



Montana Nonpoint Source Management Plan



2012

Brian Schweitzer, Governor
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Prepared by:

Water Quality Planning Bureau
Watershed Protection Section

Acknowledgements:

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**Montana Department of
ENVIRONMENTAL QUALITY**

Brian Schweitzer, Governor

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May 21, 2012

Dear Reader:

Protecting water quality in Montana from poorly controlled runoff is one of our greatest environmental challenges. The 2012 Nonpoint Source Management Plan discusses the various sources of nonpoint source pollution in Montana and outlines management goals and activities for the next 5 years. As you'll learn in this document, every Montanan has an interest, role, and responsibility in addressing this issue.

Nonpoint source water pollution is a statewide and national issue that threatens our opportunities to fully enjoy a clean and healthful environment. Furthermore, as a headwaters state, we have a responsibility to ensure that citizens living downstream can count on receiving clean water from Montana.

Montana's approach to managing polluted runoff from nonpoint sources of pollution is largely through voluntary actions. These can involve changes in our behaviors and land management practices. Sources of polluted runoff include bacteria from pet waste, pesticides and herbicides from lawns and fields, sediment from roads and disturbed soil, and nitrogen and phosphorus from septic systems and fertilizers. All of these pollutants can harm aquatic life, increase costs for private and public water supplies, and limit recreational uses.

Montana is lucky to have a broad group of partners who are developing and implementing solutions to nonpoint source pollution at the local-watershed level. I urge you to join us in the challenge of providing a clean and healthful environment for all Montanans by working together to address water pollution and protect water quality in our great state!

Sincerely,

Richard H. Opper
Director

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ACRONYMS

Acronym	Definition
AFO	Animal Feeding Operation
ARM	Administrative Rules of Montana
ARM	Air Resources Management Bureau
BER	Board of Environmental Review
BLM	Bureau of Land Management
BMP	Best Management Practices
CAFO	Concentrated (or Confined) Animal Feed Operations
CCAC	Climate Change Advisory Committee
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CWA	Clean Water Act
CWAIC	Clean Water Act Information Center
DEQ	Department of Environmental Quality
DNRC	Department of Natural Resources & Conservation
EDD	Electronic Data Deliverable
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FWP	Fish, Wildlife & Parks
GIS	Geographic Information System
HCP	Habitat Conservation Plans
HUC	Hydrologic Unit Code
IPCC	Intergovernmental Panel on Climate Change
LID	Low-Impact Development
MACD	Montana Association of Conservation Districts
MBMG	Montana Bureau of Mines and Geology
MCA	Montana Code Annotated
MDT	Montana Department of Transportation
MPDES	Montana Pollutant Discharge Elimination System
MS4	Municipal Separate Storm Sewer System
MSU	Montana State University
MSUEWQ	Montana State University Extension Water Quality
MTWC	Montana Watercourse
MWCB	Mine Waste Cleanup Bureau
MWCC	Montana Watershed Coordination Council
NHD	National Hydrography Dataset
NOAA	National Oceanographic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
OHV	Off-Highway Vehicle
PCB	Polychlorinated biphenyl
PCP	Personal Care Product
QAPP	Quality Assurance Project Plan
SAP	Sampling and Analysis Plan

Acronym	Definition
SARA	Superfund Amendments and Reauthorization Act
SMZ	Streamside Management Zone
STORET	EPA STOrage and RETrieval database
TFAB	Technical and Financial Assistance Bureau
TMDL	Total Maximum Daily Load
USACE	United States Army Corp of Engineers
USDA	United States Department of Agriculture
USFS	United States Forest Service
USFWS	US Fish and Wildlife Service
USGS	United States Geological Survey
MWCB	Mine Waste Cleanup Bureau
WPB	Water Protection Bureau
WQIP	Water Quality Improvement Plans
WQPB	Water Quality Planning Bureau
WQPD	Water Quality Protection District
WQX	EPA's Water Quality Exchange System
WRP	Watershed Restoration Plan

NONPOINT SOURCE MANAGEMENT PLAN OVERVIEW

NPS PLAN GOALS

The goal of Montana's Nonpoint Source Management Program is to provide a clean and healthy environment by protecting and restoring water quality from the harmful effects of nonpoint source pollution. We believe this can best be achieved through the voluntary implementation of best management practices identified in science-based, community-supported watershed plans.

The goals of this plan are to:

- Inform Montana citizens about the causes and effects of NPS pollution on water quality.
- Set priorities for controlling NPS pollution on a statewide basis.
- Identify strategies for restoring water quality affected by NPS pollution.
- Describe a set of focused, short-term activities (5-year action plan) for attaining the statewide NPS pollution control program goals.

WHAT'S NEW IN THE 2012 NPS PLAN

The 2012 Plan has been reformatted and shortened to make it easier to read and understand. In addition, we've added more pictures and figures to illustrate the various discussions. The 2012 Plan has incorporated more recent information on waterbody impairments and land use. A new section on Water Quality Assessment and Monitoring has been added to provide additional information on this important component of the nonpoint source program. Montana's priorities and action plan for the next 5 years have been reviewed and updated, with additional specificity added to measurable outcomes, making them more quantifiable. Finally, appendices have been updated and refined, especially **Appendix A**, Montana's Best Management Practices to Control NPS Pollution. We hope you find the 2012 NPS Plan useful, informative, and most of all a tool for positive change in protecting and improving a vital resource.

WHAT THIS REPORT CONTAINS

The 2012 Montana Nonpoint Source Management Plan is an update of the 2007 Plan. Additionally, the 5-year action plan (explicit short-term objectives and indicators to measure progress) was evaluated and updated.

The Montana Nonpoint Source Management Plan is divided into 10 sections:

- **Section 1** describes Montana's NPS Pollution Management framework.
- **Section 2** provides background information on Montana's water resources.
- **Section 3** describes Montana's NPS pollution and control strategy on a statewide basis.
- **Section 4** describes the state's NPS education and outreach strategy.
- **Section 5** describes Montana's monitoring and assessment strategy.
- **Section 6** provides information on Montana's enforceable regulatory programs that address NPS pollution.
- **Section 7** describes the state's partnerships and funding resources.
- **Section 8** contains the 5-year action plan, the explicit objectives, and measures of progress.
- **Section 9** describes the Department of Environmental Quality's plan for periodically self-evaluating the effectiveness of the NPS strategy.

- **Section 10** describes how to find additional information and resources pertaining to NPS pollution.

A number of appendices provide additional details on NPS control activities and other subject matters.

INTRODUCTION

Nonpoint source (NPS) water pollution comes from contaminants (originating from a variety of land-use activities over generally large areas) that are transported to streams, lakes, wetlands, and groundwater by precipitation, snowmelt, and stormwater runoff. Nonpoint pollution also comes from substances that erode directly into surface waters or from aerially transported substances deposited on land and water. Common nonpoint pollutants include sediment, nutrients (nitrogen and phosphorus), temperature changes, metals, pesticides, pathogens, and salt.

NPS pollution is a significant problem in Montana, comprising the single largest cause of water quality impairment on a statewide basis. More than 75% of Montana's assessed rivers and streams and 45% of its lakes, reservoirs, and wetlands fail to meet state water quality standards largely as a result of the effects of NPS pollution (from Table 4-1, Montana Department of Environmental Quality, 2012). DEQ estimates that approximately 37% of the state's perennial river and stream miles, and 72% of the lake and reservoir acres, have been assessed.

HOW DID NPS MANAGEMENT ORIGINATE?

The 1972 federal Clean Water Act (CWA) established a national framework for protecting and improving water quality. The overall goal of the CWA is "to restore and maintain the chemical, physical and biological integrity of the Nation's waters." Implementation of the CWA in the early decades following its passage resulted in considerable national water quality improvements through improved treatment requirements for industrial and municipal wastewater discharges (i.e., point sources).

Following these early successes in controlling point source pollution, the CWA was amended in 1987 to require states to develop plans for controlling nonpoint sources of water pollution. Montana's Nonpoint Source Pollution Control Program was established shortly after the passage of the Section 319 amendments to the federal CWA in 1987. Section 319, titled "Management of Nonpoint Sources of Pollution," provides grant monies to states for a wide variety of NPS control activities, including technical and financial assistance, education and training, technology transfer, on-the-ground demonstration projects, and monitoring to evaluate the effectiveness of NPS control projects. In order to receive Section 319 funding, states must complete an assessment of their NPS pollution problems (updated biennially as part of the 305(b)/303(d) reporting process described below) and develop a management program to address the problems identified in the assessment report.

Other new sections of the CWA passed in 1987, Sections 303(d) and 305(b), require states to monitor and assess statewide water quality conditions, identify and list waterbodies that fail to meet water quality standards, and prepare Water Quality Improvement Plans (WQIPs) for restoring water quality. These WQIPs must include quantitative limits, known as Total Maximum Daily Loads (TMDLs), for each of the pollutants of concern. Most of Montana's water quality impairments reflected on the 303(d) list are a result of NPS pollution.

WHO IMPLEMENTS THE NPS MANAGEMENT PLAN?

Authority for controlling NPS pollution on a national level is provided in the federal CWA, which the Environmental Protection Agency (EPA) oversees. The Montana Department of Environmental Quality

(DEQ) is the agency responsible for developing and implementing water quality protection and improvement programs in Montana.

DEQ maintains a point-source pollution control program known as the Montana Pollutant Discharge Elimination System (MPDES), which is aimed at protecting water quality in waterbodies receiving point source discharges from sewage, industrial, or other wastes.

The programs and procedures described in this Montana Nonpoint Source Management Plan (Plan) are the state's primary vehicle for controlling and preventing negative effects to water quality from NPS pollution. DEQ's Water Quality Planning Bureau is responsible for managing Montana's Nonpoint Source Management Program and updating the Plan.

In addition, DEQ relies on many other agencies, entities, and individuals to help prevent, minimize, and reduce nonpoint source pollution in Montana. As this document describes, numerous partners are involved and are integral to implementing nonpoint source pollution control.

EPA'S NINE KEY ELEMENTS

In March 2003, EPA provided major new guidance for states in developing their NPS management programs. This guidance requires states to address nine key elements in their programs. Montana incorporated those nine specific elements into the 2007 Nonpoint Source Management Plan and includes them in this 2012 Plan (listed below). **Appendix H** lists where the nine elements are addressed in this updated Plan.

1. The state program has explicit short- and long-term goals, objectives, and strategies.
2. The state strengthens its working partnerships and linkages with appropriate groups, entities, and agencies.
3. The state uses a balanced approach that emphasizes both state-wide and on-the-ground management of individual watersheds where waters are impaired.
4. The state program abates known water quality impairments and prevents degradation from present and future activities.
5. The state program identifies waters and watersheds impaired by nonpoint source pollution through a comprehensive assessment program, develops Water Quality Improvement Plans, and implements the plans.
6. The state reviews, upgrades, and implements all program components and uses a range of approaches to address NPS pollution.
7. The state identifies federal lands and activities that are not managed consistently with the state's NPS Program.
8. The state has an efficient and effective management program, including financial management.
9. The state has an adaptive management approach for reviewing, evaluating, and updating the NPS Plan every 5 years.

The 2012 Plan meets the requirements of element 1, with explicit short- (up to 5 years) and long-term goals, objectives, and strategies to protect surface water and groundwater. The 2012 Plan also meets element 9 through a review and evaluation of the program, thereby updating the 2007 Plan.

1.0 MONTANA’S NPS POLLUTION MANAGEMENT PROGRAM FRAMEWORK

THE WATER QUALITY MANAGEMENT PROCESS

Protection and management of Montana’s water resources is accomplished through a series of components, which are described in the following sections in relation to the state’s management of nonpoint sources. A schematic of DEQ’s water quality management planning process is shown in **Figure 1-1**. The NPS Program relies on the successes of other programs within the Water Quality Planning Bureau (such as monitoring, standards, and TMDL development) to achieve its own successes; therefore, the NPS Program dedicates some of its resources to these other water quality programs in order to achieve restoration of impaired waterbodies and watersheds.

Achieving clean water begins with identifying indicators of desired water quality (i.e., establishing water quality standards). The next step is monitoring and assessing state waters to determine if they meet the established standards. The outcome of this effort is reported every 2 years in DEQ’s Water Quality Integrated Report. For those waters not meeting standards, total maximum daily loads (TMDLs) are developed, followed by voluntary implementation of best management practices 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.

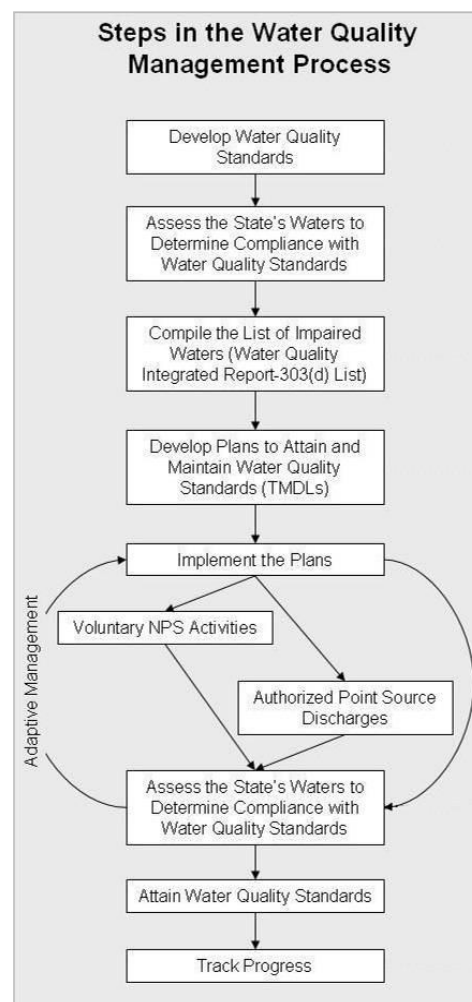


Figure 1-1: Schematic of Montana DEQ’s Adaptive Water Quality Management Process

1.1 WATER QUALITY STANDARDS AND CLASSIFICATION

Montana’s water quality standards include the uses designated for a waterbody (beneficial uses), 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. The Montana Water Quality Act requires the Board of Environmental Review (BER) to adopt water quality standards to protect beneficial uses. The act also directs BER to establish permit and nondegradation requirements. 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.

For most rivers, lakes, and streams “beneficial uses” are those which the waterbody supported when the classification system was adopted in 1955; also, they include future beneficial uses that the waters

should be capable of supporting. Beneficial uses include agriculture, aquatic life support, recreation, and drinking water. Waterbodies are assessed for each beneficial use (see **Section 1.2**). A lake or stream segment might fully support one use, such as recreation, while only partially support another use, such as aquatic life.

Four levels of beneficial-use support are used to describe Montana's waters:

1. **Full Support:** Waters are at their natural or best practical condition and water quality standards are attained.
2. **Full Support (Threatened):** The use is currently supported, but observed trends, or proposed new sources of pollution not subject to permitting, indicate a high probability of future impairment.
3. **Partial Support:** One or more data types indicate impairment. The state may list a beneficial use as partially supporting uses based on the nature and rigor of the data, as well as site-specific conditions.
4. **Non-Support:** One or more water quality standard for the beneficial use is not attained.

Montana, unlike many states, uses a watershed-based classification system, with some specific exceptions. As a result, all waters of the state are classified and have designated uses and supporting standards. Montana's surface water and groundwater numeric standards are detailed in a single department circular, "DEQ-7, Montana Numeric Water Quality Standards" (most recently updated in August 2010 and revised periodically).

1.2 IMPAIRED WATERBODIES AND 303(d) LIST AND WATER QUALITY ASSESSMENT

Under the federal Clean Water Act (CWA) and Montana Water Quality Act (Section 75-5-702), DEQ is responsible for assessing the condition of state waters. Since 2000 DEQ's monitoring focus has been on developing and implementing a process to assess and collect adequate credible data for determining beneficial-use support (Montana Department of Environmental Quality, 2011).

Assessed waters that do not meet water quality standards are placed on the state's list of impaired waters, which is approved by EPA under section 303(d) of the CWA. Over the ensuing 5 years, DEQ's monitoring and assessment efforts will focus on supporting TMDL formation, reviewing the TMDL, developing standards, and expanding the current statewide monitoring program described in the 2010 Water Quality Integrated Report. Briefly, this effort includes continuing and expanding baseline monitoring in reference sites, lakes, rivers, and streams across the state using different monitoring designs according to the needs and priorities of the program.

DEQ supports both internal and external monitoring efforts to address the many different data needs associated with its NPS Program. DEQ is especially interested in developing a volunteer monitoring program at the watershed level that could provide valuable data on the effectiveness of water quality improvement projects and watershed trends.

Monitoring efforts support the NPS Program by providing accurate information on the status of state waters, identifying causes and sources of NPS pollution, and noting trends in water quality. The monitoring and assessment efforts are integral to ensuring an effective NPS Program by focusing on the important pollutant causes and sources and assessing the outcomes of mitigation activities.

1.3 THE TMDL DEVELOPMENT PROCESS AND WATER QUALITY PLANNING

A total maximum daily load (TMDL) is the allowable pollutant loading from all sources (point, nonpoint, and natural background) established at a level that meets applicable surface water quality standards (75-5-103 (32), MCA). Montana state law (75-5-703, MCA) directs DEQ to develop TMDLs for waterbodies impaired or threatened by pollutants. TMDL development is also required for these waterbodies under the federal Clean Water Act.

In practical terms, a TMDL is a plan to attain and maintain water quality standards for waters that are not meeting standards. The basic steps of the process include:

1. Developing an understanding of the water quality pollutant problem (e.g., sediment, temperature, arsenic, etc.).
2. Identifying the pollutant(s) sources.
3. Quantifying the pollutant loads from each of the sources.
4. Allocating pollutant reductions to the sources.
5. Establishing water quality goals for attaining water quality standards.

In Montana, TMDLs are developed using a watershed approach, that is, TMDLs are developed for all streams impaired by a certain pollutant, or set of pollutants, within a given watershed. The scale of the watershed used for TMDL development is generally based on USGS Hydrologic Unit Code (HUC – 4th-5th code) boundaries, where practical. Although not required, Montana’s plans generally also include at least a conceptual restoration or implementation strategy. For this reason DEQ calls the watershed documents containing the TMDLs Water Quality Improvement Plans (WQIPs).

For at least the next 5 years, Montana’s TMDL Program will be the primary means through which DEQ will conduct site-specific and watershed-scale assessments of NPS effects, quantify the magnitude of the NPS problem at the watershed scale, and develop watershed-scale WQIPs. This is because

- 75% of Montana’s assessed streams and 45% of Montana’s lakes are impaired, largely from nonpoint sources;
- TMDLs must be prepared for all of the pollutant-impaired waters in the state;
- the TMDL process results in watershed scale assessments to identify pollutant sources, quantify pollutant loads, allocate load reductions, and establish water quality goals; and
- by court-order, watershed-scale TMDLs must be completed for approximately 600 additional streams and lakes by 2014.

State law (75-5-703, MCA) requires DEQ to provide support to local interests to implement TMDLs and achieve water quality standards. By implementing TMDLs, DEQ can meet its NPS goal of achieving water quality standards for impaired state waters. However, local support of the program’s voluntary “reasonable land, soil and water conservation practices” is necessary in order to implement TMDLs. Therefore, integrating the TMDL Program with the NPS Program is critical to the success of the NPS Program in Montana. The development of wasteload allocations for point sources and load allocations for nonpoint sources, within the context of TMDL development, is an inherent part of DEQ’s public and stakeholder participation process during TMDL development. This process includes consulting with watershed advisory groups and appropriate technical personnel as well as allowing public comment on all aspects of the TMDL.

The TMDL schedule shown in **Appendix G** is based on the negotiated settlement agreement that has a deadline of December 2014. After 2014, a new TMDL schedule will be prepared, presenting priority watersheds and completion dates. DEQ considers the following prioritizing factors:

- stakeholder interest
- funding availability
- significant new pollution sources
- linkage to discharge permits
- planning from upstream to downstream
- data availability
- existing resource commitments
- additional factors

1.4 IMPLEMENTING TMDLS TO RESTORE WATER QUALITY

NPS control at the watershed level is focused on restoring impaired waterbodies by implementing TMDLs. The rationale for the focus on TMDLs is that these provide a science-based strategy for identifying pollutants, sources, and necessary pollutant reductions that will lead to full attainment of state water quality standards.

Implementing Montana’s NPS Program relies on a combination of voluntary and regulatory elements applied at both a state and watershed level (see **Section 6**). DEQ’s longstanding policy has been to promote a voluntary program of reasonable land, soil, and water conservation practices to achieve compliance with water quality standards for activities that create NPS pollution. 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 will implement TMDLs by providing staff support and providing (where possible) Section 319 funding to those local watershed efforts that pursue NPS controls by developing their own WRPs and using adaptive management (see **Section 1.5** for a discussion on adaptive management). Watershed Restoration Plans can be viewed as a locally developed “road map,” complete with identified priority areas and/or activities, as well as timelines for meeting milestones. In addition, funding should come from a variety of sources. These plans must be integrated with DEQ’s TMDL development efforts wherever possible.

TMDL documents provide the identified pollutant causes, sources, and load reductions. The TMDL documents also provide potential reasonable land, soil, and water conservation practices and priority areas. Local watershed efforts can then provide the necessary resources, willing partners, and local priorities for implementing conservation practices, an implementation schedule, and interim milestones, among other things. EPA has identified the components of a WRP (listed below) necessary for ensuring that load allocations will be achieved and realistic plans will be developed:

- pollutant causes, sources, and necessary load reductions
- prioritized management practices and treatment areas
- potential projects
- monitoring plan/sampling and analysis plan (SAP) to measure success of specific practices and water quality trends
- information/education plan
- evaluation process
- a list of technical and financial assistance needed to implement the plan

- an implementation schedule
- interim milestones to track implementation and effectiveness of management measures
- designated responsible parties for reviewing and revising the plan

Assessment of progress and adaptive management should include:

- information assessment—review and evaluation
- interagency collaboration and shared results
- reports back to stakeholders and others
- adjustments to program

The Montana Watershed Coordination Council (MWCC, see **Appendix C**) 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 (Montana Department of Environmental Quality, 2012). These agencies usually have multiple management objectives, planning processes that occur outside water quality implementation or WRP development, and TMDL implementation activities that occur outside the previously described process. DEQ has developed interagency agreements (e.g., memoranda of understanding) that provide additional mechanisms to inform, coordinate, and cooperate on NPS pollution reductions and TMDL implementation. One main objective of Montana’s NPS Plan is to identify all reasonable land, soil, and water conservation practices in Water Quality Improvement Plans and implement them on state and federally managed lands within 5 years of EPA approval.

1.5 TMDL IMPLEMENTATION EVALUATION AND ADAPTIVE MANAGEMENT

Once the watershed restoration measures identified in approved WRPs have been implemented, watershed groups and DEQ can systematically 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).

Under state law, if the beneficial uses of a waterbody are not fully supported within 5 years of TMDL or WRP implementation, DEQ must conduct an evaluation to determine if

- the implementation of new, or an improved phase of, voluntary reasonable land, soil, and water conservation practices is necessary;
- water quality is improving but more time is needed to meet water quality standards;
- revisions to the Water Quality Improvement Plan are necessary to achieve water quality standards.

The criteria below help DEQ decide whether to evaluate TMDL implementation:

1. TMDLs have been completed for a minimum of 5 years.
2. Implementation activities identified in the Plan (TMDL and/or WRP) are either underway or have been completed.

3. Progress on restoration activities/projects has been significant, and there is a high likelihood that TMDL targets have been achieved or there has been significant progress toward meeting TMDL targets.
4. Monitoring efforts have been significant, and data is available to evaluate if TMDL targets have been met.

DEQ has completed four TMDL Implementation Evaluations (TIEs), and is committed to continuing TIEs, despite DEQ's resource constraints and competing priorities. A goal of the program is to complete four TIEs per year. This is indicated in **Section 8.1** Resource Related Action item 8 – and is identified as a high priority measurable outcome.

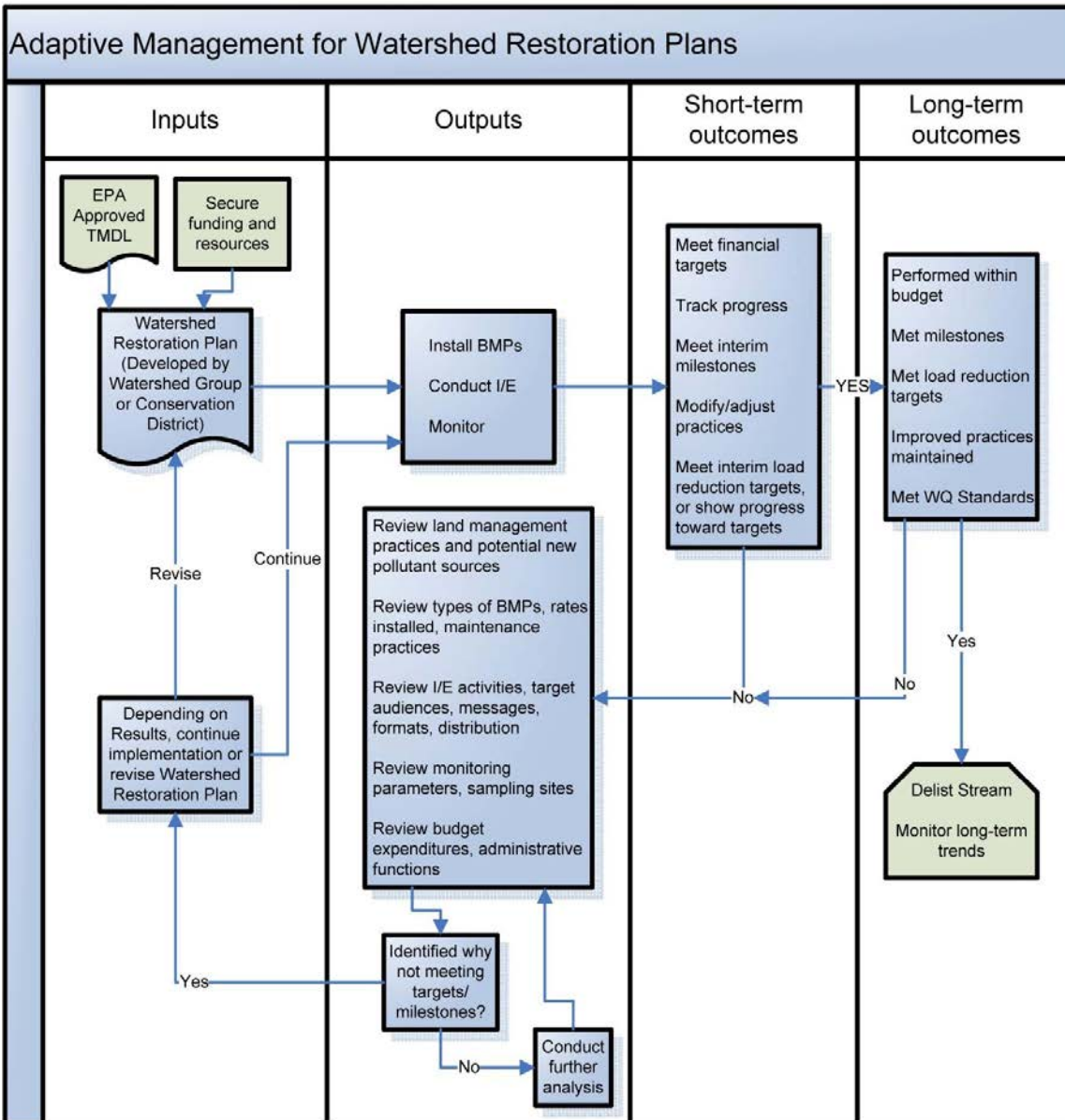


Figure 1-2: Diagram of Adaptive Management Approach for Montana Watershed Restoration Plans

1.6 STATEWIDE NONPOINT SOURCE PROGRAM EMPHASIS ON POLLUTION PREVENTION

Montana values its waterbodies that meet or exceed water quality standards. To maintain and protect these waters, the NPS Program emphasizes statewide 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 Program supports integrated statewide, watershed, and community education and outreach on NPS pollution prevention. Because Montana is geographically large but has a low population, statewide coordination and integration of various partners' resources is most effective, using such organizations as the Montana Watershed Coordination Council, the Forestry BMP Workgroup, the Animal Feeding Operation/Confined Animal Feeding Operations Task Force, and Governor's Task Force for Riparian Protection.

Montana laws address water quality protection from an array of NPS pollution and groundwater issues, such as stream crossings, individual sewage disposal systems (septic systems), strip mines, and landfills. 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. **Section 7** and **Appendix C** provide information regarding other agencies and partners who participate in programs to control NPS pollution in Montana.

Adaptive management also plays an integral role in pollution prevention by addressing emerging and new potential threats to clean water. Examples could include developing additional regulatory authorities to address the cumulative effects of septic systems on water quality and developing additional water quality standards for new pesticides.

The NPS Plan, through the combined strategies of TMDL implementation and pollution prevention, will meet the NPS Program's goal to provide a clean and healthy environment by protecting and restoring water quality from the harmful effects of nonpoint sources of pollution.

2.0 MONTANA’S WATER RESOURCES

Montana’s water resources are the lifeblood 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 paints a picture of Montana’s water resources to provide a context for the strategies and recommendations contained within the rest of the NPS Management Plan.

2.1 STREAMS AND LAKES

Montana has approximately 59,752 miles of perennial streams; 307,406 miles of intermittent and ephemeral streams; 13,114 miles of ditches and canals; and 713,742 acres of lakes, reservoirs, and 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 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.

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

- 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 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 Planning Bureau (WQPB) 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 generally thought to represent a transition between aquatic and upland habitats but are difficult to define because the distinction between wet and dry environments lies along a continuum (**Figure 2-2**) and because there is a diversity of wetland types. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands are 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. Jurisdictional wetlands are those that satisfy all three criteria in the wetland definition—hydric soils, hydrophytic plants, and wetland hydrology—and are considered waters of the United States. All wetlands perform a range of vital functions (e.g., aquatic habitat, flood control, groundwater recharge) in addition to filtering pollutants, yet only jurisdictional wetlands are afforded federal protection under the Clean Water Act. Ecological or functional wetlands perform the same range of vital functions and pollution control and yet may only meet one of the three criteria of jurisdictional wetlands. Wetlands adjacent to streams and lakes often have the ability to remove pollutants before they enter these waters. However, they should not be viewed as “sinks,” “storage,” or “recycling bins” for pollution. They do not have a limitless capacity to use and store pollutants, and many wetland ecosystems are as sensitive to pollution as streams and lakes.

Man-made wetlands can be an effective tool for capturing NPS pollution and preventing it from entering streams and lakes. However, to maintain their effectiveness, these constructed wetlands must be managed so that they continue to take up pollution. If not maintained, chemical and biological processes can get overwhelmed and no longer function as designed.

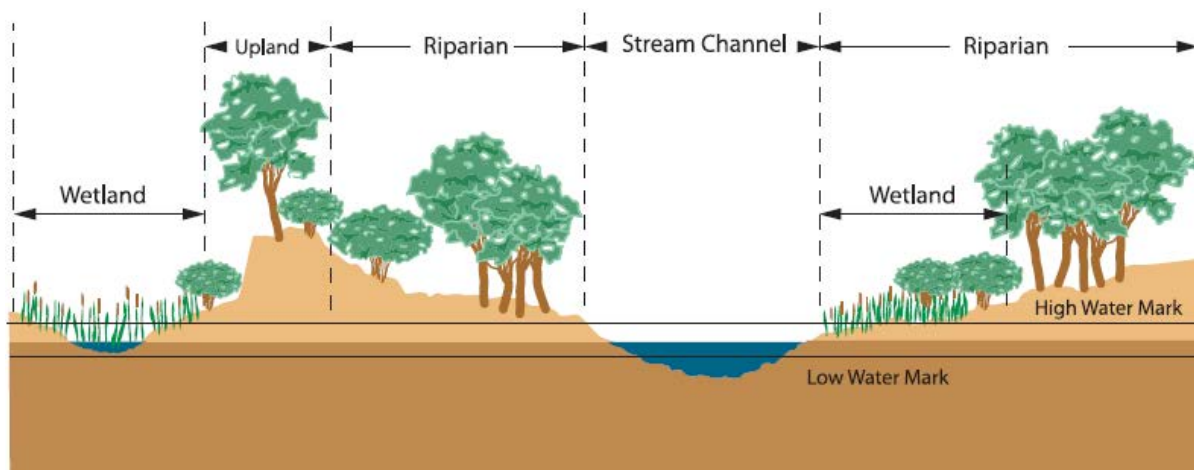


Figure 2-2: Relationship between Wetlands, Uplands, Riparian Areas, and the Stream Channel

2.2.2 Riparian Areas

Montana has a tremendous variety of riparian areas, ranging from cottonwood galleries to willow forests to high-altitude bogs and fens. Riparian areas are 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. Similar to wetlands, riparian areas have many definitions. For uniform identification, classification, and mapping, the U.S. Fish and Wildlife Service defines 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, 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 wetland and upland habitat and generally perform the same functions as 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.*

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 frequency 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.



Consider the following axiom:

Anything located in a floodplain will one day be located in a lake or river.

This means houses, buildings, livestock, wells, or other objects in a floodplain will be flooded with a certain degree of frequency. If feedlots, barns, houses, and businesses are located on a floodplain, their contents will become pollution during a flood.

Figure 2-3: Flooded Fishing Access Latrine

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

- Federal Emergency Management Agency (FEMA)
- United States Army Corp of Engineers (USACE)
- United States Geological Survey (USGS)
- Natural Resources Conservation Service (NRCS)
- NOAA/National Weather Service (NWS)

On a state level, the Montana Department of Natural Resources & Conservation's Floodplain Management Program provides technical assistance to local floodplain administrators participating in the National Floodplain Insurance Program and has statutory responsibilities to delineate and designate floodplains and floodways. Local governments are charged with adopting land-use regulations that meet or exceed minimum federal and state standards. Local floodplain administrators implement locally adopted floodplain ordinances. The ordinances are a prerequisite for obtaining federal flood insurance and federal financial assistance following a flood event. These ordinances are geared to promoting public safety and preventing damage to buildings and other infrastructure; they may not protect water quality in the event of a flood. Montana will continue to encourage landowners to avoid building infrastructure in floodplains.

2.3 GROUNDWATER

Montana state law protects 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.

NPS pollution can enter groundwater via infiltration/percolation or through sub-surface flow. Groundwater frequently comes in contact with surface water. In any given stream, there are typically some sections where stream water is leaving the stream and entering groundwater, and other sections where groundwater is entering the stream. Groundwater (even in deep aquifers) is often mobile. NPS pollution may enter groundwater in one location and then travel underground for many miles before resurfacing and polluting a stream or lake. Rates of travel are highly variable, ranging from a few inches per year to hundreds of feet per day.

Groundwater is a critical source of drinking water and irrigation water for many of Montana’s rural communities. Common sources of NPS pollution in groundwater include:

- Improper application of fertilizer
- individual household septic systems
- groundwater recharge from contaminated surface waters
- oil, gas, and mineral extraction, which can cause acid mine seepage

3.0 MONTANA’S NPS POLLUTION CONTROL STRATEGY

This section of the Montana Nonpoint Source Management Plan describes the program goals and strategies for managing NPS pollution from various land uses.

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 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, 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 using 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 historically relied on (and continues to rely on) other DEQ and agency programs to achieve its goals of attaining and maintaining water quality standards. **Section 7** discusses examples of 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 must be 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. Most BMPs are amply described in existing publications, available from state and federal agencies, land grant universities, and private organizations.

The TMDL process is designed to provide the necessary guidance to implement all reasonable land, soil, and water conservation practices.

Best Management Practices collectively applied in a systematic fashion constitutes what Montana law and administrative rules refer to as “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, but are not limited to, 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 the necessary 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 C** for a list of partners and resources that may be able to provide additional information on BMPs.

NPS Program Goals

The goal of Montana’s Nonpoint Source Management Program is to provide a clean and healthy environment by protecting and restoring water quality from the harmful effects of nonpoint source pollution. The short-term (5-year) goal of the NPS Plan is to demonstrate significant progress in protecting and restoring water quality from nonpoint sources of pollution, which will be measured by achieving the actions outlined in this Plan. In order to accomplish the goals of the NPS Program, DEQ will use the following principles:

The goal of Montana’s Nonpoint Source Management Program is to provide a clean and healthy environment by protecting and restoring water quality from the harmful effects of nonpoint source pollution.

- Support local conservation activities.
- 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

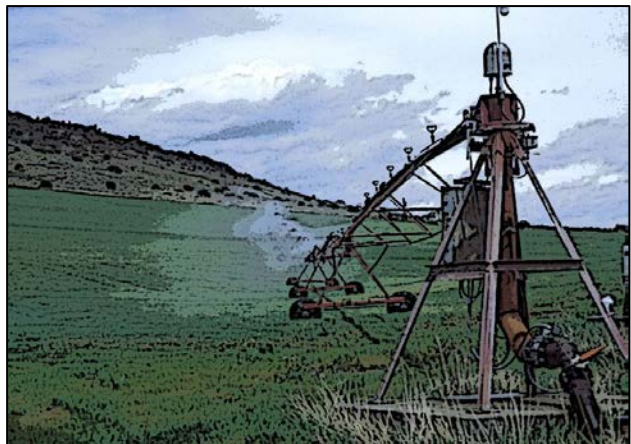
DEQ has identified seven major land uses that contribute significantly to NPS pollution: agriculture, forestry, hydrologic modification, mining and industry, recreation, transportation, urban and suburban development. Montana’s 2012 Water Quality Integrated Report provides the basis for identifying and addressing these sources (see **Table 3-1**). Each use is discussed in the following sections. Two additional sources of NPS pollution include contributions from the atmosphere and from climate change. These sources are also discussed below.

Table 3-1. Top 10 Confirmed Sources of Impairment – All Assessment Units (Montana Department of Environmental Quality, 2012)

Source Name	# of Assessment Units
Grazing in Riparian or Shoreline Zones	117
Irrigated Crop Production	51
Forest Roads (road construction and use)	37
Unspecified Unpaved Road or Trails	28
Flow Alterations from Water Diversions	27
Effects from Abandoned Mine Lands (inactive)	19
Silviculture Harvesting	19
Channelization	17
Natural Sources	16
Mine Tailings	16

3.1.1 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 including water quality



protection conditions in grazing leases, permits, and funding agreements can be an effective method of encouraging people to implement BMPs.

Contribution to Nonpoint Source Pollution

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 the agricultural uses with the needs of other beneficial uses, such as drinking water, fish and wildlife production, and recreation.

Strategies

It would be impractical and impossible to eliminate all agricultural sources of NPS pollution; however, BMPs can often be implemented to reduce NPS pollution and improve water quality. Detailed information on specific agricultural BMPs can be found in **Appendix A** and in the USDA Natural Resources Conservation Service's Field Office Technical Guide, available electronically at http://efotg.sc.egov.usda.gov/efotg_locator.aspx?map.

Montana's NPS Program will use the following strategies to increase implementation of water quality-based agricultural BMPs.

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

All members of the agricultural community (farmers, ranchers, educators, agencies, and consumers alike) should be familiar with, and must feel comfortable discussing, NPS pollution issues as frequently as necessary. The NPS Program will use a variety of tools to 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.
- **Continuing education.** Agency staff, educators, and watershed group members will continually seek new methods and opportunities to discuss NPS pollution with farmers and ranchers.

- **Mutual respect and support.** Government agencies, agricultural producers, trade organizations, and educators will work to reduce “us vs. them” feelings among different members of the agricultural community, regulators, and the environmental community.

Strategy 2: Evaluate NPS pollution reduction efforts and activities.

Montana’s NPs Program will continually evaluate what has and has not worked in the past, identify existing and potential sources of pollution, and determine what can reasonably be done to reduce and prevent NPS pollution. This will be an ongoing process involving government agencies, citizens, and partner organizations.

- Encourage individuals, organizations, and government entities to report on, and highlight, their efforts to reduce NPS pollution.
- Inventory and monitor potential sources and types of NPS pollution.
- Evaluate the effectiveness of past efforts to reduce or prevent NPS pollution from agricultural sources.

Strategy 3: Facilitate activities to reduce NPS pollution.

In order to implement on-the-ground activities to reduce NPS pollution, technical and financial assistance, effective programs and tools, and mutual support and encouragement must be present.

- Evaluate NPS pollution reduction programs, activities, BMPs, and tools to apply to specific pollution issues and sources.
- Provide technical and financial assistance to individuals and groups seeking to reduce NPS pollution from agricultural sources.
- Encourage individuals, organizations, and government entities to identify and advertise their successes in reducing NPS pollution, especially in watersheds with significant unaddressed NPS pollution problems.
- Encourage state, federal, and private land managers to incorporate NPS pollution reduction BMPs in their management plans.

Over the next 5 years, the NPS Program will focus on addressing three significant agricultural sources of NPS pollution. These three sources were chosen based on the magnitude of their NPS pollution contribution, the anticipated availability of resources, and the interest in, and ability to, address them:

- excessive livestock use of riparian and wetland areas
- nutrient and sediment losses from crop fields
- irrigation-induced NPS pollution (addressed in **Section 3.1.3**)

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 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. The



state's largest forest-land holder is the U.S. Forest Service, followed by non-industrial private land owners (**Figure 3-1**). In 2010, forest lands produced approximately \$325 million in wood and paper products (Morgan et al., 2011). In 2007, 75% of the total timber harvested in Montana came from private lands (38% from non-industrial and 37% from industrial ownerships), while 14% came from national forests (Montana Department of Natural Resources and Conservation, 2010).

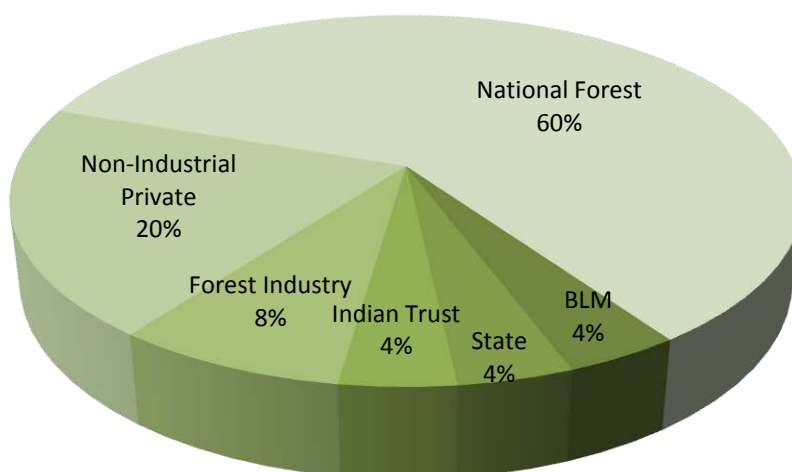


Figure 3-1: Forest Land Ownership in Montana in Year 2004

(Montana Wood Products Association, 2005). The acreages shown do not include National Park or wilderness area acres because these are unavailable “timber base.”

Contribution to Nonpoint Source Pollution

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 164 waterbodies (stream segments or lakes) identified as impaired from forestry-related activities; forest roads and silviculture are the primary sources of impairment (**Table 3-2**). Forest-related impairments occur on a total of 1,907 miles of streams.

Table 3-2: Forestry-Related Waterbody Impairments

Forestry Sources ²	Rivers, Streams, and Lakes Number of waterbody segments (% of total impaired waterbodies)	Rivers and Streams Miles impaired (% of total miles)
Forest Roads (road construction & use)	97 (17%)	1,010 (8%)
Silviculture Activities	77 (13%)	880 (7%)
Silviculture Harvesting	48 (8%)	509 (4%)
TOTAL Forestry Related Impairments ¹	164 (28%)	1,907 (15%)

¹Waterbodies may be impaired by multiple forestry-related impairments; therefore, totals will be less than the sum of individual forestry sources.

²From DEQ, 2012 Assessment Database.

Forest Road Construction and Use

Improperly located or constructed, or inadequately maintained, forest roads generate sediment that can be delivered to stream channels (See review by Sugden and Woods, 2007). Implementing contemporary BMPs, where roads are properly located, well designed, and well maintained (including keeping stream crossings to a minimum), can dramatically reduce the effects on water quality (Ice and Schilling, 2012).

Silviculture 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 indiscriminant streamside harvesting include shading (affecting water temperature), large woody debris recruitment, nutrient cycling, streambank stability and 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 is designed to protect the water quality functions of these streamside zones.

Strategies

Because forested lands cover near 25% of Montana, strategies for reducing the effects of NPS pollution from forestry activities must be effectively implemented across forest lands and agencies. Montana forestry professionals have developed sets of effective strategies for reducing forestry-related NPS pollution. See **Appendix A** for a description of commonly used forestry BMPs. See **Appendix C** for a list of 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 audits via an interdisciplinary team who reviews recent forest harvest activities of participating landowners. Since 1990 assessment teams have examined the use of forestry best practices 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. Assessments in 2010 found that forestry BMPs were correctly applied 97% of the time (Ziesak, 2010). These assessments also found that Stream Management Zone (SMZ) requirements were met 97% of the time; in addition, the effectiveness of SMZs were rated as very high (98%). In 2010 the forestry BMP program developed fish passage assessment tools for forest road culverts and stream crossings.

Strategy 2: Develop and implement restorative best management practices that promote fully functioning aquatic conditions for historically impaired waterbodies.

Historic forestry practices, such as poorly designed roads and removal of stream-side forests, have increased instream sediment and temperatures (Richardson et al., 2012). Waterbodies impaired from past forestry practices can benefit from BMPs for reconstructing roads with effective drainage and enhancing buffers of woody streamside vegetation. If TMDL implementation is unable to meet standards, then a new or improved phase of voluntary BMPs is required.

Strategy 3: Minimize NPS pollution by collaborating with others to implement 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 Program supports forestry BMP collaboration by developing and implementing Habitat Conservation Plans (HCPs) that outline forest-riparian habitat policies and standards for fish and wildlife. These plans can include (a) reducing sediment delivery from existing roads, (b) monitoring the effectiveness of road BMPs, (c) measuring riparian and canopy cover, (d)

identifying the effects of changes in water temperature, and (e) measuring and monitoring riparian conditions. DNRC and Plum Creek Timber are currently implementing HCPs in cooperation with the U.S. Fish and Wildlife Service.

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

3.1.3 Hydrologic Modification

Changes in the amount and/or location of water in a river or lake, even temporarily, can alter every natural process within that waterbody. Hydrologic channel and shoreline modifications often have significant negative pollution effects on aquatic processes, including changes to:

- vegetation growth
- water temperature
- erosion rates
- sediment deposition
- channel migration
- fish habitat
- salinity and alkalinity levels
- navigability for boaters



Hydrologic modification by people consists of three primary activities:

1. channelization and channel modification
2. streambank erosion
3. dams

Contribution to Nonpoint Source Pollution

The Montana Constitution and state water law provides Montanans the right to appropriate water and apply it for beneficial use (85-2-101, MCA). The Montana Water Quality Act recognizes this right, while assuring “the protection of the environmental life support system from degradation and [provide] adequate remedies to prevent unreasonable depletion and degradation of natural resources” (75-5-102, MCA). The federal Clean Water Act’s TMDL requirements apply only to the creation and discharge of pollutants. Hydrologic modification is classified as pollution, not a pollutant, but is a source of waterbody impairment and appears as a source on Montana’s list of impaired waterbodies (see **Table 3-3**). Hydrologic modifications are generally not included in TMDL development but can appear in WQIPs as part of planning to restore all beneficial uses.

Table 3-3: Hydrologic Modification Impairment Listings

Hydrologic Modification Sources	Rivers, Streams, and Lakes Number of waterbody segments (% of total impaired waterbodies)	Rivers and Streams Miles Impaired (% of total impaired miles)
Channelization and channel modification	153 (23%)	3,217 (22%)
Streambank erosion	105 (15%)	2,575 (20%)
Dams and diversions	196 (29%)	4,321 (29%)
TOTAL Hydrologic Modification Related Impairments	355 (52%)	7,619 (51%)

Channelization and channel modification includes straightening, widening, deepening, and clearing channels of debris and sediment; flood control; water drainage; navigation; sediment control; infrastructure protection; stream channel mining; channel and bank instability; habitat improvement/enhancement; and flow controls.

Streambank erosion is the tearing away of banks along streams and rivers and the shorelines of lakes. Human-caused degradation of streambank vegetation accelerates erosion when flowing waters overwhelm the soil and vegetation holding the streambank in place. Eroded materials are carried downstream and re-deposited in the channel bottom or in point bars along the channel. Streambank erosion includes a natural rate of normal background levels of sediment accumulation and deposition.

Dams and diversions are constructed facilities used for impounding or diverting water for flood control, power generation, irrigation, or navigation or to create ponds, lakes, and reservoirs.

Notable sources of NPS pollution from hydrologic modification include:

- irrigation water withdrawals and return flows
- bank armoring
- stream straightening
- instream structures, such as diversions, dams, and weirs
- ditching and draining of wetlands

Strategies

The goal for improving water quality from hydrologic degradation is to improve support for all applicable beneficial uses through appropriate BMPs, regulatory action, and cooperative programs.

