunities.

Strategies

Where appropriate, the negative water quality impacts from hydrologic modifications will be reduced through a combination of strategies discussed below. These strategies will be implemented while ensuring water rights are respected.

Strategy 1: Support efforts to minimize or avoid development within floodplains, along streambanks, within wetlands and adjacent to lakes.

This strategy will be pursued primarily through education and outreach to landowners, developers and other decision makers about the water quality impacts and property risks associated with development and other activities that alter the amount, location, timing, and energy of water in streams or lakes. It will also be pursued by supporting existing regulations that help avoid or minimize this type of development.

Strategy 2: Support efforts to restore natural hydrologic conditions

This strategy will be pursued by supporting actions that restore floodplain connectivity and function and improve natural stream processes. It also involves implementing BMPs and endorsing land use modifications that minimize disturbance within floodplains, riparian areas, wetlands and along streambanks. Efforts to improve stream flows during critical low flow periods will be supported, while at the same time ensuring no harm to water rights. Montana recognizes that it is ultimately up to local users, agencies, and entities to voluntarily improve instream flows through water and land management, which may include irrigation efficiency improvements and/or instream water leases.

This strategy includes restoring fish passage where appropriate. FWP, Trout Unlimited, and other partners will be encouraged to continue efforts to retrofit diversion and other structures to improve fish passage.

Strategy 3: Promote practices and activities that help minimize the impacts of hydrologic modifications

Implementing this strategy involves promoting and applying many of the numerous BMPs and other practices and activities that can help minimize negative impacts from hydrologic modifications, including:

- Promoting practices and projects that minimize changes in the amount, location, timing, and energy of water in streams and lakes
- Supporting Department of Natural Resources and Conservation's Water Management Division drought resilience planning
- Ensuring that Clean Water Act and other environmental improvement funding sources used toward irrigation efficiency projects are designed to ensure that water savings will result in improved instream flows
- Promoting the use of open-bottomed culverts or wide-spanning bridges instead of traditional corrugated metal pipe
- Promoting the use of "soft" bank armoring (riparian vegetation, brush-toe), and limiting the use of "hard" bank armoring (rip-rap, rock, and log bulwarks) to the minimum amount necessary to protect critical infrastructure
- Providing geomorphic and flow- contextually appropriate guidance and recommendations to parties engaged in stream restoration

Strategy 4: Mitigate hydrologic modifications where possible

Mitigation activities will be encouraged and supported where hydrologic modification cannot be avoided. This includes promoting public and private support for wetland, streambank and other types of mitigation banking and efforts to advance restoration and mitigation science.

3.1.4 Mining and Industry

In Montana, mining includes activities associated with the removal of hard rock minerals, ore, coal, sand and gravel. Industry includes activities associated with the manufacturing of tangible products, and extraction and refinement of oil and gas. Frequently, state and federal regulatory programs that address pollution from mining also address pollution from industrial sources. Some of these "crossover" programs are identified below and described in greater detail in **Section 6.0** Enforceable Regulatory Programs.

- State Superfund (CECRA)
- Federal Superfund (CERCLA and SARA)
- Montana Hazardous Waste Act

Figure 3-2, below, depicts CECRA and CERCLA sites throughout Montana. These sites represent significant land and/or water contamination from mining, industry, and a small number of livestock operations.

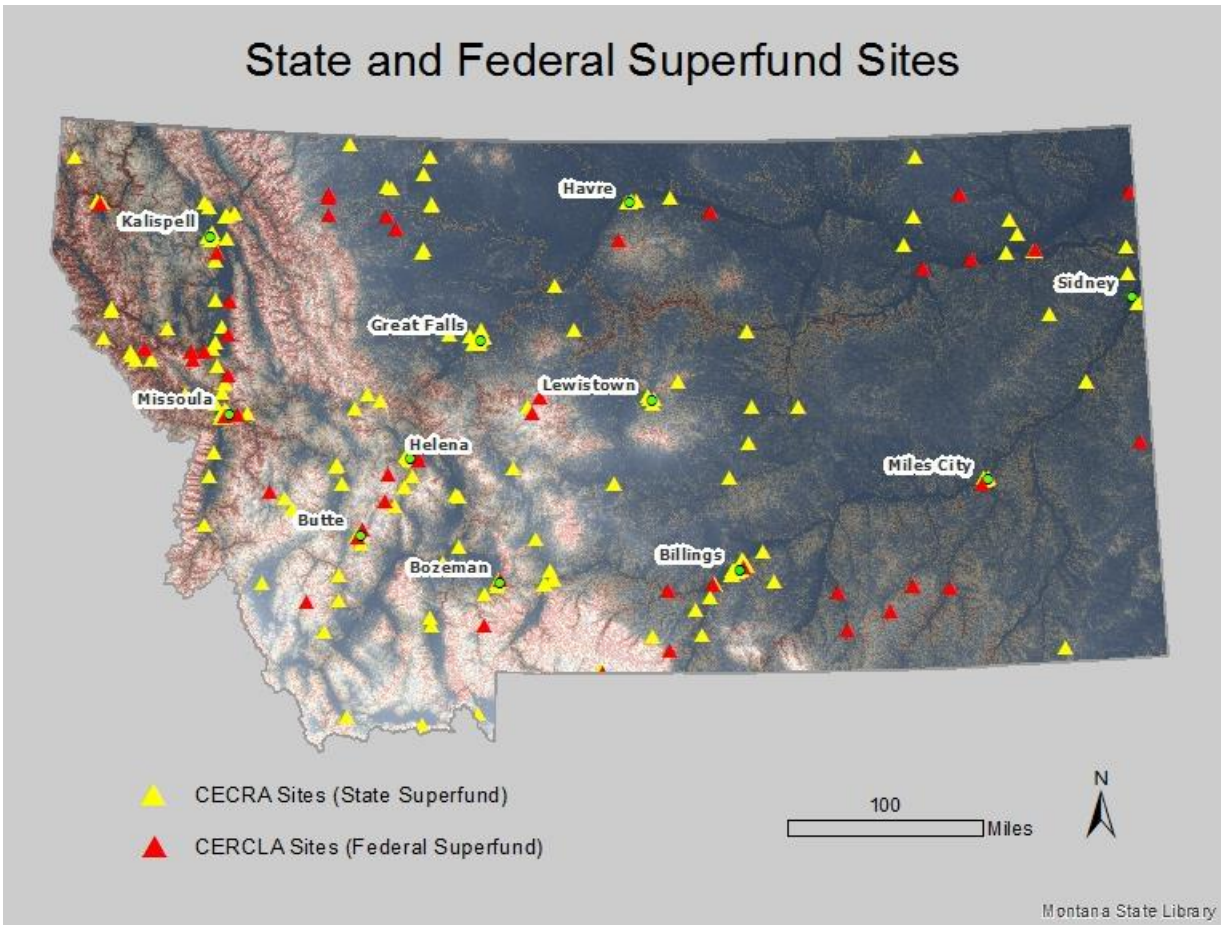


Figure 3-2. Montana CECRA and CERCLA sites

Contribution to Nonpoint Source Pollution from Mining

NPS pollution from mining is typically the result of one or more of the following processes:

- stormwater runoff (sediment, metals, salts, petrochemicals)
- acid mine drainage (acid, lead, copper, zinc, cadmium, other heavy metals)
- direct additions of waste rock, spoil piles, or placer piles (riparian and wetland habitat loss, sediment, metals)

Strategies

Working mines are regulated under federal and state permits and laws (see Section 6). Discharges from active mine sites are considered point-source discharges and are controlled by the permit conditions issued under the Montana Pollutant Discharge Elimination System (MPDES). In order to obtain a permit, mine operators must pay a fee and agree to maintain mine site conditions that protect water quality. In many cases, they must also post a bond covering liability for cleanup and restoration.

Abandoned mines often include point sources and nonpoint sources of pollution. Discharges from abandoned mines are not typically covered under MPDES permits, leaving their control and abatement up to non-regulatory programs and the efforts of various agencies, private organizations, and individuals often in collaboration with DEQ.

DEQ's Abandoned Mine Lands Program (AML) has identified approximately 3,000 abandoned or inactive hardrock mine and milling sites in Montana. Approximately 128 priority hardrock mines were incorporated into a priority site list (**Figure 3-4 and Table 3-2**). AML has addressed many long abandoned mine and mill sites. Montana is also home to approximately 3,200 abandoned coal mines. Hundreds of these mines have been reclaimed since the passing of the Surface Mining Construction Reclamation Act (SMCRA) in 1977.

The map in **Figure 3-3** depicts the locations of the 128 abandoned mine sites that are currently on the State of Montana's prioritized short list of sites needing to be addressed. Some, though not all, of these sites contribute pollution to state waters. The tables below indicate how many of the 128 sites are located within each county. If a county is not included in the tables, then no prioritized sites exist within that county.

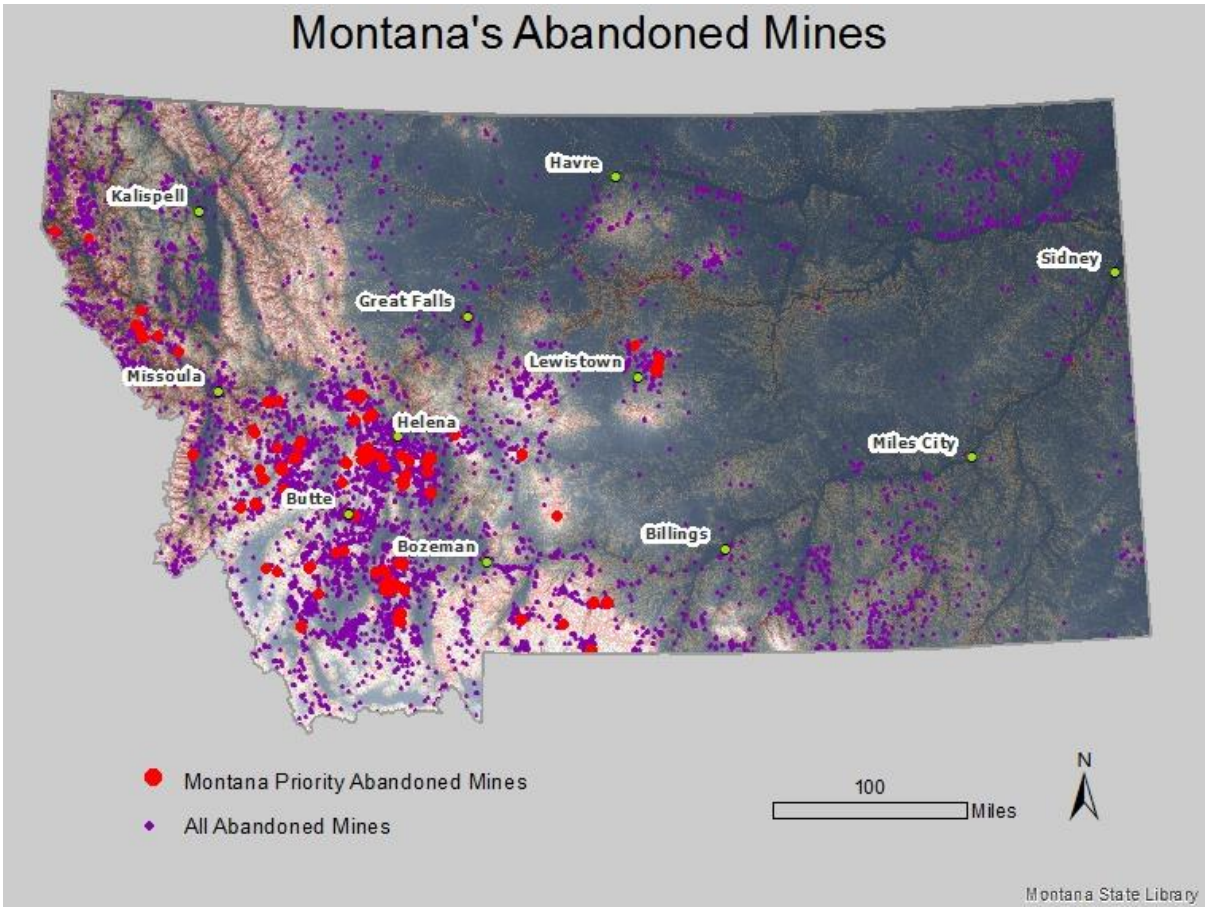


Figure 3-3 Locations of Montana's Abandoned Mines

Table 3-2. Montana's Counties with Prioritized Abandoned Mine Sites

COUNTY	# Sites
Beaverhead	8
Broadwater	9
Deer Lodge	2
Fergus	6
Granite	21
Jefferson	11
Lewis & Clark	10
Lincoln	1
Madison	19
Meagher	3

COUNTY	# Sites
Mineral	4
Missoula	5
Park	4
Powell	13
Ravalli	2
Sanders	4
Silver Bow	3
Stillwater	2
Sweet Grass	1
Total	**128**

Continuous inventory of abandoned mines identifies hazardous mine openings and impacts to surface water and groundwater. These issues are addressed through a combination of Office of Surface Mine Reclamation and Enforcement (OSMRE) funds, Orphan Share funds, and in collaboration with DNRC, U.S. Forest Service, local chapters of national organizations (e.g., Trout Unlimited), and county governments that also contribute funds through grants, direct and in-kind contributions.

Strategy: Improve collaboration between the DEQ Watershed Protection Section (WPS) and the DEQ Abandoned Mine Lands (AML) program to address non-permitted pollution from mining-related sources.

As funding for mine reclamation becomes increasingly scarce, agencies and organizations face an ever-increasing need to pool technical and financial resources in order to complete mine reclamation projects. The DEQ may use Section 319(h) funds to pay for abandoned mine site reclamation projects designed to protect water quality if those activities meet both of the following conditions: (1) the activities are not specifically required by a draft or final NPDES/MPDES permit and (2) the activities do not directly implement a draft or final NPDES/MPDES permit. DEQ will:

- design, fund, implement, and monitor on-the-ground projects to remediate water pollution from abandoned mines or portions of abandoned mines
- educate landowners, land managers, conservation districts, watershed groups, and others seeking to address pollution from abandoned mines

Contribution to Nonpoint Source Pollution from Industry

Pollution from industrial sources (manufacturing, oil refining, chemical production) is typically the result of direct discharge, stormwater runoff, seepage of chemicals into groundwater (which may come into contact with surface water), or erosion of contaminated sediments. Pollution from active, industrial facilities is typically regulated under a point source discharge permit. Pollution from inactive facilities, and in rare cases pollution from some active facilities, is addressed through application of the site remediation programs identified below and described in greater detail in Section 6.0 Enforceable Regulatory Programs.

- Federal Superfund (CERCLA and SARA)
- State Superfund (CECRA)
- State Water Quality Act (WQA) Groundwater Remediation Program (GRP)

- State and federal underground storage tank release laws
- Montana Hazardous Waste Act
- Montana Solid Waste Management Program

Strategies

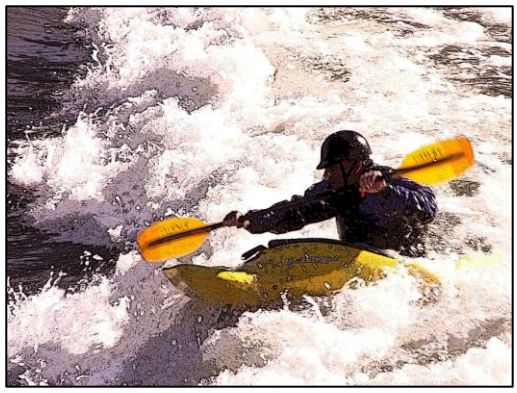
Montana will use the following regulatory and voluntary methods to address nonpoint source pollution from industrial sources.

Strategy 1: Using the authorities and funding sources described above, DEQ's Waste Management and Remediation Division will continue to investigate and remediate NPS pollution from industrial sources.

Strategy 2: DEQ's Waste Management and Remediation Division will continue to collaborate, where appropriate, with EPA to investigate and remediate pollution from federal Superfund sites.

Strategy 3: Collaborate with others to address pollution from industry-related sources.
Other state and federal agencies, as well as private individuals, may become involved in efforts to reduce pollution from industrial sources. The NPS Management Program will work with these stakeholder groups as needed and as resources permit.

3.1.5 Recreation



According to the Outdoor Industry Association, outdoor recreation generates $1.5 billion in wages and salaries, $403 million in state and local tax revenue, and 64,000 direct jobs in Montana (Montana Department of Fish, Wildlife and Parks, 2014). Approximately 95% of Montanans feel that outdoor recreation is important to their quality of life. Approximately 88% of Montana residents participated in some form of outdoor recreation in the past 12 months with high participation in water-based activities (Montana Fish, Wildlife and Parks, 2014). Water-based recreation includes activities on lakes and rivers; along the shores of rivers, streams, and lakes; and in riparian areas. Intensive or inappropriate recreational activities can harm water quality, and poor water quality can degrade recreational activities.

Many recreational activities in Montana are directly related to surface water, and those activities can contribute to nonpoint source pollution and negatively affect water quality. There is a high potential for water quality degradation associated with boating activities from aquatic invasive species, contaminated bilge water, petroleum products, trash, and solvents being released into state waters. In addition, boat wakes can increase bank erosion. If improperly designed, marinas can cause water quality problems by destroying habitat and restricting water flows. Recreational uses, such as swimming, water skiing, fishing, and others, are adversely affected by water quality degradation.

In addition to water-based recreational activities, activities on upland areas can also contribute to NPS pollution. Many of the unpaved roads on public lands (**Section 3.1.2**) remain open to sustain recreational activities. Repeated and unauthorized travel off of designated roads by vehicles, ATVs,

motorcycles, and mountain bikes contribute to riparian damage and excess sediment runoff into nearby streams and lakes.

Strategies

The Montana NPS Management Program will support the following strategies be used to increase implementation of water quality-based BMPs for recreational activities.

Strategy 1: Educate and engage Montana's recreation community.

Quality outdoor recreation relies on a clean and healthful environment. Montana Fish, Wildlife and Parks presented a vision for recreation management in Montana that encourages coordinated management that crosses agency boundaries and develops partnerships across jurisdictions at all levels. One of their priorities is to promote stewardship and sustainability that engages users as stewards of land and water resources through volunteer opportunities and citizen science programs (Fish, Wildlife, and Parks, 2014).

- Enhance agency coordination to ensure the recreation community understands their potential impacts to water quality
- Engage the fishing community in ongoing stream restoration and fish habitat improvement projects
- Promote responsible boating through educational campaigns, materials, and signage

Strategy 2: Promote and support responsible water-based recreation.

In order to promote responsible water-based recreation, the NPS Management Program supports the proper development and maintenance of marinas, fishing access sites, and other recreational facilities. These facilities can provide essential services for safe and effective disposal of wastes, particularly sewage and petroleum products.

- Properly site and establish boat ramps to minimize bank erosion and habitat loss
- Address unofficial trails to and along the water
- Properly site, place, and maintain vault latrines
- Promote responsible boating through educational campaigns, materials, and signage

Strategy 3: Support off-highway travel planning and promote responsible OHV use.

Motor vehicles are a legitimate and appropriate way for people to enjoy public lands with responsible use and proper management. Local, state, and federal agencies can proactively address effects from off highway vehicles (OHV) by developing polices and BMPs to monitor, minimize, and prevent NPS pollution from OHV use. In general, this can be done through the U.S. Forest Service's and Bureau of Land Management Travel Management Plans. These plans provide guidance for the appropriate use of public lands and will help ensure the protection of water quality in Montana. In watersheds where water quality is impaired, agencies can evaluate the current extent of OHV access, work to reduce access near impaired waters, and improve and maintain degraded routes.

- Review federal public land Travel Management Plans for addressing water quality protection
- Support responsible OHV use through educational campaigns, materials, and signage

3.1.6 Transportation

The Montana Department of Transportation (MDT) is the primary agency that deals with transportation issues in Montana. MDT has maintenance responsibilities for 12,946 miles of roadway and 4,510 bridges statewide. Additionally, Montana has approximately 3,125 miles of active main-line track owned and operated primarily by BNSF Railway. Local governments maintain additional roads and bridges throughout the state. Transportation is also a significant source of jobs and economic development in local communities. Transportation construction and maintenance projects employ approximately 16,000 people every year. Between 2012 and 2016, MDT awarded 449 construction projects totaling nearly $1.2 billion (Montana Department of Transportation, 2016).

Contribution to Nonpoint Source Pollution

Many of the transportation routes in Montana are located in floodplains adjacent to lakes, wetlands, rivers, and streams. If not properly managed, these transportation routes (roads, highways, railroads, etc.) can be a significant source of NPS pollution, especially where bridges cross over water. Litter from vehicles, oils and gasoline, and traction sand and road salt all accumulate in transportation corridors, potentially ending up in surface waters. In 2016, MDT crews applied 170,640 cubic yards of traction sand and 8,793,620 gallons of chemical deicer and brine (Montana Department of Transportation, 2016). Transportation routes that travel directly along streams and rivers can further limit lateral migration and floodplain function, affecting sediment transport and bank erosion.

Strategies

There are a variety of programs and practices that limit the potential effects of NPS pollution from transportation sources, including stormwater permitting and construction BMPs, the MS4 Program, wetland and stream mitigation procedures, corridor planning, and the Adopt-A-Highway program. For more information on the specifics of these programs and partners see **Appendix E and A**.

Strategy 1: Increase collaborative efforts to manage NPS pollution from transportation sources.
In order to minimize NPS pollution from transportation sources and improve water quality, it is important for DEQ and other natural resource agencies to work with MDT to increase information sharing and project planning.

- Work with MDT to identify opportunities and priorities to reduce NPS pollutants from Montana's surface transportation system.

Strategy 2: Increase nonpoint source pollution awareness for road maintenance personnel.
Because road maintenance personnel work on site, they can have the biggest effect on transportation-related sources of NPS pollution. An effective management tool for limiting NPS pollution from transportation sources is to develop and/or

distribute educational materials and trainings specifically for road maintenance personnel. The tools would raise awareness about NPS pollution and workers' roles in preventing and limiting it. Specifically, DEQ will work to:

- Continue efforts of training personnel and equipment calibration to ensure that the correct quantities of sand and chemical deicers are used to provide safe roadways for traveling
- Proper implementation of stormwater runoff BMPs on transportation construction sites to reduce sediment delivery to waterways

3.1.7 Urban and Suburban Development

Montana surpassed a population of one million people in 2012 with urban areas experiencing the highest population growth. A total of 56% of Montanans are now living in urban areas (Montana Fish, Wildlife and Parks, 2014). According to the 2010 Census, 41.7% of Montana's population lives in urban areas with over 25,000 people. NPS pollution from urban and suburban sources is generated by a broad range of activities associated with domestic, municipal, industrial, and commercial land development and uses. Population density and intensity of land use in urban and suburban areas results in inherently higher concentrations of pollutants in waters draining from these areas. Adequate water quality protection is more challenging to achieve in urban and suburban areas because it depends upon the collective actions of a greater number of people relative to more sparsely populated areas.

Because individuals and businesses continually generate waste, their cooperation and stewardship is essential for preventing water quality degradation. Although complete elimination of NPS pollution generated from urban and suburban land uses is impossible, Montanans must make substantial progress to ensure that preventable and controllable sources of NPS pollution do not cause water quality impairments.

Contribution to Nonpoint Source Pollution

Rapid development and growth require specific attention in order to protect water quality. Stormwater runoff, residential waste disposal, and alterations of riparian areas are major sources of nonpoint source pollution in Montana's urban and suburban areas.

Stormwater

Snowmelt and rainfall that does not infiltrate into the ground runs off the landscape as stormwater. In urban areas, where a large portion of land is covered with impervious surfaces (e.g., streets, parking lots, roofs) stormwater pollutant concentrations increase and contribute to waterbody impairments. Urban stormwater pollutants include nutrients (e.g., fertilizers), sediment, increased water temperature, oil and grease, PCBs, metals, bacteria, and viruses. Polluted stormwater can harm aquatic organisms and their habitat, contaminate drinking water supplies, and render waterbodies unfit for recreational activities.

As the percentage of impervious surfaces in a watershed increases, so does the volume of stormwater and pollutant loads delivered to waterbodies. The DEQ issues a Montana Pollutant Discharge Elimination

System (MPDES) general permit for stormwater discharges associated with small municipal separate storm sewer systems (small MS4s), construction activity, and industrial activity. MS4 permits apply to Montana's seven largest cities - Billings, Missoula, Great Falls, Bozeman, Helena, Butte, and Kalispell. This general permit requires permitted municipalities to develop a stormwater management program that includes six minimum control measures. Permittees must then implement best management practices consistent with these control measure for ensuring that the discharge of pollutants to waterbodies from stormwater is reduced "to the maximum extent practicable". Additional voluntary practices can be implemented by urban residents to reduce stormwater pollution, such as reducing lawn fertilization, pet waste removal, and installing rain barrels or rain gardens to temporarily store runoff.

Suspended sediments tend to be the largest pollutant loads to receiving waters in urban and suburban areas. Soils eroding from construction sites and traction material (road sanding) are major source of suspended sediment. Higher percentages of impervious surfaces can also drastically alter hydrology. Water that would otherwise infiltrate soils, providing moisture for vegetation and recharging groundwater, is quickly routed to waterbodies after snowmelt or rain events. Not only does altered hydrology have severe consequences for local aquatic and riparian habitats, but it also increases the risk of property damage by flooding and eroding streambanks.

Waste Disposal

Residential and commercial waste disposal includes a variety of pollutant sources, such as septic systems, pet wastes, solid waste disposed in landfills, and hazardous chemicals and materials.

"Sediment runoff rates from construction sites are typically 10 to 20 times greater than those from agricultural lands and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction activity can contribute more sediment to streams than was previously deposited over several decades."

(American Society of Civil Engineers, Urban Water Resources Research Council, 1992)

The primary water quality concerns with septic systems include the contamination of groundwater and surface water by nutrients (nitrogen and phosphorus), pathogens (bacteria, parasites, and viruses), household chemicals, and chemicals derived from pharmaceutical and personal care products (PPCPs). A properly functioning septic system can significantly reduce levels of nutrients and bacteria in wastewater; however, with conventional designs even a properly functioning septic system will release fairly high amounts of nitrogen in the form of nitrate, with estimates ranging from 26 to 75 mg/L (U.S. EPA, 2002). In some surface waters, total nitrogen levels as low as 0.25 mg/L and nitrate levels as low as 0.1 mg/L can contribute to nuisance algae blooms that harm aquatic life and degrade recreational uses. Under some circumstances, septic systems that may impact surface waters due to nutrient discharges are evaluated for conformance with the state nondegradation rules and numeric water quality standards.

Based on scientific literature, a properly designed and approved septic system should be installed as far away from water as possible, but at least 100 feet. Most platted lots have a pre-approved location where the leach field must be constructed. The effectiveness of septic systems in treating PPCPs is not known and is likely to be compound specific. However, many studies across the country, and several studies in Montana, have detected PPCPs in both groundwater and surface water. Maximum contaminant levels for individual PPCPs, as well as the synergistic effects of PPCPs, are largely unknown.

Landfills, particularly historical facilities, which were unpermitted and unlined, pose a threat to surface water and groundwater quality because carcinogenic and toxic substances may leach into aquifers or surface waters. For example, bisphenol-A, fire retardants, and plasticizers, which can be toxic and/or carcinogenic have been found in groundwater and/or streams across the nation (National Capital Poison Center, 2012). As of 2017, there were 69 licensed landfills in Montana, which includes 34 Class III facilities. Class III landfills are not lined but do not pose a threat because they accept only inert materials such as rock, brick, and untreated lumber.

Alteration of Urban and Suburban Riparian and Wetland Areas

When complex riparian systems are simplified or reduced in size by changing the vegetation, soils, and/or water-flow patterns, their ability to serve as "sinks" for pollutants (i.e., areas that filter pollutants from upland runoff) can be greatly diminished. Substantially degraded riparian areas do not filter pollutants from upland runoff and the riparian area itself becomes a source for pollutants. For example, as riparian soils erode, they begin to export sediment and nutrients to waterbodies.

Riparian areas that have been converted to lawns or small acreage pastures for domestic livestock can contribute to: higher levels of instream nutrients, sediment, bacteria, and algae; higher summer water temperatures and lower dissolved oxygen; greater amounts of channel erosion; and greater damage to property by flooding.

Three types of alteration to urban and suburban riparian areas are currently of greatest concern to the NPS Management Program:

1. The alteration of native vegetation, soils, and/or hydrology of riparian areas.
2. Residential and commercial development within riparian areas, floodplains, and/or channel migration zones.
3. The cumulative effects on watersheds by heavy riparian area usage from domesticated animals on suburban small acreages.

Strategies

DEQ intends to use and promote the following strategies to increase implementation of water quality-based BMPs for urban development practices. For BMPs related to stormwater see **Appendix A**.

Strategy 1: Work collaboratively between regulatory and non-regulatory programs to protect water quality from stormwater pollution.

Many stormwater sources of pollution are regulated by discharge permits issued under the Montana Pollution Discharge Elimination System (MPDES). The three types of stormwater MPDES permits that apply to urban and suburban areas are industrial, construction, and municipal separate storm sewer systems (MS4). Montana also addresses stormwater through the state's subdivision permitting process and local government development regulations.

Stormwater that is not addressed by an MPDES or subdivision permit can be managed through voluntary BMPs.

- Characterize and assess the effects of stormwater pollution on the quality of state waters
- Provide technical and financial assistance to local stakeholders for educational and outreach campaigns that address stormwater pollution prevention and control
- Increase the effectiveness of Montana's stormwater permitting program
- Increase the effectiveness of Montana's subdivision permitting program
- Provide technical and financial assistance to plan and implement voluntary BMPs by public and private entities for reducing and controlling stormwater pollution
- Promote low impact development
- Participate in EPA's revised stormwater rule-making

Strategy 2: Maintain and improve programs that address residential septic systems, solid waste disposal, land-applied bio-solids, and hazardous household wastes.

Proper disposal of residential waste is essential to protecting water quality from NPS pollution.

- Continue to assess contributions of septic systems to surface water-quality impairments, develop TMDLs that address pollutant loading from septic systems, and provide technical and financial assistance for projects that focus on specific septic system issues
- Increase monitoring at closed landfills to detect groundwater contamination
- Continue to provide technical assistance to solid waste professionals

Strategy 3: Encourage the adoption of local regulations that protect the functions of floodplains, riparian, and wetland areas to address the cumulative effects of NPS pollution from urban and suburban development on water quality.

Functioning riparian areas in urban and suburban areas are important in protecting water quality. They maintain the integrity of stream functions and act as natural filters for stormwater runoff. Impacts from public and private infrastructure can limit the extent of riparian areas and the degree to which streams can access their floodplains. Maintaining and improving the health and extent of native vegetation and soils is key to ensuring that riparian areas can function properly. The soils, vegetation, and hydrological characteristics of intact riparian areas help maintain water quality standards.

- Support the development and adoption of guidelines and regulations addressing urban and suburban development near waterbodies
- Support channel migration zone mapping as an educational and decision-making tool

3.2 STRATEGIES FOR OTHER WATER QUALITY CONCERNS

Aquatic invasive species, atmospheric deposition, and climate change can have negative effects on Montana's waterbodies and efforts to control the impacts of NPS pollution. The contributing sources can be generated at a scale outside the ability of a single state, or even country, to control. Nevertheless, Montana has strategies for reducing some of the potential contributing sources and water quality effects from these three water quality concerns.

3.2.1 Aquatic Invasive Species

Aquatic Invasive Species (AIS), (also referred to as exotic, non-indigenous or non-native species), are organisms that invade aquatic ecosystems beyond their natural, historic range. These species include non-native fish, mussels, clams, plants, and disease-causing pathogens.

AIS can overwhelm lakes and rivers, kill or displace native animals and plants, and damage the ecosystems that keep our waters clean and abundant. They can damage boats and gear, clog water pipes and hydropower facilities, obstruct community water sources, and constrict irrigation systems. Once an invasive species is established, it can be extremely costly and/or logistically impossible to eradicate. Every water user in the state has a vested interest in protecting Montana's water resources from the effects of AIS. Prevention, early detection, and education are the best strategies to combat this problem.

Several state agencies collectively implement the Montana Aquatic Invasive Species Management Plan. The goal of this plan is to minimize the harmful impacts of AIS by limiting or preventing the spread of AIS into, within, and out of Montana. This goal is achieved through coordination and collaboration between partner agencies and stakeholder groups; prevention of new AIS introductions; early detection and monitoring; control and eradication of new and established AIS populations; and outreach and education efforts.

Montana also developed the "*Montana Invasive Species Strategic Framework"* in January 2017, available from the Department of Natural Resources and Conservation's Conservation and Resource Development Division. Since the detections of invasive mussels in fall 2016, Montana has ramped up its efforts to prevent and control the spread of aquatic invasive species. This includes enhanced outreach coordination among relevant programs including the NPS Management Program. This coordination benefits both programs by increasing stakeholder awareness of actions they can take to control both AIS and NPS pollution. Inclusion of AIS within this Plan represents one component of this coordination.