Strategy 1: Restore riparian functions affected by past hydrologic modification through enhanced BMPs.

- Plant and/or maintain native vegetation buffer zones and landscapes to support surface water runoff infiltration within appropriate buffer zones.
- In forested lands, apply forest BMPs for current and future forestry activities. Restore streambank problems from past forestry activities.
- Implement local floodplain and wetland protection measures and develop Watershed Restoration Plans.

- Promote local setback requirements or buffer zone(s) to reduce concentrated flows and promote infiltration of surface water runoff in riparian and wetland areas.

Strategy 2: Participate in the permitting and licensing process for dams and diversions.

- For reservoir operation planning, promote the protection of the quality of surface waters and aquatic habitat in reservoirs and water releases (tailwaters) from impoundment degradation effects.
- DEQ certifies federal actions and permits to be in compliance with water quality standards through Clean Water Section 401 and, therefore, can ask permit and license holders to meet conditions that promote optimal hydrologic functioning and BMPs for dam/diversion construction and operation.

Strategy 3: Develop and implement other initiatives to address channel modification, irrigation practices, and flow issues.

- Channel modification
 - Minimize or restore detrimental changes to instream channels and riparian vegetation from channel modification projects, both proposed and existing (through Conservation Districts and Section 310 permits).
 - For urban land use and transportation activities, discourage development of infrastructure, buildings, and other development in floodplains, where practical.
- Irrigation Practices
 - Promote irrigation efficiency and water conservation practices, while seeking to retain irrigation water savings for instream water quality improvement.
- Flow
 - Work with agencies, non-governmental organizations, and local watershed groups to assess potential opportunities to address instream flow concerns through water conservation, irrigation efficiency, drought management planning, water rights leasing, improvements, and other appropriate activities.
 - Work with Montana Fish, Wildlife & Parks to develop clear criteria for determining and documenting when changes in flow from human activities negatively affect aquatic life.

3.1.4 Mining and Industry

In Montana, mining includes activities associated with the removal of hard rock, coal, sand and gravel, or oil and gas. Industry includes activities associated with the manufacturing of tangible products.

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)
- disposal and discharge of by-products of oil and gas extraction, such as the water extracted during coalbed methane production (salts, metals)

Strategies for Mining

Working mines are regulated under federal and state permits. 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 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. Because of resource limitations, discharges from abandoned mines are not typically covered under MPDES permits, leaving their control and abatement up to non-regulatory programs and the voluntary efforts of various agencies, private organizations, and individuals.



DEQ's Mine Waste Cleanup Bureau has designated 300 priority mines and has addressed many long abandoned mine and mill sites. To date 283 projects have been completed. As of 2011 DEQ's Abandoned Mine program has 13 active reclamation projects across the state.

Strategy 1: Collaborate with MWCB to address non-permitted pollution from mining-related sources.

Under the Surface Mining Control and Reclamation Act of 1977, the Abandoned Mine Section of DEQ's Mine Waste Cleanup Bureau (MWCB) is responsible for administering abandoned mine reclamation projects that are funded by federal grants derived from coal taxes.

The Federal Superfund Section of DEQ's MWCB oversees or implements remedial actions at sites on the federal National Priorities List that have been delegated to Montana for state-lead status under cooperative agreements with EPA. The state Superfund Section also provides technical and management assistance to EPA for remedial investigations and cleanup actions at Superfund sites maintained in federal-lead status. The majority of the Superfund projects in Montana are designed to address pollution from mining-related activities (e.g., resource extraction, smelting).

The NPS Program works with DEQ's MWCB and other stakeholder groups to develop abandoned mine site remediation BMPs.

Strategy 2: Address non-permitted pollution from mining-related sources.

The Water Quality Monitoring and Assessment Section of DEQ's Water Quality Planning Bureau (WQPB) may assess waterbodies to determine if their beneficial uses are being impaired by pollution from abandoned mines. As appropriate, WQPB's Watershed Management Section will develop TMDLs to address impairments. Consistent with resources and priorities, WQPB's Watershed Protection Section will implement WQIPs and conduct periodic TMDL Implementation Evaluations to determine the extent to which pollution from abandoned mines is being addressed.

WQPB may use Section 319(h) monies to pay for abandoned mine-land 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 (a.k.a. MPDES) permit and (2) the activities do not directly implement a draft or final NPDES/MPDES permit. Activities that might meet the above requirements include:

- remediating water pollution from abandoned mines or portions of abandoned mines

- mapping and planning of remediation
- monitoring
- providing technical assistance
- creating information and education programs
- training and technology transfer
- developing and implementing policies to address abandoned mines

Contribution to Nonpoint Source Pollution from Industry

NPS pollution from industrial sources is typically the result of one or more of the following: stormwater runoff, seepage of chemicals into groundwater (which may come into contact with surface water), and erosion of contaminated sediments.

Strategies for Industry

The NPS Program addresses NPS pollution from industrial sources in much the same way it addresses pollution from mining. Discharges from active industrial facilities are regulated through permits.

Strategy 1: Water Protection Bureau and Hazardous Waste Cleanup Bureau (HWCB) collaborate to address permitted pollution from industry-related sources.

DEQ's Water Protection Bureau has the primary responsibility for regulating discharges from active industrial facilities. Information on discharge permits is available online at:

<http://deg.mt.gov/Permits.mcp.x>.

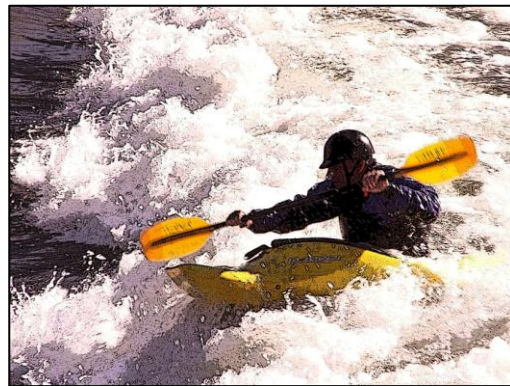
DEQ's HWCB works with EPA to address hazardous waste cleanup from major industrial sites. This work is performed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. sections 9601-9657, and the Superfund Amendments and Reauthorization Act (SARA), Public Law No. 99-499 stat. 1613 et seq.

Strategy 2: Collaborate with others to address permitted 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 Program will work these stakeholder groups as needed, and as resources permit, to address these issues.

3.1.5 Recreation

More than 80% of all Montana residents engage in outdoor recreational activities, and more than 60% of those 80% participate in water-based activities (Montana Fish, Wildlife and Parks, 2005). 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.



Contributions to Nonpoint Source Pollution

Because many recreational activities in Montana are directly related to surface water, those activities can be a source of nonpoint source pollution and negatively affect water quality. There is a high potential for water quality degradation associated with boating activities from contaminated bilge water, petroleum products, trash, and solvents being released into state waters. In addition, boat wakes can cause 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.

Montana households annually participate in the following outdoor recreational activities (FWP 2008):

- Swimming or wading (32%)
- Fishing (other than fly-fishing) (27%)
- Fly-fishing (13%)
- Boating: motorized (13%)
- Boating: floating, whitewater rafting, canoeing and kayaking (11%)
- Driving: off highway vehicle (OHV)/all terrain vehicle (ATV) (10%)
- Water skiing (6%)
- Ice Fishing (5%)
- Hunting (18%)

In addition to water-based recreational activities, activities on upland areas can also contribute to NPS pollution. Off-highway vehicles (OHVs) include motorcycles, all terrain vehicles (ATVs), and amphibious vehicles (snowmobiles are not OHVs). Repeated and unauthorized travel by OHVs can contribute to riparian damage and excess sediment and runoff into nearby streams and lakes.

Strategies

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

Strategy 1: Promote and support responsible water-based recreation.

In order to promote responsible water-based recreation, the NPS Program supports the proper development 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 2: Support off-highway travel planning and promote responsible OHV use.

Local, state, and federal agencies can proactively address effects from OHVs by developing policies and BMPs to monitor, minimize, and prevent NPS pollution from OHV use. In general, this can be done through the US Forest

Service's Travel Management Plans. These plans provide guidance for the appropriate use of national forests and will help ensure the protection of water quality in Montana. In watersheds where water

"Motor vehicles are a legitimate and appropriate way for people to enjoy their National Forests – in the right places, and with proper management... A designated system of roads, trails, and areas for motor vehicle use, established with public involvement, will enhance public enjoyment of the National Forests while maintaining other important values and uses on NFS lands."
–Federal Register 2005: 70 FR 68264

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 USFS 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 10,958 miles of roadway and 4,416 bridges statewide (Martin, Tom, personal communication 2011). 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. Likewise, \$574 million were spent in federal fiscal year 2011 on these projects.

Contribution to Nonpoint Source Pollution

If not properly managed, transportation routes (roads, highways, railroads, etc.) can be a significant source of NPS pollution. Litter from vehicles, oils and gasoline, and traction sand and road salt all accumulate in transportation corridors, potentially ending up in surface waters. Changes in sediment transport and bank erosion can also be affected by transportation routes that limit lateral migration and floodplain functions.

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 see **Appendix C**.

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.

- Develop and implement a Memorandum of Understanding between DEQ and MDT specific to water quality protection and improvement.

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 could be to develop educational materials and trainings specifically for maintenance personnel. The tools would raise awareness about NPS pollution and workers' roles in preventing and limiting it.

- 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.

3.1.7 Urban and Suburban Development

NPS pollution from urban and suburban sources 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.



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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. **Table 3-4** lists the number of waterbodies in Montana in which urban and suburban development has been identified as a probable source of water quality impairment.

Table 3-4: Urban and Suburban Development Impairment Listings

Urban and Suburban Development	Rivers, Streams, and Lakes Number of waterbody segments
Stormwater	15
Septic	11
Riparian Degradation	23
TOTAL Urban and Suburban Development Related Impairments	49

Stormwater

Where snowmelt and rainfall does not infiltrate soils, it drains off the landscape as stormwater. Polluted stormwater can harm aquatic organisms and their habitat, contaminate drinking water supplies, and render waterbodies unfit for recreational activities. Stormwater has been identified as a source of the following pollutants in Montana waterbodies with impaired water quality: nutrients, sediment, increased water temperature, oil and grease, PCBs, metals, bacteria, and oxygen depletion.

As the percentage of impervious surfaces (e.g., streets, parking lots, roofs) in a watershed increases, so does the volume of stormwater and pollutant loads delivered to waterbodies. Suspended sediments tend to constitute the largest pollutant loads to receiving waters in urban and suburban areas. Soils eroding from construction sites are a major source of suspended sediment.

Higher percentages of impervious surfaces can also drastically alter hydrology. Water that used to 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.

Residential Waste Disposal

Residential and commercial waste disposal includes a variety of pollutant sources, such as septic systems, 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 personal care products (PCPs). 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 30 to 90 mg/L (Tri-State Water Quality Council, 2005). In surface waters, nitrate levels as low as 0.3 mg/L can cause nuisance algae blooms that harm aquatic life and degrade recreational uses; however, the potential contribution of septic systems to nutrient levels in surface waters is rarely evaluated.

The effectiveness of septic systems in treating PCPs is not known and is likely to be compound specific. However, many studies across the country, and several studies in Montana, have detected PCPs in both groundwater and surface water. Maximum contaminant levels for individual PCPs, as well as chemical “cocktails” derived from PCPs, are largely unknown.

Landfills, particularly unlined facilities, 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 have been found in groundwater and/or streams across the nation (National Capital Poison Center, 2012). Solid wastes contain toxic substances, such as heavy metals and carcinogens. As of 2007, there were 108 licensed solid waste facilities in Montana.

Alteration of Urban and Suburban Riparian and Wetland Areas

When complex riparian systems are simplified or reduced 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 suffer from (a) higher levels of nutrients, sediment, bacteria, and algae; (b) higher summer water temperatures; (c) greater amounts of channel erosion; and (d) greater damage to property by flooding.

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

1. The alteration of soils, native vegetation, 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). Another way that stormwater is addressed in Montana is through the state's subdivision permitting process.

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.
- 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.

Ensuring that residential waste is properly disposed of 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.

Fully functioning riparian areas in urban and suburban areas are necessary for protecting water quality. Maintaining and improving the health of soils and native vegetation communities is the key to ensuring that riparian areas are functioning properly. The soils, vegetation, and hydrological characteristics of intact riparian areas help maintain beneficial uses.

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

3.2 STRATEGIES FOR OTHER POLLUTION SOURCES

Atmospheric deposition and climate change can also be conduits of NPS pollution. However, these pollutant contributions are generated at a scale that is outside the ability of a single state, or even country, to control. Nevertheless, Montana, as both a contributor and receptor of effects associated with these large-scale sources, has strategies for reducing sources and minimizing the effects.

3.2.1 Atmospheric Contributions

Montana's 2006 Water Quality Integrated Report identifies atmospheric deposition as a probable source of impairment for four lakes and reservoirs in Montana (totaling more than 385,000 surface acres) and seven stream/river segments. Pollutants attributed to atmospheric deposition in Montana include mercury and other metals, nitrogen, phosphorus, and chemicals such as PCBs. Mercury is widespread in the environment and low concentrations naturally occur in soils. These deposits and other sources, such as emissions from coal-fired power plants, cause 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 at: <http://fwp.mt.gov/fwDoc.html?id=28187>. 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 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 Resources Management Bureau (ARM) 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 ARM.

3.2.2 Climate Change Contributions

EPA recognizes that climate change has effects on aquatic ecosystems (see EPA's climate change website at <http://www.epa.gov/climatechange>). Recognizing the profound implications that global warming and climate variation could have on the economy, environment, and quality of life in Montana, the Climate Change Advisory Committee (CCAC) was established to formulate recommendations for specific actions for reducing or sequestering greenhouse gas emissions. CCAC released a final report of their findings and suggestions in November 2007. More information on this committee, as well as a copy of their final report, "Montana Climate Change Action Plan," is available online at <http://www.mtclimatechange.us>. Following the release of their final report, CCAC disbanded.

If the magnitude of global warming is consistent with the mid or upper range of the Intergovernmental Panel on Climate Change (IPCC) simulations, serious and damaging ecological effects are likely to result. Higher latitudes are predicted to see greater temperature increases than lower latitudes, especially during winter and spring. The IPCC predicts rising sea levels, increased rainfall rates and heavy precipitation events (especially over the higher latitudes), and higher evaporation rates, which would accelerate soil drying following rain events. With higher sea levels, coastal regions could face increased wind and flood damage, and some models predict an increase in the intensity of tropical storms. The IPCC's Fifth Assessment Report is scheduled for completion sometime in 2013 or 2014. More information on IPCC activities, as well as copies of many of their publications, is available online at www.ipcc.ch.

Small regional and state effects of climate change are harder to predict than large regional or global effects. Regional models indicate these possible issues in Montana:

- As climate changes, this could cause some plants and animals to go extinct, some to decline or increase in population, and others to migrate to areas with more favorable conditions.
- Diseases and pests that thrive in warmer climates could spread into Montana, such as the West Nile virus, which used to be confined to the Mideast and only recently has spread to the United States.
- Crops and trees that need cooler climates may not grow as well in Montana.
- More severe storms and droughts could affect crop production, pests, and plant growth.

Climate change could result in higher stream temperatures and more intense watershed disturbances (e.g., rain events, high streamflows, landslides), which could affect aquatic beneficial uses, including 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. Climate change has the potential to alter this cycle by reducing the amount of snowpack. As air temperatures warm, the snowpack would likely 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 (Kinsella, 2005).

Some experts predict more precipitation in the West in the form of rain, not snow. This additional rain could speed melting of the snowpack, increasing the likelihood of winter floods, and increase erosion and streambed and bank scouring. 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).

There are many ways that ordinary citizens can lower their effects, including reducing water use, choosing energy efficient appliances, buying locally (thereby reducing carbon emissions associated with transportation of products), carpooling or walking/biking to work, and buying fuel-efficient cars.

Montana's NPS pollution control objectives for climate change are to

- identify waterbodies and aquatic organisms most susceptible to climate change, including flow and temperature regimes;
- support temperature and flow monitoring efforts in Montana watersheds;
- protect and restore coldwater refuges, including deep pool habitat and cool spring and groundwater return flows to rivers and streams;
- protect and restore riparian areas with native vegetation, which provides shade and stabilizes banks;

- reconnect rivers with their floodplains;
- encourage development of long-term strategies for water use, water conservation, and water lease agreements to maintain optimal flows for desirable temperature aquatic habitat;
- increase public awareness of water quality problems associated with climate change;
- Protect and restore wetland areas with natural vegetation, which provide water storage, wildlife habitat, and pollutant attenuation and contribute to groundwater flows to streams and rivers.

4.0 NPS POLLUTION EDUCATION AND OUTREACH

Most NPS pollution is generated by individuals, and though people are the cause, Montanans also play a key role in effectively addressing NPS pollution. The first step in protecting state waters is to educate people about how their actions affect Montana's water quality, for better or worse. Because compliance with the NPS Plan in Montana is voluntary, tools are needed to increase citizen awareness and stewardship of water resources. Education and Outreach (E&O) is one of these tools. E&O is a proactive approach that builds trust among agencies, organizations, tribal communities, and the public.



Scientific, social, and economic factors overlap in their affects on water quality. Some people recognize Montana's waters as a source for 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. These interactions help to identify priority areas where E&O can have the greatest benefit to water quality in Montana. A collaborative effort is essential for addressing water quality issues at the state and watershed levels.

Since there is no single authority in the state designated to provide E&O for NPS pollution, the NPS Management Plan will direct these efforts through three main components:

- target audiences
- program priorities
- program strategies and objectives

These components are intended to increase water quality awareness, build expertise, and assist targeted citizen groups in taking positive actions to protect, maintain, and improve water resources.

Social Marketing

In Montana, social marketing is used extensively as the preferred E&O method to address NPS pollution. Social marketing is "the application of commercial marketing technologies to solve social problems through sustained behavior change" (Wilber, 2006). Understanding the barriers and motivations associated with changing behavior is imperative to a successful E&O strategy.

Adaptive Management

In order to successfully meet E&O goals, an adaptive management approach will be used. Adaptive management allows for change by identifying new priorities and shifting the focus of actions to manage these changes as they occur. Monitoring, evaluating, and adjusting actions as appropriate allows

flexibility to meet NPS Plan E&O goals. This approach is essential to managing the NPS Program in Montana, since issues, priorities, and concerns change as the program continues to mature.

4.1 TARGETED AUDIENCES

The NPS Plan E&O strategy is designed to reach a broad audience. Internally, the E&O strategy outlines actions for DEQ personnel. This strategy focuses on internal communication and creating a better understanding of NPS issues in order to communicate those issues to citizens. Externally, the E&O strategy supports projects that target three major audiences:

- **General:** Members of the public who have the ability to affect water quality (e.g., land owners, land managers, recreationist, individuals);
- **Professional:** Those who manage, promote, or influence water resources (e.g., professionals from tribes, universities, federal and state agencies, local governments, nonprofit organizations, private businesses, real estate agents, and watershed groups);
- **Educational:** Educators and school administrators who have a direct influence on students (e.g., K–12 teachers, secondary education professors, curriculum developers).

Targeting specific audiences should lead to a successful E&O program and positive behavioral changes. Together, these audiences have a greater ability to improve and protect water quality from NPS pollution.

4.2 PROGRAM PRIORITIES

Education and outreach efforts should be tailored to fit a variety of needs that best address NPS pollution. The NPS Plan has been developed to meet the goals of Section 319 of the Clean Water Act and to guide Section 319 funding in Montana. The Plan is also meant to encourage collaboration and coordination within DEQ and among state and federal agencies, local water quality districts, watershed groups, nonprofit organizations, tribal communities, universities, and citizens.

In 2004, DEQ hosted meetings across the state to identify E&O needs that the agency could manage. These meetings recognized nine E&O actions that could improve E&O in Montana:

1. Simplify and distribute information about watersheds and government policies.
2. Provide information on emerging issues.
3. Provide learning sites and opportunities around the state.
4. Empower local groups to carry out E&O activities.
5. Provide regional perspective in E&O materials.
6. Focus on high school students.
7. Target audiences and tailor materials to maximize behavior change (for developers, real estate professionals, etc.).
8. Provide training and information about BMPs for managing riparian areas, floodplains, and groundwater.
9. Evaluate the success of the E&O program.

The E&O plan is to assist in developing well-designed environmental protection goals, strategies, and tools that meet the needs and interests of individual communities. Because resources are limited, priority E&O projects will address the effects of NPS pollution on water resources in areas that have completed TMDLs or in areas in which significant physical and social changes are occurring.

4.3 PROGRAM STRATEGIES AND OBJECTIVES

The three strategies outlined in this section are intended to meet the priority E&O needs for Montana and build a systematic approach to education and outreach around NPS pollution. Communication increases awareness of NPS issues, which leads to a desire for additional information and training in the subject. Once the necessary skills and expertise are obtained through education, people are capable of taking responsible actions to improve and maintain healthy water resources. Specific E&O actions can be found in **Section 8**.

Strategy 1: Increase knowledge and awareness of NPS pollution issues and promote positive actions through communication of the issues and solutions.

- Educate Montanans about particular NPS pollution issues.
- Collaborate across professional fields to promote and encourage NPS pollution knowledge.
- Create and position messages to give people a compelling reason to adopt a new behavior, mindset, or lifestyle.

Strategy 2: Develop skills and expertise on NPS pollution issues and improve environmental awareness among citizens about NPS issues.

- 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 workshops, watershed tours, watershed festivals, and other NPS educational activities.

Strategy 3: Increase the frequency and magnitude of responsible actions taken by Montanans to decrease NPS pollution and its effects.

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

5.0 WATER QUALITY ASSESSMENT AND MONITORING

The terms “assessment” and “monitoring” are often used interchangeably; however, it is important to distinguish the difference between these activities. 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.

Understanding the difference between assessment and monitoring allows us to structure a series of activities that will answer specific questions of interest.

Water Quality Assessment: *The overall process of evaluating the physical, chemical, and/or biological nature of water in relation to natural quality, human effects, and intended uses. An assessment requires a clear understanding of how to use data to make decisions. The functions of an assessment determine the structure of the associated monitoring activities.*

Water Quality Monitoring: *The repeated sampling of environmental conditions at predetermined locations in order to provide a set of data that can be used to address specific, predefined assessment questions.*

5.1 TYPES OF WATER QUALITY ASSESSMENTS

There are five types of water quality assessments recognized by Montana’s NPS Program (**Figure 5-1**). Assessment types are defined by the desired outcomes and thus, there are important differences between the structure and function of the assessment types. In general, data from one type of assessment can be used to inform the completion of another type of assessment; however, the specific data collected to answer questions formulated under one type of assessment usually only partially meets the data requirements for questions formulated under a different type of assessment.

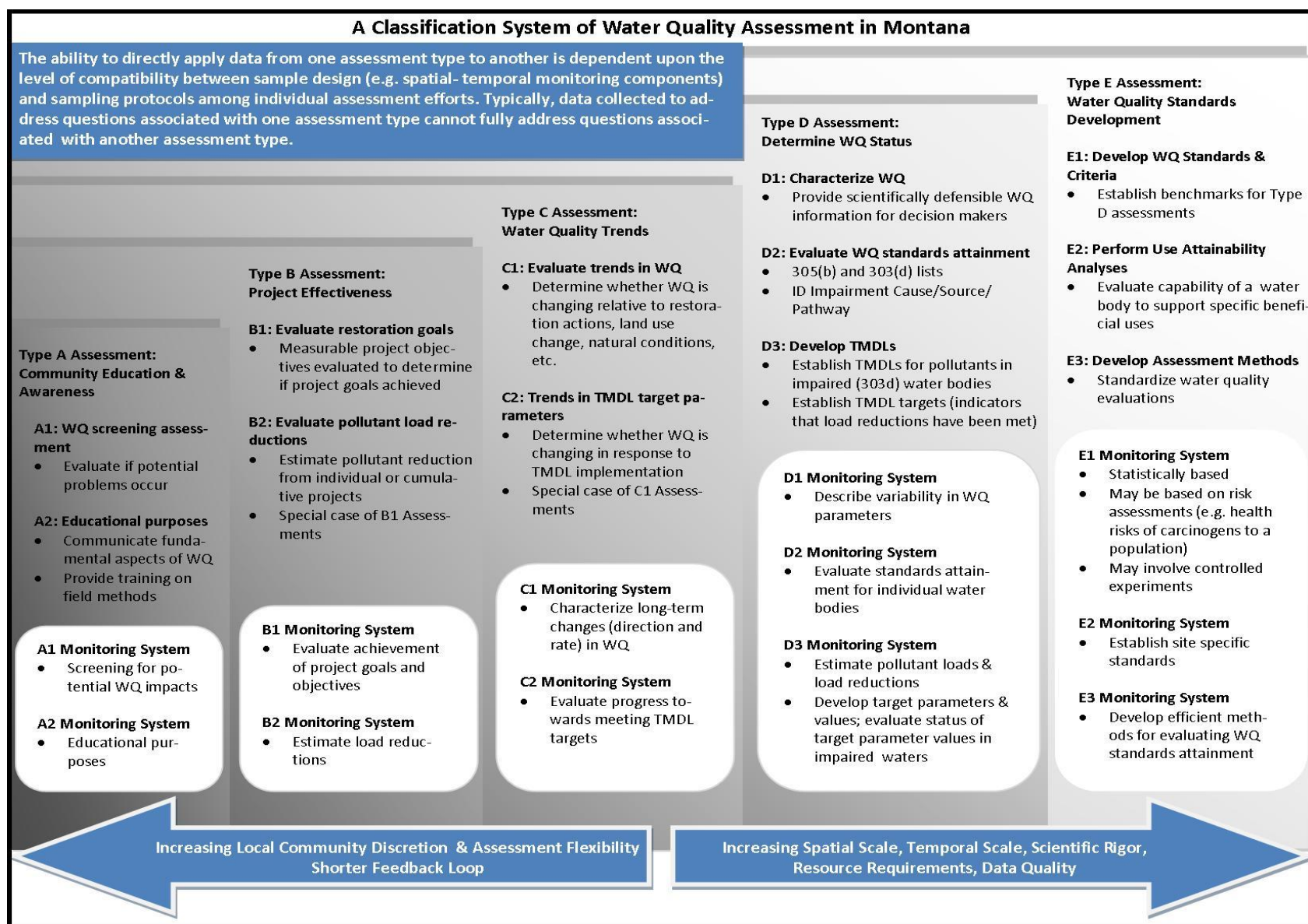


Figure 5-1: A Classification System of Water Quality Assessment in Montana

5.2 WATER QUALITY ASSESSMENT AND MONITORING COLLABORATORS AND PARTNERS

Water quality assessment and monitoring activities are essential for achieving the goals of the federal Clean Water Act and the Montana Water Quality Act. Furthermore, these activities play an integral role in preventing and controlling NPS pollution in state waters. Numerous federal, state, and local agencies and other organizations are involved in water quality assessment and monitoring programs that support the goal of Montana's NPS Management Program.

It's important to note that Montana's universities also conduct water quality monitoring throughout the state. Some examples include: Montana State University Extension Water Quality, which works with watershed groups and throughout the state to develop water quality monitoring programs and projects. The Montana Flathead Lake Biological Station has done significant work collecting water quality data and monitoring long-term trends in the Flathead Lake basin. The University of Montana's Watershed Health Clinic also develops and carries out monitoring in the Clark Fork River basin.

Funding constraints usually limit water quality monitoring activities. Tradeoffs between the quantity and the quality of data collected, in addition to how the data are to be used, are important to consider when prioritizing monitoring activities. Montana's partial solution to addressing water quality monitoring needs with limited funding is to form partnerships with local stakeholder groups. These groups can be trained to collect data that meet specified quality assurance and control requirements and operate under a formal monitoring plan (e.g., a DEQ approved Sampling and Analysis 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, methodology, and quality control needs often exist among partner organizations, and these differences can limit the amount of data usability that occurs between water quality monitoring projects or partners.

5.2.1 DEQ Water Quality Planning Bureau

DEQ's Water Quality Planning Bureau (WQPB) sets water quality standards, develops monitoring and assessment methods, identifies statewide water quality conditions and trends, develops Total Maximum Daily Loads (TMDLs), works with stakeholders to implement TMDLs, and evaluates the effectiveness of TMDL implementation. For more information about the specific assessment and monitoring efforts by individual working groups within WQPB, visit the bureau's website at:

<http://deq.mt.gov/ppa/wqp/default.mcpix>. DEQ's assessment and monitoring approaches and priorities to implement the state's NPS Program are provided in the Montana Statewide Water Quality Monitoring and Assessment Strategy 2009-2019 (Montana Department of Environmental Quality, 2009b). The document is available at: <http://deq.mt.gov/wqinfo/monitoring/default.mcpix>.

Montana's water quality assessment methodology was updated in 2011 to reflect scientific advances as well as changes made to water quality standards and criteria. Information on the assessment methodology used by WQPB to assess water quality standards attainment is available at: <http://deq.mt.gov/wqinfo/qaprogram/sops.mcpix>.

5.2.2 Other DEQ Organizational Units

The following DEQ organizational units perform water quality monitoring and assessment activities and/or rely upon data collected by other entities in order to prevent and control NPS pollution.

Technical and Financial Assistance Bureau

- Source Water Protection Program
- Wetlands Protection Program

Public Water and Subdivisions Bureau

- Public Water Supply Section
- Subdivision Review Section

Abandoned Mine Lands Bureau

Each of these work units has strategies and priorities for addressing NPS pollution that are not detailed in this document. Information on the role of these units in water quality monitoring and assessment activities can be found in the publication Montana Statewide Water Quality Monitoring and Assessment Strategy 2009-2019. (Montana Department of Environmental Quality, 2009b).

5.2.3 Water Quality Monitoring and Assessment Activities by Other Local, State, and Federal Organizations in Montana

A variety of water quality assessment information and monitoring data is collected by many local, state, and federal agencies and is used in Montana's NPS Program. The general types of water quality monitoring assessment activities are indicated in **Appendix C**. A detailed discussion of the water quality monitoring and assessment activities conducted by the various agencies is not provided in this document. For additional details contact the relevant organization.

5.2.4 Water Quality Monitoring by Citizens

The role of citizen, or volunteer, monitoring in Montana is rapidly expanding. Most of the volunteer monitoring groups in Montana are associated with a conservation district, a water quality protection district, or a watershed group. Volunteer monitoring allows communities to have a stake in protecting their local water resources. Volunteer monitoring projects are undertaken for a variety of purposes. At the most basic level, volunteer monitoring helps to inform citizens about the fundamental aspects of water quality and educates people on the importance of protecting water resources from NPS pollution. Volunteer monitoring can also be used to screen for potential problems, to assess trends in water quality, to support assessments by DEQ's NPS pollution prevention program, and to evaluate the success of watershed restoration projects.

5.3 ASSESSMENT AND MONITORING STRATEGIES

Montana's nonpoint source assessment and monitoring goal is to establish and strengthen collaborative, effective, and efficient water quality monitoring and assessment efforts among federal, state, and local organizations that adequately inform the state's NPS Program. To meet these goals, the NPS Program:

- Communicates on roles, resources, and responsibilities associated with NPS water quality monitoring.
- Provides forums for this communication, such as the Montana Watershed Coordination Council's Water Monitoring and Groundwater Work Groups and the State Chapter of the American Water Resources Association;
- Shares technical expertise, resources, equipment, and funding at the appropriate level and scale.
- Supports local monitoring efforts through development of programs, guidance, and review.

- Works toward providing fully accessible information on NPS pollution water quality assessment and monitoring at appropriate levels of detail and comprehension.

Table 5-1 summarizes the general types of NPS pollution assessments undertaken by various organizations within Montana. See **Figure 5-1** for information on Water Quality Assessment Types.

Table 5-1: NPS Pollution Assessments in Montana

Organization	Water Quality Assessment Types Performed
Volunteer Groups	
Watershed Groups	A1 through C2
Local Government	
Water Quality Protection Districts	A1 through D1
State Government	
DEQ-WQPB-Water Quality Standards	E1 through E3
DEQ-WQPB-Monitoring and Assessment	D1
DEQ-WQPB-Watershed Management	D2
DEQ-WQPB-Watershed Protection	B2 through C2
DEQ-TFAB-Source Water Protection	C1, D1, D2
DEQ-TFAB-Wetlands	D1
DNRC-Water Management Bureau	A1, C1, D1
MBMG-Groundwater Assessment	C1, D1
MBMG-Groundwater Investigation	D1
MT Dept. Agriculture	C1, D1, D2
MT Dept. Fish, Wildlife & Parks	A1, B1, C1, D1
Federal Government	
U.S. Forest Service	B1, C1, D1
U.S. Bureau of Land Management	B1, C1, D1
U.S. Geological Survey	C1, D1
U.S. Environmental Protection Agency	D2, D3
Natural Resources and Conservation Services (NRCS)	A1, A2, B1, B2, C1

5.4 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. For more information refer to: <http://deg.mt.gov/wqinfo/QAProgram/default.mcp>.

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 and to ensure the quality of the environmental data so it can be used by groups or agencies to make decisions. In some cases, a SAP for a specific project can be developed under a pre-existing QAPP.

6.0 ENFORCEABLE REGULATORY PROGRAMS

The Department of Environmental Quality supports a voluntary program of reasonable land, soil, and water conservation practices under state law. DEQ's statutory authority and approach toward NPS pollution control when developing TMDLs recognizes that the cumulative effects of many NPS activities can best be addressed via voluntary measures, with assistance from DEQ and other entities. This often applies to agricultural and other landowner activities along or near streams. However, the state's voluntary policies do not apply to all NPS activities. For certain activities local, state, and/or federal regulations apply. Examples where non-voluntary approaches are required within existing regulations include streamside management zone requirements for timber production, individual septic system design and location requirements, local requirements for riparian or streambank protection, and compliance with the Section 310 law. Where voluntary measures cannot be relied upon to prevent permanent, irreversible damage to water quality, DEQ will promote or pursue the use or development of local, state, or federal regulations to avoid these effects.

Existing regulatory programs for controlling NPS water 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 DISCHARGE LIMITATIONS

DEQ has regulatory authority for activities that have an NPS pollution component with the potential to discharge pollutants to state waters. These activities include construction, subdivision development, septic system construction, solid waste disposal, and animal feeding operations. DEQ requires stormwater discharge permits for construction activities that will disturb more than 1 acre of land surface. DEQ has authority for ensuring that proposed subdivisions have adequate water and wastewater facilities and meet stormwater discharge requirements. DEQ also has regulations requiring minimum design standards (Circular DEQ-4, (Montana Department of Environmental Quality, 2009a) for septic systems (on-site subsurface wastewater treatment systems).

The Spill Prevention, Containment and Countermeasure (SPCC) Program is an EPA regulation (40 CFR 112) under the Clean Water Act that requires facilities with above-ground storage of more than 1,320 gallons of oil (including petroleum, vegetable, and mineral oils) to develop SPCC plans. The plans must describe operating procedures and control measures to prevent oil spills and countermeasures to contain, clean up, and mitigate oils spills.

Landfill discharges of pollutants to groundwater are limited by provisions that are licensed by DEQ's Solid Waste Program. DEQ's landfill licenses require corrective action, cleanup, and financial assurance to maintain the state's groundwater protection standards (Circular DEQ-7 (Montana Department of Environmental Quality, 2010)).

DEQ requires permits for concentrated animal feeding operations (CAFOs) that discharge to state waters. Information about CAFOs and state regulations are available online at:

<http://deq.mt.gov/wqinfo/MPDES/CAFO.mcpix>.

6.3 AGRICULTURE REQUIREMENTS

The Montana soil conservation law (76-15-101 et seq., MCA) allows soil conservation districts to conduct research, implement projects, and provide technical assistance and education on soil conservation. These districts are authorized to develop soil and water conservation regulations, subject to approval by referendum. Once approved, the regulations can prescribe specific agricultural practices for soil and water conservation within the district.

The Natural Streambed and Land Preservation Act (310 Law) requires that any "project," defined as the physical alteration of a stream resulting in change in the state of the stream, be approved by the local soil conservation district or board of county commissioners before beginning work. The decision is based on multiple factors, including soil erosion and sedimentation, upstream or downstream flooding, streamflow, turbidity, effects on water quality, and effects on fish and aquatic habitat.

The Agricultural Chemical Ground Water Protection Act covers both pesticides and fertilizers and requires the Department of Agriculture and DEQ to cooperate to administer groundwater standards for agricultural chemicals. It requires DEQ to develop numerical standards and interim standards for agricultural chemicals, primarily based on EPA's standards under the Clean Drinking Water Act. Both departments are authorized to "implement appropriate actions ... to mitigate any existing impacts of an agricultural chemical found in ground water." These include development of a general groundwater management plan (see **Appendix B**, Groundwater Strategy for the Montana Nonpoint Source Management Plan) and site-specific management plans. The plans are adopted by rule-making or with emergency authority. Site-specific management plans may include restrictions on chemical use in certain areas, BMPs, certification, training and licensing requirements, setback areas near water wells, and alternative practices.

The Montana Department of Agriculture is the lead for determining compliance with groundwater management plans and is granted inspection authority under the act. DEQ is the lead for determining health risks and may enforce the act using its enforcement authority under the water quality code.

Montana's general pesticide law makes it illegal "to discard any pesticide or pesticide container in a manner that causes injury to humans, domestic animals, or wildlife or that pollutes any waterway in a way harmful to any wildlife in the waterway or to the environment." The Department of Agriculture has general entry, investigation, and enforcement authority for pesticide violations, including violations of the handling, use, and application standards.

6.4 FORESTRY REQUIREMENTS

When conducting forestry practices, Montana's Streamside Management Zone law (77-5-302 et seq., MCA) requires creation of streamside management zones (SMZs) for forest streams. An SMZ must "encompass 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."

Within these zones, there are specific prohibitions on certain forest activities:

- broadcast burning
- operating wheeled or tracked equipment (except on established roads)
- clear-cutting
- road constructing unless necessary for stream crossing
- handling, storing, applying, or disposing of hazardous or toxic substances in a manner that pollutes waterbodies or that may damage humans, land, animals, or plants
- side-casting of road material into waterbodies
- depositing slash in waterbodies

There are detailed regulations delineating the SMZs and defining prohibited practices and site-specific alternative practices. The Department of Natural Resources and Conservation (DNRC) has inspection authority on federal, state, and private land to ensure compliance with the rules for SMZs. DNRC may issue civil penalties of up to \$1,000 per day per violation, as well as rehabilitation orders.

The state law also contains a section titled "protection of forest resources," (76-13-101-134, MCA), which "encourages" the use of BMPs and includes a requirement that DNRC be given notice before starting any forestry practices. Upon receiving notice, DNRC decides whether to require an onsite consultation with the operator, because "the proposed timber sale is in a high-priority location for watershed resources" or "a consultation could contribute to improved watershed management."

6.5 DEVELOPMENT AND OTHER EARTH-DISTURBING ACTIVITIES

Apart from programs for the control of urban stormwater under the federal CWA, or that may be authorized by general land-use regulations, such as zoning, state law provides additional authorities.

The Legislature enacted Montana Code Annotated 7-13-45, which 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 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.

The legislature has also enacted a law protecting lakeshores and declared that "local governments should play the primary public roles in establishing policies to conserve and protect lakes." Under that law, "a person who proposes to do any work that will alter or diminish the course, current, or cross-sectional area of a lake or its lakeshore must first secure a permit for the work from the local governing body."

Local jurisdictions are required to adopt regulations, including criteria for issuing and denying permits, for work in lake areas. Factors for consideration include water quality, fish and wildlife habitat,

navigation and recreation, public nuisance, and visual and aesthetic values. Regulations and decisions of these governing bodies are judicially enforced and judicially reviewable.

6.6 NUTRIENT TRADING AS A POTENTIAL TOOL

Montana is currently proposing to adopt numeric criteria for nitrogen and phosphorus. As part of this effort, DEQ is developing a policy on nutrient trading as a cost-effective, flexible, and voluntary alternative method for achieving the numeric nutrient criteria. Nutrient trading could be used to:

- comply with an approved TMDL
- offset a new or increased discharge of nutrients
- comply with water quality-based effluent limits
- offset a new or increased discharge of nutrients into high-quality waters

The policy is intended to support the following objectives:

- To provide a cost-effective method for achieving compliance with Montana's numeric nutrient standards or a variance from those standards.
- To offset new or increased discharges resulting from growth in order to maintain and improve levels of water quality that support all designated uses.
- To establish economic incentives for nutrient reductions from all sources within a watershed.
- To reduce the cost of implementing nutrient TMDL or water quality-based effluent limits for nutrients through greater efficiency and flexible approaches.
- To achieve greater environmental benefits than through the existing regulatory framework (such as through the creation and restoration of wetlands and riparian habitat).

All nutrient trades involving point sources will be implemented and enforced using Montana Pollution Discharge Elimination System (MPDES) permits. MPDES permittees, third parties (e.g., county governments, nonprofit organizations, and nonpoint sources) may participate in trading.

7.0 PARTNERSHIPS AND FUNDING

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.

7.1 INTERAGENCY COORDINATION

One of EPA's requirements for NPS management plans 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 C 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 Program may pursue within the watershed framework. In many of these descriptions, both long- and short-term goals of the NPS 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 C** 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. DEQ anticipates that the Montana Watershed Coordination Council (MWCC) will be a lead partner for facilitating these opportunities as they arise.

7.2 RESOURCES AND FUNDING FOR IMPLEMENTATION

Funding resources for implementing the Montana Nonpoint Source Management 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 Program support comes from Montana's general fund support for the Water Quality Planning Bureau. Additionally, external Section 319-funded projects are required to provide a 40% local match to these federal funds. Section 319 grant funding levels for NPS control activities during the period 2007–2011 are summarized in **Appendix F**.

Other EPA and DEQ agency funds are also 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.

As previously discussed in the **Introduction** and in **Section 3**, the NPS Program relies heavily upon other federal, state, and local agencies and entities to implement the Montana Nonpoint Source Management 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.

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

Some important agency resources at the federal level include:

- 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

At the state level key agency resources that work to support the NPS management program include:

- Department of Natural Resources & Conservation
 - Conservation and Resource Development
 - Forestry
 - Trust Lands
 - Water Resources
- State Library
 - Natural Resources Information System
- Montana Fish, Wildlife & Parks
- Department of Transportation
- Department of Agriculture

At the local governmental level important resources include:

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

Finally, numerous non-governmental organizations' resources assist in implementing the Montana Nonpoint Source Management Plan. Montana's university system, industry (e.g., PPL, Bonneville Power, Avista, ditch companies, and Plum Creek Timber), land trusts, and other organizations (e.g., the River Alliance and the Sonoran Institute, Trout Unlimited, etc.), volunteer-supported organizations, such as the Montana Watershed Coordination Council, and local watershed groups all devote resources to address NPS pollution in Montana.

However, this tremendous wealth of resources is not enough to address all the NPS Program needs in a 5-year timeframe. Therefore, DEQ must prioritize 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.

8.0 MONTANA’S NONPOINT SOURCE PRIORITIES AND ACTION PLAN

The goal of Montana’s Nonpoint Source Management Program is to provide a clean and healthy environment by protecting and restoring water quality from the harmful effects of NPS pollution. The short-term (5-year) goal of the Plan is to demonstrate significant progress in restoring and protecting Montana’s water quality from nonpoint sources of pollution, measured by achieving the actions outlined in this Plan.

8.1 FIVE-YEAR ACTION PLAN AND PRIORITIES

Tables 8-1 through 8-3 describes DEQ’s 5-year action plan for addressing NPS pollution, including specific audiences, actions, and outcomes for evaluating success. These 5-year goals meet EPA’s NPS Program guidance requiring explicit short-term goals.

Table 8-1: DEQ’s 5-year Action Plan for addressing NPS Pollution - Resource Related Actions

No.	Responsible Party	Actions (Outcomes/Objectives)	Measurable Milestones/Outputs
R1*	DEQ, EPA	Complete Water Quality Improvement Plans (WQIPs) and necessary TMDLs.	<ul style="list-style-type: none"> At least 500 additional TMDL pollutant-waterbody combinations between 2012 and 2014
R2*	DEQ	Conduct statewide water quality assessments.	<ul style="list-style-type: none"> 130 water quality assessments completed by 2014
R3*	DEQ	Review/update Water Quality Integrated Report (305(b)/303(d)).	<ul style="list-style-type: none"> Updated reports in 2014 and 2016
R4	DEQ	Re-evaluate the chemical, physical, and biological condition of reference sites.	<ul style="list-style-type: none"> At least 100 reference sites re-evaluated by 2017
R5*	DEQ	Work with watershed groups to develop watershed restoration plans (WRPs).	<ul style="list-style-type: none"> 20 DEQ-accepted WRPs by 2017
R6*	DEQ	Encourage and fund WQIP and WRP-directed NPS watershed restoration projects, including demonstration projects, for adoption of new technology.	<ul style="list-style-type: none"> Annually fund on-the-ground watershed restoration activities
R7	DEQ	Identify the TMDL Planning Areas having WQIPs and TMDLs in which at least some implementation activity has occurred during the previous calendar year.	<ul style="list-style-type: none"> Annual reporting spreadsheet included in NPS Annual Report
R8*	DEQ	Develop and implement a monitoring strategy for Section 319 restoration activities for effectiveness and pollutant load reductions.	<ul style="list-style-type: none"> Approved monitoring strategy by 2017 100% of projects for nutrient and sediment reduction reported to EPA Grant Reporting and Tracking System
R9*	DEQ	Conduct TMDL implementation evaluations.	<ul style="list-style-type: none"> Complete 20 reviews by 2017
R10	DNRC	Work with forest agency partners (especially DNRC Forestry Assistance) to ensure effective forestry BMP and SMZ activities.	<ul style="list-style-type: none"> Biannual reports on forestry BMP audits
R11	DNRC	Work with forest agency partners to develop assessments to ensure BMPs and SMZs are protecting riparian and wetland functions.	<ul style="list-style-type: none"> Assessment of BMP and SMZ adequacy for riparian and wetland functions

Table 8-1: DEQ's 5-year Action Plan for addressing NPS Pollution - Resource Related Actions

No.	Responsible Party	Actions (Outcomes/Objectives)	Measurable Milestones/Outputs
R12	DNRC, Plum Creek	Assess the effectiveness of SMZ and HCPs.	<ul style="list-style-type: none"> Reporting from the resource agencies on SMZ and HCPs by 2017
R13*	DEQ	Provide reviews and comment on outside agency proposed projects that may have an effect on NPS pollution.	<ul style="list-style-type: none"> Reviews completed and comments provided as appropriate
R14	DEQ	Develop, maintain, and enhance Clean Water Act Information Center (CWAIC online) to provide public access.	<ul style="list-style-type: none"> System operable and available to public
R15	DEQ	Administer MT-eWQX water quality database system.	<ul style="list-style-type: none"> Upload all ambient water quality monitoring data collected by DEQ, its contractors, or data partners to EPA National STORET/WQX water quality data warehouse
R16	DEQ	Administer electronic data deliverables (EDD) submittal process for non-DEQ eWQX data submittals using EQUIS data management tools.	<ul style="list-style-type: none"> Provide Web access to data submittal process information, data management tools and training, and technical assistance to data partners and contractors
R17*	DEQ	Develop nutrient models for large rivers (e.g., Missouri, Yellowstone).	<ul style="list-style-type: none"> Models developed for at least 2 large river segments by 2017
R18*	DEQ	Protect, restore, and create riparian and wetland buffers designed to prevent or reduce NPS pollution.	<ul style="list-style-type: none"> 3 miles of riparian and/or wetland buffers as part of Section 319 contracts
R19	DEQ	Identify watersheds where NPS pollution from AFOs can be reduced.	<ul style="list-style-type: none"> Identify 3 high-priority watersheds for restoration work by 2017
R20	DEQ	Encourage additional stormwater quality improvement projects funded through the state revolving fund program.	<ul style="list-style-type: none"> At least 4 stormwater projects funded by 2017
R21*	DEQ	Manage and implement the NPS program in efficient and effective manner, including fiscal management.	<ul style="list-style-type: none"> Provide consistent guidance on state reporting requirements Conduct contract "kick-off" meetings Ensure 75% of 319 contracts are closed by initially-agreed date Refine watershed project field evaluation form

* Indicates a high priority for the NPS Program

Table 8-2: DEQ's 5-year Action Plan for addressing NPS Pollution - Policy Related Actions

No.	Responsible Party	Actions (Outcomes/Objectives)	Measurable Milestones/Outputs
P1*	DEQ, FWP, MWCC, USACE, USFS, NRCS, BLM, DNRC, Individual watershed groups, private consulting firms, USFWS, MACD, others	Develop an interagency policy for river restoration work, emphasizing restoration of natural processes.	<ul style="list-style-type: none"> Interagency policy supported by a wide range of government, nonprofit, and private entities by 2017
P2*	DEQ in collaboration with agencies, watershed groups, and other interested parties	Develop and implement a strategy for identifying priority watersheds on which to focus technical and financial resources leading to two 12-digit HUC watersheds achieving water quality standards.	<ul style="list-style-type: none"> Strategy document, set of action items, and at least 1 action item completed by 2017
P3*	DEQ	Develop and implement DEQ water quality improvement MOUs with agencies, including USFS, BLM, DNRC, MDT, NRCS, and MFWP.	<ul style="list-style-type: none"> 3 MOUs established or revised by 2017
P4	DEQ	Assist in efforts to develop cumulative effects assessment strategies for groundwater in high-density septic/development areas.	<ul style="list-style-type: none"> Provide assistance with developing 5 assessment strategies
P5	DEQ, DNRC, NRCS, irrigation districts, CDs, watershed groups, private landowners	Provide technical and/or financial support to efforts designed to reduce irrigation-induced NPS pollution.	<ul style="list-style-type: none"> Technical and/or financial support provided to at least 3 projects
P6*	DEQ	Develop numeric nutrient water quality standards and implementation procedures for surface waters.	<ul style="list-style-type: none"> Standards and implementation procedures in place by 2012 BER-approved nutrient trading policy for point/nonpoint sources
P7*	DEQ	Develop technical basis for a lake classification system based on nutrient status.	<ul style="list-style-type: none"> Lake classification system by 2017

Table 8-2: DEQ's 5-year Action Plan for addressing NPS Pollution - Policy Related Actions

No.	Responsible Party	Actions (Outcomes/Objectives)	Measurable Milestones/Outputs
P8*	DEQ	Develop and circulate numeric standards for all pesticides identified in Montana groundwater and surface waters.	<ul style="list-style-type: none"> Adoption of numeric standards for all pesticides within 4 years of DEQ notification of detection in state waters
P9	counties, with DEQ support	Encourage the establishment of additional Water Quality Protection Districts (WQPD) within urban areas.	<ul style="list-style-type: none"> One additional WQPD established by 2017
P10*	cities and counties	Incorporate NPS pollution prevention into city and county planning processes.	<ul style="list-style-type: none"> By 2017, 3 additional communities have incorporated NPS pollution prevention into local planning processes
P11	DEQ	Support improved urban stormwater management and information sharing through the MS4 task force.	<ul style="list-style-type: none"> Active MS4 task force by 2013
P12*	DEQ, MWCC, collaborate with other federal, state, and local agencies	Develop a system or network for long-term monitoring that will produce data to evaluate water quality trends in waterbodies with completed TMDLs.	<ul style="list-style-type: none"> Develop system/network architecture by 2015 Begin implementation by 2017
P13	DEQ	Develop guidance for water quality monitoring.	<ul style="list-style-type: none"> Guidance for monitoring under Section 319 contracts QAPP guidance SAP guidance
P14	DEQ, MWCC, MSUEWQ	Provide technical and financial support to volunteer monitoring groups.	<ul style="list-style-type: none"> Continue funding for laboratory analysis Provide on-going technical support for development of QAPPs and SAPs
P15	DEQ	Develop a nutrient trading policy that encourages nutrient load reductions consistent with WQIP/TMDLs	<ul style="list-style-type: none"> Nutrient Trading Policy and demonstrated effective trades

* Indicates a high priority for the NPS Program

Table 8-3: DEQ's 5-year Action Plan for addressing NPS Pollution - Education and Outreach Actions

No.	Responsible Party	Actions (Outcomes/Objectives)	Measurable Milestones/Outputs
EO1*	MTWC, DEQ	Incorporate school lesson plans that address water resources and NPS pollution issues.	<ul style="list-style-type: none"> Incorporate up to 20 lessons into the appropriate units of study at 60 elementary schools, 30 middle schools, and 20 high schools
EO2*	MWCC	Provide support and promote the development and coordination of watershed groups through MWCC activities, training workshops, advertising campaigns, etc.	<ul style="list-style-type: none"> Annual watershed coordinator training Annual watershed tour Bi-weekly newsletter Coordinate a volunteer water monitoring group to collect water quality data and human-effects info within specific watersheds.

Table 8-3: DEQ's 5-year Action Plan for addressing NPS Pollution - Education and Outreach Actions

No.	Responsible Party	Actions (Outcomes/Objectives)	Measurable Milestones/Outputs
EO3*	DEQ	Support riparian and wetland buffer education campaigns.	<ul style="list-style-type: none"> • Support 5 county-wide campaigns by 2017
EO4	DEQ, MDT, MSU	Promote and support BMP training for road maintenance personnel.	<ul style="list-style-type: none"> • Compile library of training materials • Bi-annual training for road maintenance personnel
EO5	DEQ	Develop and deliver multi-media presentations that teach basic concepts in reducing NPS pollution from agricultural sources.	<ul style="list-style-type: none"> • Develop at least 2 presentations • Deliver each presentation twice by 2017
EO6	DEQ	Support conferences that address stormwater pollution prevention and control strategies.	<ul style="list-style-type: none"> • Two stormwater conferences held between 2012 and 2017
EO7	DEQ	Identify and/or develop monitoring and assessment methods for private landowners to inform land management decisions.	<ul style="list-style-type: none"> • Develop self-assessment tool for private landowners by 2017
EO8	DEQ, MWCC, MSUEWQ	Provide training opportunities for volunteer monitors.	<ul style="list-style-type: none"> • Training provided to 10 watershed groups by 2017
EO9	DNRC, Montana Logging Assoc., and MSU Forestry Ext.	Promote and conduct forestry BMP and stewardship educational workshops and programs.	<ul style="list-style-type: none"> • Annual BMP/SMZ education workshops for loggers and landowners • Forest stewardship program targeting small landowners throughout Montana

* Indicates a high priority for the NPS Program

9.0 MEASURING SUCCESS

Montana's NPS Program is anchored in a voluntary approach to protecting existing clean water and implementing reasonable land, soil, and water conservation practices for nonpoint sources to achieve compliance with water quality standards. The NPS actions described in **Section 8** identify the activities most likely to result in sustained quality improvements statewide, regarding nonpoint sources. Achieving water quality standards, including full support of all applicable beneficial uses and nondegradation statewide, is the goal against which we measure success.

9.1 EVALUATING WATER QUALITY IMPROVEMENT

Water quality monitoring is an essential tool for evaluating the success of the NPS Management Program. 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 5**). One of the NPS Program's priorities is to improve the coordination of sampling efforts among organizations that collect credible data.

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

1. **Effectiveness monitoring** addresses how well a practice or project reduces pollution at the site scale. This information is important for ensuring that effective practices are being implemented.
2. **Trend monitoring** evaluates progress toward attaining water quality standards at the reach scale.
3. **Standards attainment monitoring** provides sufficient data for a formal assessment of water quality standards attainment and a determination of beneficial-use support.

As part of the Section 319-funded grant contracts, effectiveness monitoring is required for implementation projects. Montana law requires an evaluation of TMDL implementation effectiveness (see **Section 1.5**) 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.

9.2 OTHER RESOURCE AND POLICY MEASURES OF SUCCESS

Besides actual standards attainment that, in most cases, are long-term achievements, or trends in water quality that are sometimes not clear, there are many other appropriate measures of success of Montana's NPS Management Program. Some measures are directly linked to water quality monitoring and others do not have a direct connection. For example, the actual development of nutrient and biological criteria are a measurable outcome and an appropriate measure of success of the program that are directly related to water quality monitoring. Alternatively, the acres of wetlands protected through easements and buffers, or miles of streambank protected by local ordinances, are not directly linked to instream water quality monitoring but have a positive effect on water quality and, thus, are an appropriate measure of program success. Examples of even more indirect measures of program success are the number of riparian protection brochures that are distributed and the number of grade-school children who participate in Montana's Project WET.

The education and outreach resource directed actions and policy directed actions identify the actual measurable outcomes that will be used to determine success of the program over the next 5 years, some of which relate to water quality monitoring.

The resource-specific directed goals identify NPS Program actions that should be used to determine success of the program over the next 5 years and will most likely result in actual changes in water quality at the watershed-to-state level. Actual water quality standards achievement is the end-goal but may take years to achieve and is difficult to demonstrate in the short term (i.e., the 5-year timeframe) given the variability of natural systems, the resources available to address the problems, and extent and nature of the NPS pollution problem. Therefore, interim goals (5-year goals) beyond water quality monitoring are important measures of progress.

DEQ currently has four main mechanisms for measuring the progress and successes of the NPS Program:

1. 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.
2. DEQ documents progress in achieving NPS Program goals within annual reports provided to EPA, as well as in 5-year Project Grant Final Reports to EPA (
3. DEQ uses TMDL Implementation Evaluations for tracking progress of water quality restoration efforts in watersheds that have completed TMDLs.
4. DEQ uses its Water Quality Integrated Report, submitted to EPA biennially, to tracks the success of the NPS Program regarding the number of waterbodies that are partially or fully supporting beneficial uses.

While tracking progress made toward achieving NPS Program goals is relatively straightforward when DEQ is the primary responsible party, there are significant challenges in attempting to track progress in addressing NPS pollution by other organizations. For example, the USFS, BLM, and NRCS undertake a multitude of efforts to reduce NPS pollution and improve water quality. However, obtaining information from projects undertaken by various other partners has been impractical. DEQ attempts, however, to track progress within the scope of specific watersheds of interest, such as those on the 303(D) list and those with completed TMDLs.

EPA also evaluates Montana's NPS Management Program using its own strategic targets and program activity measures and works with DEQ in reporting on the progress toward accomplishing those measures. These include the

- number of waterbodies partially or fully supported
- number of watershed-based plans supported by the Section 319 Program
- estimated pounds of nitrogen reduced from Section 319 projects in N-impaired waters
- estimated pounds of phosphorus reduced from Section 319 projects in P-impaired waters
- estimated tons of sediment reduced from Section 319 projects in sediment-impaired waters
- watershed trends toward meeting water quality standards

9.3 EDUCATION AND OUTREACH PROGRAM EVALUATION

Evaluation mechanisms ensure a successful Education and Outreach (E&O) strategy. Various indicators can be used to measure and monitor effectiveness. 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. In addition, short-term and long-term outcomes should be evaluated. Short-term outcomes refer to changes in public attitudes and behaviors, while long-term outcomes refer to collective reductions in NPS pollution. Future E&O funding should focus on short-term outcomes, while collectively these outcomes will address DEQ's long-term goals of reducing NPS pollution.

Various short-term evaluation tools used by grant funded programs toward implementation:

- **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.

DEQ will be responsible for long-term evaluations by assessing the effects of NPS pollution changes over time.

10.0 ADDITIONAL INFORMATION RESOURCES

A vast amount of information can now be gained through many online resources and links developed by various entities. Federal and state agencies, tribes, universities, local communities, nonprofit groups, private companies, and volunteer groups are just some of the entities that provide information online. Below is a partial list of websites that provide information on water resource topics. Topics can 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 following websites.

Please note that these website addresses were last accessed in June 2012 and URLs can change. Where possible, a main website address is provided for listed entities below.

FEDERAL

Army Corps of Engineers

Main Army Corps of Engineers Website: <http://www.usace.army.mil/>

Hydrologic Engineering Center Programs: <http://www.hec.usace.army.mil/>

Regulatory Program and Permits:

<http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits.aspx>

Technical & Biological Info:

<http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/techbio.aspx>

Mitigation Info:

http://www.usace.army.mil/Missions/CivilWorks/RegulatoryProgramandPermits/mitig_info.aspx

Bureau of Land Management

Main BLM Website: <http://www.blm.gov>

BLM-Montana/Dakotas: <http://mt.blm.gov/>

BLM National Science Center: <http://www.blm.gov/nstc/>

BLM Riparian Database: <http://www.ecologicalsolutionsgroup.com/Lasso/default.html>

BLM Tech References: <http://www.blm.gov/nstc/library/techref.htm>

BLM Library: <http://www.blm.gov/nstc/library/library.html> or

<http://www.doi.gov/library/index.cfm>

BLM Search Engine: <http://www.blm.gov/search/>

National Riparian Service Team: <http://www.blm.gov/or/programs/nrst/index.php>

Oil and Gas BMPs: <http://www.blm.gov/bmp/>

BMP Effectiveness Information: http://www.epa.gov/owow_keep/nps/categories.html

U.S. Environmental Protection Agency

Main EPA Website: <http://www.epa.gov/>

Climate Change: <http://www.epa.gov/climatechange>

Education & Outreach: <http://www.epa.gov/owow/nps/eduinfo.html>

Fundamentals of Classification: http://www.epa.gov/watertrain/stream_class/

Funding: http://water.epa.gov/grants_funding/

Groundwater and Drinking Water: <http://www.epa.gov/safewater/mcl.html#mcls>

Low Impact Development (LID) Program: <http://www.epa.gov/owow/nps/lid/>

National Service Center for Environmental Publications: <http://nepis.epa.gov/>

Nonpoint Source BMPs for Forestry: <http://www.epa.gov/owow/nps/forestrymgmt/>
 Program Evaluations: <http://www.epa.gov/nps/toolbox/surveys.htm>
 Roads: <http://www.epa.gov/owow/nps/sensitive/sensitive.html>
 Stormwater and Construction Industry: www.epa.gov/npdes/stormwater
 Stormwater BMPs: <http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm>
 TMDLs: <http://www.epa.gov/owow/tmdl/2006IRG/>
 Water Quality Standards: <http://www.epa.gov/waterscience/standards/>
 Watershed Assessment of Stability & Sediment (Rosgen): <http://www.epa.gov/WARSSS/index.htm>
 Watershed Plan Builder: http://water.epa.gov/polwaste/nps/handbook_index.cfm
 Wetlands: <http://www.epa.gov/owow/wetlands/>

Natural Resources Conservation Service

Main NRCS Website: www.nrcs.usda.gov
 Basin Outlook Reports: <http://www.wcc.nrcs.usda.gov/cgibin/bor.pl>
 Buffers: <http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/alphabetical/plants/pub/?cid=stelprdb1042930>
 Ecological Site Information: <http://esis.sc.egov.usda.gov/>
 Montana Office: <http://www.mt.nrcs.usda.gov/>
 Montana Plant Materials Program: <http://www.mt.nrcs.usda.gov/technical/ecs/plants/>
 Montana Riparian and Floodplain: <http://www.mt.nrcs.usda.gov/technical/ecs/water/setbacks/index.html>
 Montana Soils: <http://www.mt.nrcs.usda.gov/soils/>
 Montana Water and Snow: <http://www.mt.nrcs.usda.gov/water.html>
 Montana Water Supply & Reservoir Storage: <http://www.mt.nrcs.usda.gov/snow/watersupply/>
 National Conservation Practice Standards: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/alphabetical/ncps>
 National Soils: <http://soils.usda.gov/>
 Web Soil Survey: <http://websoilsurvey.nrcs.usda.gov/app/>
 Urban Conservation: <http://www.ia.nrcs.usda.gov/news/brochures/urbanfactsheets.html>

U.S. Forest Service

Main USFS Website: <http://www.fs.fed.us/>
 Region 1: <http://www.fs.fed.us/r1/>
 Region 1 Air Quality: <http://www.fs.fed.us/r1/gallatin/resources/air/index.shtml>
 Aquatic and Riparian Ecosystems (Fort Collins): <http://www.fs.fed.us/rm/rwu4352/>
 Burned Area Emergency Response (BAER) Treatment Catalog: http://www.fs.fed.us/eng/pubs/pdf/BAERCAT/lo_res/06251801L.pdf
 Great Basin Watersheds/Ecosystems (Reno): <http://www.ag.unr.edu/gbem/>
 Pacific NW Research Station: <http://www.fs.fed.us/pnw/>
 Pacfish-Infish Monitoring: <http://svinetfc4.fs.fed.us/pibo/>
 Rocky Mountain Research Station: <http://www.fs.fed.us/rm/>
 San Dimas Research and Development: <http://www.fs.fed.us/eng/techdev/sdtcdc.htm>
 Stream Team: <http://www.stream.fs.fed.us/>
 Watershed Erosion Modeling: <http://forest.moscowsl.wsu.edu/engr/software.html>

U.S. Geological Survey

Main USGS Website: <http://www.usgs.gov/>
 Benchmark Hydrologic Stations: <http://pubs.usgs.gov/circ/circ1173/>
 Current Stream Flow Data: <http://waterdata.usgs.gov/mt/nwis/current?type=flow>
 Hydrologic & Erosional Responses of Burnt Watersheds:
http://www.brr.cr.usgs.gov/projects/Burned_Watersheds/index.html
 National Hydrography Dataset (NHD): <http://nhd.usgs.gov/>
 Northern Rocky Mountain Science Center: <http://www.nrmsc.usgs.gov/>
 Open File Reports: <http://pubs.usgs.gov/of/index-water.html>
 Science in Your Watershed: http://water.usgs.gov/wsc/map_index.html
 SURF Your Watershed: <http://cfpub.epa.gov/surf/locate/index.cfm>
 Water Cycle (Education): <http://ga.water.usgs.gov/edu/watercycle.html>
 Water Resources of Montana: <http://mt.water.usgs.gov/>
 Water Resource Reports: <http://water.usgs.gov/pubs/>
 Western Wetland Flora: <http://www.npwrc.usgs.gov/resource/plants/florawe/species/2/phleprat.htm>

Other Federal

National Wetlands Inventory: <http://www.fws.gov/nwi/>

MONTANA

Montana Department of Environmental Quality

Main DEQ Website: <http://deq.mt.gov/index.asp>
 Abandoned Mines List: <http://deq.mt.gov/AbandonedMines/priority.mcp>
 AFO/CAFO: <http://deq.mt.gov/wqinfo/MPDES/CAFO.mcp>
 Circular WQB-7: <http://deq.mt.gov/wqinfo/Circulars/WQB-7.PDF>
 Climate Change: <http://www.mtclimatechange.us>
 Coal bed Methane: <http://deq.mt.gov/CoalBedMethane/index.asp>
 DEQ Discharge Permits: <http://www.deq.mt.gov/wqinfo/WaterDischarge/Index.asp>
 DEQ Groundwater Discharge Permits: <http://deq.mt.gov/wqinfo/MGWPCS/default.mcp>
 DEQ Surface Water Discharge Permits: <http://deq.mt.gov/wqinfo/mpdes/default.mcp>
 Nonpoint Source Program: <http://deq.mt.gov/wqinfo/nonpoint/NonpointSourceProgram.mcp>
 Permitting: <http://deq.mt.gov/Permits.asp>
 Source Water Protection Database: <http://nris.state.mt.us/wis/swap/swapquery.asp>
 TMDLs: <http://deq.mt.gov/wqinfo/tmdl/index.asp>
 Water Quality: <http://deq.mt.gov/wqinfo/Laws.asp>
 Water Quality Assessment Database: www.cwaic.mt.gov
 Water Quality Rule: <http://www.mtrules.org/gateway/ChapterHome.asp?Chapter=17%2E30>
 Water Quality Statutes: <http://deq.mt.gov/wqinfo/Laws.asp>
 Wetland Conservation: <http://deq.mt.gov/wqinfo/Wetlands/Index.asp>
 Wetlands in Montana (biocriteria): <http://www.epa.gov/owow/wetlands/bawwg/case/mtdev.html>

Department of Natural Resources & Conservation

Main DNRC Website: <http://dnrc.mt.gov/>
 Water Quality BMPs for Montana Forests:
<http://www.dnrc.mt.gov/Forestry/Assistance/Practices/Documents/2010BMPLONGRPT.pdf>

BMP Guide Book:

<http://www.dnrc.mt.gov/Forestry/Assistance/Practices/Documents/2001WaterQualityBMPGuide.pdf>

Current BMPs: <http://www.dnrc.mt.gov/Forestry/Assistance/Practices/fpractices.asp>

Water Resources Division: <http://dnrc.mt.gov/wrd/default.asp>

Water Rights: http://dnrc.mt.gov/wrd/water_rts/default.asp

Water Rights Query System: <http://nris.mt.gov/dnrc/waterrights/default.aspx>

Natural Resource Information System

Main NRIS Website: <http://nris.mt.gov>

NRIS- GIS: <http://nris.mt.gov/gis/>

Map Builder: <http://maps2.nris.mt.gov/mapper/>

River Basins: <http://nris.mt.gov/wis/mrispdfs.html>

Water Information System: <http://nris.mt.gov/wi.asp>

Miscellaneous Montana

Department of Transportation Studies (Erosion, Fish):

http://www.mdt.mt.gov/research/projects/res_final.shtml

Department of Transportation (Wetlands):

<http://www.mdt.mt.gov/other/environmental/external/wetlands/>

Groundwater Information Center, Montana Bureau of Mines and Geology:

<http://mbmggwic.mtech.edu/>

Montana Environmental Education Association: <http://www.montanaeea.org>

MSU Extension Program within the Dept. of Animal Range Sciences:

<http://animalrangeextension.montana.edu/>

MSU Watershed Hydrology: <http://landresources.montana.edu/watershed/>

MSU Extension Water Quality Program: <http://waterquality.montana.edu>

MSU Department of Land Resources: <http://landresources.montana.edu/>

Montana Natural Heritage Program: <http://nhp.nris.mt.gov/reports.asp#ecology>

Montana Smart Growth Coalition: <http://mtsmartgrowth.org/>

Montana Water Center: <http://www.watercenter.montana.edu>

Montana Watercourse: <http://mtwatercourse.org/index.php>

Montana Watershed Groups: <http://mtwatersheds.org/Watersheds/WatershedDirectory.html>

Montana Watershed Coordinating Council: <http://mtwatersheds.org>

Montana Wetland and Riparian Mapping Center: <http://mtnhp.org/nwi/>

Montana Wetland Legacy: <http://www.wetlandslegacy.org/>

Natural Heritage Program (NHP): <http://nhp.nris.mt.gov/>

NHP Wetland Assessments (many on BLM): <http://mtnhp.org/Reports.asp?key=4>

Stream-Riparian Mgt:

http://www.animalrangeextension.montana.edu/riparianmgt/supplement/pg5_edu_resources.htm

Undaunted Stewardship: <http://www.undauntedstewardship.montana.edu/>

University of Montana College of Forestry and Conservation: <http://www.forestry.umt.edu/>

Water Quality BMPs for Montana's Forests Manual:

<http://dnrc.mt.gov/forestry/Assistance/Practices/Documents/2001WaterQualityBMPGuide.pdf>

The Western Transportation Institute (WTI): <http://www.coe.montana.edu/wti/>

PROFESSIONAL SOCIETIES

Alberta Riparian Habitat Management: <http://www.cowsandfish.org/>
American Fisheries Society – Montana: <http://www.fisheries.org/units/AFSmontana/>
American Institute of Hydrology: <http://www.aihydrology.org/>
Association of State Wetland Managers: <http://www.aswm.org/>
American Water Resource Association (AWRA (MT): <http://www.awra.org/state/montana/index.htm>
Geological Society of America: <http://www.geosociety.org/>
Society for Range Management: <http://www.rangelands.org/srm.shtml>
Soil and Water Conservation Society: <http://www.swcs.org/>
Soil Science Society of America: <http://www.soils.org/>
Montana Soil and Water Conservation Society: <http://www.mtswcs.org/>

CLIMATE

American Tree Farm System: <http://www.treefarmssystem.org/>
Climate and Hydrology Database (USFS): <http://www.fsl.orst.edu/climhy/>
Climate Change: <http://www.epa.gov/climatechange> or www.mtclimatechange.us
Current Snow-Precipitation: <http://www.wcc.nrcs.usda.gov/snow/update.html>
Forest Stewardship Council: <http://www.fscus.org/>
National Water and Climate Center: <http://www.wcc.nrcs.usda.gov/>
National Climate Center: <http://www.ncdc.noaa.gov/oa/ncdc.html>
National Weather Service – Hydrologic Information: <http://www.nws.noaa.gov/oh/hic/>
National Weather Service Satellite Imagery: <http://www.wrh.noaa.gov/satellite/index.php?wfo=byz>
NOAA Drought Center: <http://www.drought.noaa.gov/>
RAWS Station Data: <http://www.raws.dri.edu/index.html>
Spatial Climate Analysis Center: <http://www.ocs.orst.edu/prism/>
High Plains Climate Center: <http://www.hprcc.unl.edu/>
Western Regional Climate Center: <http://www.wrcc.dri.edu/>
Historical Climate: <http://www.wrcc.dri.edu/CLIMATEDATA.html>
Western Precipitation Frequency Maps: <http://www.wrcc.dri.edu/pcpnfreq.html>
Montana Drought Resources: <http://drought.mt.gov/>
Montana Climate Office: <http://www.cfc.umt.edu/MCO/>
Montana Climate Summaries: <http://www.wrcc.dri.edu/summary/climsmmt.html>
Montana Snow and Precipitation: <http://www.mt.nrcs.usda.gov/snow/data/>
Montana Snow Survey Program: <http://www.mt.nrcs.usda.gov/snow/index.html>

RESTORATION

Center for Riverine Science and Stream Renaturalization: <http://www.umt.edu/rivercenter/>
Center for Watershed Protection: <http://www.cwp.org/>
Future Fisheries: <http://fwp.mt.gov/fishAndWildlife/habitat/fish/futureFisheries/default.html>
National River Restoration Science Synthesis: [http://www.acronymfinder.com/National-River-Restoration-Science-Synthesis-\(NRRSS\).html](http://www.acronymfinder.com/National-River-Restoration-Science-Synthesis-(NRRSS).html)
Pacific Northwest Direct Seed Association: <http://www.directseed.org>
Restoring Rivers: <http://www.restoringrivers.org/>
River Restoration Northwest: <http://www.rrnw.org/>

Stream Corridor Restoration:

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/ndcsmc/?cid=nrcs143_009158

U.S. Fish & Wildlife Service: <http://www.r6.fws.gov/pfw/r6pfw2h.htm>

WA State Aquatic Habitat Guidelines: <http://www.wdfw.wa.gov/hab/ahg/index.htm>

Wild Fish Habitat Initiative: <http://wildfish.montana.edu/resources/default.htm>

OTHER

Conservation Tillage: <http://www.ctic.purdue.edu>

Educating Young People: <http://www.uwex.edu/erc/ey paw/>

Direct Seed: www.directseed.org/

Hydrology Tools (inc. Mannings): http://www.sd-w.com/civil/mannings_formula.html

Digital Library for Earth System Education: <http://www.dlese.org/library/index.jsp>

Low Impact Development (LID) Center: <http://lid-stormwater.net/index.htm>

Montana River Action: <http://www.montanariveraction.org/>

Native Fish Habitat Conservation Plan by Plum Creek Timber Company:

<http://www.plumcreek.com/Environment/nbspsustainableforestrySFI/nbspsFIImplementation/HabitatConservationPlans/tabid/153/Default.aspx>

National Agriculture Statistics Database: <http://www.nass.usda.gov>

Organic Farming: <http://www.aeromt.org>

Pollution Locator (find pollutants for an area): <http://scorecard.goodguide.com/>

Research in Watersheds Conference: <http://www.tucson.ars.ag.gov/unit/ICRW.htm>

Stream Line Watershed Mgt. Bulletin: <http://www.forrex.org/streamline/streamline.asp>

Stream Morphology Tools: <http://www.dnr.state.oh.us/default/tabid/9188/Default.aspx>

Terraserver (air photos): <http://www.terraserver.com>

TopoZone (maps): <http://www.topozone.com/>

Understanding the CWA: <http://www.cleanwateract.org/>

U.S. Green Building Council (USGBC): <http://www.usgbc.org/>

Washington State Education, Environmental and Economic issues: <http://www.e3washington.org/>

Wildland Hydrology: <http://www.wildlandhydrology.com/>

Yellowstone Business Partnership: <http://www.yellowstonebusiness.org/>

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8

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Ref: 8EPR-EP

JUL 03 2012

Honorable Brian A. Schweitzer
Governor, State of Montana
Montana State Capitol Building
P.O. Box 200801
Helena, MT 59620-0801

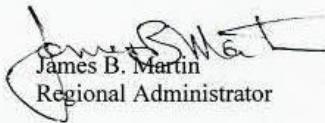
Dear Governor Schweitzer:

The U.S. Environmental Protection Agency (EPA) Region 8 received the State of Montana's updated Nonpoint Source Management Plan (Plan) with your cover letter dated June 11, 2012. The EPA is pleased to inform you of its approval of the Plan submitted in accordance with Section 319 of the Clean Water Act (CWA §319). Montana has satisfied all conditions of program approval by incorporating the nine key elements pursuant to CWA §319 that characterize an effective and dynamic state nonpoint source program. The EPA congratulates Montana on its efforts to successfully complete development of this comprehensive plan.

Nonpoint source pollution, caused by a wide range of activities, is the leading cause of water quality impairment in Montana. Protection and restoration of Montana's waters will depend on a wide range of regulatory and non-regulatory actions. The EPA fully supports Montana's emphasis on cooperation and local stewardship to solve nonpoint source problems. The EPA appreciates your assurance that all applicable State water programs will be used as appropriate to protect and restore water quality degraded by nonpoint source discharges. Success will ultimately rely on your ability to use these programs to foster the widespread implementation of practices that will restore and maintain the chemical, physical, and biological integrity of Montana's waters.

Your staff's effort and commitment to updating the plan is appreciated. The EPA looks forward to working closely with the State of Montana to implement pollution control measures to achieve water quality goals. If you have any questions, the most knowledgeable person on my staff is Mr. Peter Ismert and he can be reached at (303) 312-6215.

Sincerely,


James B. Martin
Regional Administrator

cc: Mr. Richard Opper

Director, Montana Department of Environmental Quality (MDEQ)

APPENDIX A – BEST MANAGEMENT PRACTICES

A1.0 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	Move 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 built 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 device and its location should encourage or enable livestock to obtain water from a source other than a surface waterbody. The device can also improve livestock distribution.	Watering Facility (NRCS 614)	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
Filter Strip	A strip of permanent perennial vegetation placed on the downgradient edge of a field, pasture, barnyard, or animal confinement area. The strip can slow surface runoff, filter particulate matter, or absorb and use nutrients. If the purpose of the strip is to take up nutrients, the vegetation must be periodically harvested in order to prevent nutrient buildup. Grazing would not constitute harvesting because nutrients are deposited as well as removed.	Field Border (NRCS 386), Filter Strip (NRCS 393), Hedgerow Planting (NRCS 422), Vegetated Treatment Area (NRCS 635)	X	X	X	X			X	X		N
Forage Use / Livestock Distribution Improvements	This practice includes such things as rotational grazing, cross-fencing, watering facility development, and other techniques designed to promote uniform forage use 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

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
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			?
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 field by field. Where necessary, it must contain contingency plans to deal with periodic drought. The plan must identify grazing management strategies that will be used to prevent nonpoint source pollution. The plan must contain a map in which all fields, watering facilities, heavy-use areas, surface waters, riparian and wetland buffers, and fence lines and other pertinent structures are labeled.	Prescribed Grazing (NRCS 528), Silvopasture 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 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 a 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 strip can 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

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	
Strip-cropping	Growing planned rotations of row crops, forages, small grains, or fallow in a systematic arrangement of 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.	Strip-cropping (NRCS 585)		X	X							N
Irrigation Diversion Maintenance or Replacement	Repairing or replacing 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, and the cost 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	Converting from one type of irrigation system to another, resulting in significant improvements to water quality. For example, converting 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, Microirrigation (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, rehabilitating wasteway, capturing and reusing tailwater, creating settling basins, remotely controlling headgates, or revegetating tailwater-induced erosional features. Projects must not trade one NPS pollution problem for another (e.g., changing from flood irrigation to sprinkler irrigation, 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 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 insure proper waste transfer and use (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 upgradient 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 byproducts into biologically stable organic material. The facility must be designed to prevent runoff 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), Silvopasture 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	Converting highly erodible lands to permanent vegetative cover.	Range Planting (NRCS 550), Pasture and Hay Planting (NRCS 512)	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
Salinity and Sodic Soil Management	Managing 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")	Altering 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 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
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	?

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
Pet Waste Management	Removing and disposing of pet excrement, cat box filler, and soiled bedding materials to prevent them from entering surface water or groundwater.		X	X					X	X		N
Septic System Maintenance	Regular inspection and clean out of onsite wastewater treatment systems (septic systems). Repair of leaking or otherwise malfunctioning components.		X	X					X	X	X	Y
Storm Drain Inlet Protection	Installing grates or trash racks to catch large debris. Regular clean out of storm drain inlets. Painting or onsite posting of information regarding storm drain discharges (e.g., a stenciled label stating "Drains to fish stream").		X	X	X				X	X	X	N
Lawn and Garden Fertilizer Management	Applying lawn and garden fertilizers to minimize offsite 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
Litter Control	Preventing and removing litter (trash). For example, providing an adequate number 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

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
Construction Site Stormwater Runoff Control	Silt fences, straw wattles, 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 Sheet), 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 failing septic systems and hooking up to a sanitary sewer system. Sanitary sewers (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	Installing and maintaining green belts, parks, permeable pavement, public gardens, and other forms of landscape that allow gradual percolation of precipitation and reduce flow of concentrated runoff.		X	X	X	X			X	X	X	?
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	Designing and installing new stormwater control technology.		X	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	
Preservation of Existing Vegetation	Preserving existing riparian vegetation.		X	X	X	X			X	X	X	N
Conservation Easements	Legally binding restrictions on 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	Identifying, assessing, and cleaning up 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	Identifying and eliminating 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 System (NRCS 570)	X	X	X				X		X	Y
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

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	
Wash-water 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 wash-water 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	Judiciously applying and promptly removing 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	Applying and removing 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
Travel Management Plans	Developing and implementing comprehensive travel management plans to limit NPS pollution from transportation networks and limiting 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 restrict contact to hardened crossings or bridges.			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	
Road Crossing	Site, design, and construct bridges, culverts, hardened crossings, and fords to prevent 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	Remove or decommission roads that have been significant sources of NPS pollution.			X	X							Y
Disturbed Soil Roughening	Roughen disturbed soil to temporarily discourage concentrated runoff.			X	X							N
Settling Basins or Sediment Traps	Construct pits or depressions to trap or settle sediment from road runoff. These structures must be periodically cleaned 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												
Mine Tailings Removal and Storage	Remove mine tailings and waste rock from floodplains and riparian areas and store them where they will not come into contact with surface water or groundwater.				X		X				X	Y
Groundwater Recharge Control	Implement land-use practices to reduce groundwater recharge of flooded mine workings, thereby reducing acid mine drainage.						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	
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 " <i>Transportation</i> " 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 hazardous material spill.										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
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

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	
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	Develop, designate, and maintain trails for OHV recreation. Trails should be designed to avoid OHV contact with surface water and riparian areas, or to restrict contact to hardened crossings or bridges.				X						X	N
<i>Stream Restoration</i>												
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
<i>Forestry - Please see Appendix A - 2.0 for Montana forestry BMPs</i>												
<i>Miscellaneous BMPs</i>												
Wetland Restoration or Creation	Restore, re-create, or enhance wetlands to address NPS pollution.	Wetland Restoration (NRCS 657), Wetland Creation (NRCS 658), Wetland Enhancement (NRCS 659)	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
Revegetation	Plant, protect, or reestablish permanent vegetative cover in riparian or upland areas to reduce NPS pollution. Practices may include, but are not limited to, seeding, sprigging, shrub planting, and fence building to protect emerging or fragile vegetation, as well as creating willow lifts and sod mats. Additional practices include over-seeding, removing non-native plants, reintroducing native plants, creating riparian buffers, and replacing 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	Reestablishing a stream's floodplain or reconnection to an abandoned floodplain to address NPS pollution. Practices 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	Removing or replacing culverts to reduce NPS pollution.	Stream Crossing (NRCS 578)		X	X							Y
Dam Removal or Modification	Removing or modifying dams to restore the natural hydrograph of a stream in order to facilitate natural stream processes that would reduce NPS pollution.				X	X						Y
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

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	
Brochures, Newsletters, Fliers, Mailings, Listservs, Web pages, 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	Using 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	Applying 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	?

A2.0 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. Cross drains, 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. MAINTENANCE

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 cross drains, 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 side-casting 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, re-contour 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 CROSSING

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 non-roaded, 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.*

A3.0 SETBACK REGULATIONS BY LOCAL GOVERNMENT

Riparian Setbacks and Land Use Planning in Montana										
List of Adopted Local Government Regulations and Policies			Compiled by: MT Audubon, P.O. Box 595, Helena, MT 59624; 406-443-3949: website: www.mtaudubon.org							
Date Updated: July 31, 2009			NOTE: This chart is sorted by Type of Regulation (Flood plain, Subdivision , Zoning, etc.) and "Local Government" name.							
Local Government	Purpose of Regulation	Size of Setback or Other Stream Protection Measure	Restrictions Apply To...	Specific Exceptions	Setback measured from	Area Covered: Streams, wetlands, or lakes	Reference	Vegetation Requirements	Additional Requirements/ NOTES	How to Obtain
Date Regulation Adopted										
Type of Regulation: Development Permit Ordinance										
Beaverhead County Date: Big Hole River policy adopted March 2, 2005	Protect water quality, flood plain, riparian resources, public health and safety	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 & Permitting Process	Indicates that development should be outside flood plain (but not clear)	NOTE: Ordinance also adopted in Madison County; zoning regulations adopted in Butte- Silver Bow and Anaconda-Deer Lodge Counties.	Use this link: http://www.beaverheadcounty.org/html/land_use_and_planning_department.html
Madison County Date: Big Hole River Policy adopted Nov. 8, 2004	Protect water quality, flood plain, riparian resources, public health and safety	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 & Permitting Process	Indicates that development should be outside flood plain (but not clear)	NOTE: Ordinance also adopted in Beaverhead County; zoning regulations adopted in Butte- Silver Bow and Anaconda-Deer Lodge Counties.	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. Builders are responsible for locating new structures a safe distance from the waterway and riprap is not permitted to protect a structure built after adoption of the amendments.	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 road must minimize impacts.	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 not listed in Table 4-6-1 of the regulation is prohibited in the flood plain.	Buildings and associated structures			All rivers and streams with delineated 100-year floodplains	Flood plain Regulations, Development Standards, Section 4-6 and Table 4-6-1	None		Use this link: http://www.ravalliacounty.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 protection standards..."				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

Local Government Date Regulation Adopted	Purpose of Regulation	Size of Setback or Other Stream Protection Measure	Restrictions Apply To...	Specific Exceptions	Setback measured from...	Area Covered: Streams, wetlands, or lakes	Reference	Vegetation Requirements	Additional Requirements/ NOTES	How to Obtain
Lewis and Clark County Date: Riparian policy adopted February 15, 2004		"Develop residential and commercial setback requirements along streams, rivers, lakes, and reservoirs to preserve water quality and other natural resources, view sheds, and recreational uses." "Develop effective land use controls to protect wetlands."				Streams and wetlands	2004 Growth Policy, Chapter V, Issue A, Goal 1, Policy 1.8 and Issue E, Goal 5		NOTE: Growth Policies are non- regulatory but local regulations should comply with the Growth Policy.	Use this link: http://www.co.lewis-clark.mt.us/departments/community-developmentplanning/countygrowth/growth-policy.html
Meagher County Date: Riparian policy adopted in October 2005	Prohibit new development in flood-hazard areas	Setback is 200 horizontal feet from streams; 300 feet from delineated riparian areas and wetlands. Well/ septic tank setbacks: at least 100 feet from streams, lakes, and identified 100-year floodways; and 300 feet from identified riparian areas.	New development, including subdivisions	Agricultural structures	High water mark	Streams and wetlands	2004 Growth Policy, Section III, Page 29		NOTE: Growth Policies are non- regulatory but local regulations should comply with the Growth Policy.	Contact county (obtain copy through mail) or download (from www.mtaudubon.org)
Type of Regulation: Subdivision Regulations										
Cascade County Date: Setbacks adopted September 25, 2007	Mitigate impacts to natural environment	Setback includes 100-year flood plain or 50 foot vegetated buffer/setback for all watercourses (whichever is greater). Wetlands of 1 acre in size or less with 50-foot vegetated buffer. Wetlands of more than 1 acre with 100 vegetated buffer. "No structure shall be located within the 100-year flood plain..."	"All structures and roads..."	Structures and improvements are only allowed in the wetland buffer for "educational and scientific purposes."	Ordinary high water mark	Rivers, perennial & intermittent streams, reservoirs, drainage channels, irrigation canals, and wetlands.	Subdivision Regulations, Chapter VI, Design & Improvement Standards, Impacts on Natural Environment	Vegetated buffer and setback are the same distance. The vegetated buffer standard states that "...existing native species	In addition to rivers and streams, protection extends to intermittent streams and irrigation district canals	Use this link: http://www.cascade.mt.us/?p=departament&ido=98
Flathead County Date: Prohibit subdivision of flood plain: May 2005; Riparian Protection Requirement: Jan. 15, 2009	Protect water quality, wildlife corridors, protecting persons and property.	Prohibits subdividing land in the flood plain for "building or residential purposes." Requires streamside vegetated buffers and management plans for each new subdivision. The size of the setback is determined on a case-by case basis and is based on the area of riparian resource.	New subdivisions Also prohibited within Riparian Protection Zone: construction and new structures, roads, driveways, and imperious surfaces.	Recreational structures (non-motorized trails, etc.); stream bank stabilization; limited road and utility crossing; forestry and agriculture, etc.	Determined on a case-by case basis	Perennial and intermittent streams.	Development Code, Chapter 4, Subdivision Regulations, Policy 4.7.7.h	"The vegetated buffer shall be clearly delineated on the preliminary plat and on the final plat and designated as the Riparian Protection Zone."		Use this link: http://flathead.mt.gov/planning_zoning/downloads.php
Gallatin County Date: Setbacks adopted March 1, 2005	"Preserve or enhance" natural terrain, natural drainage, flood plains, and natural vegetation.	Setback is: <ul style="list-style-type: none">• 300 feet along East and West Gallatin, Madison, Jefferson, and Missouri Rivers; and• 150-foot setbacks from all other watercourses.	Residential or commercial structures	Structures used for agricultural purposes or the maintenance of livestock.	Ordinary high water mark	Perennial and intermittent streams.	Subdivision Regulations: Section 6, Policy A.5.a. General Standards: Watercourse Mitigation: Setback	None	Allows for watercourse mitigation plan	Use this link: http://www.gallatin.mt.gov/Public_Documents/gallatincomtplaintdept/gallatincomt_planregs/subregs

Local Government Date Regulation Adopted	Purpose of Regulation	Size of Setback or Other Stream Protection Measure	Restrictions Apply To...	Specific Exceptions	Setback measured from...	Area Covered: Streams, wetlands, or lakes	Reference	Vegetation Requirements	Additional Requirements/ NOTES	How to Obtain
Lewis and Clark County Date: Setbacks adopted January 2005	Preserve water quality and other natural resources, view sheds, and recreational uses.	4 categories of setbacks: <ul style="list-style-type: none">• Type I (main rivers): 250 feet with a 100-foot vegetation buffer;• Type II (large streams): 200 feet with a 75-foot vegetation buffer;• Type III (reservoirs, small streams, wetlands): 100 feet with a 50-foot vegetative buffer; and• Type IV (irrigation ditches): 50 feet with a 30- foot vegetative buffer.	Buildings; improvements to existing dwellings of up to 50% of square footage; septic tanks and drain fields; barns, feedlots, and corrals; communication towers.	Agriculture; water-related recreational structures (docks, etc.); fencing; non- motorized trails; pre-existing park lots and other impervious surfaces.	Ordinary high water mark	Rivers, perennial and intermittent streams, wetlands, drainage canals for stormwater, irrigation canals, and lakes	Subdivision Regulations: Chapter XI, Policy: W. Waterbody Setbacks and Buffer Areas Appendix L categorizes each waterbody in the county	Each setback type has specific vegetated buffers, which are defined as areas where "all natural vegetation, rocks, soil, topography" should "remain undisturbed" or be enhanced by "additional planting of native plants."	Includes 100-year flood plains. Docks, walkways, lawns, etc. are allowed on 25% of the linear footage along the waterway; buffer requirement are for 75% of linear footage along affected water bodies.	Use this link: http://www.co.lewis-clark.mt.us/departments/community-development-planning/subdivision-regulation.html
Madison County Date: Setbacks on rivers since 1994; setbacks on all other waterways since 2000	Protect local economy, public health and safety, flood plain, water quality, riparian resource, visuals, etc.	3 categories of setbacks: <ul style="list-style-type: none">• Madison River: 500 feet;• Big Hole River, Jefferson River, Ruby River, Beaverhead River, Boulder River, and West Fork of the Gallatin River: 150 feet; and• All other waterways: 100 feet.	New subdivisions - minimum construction (=buildings) setback		Rivers: ordinary high water mark Other waterways: from "bank"	Rivers; perennial and intermittent streams; lakes and ponds, both natural and man- made.	Subdivision Regulations: Chapter IV-B.1. Construction setbacks from water bodies, Pages 71 - 72.	Includes flood plain Lands considered unsuitable for development include "riparian areas."	Construction setback is defined to protect rivers and "riparian areas."	Use this link: http://madison.mt.gov/departments/plan/publications/planpub.asp
Meagher County Date: Setback adopted August 8, 2003		300-foot setback from high water mark of stream, lake or reservoir	New structures, septic systems, drain fields		High water mark	Streams, lakes and reservoirs	Subdivision Regulations: Design Standards, Policy II-A-20	"All natural vegetation, except weeds, within this set back must be left undisturbed."		Contact county (obtain copy through mail) or download (from www.mtaudubon.org)
Missoula County & City of Missoula Date: Setbacks adopted in 1995	Protect long list of items: water quality, wildlife, quality of life, flooding, etc.	No subdivisions allowed that are wholly within the "area of riparian resource." Subdivisions that encompass these areas "shall place development outside the areas of riparian resource." The area of riparian resource is determined on a case-by-case basis.	Construction is permitted for trails and roads crossing streams.		Determined on a case-by-case basis	Perennial and intermittent streams, wetlands, ponds, and woody draws.	Subdivision Regulations: Article 3-13, Areas of Riparian Resource	Exhibit 5 identifies key plants associated with local riparian resources. "Removal or disturbance of riparian resources shall be minimized."	Identical provisions were adopted in city and county subdivision regulations in 1995.	Use this link: http://www.co.missoula.mt.us/opgweb/Documents.htm
Park County Date: Setback adopted May 22, 2000	Protect wildlife habitat and water quality	2 categories of setbacks: <ul style="list-style-type: none">• Yellowstone, Shields, and Boulder Rivers: 150 feet or outside the 100-year flood plain, whichever is greater.• All other perennial streams: 100 feet or outside the 100-year flood plain, whichever is greater.	New subdivisions	Lots in 100-year flood plain must 1) have 1(+) acre outside the flood plain, and 2) designate building site outside the flood plain.	Mean high water mark	Rivers, perennial streams, and lakes	Subdivision Regulations: Chapter VI, Item D, flood plain Provisions	None	Considered a minimum setback; a list of factors can allow expansion (including width of riparian area, critical wildlife habitat, etc.).	Use this link: http://www.parkcounty.org/subdivision%20regs.html