3.2.2 Atmospheric Contributions

Montana's 2016 Water Quality Integrated Report identifies atmospheric deposition as a probable source of impairment for five of Montana's largest lakes and reservoirs (Flathead Lake, Fort Peck Reservoir, Medicine Lake, Hauser Lake, and Holter Lake) and five stream/river segments. Pollutants attributed to atmospheric deposition in Montana include mercury and other metals, nitrogen, phosphorus, and chemicals such as PCBs. Large forest fires can contribute significant amounts of particulates as well as nutrients over landscape-scale and larger areas via smoke, precipitation and deposition. Mercury is widespread in the environment and low concentrations naturally occur in soils. Geological deposits as well as other sources, such as emissions from coal-fired power plants, have led to elevated levels of mercury in fish in many areas of Montana. Further information regarding mercury and PCBs in Montana fish populations can be found in the Montana Sport Fish Consumption Guidelines published by the Montana Department of Fish, Wildlife and Parks. Controlling atmospheric deposition requires significant coordination among state, regional, national, and international agencies because sources may be far removed from affected waterbodies.

Given the resource constraints of the NPS Management Program, and the large-scale, often remote and/or diffuse nature of the sources of atmospheric contributions, DEQ has not yet prioritized actions from this source. When other more immediate and direct nonpoint source pollution sources are well controlled and addressed, DEQ may consider additional strategies to reduce atmospheric pollutants.

Montana's NPS pollution control strategy for atmospheric deposition is to:

- Assess sources of water quality pollution in the state

- Collaborate with DEQ's Air Quality Bureau (AQB) to identify atmospheric sources of NPS pollution in Montana and recommend actions to reduce sources where possible
- Support EPA's nation-wide air quality monitoring efforts, which include long-term monitoring sites in Montana
- Increase public awareness of atmospheric deposition on water quality using educational and outreach activities through work with DEQ's AQB

3.2.3 Climate Change Contributions

Recognizing the profound implications that climate change has on Montana's water quality and aquatic ecosystems is an important component in planning for the future. While the scope of this plan is limited in its ability address the sources of human caused climate change, the practices articulated can help mitigate some of the causes and their effects on water quality. These practices, while intended to improve water quality, can also improve other factors such as the economic and social well-being of Montana into the future. The 2017 Montana Climate Assessment (C. Whitlock et al. 2017) reports that "rising temperatures will reduce snowpack, shift historical patterns of streamflow in Montana and likely result in additional stress on Montana's water supply, particularly during summer and early fall."

Specific to water quality, climate change could result in higher stream temperatures and more intense watershed disturbances (e.g., rain events, flooding, high stream flows, landslides, large forest fires), which would likely lead to negative affects to aquatic life, including native fish populations. In the mountainous regions of Montana, high-elevation snowpack serves as a natural water storage system, slowly releasing water into streams and groundwater throughout spring and summer and recharging in the fall and winter. As air temperatures warm, the snowpack is predicted to develop later and melt earlier, causing peak runoff to come earlier in the winter and spring. This could result in decreased streamflows and reduced groundwater levels in summer and fall (Kinsella, 2005). More precipitation is predicted in the form of rain in future decades, not snow, which could also speed melting of the snowpack. This would increase the likelihood of winter floods resulting in increased streambed scouring and streambank erosion. Periodic droughts may affect the way water is stored and used, diminishing the amount available for release to maintain flows needed for optimal stream temperatures and aquatic habitat (Kinsella, 2005). Isaak, et al. (2015) delineated existing and predicted cold water fishery habitat, showing a significant decline in native western cutthroat and bull trout distribution and populations by 2040 due to increased stream temperatures.

The actions already outlined in this Plan will help mitigate many of these effects while also addressing some of the causes. These actions include:

- Supporting local planning efforts that address water quality impacts associated with climate change
- Supporting temperature and flow monitoring efforts in Montana watersheds
- Protecting and restoring riparian areas with native vegetation, which provides shade and stabilizes banks
- Reconnecting rivers with their floodplains, providing additional groundwater storage
- Protecting and restoring wetland areas with natural vegetation, providing water storage, wildlife habitat, pollutant attenuation and contributing to groundwater recharge to streams and rivers
- Protecting and restoring cold water refuges, including deep pool habitat and cool spring and groundwater return flows to rivers and streams
- Encouraging development of long-term strategies for water use, water conservation, and water lease agreements to maintain optimal flows for desirable temperature aquatic habitat

- Supporting local and statewide efforts to increase drought resiliency
- Increasing public awareness of water quality problems associated with climate change

4.0 ENGAGING MONTANANS IN ADDRESSING NONPOINT SOURCE POLLUTION

[Restoration] science advances by improving our understanding of ecosystem operation, whereas implementation advances by energizing stakeholder demand for restoration (and so, for the science informing that restoration) (Wohl et al., 2005).

NPS pollution in Montana is a statewide issue that spans both public and private lands, and is generated by most land uses. Because implementation of this Plan is voluntary, Montanans play a key role in addressing NPS pollution. A principal goal of the Plan is to inform Montana's citizens about the causes and effects of, and solutions to NPS pollution. Through education and outreach to targeted audiences, this information can be used to increase knowledge and change behaviors that will produce a benefit to water quality. This proactive approach can foster stewardship of water resources, inform policy, and guide management decisions. Since there is no single authority in the state designated to provide education and outreach (E&O) for NPS pollution, a collaborative effort is essential for addressing water quality issues at the state and watershed levels. Nonpoint source E&O can be initiated by DEQ and state and federal agencies, local water quality districts, conservation districts, watershed groups, nonprofit organizations, tribal communities, universities, schools, citizens, and landowners.

Education and outreach efforts should be tailored to fit a variety of needs that best address specific NPS pollution topics. These efforts should have carefully-considered goals, strategies to achieve the goals, and appropriate tools that meet the needs and interests of individual communities or stakeholders. This Plan directs these efforts through three main objectives:

- enhance awareness
- improve knowledge
- develop skills

These objectives are interrelated and build upon each other. Through the identification of targeted audiences and by using an adaptive management approach, achieving E&O goals can effectively change behaviors to protect and restore our water resources.

4.1 TARGETED AUDIENCES

Scientific, social, and economic factors all influence how Montana's water resources are used. Some people recognize Montana's water as a source of biological diversity or clean drinking water, others view it as a source for first-rate recreational opportunities, while still others depend on it for their economic livelihood. Identification of these factors at the statewide and local level can help to find priority areas where E&O can have the greatest benefit to water quality.

E&O efforts broadly target three major audiences:

- **General:** Members of the public who have the ability to affect water quality (e.g., land owners, land managers, recreationists, individuals)
- **Professional:** Those who manage, promote, or influence water resources (e.g., professionals from tribes, universities, federal and state agencies, local governments, watershed groups, nonprofit organizations, private businesses, and real estate agents)

- **Educational:** Educators and school administrators who have a direct influence on students (e.g., K–12 teachers, secondary education professors, curriculum developers)

DEQ works to ensure the scientific credibility of water quality information provided to the above audiences and recognizes the need to work with local stakeholders to ensure that information and decisions are also relevant to their social and economic needs. Ultimately, change is managed and accomplished by the people who live within each watershed. And due to the voluntary nature of many nonpoint source prevention and protection practices, reaching the first audience listed above is essential. Fitting with the diffuse nature of nonpoint source pollution, DEQ relies on a broad network of locally based organizations including watershed groups, conservation districts, and large nonprofit organizations to engage stakeholders at the community and individual levels. DEQ works directly with these groups and through the Montana Watershed Coordination Council (MWCC) and the Soil and Water Conservation Districts of Montana (SWCDM). Engaging Montanans in addressing nonpoint source pollution is not a discrete action, but rather an integral part of all the work DEQ does. MWCC and SWCDM provide critical assistance toward to ensuring that DEQ is responding and proactively providing the necessary tools and information to the needs of all Montanans.

Figure 4.1 illustrates different levels of public engagement. Although all of the levels are used by DEQ, the ultimate goal is to use education and outreach to empower the public in the decision making process, especially at the watershed level.

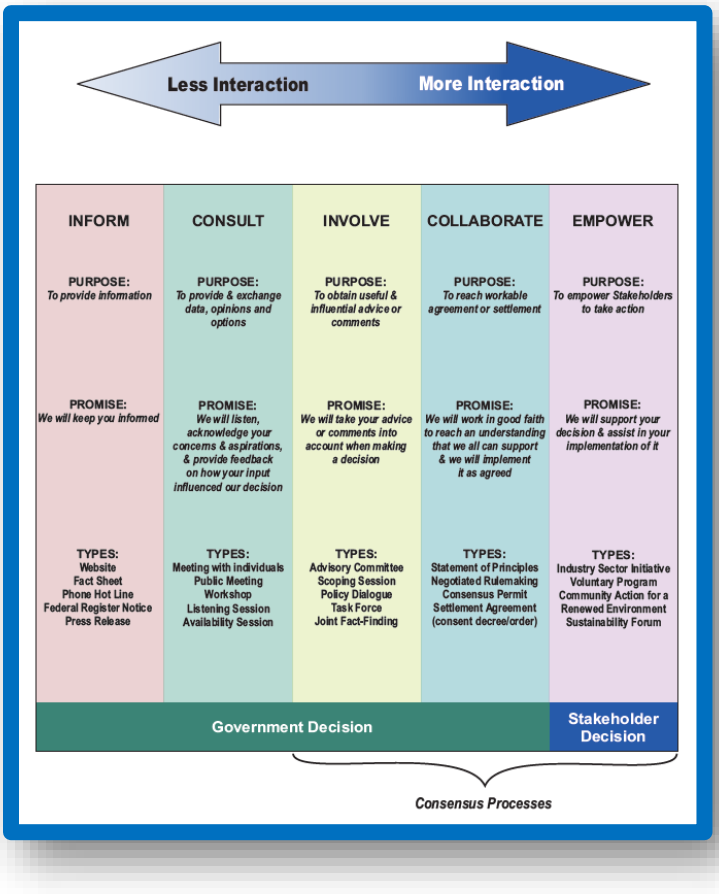


Figure 4.1. Engagement Process Spectrum

4.2 OBJECTIVES AND STRATEGIES

The strategies outlined in this section can be used to create awareness of NPS pollution issues and share solutions with targeted audiences with the ultimate goal of changing behaviors. Many of these strategies support creation and enhancement of locally-led watershed groups as a critical step to implementing many aspects of the state's NPS Management Program. Specific E&O action items can be found in **Section 8**.

Objective 1: Enhance awareness of NPS pollution issues at a statewide and local level.

Strategies:

- Share water quality information through the Clean Water Act Information Center (CWAIC) online
- Develop TMDLs and restoration planning documents for waters not meeting standards and engage the public and stakeholders throughout the process through stakeholder meeting and presentations
- Support locally led education and outreach efforts to targeted audiences through Montana's Education and Outreach Mini-Grant program administered by Soil and Water Conservation Districts of Montana
- Collaborate across professional fields to spread NPS pollution awareness
- Support and promote partnerships with entities such as MWCC, Montana Watercourse, and MSU Extension Water Quality that are committed to providing E&O
- Promote the Nonpoint Source Program and "success stories"

Objective 2: Increase knowledge of NPS pollution issues and solutions in order to foster engagement and empowerment.

Strategies:

- Provide conceptual restoration or implementation strategy details in TMDL documents
- Support the creation and implementation of locally led Watershed Restoration Plans
- Provide citizens with opportunities to acquire knowledge, values, attitudes, commitment, and the skills needed to protect water resources from NPS pollution
- Promote leadership and community collaboration for problem-solving
- Use multi-media applications to promote targeted NPS educational campaigns (riparian and wetland protection, urban growth and development issues)
- Support trainings, presentations, workshops, watershed tours, watershed festivals, and other NPS educational activities
- Engage local watershed groups and the public in evaluating the effectiveness of TMDL implementation activities

Objective 3: Develop skills that will lead to responsible actions taken to decrease NPS pollution. Increase the frequency and magnitude of these actions.

Strategies:

- Turn awareness and knowledge into on-the-ground activities
- Identify and reduce barriers to responsible action and encourage Montanans to take action to protect water resources
- Promote the use of knowledge, skills, and assessments as a basis for responsible decision making and for taking action

4.3 ADAPTIVE MANAGEMENT

Adaptive management allows for change by identifying new priorities and shifting the focus of actions as E&O goals are being met (or not met). Monitoring and evaluating E&O efforts will highlight areas where goals may need to be changed, or actions adjusted. This approach is essential since issues, priorities, and concerns change over time.

5.0 WORKING PARTNERSHIPS

Montana's NPS Management Program relies on many relationships with agencies and organizations that work to protect and restore watersheds and water quality in Montana.

5.1 COORDINATING WITH AGENCIES AND ORGANIZATIONS

One of EPA's requirements for this Plan is to describe how the program will work with other agencies and programs to achieve water quality objectives. To address this requirement, DEQ has prepared an extensive appendix describing the partner organizations and activities with which it collaborates on NPS control activities.

Appendix E provides a brief overview of each of the various cooperating entities and its role and activities in NPS management. These include federal, state, local, and tribal agencies; universities; nonprofit organizations; private companies; and other entities that contribute to the stewardship of watersheds and water quality in Montana. This information is followed by a list of coordination and collaboration opportunities that DEQ's NPS Management Program may pursue within the watershed framework. In many of these descriptions, both long- and short-term goals of the NPS Management Program are addressed. The listing of an opportunity does not imply a commitment or requirement on the part of the collaborating entity. The purpose of the list is to develop an awareness of the opportunities that may lead to voluntary coordination or collaboration between organizations.

It is DEQ's policy to create working partnerships with local agencies and organizations. Conservation districts, water quality districts, watershed groups, and other groups working at a more local level are generally more in tune with problems and are often in a better position to educate citizens and implement projects in their areas. DEQ intends to rely on the information presented in **Appendix E** to guide its efforts to coordinate and collaborate with other agencies and organizations whenever and wherever feasible in order to leverage resources and minimize duplication of effort. DEQ anticipates that the Montana Watershed Coordination Council (MWCC) will be a lead partner for facilitating these opportunities as they arise.

The mission of the MWCC is "uniting and supporting Montana's watershed communities to promote healthy and productive landscapes". Since first formalized in a 1995 MOU signed by over 20 state and federal agencies, MWCC has served as a forum for "hands on" coordination, and sharing of expertise and other resources to local management teams to facilitate development and implementation of management strategies. MWCC sponsors biennial watershed symposiums, provides training opportunities for watershed groups and conservation and supports several committees and work groups (Education, Water Monitoring, Water Activities). As an example of promoting working partnerships, MWCC's Water Monitoring Work Group supports monitoring activities at many different levels (see **Appendix C**). Often, the water monitoring activities themselves are supported through partnerships, such as: U.S. Geological Survey, irrigation companies and conservation districts; local water quality districts, DEQ and NRCS; and volunteer monitoring efforts, DEQ and Montana State University Extension Water Quality.

DEQ's Watershed Protection Section staff play a critical role in facilitating interagency and partner organization outreach, communication and coordination. Most staff have liaison duties that provide

essential representation for the nonpoint source program. As examples, several staff serve as workgroup leaders or in a leadership role with the Montana Watershed Coordination Council (MWCC).

5.2 FUNDING AND OTHER RESOURCES FOR NPS MANAGEMENT PROGRAM IMPLEMENTATION

Funding resources for implementing this Plan include CWA Section 319 federal funding, which is provided to DEQ for program development and implementation. This federal funding requires a 40% non-federal match. Match for Section 319 program funds used by DEQ for internal NPS Management Program support comes from Montana's general fund support for the Water Quality Planning and Water Protection Bureaus. Additionally, external Section 319-funded projects are required to provide a 40% local match to these federal funds. Section 319 grant project funding levels for NPS control activities during the period 2012–2017 are summarized in **Appendix G**.

Other EPA and DEQ agency funds are instrumental in funding activities that are related to Montana's NPS Management Program. These include federally funded CWA Sections 104, 106, and 604 and Montana's general fund support to carry out work related to DEQ's responsibilities under the CWA and Safe Drinking Water Act dealing with NPS pollution.

In Montana there are many other funding sources, in addition to Section 319 grants, available to address NPS pollution. **Appendix H** contains information on funding available through Montana state agencies for NPS management.

As previously discussed in the **Introduction** and in **Section 3**, the NPS Management Program relies heavily upon other federal, state, and local agencies and entities to implement the this Plan. It is important to note that in spite of this reliance, the Section 319 program does not have authority over either the programs or the funds that these agencies manage. Listed below are some of the federal agencies, state agencies, and local government entities that provide a variety of important resources toward NPS management in Montana. Our most important partners are those who manage state and federal public lands (Bureau of Land Management, Forest Service, and Department of Natural Resources and Conservation) and those agencies whose mission, goals and resources overlap with DEQ (DNRC, FW&P, NRCS).

Federal Agencies:

- U.S. Environmental Protection Agency
- U.S. Department of Agriculture
  - Forest Service
  - Natural Resources Conservation Service (NRCS)
- U.S. Geological Survey
- U.S. Army Corps of Engineers
- U.S. Bureau of Land Management
- U.S. Bureau of Reclamation

State Agencies:

- Department of Natural Resources & Conservation
  - Conservation and Resource Development

  - Forestry
  - Trust Lands
  - Water Resources
- State Library
  - Natural Resources Information System
  - Natural Heritage Program
- Department of Fish, Wildlife & Parks
- Department of Transportation
- Department of Agriculture

Local Governmental Entities:

- city and county planning
- public health departments
- public works departments
- conservation districts
- irrigation districts
- local water quality protection districts

In addition to the above, local watershed groups and other non-profit organizations, as previously identified, are critical partners in Montana's NPS Management Program. They are often the lead organization in developing and implementing watershed restoration plans. These organizations integrate local, state and federal agency resources to implement on-the- ground water quality improvement projects.

Finally, numerous non-governmental organizations' resources assist in implementing this Plan. Montana's university system, industry (e.g. Avista, Northwestern Energy, ditch companies, Weyerhaeuser), land trusts, the MWCC, and other organizations (e.g. River Network, Sonoran Institute, Trout Unlimited, etc.) all devote resources to address NPS pollution in Montana.

A vast amount of nonpoint source pollution prevention information is currently available on the internet from federal and state agencies, tribes, universities, local communities, nonprofit groups, private companies, and volunteer groups. Topics range from BMPs to news events, informative articles, and interactive educational materials. Many other informative links can be found just by reading and working through the various websites.

However, the tremendous wealth of resources is not enough to address all the NPS Management Program needs in a 5-year timeframe. Therefore, DEQ must prioritize many of the actions and activities of the NPS Management Program to maximize available resources to accomplish the goal of protecting and improving Montana's water quality. Priorities and criteria for setting priorities are discussed in **Sections 8.1, 8.2 and Appendix D.**

6.0 ENFORCEABLE REGULATORY PROGRAMS

As directed in the Montana Water Quality Act, the Department of Environmental Quality supports "a voluntary program of reasonable land, soil, and water conservation practices to achieve compliance with water quality standards for nonpoint source activities for water bodies that are subject to a TMDL" [75-5-703 MCA]. However, state, local, and federal laws include some exceptions to the state's voluntary approach. Existing regulatory programs for controlling NPS pollution are described below.

6.1 DISCHARGE PROHIBITIONS

Montana's water pollution control law includes some provisions that may be used to take enforcement action against NPS pollution discharges. A general provision prohibits discharges or placement of wastes that cause pollution, including pollution from nonpoint sources (75-5-605, MCA). This state law makes it illegal to "cause pollution ... of any state waters or to place or cause to be placed any wastes where they will cause pollution of any state waters." "Pollution" is defined broadly and clearly includes pollution from nonpoint sources. However, exempt from the prohibition is "any placement of materials that is authorized by a permit issued by any state or federal agency ... if the agency's permitting authority includes provisions for review of the placement of materials to ensure that it will not cause pollution of state waters."

6.2 OTHER REGULATORY PROGRAMS

Numerous local, state, and federal regulatory programs reduce, eliminate, or prevent NPS pollution.

Agricultural Chemical Ground Water Protection Act
Law/Rule: Title 80, Chapter 15, MCA
Program Description: Monitoring and assessment of pesticide discharges to groundwater; development and implementation of water quality standards for specific pesticides; development and implementation of site-specific management plans to mitigate existing impacts of agricultural chemicals found in groundwater.
Contact 1
Montana Department of Agriculture, Agricultural Sciences Division, Agricultural Services Bureau, Natural Resource Program
Phone: (406) 444-3790
Contact 2
DEQ, Water Quality Division, Water Quality Planning Bureau, Standards and Modeling Section
Phone: (406) 444-6697
Contact 3
DEQ, Waste Management and Remediation Division, Contaminated Site Cleanup Bureau, Groundwater Remediation Program
Phone: (406) 444-6444

Clean Water Act Section 404 Permit Program and 401 Certification
Law/Rule: Federal Clean Water Act, Sections 404 and 401
Program Description: Permit requirements for discharge of dredged or fill material into waters of the United States, including jurisdictional wetlands; permit conditions are generally designed to prevent, minimize, or mitigate adverse impacts to navigation, public health and safety, and the environment;

through the 401 certification program, the State of Montana may certify, condition, or deny 404 permit authorizations in order to prevent violations of state water quality standards.
Contact 1
USACE, Omaha District
Phone: Billings Office (406) 657-5910; Helena Office (406) 441-1375; Missoula Office (406) 541-4845
Contact 2
DEQ, Water Quality Division, Water Protection Bureau
Phone: (406) 444-6697

Coal and Uranium Mine Reclamation Program
Law/Rule: Title 82, Chapter 4, Part 2, MCA
Program Description: Permit required for all coal and uranium mining operations; permit conditions include requirements for reclamation of mined areas and restoration of impacted water resources; permitting and compliance is conducted by DEQ, in partnership with the U.S. Department of the Interior's Office of Surface Mining Reclamation and Enforcement (OSMRE).
Contact 1
DEQ, Air, Energy and Mining Division, Coal and Opencut Mining Bureau
Phone: (406) 444-4970
Contact 2
U.S. Department of the Interior, Office of Surface Mining Reclamation and Enforcement, Denver Field Division
Phone: (307) 261-6555

Conservation District Law
Law/Rule: Title 76, Chapter 15, MCA
Program Description: Conservation districts may adopt land use regulations in the interest of conserving soil and water resources and preventing and controlling erosion, subject to approval by referendum. The Rosebud Conservation District has enacted a land use ordinance to protect soil and water resources from impacts from coal bed methane development. Among other requirements, the ordinance requires monthly monitoring of groundwater and quarterly monitoring of surface water in the vicinity of all coal bed methane produced water impoundments. It also contains design standards for impoundments and rules for proper use or disposal of all produced water.
Contact 1
DNRC, Conservation and Resource Development Division, Conservation Districts Bureau
Phone: (406) 444-6669
Contact 2
Rosebud Conservation District
Phone: (406) 346-7479

Hazardous Waste Act
Law/Rule: Title 75, Chapter 10, Part 4, MCA
Program Description: Montana uses authority under the Act to provide technical assistance, and to regulate hazardous waste and used oil handling through registration, permitting, inspections and facility-wide corrective action. The program also supports recycling and other waste reduction activities.
Contact
DEQ, Waste Management and Remediation Division, Waste and Underground Tank Management Bureau
Phone: (406) 444-5300

Lakeshore Protection Permit Program
Law/Rule: Title 75, Chapter 7, Part 2, MCA
Program Description: Permit requirement for any project that will “alter or diminish the course, current, or cross-sectional area of a lake or its lakeshore”; permits are crafted and issued by a board of county commissioners or the governing authority of a city or town according to state statute and local regulations; the purpose of the permit program is to conserve and protect lakes, and maintain public health, welfare, and safety.
Contact
Local county and city governing bodies

Local Water Quality District Law
Law/Rule: Title 7, Chapter 13, Part 45, MCA
Program Description: Allows for the creation of local water quality districts "to protect, preserve, and improve the quality of surface water and ground water"; county commissions and/or city councils may establish such districts, whose directors can then develop a local water quality program that is implemented through local ordinances; specific focuses of the programs developed by the districts include onsite wastewater disposal, stormwater runoff, and engine lubricants; currently, water quality districts have been established in the urban areas of Bozeman, Helena, and Missoula.
Contact 1
Gallatin Local Water Quality District
Phone: (406) 582-3168
Contact 2
Lewis and Clark County Water Quality Protection District
Phone: (406) 457-8926
Contact 3
Missoula Valley Water Quality District
Phone: (406) 258-4890

Metal Mine Reclamation Act (MMRA)
Law/Rule: Title 82, Chapter 4, Part 3, MCA
Program Description: Rules, policies, and procedures governing reclamation of mined lands; the basic objective of reclamation under the act is “to establish, on a continuing basis, the vegetative cover, soil stability, water condition, and safety condition appropriate to any proposed subsequent use of the [disturbed] area” (82-4-302, MCA); includes permitting, licensing, and bonding requirements for mining exploration, development, and operation; regulates the mining of all ore, rock, or substances except oil, gas, bentonite, clay, coal, sand, gravel, peat, soil materials, and uranium.
Contact
DEQ, Air, Energy and Mining Division, Hard Rock Mining Bureau
Phone: (406) 444-4953

Natural Streambed and Land Preservation Act (310 Law)
Law/Rule: Title 75, Chapter 7, Part 1, MCA
Program Description: Process for permitting physical alterations or modifications that result in a change in the state of a natural, perennial-flowing stream or river, its bed, or its immediate banks; the intent of the program is to minimize soil erosion and sedimentation, and prevent unreasonable depletion and degradation of natural resources; program applies to all non-governmental entities.
Contact 1

Local conservation districts
Contact 2
DNRC, Conservation and Resource Development Division, Conservation Districts Bureau
Phone: (406) 444-6669

Opencut Mining Act
Law/Rule: Title 82, Chapter 4, Part 4, MCA
Program Description: Permit required for the mining of bentonite, clay, scoria, soil materials, peat, sand, or gravel when the operation will result in the removal of a total of 10,000 cubic yards or more of materials and overburden; a plan of operation must be submitted, and DEQ cannot accept a plan unless the plan provides that surface water and groundwater will be given appropriate protection, consistent with state law, from deterioration of water quality and quantity.
Contact
DEQ, Air, Energy and Mining Division, Coal and Opencut Mining Bureau
Phone: (406) 444-4970

Phosphorus Ban Act
Law/Rule: Title 75, Chapter 5, Part 9, MCA
Program Description: With some exceptions, household cleaning products that contain phosphorus in concentrations in excess of a trace quantity may not be distributed, sold, offered, or exposed for sale in counties in which one or more surface water bodies exceed the numeric algal biomass or total phosphorus water quality standards; for all intents and purposes, the ban has eliminated the sale of phosphorus containing household cleaning products throughout Montana.

Solid Waste Management Program
Law/Rule: Solid Waste Plans, Funds & Administration (75-10-101, MCA); Montana Solid Waste Management Act (75-10-201, MCA); Ground Water Monitoring (75-10-207, MCA); Integrated Waste Management (75-10-801, MCA); Infectious Waste Management Act (75-10-1001, MCA); Septic Disposal and Licensing (75-10-1201, MCA); ARM Title 17, Chapter 50, Subchapters 1, 4, 5-15
Program Description: Technical review and licensing of solid waste treatment and disposal facility design and operational plans; inspections and compliance assistance for solid waste management facilities; licensing of septic tank pumpers; inspections of disposal sites for septic tank and sump wastes; technical review and licensing of motor vehicle recycling and disposal facilities.
Contact
Montana Department of Environmental Quality, Waste Management and Remediation Division, Waste and Underground Tank Management Bureau
Phone: (406) 444-5300

Streambed Protection Act (SPA 124)
Law/Rule: Title 87, Chapter 5, Part 5, MCA
Program Description: Permit program for state, county, or city government projects that may affect the bed or banks of any stream in Montana; the state and local government equivalent of the 310 law; designed to protect and preserve fish and wildlife resources, and to maintain streams and rivers in their natural or existing state.
Contact
FWP, Fisheries Division, Fisheries Habitat Bureau
Phone: (406) 444-2449

Streamside Management Zone Law (SMZ law)
Law/Rule: Title 77, Chapter 5, Part 3, MCA
Program Description: Regulation and prohibition of certain forest management activities within certain distances of forest streams; standards and conditions designed to protect the quality and integrity of forest streams.
Contact
DNRC, Forestry Division, Forestry Assistance Bureau
Phone: (406) 542-4300

Subdivision Review Program
Law/Rule: Title 17, Chapter 36, ARM; DEQ Circular 8
Program Description: Review of divisions of land comprising less than 20 acres, as well as condominiums and recreational camping vehicle and mobile home parks, regardless of the size of the parcel on which they are located; review is limited to sanitation facilities, including the water supply, sewage disposal, solid waste disposal, and storm drainage systems; proposed subdivision designs are compared against established design standards and minimum separation distances between water supply sources and potential contamination sources such as wastewater treatment systems, surface waters, and floodplains; the regulations and review are structured to prevent pollution problems through the proper design, location, operation, and maintenance of sanitation facilities.
Contact
DEQ, Water Quality Division, Engineering Bureau
Phone: (406) 444-6697

Superfund Program (State and Federal)
Law/Rule: Comprehensive Environmental Cleanup and Responsibility Act, or CECRA (Title 75, Chapter 10, Part 7, MCA); federal Comprehensive Environmental Response, Compensation, and Liability Act, or CERCLA (42 U.S.C. sections 9601-9657); federal Superfund Amendments and Reauthorization Act, or SARA (Public Law No. 99-499 stat. 1613 et seq).
Program Description: Montana uses CECRA to investigate and clean up hazardous substances at sites not addressed by federal Superfund. Historical waste disposal activities at these sites caused contamination of air, surface water, groundwater, sediments, and/or soils with hazardous or deleterious substances. Under CECRA, sites are ranked based on potential risks to human health and the environment. Potentially liable persons investigate and clean up contamination that poses an unacceptable risk to human health and the environment. Some funding may be available through the State's orphan share account to assist with investigation and cleanup and eligible sites. EPA, often in coordination with DEQ, uses CERCLA and its associated funding to investigate and clean up hazardous substances.
Contact 1
DEQ, Waste Management and Remediation Division, Contaminated Site Clean-up Bureau, State Superfund Unit
Phone: (406) 444-6444
Contact 2
DEQ, Waste Management and Remediation Division, Federal Superfund and Construction Bureau
Phone: (406) 444-6444

Underground Storage Tank Laws
Law/Rule: Montana Underground Storage Tank Act (Title 75, Chapter 11, Part 5, MCA); Montana Petroleum Storage Tank Cleanup Act (Title 75, Chapter 11, Part 3, MCA), and the federal Leaking Underground Storage Tank (LUST) Trust Fund Program.
Program Description: The Petroleum Tank Cleanup Section uses these programs to investigate and cleanup unpermitted releases from petroleum storage tanks. Approximately 50 petroleum releases are confirmed at mines that extract gold, platinum, talc, vermiculite, coal, sapphires, and other precious and industrial. Funding to assist tank owners and operators to remediate petroleum releases at these sites is potentially available from Montana's Petroleum Tank Release Cleanup Fund.
Contact
DEQ, Waste Management and Remediation Division, Contaminated Site Cleanup Bureau, Petroleum Tank Cleanup Section
Phone: (406) 444-6444

Water Quality Law
Law/Rule: Montana Water Quality Act (Title 75, Chapter 5, Part 6, MCA)
Program Description: The Groundwater Remediation Program requires responsible parties to investigate and cleanup non-permitted releases that potentially impact state waters. Approximately 90 releases of petroleum and other contaminants are confirmed at a variety of sites including: pipelines, trucking accidents, maintenance shops, and farms/ranches. Responsible parties investigate and cleanup contamination that poses an unacceptable risk to human health and the environment.
Contact
DEQ, Waste Management and Remediation Division, Contaminated Site Cleanup Bureau, Groundwater Remediation Program
Phone: (406) 444-6444

Water Use Law
Law/Rule: Title 85, Chapter 2, MCA; Title 44, Chapter 4, Part 11, MCA
Program Description: Program for granting and enforcing water rights; designed to regulate the use of state water resources and "provide for the wise utilization, development, and conservation of the waters of the state for the maximum benefit of its people with the least possible degradation of the natural aquatic ecosystems" (85-2-101, MCA).
Contact
DNRC, Water Resources Division, Water Rights Bureau
Phone: (406) 444-6610

7.0 EVALUATING SUCCESS

The success of Montana's NPS Management Program is based on meeting our goal of protecting and restoring water quality from the harmful effects of nonpoint source pollution. Montana's NPS Management Program is responsible for articulating a pathway toward this goal, coordinating specific steps along this pathway, and defining the environmental and functional measures of success for these steps. This Plan establishes specific outcomes and actions in **Section 8** that define the pathway and steps most likely to result in restoration and protection of all applicable beneficial uses for the state's waterbodies, regarding nonpoint sources. Measuring the success of this plan in achieving our goal is accomplished in two primary ways: measuring the milestones for the actions within the pathway and measuring the extent to which these actions have accomplished related outcomes.

Outcomes are observable and measureable results achieved through sustained actions. Measuring the long term outcomes (i.e., water quality improvements) related to discrete actions (e.g., a single riparian restoration project) is difficult given the time necessary for those actions to take effect and the geographic scale of the actions in comparison to the overall issue. This presents significant challenges for planning and adaptive management. Planning for and measuring success is further complicated by the fact that many different public and private entities play significant roles in implementing the actions identified in **Section 8**. Therefore, it is appropriate and necessary to track interim outcomes, which DEQ considers necessary achievements along the pathway toward meeting our long term outcomes and goal. Actions taken, with annual milestones, within each interim outcome provide the necessary mechanisms for reaching these outcomes. The extent to which we have achieved these interim outcomes can be measured over the next five years.

Interim Outcomes:

- Water quality standards have been developed
- Montana's waters have been assessed to determine compliance with water quality standards and compiled in an updated Integrated Report
- TMDLs have been completed for required waterbodies
- Sources of pollutants identified are sufficient for local planning efforts
- Plans are in place to ensure efficient and effective implementation
- Public has knowledge and resources to address NPS issues
- Projects and practices are implemented to address NPS issues
- Progress on implementation is tracked and reported

Note that these interim outcomes directly relate back to Montana's water quality management process, outlined in **Section 1.1** and illustrated **in Figure 1-1**.

Long Term Outcomes:

- All Montanans are aware of their contributions to nonpoint source pollution and taking actions to reduce them
- All reasonable land, soil, and water conservation practices are in place to protect water quality
- Montana's waterbodies are meeting beneficial uses

This Section identifies some of the appropriate measures for success and the steps to evaluate the success of actions and outcomes.

7.1 INTERIM MEASURES OF SUCCESS

As noted, attainment of water quality standards or demonstrable improvement to water quality can be long-term achievements. The interim outcomes are intended to serve as evidence that the NPS Management Program is making progress along the pathway toward meeting water quality standards. Appropriate measures of success of the interim outcomes and actions in Montana's NPS Management Program cannot in most cases be accomplished through direct measures of water quality. However, we expect that these cumulative actions will lead to improvements in water quality at the watershed-to-state level over time.

DEQ currently has several mechanisms for measuring and reporting the progress toward meeting interim outcomes and actions laid out in **Section 8**. These mechanisms provide an opportunity to bring together information from private and public partners, who play a critical role in implementing actions and meeting outcomes. These mechanisms also provide EPA with necessary information to meet its own strategic targets and program activity measures, including beneficial use support, pollutant load reductions, and water quality trends.

- DEQ uses its Water Quality Integrated Report, submitted to EPA biennially, to track the success of the NPS Management Program regarding the number of waterbodies that are partially or fully supporting beneficial uses.
- DEQ uses EPA's Grant Reporting and Tracking System to document project level information that addresses progress achieved through the expenditure of Section 319 funding provided by EPA to the state of Montana.
- DEQ documents progress in achieving NPS Management Program goals within annual reports provided to EPA, as well as in 5-year Project Grant Final Reports to EPA.
- DEQ uses TMDL Implementation Evaluations for tracking progress of water quality restoration efforts in watersheds that have completed TMDLs.
- DEQ identifies success stories that highlight watersheds and/or waterbody/pollutant combinations that are no longer impaired, are improving water quality trends, and are protecting healthy waters through good land management and restoration work.

7.2 EVALUATING EDUCATION AND OUTREACH EFFORTS

Education and Outreach (E&O) is a necessary activity to ensure that the public has knowledge and resources to address NPS issues and actions are being taken. Given that actions for addressing NPS pollution are voluntary, an informed and empowered public is critical to meeting long term outcomes of the NPS Management Program. Evaluation mechanisms ensure a successful E&O strategy on the state and local scales. Various indicators can be used to measure and monitor effectiveness of E&O efforts. After an evaluation, the goals and actions can be adjusted as needed, consistent with adaptive management.

Evaluation mechanisms can measure both the qualitative and quantitative elements of E&O efforts. Programs must have an evaluation strategy at the beginning and implement checks to ensure goals are being met. The intent of E&O efforts should be to improve on-the-ground environmental conditions as

well as changes in behavior. Future E&O funding should focus on interim outcomes, while collectively these outcomes will address DEQ's long-term goals of reducing NPS pollution.

Various evaluation tools used by grant funded programs toward implementation include:

- **Pre- and post-evaluations –** to measure changes in knowledge, behavior, and attitudes toward NPS pollution
- **Interviews –** to measure audience perception, attitudes, and beliefs at a local level
- **Focus groups –** to measure knowledge, behavior, and attitudes of NPS pollution issues either before, during, and/or after a particular E&O effort
- **Questionnaire/survey –** phone or Web surveys to measure knowledge, behavior, or attitudes toward NPS pollution or particular issues
- **Observation –** to measure behavior and attitudes toward a particular NPS pollution issue
- **Mapping analysis –** to use GIS to illustrate spatial and temporal differences

7.3 EVALUATING WATER QUALITY IMPROVEMENT

Water quality monitoring is an essential tool for evaluating the long term success of the NPS Management Program. However, improvements to water quality can take a long time and the success of individual projects or actions may be better evaluated against interim outcomes. In Montana, many different entities collect water quality data, which DEQ uses to determine if water quality is improving and water quality standards are being achieved (see **Section 1 and Appendix C**). One of the NPS Management Program's interests is to improve the coordination of sampling efforts among organizations that collect credible data. However, DEQ will be responsible for long-term evaluations by assessing the effects of NPS pollution changes over time.

Three types of monitoring can be used to evaluate program success:

1. **Project effectiveness monitoring** addresses how well a practice or project reduces pollution at the site scale. This information ensures that effective practices are being implemented and informs maintenance activities necessary for long term effectiveness. In many cases, monitoring is completed in order to populate a model to demonstrate effectiveness of project (e.g., pollutant load reductions). However, it is important to note that effectiveness of discrete projects is not necessarily transferable to water quality effects on a broader scale.
2. **Trend monitoring** evaluates progress toward attaining water quality standards at the reach scale and informs broad scale restoration activities (e.g., road BMP implementation, multiple instream restoration projects).This requires consistent and long term data collection.
3. **Standards attainment monitoring** provides sufficient data for a formal assessment of water quality standards attainment and a determination of beneficial-use support. It also informs potential updates the TMDLs and standards/targets.

Effectiveness monitoring is required for implementation projects funded with Section 319 grant contracts. This information is useful for tracking progress toward TMDL targets and is provided to EPA for tracking on a national level. Montana law requires an evaluation of TMDL implementation effectiveness (see **Section 1.6**) and DEQ's NPS website has examples of these evaluations. Lastly, under the federal CWA, formal assessments of water quality standards attainment are intended to accurately characterize the quality and assess beneficial-use support of the nation's rivers, streams, and lakes.

8.0 MONTANA'S NONPOINT SOURCE ACTION PLAN AND PRIORITIES

The goal of Montana's NPS Management Program is to protect and restore water quality from the harmful effects of NPS pollution. This section identifies the key interim-term outcomes, actions, and milestones necessary to demonstrate significant progress toward meeting this goal. It also provides information on DEQ's NPS Management Program's approach for implementing this Plan. Success is measured by reaching the milestones outlined in this Plan and moving closer to achieving the interim outcomes.

8.1 FIVE-YEAR ACTION PLAN

Tables 8-1 through **8-8** describes DEQ's 5-year action plan for addressing NPS pollution. These tables are arranged in a stepwise order based on Montana DEQ's water quality management process (see **Figure 1-1**) and interim outcomes (**Section 7.0**), listing key partners, actions, and milestones for evaluating success in achieving the interim outcomes. This five year timeframe for implementing actions meets EPA's NPS Management Program guidance requiring explicit short-term goals. While the interim outcomes are listed in a stepwise management process order, individual actions are not listed by priority.

Montana's NPS Management Program highest priority actions are those that directly move Montana towards achieving its vision (**Overview – Goal of the Nonpoint Source Program**). Most of these are identified in **Table 8-6: Public has knowledge and resources to address NPS Issues** and **Table 8-7: Projects and practices are implemented to address NPS issues**.

8.2 DEQ NPS PRIORITIES

Montana's Governor has designated DEQ as the state agency responsible for developing and implementing many aspects of Montana's NPS Management Program. The program has made great strides over the past 20 years, but the scale of NPS pollution across the state requires a targeted approach to demonstrate measurable improvements. Over the next two years, working with internal and external partners, DEQ will develop a 20-year strategic vision. This vision will prioritize watersheds where DEQ will focus of their NPS support activities.

8.2.1 NPS Support Activities

DEQ NPS support activities for the next five years will continue to revolve around the process steps identified in **Section 1** and achieving the outcomes identified in **Tables 8.1** through **8.8**. This includes continued NPS project funding via the 319 grant program as well as continued outreach and coordination with our NPS partners. DEQ will emphasize riparian protection since it is DEQ's view that the most effective nonpoint source pollution reduction approach is the protection and restoration of healthy riparian zones. DEQ will also evaluate and promote wetland health within and beyond riparian zones in recognition of the many additional benefits provided by wetlands, including water storage and nutrient cycling.

8.2.2 Priority Watersheds

DEQ's NPS Management Program currently prioritizes support activities where watershed restoration plans (WRPs) have been developed (**Appendix D**). This provides multiple opportunities for DEQ

assistance and project funding in many locations. Yet, it is difficult to fully implement many of DEQ's NPS support activities in all watersheds with WRPs. Therefore, a component of DEQ's 20-year vision will be to focus resources to accomplish a higher level of DEQ NPS support in watersheds where WRPs are in place and DEQ will likely have the most influence in implementing, or helping others implement, the goals of this Plan. By focusing on particular high priority watersheds, DEQ is not eliminating support for other areas of Montana. Instead, DEQ is working to improve our approach for achieving and demonstrating NPS program successes within Montana. DEQ's 20-year strategic vision will identify the process for identifying high priority NPS support watersheds. Within these watersheds, DEQ will additionally pursue the following NPS support activities.

- Provide an increased level of constructive feedback on locally led efforts to address NPS pollution via completion of TMDL Implementation Evaluations and highlighting good examples of landowner NPS management practices.
- Support enhanced monitoring activities to track water quality improvement trends and NPS management successes. Monitoring support can include volunteer monitoring actions and tracking important indicators such as riparian health.
- Assist watershed groups, conservation districts, and other groups on developing and expanding relationships with landowners. The goal of this work will be to help develop and expand the number and quality of projects within priority watersheds.
- Facilitate nutrient NPS reductions above point sources dischargers to help economically achieve water quality standards upstream and downstream of applicable point sources.

Table 8-1: Interim Outcome - Water quality standards have been developed

No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
1	DEQ Standards and Modeling Section	Re-evaluate the chemical, physical, and biological condition of reference sites	• At least 100 reference sites re-evaluated
2	DEQ Standards and Modeling Section	Develop nutrient models for large rivers (e.g., Missouri, Yellowstone)	• Models developed for at least 2 large river segments
3	DEQ Standards and Modeling Section	Develop technical basis for a lake classification system based on nutrient status	• Demonstrated progress in developing numeric nutrient and transparency lake water quality standards
4	DEQ Standards and Modeling Section, MT Department of Agriculture	Develop and circulate numeric standards for all pesticides identified in Montana groundwater and surface waters	• Adoption of numeric standards for all pesticides within 4 years of DEQ notification of detection in state waters

Table 8-2: Interim Outcome - Montana's waters have been assessed to determine compliance with water quality standards and compiled in updated Integrated Report			
No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
5	DEQ Monitoring and Assessment	Conduct statewide water quality assessments.	• Musselshell watershed, Beaverhead watershed, Big Creek and Jim Creek assessment projects will be completed for the 2018 Integrated report
6	DEQ Monitoring and Assessment Section, watershed groups	Assess water quality status and trends in priority areas through fixed station monitoring	• Fixed station monitoring continues on the Clark Fork River through contracted efforts and annual reports are provided on the Clark Fork Coalition website • Fixed station reports will be completed by DEQ for the Musselshell River and the Red Rock River during 2017 and shared with each watershed group and other DEQ programs
7	DEQ Standards and Modeling Section	Address septic influence on surface water quality	• Septic influence characterized in 3 TMDL or other water quality protection documents
8	DEQ Information Management and Technical Services Section	Review/update Water Quality Integrated Report (305(b)/303(d))	• Updated reports in 2018, 2020, and 2022
9	DEQ Information Management and Technical Services Section	Develop, maintain, and enhance Clean Water Act Information Center (CWAIC online) to provide public access to water quality assessment information.	• System operable and available to public
10	DEQ Information Management and Technical Services Section	Update the program's WQ assessment, TMDL, and implementation tracking system (WARD)	• Integrated Report submitted to EPA in a timely manner

Table 8-3: Interim Outcome – TMDLs have been completed for required waterbodies			
No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
11	DEQ Watershed Protection Section, EPA	Complete Water Quality Improvement Plans (WQIPs) and necessary TMDLs	• At least 150 additional TMDL pollutant-waterbody combinations completed by 2022

Table 8-4: Interim Outcome – Sources of pollutants identified are sufficient for local planning efforts			
No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
12	DEQ Watershed Protection Section, WRP sponsors	Support local efforts to refine pollutant source identification	• Updated fine-scale source identification in at least 3 WRPs

Table 8-5: Interim Outcome - Plans are in place to ensure efficient and effective implementation			
No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
13	DEQ Watershed Protection Section, WRP sponsors, MACD	Work with watershed groups to develop and revise Watershed Restoration Plans (WRPs)	• 12 new or updated DEQ accepted WRPs by 2022
14	DEQ Watershed Protection Section, Cities and Counties	Incorporate NPS pollution prevention into city and county planning processes	• Provide information on NPS pollution prevention to 3 community planning entities
15	DEQ Watershed Protection Section, WRP Sponsors	Encourage integration of wetland restoration into NPS WRPs	• Specific wetland planning components are included in 2 WRPs
16	DEQ, DNRC, CDs	Encourage the development of channel migration mapping statewide	• Number of miles mapped • Number of waterbody segments mapped

Table 8-5: Interim Outcome - Plans are in place to ensure efficient and effective implementation			
17	DEQ Watershed Protection Section, WRP sponsors	Incorporate protection of unimpaired/high quality waters into watershed restoration plans	• Number of Watershed Restoration Plans incorporating protection of healthy waters

Table 8-6: Interim Outcome - Public has knowledge and resources to address NPS issues			
No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
18	DEQ, MWCC	Provide support and promote the development and coordination of watershed groups through MWCC activities, training workshops, advertising campaigns, etc.	• Annual watershed coordinator training • Annual watershed tour • Bi-weekly newsletter • Support development and maintenance of a water quality monitoring website
19	DEQ	Support riparian and wetland buffer education campaigns	• Support 3 distinct riparian and/or wetland buffer education campaigns
20	DEQ	Participation and presentations at landuse planning meetings	• Active participation in 5 events annually
21	DEQ, EPA, Wetland Council, MWCC, NRCS, MACD, Montana Stockgrowers Association	Publish or distribute accounts of exemplary environmental stewardship	• Environmental stewardship awards and recognition highlighted in annual report
22	DEQ, SWCDM, MWCC	Support NPS Education and Outreach efforts at a local level	• Fund at least 5 E&O mini-grants annually • Staff at least 2 watershed festivals annually • Support at least 5 BSWC activities annually
23	DEQ	Support NPS Education and Outreach efforts at a statewide level	• Annual maintenance and updates to DEQ NPS Management Program webpages • NPS Annual Report • Support two Wetland Council meetings annually • Assist with the creation or updates of NPS publications • Distribute NPS publications at 5 events annually

Table 8-6: Interim Outcome - Public has knowledge and resources to address NPS issues			
No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
24	DEQ, MSUEWQ, MWCC, Montana Watercourse	Support volunteer monitoring efforts	• Create or update VM technical guidance documents • Provide training and technical guidance to 5 VM groups annually • Provide funding to support VM efforts
25	DEQ	Develop and conduct riparian and streamside land management workshop and education tools for the real estate industry	• Develop workshop syllabus and course materials for continuing education credits • Hold 2 workshops
26	DEQ, FWP, DNRC, DOJ, USACE, USFS, NRCS, BLM, DNRC, USFWS, CDs	Develop and implement an interagency policy for river restoration work, emphasizing restoration of natural processes	• Interagency policy in place and supported by a wide range of government, nonprofit, and private entities
27	MDT	Promote and support BMP training for road maintenance personnel	• Provide 3 trainings for road maintenance personnel
28	DEQ	Support conferences that address stormwater pollution prevention and control strategies	• Support 2 stormwater conferences
29	DNRC	Promote and conduct forestry BMP and stewardship educational workshops and programs	• Annual BMP/SMZ education workshops for loggers and landowners • Forest stewardship program targeting small landowners throughout Montana
30	DEQ, DNRC	Increase awareness of regulatory requirements for nonpoint source pollutions	• Factsheet of existing NPS regulatory requirements • New audiences reached through publications and presentations
31	DEQ	Increase number of applications for 319 funding	• At least 20 applications received in 2022

Table 8-7: Interim Outcome - Projects and practices are implemented to address NPS issues			
No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
32	DEQ Engineering Bureau	Encourage stormwater quality improvement projects funded through the state revolving fund program	• Fund at least 4 stormwater projects
33	DEQ, MARS, NRCS, FWP, other organizations	Support for and involvement in public and private channel migration zone and riparian conservation easement programs	• Annual report on increases in the number of stream miles covered under a conservation easement (based on available Montana cadastral data)

Table 8-7: Interim Outcome - Projects and practices are implemented to address NPS issues			
No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
34	DEQ Watershed Protection Section	Fund WQIP and WRP-directed NPS watershed restoration projects	• Fund on-the-ground watershed restoration activities
35	DEQ	Provide reviews and comment on outside agency proposed projects that may have an effect on NPS pollution	• Reviews completed and comments provided as appropriate
36	DEQ Watershed Protection Section	Protect, restore, and create riparian and wetland buffers designed to prevent or reduce NPS pollution	• Fund 10 miles of riparian buffer enhancement through Section 319 contracts • Fund 10 acres of wetland enhancement through Section 319 contracts
37	DEQ Fiscal, Watershed Protection Section	Manage and implement the NPS Management Program in efficient and effective manner, including fiscal management	• Review and update guidance annually to reflect state and federal reporting requirements • Conduct contract initiation meetings for all new contracts • Ensure 75% of 319 contracts are closed within three years of contract award
38	DEQ, USFS, BLM, MDT, NRCS, FWP	Work with agencies to encourage water quality improvement actions	• Develop, revise, or implement DEQ water quality improvement MOUs with agencies, including USFS, BLM, MDT, NRCS, and FWP
39	DEQ, DNRC, NRCS, FWP, irrigation districts, CDs, watershed groups, private landowners	Support efforts to restore and protect wetlands, natural channel migration, and natural hydrologic regimes	• Encourage submittal of requests for funding for projects that will make substantive, sustainable reductions in hydrologic modification • Encourage groups that are developing or updating a WRP to incorporate plans to address hydrologic modification and wetland protection/restoration
40	DEQ, NRCS, CDs	Continue support for the National Water Quality Initiative (NWQI) under the EQIP program	• Successful expenditure of all available funding in designated NWQI watersheds • Ongoing water quality monitoring and technical support • Identification and preparation of future NWQI watersheds

Table 8-8: Interim Outcome - Project implementation and effectiveness is tracked and reported			
No.	***Key Partner(s)***	***Actions***	***Measurable Milestones***
41	DEQ Watershed Protection Section	Conduct TMDL implementation evaluations	• At least 15 reviews completed
42	DEQ Watershed Protection Section	Implement a long-term 319 project effectiveness evaluation program	• Project effectiveness evaluation program in place by 2019 • Project sites are evaluated every 5 years
43	DNRC	(US Environmental Protection Agency April 12, 2013)Work with forest agency partners (especially DNRC Forestry Assistance) to ensure effective forestry BMP and SMZ activities, and assess the effectiveness of SMZ and HCPs	• Biannual reports on forestry BMP audits • Reports on SMZ and HCPs
44	DEQ Information Management and Technical Services Section	Administer MT-eWQX water quality database system to track and provide public access to water quality monitoring data	• Upload all ambient water quality monitoring data collected by DEQ, its contractors, or data partners to EPA National STORET/WQX water quality data warehouse

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APPENDIX A – BEST MANAGEMENT PRACTICES

A.1 BEST MANAGEMENT PRACTICES

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Agriculture												
Clean Water Diversion	Berms, rain gutters, rain barrels, roofing, reservoirs, infiltration basins, vegetated strips, or other structures used to prevent clean runoff or precipitation from picking up pollutants.	Diversion (NRCS 362), Roof Runoff Structure (NRCS 558), Water and Sediment Control Basin (NRCS 638)	X	X	X	X			X	X		?
Corral / Pen Relocation	Moving part or all of an animal confinement facility to prevent or reduce inundation and subsequent off-site transport of pollutants.	Obstruction Removal (NRCS 500), Fence (NRCS 382)	X	X	X	X			X	X		N
Stream Crossing	A stabilized area or structure constructed across a stream to provide a travel way for people, livestock, equipment, or vehicles.	Stream Crossing (NRCS 578), Fence (NRCS 382)		X	X							?
Off-Stream Watering Facility	A permanent or portable device to provide an adequate amount and quality of drinking water for livestock and wildlife. The purpose of the device and its location should be to encourage or enable livestock to obtain water from a source other than a surface water body, or improve livestock distribution.	Watering Facility (NRCS 614)	X	X	X	X			X	X		N
Filter Strip	A strip of permanent, perennial vegetation placed on the downgradient edge of a field, pasture, barnyard, or animal confinement area. The purpose of the strip is to slow down surface runoff, filter out particulate matter, or absorb and use nutrients. If the purpose of the strip is to take up nutrients, then the vegetation must be periodically harvested in order to prevent nutrient buildup. In this situation, grazing would not	Field Border (NRCS 386), Filter Strip (NRCS 393), Hedgerow Planting (NRCS 422), Vegetated Treatment Area (NRCS 635)	X	X	X	X			X	X		N

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
	constitute harvesting, because nutrients are deposited as well as removed.											
Forage Utilization / Livestock Distribution Improvements	This practice includes such things as rotational grazing, cross-fencing, watering facility development and other techniques designed to promote uniform forage utilization and nutrient deposition, which then leads to more vigorous plant growth and nutrient uptake, as well as reduced soil erosion and pollutant runoff.	Fence (NRCS 382), Prescribed Grazing (NRCS 528)	X	X	X	X			X			?
Water Gap	A controlled access point from which livestock can obtain drinking water directly from a waterbody. Where possible, the gap should be designed to admit only one animal at a time.	Access Control (NRCS 472), Fence (NRCS 382)	X	X	X	X			X	X		N
Riparian Fencing	Fencing used to permanently or temporarily control livestock access to riparian areas. Fencing may be used to prevent streambank trampling, reduce nutrient and pathogen pollution, or promote vegetative growth and plant species diversity.	Access Control (NRCS 472), Fence (NRCS 382)	X	X	X	X			X	X		N
Heavy Use Area Protection	The stabilization of areas frequently and intensively used by people, animals, or vehicles by establishing vegetative cover, by surfacing with suitable materials, and/or by installing needed structures.	Heavy Use Area Protection (NRCS 561)	X	X	X				X			?

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Grazing Management Plan	A plan describing how livestock grazing will occur on a particular property or set of properties. The plan must identify the stocking density, season, duration and location of grazing activities on a field by field basis. Where necessary, it must contain contingency plans to deal with periodic drought. The plan must identify grazing management strategies that will be employed to prevent nonpoint source pollution. The plan must contain a map in which all fields, watering facilities, heavy use areas, surface waters, riparian buffers, fence lines and other pertinent structures are labeled.	Prescribed Grazing (NRCS 528), Silvo-pasture Establishment (NRCS 381)	X	X	X	X			X	X		Y
Livestock Protection	Permanent shelter structures to protect livestock from weather. This does not include barns, sheds or other enclosed structures. It also does not include general fencing. The purpose of the structure must have some benefit to water quality (e.g. a replacement for shelter previously provided by riparian vegetation).	Windbreak/Shelterbelt Establishment (NRCS 380), Windbreak/Shelterbelt Renovation (NRCS 650)	X	X	X	X			X	X		N
Cover Crop	Vegetation planted on what would otherwise be fallow ground. Designed to prevent mobilization and transport of pollutants by precipitation and runoff during periods when the primary agricultural crop is unable or unavailable to perform similar function.	Cover Crop (NRCS 340), Conservation Crop Rotation (NRCS 328), Conservation Cover (NRCS 327)	X	X	X			X	X			N

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Conservation Tillage	Tillage practices designed to prevent soil erosion, reduce surface or subsurface runoff potential, or otherwise prevent nonpoint source pollution. These practices may include, but are not limited to reduced tillage or minimum till, no till, strip till, direct seeding, mulch till, or ridge till.	Residue and Tillage Management, No Till/Strip Till/Direct Seed (NRCS 329), Residue and Tillage Management, Ridge Till (NRCS 346), Residue and Tillage Management, Mulch Till (NRCS 345)		X	X							?
Alley Cropping	Trees, shrubs or tall, rigid, perennial, herbaceous vegetation planted in sets of single or multiple rows with agronomic, horticultural crops or forages produced in the alleys between the sets of woody plants. Alley cropping must be designed to significantly reduce soil erosion.	Alley Cropping (NRCS 311), Herbaceous Wind Barrier (NRCS 603)		X	X							N
Windbreak	A strip of stiff, permanent, perennial vegetation placed perpendicular to the prevailing wind direction or parallel to the edge of a waterbody. The purpose of the strip is to either capture and retain wind-born pollutants that might otherwise blow into surface waters, or lessen the force of the wind thereby preventing wind erosion of downwind fields.	Cross Wind Trap Strips (NRCS 589C), Field Border (NRCS 386), Hedgerow Planting (NRCS 422)	X	X	X				X			N
Contour Farming	Tilling, seeding, fertilizing, subsoiling, and harvesting along the contour of a hill. The practice must be applied to reduce sheet, rill and wind erosion that would otherwise add sediment and other pollutants to surface waters.			X	X							N
Stripcropping	Growing planned rotations of row crops, forages, small grains, or fallow in a systematic arrangement of	Stripcropping (NRCS 585)		X	X							N

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
	equal width strips across a field. The practice should be applied to reduce sheet, rill and wind erosion that would otherwise add sediment and other pollutants to surface waters.											
Irrigation Diversion Maintenance or Replacement	Repair or replacement of a structure designed to divert surface water for the purpose of watering crops or livestock. The repair or replacement must have a clear benefit to water quality in a stream or lake. The cost of the repair or replacement must be weighed against the potential benefits to water quality.	Dam, Diversion (NRCS 348)			X	X						Y
Irrigation Canal Conversion	Adding an impermeable liner to an unlined irrigation canal or replacing an irrigation canal with an underground pipe. The conversion must tied to one or more of the following: 1) a reduction in water removal from a stream or lake; 2) prevention of irrigation-induced saline seeps that contribute salts to surface water; 3) a reduction in the temperature of irrigation return flows; 4) a reduction in irrigation-induced sediment pollution.	Irrigation Pipeline (NRCS 430), Irrigation Water Conveyance Ditch and Canal Lining, Flexible Membrane (NRCS 428B), Irrigation Water Conveyance Ditch and Canal Lining, Plain Concrete (NRCS 428A)			X	X						Y
Irrigation System Conversion	Conversion from one type of irrigation system to another, resulting in significant improvements to water quality. For example, conversion from flood irrigation to sprinkler irrigation in order to reduce the amount of contaminated tailwater leaving a field and entering a waterbody. Projects must not trade one NPS pollution problem for another (e.g. going from flood irrigation to sprinkler irrigation and thereby creating a salinity problem).	Irrigation System, Micro-irrigation (NRCS 441), Irrigation System, Sprinkler (NRCS 442), Irrigation Water Management (NRCS 449)	X	X	X	X		X				?

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Irrigation Tailwater Control	Structures, vegetation, or managerial controls designed to prevent sediment, nutrient, or temperature pollution from irrigation tailwater. These practices may include, but are not limited to: wasteway rehabilitation, tailwater capture and reuse, settling basins, remotely controlled headgates, or revegetation of tailwater-induced erosional features. Projects must not trade one NPS pollution problem for another (e.g. going from flood irrigation to sprinkler irrigation and thereby creating a salinity problem, or installing a large, shallow sediment trap that leads to higher return flow temperatures). These projects must have clear, significant, long-term water quality benefits.	Critical Area Planting (NRCS 342), Irrigation Water Management (NRCS 449), Lined Waterway or Outlet (NRCS 468), Structure for Water Control (NRCS 587), Water and Sediment Control Basin (NRCS 638)	X	X	X	X		X		X		Y
Grassed Waterway	A shaped or graded channel that is permanently vegetated, and is designed to convey water at a non-erosive velocity to a stable outlet. The vegetation in the channel must be capable of withstanding periodic inundation, as well as the reasonably expected erosive forces associated with foreseeable flow events.	Grassed Waterway (NRCS 412)		X	X							?
Waste Utilization	Storing, transporting and using agricultural wastes such as manure, wastewater, and organic residues in a manner that reduces nonpoint source pollution. Also includes equipment necessary in order to ensure proper waste transfer and utilization (e.g. small manure spreaders).	Waste Utilization (NRCS 633), Waste Storage Facility (NRCS 313), Waste Transfer (NRCS 634)	X	X					X	X		?

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Riparian Buffer	A strip of perennial vegetation located adjacent to and up-gradient from a waterbody. The strip must be designed to reduce nonpoint source pollution. Buffer width, slope, species composition and target pollutants must be considered in the design.	Access Control (NRCS 472), Critical Area Planting (NRCS 342), Field Border (NRCS 386), Hedgerow Planting (NRCS 422), Fence (NRCS 382), Riparian Forest Buffer (NRCS 391), Riparian Herbaceous Cover (NRCS 390)	X	X	X	X			X	X		?
Composting Facility	A facility to process raw manure or other raw organic by-products into biologically stable organic material. The facility must be designed to prevent run-off or infiltration from nutrients and/or bacteria.	Composting Facility (NRCS 317), Animal Mortality Facility (NRCS 316)	X	X					X	X		Y
Revegetation	Establishing permanent vegetative cover in order to prevent soil erosion. Where appropriate, revegetation efforts should focus on establishing native vegetation communities matched to site-specific resource goals and conditions.	Conservation Cover (NRCS 327), Critical Area Planting (NRCS 342), Silvi-pasture Establishment (NRCS 381)	X	X	X	X						Y
Nutrient Management Plan	A plan describing how plant nutrients will be managed in order to prevent nonpoint source pollution. The plan must identify the amount, source, placement, form and timing of all nutrient applications on a given farm or set of farms. This practice does not include the creation of Nutrient Management Plans where the plans are required in order to obtain permit coverage.	Nutrient Management (NRCS 590)	X	X					X	X		Y
Erodible Land Conversion	Conversion of highly erodible lands to permanent vegetative cover.	Range Planting (NRCS 550), Pasture and Hay	X	X	X			X				N

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
		Planting (NRCS 512)										
Salinity and Sodic Soil Management	Management of land, water and plants to reduce accumulations of salts and/or sodium on the soil surface. This may include monitoring to identify saline seep recharge areas, making changes in cropping or irrigation practices to dry up saline seeps, and/or installing practices to prevent saline or sodic sediment from reaching surface water.	Salinity and Sodic Soil Management (NRCS 610)						X				Y
Hydrologic Function Restoration (Swamp "un-busting")	Alterations made to groundwater or surface water hydrology or channel morphology in order to reestablish hydraulic connectivity, groundwater elevation, stream flow, wetland function, stream channel function, or other waterbody attributes that were once eliminated in order to facilitate agricultural production. The cost of this practice must be carefully balanced against the value of the particular hydrologic functions in preventing nonpoint source pollution.	Wetland Restoration (NRCS 657), Wetland Enhancement (NRCS 659)	X	X	X	X		X	X			Y
Urban/Stormwater												
Setbacks and Zoning	Laws and ordinances limiting or prohibiting certain activities adjacent to streams, lakes, floodplains, and/or wetlands.	Please see Appendix A - 3.0 for a detailed description of current setback and zoning regulations in Montana.	X	X	X	X			X	X	X	Y

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Disposal of Household Hazardous Wastes	Storing, transporting, recycling, and permanent disposal of household chemicals, batteries, used motor oil, paint, pesticides, herbicides, fertilizer, cleaning solutions, personal care products, medications, and other potentially toxic substances to prevent surface water or groundwater contamination.										X	?
Pet Waste Management	Removal and disposal of pet excrement, kitty litter, and soiled bedding materials to prevent them from entering surface water or groundwater.		X	X					X	X		N
Septic System Maintenance	Regular inspection and cleanout of onsite wastewater treatment systems (septic systems). Repair of leaking or otherwise malfunctioning components.		X	X					X	X	X	Y
Storm Drain Inlet Protection	Installation of grates or trash racks to catch large debris. Regular cleanout of storm drain inlets. Painting or onsite posting of information regarding storm drains discharges (e.g. a stenciled label stating " Drains to fish stream").		X	X	X				X	X	X	N
Lawn and Garden Fertilizer Management	Application of lawn and garden fertilizers to minimize off-site transport and deep percolation of nutrients. May include managing the amount, placement and timing of fertilizer applications.		X	X							X	N
Lawn and Garden Irrigation Water Management	Adjusting the amount, timing and placement of irrigation water to prevent excess surface runoff and leaching of nutrients and pesticides below the root zone. Also, choosing lawn and garden plant varieties that require the least amount of water (e.g. xeriscaping).		X	X	X	X			X		X	N

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Litter Control	Prevention and removal of litter (trash). For example, providing adequate number and placement of trash receptacles in public spaces, or holding park cleanup days.								X		X	N
Vehicle and Equipment Maintenance and Operation	Maintaining and operating vehicles and equipment in a manner that prevents leakage of fuel and lubricants. Storage and transport of fuel in suitable receptacles to prevent leakage into the environment.										X	N
Construction Site Stormwater Runoff Control	Silt fences, straw waddles, clean water diversions, sediment settling basins, road maintenance, mulching, and other practices designed to prevent water from entering or exiting a construction site.	EPA Construction Site Stormwater Runoff Control BMP Fact Sheets, available at http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=min_measure&min_measure_id=4	X	X	X				X		X	?
Street Sweeping	Regular removal and appropriate disposal of trash, road sand, and other debris from roads.				X			X	X		X	Y
Hookup Failing Septic Systems to Sanitary Sewer	Decommissioning of failing septic systems and hookup to a sanitary sewer system. Sanitary sewer (e.g. municipal wastewater systems) may offer a higher level of treatment.		X	X					X	X	X	Y
Parking Lot Cleanup	Regular removal and safe disposal of sand, trash, and other accumulated materials from parking lots.				X			X			X	N
Permeable Landscaping	Installation and maintenance of green belts, parks, permeable pavement, public gardens, and other forms of landscape that allow gradual percolation of precipitation and reduce concentrated runoff flow.		X	X	X	X			X	X	X	?