Local Government	Purpose of Regulation	Size of Setback or Other Stream Protection Measure	Restrictions Apply To...	Specific Exceptions	Setback measured from...	Area Covered: Streams, wetlands, or lakes	Reference	Vegetation Requirements	Additional Requirements/ NOTES	How to Obtain
Date Regulation Adopted										
Type of Regulation: Zoning: Zoning District										
Bridger Canyon Zoning District Date: Setbacks adopted in 1971	Protect long list of items: water quality, wildlife, quality of life, etc.	Several zones established: <ul style="list-style-type: none">Setbacks range from minimum of 100-foot setback from streams and one building per 40 acres, to minimum setback of 50-feet from stream and one building per 10 acres.Higher densities allowed.	"all buildings and structures" Residential buildings		No description in regulation where measurement is taken from	Streams and creeks (undefined)	Bridger Canyon Zoning Regulation (e.g. Section 6.5, Agriculture Exclusion District; Section 7.5, Recreation and Forestry; etc.)	For Planned Unit Developments (higher density areas): "Preserve...natural characteristics of the land, including topography, vegetation, streams, and tree cover."	District covers 51,440 acres Setbacks and acreage restrictions on lot size help protect the riparian areas along streams.	Use this link: http://www.gallatin.mt.gov/public_documents/gallatincomt_plandist/zoningdistricts/bridgercanyon
Park County: East Yellowstone Zoning District Date: Setbacks adopted Nov. 17, 1997	Maintain the rural character of the area, and protect and enhance the natural environment, water quality, and wildlife.	100-foot setbacks: from the Yellowstone River (for buildings or structures) 30-acre density standard (for single family dwellings)	New buildings and structures		No description in regulation where measurement is taken from	Yellowstone River only	Park County: East Yellowstone Zoning District	None	Within the variance process "no residence shall be closer than 100 feet to the Yellowstone River."	Use this link: http://www.parkcounty.org/zoning%20regs.html
Georgetown Lake Area Date: Setback adopted 1992	Protect scenic resources, wildlife habitat, and water quality	3 categories of setbacks established: <ul style="list-style-type: none">50 feet from streams100 feet from open lakeshore50 feet from timbered lakeshore	Development activity	Trails; road crossings; bank stabilization structures; and more	Average annual high water mark of centerline of stream, whichever is greater	Wetlands and lakes. Streams with well- defined or poorly defined channels, and ravines.	Anaconda-Deer Lodge County Development Permit System, Chapter IX - Georgetown Lake Development District	Corridors created by setbacks shall "consist of existing or restored native riparian or wetland or lawns capable of functioning as vegetative filter strips."	NOTE: These regulations only cover Anaconda-Deer Lodge County portion of Georgetown Lake. Granite County is currently considering zoning their portion of the lake.	Contact county (obtain copy through mail) or download (from Montana Audubon website: www.mtaudubon.org)
Type of Regulation: Zoning										
Anaconda-Deer Lodge (City/ County) Date: Big Hole River policy adopted May 19, 2005	Protect wildlife and wildlife habitat, water quality, and riparian and aquatic resources; and preserve agriculture.	Examine all new buildings proposed within 500 feet of Big Hole River; minimum setback is 150 feet.	All new structures (includes private bridges)	Agricultural structures including barns, shed, dwellings, and other structures directly related to agriculture.	Ordinary high water mark.	Big Hole River only	Ordinance No. 208: Big Hole River Conservation Development Standards and Permitting Process	None	NOTE: Ordinance adopted in Beaverhead and Madison Counties; zoning regulations also adopted by Butte- Silver Bow County.	Use this link: http://www.anacondadeerlodge.mt.gov/departments/planning.aspx
Butte-Silver Bow (City/ County) Date: Open Space District adopted in 2000; Channel Mgmt Zone in 2005	Protect wildlife and wildlife habitat, water quality, and riparian and aquatic resources; and preserve agriculture.	In Open Space Zoning District: "water resource protection setback" is 100 feet from the high water mark of 100-year flood plains for navigable streams or designated flood plains. Water Channel Management Zone (17.47): for the Big Hole River and Silver Bow Creek the minimum setback is 150 feet.	All new structures. Special regulations have been adopted for private bridges.	Agricultural structures including barns, shed, dwellings, and other structures directly related to agriculture.	High water mark or ordinary high water mark.	Big Hole River, Silver Bow Creek, and navigable streams or streams with designated flood plains	Title 17 Zoning provisions: 17.21.100 (water resource protection setback) and 17.47 (Water Channel Management Zone)	None	NOTE: Ordinance adopted in Beaverhead and Madison Counties; zoning regulations also adopted by Anaconda-Deer Lodge County.	Use this link: http://www.co.silverbow.mt.us/departments/community_dev.aspx#planning

Local Government Date Regulation Adopted	Purpose of Regulation	Size of Setback or Other Stream Protection Measure	Restrictions Apply To...	Specific Exceptions	Setback measured from...	Area Covered: Streams, wetlands, or lakes	Reference	Vegetation Requirements	Additional Requirements/ NOTES	How to Obtain
Cascade County Date: Setbacks adopted July 15, 2009	Mitigate impacts to natural environment	50-foot setback from perennial streams.	"to the outer wall of any structure..."		Ordinary high water mark	Perennial streams and rivers	Cascade County Zoning Regulations 2009	None		Use this link: http://www.cascade.mt.us/?p=department&ido=98
Choteau County Date: Setbacks first opted in 1985	Encourage growth to be compatible with rural nature of county and agriculture, protect rivers and streams.	Missouri River setbacks: <ul style="list-style-type: none"> Coal Banks Landing to eastern county line: 3 miles (when visible from river); Ft. Benton to Coal Banks Landing: 400 horizontal feet (plus density restrictions) Other Waterbodies (includes lakes): "Structures, wells and septic tanks must be set back at least 100 feet from streams, lakes, and identified 100- year floodways."	Missouri River: "new residential development, including subdivisions" Other Waterbodies: structures, wells, and septic systems.		High water mark or "identified 100-year flood plain."	Rivers, streams, and lakes	Choteau County Development Regulation, Item XIII, Items C and F	None	Ft. Benton to Coal Banks Landing with a 1 dwelling per 8 acres density standard	Use this link: http://www.co.choteau.mt.us/development_regs.htm
City of Bozeman Date: Setbacks first adopted in July 2002; wetland protection in October 2005	Mitigate impacts to watercourse through stabilization of stream banks; sediment, nutrient and pollution removal; and flood control.	3 categories of setbacks: <ul style="list-style-type: none"> Previously Platted Development: 100 feet from East Gallatin River; 35 feet from all other watercourses. New Platted Development: 100 feet on East Gallatin River; 75 feet from Sourdough, Bozeman, and Bridger Creeks; 50 feet from all other watercourses For wetlands not adjacent to streams: setback is determined on a case-by-case basis by Wetlands Review Board 	Residential and commercial structures, additions to buildings, parking lots or other impervious surfaces	Trails; stormwater facilities; crossings for sidewalks, streets, utility lines, etc.; agricultural uses. Wetlands must be larger than 400 square feet in size.	Ordinary high water mark for streams; Wetlands: determined on case-by- case basis	Perennial or intermittent streams; wetlands adjacent to streams and wetlands identified on Bozeman Area Wetland Map	Unified Development Ordinance, Chapter 18.42.100: Watercourse Setback; Chapter 18.56: Bozeman Wetland Regulations	Setback planting plan must be approved; specific requirements for native vegetation (based on a formula)	Setbacks extend to the edge of the 100-year flood plain, include adjacent wetlands, and does NOT include slopes greater than 25% (these areas need to be subtracted). Regulation also prohibits ditching and filling of wetlands.	Use this link: http://www.bozeman.net/bozeman/planning/landUse.aspx
City of Missoula Date: Setback provisions adopted in 1995	Protect long list of items: water quality, wildlife, quality of life, flooding, etc.	Buffer size is determined on a case-by-case basis using specific criteria: impacts to wildlife habitat, water quality or quantity, fish, or other aquatic resources.	Construction is permitted for trails and roads crossing streams.	Construction is permitted if mitigation projects meet a "no net loss of area of riparian resource."	Determined on a case-by case basis	Perennial and -intermittent streams, wetlands, ponds, and woody draws.	Missoula Zoning Ordinance, Riparian Resource Zoning District, Title 19, Chapter 19.51	"Removal or disturbance of riparian resources shall be minimized." 19.51.110 identifies key plants associated with local riparian resources.		Use this link: ftp://www.co.missoula.mt.us/opgftp/Documents/CurrentRegulations/CityZoningTitle19/CityOrdinanceLP.htm

Local Government Date Regulation Adopted	Purpose of Regulation	Size of Setback or Other Stream Protection Measure	Restrictions Apply To...	Specific Exceptions	Setback measured from...	Area Covered: Streams, wetlands, or lakes	Reference	Vegetation Requirements	Additional Requirements/ NOTES	How to Obtain
City of Whitefish Date: Setback provisions adopted March 2, 2008	Protect water quality, stormwater management, public safety, property protection	3 categories of vegetated buffers, with setbacks for new buildings: <ul style="list-style-type: none">Whitefish River, Whitefish Lake, and other lakes: 75-foot vegetated buffer or top of bank, whichever is greater, with 10-foot building setback (85 feet total).Perennial streams and wetlands: 100-foot vegetated buffers with 10-foot building setbacks (110 feet total). Second Creek (upstream from city's water supply): 200-foot vegetated buffer with 10-foot building setbacks (210 feet total).Intermittent Streams: 50-foot vegetated buffer with 10-foot building setback (60 feet total).	Lakes, river, perennial streams, intermittent streams, and wetlands. Wetlands larger than 10,000 square feet (0.23 acres) are protected; wetlands between 1,000 - 10,000 square feet (0.02 - 0.23 acre) with	Wetlands less than 1,000 square feet (0.02 acres) are not protected. Mitigation measures spelled out: e.g., viewing structures within buffer must plant area equal in size with native vegetation.	Ordinary high water mark for streams	Perennial and intermittent streams Lakes Wetlands: full protection for wetlands 1/4 acre or larger; less protection for smaller wetlands	Whitefish Critical Areas Ordinance, p. 16	This regulation is based on vegetated buffers. The building setback in all cases is just 10 feet beyond the vegetated buffer. The following items are allowed in the vegetated buffer: viewing structures, walkways, and trails. Also permitted under certain conditions: forest management, pesticide and fertilizers use, etc.	Buffer averaging is allowed. Restrictions on bank stabilization are spelled out (riprap and other hard structures are prohibited). NOTE: This regulation originally applied to a 2-mile radius around Whitefish. Flathead County now prohibits Whitefish from applying it outside city limits. This conflict is currently being litigated.	Use this link: http://www.whitefish.govoffice.com/index.asp?Type=B_BASIC&SEC={EBC22BEF-67FD-408A-8287-ED4C2E8FADDD}
Lake County Date: Zoning regulations adopted on October 1, 2005; Flathead Lake setbacks established in mid-1990s	Encourage development close to cities and towns, maintain the rural character of the area, and protect important wildlife habitat, water quality and natural resources.	Lake County Density Map and Regulations: 40 acre minimum lot size along Flathead River, Mission Creek, Crow Creek, and Jocko River. One dwelling per 40 acres restriction applies 1/2 mile on either side of Flathead and Jocko Rivers; 1/4 mile on either side of Crow and Mission Creeks. The pothole area surrounding Ninepipe National Wildlife Refuge is also zoned in 40-acre minimum lot sizes. Lake County also has community zoning districts around 50% of Flathead Lake that have been in place for over 10 years; these regulations require a 50-foot setback from the "highwater elevation."	Hazard areas are not considered developable, including stream banks, wetlands, areas with riparian vegetation, lakes, areas within a designated 100- year flood plain; and areas within 50 feet of the		High water mark	Flathead/ Jocko Rivers, Mission/ Crow Creeks, & Flathead Lake Wetlands: density standards around Ninepipe National Wildlife Refuge.	Lake County Density Map Regulations: Final Version 10-1-2005	None	Development bonus exists for clustering development and permanently protecting sensitive areas.	Use this link: http://www.lakecountymt.org/planning/Lake_County_Density_Map.html
Powell County Date: Setbacks in place since at least 2000	Protect open space, watersheds, grazing lands, wildlife resources, soil and water resources, agricultural lifestyle.	Blackfoot River, including the North Fork of the Blackfoot River: 25 yard setback. Clark Fork and Little Blackfoot Rivers: no development within 100-year flood plain. New development in northern 2/3 of county (where the Blackfoot River is located): only one non-farm/ranch dwelling is allowed per 160 acres. This density standard protects riparian areas because the lot size prevents houses from lining rivers and streams.	Single family residential uses	Agricultural uses, home occupations	"river's edge or river's flood plain."	Blackfoot River, Clark Fork River, and Little Blackfoot River	Flood plain Overlay District and Agricultural District #3	Buffer strips of vegetation may be required.	Also have "Important Wildlife Area Overlay District" that has a density standard of "one residence per 80 acres."	Use this link: http://www.mtsmartgrowth.org/CS&Rpub/Ordinances/Powell%20County%20Development%20Regulations.pdf

APPENDIX B - GROUNDWATER QUALITY STRATEGY FOR THE MONTANA NONPOINT SOURCE MANAGEMENT PLAN

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B1.0 INTRODUCTION

This appendix gives an overview of the current programs in place at the state level in Montana that are designed to protect ground water, and ultimately defines the role of the state's 319 program within this context. Although groundwater quantity and quality are inseparably linked, the focus of this appendix is on groundwater quality. Much of this appendix borrows language from components of the *2006 Integrated 305(B)/303(D) Water Quality Report for Montana* (DEQ), as well as the *Ground Water Section of Montana's State Water Plan* (DNRC 1987-1999). Because the groundwater section of the state's water plan, the *Montana Ground Water Plan*, dates back to 1999, some of the state water plan's information had been updated here to reflect current information on groundwater quality related issues, policies and programs. This appendix also outlines new direction to the *Montana Ground Water Plan* for the Department of Environmental Quality's 319 Nonpoint Source Grant Program, and proposes strategies for the successful implementation of these new directives.

B2.0 FOCUS ON THE STATE'S GROUNDWATER QUALITY PROGRAMS ADAPTED FROM THE 2006 INTEGRATED 303(D)/305(B) WATER QUALITY REPORT FOR MONTANA

B2.1 THE MONTANA GROUNDWATER ASSESSMENT PROGRAM

The 1991 Montana Legislature established the Montana Groundwater Assessment Program. Through this program it directed the Montana Bureau of Mines and Geology (MBMG) to characterize Montana's hydrogeology and to monitor long term water-level conditions and water chemistry through two complimentary programs. The Groundwater Characterization Program is designed to systematically evaluate Montana's aquifers. The Groundwater Monitoring Program is designed to collect long term water-level and water-quality data. The Groundwater Information Center (GWIC, <http://mbmggwic.mtech.edu>) holds and distributes data generated by the characterization and monitoring programs, and also data generated by many other groundwater projects.

MBMG's Groundwater Characterization Program has visited more than 6,000 wells in 18 Montana counties. The site visits provide high-quality inventory information about the groundwater resource within each study area. MBMG's groundwater atlases for the Lower Yellowstone River (Dawson, Fallon, Prairie, Richland, and Wibaux counties) and the Flathead Lake (Lake and Flathead counties) areas have been released. These atlases include descriptive overviews of aquifers and 21 maps describing the groundwater resources. Fifteen aquifer maps are in preparation or review for the Middle Yellowstone River Area (Treasure and Yellowstone counties outside of the Crow Reservation) and the Lolo-Bitterroot Area (Mineral, Missoula, and Ravalli counties). Field work has been completed in the Upper Clark Fork River (Deer Lodge, Granite, Powell, and Silver Bow counties) and the Clark's Fork of the Yellowstone River (Carbon and Stillwater counties) areas and begun in the Giant Springs area (Cascade and Teton counties). The Groundwater Assessment Steering Committee has scheduled the Missouri Headwaters (Gallatin and Madison counties) and the Upper Yellowstone River (Sweet Grass and Park counties) areas for future work. The Groundwater Assessment program expects to begin work in the Missouri Headwaters area (Gallatin and Madison Counties) in the spring of 2008.

MBMG's Groundwater Monitoring Program's statewide network contains 883 wells in which static-water levels are measured at least quarterly. Within the network there are 98 water-level recorders that provide hourly to daily water-level records. New water-level data for any well in the network are generally available from GWIC about 10 days after they were collected.

Even with activity of MBMG's Characterization and Monitoring Programs, there is no comprehensive state-wide set of groundwater chemistry data collected between July of 2001 and June of 2005.

B2.2 GROUNDWATER QUALITY PROTECTION PROGRAMS

The state's programs for the protection and remediation of ground water 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 ground water. 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 B-1**. The numeric drinking water standards that apply to groundwater based public water supplies are found in a single department circular, DEQ-7, Montana Numeric Water Quality Standards (February 2006).

Table B-1. Montana's Ground Water Classifications and Water Quality Standards*.

Classification	Description
Class I	Ground water has a specific conductance less than 1,000 μ Siemens/cm at 25°C 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	Ground water has a specific conductance range of 1,000 to 2,500 μ Siemens/cm at 25°C and may be used for public and private water supplies where better quality water is not available. The primary use of Class II ground water is for irrigation, stock water, and industrial purposes.
Class III	Ground water has a specific conductance range of 2,500 to 15,000 μ Siemens/cm at 25°C. Its primary use is for stock water and industrial purposes. It is also marginally suitable for some salt tolerant crops.
Class IV	Ground water has a specific conductance greater than 15,000 μ Siemens/cm at 25°C. Class IV ground water is used primarily for industrial purposes.

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

B2.3 GROUNDWATER QUALITY MANAGEMENT STRATEGY

B2.3.1 Protection Strategy

The level of effort at DEQ for groundwater protection through public awareness and education is less than that for surface water and wetlands. This is a concern because of the dependence on ground water for drinking water supplies, because contaminated ground water is very difficult and expensive to clean up, and because water quality restoration plans have been developed for surface waters that may be intricately linked to ground water. Concern about the rate and scale of groundwater impacts is increasing in the state, for the most part due to the rising use of wells for drinking water and individual septic systems for on-site waste disposal. Septic systems and other domestic on-site wastewater treatment systems are of particular concern in the rapidly developing areas of the state because there are no specific enforcement programs in place to regulate the maintenance and operation of private individual septic systems.

The need to develop a management strategy to protect Montana's ground water has been widely recognized for at least the past two decades. A planning committee has met at various times over the past 15 years to discuss management strategies for protecting and conserving ground water in Montana. Wide-ranging scope, goals, agency reorganizations, and personnel changes have complicated this process. In 1992, the Department of Natural Resources and Conservation (DNRC) released *Montana's State Water Plan*. They, with the assistance of other state agencies, elaborated on one of the key sections, Integrated Water Quality & Quantity Management, resulting in the Montana Ground Water Plan, which the DNRC released in 1999.

Several DEQ bureaus and other state agencies, as part of their daily business, address many of the strategies laid out in the 1999 Groundwater Plan. However, a major recommendation laid out by the Groundwater Plan stated that: *"State agencies with groundwater programs should regularly evaluate the adequacy and effectiveness of their groundwater protection programs and submit the results of these evaluations to the Environmental Quality Council. Beginning in 2001, the Environmental Quality Council should review these evaluations and publish a summary report every four years. (p. 6)"* To date, no reports dating post-2001 are available on the Environmental Quality Council's website that are specific to a comprehensive evaluation of the state's groundwater programs (<http://leg.mt.gov/css/publications/lepo/default.asp>).

Currently, implementation of groundwater protection strategies at the state level is fragmented between multiple agencies. As of 2007, the Groundwater Work Group of the Montana Watershed Coordination Council (MWCC) was reconvened in an attempt to 'foster coordination, collaboration, and dissemination of research, development, protection, and remediation efforts concerning Montana's groundwater resources'. One of the tasks that the MWCC Groundwater Work Group will undertake is a coordinated review of the Montana Ground Water Plan which will result in recommended updates, modifications, and/or new strategies that will be proposed to the DNRC for consideration.

B2.3.2 Remediation Strategy

The DEQ 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; 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 sites release to soil, sediment, surface water, or ground water; and to ensure compliance with applicable state and federal regulations.

The Groundwater Remediation Program regulates these sites under the Montana Water Quality Act (WQA). These sites typically require long-term soil, surface water, and/or groundwater remediation and monitoring. This program addresses sites that the Leaking Underground Storage Tank Program, Comprehensive Environmental Cleanup and Responsibility Act (CECRA) Program, Permitting and Compliance Division, or other state authorities do not address.

The Groundwater Remediation Program has overseen remediation at sites contaminated with petroleum, pesticides, metals, nutrients, and solvents. Sites range from small (not on National Priority List (NPL)) to large (on NPL) in scale. The program ranks sites as maximum, high, medium, or low priority sites, or as operation and maintenance sites (DEQ 1996). 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 ground water.

B2.3.3 Ground Water Pollution Control System

A Montana Ground Water Pollution Control System (MGWPCS) permit from the DEQ is typically required to construct, modify, or operate a disposal system or to construct or use any outlet for discharge of sewage, industrial, or other wastes into ground water. 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 upon preservation of Montana's water quality standards. Each discharge permit issued is designed to protect the receiving water's quality at the point of discharge.

Solid wastes are also a concern for groundwater quality and often contain 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.

Groundwater quality may be more likely to experience degradation from the leaching of solid wastes. Thirty years ago there were more than 500 landfills and waste dumps in Montana. Most of these have been closed. As of 2007 there are 108 licensed solid waste facilities. Twenty-seven of these sites require groundwater monitoring. Thirteen sites which have been closed continue to require groundwater monitoring. Closed landfills that do not require monitoring for water quality impacts may be a concern for nonpoint source pollution.

B2.3.4 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 (42 U.S.C. § 300j-13) 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:
Potential significant contaminant sources within the source water protection area are identified. Regulated contaminants of concern in Montana generally include nitrate, microbial contaminants, solvents, pesticides, and metals. Potential sources of these types of contaminants include septic systems, animal feeding operations, underground storage tanks, floor drains, sumps, and certain land use activities.
3. Assess the susceptibility of the PWS to those identified potential contaminant sources:
A susceptibility assessment considers the hazard rating of a potential contaminant source and potential barriers to evaluate the likelihood that a spill or release would reach the well or intake.

A determination of susceptibility will be made for each identified potential contaminant source within the source water protection area.

4. Make the results of the delineation and assessment available to the public:
Source water assessments must be made available to the public. Different resources will be used to bring this information to the public including consumer confidence reports, SWP Internet site, posting at public libraries, posting at local health department, and others.
 - a. Delineation and assessments will be compiled into a map and text report for each PWS.
 - b. Assistance is available for PWSs to help them use the delineation and assessment report to develop local source water protection plans. Participation in this part of the program will remain voluntary.
 - c. The program is applicable to all public water systems.

Implementation of SWP takes several forms in Montana, ranging from recognizing a PWS protection strategy to certification of a source water protection plan (SWPP). When a PWS concurs with their Source Water Delineation and Assessment Report (SWDAR), the SWP section recognizes that the PWS has an established protection strategy. This demonstrates the PWS has acknowledged the assessed level of susceptibility, and recognizes management actions they can take to reduce susceptibility. If a PWS needs to take an action in order to reduce susceptibility, they have acknowledged by their concurrence that they are susceptible and they have acknowledged the existence of, or need for barriers. When all significant potential contaminant sources identified in the source water assessment are ranked low or moderate, a PWS may not need to take any action to protect the source water. In addition, the SWP Section considers a PWS in this situation to have a protection strategy in place and to be “Substantially” implementing that strategy. Alternatively, a PWS with high or very high susceptibility ratings for one or more significant potential contaminant sources is considered to **not** have a protection strategy in place and will be encouraged to develop, and implement, a source water protection plan. The SWP Section will assist a PWS in this situation to complete a source water protection plan. Implementing the plan is the responsibility of the PWS.

DEQ’s SWP Program developed these implementation definitions since they tie directly to the process of assessing susceptibility according to a hazard rating tempered by barriers. It is measurable and will be reportable through a database query. Using SWP’s definitions, the DEQ may consider a PWS to be implementing a protection strategy without explicitly taking an action. This is acceptable in some Montana settings where thoughtful well field selection or aquifer conditions are such that protection is achieved when the well is constructed. The SWP program includes a 5-year inventory update so that changing conditions affecting susceptibility are addressed.

Additionally, a PWS may elect to complete a SWPP, and have the SWP program certify the plan. This process involves adding to and enlarging the scope of the SWDAR, and incorporating elements such as emergency and contingency planning. Due to the voluntary nature of the program and the considerable time and expense required to complete a plan, DEQ has certified relatively few SWPPs. Currently, the primary incentive for completing a SWPP is to eliminate the filtration requirement for a spring or surface water source. DEQ is currently considering a requirement for a certified SWPP in advance of granting PWS water quality-monitoring waivers.

B2.3.5 Local Water Quality Districts

Local Water Quality Districts (LWQD) are established to protect, preserve, and improve the quality of surface water and ground water within the district. Currently there are four in Montana (**Table B-2**).

Additionally, local groups in Yellowstone, Flathead, and Ravalli counties have expressed interest in forming LWQDs.

Table B-2. Web Addresses for Local Water Quality Districts in Montana.

Name	Web Address
Butte-Silver Bow County Water Quality Protection District	http://water.montana.edu/topics/quality/districts/butte.htm
Gallatin Local Water Quality District	http://www.gallatin.mt.gov/Public_Documents/gallatincomt_wqdpages/lwqd
Lewis and Clark Water Quality Protection District	http://www.co.lewis-clark.mt.us/index.php?id=56
Missoula Valley Water Quality District	http://www.co.missoula.mt.us/wq/

LWQDs are formed pursuant to 7-13-4501 et seq., MCA by county governments. This legislation describes district organization and specifies local-level authorities. The DEQ provides support to LWQD programs, but does not have an active management role in their activities. These groups serve as local government districts with a governing board of directors, and funding obtained from fees collected annually with county taxes, similar to funding mechanisms for other county districts.

The districts must prepare an annual report that summarizes the yearly activities. These reports provide a review of the ongoing activities and allow for an assessment of each LWQD in meeting their program objectives established during formation of the districts. A staff member with the DEQ Source Water Protection Section serves as coordinator for LWQD activities, and reviews the annual reports.

A significant component of selected district programs is the ability to participate in the enforcement of the Montana Water Quality Act and related rules. Districts also may develop and implement local water quality protection ordinances, which they perform in conjunction with the Enforcement Division at DEQ.

DEQ is working with the districts to support implementation of the SWP Program at PWS systems within district boundaries. DEQ's LWQD coordinator participates annually in the process of planning for a meeting with all the districts to review programs and activities, and generally share ideas about how each district approaches and manages local water quality related issues.

B2.3.6 Prevention of Agriculture Chemical Pollution

The Montana Department of Agriculture (MDA) Ground Water Protection Program has the responsibility of protecting ground water and the environment from impairment or degradation due to the use or misuse of agricultural chemicals (pesticides and fertilizers).

The program ensures the proper and correct use of agricultural chemicals; the management of agricultural chemicals to prevent, minimize, and mitigate their presence in ground water; and provides education and training to agricultural chemical applicators, dealers and the public on groundwater protection, agricultural chemical use and the use of alternative agricultural methods. The program was formed in 1989 and is comprised of groundwater monitoring, education, management plan development, and enforcement.

The MDA is also responsible for the Generic Management Plan (GMP) for the state. 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). Copies may be obtained by request from the Agricultural Sciences Division of the MDA.

Groundwater Monitoring & Education

The MDA conducts ambient groundwater monitoring for agricultural chemicals. The groundwater monitoring program's purpose is to determine whether residues of agricultural chemicals are present in ground water and to assess the likelihood of an agricultural chemical entering ground water. If agricultural chemicals are found in ground water, the MDA is tasked to verify, investigate, and determine an appropriate response to the findings. The department also has an education program under which they conduct initial and re-certification training for commercial and government pesticide applicators. The department staff is available to provide or assist in training and education for the public regarding pesticides.

Groundwater Monitoring

Permanent monitoring wells serve as the foundation from which the MDA looks for current and new agricultural chemicals. The MDA selects sites to be representative of agricultural crops and cropping, as well as their associated pesticide usage. Monitoring wells are located in the following counties: Beaverhead, Blaine, Broadwater, Carbon, Chouteau, Daniels, Dawson, Glacier, Hill, Judith Basin, Lake, McCone, Pondera, Richland, Teton, Valley, Wheatland and Yellowstone. The department also evaluates new chemicals when labeled for use in Montana as analytical methods are established.

Fairfield Bench

In 2002, a review of monitoring data on the Fairfield Bench (Teton and Cascade Counties, Sun River Watershed) determined that criteria necessary to implement a Specific Management Plan (SMP) for Imazamethabenz-methyl in ground water had been met, per 4.11.1206 of the Administrative Rules of Montana. In 2005 an evaluation of the SMP concluded that the conditions necessary for mitigation of Imazamethabenz-methyl on the Fairfield Bench had been achieved, and the SMP was repealed in 2006 (Bamber 2006b).

Statewide Groundwater/Pesticide Projects

The MDA Ground Water Protection Program is in its second year of performing statewide groundwater/pesticide characterization projects. The MDA will prioritize watersheds around the state in which to conduct one-year monitoring projects. The Department selects sites based on agricultural setting, soil type, groundwater table, and sampling availability of the wells. These projects provide a snapshot of pesticide and nitrate levels in the ground water, usually associated with a surface water source such as a river system. In 2005, the Department of Agriculture received a grant from EPA to sample the ground water along the Yellowstone River Valley for pesticides and nitrates (MDA 2005). This Lower Yellowstone River Project sampled 22 wells twice during 2005. Wells sampled for this project were located in agricultural settings from Stillwater County to Richland County. The wells are predominantly located within two miles of the Yellowstone River. In 2006, the Department of Agriculture completed the Gallatin Valley Project, which consisted of 26 groundwater wells and 3 surface water sites in the Belgrade, Bozeman, Manhattan, and surrounding area (Bamber 2006a).

Groundwater Enforcement Program

The MDA is responsible for primary enforcement of the Montana Agriculture Chemical Ground Water Protection Act. The DEQ is responsible for adopting water quality standards for agricultural chemicals (pesticides and fertilizers). The MDA ensures compliance by conducting statewide comprehensive

inspections at agricultural chemical users, dealers, and manufacturers, by collecting ground water and soil samples, and by investigating and monitoring incidents and spills that could cause impairment. Where necessary, the MDA implements compliance actions and orders to prevent or remediate agricultural chemical groundwater problems.

B2.3.7 Groundwater and Surface Water Interactions

The Surface Water Treatment Rule (SWTR) was introduced in the 1986 provisions of the federal Safe Drinking Water Act. Surface water sources, or sources influenced by surface water, are subject to additional treatment requirements (i.e. filtration). The SWTR required each state to assess all PWS that utilize ground water to determine whether surface waters influence the water source. The DEQ performed these assessments, under a project known as the Ground Water Under the Direct Influence of Surface Water (GWUDISW) program.

Evidence of surface water influence on ground water was defined under SWTR as:

- Significant occurrence of insects or other macro organisms, algae, or large diameter pathogens such as *Giardia lamblia*, or *Cryptosporidium*; or
- Significant and relatively rapid shifts in water characteristics such as turbidity, temperature, conductivity, or pH, that closely correlates to climatological or surface-water conditions.

The initial step in the GWUDISW program is completion of a preliminary assessment (PA). The PA scores the source based on the source location relative to surface waterbodies and information provided on the driller's log. Accordingly, large numbers of wells far removed from any surface water failed the PA due to lack of a well log. The DEQ completed further assessment on sources that failed the PA. In some instances, the DEQ retained the MBMG to perform a detailed hydrogeologic assessment. These assessments were contracted primarily for spring sources or other complex hydrogeologic situations, in which a detailed study was warranted.

DEQ's evolving database does not currently provide discrete tracking of the GWUDISW program. As of 2005, DEQ has completed roughly 90% of the preliminary assessments. The MBMG completed approximately 45 hydrogeologic assessments on systems that failed the preliminary assessment.

B3.0 MONTANA'S GROUND WATER PROTECTION FRAMEWORK ADAPTED FROM THE *MONTANA GROUND WATER PLAN*

B3.1 BACKGROUND

The *Montana Ground Water Plan* 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 section states: "The DNRC shall formulate and adopt and amend, extend, or add to a comprehensive, coordinated multiple-use water resources plan known as the *State Water Plan*. The *State Water Plan* may be formulated and adopted in sections, these sections corresponding with hydrologic divisions of the state. The *State Water Plan* must set out a progressive program for the conservation, development, and utilization of the state's water resources and propose the most effective means by which these water resources may be applied for the benefit of the people, with due consideration of alternative uses and combinations of uses (MCA 85-1-203)." This effort also

addresses a U.S. Environmental Protection Agency (EPA) recommendation for states to develop a comprehensive groundwater protection program.

Initial work on the *Groundwater Plan* began in 1992. A state Groundwater Planning Committee consisting of 22 groundwater users, regulators, legislators, well drillers, and academicians identified a number of recommendations to assist citizens in preserving Montana's aquifers to sustain current and future beneficial uses. To guide plan formation, informational meetings were held around the state and a survey of almost 1,000 well owners, water interest groups, ground water discharge permit holders, and city and county governments was conducted. After a long hiatus resulting from personnel changes and the reorganization of state government, a newly formed Groundwater Work Group resumed work on the plan in 1998 by building on the information collected by the original planning committee. Comments on the plan were again solicited from members of the public, special interest groups and agency specialists through targeted mailings. To further gauge public sentiment regarding groundwater issues, public meetings were held in major cities around the state. Finally, a series of collaborative editing sessions were held by the Groundwater Work Group to develop consensus language for the Plan's recommendations and implementation provisions.

The Groundwater Plan is divided into three subsections: Protection, Education and Remediation. Each of these subsections presents a series of issues which have been identified through the plan development process.

B3.2 CURRENT CONTEXT

Under the Montana Water Use Act, ground water is defined as "any water that is beneath the ground surface."...

To secure a right to use ground water at a rate greater than 35 gallons per minute (gpm), or more than 10 acre-feet per year (afy), requires a permit from the Montana Department of Natural Resources (DNRC). More than one well or spring linked together also requires a permit if the combined withdrawals exceed 35 gpm or 10 afy. Groundwater use permits for less than 35 gpm or 10 afy, are known as 'exempt permits' because they are generally not subject to the DNRC's nor the Montana Water Court's appropriation review process. For a groundwater use of less than these amounts, an appropriator simply should file a notice of completion with DNRC within 60 days of developing a well or spring. The applicant will then receive a water use certificate. These permits and certificates secure the appropriator's right to use ground water. All well drillers are required to comply with construction standards adopted by the Board of Water Well Contractors and to submit a well log for each new well to the Department of Natural Resources and Conservation.

Across Montana, spills, improper waste disposal, and certain land use practices have caused groundwater contamination. The Montana Water Quality Act (75-5-101 through 641, MCA) is designed to protect, maintain, and improve the quality of Montana's water resources. Contained within the Water Quality Act are provisions to prevent degradation of water quality and to protect beneficial uses of state water. Pursuant to the Water Quality Act, the Board of Environmental Review must establish classifications for all state waters and establish water quality standards to protect human health and the environment. A permit system is also administered under the Water Quality Act to control discharges of contaminants to surface water and ground water. In addition to the Water Quality Act, other statutes that include water quality protection provisions have been passed. These include laws to control mineral extraction and processing, hazardous and solid waste management, underground storage tank

installation and monitoring, pesticide and fertilizer management, and municipal and domestic sewage disposal. Any of these activities may threaten the quality of ground water.

Unanticipated spills and releases may cause contamination of ground water at almost any location in Montana, particularly along transportation routes. Abandoned or inactive sites where ground water is contaminated or where wastes have been improperly disposed are being discovered in many locations. Attention at the state level has historically focused on ground water pollution from mining and industry, sewage and improper animal waste management, and certain farming practices which cause saline seeps.

Montana's population relies heavily on ground water. Ground water is the primary source of drinking water for rural domestic water supply as well as public water systems (greater than 90% for both categories). In most cases Montanans enjoy a wholesome and plentiful supply of ground water; however, recent recognition at the state level of the connections between ground water and surface water has sparked debate on the viability of the less than 35 gpm or 10 afy 'exempt' groundwater permits. This debate is primarily centered on water rights and uses in Montana's closed surface water basins. Where ground water has been contaminated, the public has become increasingly aware that the cost of clean-up generally exceeds the financial ability of most communities and state government. Therefore, along with enforcing the law, citizens need new ways to prevent groundwater contamination and to protect this vital resource.

B3.3 POLICY STATEMENT

It is the policy and practice of Montana to protect and improve the quality and quantity of its groundwater resources. The *Montana Ground Water Plan* sets forth recommendations for improving public and private management of the state's ground water with a goal of sustaining current and future uses.

B3.4 GROUNDWATER ISSUES, POLICIES, AND RECOMMENDATIONS

B3.4.1 Groundwater Protection Strategy

Goal: To protect and improve the quality and quantity of Montana's groundwater resources in order to sustain current and future uses and to protect public health.

Purpose: To provide government, businesses, and individuals with the best possible information and guidance for making decisions that protect and improve Montana's ground water.

Since 1986, the state has made considerable progress in establishing programs to protect ground water. **Attachment B-1** is a current listing of groundwater and protection-related programs within the state.

Issue 1-Ground Water Resources and Uses: Inventory, classify, and monitor ground water to determine existing conditions.

Because available data indicate that a number of Montana's surface water basins are over appropriated, the Montana Legislature closed several of them to future appropriations. These river basins include the Upper Missouri, Jefferson, Madison, Teton, Upper Clark Fork, Beaverhead and Red Rock. As a result of these surface water closures, and surface water shortages elsewhere, more people are turning to ground water to satisfy their water needs. The state should ensure that these ground water

appropriations do not adversely affect surface water flows or uses. Baseline information on the status of groundwater resources is needed to protect groundwater quality, to sustain groundwater supplies, to make better groundwater management decisions, and to define the role surface water interaction plays in groundwater quality and availability. Montana does not yet have comprehensive information on the quality and quantity of its ground water.

Issue 2--Sources of Pollution: Identify those activities and substances; including naturally occurring substances that pollute ground water in Montana.

To help identify and track groundwater contaminants, site information collected by federal, state, and local agencies should be available and linked through the Natural Resource Information System for ready access and comparison. In addition, those activities that affect the flow or chemical characteristics of ground water should be determined. Similarly, the biological components of ground water need better definition.

Saline ground and surface water are gradually developing over the Northern Great Plains as a result of annual cropping systems and less dependence on perennial forage. The salts are naturally present in the ground water from the native bedrock and overlying soil. Land use management redistributes the salt load, bringing it closer to the surface and/or into solution in the locally derived water table. The same land use management practices responsible for inducing saline seep, in some instances, have also been linked to elevated levels of soil organic nitrogen in shallow ground water.

Issue 3--Management and Protection: Help Montanans protect the state's ground water.

Improved management practices are needed to protect the state's ground water from contamination. Knowingly or unknowingly, Montanans have the potential to degrade ground water through many activities in their daily lives. This may occur directly through routine sewage disposal practices or accidental leaks and spills, or more indirectly by use or handling of toxic or potentially contaminating materials on the land surface. Industrial sites, animal confinement facilities, and even certain agricultural activities may contaminate ground water. Pathways that provide direct routes for contaminant flow to ground water include exploratory well drilling, water well construction, gravel pit excavation,] and seismic exploration activities. Existing land use practices and the conversion of agricultural land to residential land, coupled with inadequate completion of domestic drinking water wells and improperly functioning on-site wastewater treatment systems, are significantly affecting ground water in some areas of Montana. Improved water management through land use changes in dry land and irrigated agriculture, as well as comprehensive land-use planning] are needed to [protect groundwater quality.

Individuals, watershed groups, and other water users should be encouraged to define and protect local ground water resources. Citizen participation in the state's groundwater permitting process is one means to accomplish this. Strategies need to be developed to strengthen the ability of local and state agencies to effectively and proactively implement groundwater protection programs. Creation of Local Water Quality Districts is one way to accomplish this. Government should provide technical support and information to the public to prepare them to address groundwater issues. There is a need for better coordination and systematic evaluation of the many groundwater protection programs dispersed among various federal, state and local agencies. Consistent enforcement and administration of statutes intended to protect ground water is necessary for the public to have confidence in existing regulatory programs.

B3.4.2 Groundwater Education Strategy

Goal: To engage Montanans of all ages in action (personally or publicly) that supports the wise use, management and protection of ground water.

Purpose: To develop and support effective groundwater education strategies and programs that includes information, training, and action.

Education is critical for protecting ground water. Groundwater protection requires pollution prevention. This can only be accomplished by people who are aware of the effects their actions have on ground water. Groundwater education and outreach strategies should address subject familiarity, knowledge barriers and motivation to behavior changes. Informational materials, education, technical assistance, and training on basic groundwater laws, characteristics, and processes are essential prerequisites to successful groundwater policy implementation. This subsection of the *Montana Ground Water Plan* identifies educational assistance and information necessary to effectively implement all components of this plan.

Issue 4--Public Awareness: Expand public awareness of ground water.

Many Montanans may not be aware that more than 50 percent of Montana's domestic water comes from groundwater sources, and that individual actions can pollute those sources. There is a real need to expand public awareness of issues related to ground water. Activities that were once considered harmless are now known to threaten ground water (for example, septic systems, agricultural runoff, and using waste oil for dust suppression). Citizens should know that ground water is a valuable resource; that it can be overused or permanently contaminated; that the costs of pollution clean-up can be prohibitive, and in some cases, infeasible; and that pollution prevention is easier than clean-up.

Several groundwater education programs have the goal of elevating public awareness and understanding of ground water. For example, Project WET (Water Education for Teachers), Local Water Quality Districts, and the Montana Watercourse's "Know Your Watershed" workshops all provide community education opportunities that include general groundwater information.

Issue 5--Understanding and Making Knowledge: Increase public knowledge of groundwater characteristics and processes, and prepare citizens to take positive action to protect and enhance Montana's ground water.

A basic knowledge and understanding of ground water is necessary to make informed personal and public choices about groundwater use and management, and to avoid land use practices that can adversely impact aquifers. Ground water education and information resources should target audiences (for example, agricultural interests, private well-owners and septic system owners) to prepare citizens to protect ground water and to manage their systems responsibly. Groundwater seminars should be conducted for city and county decision makers to equip local leaders with the knowledge they need to institute appropriate protection strategies. Citizens who understand the economic, ecological, and health costs of contaminated ground water, who know that clean-up of ground water can be prohibitively expensive, and who see the connection between conservative uses of ground water and a sustained supply, are citizens prepared for responsible management of groundwater resources.

A number of groundwater education programs in Montana, currently work to improve public understanding and knowledge of groundwater attributes and processes. **Attachment B-2** identifies existing groundwater education programs in Montana. The ongoing work of the Montana Bureau of Mines and Geology's Ground-Water Assessment Program contributes valuable information, data, and interpretations that can only strengthen these educational programs. Additionally, the State Library has available through the Natural Resource Information System, a Montana Groundwater Atlas showing the state's major aquifer systems. It is critical that these efforts receive financial support to ensure their effectiveness in realizing this plan's recommendations.

Issue 6--Technical Assistance, Training, and Action: Enhance Montanans' abilities to take action to prevent contamination and to clean-up contaminated ground water.

Montanans will benefit from ready access to technical assistance and training that will enhance their skills and abilities to use current technology to prevent pollution and clean-up contaminated ground water. A variety of programs exist in Montana which provide training and technical assistance for targeted audiences (see **Attachment B-2** for listing). Water and wastewater operators, specifically, have access to technical training and assistance through several programs. The Montana Rural Water Systems offers information for city governments about wellhead protection, and provides classes on wellhead protection and well construction for interested citizens, local officials, water and wastewater operators, and others. The Department of Environmental Quality's Source Water Protection ... Program offers a voluntary program emphasizing local assessment, education, and training for professionals working with drinking water systems to protect public water supplies. Existing programs should be funded and actively coordinated to assure their continued effectiveness.

B3.4.3 Groundwater Remediation Strategy

Goal: To eliminate or reduce harmful impacts to human health and the environment posed by groundwater contamination.

Purpose: To coordinate regulatory activities to effectively address clean-up of groundwater contamination.

Legislation passed in the last twenty-five years established or enhanced a variety of regulatory programs for solid waste landfills, underground fuel storage tanks, mines, agricultural chemicals, and other sources of pollution. Due to pollution liability concerns, property assessments to document the degree of contamination that may be present at a site are standard for commercial property sales. As a result of increased regulatory requirements, as well as heightened public awareness about pollution, numerous sites with ground water contamination have been discovered in Montana. This section of the *Montana Ground Water Plan* is intended to ensure that responsible and appropriate action is taken at those sites.

Issue 7 ---Administration and Standards: Ensure compliance with Montana and federal environmental regulations and standards to accomplish site clean-up consistently and thoroughly.

Administrative procedures and clean-up standards differ under Montana's various environmental laws. Actions that responsible parties are required to undertake in the event of a pollutant release should be dependent upon the severity of the threat to human health and the environment. Currently, clean-up actions are dictated by which regulatory program has jurisdiction over the pollutant release. For example, a spill of an herbicide could result in multiple violations of environmental regulations including,

but not limited to: the Montana Water Quality Act, Montana Pesticides Act, Montana Agricultural Chemical Ground Water Protection Act, Resource Conservation and Recovery Act, Comprehensive Environmental Cleanup and Responsibility Act, and Metal Mine Reclamation Act. Although these laws serve to protect human health and the environment, they must be implemented effectively and more consistently.

Issue 8 ---Inventory and Characterize Contaminated Sites: Develop a system to identify, catalog, and characterize contaminated sites in order to focus the state’s resources.

Montana does not have a comprehensive inventory system to track the location or to evaluate the status of contaminated sites. An inventory system would benefit potential property buyers or existing property owners by making it easier, through contact with one system, to determine if any state agencies have identified existing or potential pollution at a particular site. The state cannot ensure compliance and oversee clean-up at all sites, therefore, a comprehensive inventory would assist agencies in determining the severity of pollution at specific locations relative to other sites for prioritization purposes.

The Natural Resource Information System’s (NRIS) online library, **The Water Information System**, serves as the entry portal to various digital ground water databases managed by many state agencies, as well as data from some local and federal agencies. Contaminated sites monitored by DEQ’s Remediation Division are available on NRIS.

Issue 9---Research and Technology: Support waste recycling and new pollution clean-up and containment methods.

Montana’s citizens and remediation programs would benefit from new research and methods for groundwater clean-up. Research and the development and implementation of new technologies are necessary steps to solving pollution problems that exist today and preventing pollution in the future. Developing new technologies and new solutions requires some risk that must be balanced with the potential benefits of the new technologies.

Recent national and international research on the fate and transport of Non-Aqueous Phase Liquids (NAPLs), and in particular Dense Non-Aqueous Phase Liquids (DNAPLs), (i.e. chlorinated solvents, such as trichloroethylene), has revealed that these contaminants behave quite differently than ‘traditional’, more soluble groundwater pollutants (i.e. many metal and nitrogen compounds). The state should ensure that monitoring and remediation of NAPL sources complies with findings of the most current technologies.

B4.0 MONTANA’S 319 GROUNDWATER RESTORATION FUNDING STRATEGY

Following is an overview of Montana’s administration of EPA’s Nonpoint Source Grant Program, competitive ‘Section 319 grants’, for Watershed Restoration and provides new direction to the *Montana Ground Water Plan* as well as to future grant announcements for the distribution of these funds. Montana’s Nonpoint Source Program is responsible for administering the competitive 319 grant program. Groundwater Protection/Restoration typically has been one of three categories selected for

the award of competitive 319 grant funds. Beginning in 2012, 319 groundwater restoration activities will be funded through the watershed restoration category, and 319 groundwater protection efforts will be funded through the Education and Outreach grant category.

Each year usually in early summer, DEQ publicly solicits 319 grant proposals that are intended to meet the specific non-regulatory objective of DEQ's Water Quality Planning Bureau: voluntary compliance in the control of nonpoint pollution sources. The 319 grant criteria favor endeavors that support the most effective and highest priority projects, for protecting and restoring state waters from nonpoint source pollution. Multiple stakeholder partnerships and/or statewide implications for proposed project activities strengthens a grant application.

The grant criteria specifically request proposals for on-the-ground activities that will result in measurable improvements in water quality from nonpoint source pollution. Additional grant requirements typically include project monitoring activities and publicizing results. Section 319 monies for groundwater are intended to fund projects which implement the strategies outlined in the *Montana Nonpoint Source Management Plan*.

319 Watershed Restoration grant proposals that carry out groundwater quality recommendations from initiated and/or completed TMDLs will receive priority for funding. Given that TMDLs target surface water quality and that the majority of state water quality standards are enforceable for surface waters, 319 Watershed Restoration groundwater projects must demonstrate the connection between groundwater and surface water quality within a proposed project area. When data are limited, grant applicants may hypothesize what the groundwater connection is to surface water quality. Alternatively, if the proposed 319 Watershed Restoration project targets a PWS, the health effect(s) of the identified potential contaminants must be discussed.

Section 319 groundwater grant applications not meeting the above priorities will be considered case by case, depending on project water quality concerns, stakeholder interest, and progress towards achieving the protection, maintenance, and improvement of the quality of Montana's water resources threatened or degraded by nonpoint source pollution.

Because more emphasis is being placed on interrelated groundwater- and surface water quality effects in areas where population is growing rapidly (i.e., impairments from decentralized on-site wastewater treatment systems and stormwater runoff), we hope that innovative Section 319 project ideas will be initiated. Examples include creating septic system maintenance districts, and, where possible, converting from individual septic systems to community treatment systems that use technologies such as tertiary wastewater treatment by constructed wetlands and other low impact development concepts. Grant applicants are encouraged to look into DEQ's Water Pollution Control State Revolving Fund (WPCSRF) Loan Program's category for Nonpoint Source Projects as a source of low-interest loan match for 319 funding (40% required).

Members of the Groundwater Work Group of the Montana Watershed Coordination Council (MWCC) will be encouraged to review and provide input for strengthening Section 319 groundwater project proposals during the draft review phase. Interested Groundwater Work Group members will also be invited to attend the public presentations of the final project applications.