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Regulation of Phosphorus-containing Detergents	Laws and ordinances limiting or prohibiting the sale and/or use of phosphorus-containing detergents.			X								Y
Stormwater System Retrofitting	Design and installation of new stormwater control technology.		X	X	X	X		X	X	X	X	Y
Preservation of Existing Vegetation	Preservation of existing riparian vegetation.		X	X	X	X			X	X	X	N
Conservation Easements	Establishing legally binding restrictions, attached to a piece of real estate, that either temporarily or permanently limit the activities that may take place, in order to prevent NPS pollution.		X	X	X	X			X	X	X	Y
Illicit Dumping Investigation and Cleanup	Identification, assessment and cleanup of illicit dump sites. Practice may include dump sites for waste, hazardous waste, animal/human fecal matter, or other substances that could be a source of NPS pollution.		X	X			X	X	X	X	X	?
Illicit Stormwater System Connection Investigation and Elimination	Identification and elimination of illicit discharges of waste to stormwater collection and transfer systems.		X	X	X	X			X	X	X	Y
Stormwater Reuse Systems	Practices such as rain gardens, rain barrels, constructed wetlands, vegetated swales, and filter strips designed to contain, treat and/or reuse stormwater that might otherwise carry pollutants to streams.	Filter Strip (NRCS 393), Constructed Wetland (NRCS 656), Roof Runoff Structure (NRCS 558), Runoff Management	X	X	X				X		X	Y

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
		System (NRCS 570)										
Settling Basins or Sediment Traps	Constructed pits, depressions, straw wattles, silt fences or other containment devices used to trap or settle out sediment from urban runoff. These structures must be periodically cleaned out in order to maintain function.	Runoff Management System (NRCS 570), Water and Sediment Control Basin (NRCS 638), Sediment Basin (NRCS 350)		X	X							N
Washwater Containment Facilities	Designated areas or facilities used at large construction sites, public works facilities, and heavy equipment garages to contain, treat or properly dispose of washwater from cleaning of trucks, concrete mixers and heavy equipment.				X						X	?
Composting	Composting and subsequent reuse of organic waste.	Composting Facility (NRCS 317)	X	X						X		N
Transportation												
Road Sand Management	Judicious application and prompt removal of road traction sand to prevent release of sand into surface water, while still providing traction necessary to ensure public safety.				X			X			X	Y
Road De-icing Chemical Management	Application and removal of road de-icing chemicals to prevent release of chemicals into surface water, while still providing traction necessary to ensure public safety.							X			X	Y
Road Repair and Maintenance	Timely repair of water bars, sediment traps, road ditches, culverts, and other runoff control structures.			X	X				X			Y

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Travel Management Plans	Develop and implement comprehensive travel management plans to limit NPS pollution from transportation networks, and to limit disturbance of riparian areas.			X	X	X		X			X	Y
Off-Highway-Vehicle (OHV) Management	Developing, designating, and maintaining trails for OHV recreation. Trails should be designed to avoid OHV contact with surface water and riparian areas, or to limit contact to hardened crossings or bridges.			X	X						X	N
Road Crossing	Site, design and construct bridges, culverts, hardened crossings, and fords to prevent the following: disruption of stream sediments, erosion of stream banks, removal of large amounts of riparian vegetation, and excessive bridge deck runoff.	Stream Crossing (NRCS 578)		X	X	X		X			X	Y
Road Grading	Rut removal, grade control, crowning, and other techniques to prevent concentrated flow of road runoff that can lead to erosion.			X	X							Y
Road Relocation	Relocate roads outside of riparian areas and floodplains.			X	X	X		X			X	Y
Road Obliteration or Decommissioning	Removal or decommissioning of roads that have been significant sources of NPS pollution.			X	X							Y
Disturbed Soil Roughening	Roughening of disturbed soil to temporarily discourage concentrated runoff.			X	X							N
Settling Basins or Sediment Traps	Constructed pits or depressions used to trap or settle out sediment from road runoff. These structures must be periodically cleaned out in order to maintain function.	Sediment Basin (NRCS 350), Runoff Management System (NRCS 570), Water and Sediment Control Basin (NRCS 638)		X	X			X				N
Mining and Industry												

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Mine Tailings Removal and Storage	Removal of mine tailings and waste rock from floodplains and riparian areas, and storage of tailings and waste rock in a location where they will not come into contact with surface water or groundwater.				X		X				X	Y
Groundwater Recharge Control	Implementation of land use practices to reduce groundwater recharge of flooded mine workings, and thereby reduce acid mine drainage.						X				X	N
Clean Water Diversion	Berms, reservoirs, infiltration basins, vegetated strips, or other structures used to prevent clean runoff or precipitation from coming into contact with mine tailings or waste rock, and picking up pollutants.				X		X				X	N
Adit Closure	Permanent closure of mine adits to eliminate or reduce acid mine drainage.						X				X	Y
Industrial Site Housekeeping	Maintaining a general cleanliness and order at industrial sites to limit the opportunity for uncontrolled, offsite transport of pollutants.		X	X	X	X	X	X	X	X	X	N
Transportation Network BMPs	Please see "*Transportation*" section of this table.		X	X	X	X	X	X	X	X	X	?
Spill Prevention and Control Plan	Planning documents and training designed to speed up response and recovery time in the event of a spill of hazardous material.										X	Y
Recreation												
Public Boat Ramps and Fishing Access Sites	Establish and maintain a system of boat ramps and fishing access sites that allow the public adequate access to streams and lakes through riparian areas, while discouraging creation of individual user trails through riparian areas.				X	X					X	Y

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Public Trails	Establish and maintain a system of trails in and through riparian areas. Trails should be sited and constructed to prevent erosion and control runoff from the trail surface.				X							N
Remove "Unofficial" Trails	Obliterate or restrict access to trails that generate significant amounts of NPS pollution or cause excessive damage to riparian areas.				X	X						N
Waste Handling and Disposal	Provide toilets and trash cans to encourage proper waste disposal.		X	X					X	X		N
Spill Prevention and Control	Manage vehicle and equipment fuel to prevent release into surface water or groundwater.										X	?
No-wake Zones	Establish and enforce no-wake zones to protect fragile shorelines from erosion.				X							N
Off-Highway-Vehicle (OHV) Management	Developing, designating, and maintaining trails for OHV recreation. Trails should be designed to avoid OHV contact with surface water and riparian areas, or to limit contact to hardened crossings or bridges.				X						X	N
Stream Restoration												
Streambank stabilization, stream channel and in-stream habitat restoration	Stream restoration practices will be identified and applied on a site-specific basis. Emphasis will be given to BMPs that restore natural, self-perpetuating stream processes and cost-effective controls.	Montana intends to develop guidance on appropriate stream restoration techniques during the next 5 years.	X	X	X	X			X			Y
Forestry - Please see Appendix A - 2 for Montana forestry BMPs												
Miscellaneous BMPs												

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Wetland Restoration or Creation	Restoration, re-creation or enhancement for the purpose of addressing NPS pollution.	Wetland Restoration (NRCS 657), Wetland Creation (NRCS 658), Wetland Enhancement (NRCS 659)	X	X	X	X			X	X	X	Y
Revegetation	Planting, protecting or reestablishing permanent vegetative cover in riparian or upland areas with the goal of reducing NPS pollution. Practice may include, but is not limited to seeding, sprigging, shrub planting, fencing to protect emerging or fragile vegetation, willow lifts, sod mats, overseeding, non-native plant removal, native plant reintroduction, riparian buffer creation, and replacement of annual plants with perennial vegetation.	Field Border (NRCS 386), Hedgerow Planting (NRCS 422), Pasture and Hay Planting (NRCS 512), Range Planting (NRCS 550), Riparian Forest Buffer (NRCS 391), Riparian Herbaceous Cover (NRCS 390), Tree/Shrub Establishment (NRCS 612)	X	X	X	X			X	X	X	?
Floodplain Reestablishment	Reestablishment of a stream's floodplain or reconnection to an abandoned floodplain, with the purpose of addressing NPS pollution. Practice may also include breaching, removal, or modification of dikes, levees, road bases, or railroad grades to allow streams to access or reestablish a floodplain.		X	X	X	X						Y
Culvert Replacement or Removal	Removal or replacement of culverts to reduce NPS pollution.	Stream Crossing (NRCS 578)		X	X							Y
Dam Removal or Modification	Dam removal or modification to restore the natural hydrograph of a stream in order to facilitate natural stream processes that would reduce NPS pollution.				X	X						Y

Table A.1 BMPs

BMP	Description	References: Guidance documents, internet resources, NRCS Practice Standard(s), other literature	Pollutant									Consultant or Engineer Typically Needed Y/N/?
			Nitrogen	Phosphorus	Sediment	Temperature	pH	Salinity	BOD	Pathogens	Toxic Chemicals	
Educational Tours, Field Days, Trainings, Conferences, Workshops	Educational events designed to raise awareness of NPS pollution or train people on how to address NPS pollution.		X	X	X	X	X	X	X	X	X	N
Brochures, Newsletters, Fliers, Mailings, List-servers, Webpages, Blogs	Educational materials designed to raise awareness of NPS pollution or train people on how to address NPS pollution.		X	X	X	X	X	X	X	X	X	N
Media Campaigns	Television, radio, internet or other media campaigns to raise awareness of NPS pollution or train people on how to address NPS pollution.		X	X	X	X	X	X	X	X	X	Y
Service Learning	Hands-on training and experience in techniques to address NPS pollution.		X	X	X	X	X	X	X	X	X	?
Social Networking	Use of social networking to raise awareness of NPS pollution issues or train people on how to address NPS pollution.		X	X	X	X	X	X	X	X	X	N
Special Area Management Plan	Management plans designed to help prevent NPS pollution in sensitive or threatened landscapes or watersheds.		X	X	X	X		X	X	X		Y
Mulching	Application of organic materials to bare or highly erodible soils to prevent erosion.	Mulching (NRCS 484)		X	X							N
New Technology, Practices Not Previously Considered, Other	Other practices, not mentioned above, may be useful for reducing or preventing NPS pollution. Other practices should be evaluated and applied where appropriate.		X	X	X	X	X	X	X	X	X	?

A.2 FORESTRY FROM DNRC

BEST MANAGEMENT PRACTICES FOR FORESTRY IN MONTANA

January 2006

* BMPs Not Monitored During Audits

I. DEFINITIONS

1. "Hazardous or toxic material" means substances which by their nature are dangerous to handle or dispose of, or a potential environmental contaminant, and includes petroleum products, pesticides, herbicides, chemicals, and biological wastes.

2. "Stream," as defined in 77-5-302(7), MCA, means a natural water course of perceptible extent that has a generally sandy or rocky bottom or definite banks and that confines and conducts continuously or intermittently flowing water.

3. "Streamside Management Zone (SMZ)" or "zone" as defined at 77-5-302(8), MCA means "the stream, lake, or other body of water and an adjacent area of varying width where management practices that might affect wildlife habitat or water quality, fish, or other aquatic resources need to be modified." The streamside management zone encompasses a strip at least 50 feet wide on each side of a stream, lake, or other body of water, measured from the ordinary high water mark, and extends beyond the high water mark to include wetlands and areas that provide additional protection in zones with steep slopes or erosive soils.

4. "Wetlands" mean those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include marshes, swamps, bogs, and similar areas.

5. Adjacent wetlands are wetlands within or adjoining the SMZ boundary. They are regulated under the SMZ law.

6. Isolated wetlands lie within the area of operation, outside of the SMZ boundary, and are not regulated under the SMZ law.

II. STREAMSIDE MANAGEMENT

The Streamside Management Law (77-5-301 through 307 MCA) provides minimum regulatory standards for forest practices in streamside management zones (SMZ). The "Montana Guide to the Streamside Management Zone & Rules" is an excellent information source describing management opportunities and limitations within SMZs.

III. ROADS

A. Planning and Location

1. Minimize the number of roads constructed in a watershed through comprehensive road planning, recognizing intermingled ownership and foreseeable future uses. Use existing roads, unless use of such roads would cause or aggravate an erosion problem.

2. Review available information and consult with professionals as necessary to help identify erodible soils and unstable areas, and to locate appropriate road surface materials.*

3. Fit the road to the topography by locating roads on natural benches and following natural contours. Avoid long, steep road grades and narrow canyons.

4. Locate roads on stable geology, including well-drained soils and rock formations that tend to dip into the slope. Avoid slumps and slide- prone areas characterized by steep slopes, highly weathered bedrock, clay beds, concave slopes, hummocky topography, and rock layers that dip parallel to the slope. Avoid wet areas, including moisture- laden or unstable toe slopes, seeps, wetlands, wet meadows, and natural drainage channels.

5. Minimize the number of stream crossings and choose stable stream crossing sites.

6. Locate roads to provide access to suitable (relatively flat and well- drained) log landing areas to reduce soil disturbance.*

B. Design

1. Properly design roads and drainage facilities to prevent potential water quality problems from road construction.*

2. Design roads to the minimum standard necessary to accommodate anticipated use and equipment. The need for higher engineering standards can be alleviated through proper road-use management.

3. Design roads to balance cuts and fills or use full bench construction (no fill slope) where stable fill construction is not possible.*

4. Design roads to minimize disruption of natural drainage patterns. Vary road grades to reduce concentrated flow in road drainage ditches, culverts, and on fill slopes and road surfaces.

C. **Road Drainage** Road Drainage is defined as all applied mechanisms for managing water in a non-stream crossing setting, road surface drainage, and overland flow; ditch relief, cross drains and drain dips)

1. Provide adequate drainage from the surface of all permanent and temporary roads. Use outsloped, insloped or crowned roads, and install proper drainage features. Space road drainage features so peak flow on road surfaces or in ditches will not exceed capacity.

    a. Outsloped roads provide a means of dispersing water in a low- energy flow from the road surface. Outsloped roads are appropriate when fill slopes are stable, drainage will not flow directly into stream channels, and transportation safety can be met.

    b. For in-sloped roads, plan ditch gradients steep enough, generally greater than 2% but less than 8%, to prevent sediment deposition and ditch erosion. The steeper gradients may be suitable for more stable soils; use the lower gradients for less stable soils.

    c. Design and install road surface drainage features at adequate spacing to control erosion; steeper gradients require more frequent drainage features. Properly constructed drain dips can be an economical method of road surface drainage. Construct drain dips deep enough into the subgrade so that traffic will not obliterate them.

2. Design all ephemeral draw culverts with adequate length to allow for road fill width. Minimum culvert size is 15 inch. Install culverts to prevent erosion of fill, seepage and failure as described in V.C.4 and maintain cover for culverts as described in V.C.6.

3. Design all relief culverts with adequate length to allow for road fill width. Protect the inflow end of all relief culverts from plugging and armor if in erodible soil. When necessary construct catch basins with stable side slopes. Unless water flows from two directions, skew ditch relief culverts 20 to 30 degrees toward the inflow from the ditch to help maintain proper function.

4. Where possible, install culverts at the gradient of the original ground slope; otherwise, armor outlets with rock or anchor downspouts to carry water safely across the fill slope.

5. Provide energy dissipaters (rock piles, slash, log chunks, etc.) where necessary to reduce erosion at outlet of drainage features. Crossdrains, culverts, water bars, dips, and other drainage structures should not discharge onto erodible soils or fill slopes without outfall protection.

6. Prevent downslope movement of sediment by using sediment catch basins, drop inlets, changes in road grade, headwalls, or recessed cut slopes.*

7. Route road drainage through adequate filtration zones or other sediment-settling structures to ensure sediment doesn't reach surface water. Install road drainage features above stream crossings to route discharge into filtration zones before entering a stream.

D. **Construction** (see also Section IV on stream crossings)

1. Keep slope stabilization, erosion and sediment control work current with road construction. Install drainage features as part of the construction process, ensuring that drainage structures are fully functional. Complete or stabilize road sections within same operating season.*

2. Stabilize erodible, exposed soils by seeding, compacting, riprapping, benching, mulching, or other suitable means.

3. At the toe of potentially erodible fill slopes, particularly near stream channels, pile slash in a row parallel to the road to trap sediment (example, slash filter windrow). When done concurrently with road construction, this is one method that can effectively control sediment movement, and it can also provide an economical way of disposing of roadway slash. Limit the height, width and length of "slash filter windrows" so wildlife movement is not impeded. Sediment fabric fences or other methods may be used if effective.

4. Minimize earthmoving activities when soils appear excessively wet.
Do not disturb roadside vegetation more than necessary to maintain slope stability and to serve traffic needs.*

5. Construct cut and fill slopes at stable angles to prevent sloughing and other subsequent erosion.

6. Avoid incorporating potentially unstable woody debris in the fill portion of the road prism. Where possible, leave existing rooted trees or shrubs at the toe of the fill slope to stabilize the fill.

7. Consider road surfacing to minimize erosion.*

8. Place debris, overburden, and other waste materials associated with construction and maintenance activities in a location to avoid entry into streams. Include these waste areas in soil stabilization planning for the road.

9. Minimize sediment production from borrow pits and gravel sources through proper location, development and reclamation.

10. When using existing roads, reconstruct only to the extent necessary to provide adequate drainage and safety; avoid disturbing stable road surfaces. Prior to reconstruction of existing roads within the SMZ, refer to the SMZ law. Consider abandoning existing roads when their use would aggravate erosion.

E. <u>Maintenance</u>

1. Grade road surfaces only as often as necessary to maintain a stable running surface and adequate surface drainage.

2. Maintain erosion control features through periodic inspection and maintenance, including cleaning dips and crossdrains, repairing ditches, marking culvert inlets to aid in location, and clearing debris from culverts.

3. Avoid cutting the toe of cut slopes when grading roads, pulling ditches, or plowing snow.

4. When plowing snow, provide breaks in snow berm to allow road drainage.*

5. Haul all excess material removed by maintenance operations to safe disposal sites and stabilize these sites to prevent erosion. Avoid sidecasting in locations where erosion will carry materials into a stream.*

6. Avoid using roads during wet periods if such use would likely damage the road drainage features. Consider gates, barricades or signs to limit use of roads during spring break up or other wet periods.

7. Upon completion of seasonal operations, ensure that drainage features are fully functional. The road surface should be crowned, outsloped, insloped, or water-barred. Remove berms from the outside edge where runoff is channeled.*

8. Leave abandoned roads in a condition that provides adequate drainage without further maintenance. Close these roads to traffic; reseed and/or scarify; and, if necessary, recontour and provide water bars or drain dips.

IV. TIMBER HARVESTING, AND SITE PREPARATION A. Harvest

Design

1. Plan timber harvest in consideration of your management objectives and the following*:

   a. Soils and erosion hazard identification. b. Rainfall.
   c. Topography.
   d. Silvicultural objectives.
   e. Critical components (aspect, water courses, landform, etc.). f. Habitat types.
   g. Potential effects on water quality and beneficial water uses. h. Watershed condition and cumulative effects of multiple timber management activities on water yield and sediment production. i. Wildlife habitat.

2. Use the logging system that best fits the topography, soil type, and season, while minimizing soil disturbance and economically accomplishing silvicultural objectives.

3. Use the economically feasible yarding system that will minimize road densities.*

4. Design and locate skid trails and skidding operations to minimize soil disturbance. Using designated skid trails is one means of limiting site disturbance and soil compaction. Consider the potential for erosion and possible alternative yarding systems prior to planning tractor skidding on steep or unstable slopes.*

5. Locate skid trails to avoid concentrating runoff and provide breaks in grade. Locate skid trails and landings away from natural drainage systems and divert runoff to stable areas. Limit the grade of constructed skid trails on geologically unstable, saturated, highly erosive, or easily compacted soils to a maximum of 30%. Use mitigating measures, such as water bars and grass seeding, to reduce erosion on skid trails.

6. Minimize the size and number of landings to accommodate safe, economical operation. Avoid locating landings that require skidding across drainage bottoms.

B. Other Harvesting Activities

1. Tractor skid where compaction, displacement, and erosion will be minimized. Avoid tractor or wheeled skidding on unstable, wet, or easily compacted soils and on slopes that exceed 40% unless operation can be conducted without causing excessive erosion. Avoid skidding with the blade lowered. Suspend leading ends of logs during skidding whenever possible.

2. Avoid operation of wheeled or tracked equipment within isolated wetlands, except when the ground is frozen (see Section VI on winter logging).

3. Use directional felling or alternative skidding systems for harvest operations in isolated wetlands.*

4. For each landing, provide and maintain a drainage system to control the dispersal of water and to prevent sediment from entering streams.

5. Insure adequate drainage on skid trails to prevent erosion. On gentle slopes with slight disturbance, a light ground cover of slash, mulch or seed may be sufficient. Appropriate spacing between water bars is dependent on the soil type and slope of the skid trails. Timely implementation is important.

6. When existing vegetation is inadequate to prevent accelerated erosion, apply seed or construct water bars before the next growing season on skid trails, landings and fire trails. A light ground cover of slash or mulch will retard erosion.*

C. Slash Treatment and Site Preparation

1. Rapid reforestation of harvested areas is encouraged to reestablish protective vegetation.*

2. When treating slash, care should be taken to preserve the surface soil horizon by using appropriate techniques and equipment. Avoid use of dozers with angle blades.

3. Minimize or eliminate elongated exposure of soils up and down the slope during mechanical scarification.*

4. Scarify the soil only to the extent necessary to meet the resource management objectives. Some slash and small brush should be left to slow surface runoff, return soil nutrients, and provide shade for seedlings.

5. Carry out brush piling and scarification when soils are frozen or dry enough to minimize compaction and displacement.

6. Carry out scarification on steep slopes in a manner that minimizes erosion. Broadcast burning and/or herbicide application is preferred means for site preparation, especially on slopes greater than 40%.

7. Remove all logging machinery debris to proper disposal site.*

8. Limit water quality impacts of prescribed fire by constructing water bars in firelines; not placing slash in drainage features and avoiding intense fires unless needed to meet silvicultural goals. Avoid slash piles in the SMZ when using existing roads for landings.

V. STREAM CROSSINGS

A. Legal Requirements

1. Under the Natural Streambed and Land Preservation Act of 1975 (the "310 law"), any activity that would result in physical alteration or modification of a perennial stream, its bed or immediate banks must be approved in advance by the supervisors of the local conservation district. Permanent or temporary stream crossing structures, fords, riprapping or other bank stabilization measures, and culvert installations on perennial streams are some of the forestry-related projects subject to 310 permits.

   Before beginning such a project, the operator must submit a permit application to the conservation district indicating the location, description, and project plans. The evaluation generally includes on- site review, and the permitting process may take up to 60 days.

2. Stream-crossing projects initiated by federal, state or local agencies are subject to approval under the "124 permit" process (administered by the Department of Fish, Wildlife and Parks), rather than the 310 permit.

3. A short-term exemption (3a authorization) from water quality standards is necessary unless waived by the Department of Fish, Wildlife and Parks as a condition of a 310 or 124 permit. Contact the

Department of Environmental Quality in Helena at 444-2406 for additional information.

B. Design Considerations (Note: 310 permit required for perennial streams)

1. Cross streams at right angles to the main channel if practical. Adjust the road grade to avoid the concentration of road drainage to stream crossings. Direct drainage flows away from the stream crossing site or into an adequate filter.

2. Avoid unimproved stream crossings. Depending on location, culverts, bridges and stable/reinforced fords may be used.

C. Installation of Stream Crossings (Note: 310 permit required for perennial streams)

1. Minimize stream channel disturbances and related sediment problems during construction of road and installation of stream crossing structures. Do not place erodible material into stream channels. Remove stockpiled material from high water zones. Locate temporary construction bypass roads in locations where the stream course will have minimal disturbance. Time construction activities to protect fisheries and water quality.

2. Design stream-crossings for adequate passage of fish (if present) with minimum impact on water quality. When using culverts to cross small streams, install those culverts to conform to the natural stream bed and slope on all perennial streams and on intermittent streams that support fish or that provides seasonal fish passage. Ensure fish movement is not impeded. Place culverts slightly below normal stream grade to avoid outfall barriers.

3. Do not alter stream channels upstream from culverts, unless necessary to protect fill or to prevent culvert blockage. On stream crossings, design for, at a minimum, the 25-year frequency runoff. Consider oversized pipe when debris loading may pose problems. Ensure sizing provides adequate length to allow for depth of road fill.

4. Install stream-crossing culverts to prevent erosion of fill. Compact the fill material to prevent seepage and failure. Armor the inlet and/or outlet with rock or other suitable material where feasible.

5. Consider dewatering stream crossing sites during culvert installation.*

6. Maintain a 1-foot minimum cover for stream-crossing culverts 15 to 36 inches in diameter, and a cover of one-third diameter for larger

culverts, to prevent crushing by traffic.

7. Use culverts with a minimum diameter of 15 inches for permanent stream crossings.*

D. Existing Stream Crossing

1. Ensure stream crossing culverts have adequate length to allow for road fill width and are maintained to preserve their hydrologic capacity. To prevent erosion of fill, provide or maintain armoring at inlet and/or outlet with rock or other suitable material where feasible. Maintain fill over culvert as described in V.C. 6.

VI. Winter Logging

A. General

1. Consider snow-road construction and winter harvesting in isolated wetlands and other areas with high water tables or soil erosion and compaction hazards.*

2. Conduct winter logging operations when the ground is frozen or snow cover is adequate (generally more than one foot) to prevent rutting or displacement of soil. Be prepared to suspend operations if conditions change rapidly, and when the erosion hazard becomes high.*

3. Consult with operators experienced in winter logging techniques.*

B. Road Construction and Harvesting Considerations

1. For road systems across areas of poor bearing capacity, consider hauling only during frozen periods. During cold weather, plow any snow cover off of the roadway to facilitate deep freezing of the road grade prior to hauling.*

2. Before logging, mark existing culvert locations. During and after logging, make sure that all culverts and ditches are open and functional.*

3. Use compacted snow for road beds in unroaded, wet or sensitive sites. Construct snow roads for single-entry harvests or for temporary roads.*

4. In wet, unfrozen soil areas, use tractors or skidders to compact the snow for skid road locations only when adequate snow depth exists.

Avoid steeper areas where frozen skid trails may be subject to erosion the next spring.*

5. Return the following summer and build erosion barriers on any trails that are steep enough to erode.*

VII. HAZARDOUS SUBSTANCES A.

General

1. Know and comply with regulations governing the storage, handling, application (including licensing of applicators), and disposal of hazardous substances. Follow all label instructions.

2. Develop a contingency plan for hazardous substance spills, including cleanup procedures and notification of the State Department of Environmental Quality.*

B. Pesticides and Herbicides

1. Use an integrated approach to weed and pest control, including manual, biological, mechanical, preventive and chemical means.*

2. To enhance effectiveness and prevent transport into streams, apply chemicals during appropriate weather conditions (generally calm and dry) and during the optimum time for control of the target pest or weed.*

A.3 LOCAL GOVERNMENT RIPARIAN SETBACKS AND LAND USE PLANNING ORDINANCES

Riparian Setbacks and Land Use Planning in		Compiled by: MT Audubon, P.O. Box 595, Helena, MT 59624; 406-443-3949: website:
List of Adopted Local Government Regulations and		
Date Updated: July 31, 2009		NOTE: This chart is sorted by Type of Regulation (Flood plain, Subdivision , Zoning, etc.)

Local Government Date Regulation	Purpose of Regulation	Size of Setback or Other Stream Protection Measure	Restrictions Apply	Specific Except	Setback meas	Area Covered: Streams,	Reference	Vegetation Requirements	Additional Requirements/ NOTES	How to Obtain
Type of Regulation: Development Permit Ordinance										
Beaverhead County Date: Big Hole River policy adopted March 2,	Protect water quality, flood plain, riparian resources,	Examine all new buildings proposed within 500 feet of Big Hole River; minimum setback is 150 feet.	New buildings		Ordinary high water mark	Big Hole River only	Ordinance No. 2005-1, Big Hole River Conservation Development Standards &	Indicates that development should be outside flood plain	NOTE: Ordinance also adopted in Madison County; zoning regulations adopted in Butte-	Use this link: http://www.beaverheadcounty.org/html/land_use_and_planning_departm
Madison County Date: Big Hole River Policy adopted Nov. 8, 2004	Protect water quality, flood plain, riparian resources,	Examine all new buildings proposed within 500 feet of Big Hole River; minimum setback is 150 feet.	New buildings		Ordinary high water mark	Big Hole River only	Ordinance No. 1- 2004, Big Hole River Conservation Development Standards &	Indicates that development should be outside flood plain	NOTE: Ordinance also adopted in Beaverhead County; zoning regulations adopted in Butte-	Use this link: http://madison.mt.gov/departments/plan/publications/planpub.asp
Type of Regulation: Flood Plain Regulations										
Missoula County Date: Bank stabilization provisions first adopted March 8, 2000	Protection from flooding	Prohibits new levees. Maintenance of an existing levee is allowed in three situations: if the levee is publicly maintained; if relocating, elevating, or flood-proofing the structures protected by the levee is not feasible; or if a streamside levee is to be reconstructed away from the stream bank.	New bank stabilization structures used in streams.			All river and streams with delineated 100 year floodplains	Flood plain Regulations: Chapter V: Specific Standards, 5.02.B.	Prohibits large-scale clearing of native vegetation within 50 feet of a stream or river	"Softer" bank stabilization techniques, including logs and other woody debris, may be allowed after review by administrators. New bridges and	Use this link: http://www.co.missoula.mt.us/opgweb/floodplain/floodplain.htm

Ravalli County Date: Floodway policy adopted March 17, 1999	Protection from flooding	The setback prohibits buildings in the 100-year flood plain (floodway fringe and the floodway). The setback appears under 4-6 (c) of the regulations: anything	Buildings and associated structures			All rivers and streams with delineated 100- year floodplains	Flood plain Regulations, Development Standards, Section 4-6 and Table 4-6-	None		Use this link: http://www.ravallicounty.mt.gov/Planning/Land.htm
Type of Regulation: Growth Policy										
Jefferson County Date: Riparian policy adopted June 18, 2003		"Promote investigation on stream setbacks…" "Require all construction to be setback from streams" "Recommend wetland				Streams and wetlands	2003 Growth Policy, Water Quality, Page 10 - 11.		NOTE: Growth Policies are non-regulatory but local regulations should comply with the Growth Policy.	Use this link: http://www.jeffco.mt.gov/county/planning.html

APPENDIX B - EPA'S "KEY COMPONENTS OF AN EFFECTIVE STATE NONPOINT SOURCE MANAGEMENT PROGRAM" AND "CROSSWALK" TO MONTANA'S 2017 NONPOINT SOURCE MANAGEMENT PLAN

EPA NPS Plan Element	Montana NPS Plan Section
1. The state program contains explicit short- and long-term goals, objectives and strategies to restore and protect surface water and groundwater, as appropriate.	Plan Overview Section 3- Montana's NPS Pollution Control Strategy Section 7- Measuring Success Section 8- Montana's Nonpoint Source Priorities and Action Plan Appendix F- Groundwater Quality Strategy for Montana
2. The state strengthens its working partnerships and linkages to appropriate state, interstate, tribal, regional, and local entities (including conservation districts), private sector groups, citizen groups and federal agencies.	Section 3- Montana's NPS Pollution Control Strategy Section 5- Partnerships and Funding Section 4- Public Engagement in NPS Pollution Appendix E- Entities Addressing NPS Pollution in Montana Appendix F- Groundwater Quality Strategy for Montana
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.	Section 1- Montana's NPS Pollution Management Program Framework Section 3- Montana's NPS Pollution Control Strategy Section 5- Partnerships and Funding Section 8- Montana's Nonpoint Source Priorities and Action Plan Appendix C- Water Quality Monitoring and Assessment Appendix E- Entities Addressing NPS Pollution in Montana Appendix G- 319 Projects 2012-2016 Appendix F- Groundwater Quality Strategy for Montana Appendix H-Montana Natural Resource Grant 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.	Section 1- Montana's NPS Pollution Management Program Framework Section 3- Montana's NPS Pollution Control Strategy Section 6- Enforceable Regulatory Programs Section 8- Montana's Nonpoint Source Priorities and Action Plan
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	Section 1- Montana's NPS Pollution Management Program Framework Section 3- Montana's NPS Pollution Control Strategy Appendix C- Water Quality Monitoring and Assessment

watersheds by conducting more detailed watershed assessments, developing watershed-based plans and implementing the plans.	Appendix E- Entities Addressing NPS Pollution in Montana Appendix H-Montana Natural Resource Grant Programs
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 program includes a mix of regulatory, non-regulatory, financial and technical assistance, as needed.	Section 1- Montana's NPS Pollution Management Program Framework Section 3- Montana's NPS Pollution Control Strategy Section 4- Public Engagement in NPS Pollution Section 5- Partnerships and Funding Section 6- Enforceable Regulatory Programs Section 7- Measuring Success Section 8- Montana's Nonpoint Source Priorities and Action Plan Appendix E- Entities Addressing NPS Pollution in Montana Appendix H-Montana Natural Resource Grant Programs
7. The state manages and implements in NPS management program efficiently and effectively, including necessary financial management.	Section 1- Montana's NPS Pollution Management Program Framework Section 8- Montana's Nonpoint Source Priorities and Action Plan Appendix E- Entities Addressing NPS Pollution in Montana
8. The state reviews and evaluates its NPS management program using environmental and functional measures of success and revises its NPS management program at least every five years.	Section 1- Montana's NPS Pollution Management Program Framework Section 7- Measuring Success Section 8- Montana's Nonpoint Source Priorities and Action Plan

APPENDIX C: WATER QUALITY MONITORING AND NPS MANAGEMENT

C.1 MONITORING OBJECTIVES

This section outlines DEQ's overall water quality monitoring objectives that support various aspects of Montana's NPS management program. Numerous federal, state, local agencies, nonprofits, universities, and other organizations are involved in water quality monitoring and assessment programs that often meet one or more of these same objectives. The NPS Program communicates with, coordinates with, cooperates with, and supports our monitoring partners to make the best use of our collective monitoring capabilities.

C.1.1 Problem Identification

Monitoring can be conducted to collect data used to verify or negate a perceived water quality problem. Relevant water quality parameters are collected and compared to water quality standards or reference conditions.

C.1.2 Water Quality Standards Attainment Assessments and 303(d)

DEQ assesses waterbodies to determine if they are meeting water quality standards and supporting designated beneficial uses. When performing assessments, DEQ uses data collected by DEQ as well as data collected by other entities if the data meets water quality objectives. Waters meeting standards are identified and placed in one of two different categories of the Integrated Report. Waters not meeting water quality standards are impaired and DEQ places them on the state's list of impaired waters, pursuant to section 303(d)(1)(A) of the federal Clean Water Act.

C.1.3 Monitoring Trends

Trend monitoring involves a standard suite of water quality parameters collected over a period of years from pre-selected, fixed monitoring stations at pre-determined times of year in order to analyze long-term trends in water quality condition.

DEQ reports biennially on water quality trends on large rivers in Montana's Water Quality Integrated Report to fulfill Clean Water Act Section 305(b) requirements. Fixed station monitoring also helps DEQ in fulfilling border agreement monitoring efforts.

C.1.4 Support TMDL Development and Source Assessment

TMDL development relies heavily on monitoring data to identify how a waterbody compares to standards and to evaluate pollutant sources and loads. Entities collecting water quality data in areas where DEQ is actively developing TMDLs can support the process by collecting specific parameters at specific locations that can be used to assist with aspects of TMDL development.

C.1.5 Developing and Implementing Watershed Restoration Plans

DEQ supports the development of science-based, locally-supported Watershed Restoration Plans (WRPs) to guide implementation of best management practices and education and outreach activities aimed at controlling nonpoint source pollution in a watershed. The EPA requires nine minimum elements to be included in WRPs and monitoring and data analysis is a necessary component of those plans. Monitoring data can be used to identify sources of pollution, identify potential restoration project areas, and estimate pollutant loading.

C.1.6 Evaluating Effectiveness of Individual Water Quality Improvement Projects (Project Effectiveness Monitoring)

Monitoring for project effectiveness can build local knowledge of restoration methods and BMPs that work well in a particular watershed or region of the state and may demonstrate that a specific project type is more likely to result in WQ improvements. Types of data may include water samples, photo monitoring, modeling, surveying, remote sensing, and other forms of evaluation.

Projects that receive 319 NPS funding must include project effectiveness monitoring using a DEQ-approved monitoring plan. The monitoring plan may require reporting on nutrient and/or sediment load reductions achieved by the project.

C.1.7 Evaluating Effectiveness of Cumulative Water Quality Improvement Activities

DEQ's water quality assessment and TMDL processes are usually conducted on a watershed scale as opposed to addressing individual impaired waterbodies scattered throughout the state. Likewise, WRPs developed by local entities typically address a wide range of water quality issues and multiple waterbodies throughout a watershed. This underscores the importance of evaluating water quality in the context of landscape-scale human activities and land uses that influence water quality conditions.

Over time, as water quality improvement and protection activities are completed, waterbody or watershed scale improvements are realized. Data can be collected to determine if water quality in impaired watersheds is on a trajectory toward meeting water quality standards and supporting beneficial uses. This information can be used to refine WRPs by identifying waters in need of additional water quality improvement activities. This type of monitoring is also used in a TMDL Implementation Evaluation (TIE) by DEQ. A TIE is an evaluation of progress in implementing reasonable land, soil and water conservation practices and restoring water quality, often at a watershed scale. The process involves evaluating what water quality improvement activities have been implemented and what opportunities for additional improvements remain. The process also involves evaluating existing data to determine if water quality improvements are being realized.

With sufficient data showing evidence of cumulative water quality improvements, DEQ's Nonpoint Source Program may request that DEQ's Monitoring and Assessment Section reassess a waterbody to determine if it is meeting water quality standards and supporting beneficial uses, consistent with Section B.1.8.

C.1.8 Reassessment and Potential Success Stories

DEQ's NPS Program supports water quality improvement and protection activities on impaired waterbodies. Over time, as progress is made through on-the-ground restoration and best management practices, water quality may improve to the point that water quality standards are met and beneficial uses are supported. Having data to substantiate improvements, including evidence of on-the-ground activities and water quality data, is important to trigger investigation and reassessment by DEQ. When a waterbody is removed from the impaired waters list as a result of water quality improvement activities, DEQ reports these achievements as "success stories" to encourage similar actions across the watershed and the state.

This objective involves the collection of water quality indicators relevant to the pollution impairment listing. This may include the collection of primary or secondary parameters required for DEQ assessment methods, or other supplemental information like time-lapse photos showing improvement over space and time. This objective may also require repeated monitoring to demonstrate that water quality improvements are sustained over time.

C.1.9 Establishing Baseline Water Quality Conditions

Water quality conditions can change over time, particularly as human activities and land uses in a watershed change. For example, expansion of residential development or transportation corridors, conversion of grassland to croplands, and natural resource extraction may all influence water quality. Baseline refers to conditions at some level against which future conditions can be referenced. Baseline monitoring involves the measurement of water quality or other parameters, particularly those susceptible to the change anticipated. This information can then be used to compare pre-existing conditions to conditions post-change.

C.1.10 Education

Monitoring can be an effective tool to engage community members in water quality issues and watershed science. Youth programs through schools and adult education programs often incorporate water quality monitoring. Generally, monitoring with education as the primary objective does not intend to collect data that meets specific data quality objectives, and is often used to illustrate concepts rather than to inform assessments of water quality condition, watershed planning, or restoration.

C.2 Quality Assurance and Control Processes

All projects (internal or external to DEQ) collecting water quality data using funds from EPA or DEQ are required to operate under a Quality Assurance Project Plan (QAPP) or equivalent document. A QAPP is a technical document that describes the objectives of a project and the quality assurance management processes and activities necessary to develop data that will support those objectives.

A Sampling and Analysis Plan (SAP) is also required for all projects collecting water quality data using funds from EPA or DEQ. A SAP documents all aspects of sampling and analysis activities to be performed for a particular water quality study or data collection effort to help assure that project objectives will be met. SAPs document the quality of the environmental data and ensure that groups or agencies are aware of the level of data quality for decision making purposes. Even when no EPA or DEQ funds are involved, basic sample planning, analysis, and data control principles should be used.

C.3 Monitoring Partnerships

Funding constraints usually limit water quality monitoring activities. Tradeoffs between the quantity and the quality of data collected, in addition to how the data will be used, are important to consider when prioritizing monitoring activities. DEQ's partial solution to addressing water quality monitoring needs with limited funding is to form partnerships. DEQ frequently partners with local, state and federal agencies to achieve common monitoring objectives. In addition, local stakeholder groups, many of which incorporate volunteers to perform monitoring activities, can be trained to collect data that meet specified quality assurance and control requirements, and operate under a formal monitoring plan. Such groups can screen for potential water quality problems and collect data that can identify long-term water quality trends. Montana has many examples of water quality monitoring collaboration among

multiple partners. However, important differences in legal requirements, data collection methods, and quality control needs often exist among partner organizations. These differences can limit the extent to which data can be used between water quality monitoring projects or partners in achieving differing monitoring objectives.

C.4 VOLUNTEER WATER QUALITY MONITORING

Montana has a broad spectrum of citizen-based, volunteer water quality monitoring programs. Many volunteer monitoring (VM) programs are administered by watershed groups, conservation districts, local water quality districts, and non-governmental organizations. At the most basic level, volunteer monitoring helps to engage citizens in the fundamental aspects of water quality and the importance of protecting water resources from NPS pollution, and encourages communities to protect local water resources.

Each group conducting volunteer monitoring is driven by a unique set of monitoring objectives that may include watershed education for youth and adults, collection of baseline data to study water quality status and trends, or monitoring to evaluate the effectiveness of conservation practices and restoration projects. Often, DEQ and local monitoring objectives overlap. However, volunteer monitoring programs sometimes lack adequate funds or technical expertise to collect high quality, credible data. These challenges have prompted DEQ to create a Volunteer Water Quality Monitoring Support Program.

The primary objective of DEQ's VM Support Program is to support the collection of credible data by locally-led, volunteer-based programs that will also support DEQ water quality restoration and protection programs. Support may be supplied directly to VM programs in the form of material or technical support, or may be in the form of partnerships with other entities (e.g., non-governmental, academic, or agency programs) in the state which provide similar support. DEQ's partners in Montana's VM support network include:

- Montana State University Extension Water Quality (MSUEWQ) Program
- Montana Watershed Coordination Council (MWCC)
- Big Sky Watershed Corps
- Montana Watercourse
- Montana Water Center

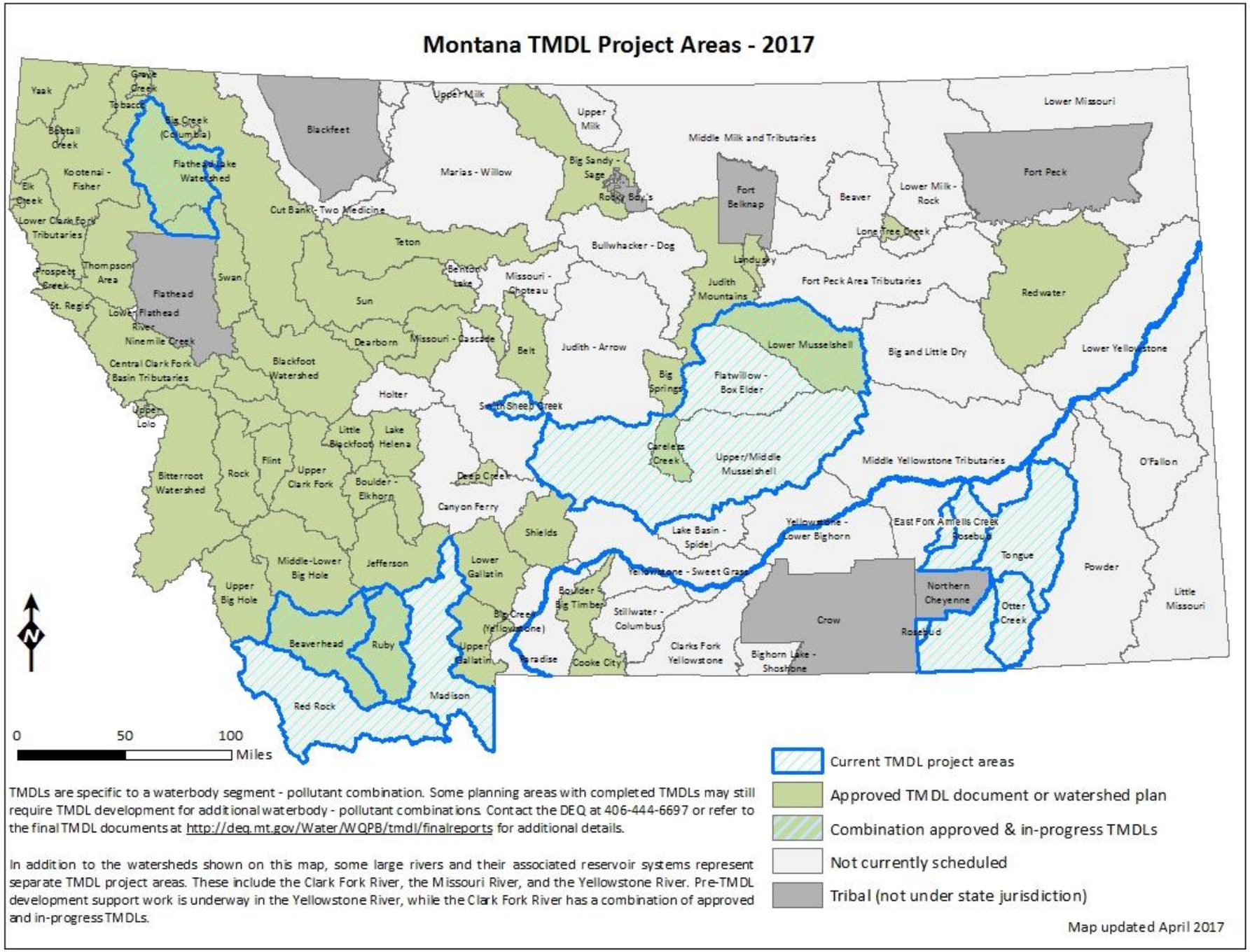
Examples of material support through DEQ's VM Support Program include providing funds to support laboratory analyses or lending monitoring equipment. Examples of technical support include monitoring design recommendations, development of volunteer-appropriate monitoring methods, reviewing SAPs, and providing training. Visit DEQ's website for more information on the VM Support Program.

Appendix D – TMDL and Watershed Restoration Plan Progress

Montana TMDL Project Areas

The map below depicts DEQ's past, present, and ongoing TMDL development projects. DEQ uses the following factors to prioritize new TMDL development projects:

- New individual point source permit application(s) or other immediate programmatic needs
- Degree of interest, support and available resources toward addressing nonpoint sources of pollution in an area
- Degree of impact to human health or aquatic life or other indicators of impairment severity
- The recreational, economic, and aesthetic importance of waterbodies in an area
- Recognition of a high quality resources in the early stage of degradation
- The ability to address the problem through TMDL implementation



TMDLs are specific to a waterbody segment - pollutant combination. Some planning areas with completed TMDLs may still require TMDL development for additional waterbody - pollutant combinations. Contact the DEQ at 406-444-6697 or refer to the final TMDL documents at http://deq.mt.gov/Water/WQPB/tmdl/finalreports for additional details.

In addition to the watersheds shown on this map, some large rivers and their associated reservoir systems represent separate TMDL project areas. These include the Clark Fork River, the Missouri River, and the Yellowstone River. Pre-TMDL development support work is underway in the Yellowstone River, while the Clark Fork River has a combination of approved and in-progress TMDLs.

Map updated April 2017

No

Table D-1. Montana Completed TMDL Documents

Completed TMDL Documents	EPA Approval Year	Pollutants Addressed
Beaverhead - Jefferson River Temperature	2014	2
Beaverhead Sediment	2012	21
Big Creek - Columbia	2003	1
Big Creek - Yellowstone	2001	0
Big Sandy - Sage	2002	9
Big Springs	2005	4
Bitterroot Headwaters	2006	13
Bitterroot Sediment & Temperature	2011	20
Bitterroot Watershed	2014	19
Blackfoot Headwaters Addendum; Sandbar Creek Sediment	2014	1
Blackfoot Headwaters Metals	2003	30
Blackfoot Headwaters Sediment	2004	4
Bobtail Creek	2005	2
Bonita - Superior Metals	2013	14
Boulder - Big Timber	2009	15
Boulder - Elkhorn Metals	2012	70
Boulder - Elkhorn Sediment, Temperature, Nutrients	2013	25
Careless Creek	2001	1
Central Clark Fork Tributaries	2014	23
Clark Fork - Silver Bow Creek Metals	2014	40
Clark Fork River Nutrients	1998	15
Cooke City	2003	41
Dearborn	2005	3
Deep Creek	1996	1
Elk Creek	1998	1
Flathead Headwaters	2005	1
Flathead Lake Nutrients	2002	2
Flathead -Stillwater	2014	23

Table D-1. Montana Completed TMDL Documents

Completed TMDL Documents	EPA Approval Year	Pollutants Addressed
Flint Creek Metals Addendum; Douglass Creek Antimony	2015	1
Flint Metals & Sediment	2012	48
Flint Nutrients	2013	11
Grave Creek	2005	1
Jefferson Metals	2014	14
Judith Mountains	2013	34
Kootenai - Fisher	2014	20
Lake Helena	2006	105
Lake Helena Metals Addendum	2013	7
Landusky Metals	2012	70
Little Blackfoot	2011	64
Little Blackfoot Addendum	2014	10
Lone Tree Creek	2001	1
Lower Blackfoot	2009	12
Lower Blackfoot Nutrients	2013	10
Lower Clark Fork Tributaries	2010	5
Lower Gallatin	2013	41
Lower Gallatin pH Addition	2014	2
Middle & Lower Big Hole	2009	70
Middle Blackfoot - Nevada	2008	94
Middle Blackfoot - Nevada Addendum	2014	8
Missouri - Cascade/Belt Metals	2011	47
Ninemile	2005	10
Prospect Creek Metals	2006	8
Prospect Creek Sediment	2009	3
Redwater	2010	28
Rock Creek	2013	34
Ruby	2007	28

Table D-1. Montana Completed TMDL Documents

Completed TMDL Documents	EPA Approval Year	Pollutants Addressed
Shields	2009	4
St. Regis	2008	8
Sun	2005	18
Swan	2004	6
Teton	2003	21
Thompson	2014	30
Tobacco Phase 2	2014	3
Tobacco Sediment	2011	8
Upper & North Fork Big Hole	2009	24
Upper Clark Fork Phase 2	2014	25
Upper Clark Fork Tributaries	2010	79
Upper Clark Fork Tributaries Addendum	2014	3
Upper Jefferson Sediment	2009	7
Upper Lolo	2003	5
West Fork Gallatin	2010	9
Whitepine Creek Temperature	2014	1
Yaak	2008	3
Yaak Nutrients	2014	1
		TOTAL - 1442

Montana Watershed Restoration Plan Status

Watershed restoration plans (WRPs) are locally developed, locally led plans for addressing impairments to water quality. WRP development typically occurs after TMDL development, and can help guide and catalyze implementation of recommendations found within TMDL documents.

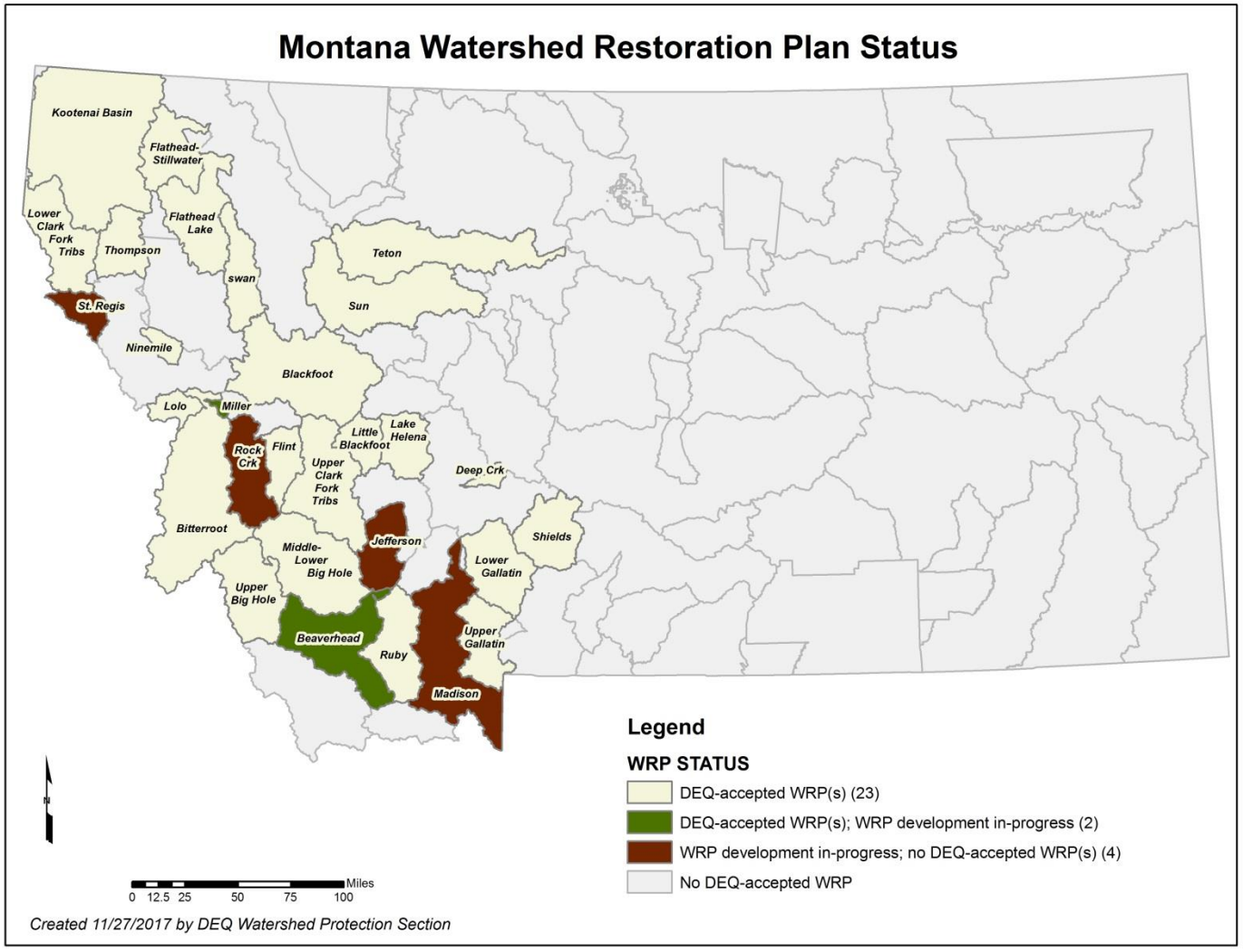


Table D-2 Montana Watershed Restoration Plans (WRPs)

WRP	Sponsor	Status
Beaverhead	Beaverhead Watershed Committee	Accepted 2014; Revision In Progress
Bitterroot	Bitter Root Water Forum	Accepted 2014
Blackfoot River	Blackfoot Challenge	Accepted 2014
Deep Creek	Broadwater Conservation District	Accepted 2014
Flathead	Flathead Conservation District	Accepted 2017
Flathead Lake	Flathead Lakers	Accepted 2014
Flint Creek	Flint Creek Watershed Group	Accepted 2014
Kootenai Basin	Kootenai River Network Inc.	Accepted 2015
Lake Helena	Lake Helena Watershed Group/Lewis and Clark Water Quality Protection District	Accepted 2016
Little Blackfoot	Trout Unlimited	Accepted 2016
Lolo Creek	Lolo Watershed Group	Accepted 2013
Lower Clark Fork	Lower Clark Fork Watershed Group	Accepted 2010
Lower Gallatin	Greater Gallatin Watershed Council	Accepted 2014
Madison River	Madison Conservation District	Under Development
Middle and Lower Big Hole Watershed	Big Hole Watershed Committee	Accepted 2013
Miller Creek	Missoula Valley Water Quality Protection District	Under Development
Ninemile Creek	Trout Unlimited	Accepted 2013
Rock Creek	Trout Unlimited	Under Development
Ruby	Ruby Watershed Group	Accepted 2015
Shields River Watershed	Park Conservation District	Accepted 2012
St. Regis	Trout Unlimited	Under Development
Sun River	Sun River Watershed Group	Accepted 2012
Swan Basin	Swan Ecosystem Center	Accepted 2012
Teton River	Teton Watershed Group	Accepted 2010
Upper & North Fork Big Hole Watershed	Big Hole Watershed Committee	Accepted 2012
Upper Clark Fork River Tributaries	Watershed Restoration Coalition	Accepted 2012
Upper Gallatin River	Gallatin River (Blue Water) Task Force	Accepted 2012
Upper Jefferson	Jefferson River Watershed Council	Under Development

APPENDIX E - ENTITIES ADDRESSING NONPOINT SOURCE POLLUTION IN MONTANA

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FEDERAL GOVERNMENT AGENCIES

ARMY CORPS OF ENGINEERS

The U.S. Army Corps of Engineers (ACE) administers permit programs for Section 10 of the Rivers and Harbors Act, and Section 404 of the Federal Clean Water Act. Section 10 permits are required for activities such as construction of certain structures (e.g. piers, wharfs, weirs), or other modifications to the navigable waters of the United States. Section 404 permits are required for activities involving the disposal of dredged or fill material into the waters of the United States. In addition, the Nationwide Permit #27 can be used to authorize stream restoration and wetland creation projects. Information can be obtained on the Montana U.S Army Corps of Engineers website, as well as information about the permitting program.

Finally, the Corps of Engineers offers planning assistance to states and tribes (through the section 22 Program) that assists entities with water resource related problems where technical planning assistance from the Corps of Engineers would be beneficial.

BUREAU OF LAND MANAGEMENT

The Department of the Interior's Bureau of Land Management (BLM) administers approximately eight million acres within Montana.

In 2010, the State Directors of the BLM and the Montana Department of Environmental Quality (DEQ) signed a Memorandum of Understanding (MOU) establishing the framework for managing and controlling nonpoint source pollution from BLM managed lands and authorizations. The overall objective is to maintain and/or improve watershed and riparian health in order to reduce nonpoint source pollution and improve water quality. A key component of the BLM's program is that the BLM focuses on addressing the causes and sources of water quality issues while also providing funding to DEQ to monitor instream water quality. This approach uses the strengths of both agencies to more efficiently and effectively manage water quality. The BLM provides DEQ a report every two years summarizing compliance with the MOU.

Opportunities for coordination and collaboration:

- Continue cooperating in the reclamation of abandoned mine lands
- Continue cooperating in the management of energy resources
- Continue coordinating data collection on public lands
- Continue participating on the Montana Watershed Coordination Council and the Montana Wetland Council
- Continue providing technical assistance on land management and its relationship to water quality
- Continue participating in the development of TMDLs and water quality restoration plans in watersheds where BLM is a significant resource manager
- Jointly evaluate BMP implementation and effectiveness

BUREAU OF RECLAMATION

The Bureau of Reclamation is a water management agency with numerous programs, initiatives, and activities that help the western states, Native American tribes, and others meet new water needs and balance the competing uses of water in the West. Reclamation's mission is to assist in meeting the increasing water demands of the West while protecting the environment and the public's investment in Reclamation constructed dams, power plants, and canals. Reclamation has many activities and programs that contribute to the stewardship of watersheds and water quality in Montana including water conservation field services and drought relief programs.

Coordination and collaboration opportunities include the following:

- Financial and technical assistance for watershed projects
- Financial and technical assistance for irrigation district issues and projects
- Participation in TMDL development and water quality restoration planning in watersheds where Reclamation activities have a significant impact

ENVIRONMENTAL PROTECTION AGENCY

EPA Region 8 is responsible for implementing water programs to protect the public and the environment in six states, including Montana. Most of EPA's water programs are delegated to the state water quality agency for implementation. Through this relationship, EPA promotes many activities and initiatives that help local watershed groups with water quality stewardship efforts in Montana. EPA programs supporting Montana's NPS program include:

- **Section 319 Funding**: Cooperative agreements are made between EPA and the state, enabling federal funds to be distributed. The state NPS program subsequently dispenses a portion of these funds to sponsors of local NPS projects. The state must match the federal contributions. DEQ applies for section 319 grant funding annually. Approximately $2 million will be available to Montana for 2017. One of Region 8's Watershed Team's primary goals is to "Assist states with integrated strategies for prioritizing and protecting /restoring waterbodies and watersheds." EPA staff provides input during DEQ NPS planning activities and participates in statewide watershed protection efforts, such as the Montana Watershed Coordination Council and the Water Activities Workgroup. EPA provides additional support to DEQ's NPS program by coordinating funding of additional grant programs, providing assistance on state-led projects, and providing information about new federal initiatives, watershed protection tools, and innovative approaches for watershed protection.
- **Water Quality Monitoring and TMDL Programs:** Significant collaboration occurs between DEQ and EPA in implementation of monitoring activities and development of total maximum daily loads (TMDLs). EPA and DEQ collaborate on development and implementation of annual water quality monitoring plans. These monitoring and assessment activities lead to the development of the biannual Integrated Report, which describes the overall water quality in Montana and provides a list of impaired waterbodies. DEQ develops the Integrated Report and EPA provides concurrence. EPA provides yearly grants to DEQ to support the monitoring and assessment work.
- **Wetland Protection Development Grants Program**: Wetlands are often important components of mitigating the potential effects of nonpoint source pollution. Recognizing this, DEQ collaborates with EPA Region 8 and Headquarters to help develop its wetland program using

EPA technical assistance and grant resources. EPA continues to provide Wetlands Protection Development Grants to DEQ to help develop its wetland program.

Coordination and collaboration opportunities include the following:

- Provide financial assistance for watershed and water quality projects
- Provide technical assistance with water quality monitoring and modeling, source water and drinking water protection, and wetland management and protection activities

FARM SERVICE AGENCY

The Farm Service Agency (FSA) of the U.S. Department of Agriculture enhances the environment by the development and implementation of programs to ensure adequate protection of natural, cultural, and historic resources. FSA programs and activities that contribute to the stewardship of watershed health and water quality include the following:

- **Conservation Reserve Program** (CRP): CRP is a voluntary program that offers annual rental payments, incentive payments for certain activities, and cost share assistance to remove environmentally sensitive land from agricultural production and plant species that will improve environmental health and quality. The program encourages the re-establishment of valuable land cover to help improve water quality, prevent soil erosion, and reduce loss of wildlife habitat. CRP is administered through local county Farm Service Agency Offices.
- **Emergency Conservation Program** (ECP): ECP provides emergency funding for farmers and ranchers to rehabilitate farmland damaged by wind erosion, floods, or other natural disasters, and for carrying out emergency water conservation measures during periods of severe drought. Emergency practices to rehabilitate farmland damaged by disasters, including drought, include providing water for livestock, fence restoration, grading and shaping of farmland, restoring conservation structures and water conservation measures.

Opportunities for the FSA to coordinate and collaborate with other agencies, organizations, and individuals include the following:

- Providing financial assistance to farmers for conservation measures
- Providing technical assistance (e.g. a landowner guide) for selecting and implementing appropriate conservation techniques and practices

FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service (USFWS) is part of the Department of the Interior and is responsible for carrying out federal laws and programs that conserve, protect, and enhance fish, wildlife, plants and their habitats. Montana has seven staffed National Wildlife Refuges (NWRs) and five Wetland Management Districts (WMDs).

The USFWS has many activities and programs that contribute to the stewardship of watersheds and water quality in Montana including the following:

- **Partners for Fish and Wildlife Program**: Provides funding and technical assistance to private landowners interested in fish and wildlife habitat projects on their land. Montana focus areas include the Blackfoot Valley, Rocky Mountain Front, Northeastern Montana, Beaver Creek, Mission Valley, and Centennial Valley.

- **Emergency Wetlands Resources Act**: Promotes the conservation of migratory waterfowl and to offset or prevent loss of wetlands by acquisition of wetlands and other essential habitat.
- **Fish and Wildlife Coordination Act**: Provides evaluations of the impacts of water resources development projects (such as dam construction or reclamation projects) on fish and wildlife and Clean Water Act Sections 402 and 404 permits.
- **National Wetland Inventory**: Responsible for identifying, classifying, mapping, and reporting on the status of wetlands of the United States.