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ATTACHMENT B-1. MONTANA GROUNDWATER PROTECTION RELATED PROGRAMS, ACTIVITIES, LEGISLATION, AND IMPLEMENTING AGENCIES

Montana Ground Water Protection Related Programs, Activities, Legislation, and Implementing Agencies

(Updated from the Montana Ground Water Plan in February of 2007 by the MWCC Groundwater Work Group)

Programs or Activities or Title of Legislation	What it Does	Legislation	Responsible State Agency
Abandoned Mine Reclamation	Uses federal funds to clean up abandoned mines operated prior to the 1970's.	Title 82, Chapter 4 MCA	DEQ Remediation Division Mine Waste Cleanup Bureau
Agricultural Chemical Ground Water Protection Act	Requires response to pesticide contamination in ground water. MOU describes what activities MDA/DEQ are responsible for implementing.	Title 80, Chapter 15, Part 1 MCA	MDA Agricultural Sciences Div.- Technical Services Bureau & DEQ PPA Div - Water Quality Planning Bureau
Ambient Ground Water Monitoring System (see Ground Water Assessment Act)			
Aquifer Vulnerability Assessment (see Ground Water Assessment Act)			
Aquifer Mapping (see Ground Water Assessment Act)			
Aquifer Characterization (see Ground Water Assessment Act)			
Board of Water Well Contractors A.K.A. Well driller rules	Establishes mandatory water well construction standards and minimum monitoring well construction standards. Mediates disputes between water well contractors and their customers.	Title 37, Chapter 43 MCA; Title 36, Chapter 21 ARM	DNRC Water Resources Division, Water Operations Bureau
Cesspool, Septic Tank and Privy Cleaners Act	Regulates the pumping and disposal of certain wastes. Approves land application sites.	Title 37, Chapter 41, Part 1 MCA	DEQ Permitting and Compliance Div. (PCD) Community Assistance Bur.
Coal Mine Hydrogeology and Coalbed Methane	Ground water and coal data related to coal strip mining and coalbed methane.		Montana Bureau of Mines and Geology (MBMG) at Montana Tech of UM
Comprehensive Environmental Cleanup & Responsibility Act (CECRA) A.K.A. Montana Superfund	Requires liable parties to clean up hazardous substances.	Title 75, Chapter 10, Part 7 MCA	DEQ Remediation Div Hazardous Waste Site Cleanup Bur. & Mine Waste Cleanup Bureau

Montana Ground Water Protection Related Programs, Activities, Legislation, and Implementing Agencies

(Updated from the Montana Ground Water Plan in February of 2007 by the MWCC Groundwater Work Group)

Programs or Activities or Title of Legislation	What it Does	Legislation	Responsible State Agency
Comprehensive Environmental Response, Compensation, & Liability Act (CERCLA) A.K.A. Federal Superfund	Requires liable parties to clean up hazardous substances. State participates through cooperative agreement with EPA.	Title 75, Chapter 10 Part 6 MCA	DEQ Remediation Div Hazardous Waste Site Cleanup Bur. & Mine Waste Cleanup Bureau
Drinking Water State Revolving Loan Fund	Establishes revolving loan program for PWSs.	Title 75, Chapter 6, Part 2 MCA	DEQ Planning Prevention, and Assistance Div, Technical and Financial Bureau; and DNRC CARDD
Environmental Policy Act	Establishes state policy protecting right to use property and to promote efforts to prevent environmental damage.	Title 75, Chapter 1, Part 1 MCA	DEQ Director's Office
Federal Superfund - CERCLA (see Comprehensive Environmental Response, Compensation & Liability Act)			DEQ Remediation Division
Generic Pesticide State Management Plan (see Agricultural Chemical Ground Water Protection Act)			
Geologic Mapping	Mapping of bedrock and surficial deposits at various scales throughout the state.		Montana Bureau of Mines and Geology (MBMG) at Montana Tech of UM
Ground water appropriations (see Water Rights)			
Ground Water Controlled Area (see also Water rights)	Establishes surface area boundaries of area from which ground water withdrawal is regulated. Can be based on ground water quantity or quality.	Title 85, Chapter 2 MCA	DNRC, Water Resources Division, Water Management Bureau
Ground Water Discharge Permits (see Ground Water Pollution Control System)			
Ground water best management practices (see Agricultural Chemical Ground Water Protection Act and Water Quality Protection Practices)			

Montana Ground Water Protection Related Programs, Activities, Legislation, and Implementing Agencies

(Updated from the Montana Ground Water Plan in February of 2007 by the MWCC Groundwater Work Group)

Programs or Activities or Title of Legislation	What it Does	Legislation	Responsible State Agency
Ground Water Use Legislation (see Water Rights)			
Ground water standards & classifications (see Ground Water Pollution Control System)			
Ground Water Assessment Act	Establishes comprehensive program to assess and monitor state ground water resources.	Title 85, Chapter 2, Part 9 MCA	Montana Bureau of Mines and Geology (MBMG) at Montana Tech of UM
Ground Water Plan (see State Water Plan)			
Ground Water Pollution Control System (MGWPCS)	Establishes ground water standards and permit requirements for discharges into ground waters. Also states emergency powers of DEQ/what RPS must do in the event of a spill.	ARM 17, Chapter 30, Subchapter 10	DEQ PCD, Water Protection Bureau
			Remediation Division, Site Response Section
Groundwater Remediation Program	Oversees and enforces clean up of groundwater and soils that fall under the jurisdiction of the Water Quality Act.	Title 75, Chapter 5 MCA	DEQ-Remediation Division, Site Response Section
Hazardous Waste Management Act	Regulates hazardous material management	Title 75, Chapter 10, Part 4 MCA	DEQ Permitting & Compliance Division, Hazardous Waste Bureau
Interagency Coordination for Groundwater Protection Initiatives Not certain if this is still in existence	Establishes agreement between resource management agencies to ensure cooperation.	formalized by Memorandum of Understanding (MOU)	DNRC, DEQ, MDA
Local Water Quality Districts	Authorizes/describes establishment of LWQD.	Title 7, Chapter 13, Part 45 MCA	DEQ Planning, Prevention, and Assistance Div (PPAD), Pollution Prevention Bur., and local government
Major Facility Siting Act	Establishes policy to ensure power generation or conversion facilities do not produce adverse environmental impacts.	Title 75, Chapter 20, Part 1 MCA	DEQ PCD, Environmental Management Bureau
Metal Mine Reclamation Act (see Mine Reclamation)			
Mine Reclamation	Establishes siting and reclamation requirements for coal, metal, and aggregate mining.	Title 82, Chapter 4 MCA	DEQ PCD, Environmental Management Bureau and Industrial & Energy Minerals Bureau

Montana Ground Water Protection Related Programs, Activities, Legislation, and Implementing Agencies

(Updated from the Montana Ground Water Plan in February of 2007 by the MWCC Groundwater Work Group)

Programs or Activities or Title of Legislation	What it Does	Legislation	Responsible State Agency
Mining and Minerals	Geologic, mineralogic, and environmental (water and soils) data related to hard rock mining.		Montana Bureau of Mines and Geology (MBMG) at Montana Tech of UM
Nondegradation Policy and Criteria for Determining Non-significance	Prohibits degradation of high quality state waters.	ARM 17, Chapter 30, sub-chapter 7	DEQ PCD Water Protection Bureau; PPAD Water Quality Planning Bur.
Oil and gas exploration and development permits	Establishes permit system for exploration.	Title 82, Chapter 1 MCA	DNRC Oil and Gas Conservation Div.
Nonpoint Source Program A.K.A. 319 Program	Encourages the implementation of voluntary pollution control activities, provides technical guidance, and match for local funding through administration of the EPA's 319 Nonpoint Source Grant Program.	Title 75, Chapter 5, Part 7 MCA	DEQ Water Quality Planning Bureau
Open Cut Mining Act (see Mine Reclamation)			
Petroleum Storage Tank Cleanup	Establishes procedures for investigation and remediation at petroleum releases.	Title 75, Chapter 11, Part 3 MCA	DEQ Remediation Div., Hazardous Waste Site Cleanup Bur.
Petroleum Tank Release Cleanup Fund	Authorizes funding mechanism to clean up leak sites.	Title 75, Chapter 11, Part 3	Petroleum Tank Release Compensation Board (administratively attached to DEQ)
Pollution Prevention Program	Provides pollution prevention technical assistance and information.	N/A	Montana State University Extension Service P2 Program
Public Water Supply and Wastewater System Program	Establishes minimum standards for construction and operation of public systems.	Title 75, Chapter 6 MCA	DEQ Permitting and Compliance Div., Public Water Supply & Subdivisions Bureau
Reclamation and Development Grant Program	Provides funding for reclamation of mined areas, identification and repair of hazardous waste sites, and research.	Title 90, Chapter 2 MCA	DNRC Conservation and Resource Development Division (CARDD)
Renewable Resource Development Grant	Provides funding to protect, conserve, or develop renewable resources including water.	Title 85, Chapter 1 MCA	DNRC CARDD
Resource Conservation and Recovery Act (RCRA)	Montana has primacy for implementation of the Act that regulates hazardous materials.	42 U.S. C.A. Section 6901 et seq.	DEQ Permitting & Compliance Division
Resource Indemnity Trust	Source of funds for clean up of contaminated sites.	Title 15, Chapter 38, Part 2 MCA	DNRC CARDD
Salinity Control	Inventories saline sites and provides technical assistance, works closely with USDA NRCS and local CDs.	N/A	Montana Salinity Control Association (MSCA); and DNRC CARDD

Montana Ground Water Protection Related Programs, Activities, Legislation, and Implementing Agencies

(Updated from the Montana Ground Water Plan in February of 2007 by the MWCC Groundwater Work Group)

Programs or Activities or Title of Legislation	What it Does	Legislation	Responsible State Agency
Sanitation in Subdivisions Act	Establishes policy to control water supply and sewage disposal at subdivisions.	Title 76, Chapter 4, Part 1 MCA	DEQ Permitting and Compliance Division, Public Water and Subdivision Bur.
SARA Title III Program (see Comprehensive Environmental Cleanup & Responsibility Act)	This is the Superfund Amendments and Reauthorization Act.		
Septic System Standards	Establishes policy to require county board of health regulations establish minimum standards for on-site sewage treatment systems.	Title 50, Chapter 2, Part 1 MCA	Local and county health departments
Small Business Assistance Program	Provides pollution prevention technical assistance and market development for MT businesses.	Federal Clean Air Act 42 USCA Section 507	DEQ Planning, Prevention and Assistance Div, Pollution Prevention Bureau
Solid Waste Management Act	Establishes authority to regulate solid waste management systems; sets goals for waste reduction in Montana. Program approved by EPA.	Title 75, Chapter 10, Part 2 MCA	DEQ Permitting and Compliance Division, Waste & Underground Tank Management Bureau
Source Water (Wellhead) Protection Program	Authorizes implementation of Montana Wellhead Protection Program.	Title 75, Chapter 6 MCA	DEQ Planning, Prevention, and Assistance Div., Technical, Financial, and Assistance Bur. (TFAB)
Source Water Assessment Program	Establishes procedures to delineate and assess the source of water used by PWS.	Title 42, Chapter 6A, Sub-chapter XII, Part E	DEQ Planning, Prevention, and Assistance Div., TFAB
State Superfund - CECRA (see Comprehensive Environmental Cleanup & Responsibility Act)			
State Water Plan	Directs DNRC to prepare continuing comprehensive inventory of water resources and develop management plan.	Title 85, Chapter 1, Part 2 MCA	DNRC, Water Resources Div.
Storm Water Discharge Permit (see Montana Pollutant Discharge Elimination System)			
Strip and Underground Mine Siting Act (see Mine Reclamation)			

Montana Ground Water Protection Related Programs, Activities, Legislation, and Implementing Agencies

(Updated from the Montana Ground Water Plan in February of 2007 by the MWCC Groundwater Work Group)

Programs or Activities or Title of Legislation	What it Does	Legislation	Responsible State Agency
Subdivision and Platting Act	Establishes policy to require minimum standards for plats, and to ensure subdivisions are in the public interest.	Title 76, Chapter 3, Part 1 MCA	local government
Underground Storage Tank Act	Establishes minimum standards for tank installation, operation, and maintenance.	Title 75, Chapter 11, Part 5 MCA	DEQ PCD, Waste & Underground Tank Management Bur.
Underground Injection Control Program	State has primacy to regulate waste injection associated with oil/gas production A.K.A. Class II Injection Wells. All other classes are regulated by U.S. EPA.	Federal Safe Drinking Water Act, Part C	DNRC Oil and Gas Conservation Div., & Montana office of U.S. EPA
Water Pollution Control State Revolving Fund	Establishes revolving loan program for wastewater and nonpoint source pollution control projects.	Title 75, Chapter 5, Part 11 MCA	DEQ Planning, Prevention and Assistance Div., TFAB, and DNRC
Water Rights	Establishes policy and authority to manage water rights through permit system and adjudication process and system to reserve water for future use.	Title 85, Chapter 2 MCA	DNRC, Water Resources Div.
Water and Wastewater Operators Certification	Establishes program to ensure certification and continuing education of operators of public systems.	Title 37, Chapter 42 MCA	DEQ Permitting and Compliance Div., Operator Certification Program
Water Quality Act	Establishes authority to protect, maintain, and improve water quality.	Title 75, Chapter 5 MCA	DEQ Enforcement Division & Remediation Division
Water Quality Protection Practices	Describes activities or procedures that protect water quality.	Title 75, Chapter 5, Part 1 MCA	DEQ Planning, Prevention, and Assistance Div., Water Quality Planning Bur.
Water Well Standards - Generally (see also Board of Water Well Contractors)	Establishes mandatory construction standards for water wells.	Title 37, Chapter 43 MCA; Title 36, Chapter 21 ARM	DNRC Water Operations Bur. Water Resources Div.
Water Well Standards - Public Water Supply	Establishes mandatory construction standards for water wells serving as public water supplies.	Title 37, Chapter 43 MCA	DEQ PCD, Public Water Supply Program

ATTACHMENT B-2. GROUNDWATER EDUCATION PROGRAMS IN MONTANA

(Updated from the *Montana Ground Water Plan* in May of 2007)

BUREAU OF LAND MANAGEMENT

The Bureau of Land Management (BLM) is a cooperator in the Montana Ground Water Assessment Program and is represented on the advisory and technical committees. BLM funds monitoring of groundwater quantity and quality effects from coal mining, studies on groundwater availability and aquifer impacts from flowing wells. BLM also conducts groundwater education for schools and at fairs utilizing a groundwater demonstration trunk. <http://www.blm.gov/mt/st/en.html>

COMMERCIAL AND GOVERNMENTAL PESTICIDE APPLICATOR RECERTIFICATION TRAINING

(Montana Department of Agriculture)

All commercial and governmental pesticide applicators must participate in training courses to obtain 12 credit hours of educational information in a four year period or take a re-examination to maintain an applicator license. Training courses includes information on protecting ground and surface water quality from pesticide contamination. (Contact: Dan Sullivan 444-3731) <http://www.agr.state.mt.us/licensing/commercialapp.asp>

COUNTY CONSERVATION DISTRICTS

Conservation Districts provide for the conservation and wise use of soil and water resources, including groundwater. Districts address resource management needs locally through educational activities and projects; including workshops, classroom programs, resource tours, demonstration projects, public forums, resource assessments, and conservation projects. Districts acquire technical and financial assistance from state, federal and private sources to address local natural resource management issues. There are 58 Conservation Districts in Montana. (Contact: County Conservation District or the Montana Association of Conservation Districts 443-5711) <http://www.macdnet.org/>

LOCAL WATER QUALITY DISTRICT PROGRAMS

Local Water Quality Districts (LWQD) are defined areas established to protect, maintain and improve the quality of state ground and surface water for human health and the environment. The Montana Dept. of Environmental Quality provides support to LWQD programs, but does not have an active management role in their activities. To date, districts have been formed in Missoula, Lewis and Clark, Silver Bow, and Gallatin counties. These groups serve as local government districts with a governing board of directors, and funding obtained from fees collected annually with county taxes, similar to funding mechanisms for other county districts. (Contact: Joe Meek 444-4806) <http://www.deq.mt.gov/wqinfo/swp/LocalWQDistricts.asp>

Butte-Silver Bow County Water Quality Protection District

The Butte-Silver Bow Water Quality District program addresses the largest Superfund site in the United States. The area covered by the program is the largest of the water quality districts at 720 square miles. Through the district, the program hopes to assume direct control for the protection of surface and groundwater. Additionally, the district hopes to control the use of contaminated water that is a threat to human health. District objectives include:

- Pursue water quality research and monitoring activities
- Develop a long-term water quality management plan
- Protect water quality and prevent pollution
- Institute a comprehensive education program
- Integrate with existing local, state, and federal programs

(Contact: Rick Larson 497-5020)

<http://water.montana.edu/topics/quality/districts/butte.htm>

Gallatin Local Water Quality District

The Gallatin Local Water Quality District covers the middle third of Gallatin County encompassing 815 square miles. The focus of the District is on water resources education and water quality monitoring for increased awareness of water-related issues and public health. District objectives include:

- Provide answers to citizen's questions related to water issues.
- Serve as a clearinghouse for water resources information.
- Assist citizens with contacting other agencies and organizations.
- Foster stewardship and increase public awareness of water resource issues within the District.
- Maintain a long-term water quality and quantity monitoring network for collecting scientific data on local water resources.
- Partner with local groups, organizations, and governmental agencies to create a solid information network on water resource issues.

(Contact: Alan English or Tammy Crone 582-3148)

http://www.gallatin.mt.gov/Public_Documents/gallatincomt_wqdpages/lwqd

Lewis and Clark County Water Quality Protection District

The Water Quality Protection District was created in July 1992 with the mission: To preserve, protect and improve water quality within District boundaries. District objectives include:

- Characterize the nature and extent of District water resources.
- Respond to citizens' concerns about water quality problems.
- Educate the Public about Local Water Issues.
- Facilitate planning for the prudent use of our municipal watersheds.
- Develop and implement water quality protection projects

(Contact: Kathy Moore 457-8926) <http://www.co.lewis-clark.mt.us/index.php?id=56>

Missoula Valley Water Quality District

The Missoula Valley Water Quality District was created by resolution of the Missoula Board of County Commissioners in January, 1993 and began operations in July, 1993. District goals include:

- Monitoring and water quality research to assess and prioritize water quality issues.
- Inspections of businesses regulated under local, state and federal water quality laws.
- Enforcement of state water quality laws and local ordinances.
- Public education on prevention of water pollution.

- Local review of state and federal groundwater cleanup sites.
- Household hazardous waste collection and Conditionally Exempt Small Quantity Generator waste collection event.
- Provision of funds for incentives to connect to public sewer.

(Contact: Peter Nielsen 258-4890) <http://www.co.missoula.mt.us/wq/>

KNOW YOUR WATERSHED WORKSHOPS

(Montana Watercourse, MSU-Montana Water Center)

The Montana Watercourse works with community-based groups to develop custom-designed watershed education workshops on the general theme of "Know Your Watershed." Using a collaborative planning process, local water users and community members develop a workshop content agenda specific to the watershed. Topics covered generally include the characteristics, and management of surface and ground water, and related land resources in the watershed. The workshop goals are: (1) to increase participants' knowledge and understanding of their watershed; (2) to share the facts about water/land use, water quality, surface/groundwater supplies, and the way these are interrelated; (3) to provide an opportunity for public dialogue among all stake holders and community members regarding the many demands and uses of the watershed; (4) to provide information and resources on other watershed planning and management initiatives being used in Montana and the West; and (5) facilitate communication and collaboration among water resource "experts" and communities needing their expertise.

(Contact: Debbie Zarnt 994-1684)

<http://www.mtwatercourse.org>.

HOMEOWNER WELL & SEPTIC SYSTEM OPERATION AND MAINTENANCE WORKSHOPS

(Planning Prevention & Assistance Division, DEQ)

Provides training to homeowners, local governments, realtors, septic system installers, and others on the operation and maintenance of septic systems and wells. (Contact: Joe Meek 444-4806)

http://www.deq.state.mt.us/wqinfo/swp/March_07_promo.pdf

MIDWEST ASSISTANCE PROGRAM, INC.

Midwest Assistance Program (MAP) is a non-profit, technical assistance organization dedicated to helping small, rural communities and other entities find affordable and acceptable solutions to their water, wastewater and solid waste problems. MAP provides on-site technical, development and management assistance to communities. Other entities, such as reservations, mobile home parks, water and sewer districts, and other areas are also beneficiaries of MAP's assistance. (Contact: Paul Torok 449-0332 or Bill Leonard 863-4800)

MONTANA GROUND WATER ASSESSMENT PROGRAM

(MT Bureau of Mines & Geology)

The Legislature established the Ground-Water Assessment Program (85-2-901 et seq.) in 1991 after considering the recommendations of a Ground-Water Task Force organized by the Environmental Quality Council in 1989. Statute specifically requires systematic Ground-Water Monitoring and Ground-Water Characterization to improve understanding of Montana's groundwater resources. (Contact: Tom Patton 496-4153) <http://www.mbm.mtech.edu/grwassessment.htm>

Monitoring Program

The result of the Montana Groundwater Assessment Act, the monitoring program builds-on and expands existing groundwater monitoring in the state. At completion, the monitoring program will establish at least 730 monitoring points in various parts of the state. The wells will be measured quarterly for the long term. Approximately 10 percent of the network will have water-level recorders installed for periods of time of up to three years and the recorders will be rotated periodically to other wells. Ten percent of the wells will be sampled each year to assess long-term changes in water quality. Data are placed in the Ground-Water Information Center and will be available in various GIS coverages.

Ground Water Characterization Program

The Montana Ground-Water Characterization Program will map the distribution and document the water quality and physical properties of the state's aquifers. The Montana Ground Water Assessment Act of 1992 established the characterization program whose purpose is to provide information to help the public and private sectors make decisions on how to manage, protect, and develop Montana's groundwater resources.

Ground Water Information Center

Water-well log, water quality, static-water level and other information related to groundwater is housed at the Information Center and are available to decision-makers and other interested people upon request. Data generated by the Ground-Water Assessment Act, other programs at the Bureau of Mines, and other agencies are also placed in the Information Center. <http://mbmgwic.mtech.edu/>

MONTANA ENVIRONMENTAL TRAINING CENTER (METC) PROGRAMS

A variety of technical training opportunities are provided by METC which either directly or indirectly affects groundwater. Annually, these include Fall Water School at MSU, Spring Water School in Miles City, Cross-Connection Training, Safe Drinking Water Act New Sampling and Monitoring, an Advanced Wastewater Workshop on activated sludge concepts, and Ground Water Protection. METC's goal is to develop and implement effective training and provide technical guidance for water and wastewater operators, water well contractors, and other environmental and public health professionals. (Contact: Gary Hall, METC Coordinator 265-3763) <http://www.msun.edu/grants/metc/>

MONTANA GROUND WATER ATLAS

Using data supplied by the Bureau of Mines & Geology, an atlas is available showing the state's major aquifer systems. A hard copy publication will also be maintained electronically, and will be available over Internet and in electronic format for schools. Data layers in the Atlas can be included in educational programs and packages and distributed to counties that rely on groundwater. <http://nris.mt.gov/wis/mtgwres.htm>

MONTANA MATERIALS EXCHANGE PROGRAM

(MSU Extension Service)

MSU Extension Service Pollution Prevention Program and the Montana Chamber of Commerce. A program to help businesses, government agencies and other organizations exchange waste materials, recyclables and other products. One program goal is to reduce waste deposited at landfills (and thereby

decrease possibilities of groundwater contamination). Includes a bulletin board service. (Contact: Cali Morrison, 994-3451) <http://www.montana.edu/mme/>

MONTANA PESTICIDE EDUCATION & SAFETY PROGRAM

(MSU Extension Service)

All private pesticide applicators must participate in a one-day training every five years in order to maintain their certification. MSU Extension regularly provides the Water Quality section of this training, and this includes information relating to the protection of groundwater quality. (Contact: Cecil Tharp, 994-5067) <http://mtpesticides.org/>

MONTANA RURAL WATER SYSTEMS

Provides training and technical assistance to members running systems for: drinking water, wastewater, and solid waste. Programs include well-head protection and classes on well construction. Membership is open to interested citizens, local officials, tribal nations, water and wastewater operators, and others. (Contact: Montana Rural Water Systems 454-1151) <http://www.mrws.org/>

MONTANA SALINITY CONTROL ASSOCIATION

(MSCA)

A satellite program through the conservation district, MSCA provides groundwater investigation for saline soil and water reclamation. MSCA works on a voluntary basis with individuals and small watershed projects, with a portion of the technical assistance fee-based. In addition to the reclamation plans, MSCA provides BMP education programs to agricultural producers, natural resources staff and other land-use management groups. The state program is based in Conrad. (Contact: Jane Holzer 278-3071) http://dnrc.mt.gov/cardd/consdist/salinity_control.asp

MONTANA WATER INFORMATION SYSTEM

The Montana Water Information System (WIS) is a component of the Natural Resource Information System (NRIS) in the Montana State Library. WIS is a water data clearing house and referral service linking users with the best source of information. The System provides access to all types of water information including data on groundwater, surface water, water quality, precipitation, snowpack, and water rights. WIS staff provides training and technical assistance on how to access sources of groundwater information, and on the use of computer software for reformatting the information to make it more usable. (Contact: 444-5354) <http://nr.is.mt.gov/wi.asp>

MONTANA WATER NEWS

(MSU Water Center)

The explosion of literature regarding water issues and information has made it extremely difficult for the water professional and/or user to keep up with current information. The purpose of Montana Water News newsletter is to provide fresh news about meetings and water topics covering “all things water in Montana”. The public is encouraged to submit relevant information and e-mail subscription services are available. <http://water.montana.edu/resources/news/archives/>

MSU EXTENSION WATER QUALITY PROGRAM

Montana State University is part of the Cooperative State Research, Education, and Extension Service (CSREES) National Water Quality Program. The goal of this program is to protect or improve the quality of water resources throughout the United States and its territories, particularly in agriculturally managed watersheds. Areas of focus include coal bed methane (CBM), household water use, irrigation management, research, and formal education opportunities. (Contact: James Bauder 994-6589) <http://waterquality.montana.edu/>

Coal Bed Methane

This program focuses on CBM research and dissemination of study results. Within the past several decades much emphasis has been placed on issues surrounding the disposal and/or beneficial use of CBM product water; specifically, how CBM product water with a characteristic saline-sodic fingerprint will interact with soil and water resources in coal bed methane/natural gas production areas of Montana and Wyoming. <http://waterquality.montana.edu/docs/methane.shtml>

Household Water Use

This program provides educational resources for household water users, private well owners, septic system owners, and small landowners that promote protection of water resources around the home. Program resources range from basic information on groundwater, drinking water quality and septic system maintenance, to the WELL EDUCATED private homeowner well water analysis program. <http://waterquality.montana.edu/docs/homeowners.shtml>

POLLUTION PREVENTION PROGRAM

(MSU Extension Service)

Non-regulatory, confidential education and technical assistance for Montana's small businesses on air, water, and solid & hazardous waste pollution prevention. Publications, workshops and individual technical assistance help businesses profit by decreasing waste disposal and treatment costs, regulatory oversight and long-term liability and increasing business efficiency and worker safety. Current business focus types include: automotive, dry cleaning, autobody, printing and hotel/motel. In conjunction with the Montana Chamber of Commerce, operates the Montana Materials Exchange for businesses networking to "turn potential waste into savings." (Mike Vogel 994-3451) <http://www.montana.edu/wwwated/>

PROJECT WET MONTANA

(Montana Watercourse)

Project WET (Water Education for Teachers) is a non-profit, interdisciplinary water education program. Every state in the US has a coordinator to enable educators around the country to have access to this program. The program facilitates and promotes awareness, appreciation, knowledge, and stewardship of water resources through educators' workshops, water education materials, watershed tours, and youth water festivals. Training consists of hands-on participation and practice with numerous groundwater teaching activities for K-12 teachers from the Project WET Activity Guide. In addition, most Project WET workshops also have training and practice with the Project WET Montana Ground Water Flow Model Education Trunk. Seven Ground Water Flow Model Education Trunks are available for use by teachers and resource personnel across Montana. Other groundwater materials disseminated by Project WET Montana include numerous pamphlets, informational brochures, posters, and videos supplied by

various local, state and federal agencies. (Contact: Kelly Hayden, Project WET Montana Coordinator at 994-6425) <http://www.projectwet.org/>
<http://www.mtwatercourse.org/Educators/MTPProjectWET.htm>

SOLID WASTE INSTITUTE OF MONTANA (SWIM)

Several Solid Waste Programs relate to and/or address groundwater in Montana. These include Training for Landfill Operators and Local Officials; a Household Hazardous Waste Consumer Education Program; a Municipal & Backyard Composting Education Program; a Precycle Community Education Program; and a Solid Waste Education for Youth program. SWIMNET provides computer access and teleconferencing regarding pollution prevention and includes training, registration, information resources, regulatory issues, special wastes, landfill operations, and source reduction. (Contact: Mike Vogel 994-3451)

SOURCE WATER PROTECTION PROGRAM

(Planning, Prevention and Assistance Division, DEQ)

A voluntary program designed to protect groundwater used for public water supply in Montana from contaminants which may have an adverse effect on human health. Emphasizes local control, education and training for professionals working with drinking water systems. Includes a school-based program for protecting water supply systems located on public school grounds. (Contact: Joe Meek 444-4086)
<http://www.deq.mt.gov/wqinfo/swp/index.asp>

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.

USDA plays a critical role in the sound stewardship of the Nation's land and natural resources. The USDA Natural Resources Conservation Service (NRCS), formerly the Soil Conservation Service, in partnership with local Conservation Districts are involved in many groundwater protection activities:

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

(Contact: State Conservationist, USDA-NRCS, 10 E. Babcock St., Fed. Bldg. Rm 443, Bozeman, MT 59715)
<http://www.mt.nrcs.usda.gov/>

U.S. GEOLOGICAL SURVEY

(USGS)

As the nation's largest earth, science, research and information agency the United States Geological Survey maintains a long tradition of providing "Earth Science in the Public Service." USGS groundwater quality activities fall within this agency's responsibility to provide geologic, topographic and hydrologic information that contributes to the wise management of the nation's water resources and that promotes the health, safety and well-being of the people. (Contact: Director, USGS Montana Water Science Center, 3162 Bozeman Ave, Helena, MT 59601) <http://www.usgs.gov>

USGS Cooperative Water Program

The mission of the USGS Cooperative Water Program is to provide reliable, impartial, and timely information needed to understand the Nation's water resources through a program of shared efforts and funding with State, Tribal, and local partners to enable decision makers to wisely manage the Nation's water resources. <http://water.usgs.gov/coop/>

USGS Ground-Water Resources Program

The mission of the USGS Ground-Water Resources Program is to provide objective scientific information and develop interdisciplinary understanding necessary to help assure the availability of the Nation's groundwater resources. <http://water.usgs.gov/ogw/gwrp/>

WATER/WASTEWATER SCHOOL

A week-long school held several times per year around the state for water and wastewater treatment plant operators and managers and co-sponsored by the Montana Department of Environmental Quality, the Montana Environmental Training Center, and the Montana University System Water Center at MSU. (Bill Bahr, 444-5337 or PWS Section 444-4400) <http://www.deq.state.mt.us/wqinfo/opcert/index.asp>

APPENDIX C - ENTITIES ADDRESSING NONPOINT SOURCE POLLUTION IN MONTANA

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FEDERAL GOVERNMENT AGENCIES

ARMY CORPS OF ENGINEERS

The Department of the Army's regulatory program initially served to protect and maintain the navigable capacity of the Nation's waters; however, Congress has expanded the US Army Corps' regulatory mission to include protection of the nation's aquatic environment.

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 structures (e.g. piers, wharfs, breakwaters, bulkheads, jetties, weirs, and transmission lines); dredging or placement of dredged or fill material, or excavation, filling, or other modifications to the traditionally 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. The ACE reviews watershed and water quality projects in Montana through their permitting process. For example, organizations and individuals proposing work in streams, wetlands, and other waterbodies may fill out a single application form, which is accepted by the ACE along with several local and state agencies. In addition, the Nationwide Permit #27 can be used to authorize wetland creation and wetland and riparian restoration and enhancement projects. Information can be attained at: <http://nwo.usace.army.mil/html/od-rmt/mthome.htm>. The Montana Joint Application form is available at this site, 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 that with water resource related problems where technical planning assistance from the Corps of Engineers would be beneficial.

Additional information about navigating the permitting process may be obtained by contacting a project manager at (406) 441-1375.

BUREAU OF LAND MANAGEMENT

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

In April 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 for the two agencies to work together to maintain and/or improve watershed and riparian health in order to reduce nonpoint source pollution and ultimately 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:

- Review the MOU every five years to keep the objectives and agreements relevant and up to date.

- Review the BLM/DEQ monitoring agreement every five years to ensure that our highest priority needs are being addressed.
- 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 of BMP implementation and effectiveness.

For additional information, please contact Mike Philbin (406) 896-5041.

BUREAU OF RECLAMATION

The Bureau of Reclamation is a contemporary 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 multitude of 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 places great emphasis on fulfilling water delivery obligations, water conservation, water recycling and reuse, and developing partnerships with customers, states, and Native American tribes, and in finding ways to bring together the variety of interests to address the competing needs for our limited water resources.

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

AgriMet: A satellite linked, weather and evapotranspiration (ET) reporting network used to assist irrigators in scheduling irrigation applications. Growers use the system's data along with field examinations to determine when and how much water is required for optimum crop growth.

Hydromet Data System: A network of automated hydrologic and meteorologic monitoring stations that collects remote field data and transmits it via satellite to provide real time water management capability. Other available information is integrated with Hydromet data to provide streamflow forecasting and current runoff conditions for river and reservoir operations.

Water Conservation Field Services Program (WCFSP): Provides technical and financial assistance for water conservation planning, water conservation education and training, demonstration of innovative conservation technologies, and implementation of water conservation measures. The WCFSP is designed to fit local needs and to complement and support other federal, state, tribal, and local water conservation efforts.

Drought Program: The Reclamation States Emergency Drought Relief Act of 1991 (P.L. 102-250), authorizes Reclamation to work with state, local and tribal entities to identify and fund emergency drought projects throughout Montana. Reclamation and the project sponsors may

undertake temporary measures to minimize or mitigate drought damages or losses and assist in the development, modification, or updating of cooperative drought contingency plans.

Western Water Initiative Challenge Grant Program: Reclamation provides 50/50 cost share funding to irrigation and water districts and states for projects focused on water conservation, efficiency, and water marketing. The focus is on projects that can be completed within 24 months that will help to prevent water crises.

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

Region 8 of the U.S. Environmental Protection Agency (EPA) consists of six states (Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming) and 27 Tribal Nations. EPA Region 8 is responsible for implementing water programs to protect the public and the environment by assessing, preventing, reducing, and regulating contamination of surface water and groundwater. 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.

Nonpoint Source Pollution and the Watershed Approach

At EPA, the Water Resource Protection Unit contains a six-member Watershed Team, one person for each state in the Region which administers the Nonpoint Source Grant Program, authorized through Section 319h of the Clean Water Act. EPA is authorized to provide federal grant funds to delegated state NPS programs, such as Montana's program, to conduct NPS efforts in the state. 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 \$1.8 million will be available to Montana for 2012, pending appropriation legislation.

DEQ staff also collaborate with staff from Region 8's Watershed Team to help carry out its statewide watershed/NPS program. One of the Watershed Team's primary goals is to "Assist states with integrated strategies for prioritizing and protecting/restoring waterbodies and watersheds." To accomplish this in Montana, DEQ invites EPA staff to provide input during DEQ NPS planning activities and participate 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.

EPA also has a goal of supporting local watershed groups. However, due to resource limitations, EPA works with local groups only on a limited basis. In these situations, EPA and DEQ collaborate on providing technical or resource assistance to help meet the needs of local groups. EPA's involvement has

been limited to large basin efforts that typically cross state boundaries, such as the Clark Fork and Missouri rivers. Region 8 provides financial assistance to local watershed groups through other grant programs. However, there are currently no other active grant programs for this type of assistance. When available, these funds can be used for many water quality improvement projects, including watershed group support activities, water quality assessments, and demonstration projects. For additional information, please contact Peter Ismert at (303) 312-6215 at EPA's Region 8 office in Denver, CO.

Water Quality Monitoring and Total Maximum Daily Load Programs

Significant collaboration occurs between DEQ and EPA for 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. Depending on the yearly workload, EPA will provide field sampling and assessment assistance to DEQ to help implement the monitoring plan. 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.

DEQ also collaborates with EPA during the development of TMDLs. DEQ is following a court ordered TMDL development schedule. To assist with meeting the TMDL completion dates in the schedule, EPA will commit to developing a certain number of draft TMDLs for DEQ. EPA also provides funding to DEQ to develop TMDLs through special allocations and through the Clean Water Act 319 grant program. Additional grant funds are available from EPA for DEQ's partners. EPA approves all TMDLs developed for Montana. For additional information about EPA's TMDL program in Montana, please contact Jason Gildea at (406) 457-5028.

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. Grant funds can be used for both regulatory and non-regulatory wetland protection activities, including: developing state water quality standards for wetlands; improving Section 401 water quality certification programs to protect wetlands; developing state wetland regulatory programs; assisting with state Section 404 assumption efforts; developing statewide wetland strategies; training leading to development of state wetlands protection programs; and wetland protection demonstration and restoration projects.

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.
- For additional information, contact Toney Ott at (303) 312-6909 or the EPA Region 8 Montana Operations office at (406) 457-5025.

Tribal Government Water Quality Program Grants

EPA's Region 8 area contains 27 Tribal Nations, seven of which are within the state boundaries of Montana. EPA's Montana Office works with these Tribal programs to develop and maintain water quality protection programs in Indian Country. Most Tribal Governments participate in EPA's water

quality grant programs, including water quality monitoring, nonpoint source pollution control, and wetlands program development. Two Tribal Governments have EPA approved water quality standards and a third has been granted authority in this program and is proceeding with EPA approval of their standards. All of the Tribal Governments located in Montana have EPA approved NPS programs with assessments and management plans. Through a cooperative relationship, EPA promotes many activities and initiatives that help Tribal Governments address water quality at a local watershed level and strengthen water quality stewardship efforts in Indian Country. For additional information about EPA's Tribal water quality grant programs in Montana, please call (406) 457-5000.

FARM SERVICE AGENCY

The Farm Service Agency (FSA) of the U.S. Department of Agriculture ensures the well being of American agriculture, the environment and the American public through efficient and equitable administration of farm commodity programs; farm ownership, operating and emergency loans; conservation and environmental programs; emergency and disaster assistance; domestic and international food assistance and international export credit programs. FSA 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 establish approved cover on eligible cropland. The program encourages farmers to plant long term resource conserving covers to improve soil, water, and wildlife resources. Eligible acreage adjacent and parallel to streams devoted to riparian buffers planted to trees may be enrolled. CRP is administered through local county Farm Service Offices.

Emergency Conservation Program (ECP): ECP provides emergency funding for farmers and ranchers to rehabilitate farmland damaged by wind erosion, floods, hurricanes, or other natural disasters, and for carrying out emergency water conservation measures during periods of severe drought. Emergency practices to rehabilitate farmland damaged by wind erosion and other disasters, including drought, may include debris removal, 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:

North American Waterfowl Management Plan (NAWMP): NAWMP is an international effort to reverse waterfowl population declines in North America. Under this plan, U.S., Canadian, and Mexican partners agreed to pool their resources to conserve millions of acres of waterfowl habitat in specific joint venture areas deemed critical to waterfowl. The joint ventures have primarily tried to pursue non-regulatory strategies that can be implemented through voluntary and cooperative actions. For additional information, please contact James Stutzman, (406) 727-7400 x 24.

Partners for Fish and Wildlife Program: Provides funding and technical assistance to private landowners interested in fish and wildlife habitat projects on their land. Projects are evaluated from a biological and cost/benefit standpoint. The program is strictly voluntary. Montana focus areas include the Blackfoot Valley, Rocky Mountain Front, Northeastern Montana, Beaver Creek, Mission Valley, and Centennial Valley. For additional information, please contact James Stutzman, (406) 727-7400 x 24.

Emergency Wetlands Resources Act: The purpose of the Emergency Wetland Resources Act of 1986 is to “promote the conservation of migratory waterfowl and to offset or prevent the serious loss of wetlands by the acquisition of wetlands and other essential habitat, and for other purposes.” Under the act, the USFWS has developed a National Wetlands Priority Conservation Plan to identify the locations and types of wetlands that should be priorities for state and federal acquisition through the Land and Water Conservation Fund Act. For additional information, please contact Wetlands Coordinator, (303) 236-2985.

Fish and Wildlife Coordination Act: Provides a key role for states in evaluating 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. The goals of the evaluation are to assess the status of affected fish and wildlife resources and to prevent or mitigate their loss and damage.

National Wetland Inventory: Responsible for identifying, classifying, mapping, and reporting on the status of wetlands of the United States. The primary objectives of the program are to develop and distribute scientific information on the extent and characteristics of U.S. wetlands and produce wetland maps that accurately represent these resources. For additional information, please contact Kevin Bonn at (303) 236-4263.

The USFWS may coordinate and collaborate with other agencies, organizations, and individuals by providing data and financial or technical assistance to land owners and local agencies with habitat protection and restoration projects.

For additional information, please contact Brent Esmoil at (406) 449-5225 x215.

NATURAL RESOURCES CONSERVATION SERVICE

The Natural Resources Conservation Service (NRCS) 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 for productive lands and a healthy environment. The role of NRCS is to provide technical and financial assistance on a voluntary basis to help land managers and communities 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 Environmental Quality Incentives Program (EQIP): Provides technical and financial assistance to farmers and ranchers who volunteer to address significant natural resource concerns. Montana has been using 10% of the state's funding allocation to address Concentrated Animal Feeding Operations (CAFOs), 10% on American Indian reservations, 20% towards special initiatives, and 60% is divided among Montana's counties.

EQIP Ground and Surface Water: There are funds designated within the EQIP program specifically for projects that increase the amount of ground or surface water on an agricultural operation. The majority of projects are related to irrigation efficiency improvements or capping artesian wells.

EQIP Conservation Innovation Grants: 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.

Farm and Ranchlands Protection Program (FRPP): The Farm and Ranchlands Protection Program is a voluntary program that helps farmers keep their land in agriculture. The program provides funding to state, local, or tribal entities with existing agricultural land protection programs to purchase conservation easements or other interests.

Wetlands Reserve Program (WRP): The Wetlands Reserve Program is a voluntary program to restore and protect wetlands on private property. WRP provides landowners with financial incentives to restore wetlands. Landowners and the NRCS develop a plan for the restoration and maintenance of the wetland.

The Grassland Reserve Program (GRP): A voluntary conservation program that assists landowners and operators in protecting grazing uses and related conservation values by conserving and restoring grassland resources on eligible private lands through easements and rental contracts.

Wildlife Habitat Incentives Program (WHIP): A voluntary program that provides both technical and financial assistance to help establish and improve fish and wildlife habitat. Participants work with NRCS to prepare a wildlife habitat development plan.

The Food, Conservation, and Energy Act of 2008 (2008 Farm Bill): Replaced the *Conservation Security Program* with the new *Conservation Stewardship Program* for fiscal years 2009 through 2017. The Conservation Stewardship Program a voluntary conservation program that offers payments to producers who maintain a high level of conservation on their land and who agree to adopt higher levels of stewardship. The program provides equitable access to all producers, regardless of operation size, crops produced, or geographic location. For additional information regarding farm bill programs, please contact Tim Ouellette at (406) 587-6794, tim.ouellette@mt.usda.gov or visit <http://www.mt.nrcs.usda.gov/programs/>.

Other NRCS Programs and Activities:

Emergency Watershed Protection Program (EWP): NRCS may provide financial and technical assistance for emergency measures that relieve imminent hazards to life and property created by a natural disaster

through the Emergency Watershed Protection program. Assistance is provided to help prevent further property damage from flooding, runoff, and erosion.

Swampbuster/Wetland Conservation Provisions: Swampbuster 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 who work hand-in-hand with local land users 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.

Cooperative Conservation Partnership Initiative (CCPI): Fosters conservation partnerships and funds projects that focus technical and financial resources on conservation priorities in watersheds of special significance and other geographic areas of environmental sensitivity. CPI grants are available to state and local governments, tribes, and nongovernmental organizations that have a history of working with agricultural producers.

The Land Evaluation and Site Assessment (LESA): Helps state and local officials make sound decisions about land use. Combined with forest measures and rangeland parameters, a locally developed LESA system can provide a technical framework to numerically rank land parcels based on local resource evaluation and site consideration needs.

Coordination and collaboration opportunities include the following:

- 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.

Population growth coupled with climate change will increase demands on the Nation's water supply. The Agency's role of providing abundant high quality water will require increased coordination and cooperation with local, state, and federal partners.

Watershed Restoration Planning and Implementation: The Agency is responsible for prioritizing watersheds for restoration and other management activities, development of watershed restoration plans and implementation of those plans.

Environmental Education: Environmental education programs are offered for local schools and other interested groups.

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.

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 Agency will continue participation in and support of the Forestry BMP audit program.
- Recently the Forest Service/Interior Agencies Burned Area Emergency Response (BAER) program has served as a model and catalyst that led to a cooperative post fire response on the 208,000 acre Derby Fire. This effort has led to efficient cooperation among participants and has reduced public confusion regarding where to turn for needed agency service provider assistance.

For additional information on USDA Forest Service watershed management activities, please contact Bruce Sims, Regional Hydrologist (406) 329-3447 or your local Forest Service Office.

GEOLOGICAL SURVEY

The U.S. Geological Survey (USGS) provides geologic, topographic, hydrologic, and biologic information. This information comprises maps, data bases, and reports containing analyses and interpretations of water, energy and mineral resources, biological resources, land surfaces, geologic structures, natural hazards, and the dynamic processes of the Earth.

The USGS Montana Water Science Center investigates the occurrence, quantity, quality, and movement of surface water and groundwater in Montana and adjacent areas. Activities include monitoring of streamflow at more than 200 sites statewide; providing real time information for more than 100 of those sites; monitoring water quality in the Clark Fork, Missouri, and Yellowstone River drainages; and conducting investigations and applied research of the quantity and quality of surface and groundwater in various areas throughout the State. Additional information about these activities is available through links on the Center's main home page (<http://mt.water.usgs.gov/>).

Opportunities to collaborate and coordinate include the following:

- Technical assistance with groundwater issues including the determination of sources of contaminants, estimation of groundwater age, and flow system modeling.
- Technical assistance with surface water issues including near real time streamflow and water temperature monitoring, flow statistics, and floodplain delineation.

- Technical assistance with water quality issues including geochemical modeling and monitoring surface water and groundwater for major ions, trace elements, pesticides, stable and radioactive isotopes, sediment, and emerging contaminants such as pharmaceuticals.
- Cooperative funding of studies utilizing the technical expertise of the USGS.

For additional information, contact John Kilpatrick at (406) 457-5900 or jmkilpat@usgs.gov.

The Northern Rocky Mountain Science Center (NRMSC) conducts research in support of natural resources management in the mountains and plains of Montana, Wyoming, and Idaho. NRMSC produces and disseminates scientific information needed for decision making in collaboration with Federal and State land management agencies, Native American tribes, academic institutions, and organizations. Additional information about the Center's activities is available through links on the Center's main home page (<http://nrmesc.usgs.gov/index.html>)

For additional information, contact Jeffrey Kershner at (406) 994-5304 or jkershner@usgs.gov.

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, two Tribal governments have water quality standards that have been approved by the EPA. A third 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 the EPA. Continued collaboration is needed 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.

<p>Confederated Salish and Kootenai Tribes of the Flathead Reservation*</p> <p>Environmental Protection Division</p> <p>Natural Resources Department</p> <p>P.O. Box 278</p> <p>Pablo, MT 59855</p> <p>PH: (406) 883-2888</p>
<p>Ft Peck Assiniboine and Sioux Tribes*</p> <p>Office of Environmental Protection</p> <p>P.O. Box 1027</p> <p>Poplar MT 59255</p> <p>PH: (406) 768-2300</p>

Northern Cheyenne Tribe** Environmental Protection Department P.O. Box 128 Lame Deer MT 59043 PH: (406) 477-6508 or 6506
Fort Belknap Indian Community Council Environmental Department RR1 Box 66 Harlem MT 59526 PH: (406) 353-8384
Crow Tribe Natural Resources Environmental Protection Department P.O. Box 400 129 Crow Agency, MT 59022 PH: (406) 638-3752 x3884
Chippewa Cree Indians Tribe of the Rocky Boy's Reservation Water Resources Department RR1 Box 800 Box Elder MT 59521 PH: (406) 395-4225
Blackfeet Nation Blackfeet Environmental Office P.O. Box 2029 Browning MT 59417 PH: (406) 338-7421

* 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 of Agriculture has many activities and programs that contribute to the stewardship of watershed health and water quality in Montana including the following:

- Pesticide Management Program** (Montana Pesticide Act, 80-8-101 et. seq., MCA): The proper use of pesticides is regulated by registering pesticide products, certifying and training pesticide applicators and dealers, and enforcing pesticide laws and regulations. Pesticide users are informed about the protection of threatened or endangered species from the use of pesticides.
- Groundwater Protection Program**: The program maintains a permanent monitoring network of 43 shallow groundwater wells across the state, and conducts several special monitoring projects annually. The samples are tested for approximately 100 pesticides, as well as nitrate levels.