NATURAL RESOURCES CONSERVATION SERVICE

The Natural Resources Conservation Service (NRCS) is a part of the U.S. Department of Agriculture and provides products and services that enable America's private land owners to be good stewards of the nation's soil, water, and related natural resources. The role of NRCS is to provide technical and financial assistance on a voluntary basis to help land managers take a comprehensive approach to the use and protection of natural resources.

The NRCS has many programs and initiatives that contribute to the stewardship of watersheds and water quality in Montana:

Farm Bill Programs

- **Agricultural Conservation Easement Program – Wetland Reserve Easements (ACEP-WRE):** The ACEP-WRE program is a voluntary program to restore and protect wetlands on private property. ACEP-WRE provides landowners with financial incentives to restore wetlands. Landowners and the NRCS develop a plan for the restoration and maintenance of the wetland.
- **Conservation Stewardship Program (CSP):** The Conservation Stewardship Program is a voluntary program that offers payments to producers who maintain a high level of conservation on their land and agree to adopt higher levels of stewardship. The program provides access to all producers, regardless of operation size, crops produced, or geographic location
- **Environmental Quality Incentives Program (EQIP):** Provides technical and financial assistance to farmers and ranchers who volunteer to address natural resource concerns on their agricultural lands. Special initiatives such as the National Water Quality Initiative (NWQI) allow NRCS to target water quality impairments through on-farm conservation. Key to NRCS efforts is the locally-led process of engaging producers, stakeholders and partners.
- **EQIP Conservation Innovation Grants (CIG)**: To promote new and innovative technologies. The goal is that these new and innovative technologies can be incorporated into the EQIP as future cost share or incentive activities.
- **National Water Quality Initiative (NWQI):** Established as a joint initiative with state water quality agencies and the EPA in 2012 to address agricultural sources of water pollution, including nutrients, sediment and pathogens, in priority watersheds throughout the country. The goal of NWQI is to implement conservation practices in a sufficient quantity in a concentrated area so that agriculture no longer contributes to the impairment of waterbodies within these priority watersheds. In Montana NRCS and DEQ have a Memorandum of Understanding (2012) that provides for the Montana Watershed Coordination Council's Water Activities Work Group to function as the State Technical Committee's Water Resources Committee. This provides a collaborative process for considering and selecting watersheds for the NAWQI. EQIP funds this assistance and attempts to leverage funding with state and local partners.

- **Regional Conservation Partnership Program (RCPP):** The RCPP is a partner-driven, locally-led approach to conservation. It offers new opportunities for USDA's Natural Resources Conservation Service (NRCS) to harness innovation, welcome new partners to the conservation mission, and demonstrate the value and efficacy of voluntary, private lands conservation. RCPP allows NRCS to match local partner funds and implement locally-driven conservation efforts.

Other NRCS Programs and Activities include

- **Emergency Watershed Protection Program** (EWP): Provides financial and technical assistance for emergency measures to address hazards to life and property created by a natural disaster.
- **Swampbuster/Wetland Conservation Provisions**: Discourages the conversion of wetlands on agricultural land by denying federal farm benefits to farmers who drain wetlands.
- **Conservation Technical Assistance**: Provides range conservationists, soil conservationists, engineers, biologists, agronomists, and soil scientists to conserve natural resources on private lands. With NRCS technical assistance, landowners plan and apply practices that reduce soil erosion; improve water quality; and enhance forest land, wetlands, grazing land, and wildlife habitat.

Coordination and collaboration opportunities include the following:

- Identification of priority NWQI watersheds
- Funding for projects conducted by landowners, conservation districts, and watershed groups
- Technical assistance for projects conducted by landowners, conservation districts, and watershed groups

FOREST SERVICE

The US Forest Service is a part of the U.S. Department of Agriculture. Watershed management and protection remains one of the primary objectives of today's National Forest System. Montana has nine National Forests covering almost 17 million acres in Montana. MT DEQ and the Forest Service collaborate and coordinate extensively on programs addressing nonpoint source pollution including:

- **Watershed Restoration Planning and Implementation**: The Forest Service is responsible for prioritizing watersheds for restoration and other management activities, development of watershed restoration plans and implementation of those plans.
- **Abandoned Mine Reclamation**: In coordination with the DEQ Abandoned Mines Program, the Forest Service prepares joint engineering and cost analyses, conducts primary responsible party searches, plans and implements site remediation activities.
- **Road Management**: The Forest Service has undertaken a program of road inventory, problem identification, and maintenance. The 2005 Travel Management Rule directs Forests and Grasslands to do travel analysis. This process will identify the minimum road system needed to meet overall management objectives. It will determine the roads and trails available for motorized and unamortized use and those that will be eliminated.
- **BMP Manual and Effectiveness Monitoring:** The Forest Service published the "National Best Management Practices for Water Quality Management on National Forest Lands" in April 2012 to improve agency performance and accountability consistent with the Clean Water Act. Following up on this technical guide, individual Forests are required to document the effectiveness of BMP practices installed on a subset of their projects.

- **Watershed Condition Framework:** The 2012 Forest Planning Rule requires all National Forests to identify select watersheds that are a priority for restoration or maintenance as part of the Forest Plan. Based on each Forest's priorities, the Forests are required to develop and implement action plans (Watershed Restoration Action Plans) that will improve watershed conditions.

Opportunities to coordinate and collaborate with the Forest Service include the following:

- Participating in TMDL development and water quality restoration planning and protection efforts
- Cooperatively provide information needed for watershed assessment and encourage cooperative efforts to assess conditions across jurisdictional boundaries
- Providing technical and financial assistance with water quality and habitat protection and restoration projects
- Share data collected in support of land and resource management plans such as hydrology and soils surveys and wetlands inventories
- Incorporating best management practice (BMP) measures into timber harvest plans that minimize impacts to water quality
- The Forest Service will continue participation in and support of the state Forestry BMP audit program

GEOLOGICAL SURVEY

The USGS was established by Congress in 1879 to provide the Nation with reliable and impartial information in order to understand the Nation's natural resources. Today, the USGS is a scientific organization concerned with providing credible, relevant, impartial, and timely information.

USGS water activities are divided into different programs including the:

- **Groundwater and Streamflow Information Program:** provides for monitoring of groundwater and surface-water resources at the local/regional/national in near real-time and over much longer temporal scales (decades to centuries).
- **National Water Quality Program:** provides an understanding of water-quality conditions; whether conditions are getting better or worse over time; and how natural features and human activities affect those conditions.
- **Water Availability and Use Science Program:** has the goal of providing an accurate assessment of the status of the water resources of the U.S., assisting in the determination of the quantity and quality of water that is available for beneficial uses, identifying long-term trends in water availability, and developing the basis for an improved ability to forecast the availability of water for economic, energy production, and environmental uses.

TRIBES

TRIBAL WATER QUALITY PROGRAMS

The State of Montana contains seven Tribal Nations within its boundaries. These Tribes are sovereign nations and are governed as such. The Tribes manage approximately 4 million acres of land in

Montana. These Tribal governments participate in EPA's water quality grant programs including water quality monitoring, nonpoint source pollution control, and wetlands program development. The EPA Montana Office works with the Tribal programs to develop and maintain water quality protection programs. In Montana, three Tribal governments have water quality standards that have been approved by the EPA. A fourth has been granted authority to administer a water quality standards program and is proceeding with seeking EPA approval of their Tribal water quality standards. All of the Tribes located in Montana have NPS programs with assessments and management plans that have been approved by EPA. Continued collaboration is encouraged between DEQ and Tribal Nations in Montana to enhance water quality programs by understanding each agency/government's concerns and needs. For additional information about EPA's Tribal water quality grant programs in Montana, please call (406) 457-5000.

Confederated Salish and Kootenai Tribes of the Flathead Reservation* Natural Resources Department Environmental Protection Division http://nrd.csktribes.org
Fort Peck Assiniboine and Sioux Tribes* Office of Environmental Protection www.fortpecoep.org
Northern Cheyenne Tribe* Department of Environmental Protection and Natural Resources www.cheyennenation-depnr.com
Fort Belknap Indian Community Environmental Department www.ftbelknap.org/environmental.html
Crow Nation Natural Resources Department www.crow-nsn.gov
Chippewa Cree Indians Tribe of the Rocky Boy's Reservation Water Resources Department
Blackfeet Nation** Blackfeet Environmental Office www.blackfeetenvironmental.com

* These Tribes have EPA approved Water Quality Standards under Section 303(c) of the Clean Water Act.
** This Tribe has received authority to administer a Water Quality Standards program under Section 518 of the Clean Water Act.

STATE GOVERNMENT AGENCIES

DEPARTMENT OF AGRICULTURE

The mission of the Montana Department of Agriculture is to protect producers and consumers, and to enhance and develop agriculture and allied industries. While serving Montana's agriculture, the Department is mandated to protect the health of the environment and the state's citizens from agriculture related impacts. The Department has many activities and programs that contribute to water quality protection in Montana including:

- **Pesticide Management Program**: The proper use of pesticides is regulated by registering pesticide products, certifying and training pesticide applicators and dealers, and enforcing pesticide laws and regulations.
- **Groundwater Protection Program**: The Groundwater Protection Program provides for the management of agricultural chemicals to prevent, minimize, and mitigate agricultural chemicals in groundwater. The Groundwater Protection Program maintains a permanent network of groundwater wells across the state, and conducts special regionally-focused projects annually. The samples collected during annual monitoring and regional projects are tested for approximately 100 pesticides, pesticide metabolites, nitrate, and nitrite concentrations.

Opportunities for collaboration and coordination with the Department of Agriculture include the following:

- Working with agencies on cooperative water resource projects that include pesticide/fertilizer related sampling and monitoring including NRCS, MSU, EPA, USGS, tribes, DEQ, MBMG, communities and local units of government.
- Sampling and monitoring of water resources and providing technical assistance in standard operating procedures, quality assurance program plans, sampling/monitoring design, well-selection criteria, analyte selection and laboratory analyses interpretation.

DEPARTMENT OF FISH, WILDLIFE, AND PARKS

Montana Fish, Wildlife, & Parks (FWP) manages the state's wildlife resources for recreational uses such as fishing and hunting and also for protection of open space, wilderness, and habitat for nongame species. The Fisheries Division provides technical assistance for managing endangered and threatened aquatic species, protecting and restoring aquatic habitat, protecting and restoring native fish populations, and controlling pollution. Staff of the Fisheries Division:

- Monitors and researches fish populations and habitat condition
- Participates in land use decisions with local, state, and federal agencies
- Assists private landowners, agencies, and organizations with habitat protection and restoration efforts through the Future Fisheries grant program and technical assistance
- Manages water flows in streams and water levels in lakes and reservoirs
- Administers the Stream Protection Act (124 Permits) and, with the Conservation Districts, implements the Natural Streambed and Land Preservation Act (310 Permits)
- Maintains the Montana Fish Consumption Advisory, which lists meal advice for people eating wild-caught fish that are contaminated with mercury or other metals or harmful organic compounds

FWP has a pollution control biologist to facilitate interagency coordination regarding activities with implications to fisheries resources. Examples of opportunities for the FWP to collaborate and coordinate with other agencies, organizations, and individuals include the following:

- Collaborating with local watershed groups to accommodate watershed restoration goals that benefit water quality and fisheries resources
- In partnership with DEQ, coordinate water pollution activities including investigation of fish kills and other activities that have implications to fisheries resources and water quality

DEPARTMENT OF JUSTICE

The Natural Resource Damage Program (NRDP) within the Department of Justice is responsible for preparing natural resource damage assessments and lawsuits pursuant to the federal and state superfund and oil pollution act laws in order to recover damages for injuries to natural resources caused by releases of hazardous substances and for developing and implementing natural resource restoration plans that guide the expenditures of the recovered damages in compliance with these laws.

The NRDP is responsible for determining natural resource injury and preparing and implementing restoration plans that guide the State's expenditure of settlement proceeds on restoration projects. In general, funds can be used on projects located within the area of the injury or nearby that will restore, rehabilitate, replace, or acquire the equivalent of the injured natural resources. Natural resources and services they provide include:

- water, fish and wildlife resources
- public drinking water supplies
- natural resource based recreational opportunities such as hunting, fishing, hiking and wildlife watching

DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

The mission of the Montana Department of Natural Resources and Conservation (DNRC) is to help ensure that Montana's land and water resources provide benefits for present and future generations.

The Conservation and Resource Development Division assists individuals and local governments with natural resource management concerns and finances conservation, resource management, and reclamation activities. It also provides financial and technical assistance for watershed management and pollution prevention projects conducted by Montana's 58 conservation districts. This division is a strong supporter of conservation activities, water quality and upland and streamside management and protection. A strong partnership has developed between this division, conservation districts, USDA, NRCS, and watershed groups. The division has a variety of grant and loan programs available to carry out activities that address conservation, watershed management, soil health, saline seep reclamation, education, and restoration and reclamation activities. Many of these grant programs are used to fund nonpoint source pollution management activities and are used as match for 319 grants.

The division also assists conservation districts in their administration of the natural streambed and land preservation act and writes the state's minimum standards for the act. One of the review criteria for this permitting program is minimization of sedimentation and erosion.

The Forestry Division is responsible for planning and implementing forestry programs through a network of field offices. The Service Forestry Bureau provides services to various client groups to help them comply with State forestry laws and achieve their own forestry related objectives. Education is a key role of the Service Forestry Bureau to make people aware of forestry Best Management Practices (BMPs), which are voluntary in Montana, and of the Streamside Management Zone Law which is regulatory and applies to all streams during commercial timber harvest. The forestry BMPs and the SMZ Law focus on protecting water quality.

DNRC administers a Rangeland Resource Program with four major areas of emphasis:

- Work with county range committees, conservation districts, and producer groups to foster sound rangeland management
- Encourage coordination and cooperation between private, state, and federal entities involved in range management
- Administer the Rangeland Improvement Loan Program
- Co-sponsor the Governor's Range Tour, Winter Grazing Seminar, and Montana Youth Range Camp

The Water Resources Division includes the Water Management, Water Rights, and Water Operations Bureaus. The division provides expertise for surface water and groundwater hydrology, floodplain management, water allocation, dam safety, assists with watershed planning, drought planning and resiliency and collects water flow data. This Division has responsibility for development of the state water plan.

Opportunities exist for DNRC to coordinate and collaborate with local groups and organizations and other agencies within the watershed framework. These opportunities include:

- Watershed planning
- Water management, water allocation and drought resiliency
- Floodplain delineation management and mitigation
- Forest practices
- Forestry BMPs and operations within Streamside Management Zones
- Educational programs on land management, grazing, streamside management forestry, and water use
- Collection of water quality, water resource and land use data from state-owned school trust lands
- Cooperative watershed assessment, planning and restoration activities in watersheds containing school trust lands intermixed with other agencies and landowners groups
- Coordinate and improve stream permitting among agencies and the public

DEPARTMENT OF TRANSPORTATION

The Montana Department of Transportation (MDT) serves the public by providing a transportation system that emphasizes quality, safety, cost effectiveness, and sensitivity to the environment. MDT contributes to the stewardship of watersheds and water quality in Montana through:

- Preparing and submitting Storm Water Pollution Prevention Plans (SWPPP)
- Implementing Best Management Practices during construction and maintenance activities
- Constructing and maintaining temporary and permanent sediment and erosion control features
- Implementing Best Management Practices (BMPs) during all construction and maintenance activities
- Implementing additional stormwater pollution prevention requirements included in Section 404 Permits, Section 401 Certification, and Stream Protection Act 124 Authorizations
- Evaluating projects for practicability of including practices that infiltrate, evapotranspire, or capture for reuse the runoff generated from the first 0.5 inches of rainfall from a 24-hour storm preceded by 48 hours of no measureable precipitation

- Planning for measures to minimize and avoid impacts to aquatic resources such as wetlands, streams and rivers along transportation project corridors
- Mitigation of transportation project wetland and stream bank impacts: more than 54 wetland and stream mitigation sites have been restored or created, resulting in approximately 1,300 acres of wetlands and 46,000 linear feet of streambank to replace aquatic resources impacted by transportation projects across the state.
- Assisting DEQ during the preparation and implementation of TMDL Restoration Plans for impaired waterways
- Installing permanent erosion and sediment control (PESC) features such as check dams and sediment traps in environmentally sensitive areas
- Increasing the salt content in the traction sand, which reduces the amount of sanding material utilized during the winter months
- Conducting annual maintenance such as sweeping roadways, repairing check dams, and removing sediment from sediment traps

STATEWIDE ORGANIZATIONS AND UNIVERSITIES

MONTANA AQUATIC RESOURCE SERVICES

Montana Aquatic Resources Services (MARS) restores, enhances and preserves Montana's Aquatic Resources. MARS has a statewide In-Lieu fee program which provides compensatory mitigation for unavoidable impacts to Montana's wetlands, streams riparian areas and other aquatic habitat. MARS also offers a channel migration easement program along the Yellowstone River

MONTANA ASSOCIATION OF CONSERVATION DISTRICTS AND

SOIL AND WATER CONSERVATION DISTRICTS OF MONTANA

Conservation districts are units of local government designed to help citizens conserve their soil, water, and other renewable natural resources. Montana's 58 conservation districts cover all counties and include more than 70 municipalities included within district boundaries. The purpose of MACD (a 501(c)4 nonprofit) is to equip districts with the authorities, powers, and funding necessary to complete their responsibilities. MACD facilitates communication among districts, with federal and state agencies, and with other organizations. MACD works with the state legislature and Congress to affect natural resource policy, acts as an information clearinghouse for districts, and generally promotes awareness of districts and their conservation activities.

The purpose of SWCDM (a 501(c)3 nonprofit) is to serve and support Montana's conservation districts through programs, technical assistance, information sharing, and other resources. SWCDM works with agency and non-government organizations in delivering programs that best serve districts and Montanans through local, commonsense conservation. Current SWCDM programs include those focused on soil health, water resources, range to name a few.

MONTANA BUREAU OF MINES AND GEOLOGY

The Montana Bureau of Mines and Geology (MBMG) has a mission of providing applied research that promotes Montana's orderly development of its mineral, rock, and water resources. Several specific water programs include:

- MBMG's extensive monitoring of Super Fund cleanup activity in the Clark Fork Basin and its understanding of statewide mine impact issues at small to large scales is directly applicable to mining related NPS questions. Additionally, MBMG maintains statewide databases for abandoned and inactive mines on federal properties in Montana, and for historical mining activity.
- MBMG has decades of water level and water quality monitoring data related to historic coal mining in southeast Montana and gathered new data during current coalbed methane development.
- MBMG projects address specific groundwater resource issues including those of potable water supplies and water quality at scales from local to drainage basin wide. These evaluations provide the hydrogeologic background to help solve groundwater issues within a study area.
- The Ground Water Assessment program (GWAP) provides regular water level measurements and collects samples to provide long term water quality data at about 950 sites state-wide. The Ground Water Information Center (http://mbmggwic.mtech.edu) delivers groundwater data for more than 236,000 sites.
- The Ground Water Investigations Program (GWIP) has recently been added to the MBMG to conduct focused groundwater research on specific issues across the state. Each project produces a detailed report describing the hydrogeologic system and a comprehensive set of data for each study area.

MONTANA RURAL WATER SYSTEMS

Located in Great Falls, Montana Rural Water Systems is a non-profit association of water and wastewater systems that provides training and technical assistance to rural water and wastewater system operators in Montana.

MONTANA SALINITY CONTROL ASSOCIATION

Montana Salinity Control Association (MSCA) is a satellite program of 34 conservation districts, addressing saline soil and water reclamation. MSCA provides groundwater assessments and site specific reclamation plans for individual landowners and groups in small and large scale watersheds.

MSCA receives funding that is administered by DNRC and competes for federal grants to address nonpoint source pollution on a watershed basis. Since 1989, Montana has received over $53 million from USDA to implement saline reclamation measures using NRCS-Environmental Quality Incentive Program (EQIP) and FSA-Continuous Conservation Reserve Program (CCRP). Since the MSCA program began, over 1225 saline sites have received site specific recommendations. There are over 100 projects in progress or waiting for technical and financial assistance with salinity control.

MSCA is also involved in eighteen watershed level saline projects. The size of projects ranges from about 5,000 acres to over 600,000 acres. EPA has provided $995,000 for technical assistance to watershed level saline projects.

MONTANA STATE UNIVERSITY, EXTENSION WATER QUALITY PROGRAM

The Montana State University Extension Water Quality Program (MSUEWQ) is a team of scientists and educators who focus efforts in research and extension education addressing soil and water resources throughout Montana. The goal of MSUEWQ is to address the broad spectrum of water quality education and information needs of a diverse audience by:

- Providing resources needed to address technical water quality questions and issues
- Providing enhanced water quality educational resources
- Providing internet accessible water quality resources for statewide and national audiences

In addition to the water quality program under MSU Extension, the MSU Department of Animal and Range Sciences offers programs to assist in NPS pollution prevention. These include MSU Extension programs in range land management and riparian management. Details can be found in MSU Department of Animal and Range Sciences at http://animalrange.montana.edu/.

MSUEWQ programming follows the research and extension education areas within the mission of the Cooperative Extension Service through collaborative partnerships with multiple federal and state agencies, local conservation and irrigation districts, and watershed groups throughout the state.

Opportunities for partnerships and collaboration include:

- Monitoring projects to quantify potential water quality impacts on impaired streams
- Water budgeting projects to quantify water use and promote BMPs for water conservation
- Monitoring and BMP projects that source and mitigate nutrient and bacteria loading on streams associated with livestock access
- Promotion and automation of the Well Educated program to ensure longevity of service for private well owners empowered to monitor and maintain personal domestic water supply
- Development of audience specific, online curriculum addressing current water resource issues throughout the region
- Development of curriculum and training for tribal entities on private well and local stream monitoring to enhance community health and wellness

MONTANA WATER CENTER AND MONTANA WATERCOURSE

The Montana Water Center at MSU is one of the federally funded water research institutes in the United States that collectively form the National Institutes for Water Resources. The Montana Water Center's mission is to provide Montana's public universities resources to resolve state water resource issues. It does this by sponsoring water related research, providing training and education for working water professionals, educating future water professionals, and conducting education and outreach to Montana citizens on water issues.

The Center provides specialized trainings and workshops for water professionals, sponsors the Annual Montana American Water Resources Association (AWRA) meeting each year as well as the week-long Montana Water School at Montana State University that draws several hundred wastewater operators from around the nation.

Montana Watercourse is the education and outreach arm of the Montana Water Center. The Montana Watercourse is a statewide water education program that supports water resource decision-making and stewardship by providing information, resources, tools and education to all water users. Montana Watercourse provides information and educational forums on a variety of water resource topics, including water management and conservation, watersheds, water quality, water rights, wetlands and riparian areas, groundwater/surface water interaction, stormwater and aquatic life.

MONTANA WETLAND COUNCIL

The Montana Wetland Council is an active networking forum of professional wetland scientists of diverse interests who work cooperatively to conserve and restore Montana's wetland and riparian ecosystems. The Council is currently operating under "A Strategic Framework for Wetland and Riparian Area Conservation and Restoration in Montana 2013 – 2018".

UNIVERSITY OF MONTANA

Since 1983, the University of Montana Watershed Health Clinic has collaborated with the Montana Department of Environmental Quality on applied studies to guide the conservation & restoration of Montana's water resources.

In 2006, UM Watershed Health Clinic students and professors conducted a survey of river users & Montana registered voters for the DEQ. The survey asked participants to indicate which levels of river algae (as shown in pictures) would interfere with their use of the river. Analysis of the survey allowed DEQ to establish levels that represent an aesthetic nuisance to significant numbers of users.
In 2011, Clinic director Vicki Watson worked with Michael Suplee of DEQ to analyze the response of the Clark Fork River to over a decade of nutrient reduction efforts in that river basin. The results were published in a peer reviewed journal.

MONTANA WATERSHED COORDINATION COUNCIL

The Montana Watershed Coordination Council (MWCC) serves as a statewide forum and communication hub connecting locally led watershed groups, conservation districts, agencies, interested stakeholders, and private or public organizations across the Montana landscape. MWCC works to build and unite the watershed communities by providing education, professional development, outreach and networking opportunities for watershed professionals. MWCC also promotes the watershed groups and the watershed approach at the state level and provides a unified voice to advocate for local solutions to natural resource challenges. By supporting, training and promoting watershed organizations, their coordinators and members, MWCC is able to streamline communication and help sustain watershed organizations in Montana. These locally-led organizations and partnerships often provide the critical first line of defense in water quality improvement and protection in meeting NPS goals. For more information visit www.mtwatersheds.org.

REGIONAL AND NON-GOVERNMENTAL ORGANIZATIONS

CLARK FORK AND KOOTENAI BASIN COUNCIL

The Clark Fork Task Force was created in 2001 by the Montana legislature to create a water management plan for the entire Clark Fork basin. The Task Force created a plan for the basin in 2004 and updated that plan in 2014 with development of a statewide water plan. After the statewide plan was adopted, members of the Clark Fork Task Force, along with many other stakeholders came together in 2016 to re vision the Task Force as a Basin Council with expanded role and membership. A major focus of this basin council is promoting and monitoring the implementation of the basin plan.

FLATHEAD BASIN COMMISSION

The Flathead Basin Commission (FBC) was created by the Montana Legislature in 1983 to monitor and protect water quality in the Flathead basin. The FBC is a uniquely structured, non-regulatory organization that works to accomplish its important mandate in a consensus building manner, stressing education, cooperation, broadly based community involvement, partnerships with agencies and nonprofit groups, and the voluntary participation of basin residents.

The FBC currently focuses on transboundary resource protection efforts and aquatic invasive species prevention, and sponsors surface and groundwater research and monitoring projects, including a Volunteer Lake Monitoring Program.

Opportunities for FBC to coordinate and collaborate with other agencies and organizations include the following:

- Voluntary nutrient reduction strategy
- Water quality projects
- Public outreach and education
- Control of aquatic invasive species

MISSOURI RIVER CONSERVATION DISTRICT COUNCIL, YELLOWSTONE RIVER CONSERVATION DISTRICT COUNCIL

These two Conservation District Councils were formed to present a unified voice for the use and conservation of the Missouri and Yellowstone rivers and to promote information sharing between districts in these river basins in eastern Montana. Coordination of conservation efforts is a key focus of both groups.

LOCAL GOVERNMENT ORGANIZATIONS

CONSERVATION DISTRICTS

Conservation districts are units of local government designed to help citizens conserve their soil, water, and other renewable natural resources. Montana's 58 conservation districts cover all counties and include more than 70 municipalities included within district boundaries. Conservation districts are responsible for implementing Montana's Natural Streambed and Land Preservation law. Opportunities for DEQ to coordinate and collaborate with conservation districts include the following:

- TMDL planning and implementation
- Project prioritization
- Support and funding for nonpoint source pollution reduction
- Volunteer monitoring
- Technical assistance

GALLATIN LOCAL WATER QUALITY DISTRICT, LEWIS & CLARK COUNTY WATER QUALITY PROTECTION DISTRICT, AND MISSOULA VALLEY WATER QUALITY DISTRICT

Local Water Quality Districts focus on water resources education and water quality monitoring for increased awareness of water-related issues and public health. Programs and activities of the Districts are based on a watershed perspective and can include activities in the following areas:

- **Education and Outreach:** Improve public awareness and understanding of local water quality, and water resources
- **Monitoring and Research:** Collect and analyze water data and implement monitoring projects that evaluate, protect, and improve long-term water quality
- **Information Collection and Dissemination:** Compile, store, and disseminate water quality data and information
- **Facilitate planning:** For the prudent use of local water resources
- **Develop and implement:** Water quality improvement and protection projects

Opportunities for collaboration and coordination with the Districts include the following:

- Working with other agencies on cooperative water resource projects that include monitoring and sampling activities related (but not limited to) watershed restoration plans, pesticides/fertilizers, pharmaceutical and personal care products, stormwater impacts, groundwater characterization and level trends, wetland inventories
- Serving as a clearinghouse for watershed and water quality information in the watershed.
- Cooperating with local, state and federal agencies and organizations to provide environmental education on watershed resources in the watershed
- Coordinating with state agencies and groups for data collection (GWIC, DEQ's Clean Water Act Information Center and the Public Water Supply database)
- Assisting numerous entities with water quality and quantity technical assistance

WATERSHED GROUPS AND CONSERVATION ORGANIZATIONS

In Montana there are over 60 local organizations that consider themselves to be a "watershed group" (self-identified), based on the Montana Watershed Coordination Council's watershed directory. These groups can be associated with a conservation district or local water quality district, may have IRS 501(c)(3) non-profit status, and may have, or be working towards having a state-accepted watershed-based plan. These organizations are dedicated to improving water resources on-the-ground through a variety of actions, including public engagement, planning, fundraising, project development and implementation, and monitoring.

PRIVATE COMPANIES

AVISTA UTILITIES, NORTHWESTERN ENERGY, STIMPSON LUMBER, WEYERHAEUSER

As part of Federal Energy Regulatory Commission licensing, or as a result of critical habitat requirements for endangered species, private companies develop agreements and habitat conservation plans with state and federal agencies that are intended and designed to mitigate negative impacts to the aquatic environment and endangered species. These agreements and plans can take the form of annual funding opportunities, technical assistance and implementation of reasonable land, soil and water conservation practices. Opportunities for collaboration and coordination with private companies include:

- TMDL planning and implementation
- Funding
- Monitoring
- Technical assistance

INTERNAL (DEPARTMENT OF ENVIRONMENTAL QUALITY)

WATER QUALITY DIVISION

The Water Quality Division integrates water resource planning and protection to protect Montana's water quality resources. The division is responsible for administering Montana's water quality laws and is delegated responsibility for Section 319 of the Federal Clean Water Act.

Water Quality Planning Bureau

The Water Quality Planning Bureau consists of three Sections: Water Quality Standards and Modeling, Water Quality Monitoring and Assessment, and Information Management and Technical Services. Together these sections work towards the common goal of attaining and maintaining state water quality standards. Activities include:

- Water quality standards and standards guidance development
- Assessment and monitoring of all State waters
- 305(b) and 303(d) reporting
- Coordination of State-wide agency water quality monitoring
- Operation of statewide water quality monitoring networks and monitoring databases
- Maintenance of all MPDES permit information

- Water quality modeling and watershed analysis
- Dissemination of monitoring data
- Coordination of citizen volunteer water quality monitoring

Engineering Bureau

The Engineering Bureau houses the Water Pollution Control State Revolving Fund and the Drinking Water State Revolving Fund Programs (SRF). Financial assistance is provided through grants and loans for water and wastewater facilities and eligible non-point source projects to protect health and improve water quality. Both SRF programs are built to maintain a permanent, self-sustaining revolving fund program that serves as a cost effective source of financing for water and wastewater projects in Montana.

The bureau also includes the Public Water and Wastewater Engineering Sections and the Subdivisions Review Section. The Public Water and Wastewater sections review plans and specifications for water and wastewater to ensure compliance with design standards. The Bureau's Subdivisions Section Program reviews design plans for proposed subdivisions. In general, this includes reviewing the adequacy of water supply, wastewater treatment and disposal, solid waste disposal, and stormwater controls for parcels of land smaller than 20 acres, and for condominiums and recreational vehicle and mobile home parks, regardless of size.

Water Protection Bureau

The Water Protection Bureau includes the Watershed Protection Section, the Groundwater and 318/401 Section, MPDES Permitting Section and Compliance, Training and Technical Support Services Section. The permitting and compliance sections prevent surface and groundwater pollution by reviewing potential sources of pollution and issuing a variety of surface and groundwater permits.
The Source Water Protection Program:

- Delineates sources of water that supply public water supply wells and intakes and assesses potential risks to these source waters
- Assists communities and public water suppliers to develop plans that protect source water
- Assists local governments to establish local water quality districts

Public Water Supply Bureau

This bureau regulates public drinking water facilities in Montana. The bureau's Public Water Supply Program assures that public health is protected and maintained through a safe and adequate supply of drinking water. These functions are achieved by water quality sampling and compliance monitoring, sanitary surveys (inspections) and through training and technical assistance. The Bureau also certifies operators of certain public drinking water systems and public wastewater treatment facilities.

AIR, ENERGY AND MINING DIVISION

Air Quality Bureau

Permitted sources are required to submit a Best Available Control Technology (BACT) Analysis for their air emitting sources. The decreased levels of pollutants from the use of emission controls generally leads to less pollution that may be deposited on waterbodies. Compliance with the air quality permit essentially sets a "backstop" for the concentration of air pollutants that can be emitted in the air and potentially end up depositing on a waterbody.

Energy Bureau

The Energy Bureau is responsible for energy efficiency and renewable energy programs, and small business assistance. This bureau works to improve efficiency for consumers, small businesses and state and local governments. Examples of work done that will protect water include:

- Training and technical assistance for small business owners about complying with environmental regulations and going beyond compliance to environmental management systems
- Training to contractors about stormwater regulations and best practices, asbestos regulations and other areas of interest
- Financing water conservation projects in state government facilities

Waste Management and Remediation Division

The Remediation Division is responsible for overseeing investigation and cleanup activities at state and federal Superfund sites; reclaiming abandoned mine lands; implementing corrective actions at sites with leaking underground storage tanks (LUSTs); and overseeing groundwater remediation at sites where agricultural and industrial chemical spills have caused groundwater contamination.