- In 1998 EPA accepted Montana's Generic Ground Water Management Plan. The plan explains legal authority, resources, assessment and planning, monitoring, prevention and management measures, responses to detections of pesticides, enforcement, public awareness and participation, information dissemination, and records and record keeping.

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

- Working with other agencies on cooperative water resource projects that include pesticide/fertilizer related sampling and monitoring including NRCS, MSU, EPA, USGS, MT Indian Reservations, DEQ, MBMG, communities and local units of government.
- Conduct pesticide specific and/or site specific sampling and monitoring to support pesticide registration/re-registration.
- Sampling and monitoring of water resources by providing technical assistance in standard operating procedures, quality assurance program plans, sampling/monitoring design, well selection, analyte selection and laboratory analyses interpretation.

For additional information, please contact Amy Bamber at (406) 444-5400.

DEPARTMENT OF FISH, WILDLIFE & PARKS

Montana Fish, Wildlife & Parks (FWP) manages the state's resources not only for recreational uses such as fishing and hunting but also for protection of open space, wilderness, and habitat for nongame species. The department achieves these goals by regulating fishing and hunting, managing wildlife management areas, and maintaining a network of state parks. FWP has many activities and programs that contribute to the stewardship of watershed health and water quality in Montana including:

The Montana Fisheries Information System (MFISH) is a database containing information on fish species distribution, supporting distribution data (e.g. population trends, spawning survey results, and genetics data), and stream level information for over 4,500 streams and rivers (e.g. angling use, fisheries resource classification, protected designation, instream flow reservations, stream channel conditions).

The Fisheries Bureau provides technical assistance for managing endangered and threatened aquatic species, protecting and restoring aquatic habitat, protecting and restoring native fish populations, and controlling pollution. In order to provide this assistance, the staff of the Fisheries Bureau:

- 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.
- 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).

The Wildlife Division administers the Montana Migratory Game Bird License Habitat Program. The emphasis is on wetland habitat projects that will increase waterfowl production and brood survival while also benefiting a host of other wetland associated wildlife. Eligible practices include restoring drained wetlands, constructing shallow reservoirs, repairing breached dams or damaged spillways,

installing water control structures, establishing suitable upland nesting cover, and working with landowners to implement managed grazing systems.

For additional information contact Tom Hinz at (406) 994-7889 or thin@mt.gov.

FWP has designated 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, coordinating all water pollution activities including investigation of fish kills and other activities that have implications to fisheries resources and water quality.

For additional information, contact Jim Darling at (406) 444-5334.

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 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 preparing and implementing restoration plans that guide the State's expenditure of settlement proceeds on restoration projects. In general, grant funds can be used on projects located in the UCFRB (from the headwaters near Butte downstream to and including the Milltown Reservoir just upstream of the City of Missoula) that will improve:

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

For more information on the NRDP, see the Montana Department of Justice website (www.doj.mt.gov under "Montana Lands") or contact Kathy Coleman, (406) 444-0205.

DEPARTMENT OF NATURAL RESOURCES & CONSERVATION

The mission of the Montana Department of Natural Resources & Conservation (DNRC) is to help ensure that Montana's land and water resources provide benefits for present and future generations. Many of the programs and activities within DNRC affect management of water quality within Montana's watersheds. <http://www.dnrc.state.mt.us/>

The Conservation and Resource Development Division assists individuals and local governments with natural resource management concerns and finances conservation, resource management, and technical 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. Grant and loan programs include Conservation District Administrative Grants, Conservation District "HB223" Grants, Education Mini-Grants, Reclamation & Development Grants, Renewable Resource Grants, Renewable Resource Project Planning Grants, Riparian/Wetlands Educational Grant Program, Watershed Planning Assistance Emergency Grants and Loans, Renewable Resource Loans, Range Improvement Loans, Private Water Development Loans, Drinking Water State Revolving Fund Loans and Water Pollution Control State Revolving Fund Loans (the State Revolving Fund is a partnership between DNRC and DEQ).

The Forestry Division is responsible for planning and implementing forestry programs through a network of field offices. The Forestry Division has two major functions: fire and aviation management and service forestry. The Service Forestry function provides services to various client groups to help them comply with State forestry laws and achieve their own forestry related objectives.

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

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

A typical rangeland loan project involves drilling a well and installing underground water lines to supply stock tanks. These stock tanks are usually located in areas where water is insufficient or unsuitable for livestock. The projects are sometimes combined with cross fencing and an overall grazing plan to improve the rangeland.

Within the Water Resources Division, the Water Management, Water Rights, and Water Operations Bureaus provide expertise for surface water and groundwater hydrology issues, floodplain management, water allocation, and dam safety, assist with watershed planning, drought planning & management and collect water flow data. This division also supports eight regional offices that provide program support to citizens in local watersheds. Responsibility of state water plan development lies in with this division. The state water plan has been used to recognize and adopt local watershed plans as part 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 may include the following:

- Watershed planning.
- Water management, water allocation and drought planning.
- 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.

DEPARTMENT OF TRANSPORTATION

The mission of the Montana Department of Transportation (MDT) is to serve the public by providing a transportation system and services that emphasize quality, safety, cost effectiveness, economic vitality and sensitivity to the environment. MDT has many activities and programs that contribute to the stewardship of watersheds and water quality in Montana including the following:

Storm Water

MPDES/NPDES (Point Source)

- Preparing and submitting Storm Water Pollution Prevention Plans (SWPPP), in accordance with MPDES/NPDES permit requirements.
- Implementing Best Management Practices (BMPs) during construction and maintenance activities.
- Constructing and maintaining temporary and permanent sediment and erosion control features.

MS4 (Point Source)

- Implementing additional good housekeeping/pollution prevention measures at MDT owned facilities located within MS4 areas.
- Requiring evaluations of permanent erosion and sediment control measures, including implementation of Low Impact Development practices, for projects located within MS4 areas.
- Maintaining the www.MontanaMS4.com website dedicated to stormwater education for all Montana MS4 communities.
- Implementing a stateside Storm Water Management Plan that addresses the following minimum control measures: public education and outreach on stormwater impacts; public involvement/participation, illicit discharge detection and elimination, construction site stormwater runoff control, post-construction stormwater management in new development and redevelopment, and pollution prevention/good housekeeping for municipal operations. Targeted approaches are identified for the designated MS4 areas.

BMPs

- Implementing Best Management Practices (BMPs) during all construction and maintenance activities, regardless of need to obtain MPDES/NPDES permit coverage.
- Implementing additional stormwater pollution prevention requirements included in Clean Water Act Section 404 Permits, Section 401 Certification, and Stream Protection Act 124 Authorizations.
- Conducting NEPA/MEPA reviews to determine if additional mitigation measures should be implemented to control and/or reduce stormwater runoff associated with both temporary and permanent impacts.

Bridge Deck Runoff

- Evaluating projects currently in design to ensure that bridge deck designs, to the maximum extent practicable, incorporate design features that do not allow the direct drainage of deck runoff laden with sand/salt, to discharge directly into state waters.

Low Impact Development (LID)

- Evaluating projects currently in design 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.

Wetlands and Streams

- Since 1996, the Montana Department of Transportation has developed a very diverse and extremely effective aquatic resource mitigation program that has developed 54+ wetland and stream mitigation sites that have restored or created approximately 1,300 + acres of wetlands and approximately 46,000 linear feet of stream to replace aquatic resources impacted by transportation projects across the state.
- Developing measures to minimize and avoid impacts to aquatic resources such as wetlands, streams and rivers along project corridors.
- Determining mitigation measures and developing stream mitigation projects to meet the US Army Corps Montana Stream Mitigation Procedure (MTSMP).
- Coordinating with a variety of federal, tribal and state agencies to develop aquatic resource mitigation sites on public, tribal and private lands.
- Participating in cooperative projects with a number of non-profit conservation organizations, tribal and federal agencies to jointly develop wetland and stream restoration projects.
- Establishing wetland construction guidelines for the reclamation of borrow pits.

Total Maximum Daily Load (TMDL)

- 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 surface water sampling to determine if MDT's winter maintenance activities are affecting nearby waterways.
- Calibrating the sanders on snow plows, which allow drivers to place the correct amount of traction sand on the roadway during winter maintenance activities.
- Conducting annual maintenance such as sweeping roadways, repairing check dams, and removing sediment from sediment traps.

Maintenance and Facilities

- Preparing and implementing Spill Prevention Control and Countermeasures (SPCC) plans for facilities storing greater than 1,320 gallons of petroleum products in aboveground storage tanks (ASTs).
- Preparing Source Water Delineation and Assessment Reports (SWDAR) for public water supply wells at rest areas.

Hazardous Materials

- Removing underground storage tanks (USTs) encountered during construction projects. In 2011 MDT removed over ten USTs from various sites throughout Montana.
- Conducting subsurface investigations and cleanup activities at leaking underground storage tank (LUST) sites. Coordinating the investigation and cleanup of LUST sites with DEQ.

- Assisting contractors and responsible parties during the cleanup of spills and releases related to traffic accidents along MDT's roadways.
- Characterizing, transporting, and disposing of waste that has been dumped on MDT's R/W.

Corridor Planning Process

- Analyzes the existing deficiencies and future needs in the corridor with the consideration of the social economic and environmental impact of the natural and human environment.
- Uses a collaborative approach that involves federal, state, tribal, and local agencies including resource agencies.
- Identifies environmental resources in potential project corridors such as demographics, land use, socioeconomics, community facilities, natural resources, water quality, cultural resources and tribes, vegetation, wildlife, sensitive species, aquatic resources, wetlands, and air quality.
- Recommends a complete package of alternative(s) and/or options(s) for improving the corridor.
- Conducts a planning level identification of potential impacts and mitigation opportunities in the corridor, incorporating initial avoidance areas, mitigation needs and opportunities identified by resource and other agencies and the public.
- Documents the recommended corridor plan including specific action items and responsible parties to carry them out.

Adopt-A-Highway

- Encourages volunteers to keep a 2-mile section of a highway free from litter. In exchange for regular litter removal, a sign with the organization's or group's name is posted on the section of the highway they maintain.

For further information, please contact Doug Compton, (406) 444-6003, dcompton@mt.gov.

REGIONAL ORGANIZATIONS

TRI-STATE WATER QUALITY COUNCIL

The Tri-State Water Quality Council is a nonprofit partnership of diverse community interests working together to improve and protect water quality throughout Clark Fork-Pend Oreille watershed. Working collaboratively to seek community based solutions through consensus, science, and education, the Council works to educate and engage communities and residents in the watershed to take an active role in protecting water quality and reducing pollution.

Priority objectives and activities are:

- Water Quality Monitoring Program – including the continuation of the existing basin-wide water quality monitoring network and five-year trends analysis, and providing scientifically sound data to the basin's decision makers.
- Water Quality Protection Program – including work on implementing TMDLs and their corresponding education program, developing a strategy for an integrated point/nonpoint source basin-wide water quality protection effort, and promoting numeric nutrient criteria basin-wide.
- Growth and Development Policy – including education Council members, the public, local governments and developers about growth related issues, developing partnerships with local governments to help them address water quality impacts related to growth, promoting state

and local regulations and policies to reduce impacts to water quality, and facilitate information exchange across jurisdictions.

- Noxious Aquatic Species – including facilitating partnerships to garner support for the use of non-chemical options to control the aggressive aquatic weed, Eurasian milfoil, and increasing the Council's role in the research and monitoring of non-chemical control measures.

The above activities provide numerous opportunities for coordination and collaboration with other agencies and organizations.

For additional information, see the Tri-State Water Quality Council website:

<http://www.tristatecouncil.org/> and / or contact Diane Williams, Executive Director (208) 265-9092.

STATEWIDE ORGANIZATIONS

MONTANA ASSOCIATION OF CONSERVATION DISTRICTS

The Montana Association of Conservation Districts (MACD) is a non-partisan, non-profit organization guided by a statewide board of directors that receives input and direction from all conservation district supervisors.

The purpose of MACD is to equip districts with the authorities, powers, and funding necessary to complete their responsibilities as elected officials. MACD facilitates communication among districts, with federal and state agencies, and with other organizations; 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.

MACD has recently entered into agreements with other entities to better manage irrigation water, to assist with livestock and water quality issues, to seek mitigation sites for construction near Montana's waters, to conserve sage-grouse, and to build capacity in districts and watershed groups by partnering with the Montana Conservation Corps and the Montana Watershed Coordination Council and the AmeriCorps program.

For additional information, contact: www.macdnet.org or Jeffrey Tiberi, Executive Director, (406) 443-5711

MONTANA BUREAU OF MINES AND GEOLOGY

The Montana Bureau of Mines and Geology (MBMG) was established in 1919 with a mission of providing applied research and service that promotes Montana's orderly development of its mineral, rock, and water resources. MBMG has more than 100 ongoing projects including programs in geologic mapping, evaluation of mines and mining impacts, coal resource and coalbed methane hydrology research, groundwater level and quality monitoring at scales from local to statewide, groundwater resource studies, and problem specific groundwater investigations at local to multi-county scales. Several specific programs include:

- MBMG's geologic mapping program provides geologic maps that reflect modern structural and stratigraphic concepts and include significant amounts of new information and are useful for many purposes including evaluation of 1) groundwater, mineral, and fossil fuel resources; 2)

seismic hazards; 3) radon hazards; 4) land use management; and 5) land slide, rock fall, and other geologic hazards.

- 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 much new data gathered during current coalbed methane development. Studies have addressed the potential impact of relatively sodium rich coalbed methane discharge water on surface water quality within the Powder River basin, and several current projects are examining alternative disposal methods for coalbed methane produced water.
- 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 people solve specific and general 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. The Ground Water Information Center (<http://mbmgwic.mtech.edu>) delivers groundwater data for more than 236,000 sites. The Ground Water Assessment program provides baseline water level, water quality, and water development data for the entire state.
- 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 will produce a detailed report describing the hydrogeologic system and a comprehensive set of data for each study area. These products are intended for public use and will provide a unified understanding of the groundwater system.

The breadth of MBMG's expertise in geologic mapping, groundwater resource evaluation, minerals resources, seismic monitoring, and data management, presents many opportunities for cooperation in the NPS management. MBMG is always willing to work with partners to evaluate, understand, and document Montana's geology, geologic hazards, mineral resources, and groundwater resources. Those interested in working with the Montana Bureau of Mines and Geology can call Edmond Deal or John Metesh at (406) 496-4180 or contact them in writing at 1300 W. Park Street, Butte Montana, 59701.

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 where it would be difficult to charge individual producers for a widespread problem. Once again, when the recharge areas are identified, the land and producers can qualify for USDA programs.

MSCA has a field team with broad based technical backgrounds that serves all of Eastern Montana. For more information, contact Jane Holzer, Program Director, at the MSCA office in Conrad, MT.

MONTANA WATER CENTER

The Montana University System Water Center's mission is to mobilize the resources of Montana's public universities to resolve the state's water problems. It does this by sponsoring water related research, providing training and education for working water professionals, educating future water professionals, and conducting outreach to Montana citizens on water issues. Projects include:

- Using innovative methods to trace groundwater inflow to Georgetown Lake
- Testing alternative approaches to determine evapotranspiration from a wetland near Sidney
- Examining the biology of a non-native snail that has begun to spread in western Montana streams
- Graduate research fellowships in areas ranging from grayling ecology to the influence of pine bark beetle outbreak on Montana mountain snowpack to drought response
- Research on technical topics to assist the Legislative Water Policy Committee
- The annual *Montana Water Conference*, conducted in Great Falls this year in cooperation with the Montana Section of the American Water Resources Association
- Water information sharing with audiences throughout the state, including individuals, watershed groups, conservation districts, cities and counties
- The monthly *Montana Water* e-newsletter, with a circulation of more than 2000

The *Montana Water* website's contains up-to-date postings of water related job openings, events and funding opportunities. The Water Center is initiating a *Wetlands Professional Development* program, so that Montana water professionals can acquire specialized training within the state. In some cases this will include field and laboratory coursework that can be applied towards the Professional Wetland Scientist credential.

The *Small Systems Technical Assistance Center* operated by the Montana Water Center is the flagship of a nationwide network that helps small public water utilities provide safe, reliable and affordable drinking water. The Center provides access to tools developed by other technical assistance centers, sponsors the week long Montana Water School that draws several hundred operators, and provides computer based training courses to water utility workers from around the nation.

The *Decision Makers' Guide to Montana Water* is a science based, non-advocacy water curriculum for Montana's local and state elected and appointed officials. Its major topics are wetlands, water data interpretation, hydrology, floodplains and riparian zones, water quality impairment and protection, and water law and policy. It includes narrative, case histories, graphics and related resources. The course is being offered in live conference presentations and via webinars. It serves an audience that includes city and town elected officials, state legislators, conservation district supervisors, county planners, floodplain administrators and environmental health staff.

Contact Information:

Montana Water Center
Director: Duncan Patten
101 Huffman Building
Montana State University
Bozeman, MT 59717
Phone (406) 994-6690
E-mail water@montana.edu
Website <http://watercenter.montana.edu>

MONTANA WATERCOURSE

Montana Watercourse is a statewide water education program that supports water resource decision making and stewardship by providing unbiased information, resources, tools and education to all water users. These products and services are typically used by: landowners and community members; educators and students; realtors and developers; decision makers such as city and county planners and commissioners; watershed groups and conservation districts; and other 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.

What can we provide for you?

- Co-sponsorship of water resource seminars, workshops, and trainings
- Volunteer water monitoring training and assistance for communities and schools
- Local water education program development assistance
- Publications and guides on water resource and watershed topics
- Teaching trunks with water resource activities
- Educator workshops, trainings, and tours using Project WET materials

Contact Information:

Montana Watercourse
PO Box 170570
Bozeman, MT 59717
Website: www.mtwatercourse.org
Phone: 406/994.6671
E-mail: mtwatercourse@montana.edu

THE MONTANA WATERSHED COORDINATION COUNCIL

The Montana Watershed Coordination Council (MWCC) serves as a statewide forum and communication hub connecting locally led watershed groups, CDs, 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.

LOCAL ORGANIZATIONS

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

For additional information, see the FBC commission website: <http://www.flatheadbasincommission.org/> or contact Caryn Miske, Executive Director (406) 437-2479.

GALLATIN LOCAL WATER QUALITY DISTRICT

The Gallatin Local Water Quality District operates as a non-regulatory department of Gallatin County and is governed by a nine-member Water Quality District Board of Directors. The mission of the District is “To protect, preserve, and improve the quality of surface waters and groundwaters within the Local Water Quality District.”

Programs and activities of the District are based on a watershed perspective and are focused on the following three areas:

Monitoring and Research:

- Maintain and improve the existing District-wide groundwater monitoring network for water quality and quantity.
- Establish and maintain District-wide surface water sampling sites to establish baselines and trends.
- Maintain and expand existing citizen based volunteer stream monitoring program.
- Conduct research projects as needed to address issues and concerns related to water quality and quantity.

Education:

- Coordinate District education activities with other organizations and agencies.

- Develop District education resources.
- Develop District educational programs to supplement existing programs (pollution prevention, NPS education, wetlands, source water protection, well and septic care).
- Conduct District outreach to improve public awareness of the District.

Communication, Information Collection and Dissemination:

- Develop and maintain District-wide databases.
- Compile historical water resource data and enter into GIS data sets.
- Maintain District website with GIS based data (potential contaminant source inventory)
www.gallatin.mt.gov/GLWQD.

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

- Working with other agencies on cooperative water resource projects in the Gallatin watershed 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 Gallatin watershed.
- Cooperating with local, state and federal agencies and organizations to provide environmental education on watershed resources in the Gallatin 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 the Association of Gallatin Agricultural Irrigators and the Greater Gallatin Watershed Council with water quality and quantity technical assistance.

For additional information contact Alan English, District Manager (406) 582-3148, alan.English@gallatin.mt.gov or Tammy Crone, Water Quality Specialist (406) 582-3145, tammy.crone@gallatin.mt.gov.

LEWIS & CLARK COUNTY WATER QUALITY PROTECTION DISTRICT

The Lewis & Clark County Water Quality Protection District operates as a non-regulatory entity of Lewis & Clark County and is governed by a nine-member Board of Directors. The mission of Lewis & Clark County Water Quality Protection District (WQPD) is "To preserve, protect and improve water quality within District boundaries."

WQPD board goals and objectives:

- Advocate. We are advocates for water quality in all we do.
- Data Collection. We are a key source of impartial water quality data.
- Educate. We are public educators.
- Cooperate and Coordinate. We achieve the mission of the Water Quality Protection District by participating with other agencies and groups to make the best use of resources in all we do.

Programs and activities of the District are based on a watershed perspective and are focused on the following four areas:

Education and Outreach:

- Conduct community outreach activities and public presentations to improve public awareness of water issues within the District.
- Conduct Water Watchers Programs for 4th and 5th graders of all Helena Area Schools with classroom instruction and field trips to stream sites. Both programs consist of classroom activities implemented by the classroom teacher; a classroom visit and field trip presented by the WQPD health educator; and follow-up, action oriented activities conducted by the teacher after the field trip.
- The WQPD provides coordination services to the Lake Helena Watershed Group (LHWG). The LHWG conducts regular meetings with educational presentations, plan and construct stream improvement projects, annual riparian planting projects, and produce newsletters, project tours, workshops and other outreach activities.

Monitoring and Research:

- Maintain and improve the existing District-wide groundwater monitoring network for water quality and quantity.
- Establish and maintain District-wide surface water and groundwater sampling sites and studies to establish baselines and trends.
- The WQPD routinely investigates water related complaints including septic contamination, stormwater contamination, illness associated with drinking water, public water supply complaints and in some cases, information or investigation requests are referred to other agencies.
- The WQPD contracts with the MBMG to provide quarterly water level measurements of 42 wells located in Lewis and Clark County, and to provide subsequent reports to the MBMG for inclusion in the statewide GWIC database (<http://mbmggwic.mtech.edu/>).
- In addition to the 42 MBMG wells, 95 wells are sampled and water levels are measured. The information collected will be used to evaluate water quality impacts resulting from subdivision and other land uses.
- Conduct research projects as needed to address issues and concerns related to water quality and quantity.

Communication, Information Collection and Dissemination:

- At the request of the county and city planning offices, the WQPD prepares and submits comments about water quality and water availability and potential water resource impacts of proposed subdivisions in the county.
- Information is also provided to DEQ for its review and use as DEQ staff evaluates subdivision and public water supply proposals.
- Maintain District website and web pages for watershed groups with various informational pages, project reports, and data links.

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

- Working with other agencies on cooperative water resource projects in the Lake Helena watershed that include monitoring and sampling activities including: watershed characterization and water quality restoration plans, pesticides/fertilizers, pharmaceutical and personal care products, stormwater impacts, groundwater characterization, and wetland inventories.
- Serving as a clearinghouse for watershed and water quality information in the Helena Area watersheds.

- Continue to work with local, state and federal agencies and organizations to provide environmental education on watershed resources within the District.
- In cooperation with state agencies, develop and maintain District data and coordinate with other agencies and groups for data collection (GWIC, U.S Geologic Survey, the DEQ Source Water Protection Program, and U.S. Environmental Protection Agency).

For additional information contact Kathy Moore, District Administrator (406) 457-8926, moore@co.lewis-clark.mt.us, Jim Wilbur, District Coordinator, (406) 457-8927, jwilbur@co.lewis-clark.mt.us.

MISSOULA VALLEY WATER QUALITY DISTRICT

The mission of the district is “To protect and improve surface and groundwater quality within the Missoula Valley.”

Fiscal Year 2011 Goals and Objectives included:

- Monitoring and Research - Conduct monitoring and water quality research to assess and prioritize water quality issues.
- Inspections and Spill Response - Inspect facilities regulated under state, local and federal water quality laws, respond to complaints and spills reported through 9-1-1,
- Enforcement - Enforce state and local water quality law and regulations,
- Public Education - Conduct public education on water pollution prevention, household hazardous wastes, and riparian resource protection.
- Cleanup Oversight - Conduct local review of state and federal groundwater cleanup sites,
- Household Hazardous Waste Collection - Conduct annual household hazardous waste collection event and Conditionally Exempt Small Quantity Generator waste collection event,
- Financial assistance for Water Quality Improvements. Provide financial assistance and incentives for projects that improve water quality, including sewer connection
- Riparian Resource Protection – encourage protection of riparian resource areas to benefit water quality
- Subdivision – review subdivisions for potential water quality impacts

Fiscal Year 2011 Highlights:

- Milltown Superfund Site remediation, restoration and redevelopment. Remediation nearing completion in fall 2011. Groundwater arsenic concentrations improving, with six of the ten compliance wells not yet attaining the arsenic drinking water standard. WQD staff conducted monitoring of domestic wells, coordinated redevelopment planning, served on remediation and restoration Design Review Teams.
- Riparian Resource Areas. WQD Received EPA Region 8 grant to conduct evaluation of Riparian Resource Areas designated through City and County subdivision Regulations since 1995. Initiated inventory and mapping phase of the project.
- Stimson Mill PCB/hydrocarbon cleanup. WQD provided local involvement and oversight. Cooling and Fire Pond removal completed, cleanup extended under stud mill. On site waste repository currently being evaluated for additional PCB waste disposal.
- Smurfit-Stone site evaluation. Missoula County requested DEQ and EPA to evaluate soil and water contamination at the former pulp mill. WQD staff prepared summary of site history,

identified contaminants of concern and prioritized areas for onsite investigation. EPA initiated preliminary assessment and site investigation under C.

- Sewer Connection incentives - Provided connection incentive funding for septic systems in the Rattlesnake and O’Keefe Creek drainages,
- Household Hazardous Waste - Conducted our 18th annual Household Hazardous Waste Collection Event.
- Missoula Water Quality Ordinance - Continued enforcement of the Missoula ordinance, identified and closed Class V injection wells, inspected fueling facilities for compliance with pollution prevention requirements.

For more information contact Peter Nielsen at (406) 258-4968.

UNDAUNTED STEWARDSHIP PROGRAM

The Undaunted Stewardship Program is directed jointly by federal, state and private entities, with guidance from statewide historic, conservation and agricultural groups, and funding from both the public and private sectors. The program seeks to ensure the long-term maintenance of the environmental quality and economic productivity of privately owned, agricultural landscapes; especially areas rich in history along the Lewis & Clark Trail in Montana. The Land Use Program helps farmers and ranchers adopt land use practices that maintain or improve the environmental health of their landscapes. This program includes monitoring to enable farmers and ranchers to evaluate their land use practices and make adjustments, as needed, to ensure a healthy environment. The Land Use Program also helps farm and ranch families provide public access to historic sites located on their private agricultural lands.

The Public Education Program addresses and involves diverse audiences; ranchers, farmers, scientists, educators, government agencies and the general public, to increase understanding of what good stewardship requires, what it accomplishes, and where it's being practiced, and to encourage more farms and ranches to adopt land use practices that maintain or improve the environmental health of the landscape. The Undaunted Stewardship message is delivered in varied ways, ranging from interpretive kiosks at historical sites to public service announcements on radio and television.

The Rural Economic Development Program helps farms and ranches create new businesses such as bed and breakfasts, campgrounds and other outdoor recreation enterprises, designed not only to serve tourists but also to help build public appreciation for the importance of environmental stewardship and preservation of the Lewis & Clark Trail. These enterprises help ensure the economic sustainability of farms and ranches, thereby preserving open space, natural environments and historic sites found on private agricultural lands. For further information see:
<http://www.undauntedstewardship.com/index.htm>.

UNIVERSITIES

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 and the Rocky Mountain region. The MSUEWQ program serves an active role in

the USDA-Cooperative State Research, Extension, and Education Service (CSREES) Northern Plains and Rocky Mountain Region. 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 using multi-dimensional curriculum materials
- 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:

Research: quantifying the effects, beneficial use, and potential phytoremediation of saline sodic water on soil and irrigation water; study of bacteria and nutrient presence in streams associated with animal feeding operations and livestock access; water budgeting studies to quantify water use and allocation within specific irrigation districts; assist in development of BMPs and water quality standards to minimize or mitigate impacts of salt laden discharges; and sediment and nutrient sourcing for TMDL processes. All of these programs are collaborative partnerships with multiple federal and state agencies, local conservation and irrigation districts, and watershed groups throughout the state.

Extension Education: Along with the research efforts, MSUEWQ has worked extensively with irrigators and water management personnel to develop BMPs that mitigate sediment load into streams, as well as promote more conservative water use for irrigation. Likewise, the team has worked with community groups, tribal entities, and local educators to help establish ongoing water monitoring efforts throughout the state that enhance community and environmental health. Specifically, the Well Educated program has educated and empowered private well users on well water testing, maintenance, and treatment to enhance domestic water resources. MSUEWQ has also developed an extensive online education program that includes a suite of soil and water quality courses for both practitioners and teachers seeking an advanced degree in science education.

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.

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. The UM Watershed Health Clinic has helped the DEQ design, execute and interpret studies of the Clark Fork River Basin's water quality problems, including artificial stream studies of the response of stream algae to elevated nutrient levels, a study of the effects of a phosphate detergent ban, and numerous TMDL related studies on tributaries. The UM Watershed Health Clinic assisted DEQ with the development of a statewide water quality monitoring system. Every year since 2001, UM Watershed Health Clinic students and professors have worked with the DEQ in an ongoing effort to characterize potential reference waterbodies (least impacted examples of streams & lakes in various ecoregions of the state). Results of this work are being used to develop physical and biological water quality criteria for streams and lakes throughout Montana.

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 have been submitted for publication.

For more information, contact:

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PRIVATE COMPANIES

AVISTA UTILITIES

As part of Avista Utilities (Avista) federal re-licensing process for Noxon Rapids and Cabinet Gorge dams, the Clark Fork Settlement Agreement was finalized in January 1999 when signatures were obtained from the 27 stakeholder groups engaged in the federal re-licensing process. The 27 signatories to the agreement consisted of local government; nine state agencies (both from Montana and Idaho), five Native American tribes, ten non-governmental organizations, two federal agencies and Avista. The Settlement Agreement was then filed with the license application in February 1999. As a condition of settlement, Avista initiated implementation of the proposed license conditions in March 1999, two years before the new federal operating license went into effect and initiated the funding of approximately \$4.7 million annually for Protection, Mitigation and Enhancement (PM&E) measures benefiting natural and cultural resources within the project area. Located within the Lower Clark Fork River – Lake Pend Oreille drainage, Avista's project area extends from Thompson Falls Dam downstream to Albeni Falls Dam in Idaho encompassing approximately 70 miles of mainstem river, Lake Pend Oreille and all associated tributaries.

The Clark Fork Settlement Agreement has become the mechanism for sustaining the collaborative relationships needed to implement a common and always evolving community vision for the river/lake and is the basis for the new license for operation of the Clark Fork Projects. Using an annual stakeholder decision making process, proposed projects are brought forward, discussed, evaluated and approved or disapproved. Many times available Avista dollars are used to bring other outside dollars into restoration efforts within the lower Clark Fork – Lake Pend Oreille watershed. The collaborative process and relationships continue as Avista and the signatories to the Settlement Agreement move forward in implementing its PM&E measures.

The 26 PM&E measures contained within The Clark Fork Settlement Agreement reflect consensus on a broad range of subjects including fisheries, water quality, wetlands, wildlife, botanical, land use, recreation, aesthetics and cultural resources. PM&E programs are divided into two primary categories, aquatic and terrestrial. Aquatic projects funded and implemented to date include fish habitat improvements, riparian restoration, sub-watershed assessments, water quality and fisheries monitoring, fish passage studies, bull trout education, support for watershed councils and acquisition of key aquatic habitats through fee title and conservation easements. Terrestrial projects funded and implemented to date include improvements to recreational facilities (e.g., added amenities, trails, universal accessibility), development of a river corridor trail plan, noxious weed controls, shoreline erosion controls, protection of black cottonwood stands, and acquisition of important wetland and riparian habitats through fee title and conservation easements.

Bull trout (*Salvelinus confluentus*) recovery is also a key issue at the Clark Fork Projects. Listed as threatened under the Endangered Species Act in 1998, bull trout are the subject of a comprehensive restoration plan additionally developed by the collaborative participants. Avista funding in excess of \$2 million annually for PM&E fisheries programs in northern Idaho and northwestern Montana will benefit all native salmonids, but with a particular emphasis on bull trout.

Over the length of the 45-year license for the two dams, Avista has committed technical and financial resources to implement these PM&Es. The CFSA sets definite annual funding levels for each PM&E, but the total actual amount spent varies from year to year. In 2006, for example, Avista spent approximately \$7 million on PM&E projects.

PLUM CREEK TIMBER COMPANY

Plum Creek is Montana's largest private forest landowner, managing 1.2 million acres in the northwest portion of the state. The growing and harvesting of forest products from these lands is directed by 40 foresters, two wildlife biologists and one forest hydrologist. These lands supply the majority of wood fiber used at company manufacturing plants located throughout western Montana, which include four sawmills, two plywood plants, a medium density fiberboard plant, and a remanufacturing facility. These mills are further supplied by wood fiber procured from lands managed by the US Forest Service, State of Montana, Bureau of Indian Affairs, and other private landowners. While the majority of Plum Creek lands are reforested after harvest through natural regeneration, Plum Creek plants approximately 2 million seedlings per year in Montana. Most of these are grown at a nursery in Pablo, Montana which produces 1.8 million containerized seedlings annually. Additional seedlings are grown at a nursery in Oregon. More information on Plum Creek can be obtained from the corporate website at www.plumcreek.com.

Sustainable Forestry Initiative

Plum Creek lands are managed in accordance with the Sustainable Forestry Initiative (SFI) program, which is a commitment to practice a land stewardship ethic which combines reforestation, growing, managing, and harvest of trees with the protection of wildlife, plants, soil and water quality. Plum Creek has been an SFI participant since the program's inception in 1994 and was among the first to be independently verified as in conformance with the standard in 1999. In September 2006, Plum Creek's Montana operations were re-evaluated by auditors from PriceWaterhouseCoopers and were again verified in conformance with the SFI standard. More information on the Sustainable Forestry Initiative can be obtained at www.aboutsfi.org and www.aboutsfb.org.

Native Fish Habitat Conservation Plan

Water quality is protected during forest operations on company lands through implementation of the Montana Streamside Management Zone (SMZ) law and Best Management Practices for Forestry in Montana. These base programs are supplemented with additional conservation commitments outlined in the Plum Creek Timber Company Native Fish Habitat Conservation Plan (NFHCP) which was approved by the US Fish and Wildlife Service in 2000. This 30-year agreement is designed to maintain and restore habitat conditions for native salmonids, including, bull trout, westslope cutthroat trout, and redband rainbow trout. Key conservation provided by the plan includes:

Roads – (1) Upgrade old roads to an improved Best Management Practice (BMP) standard by 2015; (2) Correct fish passage barriers at culverts where they exist; (3) Decommission roads that are not needed for long-term forest management; (4) Build new roads to an “enhanced” erosion control standard; and (5) Inspect the road network at regular intervals to ensure BMP function and identify maintenance needs.

Streamside Areas - Provide wider buffers than Montana SMZ law normally requires along highly sensitive stream segments, particularly those streams prone to migration.

Grazing – Requires Plum Creek's 38 leaseholders to implement grazing BMPs designed to protect and restore streamside areas, and monitor environmental conditions during the grazing season.

Land Use Planning - Creates an accounting framework which promotes land dispositions with positive conservation outcomes.

Legacy and Restoration - Requires riparian restoration along Key Migratory Rivers that have been impacted by historic activities, such land clearing for hay meadows.

Adaptive Management and Monitoring – Includes significant commitments by Plum Creek to evaluate whether or not conservation commitments are effective at achieving the biological goals of the plan. Much of this work is communicated externally at professional conferences and in peer reviewed journal publications.

More information on the Native Fish Habitat Conservation Plan can be obtained at http://www.fws.gov/ida_hoes/PlumCr/Home_pcfeis.htm.

INTERNAL (DEPARTMENT OF ENVIRONMENTAL QUALITY)

PLANNING, PREVENTION & ASSISTANCE DIVISION

The Planning, Prevention and Assistance Division develops integrated water, air, waste management and energy plans to protect Montana's environmental 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 six Sections to include: Water Quality Standards, Water Quality Monitoring and Assessment, Watershed Management, Watershed Protection, Information Management and Technical Services and Quality Assurance. Together these sections work towards the common goal of attaining and maintaining the 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
- Development of restoration plans and TMDLs for impaired waterbodies
- NPS planning and implementation
- Coordination of State-wide agency water quality monitoring
- Operation of statewide water quality monitoring networks and monitoring databases
- Water quality modeling and watershed analysis
- Dissemination of monitoring data
- Coordination of citizen volunteer water quality monitoring

Collaboration and coordination opportunities with the NPS program:

- The Bureau will take the lead in organizing and facilitating intra-agency efforts in watershed planning and water quality restoration and prevention activities related to NPS sources
- The Bureau provides NPS information and educational materials and opportunities to other local, state and federal agencies.
- Close collaboration with the Permitting and Compliance Division in TMDL and permit development.
- Use the watershed framework to identify waters requiring site specific water quality standards and to facilitate the development of site specific standards. Use watershed forums to improve information and education to public regarding water quality standards.
- Increase the level of access and distribution of environmental monitoring information within DEQ to ensure that permit decisions are well informed by the latest status and trends information.

Technical & Financial Assistance Bureau

The Technical & Financial Assistance Bureau provides low interest loan financing for drinking water and wastewater infrastructure projects and eligible nonpoint source pollution control and facilitates communication between DEQ and other state, federal, and local governments regarding environmental regulatory issues. Collaboration and coordination opportunities with the NPS program include the following:

- Promote awareness of State Revolving Fund (SRF) opportunities to address NPS pollution.

- SRF programs collaborate on monitoring and assessment to identify areas of water quality concern, and develop a shared priority ranking system for evaluating SRF projects with priorities from other agencies and programs.
- SRF programs work with the Resource Protection Planning Bureau to develop NPS applications of SRF funding.
- SRF loans used for implementation of BMPs in approved water quality restoration plans.
- Develop, demonstrate and publicize alternative energy systems for pumping irrigation water and providing off stream livestock water.

Issues requiring long term strategies to resolve:

- Participate in assessment activities to identify areas of impaired water quality for the purpose of proactively targeting the area for information and education activities regarding SRF opportunities.
- Integrate Intended Use Plan and Project Priority List with other statewide watershed reporting components.
- Close collaboration between the water quality standards and watershed planning sections in TMDL development.

The Technical and Financial Assistance Bureau also consists of the Source Water Protection Program and the Wetland Program which provide assistance through the following activities:

- 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 the source waters.
- Wetland conservation.
- Assists local governments to establish local water quality districts. Collaboration and coordination opportunities with the NPS program:
- Incorporate wetland conservation strategy into watershed framework for priority setting and grant award process.
- Include wetland identification and delineation information into the watershed domain within the CWAIC database.
- Coordinate public meeting and community outreach on a watershed basis (e.g. Wetlands, SWAP, 319, TMDL, waterbody classifications).
- Coordinate information collection and monitoring between Source Water Protection and other water quality programs including TMDLs.
- Use the watershed framework to better understand the relationship between groundwater and surface water systems. Develop a data layer for each 8 digit HUC that identifies areas of interaction between surface water and groundwater.
- Coordinate Source Water Protection and Wetland Conservation project priorities with the 319(h) grant program.

Issues requiring long term strategies to resolve:

- Detailed GIS mapping of the status of wetlands within watersheds to support local watershed planning and management efforts.
- Coordinated participation of programs on local watershed planning and management organizations.

Energy and Pollution Prevention Bureau

The Energy and Pollution Prevention Bureau is responsible for energy efficiency and renewable energy programs, energy policy analysis, waste reduction and recycling, and small business assistance. This bureau works in all media and develops strategies to prevent pollution and 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
- Establishing recycling opportunities for batteries, electronic waste, mercury and other hazardous waste to ensure chemicals from these products do not enter ground or surface water.
- Financing water conservation projects in state government facilities and leading state government efforts to use fertilizers, cleaning chemicals and other materials wisely.

PERMITTING & COMPLIANCE DIVISION

The Permitting and Compliance Division reviews and assesses all environmental permit and license applications to determine the correct control measures and requirements needed to meet the laws and rules that have been enacted to protect the quality of the state's air, water, and land. The division prepares the appropriate environmental review documents to comply with the Montana Environmental Policy Act.

Water Protection Bureau

Prevents surface and groundwater pollution by reviewing potential sources of pollution and issuing a variety of surface and groundwater permits. Collaboration and coordination opportunities with the NPS program:

- Participate with the NPS program, through the Director's office, in providing MEPA/NEPA related comments related to proposed MDT FHWA projects and for other major projects proposed by state and federal resource agencies.
- Participate on the MDT/FHWA Safe, Accountable, Flexible, Efficient Transportation Act: A Legacy for Users (SAFETEA-LU) process review for Montana. The process requires pre-MEPA/NEPA agency coordination to ultimately provide more efficiency and predictability in the permitting process.
- Participate on the NPS 319 Grant Review team.
- Improve coordination on high priority TMDLs where both point and nonpoint sources contribute to waterbody impairment.
- Serve on TMDL work teams and attend Watershed Management Team meetings.
- Coordinate discharger monitoring and baseline information to address information needs and gaps in the watershed planning database (i.e. CWAIC).
- Participate in interagency coordination meetings, regularly scheduled to review permit application of interest to DEQ, COE, FWP, USFWS, and DNRC.
- Mitigation banking review team participation convened by COE.
- Participation in ITEEM – Integrated Transportation and Ecological Enhancements for Montana.
- Participation in IRTWG – Interagency Review Team Working Group formed by Executive Order
- Participate with FWP & COE in the in-lieu fee program for impacts to aquatic resources.

- Participation in GNESA – Great Northern Environmental Stewardship Area with other stakeholders in the Middle Fork of the Flathead River watershed to find collaborative ways to protect the resources.
- Participate in DNRC's capacity building committee to improve the 310 permitting process with conservation districts.
- Participate in Lower Missouri River Recovery Team, established by the COE.
- Participate in LoMoCRM – the Lower Missouri River Coordinated Resource Management process established by the local conservation districts.

Issues requiring long term strategies to resolve:

- Participate collaboratively with COE, and DEQ's Wetlands and NPS program to develop appropriate 401 Certifications and General Conditions for the COE's Nationwide Permits that come up for 401 Certification every five years.
- Integrate stormwater, groundwater, and CAFO permit activities into overall watershed planning framework.
- Increase modeling and assessment capabilities to support MPDES permit process and TMDL development.
- Coordinate the MPDES permit's 401 water quality certification and 318 authorizations with other components of the watershed framework schedule, such as the monitoring, assessment and TMDL program.

The Public Water & Subdivisions Bureau

This bureau regulates public drinking water and subdivision facilities in Montana. The bureau's Public Water Supply Compliance Section Program assures that public health is maintained protected through a safe and adequate supply of drinking water. These functions are achieved by technical reviews, licensing, certifications, water quality sampling and compliance monitoring, sanitary surveys (inspections) and through training and technical assistance. The section also certifies licenses operators of certain public drinking water systems and public wastewater treatment facilities. The Bureau's Subdivision and Public Water Supply Plan Review Section Program reviews design plans applications for proposed subdivisions to ensure compliance with the Sanitation in Subdivisions Act. In general, this includes reviewing the adequacy of water supply, wastewater treatment and disposal, solid waste disposal, and stormwater control systems for parcels of land smaller than 20 acres, and for condominiums and recreational vehicle and mobile home parks, regardless of their size. Included in this review is the evaluation of water quality impacts from wastewater disposal systems in accordance with Montana's nondegradation and mixing zone rules. In addition this program reviews design and operation plans for proposed public water and wastewater systems or modifications to existing systems for compliance with Montana's design standards.

Collaboration and coordination opportunities between with the NPS program and the Public Water and Subdivision Bureau include:

- Contribute growth trend information to watershed planning process based on anticipated use patterns for wastewaters discharges and water supply.
- Provide watershed information for use in water and wastewater system reviews and investigations.
- Assists NPS program identify key areas of water quality concern for preservation (drinking water source) or for mitigation (wastewater inspections).
- Participation on Watershed Management Team and 16-basin TMDL work teams.

- Maintain a comprehensive record system for public drinking water sampling results.
- Assist in the identification of sensitive areas or changes in areas that might put public water supplies in jeopardy.

Issues requiring long term strategies to resolve:

- Incorporate public water supply monitoring report information into watershed planning and management databases.

Industrial & Energy Minerals Bureau

The Industrial & Energy Minerals Bureau (IEMB) is responsible for permitting and regulating activities that are related to the prospecting and mining of coal and uranium and the mining of sand, gravel, bentonite, scoria, clay, soil and peat, and the reclamation of lands disturbed by all of these operations. IEMB activities include conducting inspections of active and inactive permitted mine sites and ensuring or advising mining operations, as appropriate under the regulations that stormwater permits are obtained or may be needed, respectively. Collaboration and coordination opportunities with the NPS program include:

- Incorporating information collected in mine permitting processes into the CWAIC watershed database or other appropriate database. This could include baseline and monitoring information for surface and groundwater, vegetation, wildlife, soils, geology, and cultural and historic resources.
- Sharing information collected for MEPA analysis and TMDL development (e.g. new permits and amendments for coal mining require cumulative hydrologic impact analysis which is frequently a key element in TMDL development).
- Participation in Watershed Management Team meetings on an as needed basis.
- Participation on DEQ TMDL work teams where bureau activities are related to water quality restoration and protection.

Air Resources Management Bureau

Permitted sources are required to submit a Best Available Control Technology (BACT) Analysis for their air emitting sources. The ARMB reviews their analysis and ultimately makes a BACT determination for the emitting unit. BACT determinations conclude that either no control is required or that a specific emission control is required. The decreased levels of pollutants from emission controls would generally lead to less pollution that may be deposited on waterbodies.

The ARMB also ensures that the emissions from sources comply with ambient air quality standards through modeling. The ARMB does not issue permits that allow potential violations of ambient air quality standards. This process 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.

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. 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 have been released to soil, sediment, surface water, or groundwater; and to ensure compliance with applicable state and federal regulations.

The Remediation Division's mission includes sharing information from the statewide priority list for various kinds of cleanup. Information includes:

- Estimates of volumes of mine waste on site and numbers of discharging adits from abandoned mine sites that could be used for TMDL development.
- Possible opportunities for public notice and education for public meetings associated with the cleanup process.
- State and Federal superfund, abandoned mine and tank release facilities have monitoring requirements that often include groundwater and other parameters that are considered appropriate for the location. The monitoring requirements and collected information (e.g. annual site reports) could be included in the watershed domain of the CWAIC database. Groundwater gradient and depth information could be useful in the Source Water Assessments.
- Site corrective actions are assessment based and are logically connected to other mitigation activities that are being undertaken within the watershed management unit. The corrective actions could be considered in the context of an overall watershed recovery action strategy.
- State and federal superfund programs manage sites in many watersheds that are water supply watersheds and / or are listed on the 303(d) list of impaired waters. Risk assessments are conducted to identify potentially affected aquatic resources that could be useful to a watershed water quality planning and management process.

Opportunities for Coordination and Collaboration:

- Proposed drinking water sites and new growth/subdivision information could affect the various programs' priorities.
- Superfund program needs baseline information for their sites to determine what background conditions were prior to contamination, leading to better informed cleanup objectives.

Issues requiring long term strategies to resolve:

- Subdivision of contaminated property.

APPENDIX D - DEQ ABANDONED MINE BUREAU PRIORITY SITE LIST

Tables updated 12/20/2006

Table D-1. SITES RECLAIMED BY MWCB

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL RANK	ORIGINAL AIMSS SCORE	COUNTY	DISTRICT	SITE NAME	PA NUMBER	RAIMSS SCORE	SITE STATUS
75	28.72	Granite	South Boulder	BROOKLYN MINE/MILL	20-025	0.03	REMOVAL ACTION MWCB 1995
34	114.32	Broadwater	Winston	VOSBURG MINE/MILL	04-014	0.03	REMOVAL ACTION MWCB 1995
103	12.48	Lewis & Clark	Lincoln	BLACKFOOT TAILINGS	25-322	0.03	REMOVAL ACTION MWCB 1996
7	707.94	Ravalli	Curlew	CURLEW	41-003	2.10	REMOVAL ACTION MWCB 1996
8	540.51	Lewis & Clark	Marysville	PIEGAN GLOSTER MILL	25-172	3.50	REMOVAL ACTION MWCB 1996
49	65.61	Granite	Maxville	MAXVILLE TAILINGS/LONDONDERRY	20-209	1.66	REMOVAL ACTION MWCB 1996
21	240.02	Broadwater	Indian Creek	PARK	04-012	0.04	REMOVAL ACTION MWCB 1997
119	7.04	Broadwater	Indian Creek	Bullion King	04-081	*NYC	REMOVAL ACTION MWCB 1997
20	240.15	Lewis & Clark	Marysville	EMPIRE MILLSITE	25-175	2.41	REMOVAL ACTION MWCB 1997
27	175.59	Mineral	Cedar Creek	NANCY LEE MILLSITE - SLOWEY	31-090	0.47	REMOVAL ACTION MWCB 1998
46	73.39	Mineral	Keystone	NANCY LEE MILLSITE	31-082	21.45	REMOVAL ACTION MWCB 1998
170	2.11	Mineral	Keystone	NANCY LEE MINE	31-001	1.93	REMOVAL ACTION MWCB 1998
32	135.63	Jefferson	Clancy	NELLIE GRANT	22-244	0.54	REMOVAL ACTION MWCB 1998
15	349.49	Granite	Philipsburg	DOUGLAS CREEK TAILINGS	20-003	10.90	REMOVAL ACTION MWCB 1999
17	262.17	Jefferson	Colorado	ALTA	22-001	60.20	REMOVAL ACTION MWCB 1999
13	456.34	Lewis & Clark	Helena	SPRING HILL TAILINGS	25-067	21.60	REMOVAL ACTION MWCB 1999
10	510.15	Jefferson	High ore	COMET	22-009	*NYC	REMOVAL ACTION MWCB 2001
45	76.22	Meagher	Castle Mountain	CUMBERLAND	30-004	*NYC	REMOVAL ACTION MWCB 2001
86	21.92	Jefferson	Colorado	BERTHA	22-002	*NYC	REMOVAL ACTION MWCB 2002
57	47.21	Jefferson	Colorado	GREGORY	22-005	*NYC	REMOVAL ACTION MWCB 2002
43	76.47	Madison	Norris/Red Bluff	BOAZ MINE	29-013	*NYC	REMOVAL ACTION MWCB 2003
135	0.24	Madison	Norris/Red Bluff	GRUBSTAKE	29-399	*NYC	REMOVAL ACTION MWCB 2003
33	16.04	Lewis & Clark	Marysville	BIG OX MILLSITE	25-115	*NYC	REMOVAL ACTION MWCB 2003
NA	6058.67	Cascade	Great Falls	Montana Silver Smelter	NA	*NYC	REMOVAL ACTION MWCB 2003
24	196.19	Jefferson	Colorado	WICKES SMELTER	22-358	*NYC	REMOVAL ACTION MWCB 2004
30	99	Powell	Elliston	ONTARIO MILLSITE	39-010	*NYC	REMOVAL ACTION MWCB 2005

Table D-1. SITES RECLAIMED BY MWCB

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL RANK	ORIGINAL AIMSS SCORE	COUNTY	DISTRICT	SITE NAME	PA NUMBER	RAIMSS SCORE	SITE STATUS
3	18	Jefferson	Colorado	WASHINGTON	22-007	*NYC	REMOVAL ACTION MWCB 2006
13	NA	Jefferson	Colorado	<i>BIG CHIEF - GOLCONDA</i>	49020	*NYC	REMOVAL ACTION MWCB 2006
19	68	Madison	Sheridan	BUCKEYE	29-451	*NYC	REMOVAL ACTION MWCB 2006
20	70	Jefferson	Colorado	BLUEBIRD	22-003	*NTC	REMOVAL ACTION MWCB 2006
31	106	Jefferson	Colorado	ARGENTINE	22-102	*NYC	REMOVAL ACTION MWCB 2006

*NYC = Not Yet Calculated

Table D-2. PRIORITIZED SHORT LIST OF AML SITES

This list does not include sites that have been: referred to other agencies, have no further action contemplated, or have been included on the NPL. (SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

CURRENT RANK	ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
1	NA	Lewis & Clark	Helena	Spring Meadow Lake	25-505	4324.33	Investigation Phase
2	5	Powell	Emery	EMERY	39-004	879.62	Responsible Party Investigation
4	14	Broadwater	Radersburg	<i>Toston Smelter</i>	04-405	357.67	Investigation Phase
5	26	Lewis & Clark	Marysville	GOLDSIL MILLSITE	25-365	180.51	Investigation Phase
6	29	Broadwater	Winston	EAST PACIFIC	04-008	169.32	Design Phase
8	NA	Park	New World	Republic Mine & Mill	34-106	154.50	Investigation Phase
9	47	Lincoln	Libby	SNOWSHOE MINE	27-005	69.39	Design Phase
10	50	Lewis & Clark	Marysville	BALD BUTTE MILLSITE	25-179	60.59	Design Phase
11	51	Granite	Philipsburg	TROUT	20-062	57.60	Eligibility Under Review
12	54	Jefferson	Elkhorn	Elkhorn Creek Tailings	22-502	53.99	Investigation Phase
14	55	Granite	Philipsburg	BI-METALLIC/OLD RED	20-002	52.20	Eligibility Under Review
15	60	Granite	Philipsburg	SCRATCH ALL	20-019	46.09	Eligibility Under Review
16	61	Madison	Pony	Garnet Gold	29-035	45.73	Investigation Phase
17	65	Sanders	Plains	MONTRO GOLD	45-010	39.91	Investigation Phase
18	66	Silver Bow	Basin Creek	HIGHLAND	47-028	39.76	Eligibility Under Review
21	67	Granite	Philipsburg	GRANITE MOUNTAIN	20-110	38.66	Investigation Phase
22	71	Granite	Dunkleburg	FOREST ROSE	20-004	30.87	Investigation Phase
23	81	Broadwater	Winston	Sunrise/January	04-130	26.59	Investigation Phase
24	85	Jefferson	Clancy	<i>FROHNER</i>	22-243	22.68	Investigation Phase
25	87	Beaverhead	Bannack	GOLD LEAF/ PRISCILLA	01-031	20.66	Responsible Party Investigation
26	91	Granite	Philipsburg	ALGONQUIN	20-005	16.12	Responsible Party Investigation
27	93	Madison	Virginia City	Prospect	29-136	15.91	Responsible Party Investigation
28	96	Granite	Philipsburg	<i>DOUGLAS CREEK WASTE ROCK</i>	20-503	14.10	
29	97	Sanders	Blue Creek	BROKEN HILL	45-005	13.80	Responsible Party Investigation
32	98	Lewis & Clark	Stemple	NE NW SECTION 13	25-197	13.66	
33	108	Granite	Philipsburg	TRUE FISSURE	20-111	10.57	
34	109	Madison	Virginia City	U.S. Grant	29-095	10.57	
35	114	Lewis & Clark	Marysville	Drumlummon Mine/Mill/Tailings	25-024	9.40	Investigation Phase
36	116	Jefferson	Elkhorn	QUEEN/TOURMALINE QUEEN	22-111	7.74	
37	118	Jefferson	Elkhorn	ELKHORN QUEEN	22-027	7.51	
38	120	Lewis & Clark	Marysville	BALD MOUNTAIN	25-061	7.00	Investigation Phase

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CURRENT RANK	ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
39	121	Madison	Virginia City	PACIFIC	29-118	6.62	
40	122	Powell	Emery	HIDDEN HAND	39-502	6.53	
41	125	Mineral	Iron Mountain	DILLON MILLSITE	31-073	6.10	
42	126	Madison	Pony	BOSS TWEED	29-034	6.05	
43	128	Beaverhead	Hecla	LOWER AND UPPER CLEVE	01-143	5.99	
44	132	Granite	Philipsburg	Little Gem	20-071	5.44	
45	133	Granite	South Boulder	NONPAREIL	20-012	5.43	Investigation Phase
46	134	Broadwater	Indian Creek	ST. LOUIS	04-013	5.34	
47	135	Park	New World	MCLAREN TAILINGS	34-004	5.24	Investigation Phase
48	136	Broadwater	Radersburg	KEATING TAILINGS	04-121	4.95	
49	139	Granite	Antelope Creek	SILVER KING	20-186	4.36	
50	140	Madison	Pony	STRAWBERRY MINE	29-038	4.32	
51	141	Madison	Sheridan	LAKESHORE MINE	29-436	4.08	
52	143	Beaverhead	Hecla	True Blue	01-138	4.04	
53	144	Fergus	Warm Springs	Gilt Edge Tailings	14-008	4.03	
54	147	Broadwater	Winston	Chartam	04-501	3.94	
55	148	Powell	Elliston	JULIA	39-022	3.88	
56	152	Madison	Sheridan	UNCLE SAM	29-383	3.42	
57	154	Lewis & Clark	Stemple	SWANSEA TAILINGS/MINE	25-208	3.28	
58	155	Fergus	Warm Springs	Prester John	14-090	3.05	
59	NA	Fergus	North Mocassin	Barnes King Gulch Tailings	14-401	2.91	
60	160	Broadwater	Radersburg	OHIO	04-009	2.64	
61	161	Powell	Elliston	ANNA P./ HATTIE M.	39-044	2.59	
62	162	Meagher	Smith River	SW NE S10	30-078	2.53	
63	167	Madison	Sheridan	LATEST OUT	29-354	2.18	
64	173	Jefferson	Colorado	Crawley Camp	22-028	2.03	
65	174	Lewis & Clark	Stemple	ASTOR	25-227	2.02	
66	177	Silver Bow	Elk Park	RISING SUN	47-037	1.95	
67	178	Jefferson	Alhambra	SOLAR SILVER	22-054	1.91	
68	179	Jefferson	Alhambra	ALHAMBRA HOT SPRINGS	22-049	1.84	
69	180	Beaverhead	Birch Creek	INDIAN QUEEN	01-034	1.81	

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CURRENT RANK	ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
70	183	Missoula	Ninemile	LOST CABIN MINE	32-011	1.55	
71	184	Broadwater	Winston	Custer Millsite	04-006	1.51	
72	185	Mineral	Iron Mountain	BELLE OF THE HILLS	31-072	1.50	
73	187	Beaverhead	Hecla	TRAPPER	01-144	1.40	
74	188	Granite	Moose Lake	BANNER TAILINGS	20-175	1.39	
75	190	Madison	Virginia City	EASTON	29-121	1.33	
76	191	Powell	Elliston	GOLDEN ANCHOR	39-012	1.29	
77	NA	Fergus	North Mocassin	Little Dog Creek Tailings	14-400	1.28	
78	192	Lincoln	Cabinet	<i>King Mine</i>	27-043	1.26	
79	194	Mineral	Keystone	LITTLE ANACONDA MINE	31-077	1.22	
80	196	Powell	Emery	<i>BONANZA</i>	39-501	1.20	
81	197	Madison	Sheridan	GOLDSCHMIDT/STEINER	29-078	1.19	
82	199	Powell	Elliston	MOUNTAIN VIEW	39-062	1.16	
83	201	Jefferson	Clancy	GENERAL GRANT	22-245	1.14	
84	203	Jefferson	Elkhorn	TACOMA	22-284	1.11	
85	204	Powell	Emery	<i>EMMA DARLING</i>	39-027	1.07	
86	208	Granite	Frog Pond	Millers Mine	20-176	0.97	
87	209	Stillwater	Stillwater	BENBOW MILLSITE	48-005	0.96	
88	210	Missoula	Ninemile	NUGGET MINE	32-042	0.89	
89	211	Lewis & Clark	Marysville	WILD CAT	25-317	0.88	
90	218	Broadwater	Confederate	MILLER	04-138	0.77	
91	219	Granite	Alps	Argo	20-081	0.77	
92	221	Madison	Tidal Wave	B & H	29-083	0.75	
93	222	Deer Lodge	Silver Lake	SILVER LAKE MILLSITE	12-070	0.74	
94	223	Powell	Elliston	KIMBALL	39-018	0.74	
95	224	Powell	Elliston	MONARCH	39-008	0.69	
96	226	Granite	South Boulder	<i>PORT ROYAL MILL TAILINGS</i>	20-016	0.64	
97	228	Madison	Sheridan	BROADGAUGE MINE	29-293	0.64	
98	230	Madison	Pony	ATLANTIC/PACIFIC	29-033	0.63	
99	232	Sweet Grass	Independence	YAGER/DAISY	49-002	0.55	
100	233	Jefferson	Elkhorn	Trumley Heap Leach	22-501	0.52	

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CURRENT RANK	ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
101	234	Missoula	Copper Cliff	Copper Cliff	32-001	0.49	
102	235	Park	Emigrant	ALLISON	34-018	0.47	
103	236	Granite	Dunkleburg	JACKSON PARK	20-027	0.46	
104	238	Silver Bow	Melrose	CLIPPER	47-029	0.45	
105	239	Mineral	Packer Creek	SALTESE CONSOLIDATE	31-021	0.44	
106	240	Madison	Virginia City	Belle Mine	29-098	0.42	
107	241	Missoula	Ninemile	JOE WALLIT MINE	32-010	0.42	
108	244	Sanders	Trout Creek	HOLLIDAY MINE	45-009	0.40	
109	245	Beaverhead	Wisdom	MARTIN	01-270	0.37	
110	246	Missoula	Copper Cliff	Frogs Diner	32-027	0.37	
111	249	Madison	Sheridan	SMUGGLER	29-010	0.35	
112	251	Powell	Elliston	HARD LUCK MINE	39-014	0.32	
113	252	Lewis & Clark	Stemple	SE SW SECTION 10	25-212	0.31	
114	254	Sanders	Plains	S & H	45-017	0.29	
115	256	Madison	Tidal Wave	DRY GULCH (SOUTH)	29-282	0.28	
116	257	Broadwater	Hellgate	ARGO MINE AND MILLSITE	04-015	0.27	
117	258	Fergus	Warm Springs	CUMBERLAND	14-017	0.27	
118	259	Granite	Garnet	Free Coin/Red Cloud	20-134	0.27	
119	260	Deer Lodge	Orofino	CHAMPION	12-003	0.26	
120	263	Lewis & Clark	Stemple	Jay Gould Mine/Mill	25-500	0.23	
121	264	Granite	Dunkleburg	WASA	20-023	0.22	
122	265	Granite	Combination	SUNRISE/QUEEN MILLSITE	20-036	0.22	
123	266	Lewis & Clark	Marysville	BELMONT	25-167	0.22	Investigation Phase
124	267	Fergus	Warm Springs	TAIL HOLT	14-010	0.16	
125	268	Granite	Alps	ALPS	20-065	0.16	
126	269	Park	Big Timber Canyon	STEMWINDER SOUTH	34-500	0.16	
127	270	Beaverhead	Wisdom	CLARA	01-262	0.15	
128	273	Ravalli	Pleasant View	BLUEBIRD	41-009	0.14	
129	276	Jefferson	Elkhorn	Iron	22-359	0.13	
130	277	Madison	Sheridan	RED PINE	29-079	0.13	
131	278	Madison	Washington	SE SE SECTION 25	29-394	0.13	

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CURRENT RANK	ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
132	279	Silver Bow	Melrose	OLD GLORY	47-027	0.13	
133	280	Stillwater	Nye	MOUAT MINE	48-001	0.13	
134	281	Lewis & Clark	Ophir	VICTORY/EVENING STAR	25-010	0.12	
135	282	Powell	Elliston	TELEGRAPH	39-023	0.12	
136	284	Madison	Virginia City	APEX	29-105	0.11	
137	285	Meagher	Beaver Creek	BIGLER MINE	30-067	0.11	
138	286	Granite	Antelope Creek	ANT	20-194	0.09	
139	287	Park	New World	UPPER ALICE E.	34-085	0.09	
140	288	Ravalli	Frog Pond	MONTANA PRINCE	41-004	0.09	
141	290	Granite	Moose Lake	OLD DOMINION MINE	20-180	0.06	
142	291	Meagher	Castle Mountain	BELLE OF THE CASTLES	30-007	0.06	
143	292	Powell	Elliston	THIRD TERM	39-024	0.06	
144	293	Beaverhead	Hecla	SILVER KING	01-094	0.05	
145	294	Sanders	Plains	LOWER LETTERMAN	45-047	0.05	

Table D-3. RECLAIMED SITES BY OTHER PROGRAMS/AGENCIES

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL RANK	ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
1	4694.7	Jefferson	Colorado	CORBIN FLATS	22-004	55.40	REMOVAL ACTION PEGASUS/VCRA 1998
2	1892.74	Lewis & Clark	Helena	Joslyn Street Tailings	25-501	6.25	REMOVAL ACTION DEQ/CECRA 1996
40	97.38	Lewis & Clark	Rimini	LOWER TENMILE MILL	25-030	25.13	REMOVAL ACTION EPA 1995
12	490.37	Powell	Elliston	CHARTER OAK	39-003	318.74	REMOVAL ACTION - USFS
33	131.76	Granite	Combination	COMBINATION MILL	20-009	32.10	COMPLETED ASARCO/USFS 1996
38	99.32	Granite	Combination	COMBINATION II	20-009A	99.32	COMPLETED ASARCO/USFS 1996
6	878.86	Lewis & Clark	Rimini	RED WATER	25-007	97.67	REMOVAL ACTION EPA 1997
3	1628.48	Lewis & Clark	Rimini	RED MOUNTAIN	25-019		REMOVAL ACTION EPA 1999
7	39	Park	New World	Great Republic Smelter	34-000	97.89	REMOVAL ACTION USFS/EPA 2005

Table D-4. BASIN DISTRICT SITES PLACED ON THE EPA NATIONAL PRIORITY LIST

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE
19	Jefferson	Basin	ENTERPRISE	22-074	245.76
37	Jefferson	Basin	BULLION	22-008	99.48
53	Jefferson	Basin	BUCKEYE	22-072	55.45
80	Jefferson	Basin	Josephine	22-031	26.80
112	Jefferson	Basin	Old Basin Millsite	22-500	9.59
146	Jefferson	Basin	BASIN MILLSITE	22-036	3.98
169	Jefferson	Basin	Lady Leith (NE NW S6)	22-316	2.13
193	Jefferson	Basin	JACK CREEK TAILINGS	22-296	1.22
216	Jefferson	Basin	Doris	22-293	0.79
283	Jefferson	Basin	BULLION SMELTER	22-505	0.11

Table D-5. CATARACT DISTRICT SITES PLACED ON THE EPA NATIONAL PRIORITY LIST

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE
22	Jefferson	Cataract	CRYSTAL MINE	22-073	238.88
110	Jefferson	Cataract	EVA MAY	22-075	10.15
129	Jefferson	Cataract	Boulder Chief	22-132	5.93
137	Jefferson	Cataract	Crescent/Alsace	22-106	4.82
149	Jefferson	Cataract	Rocker/Ada	22-170	3.79
168	Jefferson	Cataract	MORNING GLORY	22-077	2.13
253	Jefferson	Cataract	MANTLE EAST	22-032	0.29

Table D-6. HUGHESVILLE DISTRICT SITES PLACED ON THE EPA NATIONAL PRIORITY LIST

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE
9	Cascade	Hughesville	BLOCK P TAILINGS	07-090	536.80
16	Judith Basin	Hughesville	BLOCK P MINE	23-001	326.17
31	Judith Basin	Hughesville	EDWARDS	23-046	152.66
74	Judith Basin	Hughesville	WRIGHT LODGE	23-045	29.30
79	Judith Basin	Hughesville	HARRISON	23-056	27.04
117	Judith Basin	Hughesville	TIGER	23-059	7.67
163	Judith Basin	Hughesville	Danny T.	23-500	2.48

Table D-6. HUGHESVILLE DISTRICT SITES PLACED ON THE EPA NATIONAL PRIORITY LIST

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE
166	Cascade	Hughesville	BON TON	07-094	2.19
186	Judith Basin	Hughesville	BELT PATENT MINE/TAILINGS	23-035	1.42
202	Judith Basin	Hughesville	CARTER	23-019	1.14
207	Judith Basin	Hughesville	MOULTON	23-058	0.98
217	Judith Basin	Hughesville	MARCELLINE	23-022	0.78
220	Judith Basin	Hughesville	SINCLAIR	23-501	0.77
231	Judith Basin	Hughesville	NE SE S7 / LUCKY STRIKE	23-042	0.59
243	Judith Basin	Hughesville	BELFONT	23-060	0.40
247	Judith Basin	Hughesville	M.T.A	23-040	0.36
261	Judith Basin	Hughesville	MAY AND EDNA	23-502	0.25

Table D-7. NEIHART DISTRICT SITES PLACED ON THE NATIONAL PRIORITY LIST

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE
30	Cascade	Neihart	SILVER DYKE ADIT	07-135	160.86
36	Cascade	Neihart	CARPENTER CREEK TAILINGS	07-103	103.53
48	Cascade	Neihart	SILVER DYKE TAILINGS	07-137	68.15
64	Cascade	Neihart	Queen of the Hills	07-085	40.68
69	Cascade	Neihart	NEIHART TAILINGS	07-134	37.58
77	Cascade	Neihart	SILVER DYKE MILL	07-138	28.33
84	Cascade	Neihart	DACOTAH	07-121	22.91
104	Cascade	Neihart	Rebellion Upper & Lower	07-157	12.12
105	Cascade	Neihart	Hartley	07-082	11.73
111	Cascade	Neihart	Broadwater	07-079	10.08
123	Cascade	Neihart	EVENING STAR MINE AND MILLSITE	07-087	6.42
130	Cascade	Neihart	BIG SEVEN MINE	07-156	5.68
145	Cascade	Neihart	SILVER BELT	07-111	4.00
153	Cascade	Neihart	MOLTON	07-084	3.30
157	Cascade	Neihart	FAIRPLAY	07-112	2.76
159	Cascade	Neihart	BENTON/BIG SNOWY	07-151	2.67
172	Cascade	Neihart	LOWER BLACK DIAMOND JAY	07-174	2.06
182	Cascade	Neihart	ROCHESTER	07-110	1.61
198	Cascade	Neihart	HAYSTACK CREEK	07-179	1.18

Table D-7. NEIHART DISTRICT SITES PLACED ON THE NATIONAL PRIORITY LIST

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE
200	Cascade	Neihart	Ripple Mines	07-163	1.14
205	Cascade	Neihart	<i>CORNUCOPIA</i>	07-147	1.00
214	Cascade	Neihart	<i>IXL/EUREKA</i>	07-083	0.84
215	Cascade	Neihart	Lexington	07-167	0.83
229	Cascade	Neihart	Emma	07-144	0.63
242	Cascade	Neihart	MAUD S.	07-129	0.40
255	Cascade	Neihart	STALLABRASS	07-120	0.28
271	Cascade	Neihart	SHERMAN NO. 2 (SOUTHWEST)	07-142	0.15
275	Cascade	Neihart	COMPROMISE	07-100	0.13
289	Cascade	Neihart	<i>LUCKY STRIKE</i>	07-169	0.06

Table D-8. RIMINI DISTRICT SITES PLACED ON THE EPA NATIONAL PRIORITY LIST

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
4	Lewis & Clark	Rimini	National Extension	25-287	1305.48	
11	Lewis & Clark	Rimini	VALLEY FORGE/SUSIE	25-008	500.06	
23	Lewis & Clark	Rimini	UPPER VALLEY FORGE	25-280	230.11	
28	Lewis & Clark	Rimini	Peerless Jenny/King	25-006	169.49	
35	Lewis & Clark	Rimini	ARMSTRONG MINE	25-102	108.59	Forest Service 2000
43	Lewis & Clark	Rimini	TENMILE MINE	25-005	79.90	
52	Lewis & Clark	Rimini	Monte Cristo	25-275	55.69	
82	Lewis & Clark	Rimini	Queensbury	25-262	26.24	
113	Lewis & Clark	Rimini	Woodrow Wilson	25-258	9.58	
131	Lewis & Clark	Rimini	BEATRICE	25-103	5.47	
189	Lewis & Clark	Rimini	Peter	25-259	1.39	
213	Lewis & Clark	Rimini	Monitor Creek Tailings	25-503	0.85	
248	Lewis & Clark	Rimini	Bear Gulch Mine	25-504	0.35	

Table D-9. NO FURTHER ACTION CONTEMPLATED ON THESE SITES

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
41	Lewis & Clark	Scratchgravel	FRANKLIN	25-339	86.59	No Further Action Contemplated/Landowner Cleanup
42	Granite	Philipsburg	Wenger #2	20-073	81.42	No Further Action Contemplated/?
NA	Jefferson	Colorado	Minnesota	22-252	48.80	No Further Action Contemplated/Access Denied
59	Jefferson	Alhambra	MIDDLE FORK WARM SPRINGS	22-046	46.31	Ineligible Due to Landowners Activities
62	Silver Bow	Elk Park	MARY EMMEE/CLINTON	47-035	43.53	MSE/Fed. (DOE) funded research project
72	Madison	South Boulder	MAMMOTH TAILINGS	29-082	30.59	No Further Action Contemplated/Access denied
73	Powell	Elliston	LILY/ORPHAN BOY	39-006	29.39	MSE/Fed. Research Project
76	Madison	Sheridan	SE SW SECTION 26	29-474	28.44	No Further Action Contemplated/Didn't meet action Levels
88	Deer Lodge	Silver Lake	GOLD COIN	12-004	17.50	No Further Action Contemplated/Subdivision
94	Madison	Silver Star	BROADWAY/VICTORIA	29-179	15.53	No Further Action Contemplated/Access Denied
102	Madison	South Boulder	MAMMOTH	29-008	12.62	No Further Action Contemplated/Access denied
107	Powell	Elliston	SURE THING	39-020	10.59	MSE/Fed. Research Project
138	Jefferson	High Ore	GREY EAGLE	22-029	4.75	No Further Action Contemplated/Subdivision
195	Lewis & Clark	Lincoln	SEVEN-UP PETE	25-020	1.20	No Further Action Contemplated/ineligible
272	Lewis & Clark	Marysville	BIG OX MINE	25-116	0.14	No Further Action Contemplated/Didn't meet action Levels

Table D-10. REFERRED TO OTHER AGENCY/PROGRAM

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
25	Flathead	Hog Heaven	FLATHEAD MINE COMPLEX	15-012	180.73	No Further Action Contemplated/Permitted EMB/DEQ
56	Missoula	Cramer Creek	LINTON MINE AND MILLSITE	32-017	49.35	Referred to BLM
58	Madison	Rochester	THISTLE MINE/TAILINGS	29-073	47.02	Referred to BLM
63	Beaverhead	Ermont	ERMONT MILL	01-005	41.98	Referred to BLM
78	Powell	Emery	<i>SPRING CREEK TAILINGS</i>	39-503	28.13	Referred to USFS
83	Madison	Washington	MISSOURI	29-373	24.42	Referred to USFS
89	Gallatin	Bozeman	KARST ASBESTOS	16-018	17.34	Referred to USFS
90	Jefferson	Elkhorn	Carmody	22-337	16.48	Under Exploration License (DEQ-EMB)

Table D-10. REFERRED TO OTHER AGENCY/PROGRAM

(SITE NAME: 1993 = CAPITALS; 1994 = Regular; 1995 = CAPITAL ITALICS; 1997 = Regular italics, 2001=Bold, 2002 Bold italics, 2004 BOLD CAPITAL ITALICS)

ORIGINAL AIMSS RANK	COUNTY	DISTRICT	SITE NAME	PA NUMBER	AIMSS SCORE	SITE STATUS
95	Missoula	Woodman	WARD LODE MINE	32-005	14.72	Referred to USFS
100	Lincoln	Libby	CHERRY CREEK MILL	27-006	13.20	Referred to USFS
101	Broadwater	Winston	Kleinschmidt	04-010	12.77	Referred to USFS
115	Beaverhead	Elkhorn	OLD ELKHORN	01-169	8.81	Referred to USFS
124	Park	New World	LOWER GLENGARRY	34-006	6.23	Referred to USFS
127	Park	New World	BLACK WARRIOR	34-079	6.04	Referred to USFS
142	Mineral	Iron Mountain	IRON MOUNTAIN MILLSITE	31-010	4.07	Referred to EPA
150	Broadwater	Winston	Golden Age	04-050	3.78	Referred to USFS
151	Beaverhead	Bannack	APEX MILLSITE	01-006	3.75	Referred to State FWP
156	Park	New World	MCLAREN MINE	34-010	2.84	Referred to USFS
158	Sanders	White Pine	JACK WAITE	45-002	2.68	Referred to USFS
164	Jefferson	Elkhorn	SOURDOUGH	22-336	2.36	Under Exploration License (DEQ-EMB)
165	Madison	Rochester	EMMA	29-061	2.27	Referred to BLM
171	Beaverhead	Lost Creek	TUNGSTEN MILLSITE	01-170	2.11	Referred to BLM
175	Missoula	Clinton	Wallace Creek Mill	32-019	1.96	Referred to BLM
176	Silver Bow	Moose Creek	MIDDLE FORK MILLSITE	47-081	1.96	Referred to USFS
181	Madison	Sheridan	NW SE SECTION 26	29-476	1.79	Referred to USFS
206	Mineral	Packer Creek	TARBOX-MINERAL KING	31-003	1.00	Referred to USFS
212	Park	New World	FISHER CREEK NO.1	34-090	0.86	Referred to USFS
227	Granite	Philipsburg	RUMSEY	20-018	0.64	EPA Enforcement
225	Park	New World	LITTLE DAISY	34-009	0.68	Referred to USFS
237	Park	New World	GOLD DUST	34-007	0.46	Referred to USFS
250	Madison	Virginia City	KEARSAGE MINE	29-102	0.33	Under Exploration License (DEQ-EMB)
274	Broadwater	Indian Creek	DIAMOND HILL	04-020	0.13	No Further Action Contemplated/Permitted EMB/DEQ
295	Madison	Rochester	WATSECA	29-075	NS	Referred to BLM
296	Madison	Pony	CMC Pony Mill	29-500	NS	EQPF FUNDED SITE

APPENDIX E - MONTANA NATURAL RESOURCE GRANT PROGRAMS

Agency and Grant Program	Program Purpose and Objective	Who Can Apply	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DEQ - Department of Environmental Quality (DEQ) 319 Program	Address nonpoint source water pollution. Two categories of applications: 1) Watershed Restoration (including groundwater) or 2) Education and Outreach.	Governmental Entities and 501c(3)	Robert Ray, DEQ, 406-444-5319, rray@mt.gov	http://www.deq.mt.gov/wqinfo/nonpoint/319Grants.mcp	Proposal 7/29/2011 Final Application 10/7/11	Yes	Varies by application category: Watershed Rest. \$300,000; E&O \$25,000
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.	All community public water systems owned by private persons or municipalities and nonprofit noncommunity water systems	Mark Smith, DEQ, 406-444-5325, marks@mt.gov	http://deq.mt.gov/wqinfo/srf/DWSRF/default.mcp	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)	Patrick Lizon, DEQ, 406-444-0531, plizon@mt.gov	http://www.deq.mt.gov/wqinfo/nonpoint/nonpointsourceprogram.mcp	first come-first serve basis	No	\$2,000

Agency and Grant Program	Program Purpose and Objective	Who Can Apply	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
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	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 - Conservation District Technical Assistance	Grants may be used for technical assistance necessary to get projects on the ground.	Conservation Districts	Laurie Zeller, DNRC, 406-444-6668, lzeller@mt.gov	http://www.dnrc.mt.gov/caridd/ConservationDistricts/Default.asp	Anytime	No	No Limit
DNRC - Conservation Districts Grant Program (223 Grants)	Conservation related activities sponsored by a conservation district.	Conservation Districts	Linda Brander, DNRC, 406-444-6668, lbrander@mt.gov	http://www.dnrc.mt.gov/caridd/ConservationDistricts/Default.asp	Jan/May/ Aug/ Oct (varies)	Yes/ No	\$15,000, but may exceed if justified

Agency and Grant Program	Program Purpose and Objective	Who Can Apply	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DNRC - FD Forestry Assistance Bureau - Urban & Community Forestry - Program Development	Development of local urban forestry programs. Examples: conducting an urban forestry project e.g.; tree/vegetation inventory, writing an urban forest management plan based upon a tree inventory, writing a city/county approved tree ordinance. All projects must be done on publicly owned land.	City, town, county, and tribal governments	Jamie Kirby, DNRC, 406-542-4288, jamiekirby@mt.gov	http://dnrc.mt.gov/Forestry/Assistance/Urban/Grants.asp	30-Oct	An additional 100% of award	Varies - \$20,000 maximum
DNRC - FD Urban & Community Forestry - Arbor Day	Help communities celebrate Arbor Day through tree planting projects. All projects must be done on publicly owned land.	City, town, county, & tribal governments & other not-for-profit organizations	Jamie Kirby, DNRC, 406-542-4288, jamiekirby@mt.gov	http://dnrc.mt.gov/Forestry/Assistance/Urban/Grants.asp	January - February	No	\$750 for communities with Tree City USA designation. \$300 for non-designated communities
DNRC – FD Urban & Community Forestry - Excellence Awards	Excellence Awards are grants to top regional communities in the State for urban forestry related projects. Must be done on publicly owned land.	City, town, county, and tribal governments	Jamie Kirby, DNRC, 406-542-4288, jamiekirby@mt.gov	http://dnrc.mt.gov/Forestry/Assistance/Urban/Grants.asp	August-September	No	Maximum award \$1,000

Agency and Grant Program	Program Purpose and Objective	Who Can Apply	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DNRC - FD Forestry Assistance Bureau - Hazardous Fuels Reduction	Protect communities within the wildland urban interface (WUI) when hazard fuels reduction activities (prescribed fires) are planned on National Forest System (NFS) lands that have the potential to place such communities at risk. Timing between project initiations on NFS lands & non-federal lands should be planned to achieve benefits from proximity and leverage treatment effectiveness	Communities, Homeowner Assns., Fire Depts., RC&Ds, CD's	Angela Mallon, DNRC, 406-542-4221, amallon@mt.gov	None	Contact Program Administrator for more details	No match required. DNRC administers as a 75-25 cost-share	No
DNRC - FD Forestry Assistance Bureau - National Fire Plan	Fuels mitigation, planning, education, and homeowner action.	Communities, Homeowner Assns., Fire Depts., RC&Ds, CD's	Angela Mallon, DNRC, 406-542-4221, amallon@mt.gov	http://dnrc.mt.gov/Forestry/Assistance/Private%20Forestry/wuigrants.asp	August-September	50-50	Maximum request is \$300,000
DNRC - FD Fire & Aviation Management Bureau - Rural Fire Assistance	The funding request is limited to training, equipment, and prevention activities. The RFD has the capability to meet cost-share at a minimum of 10%, which may include in-kind services.	Fire Service Organizations serving communities with a population under 10,000	Doug Williams, DNRC, 406-622-5455, dwilliams4@mt.gov	http://dnrc.mt.gov/forestry/fire	March	90 - 10 (10% match required)	No

Agency and Grant Program	Program Purpose and Objective	Who Can Apply	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DNRC – FD Fire & Aviation Management Bureau - Volunteer Fire Assistance	Smaller communities can join for a combined effort (staying under 10,000). Costs associated with projects prior to project approval are not normally eligible. Projects: Fire protection and Organization, Fire Training, Fire Equipment, Fire Prevention, Wildland PPE.	Fire Service Organizations that serve communities with a population under 10,000	Doug Williams, DNRC, 406-622-5455, dwilliams4@mt.gov	http://dnrc.mt.gov/forestry/fire	March	90 - 10 (10% match required)	No
DNRC - FD Forestry Assistance Bureau - Western States Competitive Grants	Forest stewardship, health fuels treatments, planning, education, biomass, and Urban Forestry	Grant process handled internally through State Forester's Office. Work with local Service Forester	Dan Rogers, DNRC, 406-542-4326, danrogers@mt.gov	http://dnrc.mt.gov/Forestry/Personnel/div/SvcForesters.asp	August-September	50 - 50	Maximum request is \$300,000

Agency and Grant Program	Program Purpose and Objective	Who Can Apply	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DNRC – FD Forestry Assistance Bureau - Forest Health	Activities that reduce the susceptibility of a forest to insects and diseases, restore forest ecosystems after a major disturbance, study the impacts of insects and diseases on forest ecosystems, or prevent and/or detect introductions of non-native invasive organisms.	Municipal and state land managers interested in conducting forest management activities that reduce the susceptibility to, and impact of, forest insects and diseases.	Amy Gannon, DNRC, 406-542-4283, agannon@mt.gov	http://dnrc.mt.gov/forestry/assistance/pests	Varies	50 - 50	No
DNRC – FD Woody Biomass Utilization	Eligible grant activities vary from feasibility studies to planning, design or permitting of small diameter/woody biomass utilization projects, and equipment and construction costs.	Private businesses, public entities, state and local governments, institutions, tribal, and non-profit entities.	Julie Kies, DNRC, 406-542-4280, jkies@mt.gov	http://dnrc.mt.gov/Forestry/Assistance/Biomass/FinAsst/FinAsst.asp	Varies	Varies	Varies
DNRC - Irrigation Development Grant	Development of new irrigation projects, and activities that increase the value of agriculture for existing irrigated lands.	Government & Private entities	Alice Stanley, DNRC, 406-444-6687, astanley@mt.gov	http://www.dnrc.mt.gov/cardd/ResourceDevelopment/IrrigationDevelopment/default.asp	Open Cycle	No	\$15,000
DNRC - Private Grants	Project relating to water where the quantifiable benefits will exceed the costs.	An individual, association, for profit corporation or NPO	Larry Bloxsom, DNRC, 406-444-6668, lbloxsom@mt.gov	http://www.dnrc.mt.gov/cardd/ResourceDevelopment/PrivateLoans.asp	Open Cycle	No	\$2,500 of 25% of the total estimated cost of the project

Agency and Grant Program	Program Purpose and Objective	Who Can Apply	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DNRC - RDGP Planning Grants	Research and application preparation for an RDGP project grant, planning for projects that are eligible for RDGP project grants.	Governmental Entities	Alicia Stickney, DNRC, 406-444-6668, astickney@mt.gov	http://www.dnrc.mt.gov/caridd/ResourceDevelopment/rdgp/ReclamationDevelopmentGrantsProgram.asp	End of each quarter beginning Sept. 30	No	Varies depending on purpose of grant
DNRC - Reclamation and Development Grants (RDGP) Grant	Reclamation, abandoned mining and hazardous materials, mitigation, research, and crucial state.	Governmental Entities	Alicia Stickney, DNRC, 406-444-6668, astickney@mt.gov	http://www.dnrc.mt.gov/caridd/ResourceDevelopment/rdgp/ReclamationDevelopmentGrantsProgram.asp	May 15th even numbered years	Yes	\$300,000
DNRC - Renewable Resource Grant and Loan Program (RRGL) Planning Grant	Must be for the conservation, management, development or protection of a renewable resource in Montana.	Governmental Entities	Pam Smith, DNRC, 406-444-6668, pamsmith@mt.gov	http://dnrc.mt.gov/caridd/ResourceDevelopment/ProjectPlanningGrants.asp	Open Cycle	No	\$25,000
DNRC - Renewable Resource Grant and Loan Program (RRGL) Project Grant	Must be for the conservation, management, development or protection of a renewable resource in Montana.	Governmental Entities	Pam Smith, DNRC, 406-444-6668, pamsmith@mt.gov	http://dnrc.mt.gov/caridd/ResourceDevelopment/rrgp/RenewableGrantProgram.asp	May 15th even numbered years	No	\$100,000

Agency and Grant Program	Program Purpose and Objective	Who Can Apply	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
DNRC - RRGL Emergency Grants	Projects that require immediate attention to prevent substantial damage or legal liability. The project cannot be the result of inadequate operation and maintenance	Governmental Entities	Bob Fischer, DNRC, 406-444-6668, rfischer@mt.gov	http://dnrc.mt.gov/cardd/ResourceDevelopment/EmergencyGrants.asp	Open Cycle	No	\$30,000
DNRC - Watershed Planning and Assistance Grant	Planning Dollars for broad-based watershed efforts including coordination, assessment and education.	Conservation Districts must be applicants	David Martin, DNRC, 406-444-5234, damartin@mt.gov	http://dnrc.mt.gov/cardd/LoansGrants/WatershedPlanningAssistance.asp	Open Cycle	No	\$10,000 per Watershed Project
MDA - MT Department of Agriculture - Noxious Weed Trust Fund	Herbicide and commercial application for noxious weed control; must have at least 3 cooperating adjacent landowners for a local cooperative projects; also provides funding for weed education and research projects.	Anyone, but with a sponsor of a County Weed District, Conservation District, University, or Reservation	Kim Johnson, MDA, 406-444-1517	http://agr.mt.gov/agr/Programs/Weeds/	December	Yes	\$75,000
MFWP - Future Fisheries	Projects that restore or enhance habitat for naturally reproducing populations of wild fish.	Anyone, but coordination with local fishery biologist recommended	Mark Lere, MFWP, 406-444-2432, mlere@mt.gov	http://fwp.mt.gov/fishAndWildlife/habitat/fish/futureFisheries/	Dec 1 & June 1	Encouraged	No

Agency and Grant Program	Program Purpose and Objective	Who Can Apply	Program Contact	Program Website	Application Due Dates	Match	Dollar Limits Per Application
MFWP - Living with Wildlife Grant	Projects that emphasize local involvement, partnership approaches, cost sharing, innovation, prevention and proactive solutions to human/wildlife conflicts.	Private, NGO, Local, State, Federal Govt.	Joe Weigand, MFWP, 406-444-3065 joweigand@mt.gov	http://fwp.mt.gov/fishAndWildlife/livingWithWildlife/grantProposals.html	Typically in June	Encouraged	\$5,000-more if justified and funding is available.
NRDP - Natural Resource Damage Program - Large Grants	Projects must restore, replace, or acquire the equivalent of injury to natural resources and/or lost services covered in Montana v. ARCO lawsuit.	Governmental Entities, Private, NPO	Kathy Coleman, NRDP, 406-444-0229, kcoleman@mt.gov	https://doj.mt.gov/lands/	March	No	No
NRDP - Project Development Grants or Small projects	Projects must restore, replace, or acquire the equivalent of injury to natural resources and/or lost services covered in Montana v. ARCO lawsuit.	Governmental Entities, Private, NPO	Kathy Coleman, NRDP, 406-444-0229, kcoleman@mt.gov	https://doj.mt.gov/lands/	Open Cycle	No	\$25,000

APPENDIX F - SECTION 319 NONPOINT SOURCE PROJECTS FROM 2007–2011

Table F-1. Fiscal Year 2007 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Local Match
<i>Watershed Restoration</i>				
207039	Haskil Basin Bridge & Restoration	Flathead CD (direct negotiate)	\$25,000	\$16,666
207040	Big Coulee Phase II	Sun River Watershed Group	\$70,350	\$67,000
207041	Teton Watershed Implementation and Monitoring Project Phase II	Teton River Watershed Group	\$68,334	\$95,300
207042	Ruby Water Quality Restoration Project Implementation Plan	Ruby Valley Conservation District	\$25,500	\$17,240
207043	Prickly Pear - Lake Helena Project	Lewis & Clark County WQP District	\$64,296	\$62,600
207044	Ninemile Watershed TMDL Implementation	Trout Unlimited (Missoula)	\$35,000	\$23,333
207045	Blackfoot TMDL Implementation & Project Design	Blackfoot Challenge	\$64,400	\$42,934
207046	Upper Lolo TMDL - Top Four Culverts Replacement	Montana Trout	\$30,000	\$102,465
207047	Swan Watershed TMDL Implementation	Swan EcoSystem	\$58,340	\$39,091
207048	Crow Creek Restoration Project	Lower Clark Fork Watershed Group	\$49,500	\$40,000
207049	Grave Creek Restoration Phase III	Kootenai River Network	\$30,000	\$23,333
207050	Marias River Watershed - A N Wasteway Rehabilitation	Pondera County Conservation District	\$69,000	\$145,500
<i>Watershed Restoration Sub-Totals</i>			<i>\$589,720</i>	<i>\$675,462</i>
<i>Groundwater</i>				
207051	Stream salinity, siltation, and flow impacts from saltcedar infestation in the Sarpy Creek watershed	Treasure County Weed Board	\$15,000	\$71,663
<i>Groundwater Sub-Totals</i>			<i>\$15,000</i>	<i>\$71,663</i>
<i>Education and Outreach</i>				
	Mini Grants FY07	Montana DEQ	\$20,000	\$13,333
207052	Volunteer Water Monitoring Certification Pilot	Montana State University - Watercourse	\$19,890	\$13,260
207053	Electronic Assistance to Watershed Projects	Montana State University - Water Center	\$19,980	\$13,320
207054	Critical Land Project	Flathead Lakers	\$10,000	\$7,635
<i>Education and Outreach Sub-Totals</i>			<i>\$69,870</i>	<i>\$47,548</i>

Table F-1. Fiscal Year 2007 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Local Match
<i>TMDL Planning</i>				
	Upper Gallatin TPA	Blue Water Task Force	\$100,000	\$66,666
	Lower / East Gallatin TPA	Greater Gallatin Watershed Council	\$100,000	\$66,666
	Bitterroot TPA	Tri-State Water Quality Council	\$75,754	\$50,502
	Upper Clark Fork TPA	Deer Lodge Valley Conservation District	\$150,000	\$253,926
	Flint Creek TPA	Granite County Conservation District	\$10,000	\$6,667
	Montana At Large	Montana DEQ	\$189,656	\$0
<i>TMDL Planning Sub-Totals</i>			<i>\$625,410</i>	<i>\$444,427</i>
TOTALS			\$1,300,000	\$1,239,100

Table F-2. Fiscal Year 2008 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Local Match
<i>Watershed Restoration</i>				
208026	Bitterroot Headwaters TMDL Implementation	Bitterroot Water Forum	\$30,000	\$23,000
208027	Blackfoot Watershed Water Quality Restoration	Blackfoot Challenge	\$50,000	\$33,669
208028	Big Spring Watershed Restoration	Fergus County Conservation District	\$70,000	\$49,300
208029	Bigfork Storm Water Project	Flathead County	\$60,000	\$40,000
208030	Mid Musselshell Watershed Restoration Project	Lower Musselshell Conservation District	\$95,000	\$218,277.15
	NPS At-Large Projects	Montana DEQ	\$50,000	\$0
208031	Prickly Pear Creek Re-Watering Project	Montana Water Trust	\$17,000	\$11,534
208032	Saubier Feedlot Reclamation Project	Ruby Valley Conservation District	\$23,000	\$25,120
208033	Swan Watershed TMDL Implementation	Swan EcoSystem Center	\$40,000	\$47,786
208034	Teton Spring Creek	Teton County Conservation District	\$35,000	\$23,650
208035	Ninemile Restoration Phase II	Trout Unlimited	\$25,000	\$16,667
<i>Watershed Restoration Sub-Totals</i>			<i>\$495,000</i>	<i>\$489,003.15</i>
<i>Groundwater</i>				
208036	Groundwater Monitoring in Flathead Basin	Flathead Basin Commission	\$25,000	\$17,000
208037	Hamilton Source Water Protection Project	Ravalli County	\$75,000	\$127,829
<i>Groundwater Sub-Totals</i>			<i>\$100,000</i>	<i>\$144,829</i>
<i>Education and Outreach</i>				
208038	Riparian Buffer Education Campaign	Flathead Conservation District	\$120,000	\$80,000
208039	Critical Lands Outreach & Education Project	Flathead Lakers	\$35,000	\$23,500
208040	NPS Education for Diverse Audiences	Montana State University - Montana Watercourse	\$80,000	\$53,334
208041	Montana Livestock NPS Water Quality Initiative	Montana State University-Extension Service	\$20,000	\$14,350
<i>Education and Outreach Sub-Totals</i>			<i>\$255,000</i>	<i>\$171,184</i>
<i>TMDL Planning</i>				
208044	Flint Creek TMDL	Granite Conservation District	\$160,000	\$106,000
208042	Upper Gallatin TMDL	Blue Water Task Force	\$75,000	\$50,000
208045	Lower Gallatin TMDL	Greater Gallatin Watershed Council	\$75,000	\$50,000
208043	Flathead/Stillwater TMDL	Flathead CD	\$40,000	\$6,000
<i>TMDL Planning Sub-Totals</i>			<i>\$350,000</i>	<i>\$212,000</i>
TOTALS			\$1,200,000	\$1,017,016.15