APPENDIX F: PROTECTING GROUNDWATER QUALITY IN MONTANA

F.1 INTRODUCTION

Montana's population relies heavily on groundwater. Groundwater is the primary source of drinking water for rural domestic water supply as well as public water systems (Department of Environmental Quality, 2016). Groundwater is also used for irrigating crops and for stock water. In many locations, groundwater also sustains flows for streams throughout much of the year.

This appendix gives an overview of the current groundwater plans, programs, and activities in Montana that are designed to protect groundwater quality. This represents an important component to the state's nonpoint source program given the inherent connectivity between groundwater and surface water. Nonpoint sources of pollution that enter groundwater may ultimately reach surface waters via a groundwater pathway, although it is important to note that not all pollutants that enter groundwater will ultimately reach surface water due to biodegradation, adsorption and other subsurface processes. Therefore, groundwater pollution does not always result in surface water pollution, or in some cases the amount of pollution entering groundwater may be significantly diminished when the groundwater interacts with interconnected surface water.

F.2 GROUNDWATER PLANNING DOCUMENTS

There are numerous Montana groundwater quality planning documents, often associated with one or more groundwater quality protection programs. Two important statewide groundwater planning documents that overlap many of the state groundwater programs are discussed below.

F 2.1 Montana Groundwater Plan

The *Montana Ground Water Plan* (Department of Natural Resources and Conservation, 1999) was developed in response to concerns identified by citizens at public scoping meetings and as a result of a recommendation of the *1992 State Water Plan Section: Integrated Water Quality and Quantity Management*. This effort also addressed a U.S. Environmental Protection Agency (EPA) recommendation for states to develop a comprehensive groundwater protection program.

The Groundwater Plan is divided into three subsections: Protection, Education and Remediation. Each of these subsections presents a series of issues and recommended options, generally for state agency implementation, identified through the plan development process. Several state agencies, including DEQ, address many of the issues and recommendations laid out in the 1999 Groundwater Plan within their existing water quality programs. This appendix discusses several of these programs that have a groundwater quality focus.

F 2.2 2015 Montana State Water Plan

Montana's priorities and strategy for obtaining more complete, timely and accurate water-availability information to support policy and decision-making is detailed in the 2015 Montana State Water Plan (Department of Natural Resource and Conservation, 2015), also referred to as the State Water Plan. During the 18-month long State Water Plan process, the Montana Department of Natural Resources and Conservation (DNRC) worked with four regional Basin Advisory Councils (BACs) to develop basin specific

recommendations to address the issues of most concern within the planning basins. The results of this effort, along with supporting data, are contained in four individual basin planning reports. Inherently the focus of each plan is on groundwater supply, although each planning report also includes groundwater quality considerations in recognition of the importance of groundwater quality for beneficial use and the interaction between groundwater and surface water.

Each of the four basin plans includes the following and serves as a standalone document for guiding the development and management of the basin's water resources:

- Inventory consumptive and non-consumptive uses of water
- Estimate the amount of water needed to satisfy new future demands
- Analysis of the effects of frequent drought and new or increased depletions on future water supplies
- Possible sources of water to meet the needs of the state
- Legislation necessary to address water resource concerns

The State Water Plan is a separate document from the individual basin plans that provides an overview of the state's water resources and recommendations for managing those resources from a water supply perspective over the next twenty years. DNRC has initiated several data collection initiatives in response to State Water Plan recommendations that may have application to groundwater quality investigations, including consumptive use characterization using Landsat satellite imagery and enhanced stream-flow gaging.

F.3 GROUNDWATER QUALITY CLASSIFICATION AND STANDARDS

The state's programs for the protection and remediation of groundwater are driven by the need to protect and support current and future beneficial water uses. Montana identifies water supply as the primary beneficial use of groundwater. Groundwater use classifications, water quality standards and criteria are defined in the Administrative Rules of Montana, Title 17, Chapter 30, Subchapter 10 and are summarized in **Table F-1.** The groundwater standards are generally based on Safe Drinking Water Standards for public water supply and are found in department circular, DEQ-7, Montana Numeric Water Quality Standards (April 2017).

Table F-1. Montana's Groundwater Classifications and Water Quality Standards*.

Classification	Description
Class I	Groundwater has a specific conductance less than 1,000 μSiemens/cm at 25ºC and is suitable for public and private water supplies, food processing, irrigation, drinking water for livestock and wildlife, and commercial and industrial purposes, with little or no treatment required.
Class II	Groundwater has a specific conductance range of 1,000 to 2,500 μSiemens/cm at 25ºC and may be used for public and private water supplies where better quality water is not available. The primary use of Class II groundwater is for irrigation, stock water, and industrial purposes.
Class III	Groundwater has a specific conductance range of 2,500 to 15,000 μSiemens/cm at 25ºC. Its primary use is for stock water and industrial purposes. It is also marginally suitable for some salt tolerant crops.
Class IV	Groundwater has a specific conductance greater than 15,000 μSiemens/cm at 25ºC. Class IV groundwater is used primarily for industrial purposes.

*Montana classifies its groundwater according to the actual quality and use as of October 1982.

Montana's nondegradation standards can also result in groundwater quality protection from new sources of nutrient loading to groundwater, such as subdivision septic systems, that can enter surface water.

F.4 GROUNDWATER QUALITY CHARACTERIZATION PROGRAMS

The Montana Bureau of Mines and Geology (MBMG) is a lead agency for the groundwater characterization programs, discussed below, that can address both groundwater quality and quantity.

F.4.1 Montana Groundwater Assessment Program

The 1991 Montana Legislature established the Groundwater Assessment Program at the MBMG to improve the understanding of Montana's groundwater resources by collecting, interpreting, and disseminating essential groundwater information.
There are three Program components:

- Groundwater Monitoring - Produce and maintain long-term water-level and water-quality records from a statewide network of wells
- Groundwater Characterization - Systematically assess and document the hydrogeology and quality of the state's major aquifers. Data have been used to compile maps and reports that describe specific aspects of Montana's aquifers, groundwater-flow systems, and groundwater quality
- Groundwater Information Center database - Make groundwater information widely available. The Ground Water Information Center (GWIC) is Montana's official repository for groundwater information. Well logs, water-quality and water-level data, hydrographs, maps, and reports are stored in the database and can be accessed online

An interagency steering committee selects study areas, coordinates groundwater research among state, federal, and local government units, and oversees Assessment Program progress.

F.4.2 Montana Groundwater investigation Program

The 2009 Montana Legislature established the Ground Water Investigation Program (GWIP) at the MBMG. The Ground Water Investigation Program, in support of science based water management in Montana, answers site-specific water resource questions that are prioritized and assigned by the Ground Water Steering Committee. To meet this goal, GWIP conducts research on specific issues in areas that are ranked as the most urgent in the State, and provides final investigative reports and other products such as computer models.

Example water research questions addressed by GWIP include aquifer and stream response to changing land use from irrigated agriculture to residential development, and changes in water quality due to increasing subdivisions. GWIP has addressed or is currently addressing water resource issues in 17 areas throughout the State.

F.4.3 Ground Water Information Center

The Ground Water Information Center (GWIC) is Montana's official repository for groundwater information and is maintained by the MBMG. Well logs, water-quality and water-level data, hydrographs, maps, and reports are stored in the database and can be accessed online. New capabilities include a web mapping application that interactively delivers water-well and other information using a graphical user interface. As of 2016, the GWIC database contained information on 251,700 wells and

boreholes, scanned images for 230,210 well-log documents, results from 87,041 water-quality analyses for 18,876 sites, and 26.4 million water-level measurements.

F.5 GROUNDWATER QUALITY PROTECTION PROGRAMS

Below is information covering some of the primary programs for protecting groundwater quality.

F.5.1 Prevention of Agriculture Chemical Pollution

The Montana Department of Agriculture (MDA) Groundwater Protection Program has the responsibility of protecting groundwater and the environment from impairment or degradation due to the use or misuse of agricultural chemicals (pesticides and fertilizers) while allowing for their proper and correct use. The program includes education, monitoring and enforcement. Education involves training to agricultural chemical applicators, dealers and the public on groundwater protection, agricultural chemical use and the use of alternative agricultural methods. Monitoring involves permanent monitoring wells and wells in targeted locations for investigating current and new agricultural chemicals. The MDA is responsible for primary enforcement of the Montana Agriculture Chemical Ground Water Protection Act (MCA 80-15) and Montana Pesticide Act (MCA 80-8). MDA enforcement activities includes conducting statewide comprehensive inspections at agricultural chemical users, dealers, and manufacturers, collecting groundwater and soil samples, and investigating and monitoring incidents such as pesticide spills.

The MDA is also responsible for the General Management Plan. The GMP is an umbrella plan, the purpose of which is to provide guidance for the state to prevent groundwater impairment from agricultural chemicals (pesticides and fertilizers—including pesticide and fertilizer use that is not directly related to agriculture). When needed, MDA has authority to implement Specific Management Plans (SMPs) that are directed to a specific agricultural chemical and to a defined geographical area when the level of an agricultural chemical found in groundwater is at 50% or greater of the standard or interim numerical standard.

F.5.2 Ground Water Pollution Control Permits

A Montana Ground Water Pollution Control System (MGWPCS) permit from the DEQ is typically required to construct, modify, or operate a disposal system for discharge of sewage, industrial, or other wastes into groundwater that has a hydraulic capacity of 5,000 or more gallons per day. All point sources of wastewater discharge are required to obtain and comply with their discharge permits. The effluent limitations and other conditions contained in DEQ's discharge permits are based on meeting Montana's water quality standards. Each discharge permit issued is designed to protect the receiving water's quality at the end of an approved mixing zone.

F.5.3 Solid Waste Management

Solid wastes are also a concern for groundwater quality. Solid waste often contains hazardous substances, such as carcinogens, in addition to more common pollutants (e.g. sediment, nutrients, and metals). Land applied biosolids from wastewater in treatment plants and septic tanks, petroleum contaminated soils, and materials placed in licensed municipal landfills, and construction and demolition waste landfills are regulated by DEQ's Solid Waste Management Program. Licensed solid waste sites are subject to technical reviews, certification, and compliance monitoring. DEQ also provides technical assistance to solid waste professionals.

F.5.4 Subdivision Review

Under subdivision regulations, DEQ reviews divisions of land comprising less than 20 acres, as well as condominiums and recreational camping vehicle and mobile home parks, regardless of the size of the parcel where they are located. This review addresses sanitation facilities, including the water supply, sewage disposal, solid waste disposal, and storm drainage systems. Proper design and location of these facilities is necessary to protect the quality of water for public water supplies, domestic uses, and other beneficial uses, including uses related to agricultural, industry, recreation, and wildlife. The subdivision reviews involve application of the nutrient nondegradation standards identified in Section F 3.0.

F.5.5 Source Water Protection

Montana is required under provisions of the 1996 federal Safe Drinking Water Act to carry out a Source Water Assessment Program (SWAP). A SWAP provides technical assistance to Public Water Supplies (PWS). The EPA formally approved Montana's program in November 1999. Directing Montana's source water protection (SWP) is the responsibility of the SWP Section of DEQ.

Section 1453 of the Safe Drinking Water Act requires the state program to:

1. Identify the source(s) of water used by a PWS. This process delineates capture zones for wells or a stream buffer area for surface water sources called the source water protection area.
2. Identify and inventory potential contaminant sources.
3. Assess the susceptibility of the PWS to those identified potential contaminant sources.
4. Make the results of the delineation and assessment available to the public.

Implementation of SWP takes several forms in Montana, ranging from recognizing a PWS protection strategy to certification of a source water protection plan (SWPP). Source water protection efforts, such as taking action to reduce a susceptibility rating, emergency and contingency planning for contamination problems, are all voluntary for a PWS. DEQ provides technical assistance for a PWS that elects to develop a SWPP. These actions can lead to enhanced groundwater or surface water protection activities from nonpoint sources of pollution.

F.5.6 USDA - Natural Resources Conservation Service (NRCS)

The Natural Resources Conservation Service (NRCS) is the federal agency that works with private landowners to help them protect their natural resources.

NRCS, in partnership with local Conservation Districts, is involved with groundwater protection activities:

- They are a partner in carrying out technical assistance and educational efforts identified in State Pesticide Management Plans
- NRCS staff provide site information, evaluation, technical specifications and planning assistance for Best Management Practices (BMPs) that often protect both groundwater and surface waters.
- The Environmental Quality Incentive Program (EQIP) administered by NRCS can provide cost-share assistance for BMPS.
- NRCS has developed county based soil surveys that rank soil for groundwater contamination vulnerability assessments.

F.5.7 Local Water Quality Districts

Local Water Quality Districts (LWQD) are established to protect, preserve, and improve the quality of surface water and groundwater within the district. Currently there are four in Montana:

- Butte-Silver Bow County Water Quality Protection District
- Gallatin Local Water Quality District
- Lewis and Clark Water Quality Protection District
- Missoula Valley Water Quality District

F.6 GROUNDWATER QUALITY REMEDIATION PROGRAMS

Remediating contaminated groundwater involves several programs at the state and federal level.

F.6.1 DEQ Groundwater Remediation

The DEQ Waste Management and Remediation Division is responsible for overseeing and inspecting permitted facilities, overseeing investigation and cleanup activities at state and federal Superfund sites; reclaiming abandoned mine lands; implementing corrective actions at sites with leaking underground storage tanks or releases from landfills, hazardous waste operations, and other permitted facilities; and overseeing groundwater remediation at sites where agricultural and industrial chemicals have caused groundwater contamination. The purpose of these activities is to protect human health and the environment; to prevent exposure of potential human and ecological receptors to hazardous or deleterious substances that these site releases to air, soil, sediment, surface water, or groundwater; and to ensure compliance with applicable state and federal regulations.

The Groundwater Remediation Program regulates sites under the Montana Water Quality Act (WQA). The Petroleum Tank Cleanup Program regulates sites under the Montana Underground Storage Tank Act (MUSTA). The state superfund program regulates sites under the Montana Comprehensive Environmental Cleanup and Responsibility Act (CECRA). The Solid Waste Program regulates sites under the Montana Solid Waste Management Act, the Hazardous Waste Program regulates sites under the Montana Hazardous Waste Act, and the Asbestos Control Program regulates sites under the Montana Asbestos Control Act.

The Groundwater Remediation Program has overseen remediation at sites contaminated with petroleum, pesticides, metals, nutrients, and solvents. Sites range from small to large in scale. The program ranks sites as maximum, high, medium, or low priority sites, or as operation and maintenance sites. Historically, the Groundwater Remediation Program addresses an average of 80 sites at any given time. The Groundwater Remediation Program works cooperatively with the Department of Agriculture when pesticides affect groundwater.

F.6.2 Federal Superfund Program

EPA's Federal Superfund program is responsible for cleaning up some of the nation's most contaminated land and responding to environmental emergencies, oil spills and natural disasters. There are several superfund sites across Montana including historical mining areas around Butte, Deer Lodge, Libby, East Helena, Rimini, Superior, and Basin. Most superfund sites involve significant groundwater quality remediation as well as surface water restoration.

F.7 Additional Groundwater Education and Outreach Programs

In addition to the education and outreach components of many of the above programs, there are also several other notable groundwater quality programs that include education and outreach. These programs include:

- **Montana Rural Water Systems:** This organization provides training and technical assistance to members running systems for: drinking water, wastewater, and solid waste.
- **Montana Salinity Control Association (MSCA):** MSCA provides groundwater investigation for saline soil and water reclamation and provides salinity control BMP education programs to agricultural producers, natural resources staff and other land-use management groups.
- **Montana State University Extension Water Quality Program:** The goal of this program is to protect or improve the quality of water resources in Montana, particularly in agriculturally managed watersheds. Areas of focus include coal bed methane (CBM), household water use, irrigation management, private well monitoring assistance, and formal education opportunities.
- **DEQ Training:** DEQ provides training to homeowners, local governments, realtors, septic system installers, and others on the operation and maintenance of septic systems and wells.
  DEQ also co-sponsors a week-long school held several times per year around the state for water and wastewater treatment plant operators and managers. Other sponsors include the Montana Environmental Training Center and the Montana University System Water Center at MSU.

F.8 Emerging Groundwater Quality Management Concerns

Groundwater is an important source for many drinking water supplies and sustains flow for streams throughout much of the year. Because contaminated groundwater is very difficult and expensive to clean up, and because contaminated groundwater can and often does negatively impact surface water, protecting groundwater quality is an important component of the nonpoint source program.

Emerging groundwater quality management concerns include:

1. Septic systems and other domestic on-site wastewater treatment systems are of particular concern in the rapidly developing areas of the state because of traditional pollutants such as nutrients, as well as emerging pollutants such as pharmaceuticals and personal care products, that can originate from these systems. Also there are limited programs in place to ensure proper maintenance and operation of private individual septic systems.
2. The increase in private, exempt well use can negatively impact surface water streamflows, particularly during late summer low flow conditions. This reduction in flow can negatively impact aquatic life due to reduced habitat and increased temperatures.

F.9 Montana's 319 Groundwater Pollution Prevention Funding Strategy

Given that TMDLs target surface water quality and that the majority of state water quality standards are enforceable for surface waters, 319 groundwater restoration projects must demonstrate the connection between ground and surface water quality within a proposed project area. Additionally, EPA 319 guidance requires that 319 project funding be directed to implementing watershed-based plans. Therefore, only groundwater projects that that are addressing surface water concerns specifically linked to watershed restoration plan actions can be funded.

F.10 REFERENCES

Montana Department of Environmental Quality. 2016. Integrated 303(d)/305(b) Water Quality Report for Montana. http://deq.mt.gov/Portals/112/Water/wqpb/cwaic/Reports/IRs/2016/Final2016IR.pdf DEQ, Water Division: Helena, MT

Montana Department of Natural Resources and Conservation. 1999. Montana Water Plan. Groundwater Section. http://dnrc.mt.gov/divisions/water/management/docs/state-water-plan/pre-2005-planning-documents/montana_groundwater_plan.pdf DNRC: Helena, MT

Montana Department of Natural Resources and Conservation. 2015. Montana's State Water Plan. http://dnrc.mt.gov/divisions/water/management/state-water-plan

APPENDIX G: SECTION 319 PROJECTS (2012-2016)

Table G-1. Fiscal Year 2012 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Match
212054	Bitterroot Watershed Restoration Planning	Bitter Root Water Forum	$21,000	$14,300
212055	Blackfoot Watershed Water Quality and Native Fish Restoration	Blackfoot Challenge	$121,320	$80,900
212056	West Fork of the Gallatin River Nitrogen Reduction Plan and Implementation	Blue Water Task Force	$50,000	$33,334
212057	Big Pipestone Creek Restoration Project-Phase 1	Jefferson River Watershed Council	$68,000	$122,800
212058	Miller Ranch Ruby River Channel Restoration	Ruby Valley Conservation District	$104,500	$115,500
212059	Ninemile Creek Watershed Restoration Plan and Josephine Creek Mine Reclamation Design	Trout Unlimited	$38,400	$25,600
212060	Browns Gulch Restoration Project-Phase 1	Watershed Restoration Coalition	$100,000	$187,582
212061	Creating Ripples of Change for Flathead's Critical Lands and Lakeshores	Flathead Lakers	$50,000	$35,000
212062	Helena Valley Nonpoint Source Assessment Project	Lewis & Clark County WQPD	$77,265	$59,610
212063	Belt Creek Acid Mine Discharge - Recharge Delineation	Montana Salinity Control Association	$108,000	$81,150
212064	Riparian and Flow Restoration Education in the Bitterroot and Upper Clark Fork Watersheds	Clark Fork Coalition	$20,000	$18,500
212065	Nonpoint Source Mobile Field Station	Livingston School Districts	$14,500	$10,650
212066	Watershed Institute for Watershed Coordinators	Montana Watercourse	$20,000	$13,400
212067	Enhancing Volunteer Monitoring Capabilities in Montana	MSU Extension-Water Quality	$20,000	$13,333
212068	Education & Outreach Mini-Grants	Soil & Water Conservation Districts of MT	$25,500	$17,000
212069	Strengthening Watershed Communities	Soil & Water Conservation Districts of MT	$30,000	$20,000
		Total	**$868,485**	**$848,659**

Table G-2. Fiscal Year 2013 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Match
213020	East Fork Bitterroot River, Watershed Improvement Project	Trout Unlimited	$40,000	$30,000
213021	North American Envirothon	Soil & Water Conservation Districts of Montana Inc.	$20,000	$70,000
213022	FY2014 Education & Outreach Mini-Grants	SWCDMI	$21,000	$14,000
213023	Lost Horse Creek Streamflow Enhancement	Clark Fork Coalition	$105,000	$206,000
213024	Watershed Restoration Plan Implementation, Education & Outreach	Bitter Root Water Forum	$19,000	$14,000
213025	Lower Gallatin Watershed Restoration Plan	Greater Gallatin Watershed Council	$30,000	$20,000
213026	Upper Teton Watershed-Riparian Improvements	Teton River Watershed Group	$72,600	$87,000
213027	Effective Watershed Communication	Montana Watershed Coordination Council Inc.	$9,000	$6,000
213028	Muddy Creek Tributaries Riparian Improvements	Sun River Watershed Group	$87,000	$86,000
213029	Upper Little Blackfoot River-Metals Restoration Strategy	Trout Unlimited	$20,000	$18,300
213030	Storm Water Conference	Montana Watercourse	$18,000	$12,056
213031	Protecting Bozeman's Surface Waters	City of Bozeman	$10,000	$14,000
213032	Volunteer Monitoring-Addressing Shared Statewide Goals	MSU Extension-Water Quality	$22,000	$16,668
213033	Upper Ninemile Creek Mine Reclamation	Trout Unlimited	$300,000	$255,000
		Total	**$773,600**	**$849,024**

Table G-3. Fiscal Year 2014 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Match
213033	Upper Ninemile Creek Mine Reclamation	Trout Unlimited	$61,250	$45,000
214008	Deep Creek Watershed Restoration Project	Broadwater Conservation District	$257,000	$224,600
214009	California Creek Restoration Project	Big Hole Watershed Committee	$156,400	$106,067
214010	FY2014 Education & Outreach Mini-Grants	Soil & Water Conservation Districts of Montana Inc.	$25,000	$17,000
214011	Big Sky Watershed Corps Support	Montana Watershed Coordination Council	$55,550	$40,000
214012	Dry Creek and Bull River Sediment Reduction and Re-vegetation Project	Green Mountain Conservation District	$290,000	$540,090
215011	Riparian Restoration and Sediment Reduction on Rye Creek	Bitter Root Water Forum	$34,000	$23,000
215012	Sediment Reduction in Lolo Creek Watershed	Lolo Watershed Group	$45,000	$30,000
		Total	**$924,150**	**$1,025,757**

Table G-4. Fiscal Year 2015 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Match
214011	Big Sky Watershed Corps Support (Added to existing open contract)	Montana Watershed Coordination Council	$49,500	$40,000
216001	Upper West Fork Nitrogen and Sediment Reduction	Blue Water Task Force	$130,000	$101,700
216002	Story Mill and Camp Creek Restoration	Greater Gallatin Watershed Council	$125,000	$83,600
216003	French Creek and Moose Creek Restoration, Big Hole River Watershed	Big Hole Watershed Committee	$225,000	$150,000
216004	Upper Ninemile Creek Mine Reclamation	Trout Unlimited	$225,000	$200,000
216005	Flathead Ripples of Change - Phase 2	Flathead Lakers	$35,000	$23,500
216006	Upper Lolo Creek Sediment Reduction Phase 1 - Planning and Design	Clark Fork Coalition	$30,000	$20,000
216007	FY2015 Education & Outreach Mini-Grants	Soil and Water Conservation Districts of Montana	$25,000	$17,000
216008	Sediment Reduction in Upper Sleeping Child and Rye Creeks	Bitter Root Water Forum	$105,000	$70,000
		Total	**$949,500**	**$705,800**

Table G-5. Fiscal Year 2016 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Match
214009	California Creek Restoration Project	Big Hole Watershed Committee	$60,000	$40,000
216028	Big Sky Watershed Corps Member Support	MWCC	$83,000	$56,000
216029	Lake Helena WRP Implementation	Lewis & Clark Water Quality Protection District	$65,750	$43,835
216030	Mandeville Creek Restoration & Education	Bozeman School PSA	$146,000	$100,000
216031	Tobacco River Restoration Project - Phase I	Lincoln Conservation District	$288,996	$192,664
216032	Dyce Creek	Beaverhead Conservation District	$10,000	$7,000
216033	Upper Lolo Creek Sediment Reduction Project Phase 2: Implementation	Clark Fork Coalition	$117,960	$81,000
216034	FY 2016 Education and Outreach Mini-Grants	SWCDM	$30,000	$20,000
216035	Lily Orphan Boy	Trout Unlimited	$32,000	$29,000
216038	Watershed Restoration Demonstration - Ramshorn Creek	Ruby Valley Conservation District	$120,000	$80,000
		Total	**$953,706**	**$649,499**

Watershed Funding Opportunities - *updated 1/07/2016**

Funding Entity / Program Name	Purpose	Who Can Apply	Funding Type	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
AGR - Noxious Weed Trust Fund Grant	Development and implementation of weed management programs. Projects should complement and enhance the Montana Weed Management Plan. Projects fall into one of three categories: Research projects; education/development projects; local cooperative projects.	Government entities and private landowners eligible to do business in Montana.	State	Dave Burch, 406-444-3140, dburch@mt.gov; Jasmine Reimer, 406-444-7882; Carol Bearden 406-444-7880	http://agr.mt.gov/agr/Programs/Development/GrantsLoans/TrustFund/ or www.mtfunding.org	Annually	Local Cooperative projects require a 50% cost-share for herbicides and commercial applications.	$75,000
DEQ - Department of Environmental Quality / 319 Program	Address nonpoint source water pollution in streams and lakes identified as "impaired" on Montana's List of Impaired Waters, in watersheds with a DEQ-accepted Watershed Restoration Plan (WRP).	Governmental Entities and 501c(3) nonprofits.	Federal	Robert Ray, DEQ, 406-444-5319, rray@mt.gov	http://www.deq.mt.gov/wqinfo/nonpoint/319Grants.mcpx	Annually in the fall.	Yes	Up to $300,000 per project.
DEQ - Drinking Water State Revolving Fund (DWSRF) Loan Program	Drinking water projects which achieve or maintain compliance with the Federal Safe Drinking Water Act. All projects anticipating the use of SRF funding must be included on the Project Priority List and Intended Use Plan.	Community public water systems owned by private persons or municipalities; nonprofit, non-community water systems.	80% Federal, 20% State.	Mark Smith, DEQ, 406-444-5325 marks@mt.gov	http://deq.mt.gov/wqinfo/srf/DWSRF/default.mcpx	Open cycle.	No	100% of eligible project costs can be borrowed-planning costs covered; ability to repay loan must be shown.
DEQ - Volunteer Monitoring Laboratory Analysis Assistance	Support voluntary water quality monitoring efforts. DEQ-approved Sampling and Analysis Plan (SAP) must be in place prior to sampling.	Governmental Entities and 501c(3) nonprofits.	Federal	Robert Ray, DEQ, 406-444-5319, rray@mt.gov	http://www.deq.mt.gov/wqinfo/nonpoint/nonpointsourceprogram.mcpx	First come-first serve basis.	No	$3,000
DEQ - Water Pollution Control State Revolving Fund (WPCSRF) Loan Program	Wastewater or nonpoint source pollution projects. All projects anticipating the use of SRF funding must be included on the Project Priority List and Intended Use Plan for the fiscal year in which funding is anticipated.	Municipalities for wastewater projects-municipalities and private entities for nonpoint source projects.	83% Federal, 17% State.	Paul LaVigne, DEQ, 406-444-5321 plavigne@mt.gov	http://www.deq.mt.gov/wqinfo/srf/WPCSRF/default.mcpx	Open cycle.	No	100% of eligible project costs can be borrowed-planning costs covered; ability to repay loan must be shown.
DNRC - "HB223" Grant	Provide funding for conservation district projects.	Conservation districts.	State	Laurie Zeller, DNRC, 406-444-6669, lzeller@mt.gov	www.dnrc.mt.gov/grants-and-loans	Quarterly	Sometimes	$20,000 for on-the-ground projects/ $10,000 for education projects; over $20,000 if 50:50 match provided.
DNRC - (forestry) Program Development Grant	To conduct tree inventories, develop an Urban Forest Management Plan, write a Tree Ordinance, or conduct an innovative urban forestry project.	Local governments.	Federal	Jamie Kirby, DNRC, 406-542-4288, jamiekirby@mt.gov	http://dnrc.mt.gov/divisions/forestry/forestry-assistance/urban-and-community-forestry/urban-and-community-forestry-grants	Fall	100% match required.	$2,000 to $15,000
DNRC - Aquatic Invasive Species Grant	Prevention and control of aquatic invasive species (AIS). Preference given to priority waters, as well as to on-the-ground projects such as surveys and removal that result in measurable control of AIS. Priority species include eurasian watermilfoil, Quagga mussels, Zebra mussels. Flowering rush and Curly-leaf pondweed control will be considered on a case-by-case basis.	City, county, tribes, and other local political subdivisions. Non-profits may be eligible for technical service contracts.	State	Stephanie Hester, DNRC, 406-444-6691, shester@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/aquatic-invasive-species	March 15, 2016, though off-cycle grants may be considered based on funding and need.	Encouraged but not required.	$15,000 for most projects. Control projects may be eligible for funding above this level.

Watershed Funding Opportunities - *updated 1/07/2016**

Funding Entity / Program Name	Purpose	Who Can Apply	Funding Type	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DNRC - Arbor Day Grant	For the purchase and planting of one or more trees in the celebration of Arbor Day.	Montana communities.	State	Jamie Kirby, DNRC, 406-542-4288, jamiekirby@mt.gov	http://dnrc.mt.gov/divisions/forestry/forestry-assistance/urban-and-community-forestry/urban-and-community-forestry-grants	Winter	Encouraged but not required.	$750 for Tree City USA communities, $300 for all other communities.
DNRC - Conservation District Development Grant	Provide funds to increase conservation district employee's hours to assist in planning, securing funding, and implementing programs that improve public outreach, improve conservation district administrative capabilities, and implement conservation plans.	Conservation districts.	State	Laurie Zeller, DNRC, 406-444-6669, lzeller@mt.gov	www.dnrc.mt.gov/grants-and-loans	Quarterly	No	$10,000
DNRC - Hazardous Fuel Reduction Grant	Hazardous fuel reduction on private lands to protect communities adjacent to National Forest System Lands where prescribed fire activities are planned. Prescribed fire activities must be imminent (to take place within 3 years of the award).	Nonprofit organizations; conservation districts; counties; municipal governments; fire departments.	Federal	Erik Warrington, DNRC Forestry Division, 406-542-4303, ewarrington@mt.gov	NA	Open cycle	25% match	$50,000 to $100,000 depending upon availability of funding.
DNRC - Irrigation Development Grant	Multi-purpose: Increase irrigation efficiencies through water conservation; expand or sustain irrigated acreage; increase production of high-value crops; Improve management of irrigation systems; improve interbasin cooperation among all water users	Private for-profit; private nonprofit; governmental entities; tribal entities.	State	Ann Kulczyk, DNRC, 406-228-4129, akulczyk@mt.gov	dnrc.mt.gov/divisions/cardd/resource-development/loan-and-grant-programs-for-irrigation-development	Annual, usually in the spring.	Government entities alone - 0%; government entities on behalf of a private entity - 25% cash match from the private entity; private entity alone - 75% cash match.	$300 minimum, $20,000 maximum.
DNRC - Landscape Scale Restoration (LSR) Grant	Intended for implementation of watershed-level, forest-based projects and activities which address the three State and Private Forestry national themes: conserve and manage working forests; protect forests from threats; and enhance public benefits from private forests.	DNRC is the applicant; may collaborate externally with nonprofit organizations, conservation districts, county and municipal governments, etc. to develop application.	Federal	Angela Mallon, DNRC Forestry Division, 406-542-4221, amallon@mt.gov	http://dnrc.mt.gov/divisions/forestry/forestry-assistance/forest-stewardship/landscape-scale-restoration-competitive-grants	Annual, usually around February or March.	25% match	$300,000
DNRC - Montana Tree City of the Year	To recognize communities that demonstrate excellence in urban forestry. This award promotes innovative and significant projects that raise awareness through urban forestry.	Montana communities.	State/Federal	Jamie Kirby, DNRC, 406-542-4288, jamiekirby@mt.gov	http://dnrc.mt.gov/divisions/forestry/forestry-assistance/urban-and-community-forestry/urban-and-community-forestry-grants	Fall	Encouraged but not required.	$10,000
DNRC - Range Improvement Loan	Provide funding for fencing, Seeding, stockwater development, and other range improvement practices.	Private landowners.	State	Laurie Zeller, DNRC, 406-444-6669, lzeller@mt.gov	http://dnrc.mt.gov/divisions/cardd/conservation-districts/range-improvement-loan-program	Open cycle	No	Up to $75,000 @ 3% interest for 10 years.
DNRC - Reclamation and Development Planning Grant	Provide funding for projects that: help plan Reclamation and Development Grants Program projects; provide site assessment; support grant writing for natural resource cleanup grants. Project examples: Abandoned mine reclamation planning; Brownfields cleanup planning; abandoned hazardous waste site cleanup planning; abandoned oil and gas well cleanup planning; crucial state needs planning.	Local, state, and Tribal government entities.	State	Alicia Stickney, DNRC, 406-444-0547, Astickney@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/reclamation-and-development-grants-program/reclamation-and-development-planning-grants-program	Fall	Yes, must be non-state funds.	$50,000

Watershed Funding Opportunities - *updated 1/07/2016**

Funding Entity / Program Name	Purpose	Who Can Apply	Funding Type	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DNRC - Reclamation and Development Project Grant	Using the interest income from the Resource Indemnity Trust Fund, provide funding for projects that compensate Montana citizens for the effects of exploration and mining on Montana lands, and/or serve the public interest and the State of Montana. Project examples: abandoned mine reclamation; Brownfields cleanup; abandoned hazardous waste site cleanup; abandoned oil and gas well cleanup; mining related erosion control; crucial state needs.	Local, state, and Tribal government entities.	State	Alicia Stickney, DNRC, 406-444-0547, Astickney@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/reclamation-and-development-grants-program	May 15th in even-numbered years.	Yes, must be non-state funds.	$500,000
DNRC - Renewable Resource Emergency Grant	To fund emergency projects that address an immediate threat to the beneficial management of renewable resources and, if delayed, will cause substantial damage or legal liability to the entity seeking assistance. Past projects have included dike repair, emergency dam repair, and emergency repairs to municipal drinking water and wastewater systems.	Counties; incorporated cities and towns; conservation districts; irrigation districts; water and sewer districts.	State	Bob Fischer, DNRC, 406-444-6688, rfischer@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/renewable-resource-grant-program/renewable-resource-emergency-grants-and-loans	Open cycle	No	$30,000 per project.
DNRC - Renewable Resource Emergency Loan	To fund emergency projects that address an immediate threat to the beneficial management of renewable resources and, if delayed, will cause substantial damage or legal liability to the entity seeking assistance. Past projects have included dike repair, emergency dam repair, and emergency repairs to municipal drinking water and wastewater systems.	Counties; incorporated cities and towns; conservation districts; irrigation districts; water and sewer districts.	State	Bob Fischer, DNRC, 406-444-6688, rfischer@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/renewable-resource-grant-program/renewable-resource-emergency-grants-and-loans	Open cycle	No	Up to $10 million in emergency loan financing each biennium. Amount of each loan limited by applicant's bonded debt capacity. Loan term limited to 20 years.
DNRC - Renewable Resource Grant	Projects that conserve, manage, develop or protect Montana's renewable resources.	State agencies and universities, counties, incorporated cities and towns, conservation districts, irrigation districts, water/sewer/solid waste districts and tribes.	State	Pam Smith, DNRC, 406-444-6839, pamsmith@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/renewable-resource-grant-program	May 15th in even-numbered years.	No	$125,000
DNRC - Renewable Resource Grants to Private Entities	Primarily to fund projects that assist small, privately owned water systems. The following may NOT be funded: Feasibility studies; research; public information projects.	Private entities.	State	Bill Herbolich, DNRC, 406-444-6686, Wherbolich@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/renewable-resource-grant-program/renewable-resource-grants-to-private-entities		Yes	$5,000 or 25% of the project cost, whichever is less.
DNRC - Renewable Resource Loan	Provide funding for development and improvements to the following: Municipal drinking water and wastewater systems; solid waste; irrigation; renewable resource projects such as dams, soil and water conservation, and forest enhancement.	State agencies and universities, counties, incorporated cities and towns, conservation districts, irrigation districts, water/sewer/solid waste districts and tribes.	State	Pam Smith, DNRC, 406-444-6839, pamsmith@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/renewable-resource-grant-program	May 15th in even-numbered years.	No	Limited by the applicant's debt capacity.
DNRC - Renewable Resource Loans to Private Entities	Private water development projects. For example, irrigation system improvements for conversion from flood to sprinkler irrigation.	Private entities.	State	Bill Herbolich, DNRC, 406-444-6686, Wherbolich@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/renewable-resource-grant-program/renewable-resource-loans-to-private-entities	Open cycle	No	Loans to individual private entities may not exceed the lesser of $400,000 or 80% of the fair market value of the security given for the project. Loans to water user associations and ditch companies may not exceed $3 million.

Watershed Funding Opportunities - *updated 1/07/2016**

Funding Entity / Program Name	Purpose	Who Can Apply	Funding Type	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DNRC - Renewable Resource Planning Grant	To fund planning efforts, for public entities, for projects that conserve, manage, develop, or preserve renewable resources in Montana.	State agencies and universities, counties, incorporated cities and towns, conservation districts, irrigation districts, water/sewer/solid waste districts and tribes.	State	Pam Smith, DNRC, 406-444-6839, pamsmith@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/renewable-resource-grant-program	May 15th in even-numbered years.	No	$10,000 for Preliminary Engineering/Technical Investigation and Feasibility; $5,000 for administrative/ $50,000 for Watershed Planning.
DNRC - Volunteer Fire Assistance Program Grant	Organize, train and equip local firefighters to prevent and suppress wildfires.	Montana communities under 10,000 in population. Smaller communities may join together in a group and or county effort to submit an application, even if their combined population is over 10,000.	Federal	Doug Williams, DNRC, 406-622-5455, DWilliams4@mt.gov	http://dnrc.mt.gov/divisions/forestry/fire-and-aviation/fire-grants	Varies annually	10% non-federal match required.	None
DNRC - Watershed Management Grant	Watershed related planning and management activities which conserve, develop, manage or preserve Montana's renewable resources and/or support the implementation and development of the state water plan.	Local, state, and Tribal government entities. Private entities that provide a cost share of 75% in in-kind services and/or cash.	State	Lindsay Volpe, DNRC, 406-444-9766, lmvolpe@mt.gov	http://dnrc.mt.gov/divisions/cardd/resource-development/renewable-resource-grant-program/watershed-management-grant-program	April 17, 2016.	No for government entities, yes for private.	$20,000
DNRC - Western States Wildland Urban Interface Grant	National Fire Plan funds to mitigate risk from wildland fire within the Wildland Urban Interface (WUI).	Nonprofit organizations; conservation districts; counties; municipal governments; fire departments.	Federal	Erik Warrington, DNRC Forestry Division, 406-542-4303, ewarrington@mt.gov	To locate your local DNRC Service Forester: http://dnrc.mt.gov/divisions/forestry/forestry-assistance/dnrc-service-forester%20-%20Services/service	Summer	25% match	$300,000
DNRC -Conservation District Administrative Grant	Provide funding for conservation districts that do not have enough funding to cover basic operation costs, such as administrative salaries, insurance, office supplies, communications, and insurance.	Conservation districts.	State	Laurie Zeller, DNRC, 406-444-6669, lzeller@mt.gov	www.dnrc.mt.gov/grants-and-loans	Annual	No	Based on financial need.
DNRC -Conservation Education Mini-grant Program	Provide funding for student and adult education projects that focus on water, weeds, or other natural resources.	Conservation districts; projects from other organizations if the project is approved and sponsored by the conservation district.	State	Linda Brander, DNRC, 406-444-0520, LLBrander@mt.gov	www.dnrc.mt.gov/grants-and-loans	Quarterly	No	$100 minimum, $500 maximum.
FWP - Community Ponds Grant	The objective of the Community Pond Program is to enhance fishing opportunities in or near Montana communities by providing funding that may be used to construct or improve public fishing ponds. Preference will be given to projects that create or enhance opportunities for youth/family angling and youth/family angler education.	State government, angler groups, civic organizations, or other community-based organizations can sponsor a project; they must be working with a representative of Fish, Wildlife, & Parks—usually a fisheries biologist.	State	Michelle McGree, FWP, 406-444-2432, mmcgree@mt.gov	http://fwp.mt.gov/fishAndWildlife/habitat/fish/communityPond/default.html	February 1 of each year.	Must provide a minimum of 30% match. May use in-kind services.	Limited by availability of funding. Typically, FWP has $25,000 each year (grant cycle).
FWP - Future Fisheries Grant	Program funding may be provided for costs of design/build, construction, and maintenance of projects that restore, enhance, or protect habitat for wild fishes. Funding cannot be used for administration, coordination, overhead, monitoring, watershed assessments, design alone, or contingency costs. Preference will be given to projects that restore habitats for native fishes.	Any group or individual. FWP strongly recommends applicants consult with their local, FWP fisheries biologist prior to submitting an application.	State	Michelle McGree, FWP, 406-444-2432, mmcgree@mt.gov	http://fwp.mt.gov/fishAndWildlife/habitat/fish/futureFisheries/default.html	Prior to December 1 and June 1 of each year.	Not required, but strongly encouraged and makes a project more competitive.	Limited by availability of funding. Typically, FWP has from $150,000 to $350,000 available (total) for each grant cycle.

Watershed Funding Opportunities - *updated 1/07/2016**

Funding Entity / Program Name	Purpose	Who Can Apply	Funding Type	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
NFWF Grant (various)	NFWF provides funding on a competitive basis to projects that sustain, restore, and enhance our nation's fish, wildlife, and plants and their habitats. NFWF manages approximately 70 different grant programs. Many of the programs apply to specific regions of the U.S. Roughly 10 are applicable to some part of Montana.	Federal, state, and local governments, educational institutions, and nonprofit organizations are welcome to apply twice annually for matching grants from NFWF conservation priority programs. For other funding opportunities, application timelines, scope and guidelines vary.	Federal and/or private	Varies by individual grant program. See website for details.	http://www.nfwf.org/whatwedo/programs/Pages/home.aspx	Varies, but typically annually.	For most grants, a minimum of 1:1.	Varies greatly by individual grant program.
SWCDM - Mini-grant Program	Provide a mechanism to improve nonpoint source-related water quality through education and outreach activities at the local level. The priority of the mini-grants is not to sustain current activities, but rather to promote new activities and partnerships.	Governmental Entities and 501c(3) nonprofits.	Federal	Ann McCauley, SWCDMI, 406-443-5711, ann@macdnet.org	www.macdnet.org	Varies	Yes	$2,000
USDA, NRCS Agricultural Conservation Easement Program - Agricultural Land Easements (ACEP-ALE)	NRCS provides financial assistance to eligible partners for purchasing Agricultural Land Easements that protect the agricultural use and conservation values of eligible land. In the case of working farms, the program helps farmers and ranchers keep their land in agriculture. The program also protects grazing uses and related conservation values by conserving grassland, including rangeland, pastureland and shrubland. Eligible partners include Indian tribes, state and local governments and non-governmental organizations that have farmland or grassland protection programs.	Land must be enrolled in ACEP-ALE through an eligible land trust. A list of entities eligible to hold ACEP-ALE land easements may be obtained from the following website: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/programs/easements/acep/?cid=nrcseprd401007	Federal	Lisa McCauley, NRCS, 406-587-6970, lisa.mccauley@mt.usda.gov	http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/programs/easements/acep/?cid=nrcseprd400836	Annual	Varies	50 to 75% of the fair market value of the land easement.
USDA, NRCS Agricultural Conservation Easement Program - Wetlands Reserve Easements (ACEP-WRE)	NRCS provides technical and financial assistance directly to private landowners and Indian tribes to restore, protect, and enhance wetlands through the purchase of a wetland reserve easement. For acreage owned by an Indian tribe, there is an additional enrollment option of a 30-year contract. Land eligible for wetland reserve easements includes farmed or converted wetland that can be successfully and cost-effectively restored. NRCS will prioritize applications based the easement's potential for protecting and enhancing habitat for migratory birds and other wildlife.	To enroll land through wetland reserve easements, NRCS enters into purchase agreements with eligible private landowners or Indian tribes that include the right for NRCS to develop and implement a wetland reserve restoration easement plan.	Federal	Lisa McCauley, NRCS, 406-587-6970, lisa.mccauley@mt.usda.gov	http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/programs/easements/acep/?cid=nrcseprd400837	Continuous	Varies	Varies by easement duration and other factors. 50 to 100% of the value of the easement, and 50 to 100% of the cost of restoration work.
USDA, NRCS Conservation Innovation Grant	Conservation Innovation Grants (CIG) is a voluntary program intended to stimulate the development and adoption of innovative conservation approaches and technologies while leveraging Federal investment in environmental enhancement and protection, in conjunction with agricultural production. CIG enables NRCS to work with other public and private entities to accelerate technology transfer and adoption of promising technologies and approaches. Funding comes from the USDA, NRCS, EQIP program.	Non-Federal governmental or non-governmental organizations, Tribes, or individuals.	Federal	Erik Suffridge, NRCS, 406-587-6873, Erik.Suffridge@mt.usda.gov	http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/programs/financial/cig/	Varies	Varies	Varies
USDA, NRCS Conservation Stewardship Program (CSP)	CSP participants will receive an annual land use payment for operation-level environmental benefits they produce. Under CSP, participants are paid for conservation performance: the higher the operational performance, the higher their payment. CSP offers participants two possible types of payments: Annual payment for installing and adopting additional activities, and improving, maintaining, and managing existing activities; Supplemental payment for the adoption of resource-conserving crop rotations.	Landowners and land managers with control of Tribal and/or private agricultural lands and non-industrial private forest land.	Federal	Jeanne LaSorte, NRCS, 406-587-6849, Jeanne.LaSorte@mt.usda.gov or contact your local USDA Service Center	http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/programs/financial/csp/	Continuous, though annual deadlines exist for application evaluation, ranking and approval. See website for details.	None	Varies

Watershed Funding Opportunities - *updated 1/07/2016**

Funding Entity / Program Name	Purpose	Who Can Apply	Funding Type	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
USDA, NRCS Emergency Watershed Protection Program (EWP)	The Emergency Watershed Protection (EWP) Program responds to emergencies created by natural disasters. It is not necessary for a national emergency to be declared for an area to be eligible for assistance. NRCS provides technical and financial assistance to install measures that reduce post-flood and fire damage. The measures are intended to reduce threats to life or property, retard runoff, restore capacity of waterways, prevent flooding and/or soil erosion and reduce damage from sediment and debris. The removal of debris deposited by the disaster that is a health or safety hazard can be a part of such measures as well. Flood easement option as well.	Units of government with authority under state law to accept financial assistance.	Federal	Steve Becker, NRCS, 406-587-6828, steve.becker@mt.usda.gov	http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/programs/planning/ewpp/	As needed.	25% non-federal	Varies
USDA, NRCS Environmental Quality Incentives Program (EQIP)	The Environmental Quality Incentives Program (EQIP) is a voluntary conservation program that helps agricultural producers in a manner that promotes agricultural production and environmental quality as compatible goals. Through EQIP, agricultural producers receive financial and technical assistance to implement structural and management conservation practices that optimize environmental benefits on working agricultural land.	Agricultural producers and owners of non-industrial private forestland and Tribes are eligible to apply for EQIP. Eligible land includes cropland, rangeland, pastureland, non-industrial private forestland and other farm or ranch lands.	Federal	Jeanne LaSorte, NRCS, 406-587-6849, Jeanne.LaSorte@mt.usda.gov or contact your local NRCS Field Office	http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/programs/financial/eqip/	Continuous, though annual deadlines exist for application evaluation, ranking and approval. See website for details.	NRCS pays a set rate for installation of practices. The balance must be paid by the producer.	Varies
USDA, NRCS Regional Conservation Partnership Program (RCPP)	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.	Agricultural or silvicultural producer associations, farmer cooperatives or other groups of producers, state or local governments, American Indian tribes, municipal water treatment entities, water and irrigation districts, conservation-driven nongovernmental organizations and institutions of higher education.	Federal	Erik Suffridge, NRCS, 406-587-6873, Erik.Suffridge@mt.usda.gov	http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/programs/farmbill/rcpp/	Annually	Yes	Varies
USFWS North American Wetlands Conservation Act (NAWCA) U.S. Standard Grant and U.S. Small Grant	The NAWCA Grants Program is a competitive, matching grants program that supports public-private partnerships carrying out projects in the United States that further the goals of the North American Wetlands Conservation Act (NAWCA). These projects must involve long-term protection, restoration, and/or enhancement of wetlands and associated uplands habitats for the benefit of all wetlands-associated migratory birds.	Unrestricted	Federal	Contact the Joint Venture Coordinator for your region. http://www.fws.gov/birds/management/bird-conservation-partnership-and-initiatives/migratory-bird-joint-ventures/joint-venture-directory.php	http://www.fws.gov/birds/grants/north-american-wetland-conservation-act.php	Annually	Minimum of 1:1.	$75,000 for Small Grants program; approximately $1 million for Standard Grants program.

DISCLAIMER: This table is a work-in-progress, being prepared by the Montana Department of Environmental Quality Watershed Protection Section, in conjunction with the Montana Watershed Coordination Council's Water Activities Work Group (WAWG). The majority of the information contained in this table was obtained directly from funding entity websites and program contacts during fall of 2015. Information will be added and updated on a periodic basis. Always contact the funding entity directly for information on current program requirements. This table is not an exhaustive list. The table focuses primarily on publicly-funded programs administered by SWCDM, DNRC, FWP, DEQ, AGR, NRCS, USFWS, and NFWF. Other public and private entities have equally valuable programs that watershed groups can actively seek out and participate in. If you have any information regarding programs that should be added or corrections that need to be made, please email Mark Ockey at mockey@mt.gov. The following is a partial acronym list for funding entity names: Soil and Water Conservation Districts of Montana, Inc. (SWCDM); Montana Department of Natural Resources and Conservation (DNRC); Montana Department of Fish, Wildlife and Parks (FWP); Montana Department of Environmental Quality (DEQ); Montana Department of Agriculture (AGR); United States Department of Agriculture (USDA); Natural Resources Conservation Service (NRCS); United States Fish and Wildlife Service (USFWS); National Fish and Wildlife Foundation (NFWF).

APPENDIX I - RESPONSE TO PUBLIC COMMENTS – 2017 MONTANA NONPOINT SOURCE MANAGEMENT PLAN

INTRODUCTION

This document contains comments extracted, summarized, paraphrased, and organized from the body of comments received during the public comment period for the 2017 Draft Montana Nonpoint Source Management Plan. Similar comments from multiple people have been combined to avoid duplication. Comments were received from the following individuals and organizations:

- Fisheries Division, Montana Department of Fish, Wildlife and Parks
- Amy Jensen, U.S. Forest Service
- Alden Shallcross, Bureau of Land Management
- Adam Sigler, Montana State University Extension, Water Quality
- Brian D. Sugden, Weyerhaeuser Company
- Roger Ziesak, Montana Department of Natural Resources and Conservation
- Informal oral comments were received from agricultural representatives

GENERAL COMMENT

Comment: *Page v (Nonpoint Source Management Authority). Reading this section, one is left with the impression that there were no non-point source components to the original 1972 federal Clean Water Act, and it was not until the 1987 amendments that these impacts were addressed through Section 319. I don't think this is the case. Section 208 of the original CWA did require NPS assessments, and these were conducted by many state Conservation Districts. It is my understanding that it is some of these assessments - mostly conducted in the early 1980s that were the original genesis of Montana's 305(b) reporting, and were ultimately incorporated in the mid-1990s 303(d) list of impaired waterbodies. I don't think you need to provide an exhaustive historical review here, but just wanted to let you know my impressions here.*

> **DEQ Response: DEQ agrees** that the 1972 CWA Section 208 required processes to identify nonpoint pollution sources, and procedures and methods to control them. With respect to Montana's 208 assessments, conservation districts were involved in working with Montana's Department of Health and Environmental Service's Water Quality Bureau and provided anecdotal information and data in developing the State's 303(d) list (personal communication with Laurie Zeller, CARDD, DNRC, 2017). Language in the introduction has been added to clarify that Section 208 of the 1972 CWA provided for nonpoint source pollution planning.

COMMENTS BY DOCUMENT SECTION

SECTION 1.0 MONTANA'S NPS POLLUTION MANAGEMENT PROGRAM FRAMEWORK

Comment: *Section 1.3. "Streams not meeting standards are placed on a list of impaired waters." Does DEQ consider the current list to be complete?*

> **DEQ Response:** Montana's list of impaired waters is a reasonably accurate representation of water quality problems throughout the state. This list was initiated more than 30 years ago and has been routinely updated to represent new information and evolving assessment methods. Updating our knowledge of impairment conditions in any watershed is part of the adaptive management approach discussed within Section 1.6. We acknowledge that it has been several years since last updating impairment conditions in several areas of the state, particularly many of the prairie watersheds of eastern Montana. Updated assessments would likely result in a mix of confirming existing impairment causes, identification of new impairment causes, and removal (delisting) of some existing impairment causes.

Comment: *Section 1.5."DEQ encourages and supports local watershed groups and CD's to develop watershed restoration plans." FWP has found local watershed groups to be very effective in some watersheds, but not all watersheds have effective local groups to lead a public process. Is this process adequately supported, and are there alternative ways to ensure a local, public process contributes to watershed priorities? In addition, the WRP development process can be daunting for some groups. In addition to DEQ assistance with WRP development, are there ways to streamline this process of WRP development?*

> **DEQ Response:** DEQ agrees that some local groups are very effective, while others are not as effective in developing and implementing watershed restoration plans. DEQ along with other Montana partners (specifically the MWCC, the SWCDM and the DNRC) have developed resources to partially support these efforts. It is likely that there are alternative ways to develop public, locally supported processes to determine watershed priorities and begin addressing water quality problems without 319 funding. However, because of EPA 319 program guidance it is not clear if there are ways to streamline the development of WRPs, unless the water quality improvement priorities are clear, limited, and can be easily addressed with available resources.

SECTION 3.0 MONTANA'S NPS POLLUTION CONTROL STRATEGY

Comment: *Page 3-8. "Where legal and appropriate, Montana will support efforts to restore natural hydrologic conditions and reduce current over-allocation of water resources." FWP's chronically dewatered stream list is one tool to prioritize this effort, and local fisheries management biologists can be consulted for additional prioritization to develop funding partnerships.*

> **DEQ Response:** There are multiple approaches that can be used and DEQ appreciates FW&P identifying the dewatered stream list and local fisheries expertise as a tool that can be used in the priority setting process.

Comment: *Page 3-5, Paragraph starting with "*Pollution from*…" In the last sentence of this paragraph, it states that "Montana has 157 waterbodies identified as impaired from forestry-related activities" I think that it might be worth noting that forestry is not the sole source of impairment for these 157 waterbodies, and there are other contributing sources that may include agriculture, highways, etc. If this is the case, one correction could be to revise by stating "Montana has 157 waterbodies identified as impaired (at least in part) by forestry-related activities". Perhaps there is another way to address this comment as well.*

DEQ Response: The language on page 3-5 was modified to incorporate this suggestion.

Comment: *With respect to forestry, I was lead author on a 2012 paper in the Journal of Forestry that described Montana's 20 year success story in implementing its forestry BMP program. I have attached that paper to these comments, as it might help further support the state NPS plan.*

DEQ Response: The language on page 3-5 was modified to incorporate this suggestion. A citation to this publication was added into "Strategy 1" in Section 3.1.2.

Informal Comment: Section 3.1.3. Hydrologic Modification. *Concerned about how dewatering is addressed and the implications associated with some of the recommended practices linked to irrigation use. Need to acknowledge water rights and take into consideration naturally dry conditions of many watersheds and resulting loss of flow from natural conditions. Also need to recognize that water is removed from streams for other used than agriculture, such as municipal uses.*

DEQ Response: The text in Section 3.1.3 was modified to address the stated concerns.

Comment: **Page 3-14: Strategy 3: Support Off-highway travel planning and promote responsible OHV use.** *The document states,* "In general, this can be done through the U.S. Forest Service's Travel Management Plans." *This omits BLM travel plans. While several field offices have completed their plans (Billings, Upper Missouri River Breaks National Monument, Dillon, Butte) others are currently developing theirs (Lewistown, Miles City, Missoula, Glasgow, Malta, Havre). These plans do/will include BMPs that reduce NPS.*

DEQ Response: The text in Section 3.1.5, Strategy 3 was modified to address the stated concerns.

Informal Comment: Section 3.2.2. Atmospheric Deposition. *The potentially significant contribution of natural events such as forest fires to atmospheric deposition should be noted.*

DEQ Response: We agree that forest fire smoke can potentially be a significant source of atmospheric deposition to waterbodies and added language identifying large forest fires as a contributor to atmospheric deposition of pollutants.

Comment: **Page 3-20: Climate Change:** *Consider referencing the Montana Climate* Office's "Montana Climate Assessment." *It likely contains pertinent and updated information for this section.*

DEQ Response: We agree that the recently published "Montana Climate Assessment" provides pertinent information and have cited the major findings from the publication in Section 3.2.3

SECTION 5.0 WORKING PARTNERSHIPS

Comment: *Section 5-3. "Local watershed groups and other non-profit groups are critical partners in Montana's NPS management program." FWP agrees that MWCC is an important player in the process providing that any "lead partner" is accepted by local stakeholders. A review of existing watershed group dynamics may help understand how effective, long-term groups operate. The presence of committed local leaders appears to be one of the most important components of effective groups, and areas with water quality problems and a void of local leadership presents challenges to the nonpoint source plan.*

> **DEQ Response:** We agree that committed, effective local leadership is critical to addressing water quality (and quantity) problems. We also believe that providing relevant inspiring examples, as well as training, group capacity building resources and on-line tools, and success stories that we can continue to build interest at the local level to address water quality problems.

Comment: **Page 5-3, last sentence.** *The document states,* "….DEQ must prioritize many of the actions and activities of the NPS Management Program to maximize available resources to accomplish the goal of protecting and improving Montana's water quality." *It may be helpful to cite the appendix/location of the prioritization criteria in this sentence.*

> **DEQ Response:** We discuss program priorities in Sections 8.1 and 8.2 and have now cited these sections in the text on page 5-3.

SECTION 7.0 EVALUATING SUCCESS

Comment: Page 7-1: Evaluating Success; Interim Outcomes. *This section discusses the need for implementation and effectiveness monitoring and lists "Progress on implementation is tracked and reported" as an interim outcome. We agree that implementation monitoring/project tracking is hugely important, especially for the "Restore" component of the NPS strategy. In order to know what has been effective, we first need to know what mitigation was done & where. Unfortunately, we are unaware of a standardized database to report and track these projects across the state. Consequently, information is often collected, but never aggregated (even within the same watershed) and is often lost/buried when project leads turnover. Therefore, one interim step towards this milestone could be the creation of a project entry module that populates a statewide geodatabase of restoration projects that mitigate NPS. This would include coded domains and enable everyone to relate mitigation projects to the water quality improvement plans, identify other groups that may be working on similar projects who would want to collaborate at the watershed scale (i.e. across jurisdictional/ownership boundaries), and likely improve coordination between land managers and the DEQ. It would also be an important first step towards the development of a strategic project effectiveness monitoring plan. Our watersheds often contain multiple land owners. If each group is working in isolation and nobody knows the cumulative status of mitigation in a watershed, it will be very difficult to measure the cumulative impacts of those projects or even correlate the water quality changes to specific actions.*

> **DEQ Response:** DEQ agrees that it is important to know what mitigation has been done and where. DEQ tracks 319 projects in a Geographical Information System (GIS) database and will be

making this available to the public with a link from our website. We also rely, in part, on other entities tracking of nonpoint source pollution progress in GIS compatible formats. The Forest Service typically tracks most of their projects and shares this information with DEQ. The TMDL Implementation Evaluations offer an opportunity to identify multiple agencies and entities NPS efforts, but to pursue storing this information in a database format is a very large task requiring constant updates and significant outreach and compilation efforts. DEQ is looking at simple approaches to track progress, but more from the aspect of tracking water quality improvement rather than project implementation.

Comment: *Section 7-2 "Evaluate Education and Outreach efforts." Since the success on nonpoint programs is strongly based on voluntary actions, the E&O efforts are critical. Additional and more specific strategies for effectively conducting E&O efforts are needed.*

This section discusses tools for evaluating Education & Outreach (E&O) efforts, but is light on what the process for E&O is. Since the success of the Non-point program is based on voluntary actions, what exactly is the process for outreach efforts within DEQ? Perhaps this is where funding and support for local Watershed Groups comes in, and that makes sense, but does DEQ provide a framework for conducting E&O efforts? I'd be interested in more what that looks like. The document as a whole seems heavy on monitoring and assessment, but light on strategies for successful voluntary compliance. For example, is this achieved by simply educating landowners on BMPs, or is there a process of then following up with cost-sharing, grant applications, and/or partnership programs? Again, this is likely where Watershed Groups would jump in, and there are sections that talk about the grants etc., but I'm unclear on how this gets accomplished in cases where there aren't proactive watershed groups.

DEQ Response: Section 4 of the NPS Management Plan ("Engaging Montanans in Addressing Nonpoint Source Pollution") provides information on the many aspects of engaging various audiences. Section 4.2 discusses objectives and strategies.

Part of DEQ's nonpoint source pollution outreach efforts begin during the monitoring and assessment phase of our water quality planning projects when public meetings are held to inform local stakeholders. Outreach continues in the TMDL development process with the establishment of watershed advisory groups, bringing together a diverse group of local citizens that may be able to continue to address NPS pollution. Throughout this process we attempt to engage and empower local communities. This includes everything from providing examples of successful groups, projects, leadership skill development and alternative funding opportunities, to actual group capacity building (e.g. Big Sky Watershed Corps members and host-site funding) and project and education and outreach ("so called "mini-grants") funding (319 contracts).

APPENDICES

Comment: *Appendix D. The map shows the Thompson River WRP as being under development. However, this status for the Thompson does not show up in Table D-2. The Lower Clark Fork Watershed Group is the Sponsor of this effort.*

DEQ Response: Thank you for pointing out the omission. The Thompson River Watershed Restoration Plan being developed by the Lower Clark Fork Watershed Group has been added to Table D-2.

COMMENTS NOT REQUIRING A SPECIFIC RESPONSE

The following comments do not require a specific response. DEQ appreciates the positive feedback on the Nonpoint Source Management Plan.

Comment: *Montana Department of Fish, Wildlife & Parks (FWP) appreciates the opportunity to provide comments on your draft Nonpoint Source Management Plan. We believe the document provides a good summary of Montana's water quality challenges and we hope to collaborate with DEQ in developing strategies for protecting and improving water quality in Montana waters.*

Fishery management direction for coldwater fish species was modified from a hatchery supplementation process to a focus on protecting/enhancing aquatic habitat since the 1970's. FWP ceased stocking trout in most Montana streams and rivers with the assumption that Montana's rivers were healthy enough to sustain a wild, natural process. Therefore, aquatic habitat protection and enhancement became the agency focus and collaboration with DEQ and local stakeholders became a priority for FWP.

Comment: *The draft plan is very well done and accurately represents the current nonpoint source control programs around forestry (Silviculture) activities in Montana.*

Comment: *The Nonpoint Source Plan is really good. It's super helpful!*

Comment: *I appreciated the characterization of the seven categories of NPS sources in chapter 3 to frame the problem.*

Comment: *Section 3.1.3. Hydrologic Modification Strategies. FWP believes streamflow and water temperature trends represent significant water quality challenges. The DEQ strategy for this issue (Avoid, Restore, Minimize, and Mitigate) provides a strong and realistic direction for streamflow for partnering agencies to consider.*

Comment: *In section 4.2 I appreciate the philosophy of public engagement throughout the process of TMDL development and support of locally lead E&O efforts.*

Comment: *I appreciate that there is a whole chapter dedicated to partnerships (section 5). Leveraging resources across organizations and finding common goals is a great way to move the needle with limited resources. In addition, I believe DEQ's demonstration of interest in collaboration improves public perception of the agency and mission.*

Comment: *I think the interim outcomes laid out in section 8 make sense for reaching the stated NPS goal. I also appreciate the specific actions and measurable milestones included in the tables and I look forward to seeing the progress reports on this.*

Comment: *In section 8.2.1 I appreciate the focus on protecting and restoring riparian zones and wetlands. While many of the instream water quality issues we see have their roots in the uplands, properly functioning riparian zones have the potential to mitigate some of the issues from the uplands. Furthermore, degraded riparian zones or those with significant pollutant sources, have a more direct and*

dramatic effect on stream water quality than upland sources. Hence, while management in the uplands is an important component of addressing instream water quality issues, with limited resources, riparian areas are where the biggest bang for the buck can be accomplished. I also very much support the concept of protecting those areas that are currently functioning well. The more work we can do to keep development out of our floodplains the better off we will be.

Comment: *Section 8-3. DEQ nonpoint source priorities. "DEQ will develop a 20-year strategic vision to prioritize watersheds for focused work." Currently, the priority watersheds are driven by locations where WRP's are developed. FWP believes this accurately reflects areas where a group has enough energy and/or funding to work through the process. FWP is committed to assisting DEQ with this long-term strategy, and hope the prioritization process can better incorporate watershed needs.*

Additionally, some text edits were provided by commenters.