Table F-3. Fiscal Year 2009 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Local Match
<i>Watershed Restoration</i>				
209060	Ruby Three Fork Corral	Ruby Valley Conservation District	\$65,000	\$45,000
209061	Big Hole Restoration Planning & Education	Big Hole Watershed Committee	\$135,000	\$330,600
209062	Deep Creek - Teton River Implementation Project	Teton River Watershed Group	\$115,000	\$113,650
209063	Shields River Watershed Restoration Plan	Park Conservation District	\$25,000	\$15,000
209064	Bigfork Storm Water Project II	Flathead County	\$125,000	\$83,333
209065	Sun River Flow Temperature Project	Sun River Watershed Group	\$95,000	\$70,000
209066	Middle Blackfoot TMDL Clearwater Implementation	Clearwater Resource Council	\$20,000	\$15,000
209067	Elk Creek Restoration Project	Lower Clark Fork Watershed Group	\$20,000	\$19,000
209068	Swan Watershed TMDL Implementation	Swan EcoSystem Center	\$40,000	\$26,783
	DEQ Watershed Protection Section Support	Montana DEQ	\$47,000	\$0
<i>Watershed Restoration Sub-Totals</i>			<i>\$687,000</i>	<i>\$718,366</i>
<i>Groundwater</i>				
209069	Clark Fork Watershed Septic Project	Tri-State Water Quality Council	\$38,000	\$25,371
209070	Bitterroot Hazardous Waste Disposal	Ravalli County	\$30,000	\$35,675
209071	Helena Area Groundwater Project	Lewis & Clark County WQPD	\$30,000	\$21,489
<i>Groundwater Sub-Totals</i>			<i>\$98,000</i>	<i>\$82,535</i>
<i>Education and Outreach</i>				
209072	NPS Riparian Wetland Buffer Education Campaign	Montana State University - Watercourse	\$52,000	\$34,667
209073	Delivering Well Educated	Montana State University Extension Service	\$39,000	\$26,000
	Mini-Grants	Montana DEQ	\$24,000	\$20,000
<i>Education and Outreach Sub-Totals</i>			<i>\$115,000</i>	<i>\$80,667</i>
<i>TMDL Planning</i>				
209074	Flint Creek TMDL Coordination	Granite County Conservation District	\$20,000	\$5,000
209075	Lolo TMDL Coordination	Lolo Watershed Group	\$10,000	\$10,000
209076	Flathead TMDL Coordination	Montana DNRC - FBC	\$15,000	\$3,000
209077	Flathead TMDL Education & Outreach	Flathead County	\$20,000	\$3,000
209078	Upper Gallatin	Blue Water Task Force	\$10,000	\$5,000
209079	Lower Gallatin	Greater Gallatin Watershed Council	\$90,000	\$60,000
	Montana TMDL At-Large	Montana DEQ TMDL	\$135,000	\$0
<i>TMDL Planning Sub-Totals</i>			<i>\$300,000</i>	<i>\$86,000</i>
TOTALS			\$1,200,000	\$967,568

Table F-4. Fiscal Year 2010 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Local Match
<i>Watershed Restoration</i>				
210115	Swan TMDL Implementation FY10	Swan EcoSystem	\$49,720	\$38,800
210109	Big Hole Watershed Planning, Education & Restoration FY10	Big Hole Watershed Committee	\$126,500	\$87,000
210116	Upper Clark Tributary Restoration	Watershed Restoration Coalition	\$100,000	\$109,160
210111	Bigfork Storm Water Project FY10	Flathead County	\$200,000	\$250,000
210114	Miller Ranch Ruby River Channel Restoration	Ruby Valley Conservation District	\$18,700	\$12,500
210110	West Fork Nitrogen Monitoring Project	Blue Water Task Force	\$32,000	\$21,700
	NPS Support	DEQ-WQPB	\$148,000	\$0
<i>Watershed Restoration Sub-Totals</i>			<i>\$674,920</i>	<i>\$519,160</i>
<i>Groundwater</i>				
210112	Helena Groundwater Project Phase II	Lewis & Clark County	\$95,000	\$172,352
<i>Groundwater Sub-Totals</i>			<i>\$95,000</i>	<i>\$172,352</i>
<i>Education and Outreach</i>				
210113	Montana Volunteer Monitoring	Montana State University-Bozeman Montana Watercourse	\$60,170	\$50,113
210117	Flathead Watershed BMP's Education Campaign	Flathead Lakers	\$40,000	\$31,350
210145	Mini Grants	SWCDMI	\$30,000	\$18,000
<i>Education and Outreach Sub-Totals</i>			<i>\$130,170</i>	<i>\$99,463</i>
<i>TMDL Planning</i>				
	Montana At Large TMDL Support	DEQ-WQPB	\$225,182	\$0
<i>TMDL Planning Sub-Totals</i>			<i>\$225,182</i>	<i>\$0</i>
TOTALS			\$1,125,272	\$790,975

Table F-5. Fiscal Year 2011 - Section 319 Projects

Contract Number	Project Title	Project Sponsor	319 Funds	Local Match
<i>Watershed Restoration</i>				
211069	Big Spring Creek Machler Restoration	Fergus CD	\$185,000	\$125,000
211079	Muddy Creek Nonsupporting to supporting	Sun River Watershed Group	\$100,000	\$86,000
211082	Deep Creek/Teton River - Phase II	Teton River Watershed Group	\$67,500	\$71,000
211073	Elk Creek Restoration	Lower Clark Fork Watershed Group	\$19,000	\$12,667
211081	Big Hole Watershed Restoration	Big Hole Watershed Committee	\$83,500	\$55,667
211072	Lake Helena Watershed Restoration Project	Lewis & Clark Co WQ Protection District	\$160,000	\$113,860
211077	Grave Creek Revegetation Treatments Project	Kootenai River Network, Inc.	\$23,000	\$15,340
211075	Corder Ditch Abandonment project	Craighead Institute	\$80,000	\$131,000
211080	Flathead Lakeshore Water Quality Protection	Flathead County	\$123,000	\$82,000
211083	Haskill Creek - Reimer Reach	Flathead Conservation District	\$30,000	\$20,000
<i>Watershed Restoration Sub-Totals</i>			<i>\$871,000</i>	<i>\$712,534</i>
<i>Groundwater</i>				
211078	Gallatin Ground Water Project	Gallatin Local Water Quality District	\$70,000	\$47,225
211084	Clark Fork Watershed Septic Maintenance	Tri-State Water Quality Council	\$20,000	\$19,680
<i>Groundwater Sub-Totals</i>			<i>\$90,000</i>	<i>\$66,905</i>
<i>Education and Outreach</i>				
211070	Education & Outreach Mini-Grants	SWCDMI	\$30,000	\$20,000
211074	Strengthening Watershed Communities Through E&O	SWCDMI	\$25,000	\$16,700
211085	Apsáalooke Watershed Education Outreach Program	Little Big Horn College	\$7,000	\$6,458
211071	Riparian, Stormwater and NPS Outreach	MTWC	\$48,000	\$32,000
211076	Volunteer Monitoring for E. coli	MSUniversity Extension Water Quality	\$22,500	\$15,000
<i>Education and Outreach Sub-Totals</i>			<i>\$132,500</i>	<i>\$90,158</i>
TOTALS			\$1,093,500	\$869,597

APPENDIX G - 2012 IMPAIRED WATERS, COMPLETED TMDL SUMMARY, AND TMDL SCHEDULE MAP

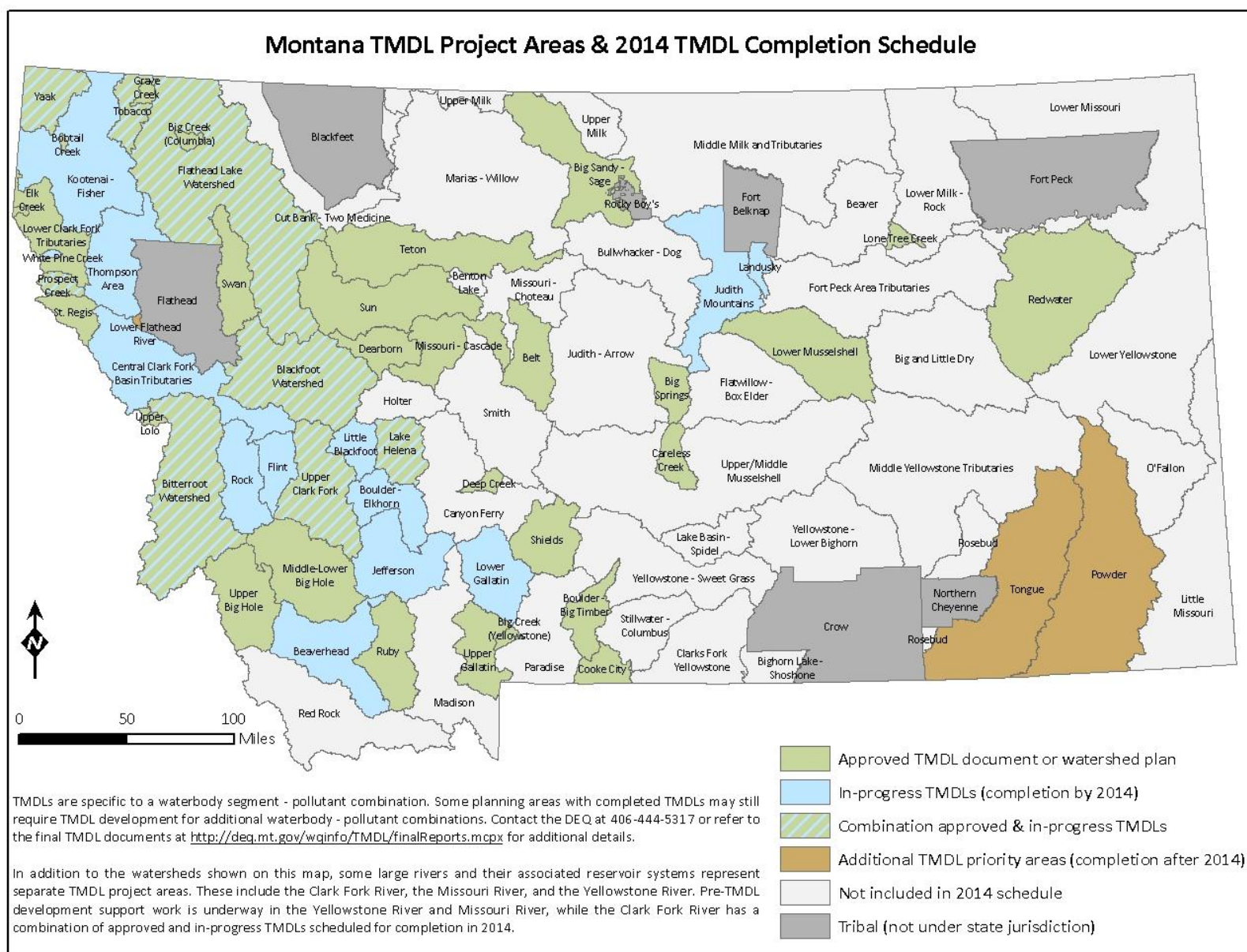


Figure G1. TMDL Schedule Map

Table G-1. Montana Completed Water Quality Restoration Plan/TMDL Summary

Approval Year	Watershed	# Waterbody - Pollutant Combinations Addressed
2012	Landusky Metals	70
2011	Little Blackfoot	64
2011	Tobacco Sediment	8
2011	Bitterroot Temperature and Tributary Sediment	20
2011	Missouri-Cascade and Belt Metals	47
2010	Lower Clark Fork Tributaries Sediment	5
2010	Redwater Nutrient and Salinity	22
2010	West Fork Gallatin	8
2010	Upper Clark Fork Tributaries Sediment, Metals, and Temperature	79
2009	Lower Blackfoot	12
2009	Upper Jefferson Tributary Sediment	10
2009	Boulder	15
2009	Middle and Lower Big Hole	71
2009	Shields Sediment	4
2009	Upper and North Fork Big Hole	24
2009	Prospect Sediment	3
2008	St. Regis	8
2008	Middle Blackfoot-Nevada	87
2008	Yaak	3
2007	Ruby	34
2007	Prospect Metals	8
2006	Lake Helena	117
2005	Dearborn River Planning Area	4
2005	Flathead River Headwaters	8
2005	Ninemile Planning Area	11
2005	Big Spring Creek	14
2005	Grave Creek	1
2005	Bobtail Creek	1
2005	Bitterroot Headwaters Planning Area	16
2005	Sun River	19
2004	Blackfoot Headwaters Sediment	7
2004	Swan Lake	16
2003	Big Creek	1
2003	Upper Lolo Creek Planning Area	5

Table G-1. Montana Completed Water Quality Restoration Plan/TMDL Summary

Approval Year	Watershed	# Waterbody - Pollutant Combinations Addressed
2003	Blackfoot Headwaters Metals	30
2003	Teton River Planning Area	11
2002	Sage Creek	1
2002	Cooke City Planning Area	40
2002	Big Sandy Creek	1
2001	Flathead Lake	2
2001	Careless Creek	1
2001	Lone Tree Creek	1
2001	Lower Musselshell River	0
1999	Teton River near Chouteau	1
1998	Clark Fork River	14
1998	Elk Creek	1
1996	Deep Creek	3

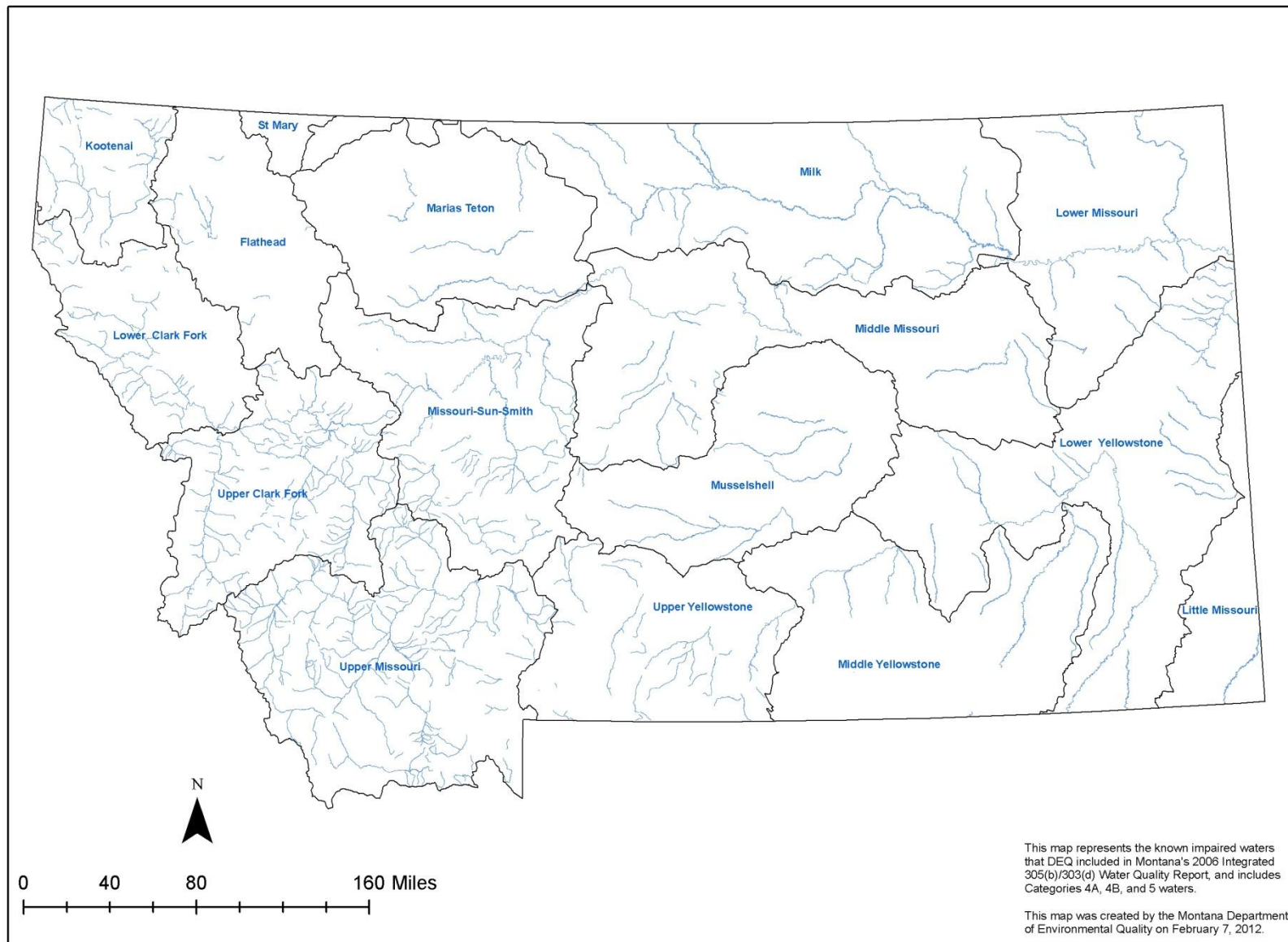


Figure G-2. Draft 2012 Montana Impaired Waters

APPENDIX H - EPA’S NINE KEY NONPOINT SOURCE PLAN ELEMENTS AND “CROSSWALK” TO MONTANA’S NONPOINT SOURCE MANAGEMENT PLAN

EPA NPS Plan Element	Montana NPS Plan Section
1. The state program has explicit short- and long-term goals, objectives, and strategies.	Section 3- Montana’s NPS Pollution Control Strategy Section 8- Montana’s Nonpoint Source Priorities and Action Plan Section 9- Measuring Success
2. The state strengthens its working partnerships and linkages with appropriate groups, entities, and agencies.	Section 3- Montana’s NPS Pollution Control Strategy Section 7- Partnerships and Funding Appendix C- Entities Addressing NPS Pollution in Montana
3. The state uses a balanced approach that emphasizes both state-wide and on-the-ground management of individual watersheds where waters are impaired.	Section 1- Montana’s NPS Pollution Management Program Framework Section 3- Montana’s NPS Pollution Control Strategy Section 8- Montana’s Nonpoint Source Priorities and Action Plan
4. The state program abates known water quality impairments and prevents degradation from present and future activities.	Section 1- Montana’s NPS Pollution Management Program Framework Section 3- Montana’s NPS Pollution Control Strategy Section 6- Enforceable Regulatory Programs
5. The state program identifies waters and watersheds impaired by nonpoint source pollution, has a comprehensive assessment program, develops watershed implementation plans, and implements the plans.	Section 1- Montana’s NPS Pollution Management Program Framework Section 3- Montana’s NPS Pollution Control Strategy Section 5- Water Quality Assessment and Monitoring Appendix C- Entities Addressing NPS Pollution in Montana Appendix E- Montana Natural Resource Grant Programs
6. The state reviews, upgrades, and implements all program components and uses a range of approaches to address NPS pollution.	Section 3- Montana’s NPS Pollution Control Strategy Section 8- Montana’s Nonpoint Source Priorities and Action Plan
7. The state identifies federal lands and activities that are not managed consistently with the state’s NPS program.	Section 1- Montana’s NPS Pollution Management Program Framework Section 3- Montana’s NPS Pollution Control Strategy Section 8- Montana’s Nonpoint Source Priorities and Action Plan
8. The state has an efficient and effective management program, including financial management.	Section 1- Montana’s NPS Pollution Management Program Framework
9. The state uses an adaptive management approach for reviewing, evaluating, and updating the NPS program every 5 years.	Section 1- Montana’s NPS Pollution Management Program Framework

APPENDIX I - RESPONSE TO PUBLIC COMMENTS – 2012 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 2012 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:

- Alan Rollo, Sun River Watershed Group and Teton River Watershed Group
- Brian D. Sugden, Plum Creek Timber Company, Inc.
- Peter Ismert, Region 8, EPA
- Seth Matters, Arcadis U.S., Inc.
- Robin Steinkraus, Flathead Lakers
- Tom Pick, Natural Resources Conservation Service

GENERAL COMMENTS

Comment: *We support the emphasis placed in the NPS Plan on stakeholder participation, flexibility (recognition that one size will not fit all), and coordination with other programs (e.g., CERCLA, NPDES, TMDL, local watershed management & restoration programs, etc.).*

DEQ Response: DEQ notes and appreciates the commenter's support regarding stakeholder participation, flexibility, and need for coordination of environmental programs.

Comment: *Details associated with coordination with ongoing CERCLA, NPDES, TMDL and other programs are lacking.*

DEQ Response: Identification of details regarding coordination with other environmental programs in the NPS Plan was weighed against providing a user-friendly document that would not bog down readers with unnecessary details. The decision was made to keep the focus of the NPS Plan for general public readership in describing the state's approach for addressing nonpoint source water pollution.

Comment: *Given that the Draft Plan provides a general framework for addressing nonpoint sources, and does not attempt to identify, define, and/or provide a solution to NPS issues, the focus on any specific source type or industry seems out of place. Either specific discussion of all impacted industries, including the mining industry, should be removed from this draft, or the Draft Plan should be revised, with input from all stakeholders, to provide additional information regarding the relationship between their industries and NPS inputs to surface waters in Montana.*

DEQ Response: DEQ disagrees that the NPS Plan does not attempt to identify, define, or provide solutions for addressing nonpoint source pollution issues. In fact, that is the purpose of the Plan.

DEQ has attempted to provide a balanced perspective on the important sources of nonpoint source pollution to state waters, using the state's impaired waters list as well as strategies for addressing NPS problems. In general, the effects on water quality from permitted industries are addressed through the permitting process, CERCLA, or other programs (e.g., RCRA, Brownfields, etc.). In some cases, specifically historical mining activities, Montana has chosen to address the effects on water quality through the NPS Program.

Comment: *The Draft Plan refers to future beneficial uses that waters should be capable of supporting and non-degradation policies which are frequently misapplied or applied inconsistently. The potential for abuse of that expectation is obvious.*

DEQ Response: DEQ's water quality standards program provides a legal and fair process for determining appropriate use designations and nondegradation policies in which the public is invited to participate. The Board of Environmental Review, a governor-appointed panel, as required by state law, is the decision-making authority for determining beneficial use and nondegradation policy.

Comment: *Page 3 states how many of the "assessed" water bodies are impaired but does not put it in perspective of how many of Montana water bodies have actually been assessed. The Draft Plan should note that number also.*

DEQ Response: The 2012 Water Quality Integrated Report (Table 4-1) indicates 1,152 waterbodies that are assigned assessment units (AUs), but note that not all stream miles have been assigned AUs. Of those, 115 have not been assessed because of insufficient data. The 1,152 assessment units are made up of 22,372 miles of rivers (1,081 AUs) and streams and 595,597 lake and reservoir acres (71 AUs). Table 2-2 (state waters exclusive of tribal lands, national parks, and wilderness areas) of the same report indicates 59,600 perennial stream miles and 780,300 lake and reservoir acres. Thus, about 37 % of the state's stream miles and 72% of the lake and reservoir acres have been assessed. DEQ will provide an approximation of the percentage of miles and acres of assessments completed in the final report.

Comment: *Throughout document it talks about teamwork, which is great, but if we are going to actually see improvements that can be documented we will need more local group/watershed efforts. The Draft Plan should put a little more emphasis on helping people work at a watershed level.*

DEQ Response: Given the limited federal and state resources for addressing NPS, DEQ is very aware of the importance of supporting efforts at the local watershed scale. DEQ is working diligently to provide the most effective support for local efforts. We believe this is best accomplished through the Montana Watershed Coordination Council, which is why this organization is highlighted in the NPS Plan. DEQ is committed to providing as many tools and mechanisms for local support through MWCC as possible. This includes weekly newsletters, training opportunities, information on funding sources, staffing opportunities (e.g., Montanan Watershed Corps), example and free outreach materials, etc.

Comment: *Additional information should be provided regarding the effectiveness of all BMPs in achieving the goal of protecting water quality, and strategies developed for improving or strengthening BMPs where needed.*

DEQ Response: The effectiveness of various BMPs is variable because of factors such as pollutant, site, and specific implementation practices. However, DEQ has provided Section 10 (Additional Information Resources) for those who are interested in greater detail of various aspects of the program, including BMP effectiveness. EPA's National Management Measures for Control of Nonpoint Source Pollution handbooks (including agriculture, forestry, hydrologic modification, and urban areas) are a good place to start looking for this type of information and are available online through EPA's NPS website. The website URL is provided in Section 10 of the final document. Numerous other websites in Section 10 also provide additional BMP effectiveness information.

Comment: *The NRCS small watershed protection program and RC&D program no longer exist, as funding was eliminated.*

DEQ Response: The references to these NRCS programs have been removed from the agency summary in Appendix C.

Comment: *EPA has been encouraging states to identify milestones in planning documents, including Nonpoint Source Management Plans, grant work plans, and annual reports. Meeting these milestones will be used, in part, to help determine satisfactory progress for the 319/Nonpoint source programs. As part of this plan update, please review identified milestones to ensure they can be used to demonstrate satisfactory progress. Ideally milestones are interim accomplishments that help guide work to the eventual desired outcomes. Because the NPS Plan is a five-year planning document, milestones most appropriate for inclusion would be the more medium to long-term milestones. Short-term milestones (usually yearly) could be included as well if known, but maybe more appropriately identified in yearly grant work plans or the annual report. A statement about how, where, and when short, medium, and long-term milestones are developed and identified could be added to provide easier evaluation of satisfactory progress.*

DEQ Response: The milestones EPA is encouraging states to identify are listed in Section 8.1 (Five-Year Action Plan and Priorities). DEQ will clearly state this in the Plan in Section 8.0. Additionally, short-term milestones will be articulated in yearly grant work plans and achievements documented in the state's annual reports.

COMMENTS BY DOCUMENT SECTION

SECTION 1.0 MONTANA'S NPS POLLUTION MANAGEMENT PROGRAM FRAMEWORK

Comment: *Section 1.0. In discussing TMDLs, there is no reference to the role of TMDLs in the ARARs process - this is a problematic omission because the establishment of TMDLs is important to the whole CERCLA alternatives evaluation process.*

DEQ Response: The ARARs must consider all applicable water quality standards. TMDLs are written to satisfy these same water quality standards and TMDLs do not create any new water quality standards. Although a TMDL often helps translate a narrative water quality standard, such translation is also often accomplished during impairment determinations outside of TMDL development. Development of ARARs must include translations of narrative water quality

standard as well as incorporate numeric water quality standards. Further, translating narrative water quality standards, or defining the applicability of numeric water quality standards, is not contingent upon TMDL development. Therefore, the TMDL is not a necessary step in the development of ARARs.

Comment: *Section 1.0. This Draft Plan is silent on how it will be integrated with the impaired water listings of 303(d) and creation of TMDLs. This potential regulatory program overlap should be recognized and addressed.*

DEQ Response: Section 1.2 discusses the development of the state’s list of impaired waters, which is approved by EPA under Section 303(d). Section 1.3 then discusses how the Clean Water Act requires TMDLs for all 303(d) listed waters and Montana’s watershed approach to developing TMDLs and a schedule for development of those TMDLs.

Comment: *Section 1.0. There is no mention of how activities or effects anticipated in the Draft Plan will be integrated with existing negotiated water quality criteria such as discharge permits, settlement agreements or Records of Decision. This issue should be addressed directly by the NPS Plan.*

DEQ Response: The purpose of the NPS Plan is to outline a path to demonstrate significant progress in protecting and restoring water quality from the harmful effects of nonpoint source pollution. Discharge permits, settlement agreements, records of decision, etc., are outside of the scope and purpose of this document.

Comment: *Section 1.0. The NPS Plan’s framework emphasizes the use of “Adaptive Management” to describe the process whereby voluntary NPS activities are integrated with Authorized Point Source Discharges, but the Draft Plan does not describe how this is to be achieved.*

DEQ Response: Figure 1.1 identifies that implementation of TMDLs is achieved through two separate mechanisms: 1) through MPDES permits for point-source discharges and 2) through voluntary NPS reduction activities, guided by the TMDL document and locally developed Watershed Restoration Plans. The TMDL Implementation Evaluation assesses how the voluntary NPS activities and permitted discharges are progressing toward achieving all beneficial uses on a recurring basis, which is the adaptive management process.

Comment: *Section 1.2. The Draft Plan states that DEQ is especially interested in developing a volunteer monitoring program at the watershed level, but there is virtually no reference to the option of specific industries functioning as volunteers.*

DEQ Response: Nothing in the NPS Plan precludes specific industries providing voluntary monitoring. An example of voluntary monitoring identified in the NPS Plan is the Forestry BMP Assessment Program, coordinated by DNRC; it includes industry participants. As another example, data collected by outside agencies and industries provided to DEQ during DEQ’s request for “readily available data” informs the development of the Water Quality Integrated Report. Also please see comments and DEQ’s response in Section 5 – Water Quality Assessment and Monitoring.

Comment: *Section 1.0. The Draft Plan should clarify public participation with respect to waste load allocations and load allocations.*

DEQ Response: The development of wasteload allocations and load allocations, within the context of TMDL development, is an inherent part of DEQ's public and stakeholder participation process. This process includes consulting with watershed advisory groups and appropriate technical personnel as well as allowing for general public comment on all aspects of the TMDL. The final document will include this information in Section 1.3 – The TMDL Development Process and Water Quality Planning.

Comment: *Section 1.0, page 1-5. The Draft Plan talks about the 5-year plan of revisiting TMDL plans to see if they are actually moving forward in improving water quality. The Draft Plan should have a statement as to the status of these reviews and how future reviews are going to be accomplished.*

DEQ Response: DEQ has completed four TMDL Implementation Evaluations (TIEs) and is committed to continuing TIEs, given DEQ's resource constraints and competing priorities. A goal of the program is to complete four TIEs per year. This is indicated in Section 8.1 – Resource related Action item 8 – and is shown to be a high priority measurable outcome.

Comment: *Section 1.0, page 1-4. It would help to better identify and discuss the relationship between a WQIP and a Watershed Restoration Plan. The differences, and I know there are several, may not be clear to many readers.*

DEQ Response: Thank you for pointing this out. Additional language will be added to the final document in Section 1.4.

Comment: *Section 1.0. Figure 1-2 doesn't show WQIP.*

DEQ Response: In Figure 1.2, the WQIP is identified as "EPA approved TMDL." In Section 1.3, paragraph 3, the statement "... DEQ calls the watershed documents containing the TMDLs Water Quality Improvement Plans (WQIPs)."

Comment: *Section 1.4, TMDL Implementation. The components of a WRP are included in this section. It would be useful to indicate that the EPA-recommended 9 Minimum Elements of a watershed plan were incorporated into the WRP components.*

DEQ Response: Thank you for your comment. DEQ will clarify this in the final document.

Comment: *Section 1.4, TMDL Implementation. Information about how the Watershed Coordination Council and Water Activities Work Group operate to assist with implementation could be included in this section. These are two groups that are important to the watershed approach in Montana and it would be good to understand how MDEQ interacts with them.*

DEQ Response: DEQ strongly agrees that the Montana Watershed Coordination Council provides critical support to local watershed groups, and DEQ is an active participant and supporter of MWCC.

Comment: *Section 1.5, TMDL Implementation Evaluations, page 1-5. Since water quality monitoring is an important component of performing TIE's, it would be helpful to consider linking the TIE monitoring needs to the state's Monitoring Strategy. An estimated TIE schedule could be developed, and the*

Monitoring Strategy could include a monitoring schedule that will help provide timely monitoring information to perform the TIE when scheduled.

DEQ Response: Montana’s Water Quality Monitoring Strategy was developed before the TMDL Implementation Evaluation Process was developed; thus, the existing monitoring strategy does not address TIE monitoring and assessment needs. The monitoring strategy will be revisited in 2014 and TIE monitoring needs will be considered at that time.

Comment: *Section 1.6, Statewide NPS Program Emphasis on Pollution Prevention. Information about the approach MDEQ takes to promote pollution prevention (i.e., protection) of unimpaired water bodies could be included in this section.*

Comment: *Section 1.6, Statewide NPS Program Emphasis on Pollution Prevention. A description of MDEQ’s outreach approach on a statewide basis could be included in this section. Statewide outreach and education on nonpoint source pollution often leads to voluntary implementation of protective BMPs to prevent pollution.*

DEQ Response: Thank you for your comment. Additional clarifying language in 1.6 will be provided in the final document.

SECTION 2.0 MONTANA’S WATER RESOURCES

Comment: *Section 2.0. Figure 2-1 doesn’t show the Little Missouri Watershed of which part is in Montana.*

DEQ Response: Figure 2-1 has been replaced with a more accurate map from the Montana 2012 Water Quality Integrated Report. For administrative purposes, the Little Missouri watershed has been included in the Yellowstone Administrative Basin, even though it is actually not connected to the Yellowstone River in Montana. Table 2-1 is similarly arranged. Table 2-1 has also been updated with data from the Montana 2012 Water Quality Integrated Report.

Comment: *Section 2.0, page 2-5. Over fertilization is often not the sole issue but rather improper placement, poor timing, or other related factors involving inefficient crop and lawn nutrient management.*

DEQ Response: The bullet point has been changed from “over-fertilization of crops and lawns” to “improper application of fertilizer.”

Comment: *Section 2.2.2, Riparian Areas. This section provides a good summary of riparian areas. It would also be good to include a description of any riparian characteristics that are prevalent in, or important to, Montana.*

DEQ Response: Montana has a tremendous variety of riparian areas. To adequately summarize the more prevalent characteristics and values would take up an excessive amount of space in the NPS Plan and could negatively affect Section 2.2.2. The following text has been added to Section 2.2.2: “Montana has a tremendous variety of riparian areas, ranging from cottonwood galleries, to willow forests, to high altitude bogs and fens.”

SECTION 3.0 MONTANA’S NPS POLLUTION CONTROL STRATEGY

Comment: Section 3.0. The Draft Plan could be more consistent in the depth and content of the descriptions of the various nonpoint categories. For example, there are seven sub-sections in Section 3.1 that deal with different land uses. Three of these land uses (Forestry, Hydro, and Urban), have specific accounting of the number (and length) of waterbodies in Montana affected by those land uses. The other land uses do not. DEQ should be consistent regarding the description of different land use categories. That is, summary tables should be included for all uses, or for none of the uses.

DEQ Response: Thank you for your comment. DEQ agrees that it would be helpful to maintain a consistent format and level of detail among land-use sections. Unfortunately, differences in the available data, the relative complexity of the individual land uses, and the methods proposed for addressing NPS pollution from the land uses preclude this level of consistency.

Comment: Section 3.1. Strategies are described for each of seven major land uses in Montana. Some of the strategies will be large undertakings. It may be useful to review the strategies and include 1- to 5-year priorities for these strategies. This would help guide work to be accomplished to implement the strategy within that timeframe.

DEQ Response: DEQ has done this in Section 8 – Montana’s Nonpoint Source Priorities and Action Plan.

Comment: Section 3.1.1, page 3-3. Need to include demonstration as a part of the adoption/implementation process.

DEQ Response: Strategy 3 has been amended as follows:

Strategy 3: Encourage and facilitate implementation of NPS pollution reduction activities.

In order to implement on-the-ground NPS pollution reduction activities, technical and financial assistance, effective programs and tools, and mutual support and encouragement must be present.

- Evaluate NPS pollution reduction programs, activities, BMPs, and tools to apply to specific pollution issues and sources.
- Provide technical and financial assistance to individuals and groups seeking to reduce NPS pollution from agricultural sources.
- Encourage individuals, organizations, and government entities to identify and advertise their successes in reducing NPS pollution, especially in watersheds with significant, unaddressed NPS pollution problems.
- Encourage state, federal, and private land managers to incorporate NPS pollution reduction BMPs into their management plans.

Comment: Section 3.1.1, page 3-3. Why not include AFOs in the 3 focal points? Why are the three listed priorities chosen - please explain.

DEQ Response: “Excessive livestock use of riparian areas” (first focal point) includes the use of riparian areas for animal feeding operations (AFOs) but is also broad enough to include overgrazing of riparian pastures and livestock loafing in riparian areas. The basis for choosing the three listed priorities is identified in the paragraph preceding the bulleted list.

Comment: *Section 3.1.1. The Ag section is pretty basic in terms of explanation of issues. Please include more data to reflect the rationale for the proposed approach (as has been done in other sections).*

DEQ Response: There are a couple of reasons why the section is this way. Agriculture comprises an extremely wide variety of activities over a large, and sometimes difficult-to-access, geographical area. As a result, it is difficult to provide quantitative, and even qualitative, data on specific sources of NPS pollution from agriculture. It is often more effective to focus on general activities that we know through collective experience occurs with agricultural operations. The Montana 2012 Water Quality Integrated Report (2012 IR) describes many of the confirmed agriculture-related sources of NPS pollution. For example, Appendix A of the 2012 IR identifies numerous waterbodies that DEQ has been able to confirm are receiving pollution from “Grazing in Riparian or Shoreline Zones,” “Irrigated Crop Production,” “Non-irrigated Crop Production,” “Animal Feeding Operations,” and “Rangeland Grazing.” The second reason for the section’s unique format is that instead of focusing entirely on programs and practices, DEQ chose to take a step back and look at the social context for addressing agricultural NPS pollution. Based on staff discussions with producers, trade organization representatives, and other members of the agriculture community, DEQ has identified barriers between producers, government agencies, watershed groups, citizen environmental organizations, and others involved in caring for water quality. These barriers are difficult to quantify using data but are nonetheless real. Many of the bulleted items in the three strategies are intended to help address some of these barriers and improve communication and cooperation between the various groups. The other bullets are intended to facilitate action as barriers are broken down.

Comment: *Section 3.1.1, Agriculture, page 3-3. Agriculture strategy 3 indicates the priority pollutant sources for the next 3 years. This will help provide focus to the limited funds available to address NPS pollution. If geographic priorities have also been developed, those areas could be indicated in this strategy as well. There could be geographic priorities for the various stages of implementation, such as working to establish a local watershed group, WRP development, and BMP implementation.*

DEQ Response: Geographic priorities for implementation have not been established. DEQ does have various 319 grant projects going in specific geographic areas, but this is largely a result of certain areas having more effective, established implementation infrastructure (watershed groups, state/federal agency involvement, community support, etc.). DEQ has recently been exploring options for targeting 319 funds and other support in order to make the most progress toward restoring water quality; however, this is still very much in the planning stages.

Comment: *Section 3.1.2, and Figure 3-1. Where do National Parks fit into this pie chart? Are they included with National Forests, or are they not counted at all in these statistics? It could be that these charts represent acres in the available “timber base” and thus do not include parks and wilderness areas? If this is the case, this figure should probably be footnoted to that effect.*

DEQ Response: National park acreage and wilderness is not included in this figure because it is not part of the timber base. The figure will be footnoted with this information.

Comment: *Section 3.1.2, page 3-4, last paragraph: In this paragraph, the Montana DNRC Statewide Forest Resource Strategy (2010) is cited as a source of the statement: “Almost half (48%) of forested watersheds contain at least one impaired reach or waterbody.” In reviewing the DNRC publication, there is no description of how this metric is calculated, in terms of how large the watersheds were, and*

whether or not forestry activities were even identified as a contributing source (many forested watersheds include other land uses). If the watersheds are large, it is not particularly surprising that at least one stream would be impaired. DEQ should not use the DNRC statistic, as its development and applicability cannot be verified. Rather, DEQ should develop a similar statistic using verifiable and applicable data sources.

DEQ Response: DEQ is comfortable with citing DNRC’s Statewide Forest Strategy as a general indication that forestry land uses have had negative effects on water quality in Montana. Given existing resources and time constraints, DEQ will retain the statement as written.

Comment: Section 3.1.2, page 3-5, paragraph titled “Forest Road Construction and Use.” There are some inaccuracies in this paragraph. Please re-word as follows:

Forest Road Construction and Use

Improperly located, constructed, or inadequately maintained forest roads generate sediment that often reaches can be delivered to stream channels (see review by Sugden and Woods 2007). Implementation of contemporary Best Management Practices, where ~~When~~ roads are properly located, well designed, and well maintained (including keeping stream crossings to a minimum), can dramatically reduce impacts to water quality (Ice and Schilling 2012). ~~watersheds typically exhibit near-natural rates of sediment production (Sugden and Woods, 2007), thus maintaining high-quality aquatic species habitat (Gucinski, et al., 2001) and water quality.~~

Citation: Ice, G.G. and E.B. Schilling. 2012. Assessing the effectiveness of contemporary forestry Best Management Practices (BMPs): Focus on Roads. Special Report No. 12-01. Research Triangle Park, NC: National Council for Air and Stream Improvement Inc. (NCASI). 23 p plus appendices.

DEQ Response: Thank you for your comment. DEQ accepts the proposed language and will revised the Plan accordingly.

Comment: Section 3.1.2, page 3-5, paragraph titled “Silviculture Harvesting in Riparian Areas.” Please re-word as follows:

Silviculture Harvesting in Riparian Areas

*~~Harvesting timber~~ **harvesting** within riparian areas has the potential to adversely impact riparian functions to the detriment of water quality and biological integrity. Riparian functions that can be impacted by indiscriminant streamside harvesting include shade (i.e., water temperature), large woody debris recruitment, nutrient cycling, streambank stability and sediment filtration and flood-flow attenuation. ~~often reduces riparian vegetation. Vegetation slows surface water flows, and plant roots strengthen streambanks, thus minimizing erosion. In addition, woody riparian vegetation provides a runoff buffer, filtering sediments and nutrients and preventing most from entering the waterbody. Finally, removing riparian trees and vegetation reduces streamside shading, which can increase stream temperatures, which in turn can harm aquatic life.~~ Montana’s Streamside Management Zone (SMZ) law (77-5-301 et seq. MCA) **was passed by the 1991 state legislature and** is designed to protect the water quality functions of these streamside zones.*

DEQ Response: Thank you for your comment. DEQ accepts the proposed language and will revised the Plan accordingly.

Comment: *Section 3.1.2, page 3-6, Strategy 2. The first sentence in this section implies that Richardson et al. was done in Montana, when in fact it was a broad-scale review piece.*

DEQ Response: DEQ will modify the language to clarify that this research was a broad-scale review.

Comment: *Section 3.1.2. In most cases legacy impacts from silviculture can be adequately addressed through implementation of standard BMPs as opposed to enhanced or “heightened” levels of BMPs.*

DEQ Response: When establishing TMDLs, state law requires the development of “reasonable land, soil, and water conservation practices” (BMPs) that recognize “established practices and programs” for eliminating nonpoint source pollution. See § 75-5-703(2), MCA. State law also requires the evaluation of progress made toward achieving water quality standards after implementing the TMDL. If progress is lacking, then a “new or improved phase of voluntary” BMPs is necessary. Consequently, the reference to a “heightened level of BMPs” in the Draft Plan will be eliminated since state law requires an improved phase only if implementation of the TMDL fails to achieve water quality standards.

Comment: *Section 3.1.3, Hydro-modification section. Bank alteration and riprap – is this really hydromodification?*

DEQ Response: Yes. Bank alteration and riprap are activities or practices that can alter natural stream and river channel processes and potentially create negative nonpoint source pollution. They are a subset of channelization and channel modification concerns. EPA and DEQ have identified bank alteration and riprap as both sources of NPS pollution and potential practices to address NPS problems. For more on this subject, see EPA’s “National Measures to Control Nonpoint Source Pollution from Hydromodification,” Chapter 3, titled “Channelization and Channel Modification.” Nevertheless, DEQ does not understand the context for this question, as bank alteration and riprap are not discussed in Section 3.1.3.

Comment: *Section 3.1.3. Emphasize efforts to reduce the impact of hydrologic modification (flow alteration examples of drought plans and other group efforts/water rights/leasing, etc).*

DEQ Response: Thank you for your comment. DEQ will add language in Section 3.1.3, Strategy 3 to address this oversight.

Comment: *Section 3.1.3. In the Draft Plan, the only strategy to address hydromodification is to protect banks. Are there other strategies that should be added (e.g. addressing flow alteration, development and implementation of drought management plans, group efforts, acquiring water rights or engaging in water leasing).*

DEQ Response: Thank you for your comment. DEQ will modify the goal statement for hydrologic modification, which is misleading.

Comment: *Section 3.1.3, Table 3-2 on Page 3-7. This Table is a summary of impairment contribution in the state by various sources. It is in fact not even cited in the draft document, and is out of place in the Hydro Modification section of the document. This Table should be cited and pulled to the front of Section 3.1.*

DEQ Response: Thank you for your comment. Table 3-2 will be removed. Instead, the 2012 Water Quality Integrated Report will be cited in Section 3.1 to address the major sources of impairment.

Comment: *Section 3.1.4. The Draft Plan includes in a number of places, reference to the mining industry and associated impacts without providing complete, or even general, context.*

DEQ Response: DEQ will cite the 2012 Water Quality Integrated Report and provide general context in Section 3.1. Additional new contextual information will be provided in Section 3.1.4 of the final document.

Comment: *Section 3.1.4. The draft plan references CERCLA as a tool available and currently being used to combat NPS pollution but it does not reference, in any detail, the CERCLA process or the NCP. This is significant for a number of reasons including: Both CERCLA and the NCP incorporate the concept of cost effectiveness in alternative screening and remedy selection; the NCP process protects all stakeholders, including PRPs, from the misapplication of ARARS; the NCP further provides for protection (through the ARAR waivers) from a state applying standards that have not been duly promulgated or consistently applied; finally the NCP requires that responses be necessary and reasonable. (The Draft Plan addresses "reasonable land, soil, and water conservation practices".) The Draft Plan references CERCLA but does not reference the NCP or the provisions of the alternatives screening process and remedy selection process. The Draft Plan should reference these provisions, which will be applicable in situations where the Draft Plan overlaps with CERCLA responses.*

DEQ Response: The Montana 2012 NPS Management Plan (2012 NPS Plan) is not expected to “overlap” with CERCLA responses. The 2012 NPS Plan itself has no legal or administrative control over CERCLA actions. The 2012 NPS Plan does not serve to guide or otherwise influence CERCLA actions. The brief mention of CERCLA is simply intended to acknowledge that CERCLA actions often do address nonpoint sources of pollution.

Comment: *Section 3.1.4. The emphasis the Draft Plan places on NPS pollution seems particularly misplaced and misleading for the Butte/Anaconda area. Comparing water-quality impacts primarily from sediment in nonpoint sources to the potential impact to human health and the environment from metals and ARD, is unreasonable.*

DEQ Response: The purpose of the 2012 NPS Plan is to describe what is being done and what may be done to address NPS pollution in Montana. Therefore, DEQ feels that the emphasis on NPS pollution is neither misplaced nor misleading. DEQ does not feel that sediment is the primary NPS pollutant. It is one of many, and each one can have detrimental effects on water quality and beneficial uses. Factors such as concentration, location, and quantity of a pollutant are often as important as the type of pollutant in determining the overall effect of a pollution problem on water quality. That said, DEQ acknowledges that the effects of mining-related pollution are quite severe and troublesome in certain state waters in the Butte/Anaconda area.

Comment: *Section 3.1.4. For each land use mentioned in the Draft Plan, implementation of BMPs is the primary method to reduce NPS pollution. Abandoned mines are managed by the Mine Waste Cleanup Bureau. The only strategy presented to address abandoned mines is to coordinate efforts with the MWCB.*

DEQ Response: This is an incorrect statement. Please refer to the second paragraph and associated bulleted list under Strategy 2 of the Mining discussion in Section 3.1.4 of the 2012 NPS Plan for additional strategies to address abandoned mines.

Comment: *Table 3-2 addresses Leading Sources of Water Quality Impairments for Rivers and Streams. This table is difficult to interpret and seems somewhat misleading in that it indicates that Mining and Industry impact 8% of the miles of waters within the state but does indicate how many rivers or streams are impacted.*

DEQ Response: DEQ agrees that this table is difficult to interpret and will remove the table from the final document. Instead, DEQ will provide a summary table derived from the 2012 Water Quality Integrated Report in Section 3.1.

Comment: *Section 3.1.4 Mining & Industry. The impacts of gravel mining in and near the floodplain or in areas of shallow groundwater are not discussed. Please discuss the impacts of gravel mining in and near the floodplain or in areas of shallow groundwater. In your discussion, include strategies for reducing impacts to water quality from these sources.*

DEQ Response: As noted in Section 3.1.4, discharges from active mine sites (including discharges from sand and gravel mines) are considered point-source pollution and are subject to regulation under the Montana Pollutant Discharge Elimination System. Discharges from abandoned mine sites (including those from abandoned sand and gravel mining operations) are addressed in Strategy 2 of the mining discussion in Section 3.1.4 of the 2012 NPS Plan.

Comment: *Section 3.1.5. Please identify recreation waste intentionally dumped in waters or unintentionally spilled while pumping out waste from boats, and include a strategy for addressing this problem.*

DEQ Response: Please see Section 3.1.5 Strategy 1, which identifies promotion of responsible boating through proper development of recreational facilities and educational campaigns.

Comment: *Section 3.1.5. In the recreation box, please include hunting.*

DEQ Response: Hunting was not initially included because FWP did not specifically separate waterfowl hunting and game hunting. Hunting is now included in the break-out box in section 3.1.5.

Comment: *Section 3.1.5. Please address off-road vehicle damage as a source of NPS pollution (sediment).*

DEQ Response: Section 3.1.5 states that “Repeated and unauthorized travel by OHVs (off-highway vehicles) can contribute to riparian damage and excess sediment and runoff into nearby streams and lakes.

Comment: *Section 3.1.6, Transportation section. Please note that county governments also maintain and control lots of roads cumulatively around state.*

DEQ Response: Please note the addition in section 3.1.6: “Local governments maintain additional roads and bridges throughout the state.”

Comment: *Section 3.1.6, Transportation section. Please address road dust and maintenance issues.*

DEQ Response: Section 3.1.6 addresses maintenance issues through Strategy 2, which proposes increased training for transportation maintenance workers to prevent NPS pollution. DEQ is not aware of information that identifies road dust as a significant source of impairment of state waters.

Comment: *Section 3.1.6 Transportation, second paragraph. This paragraph identifies pollutants for transportation routes. Because transportation routes often affect river channels and their lateral migrations, sediment could be included in this paragraph as a potential pollutant.*

DEQ Response: Please note the change in section 3.1.6: “Changes in sediment transport and bank erosion can also be affected by transportation routes that limit lateral migration and floodplain functions.” Please note that transportation practices can result in channelization and channel modification (hydrologic modifications).

Comment: *Section 3.1.7, Residential Waste Disposal. Although pharmaceuticals and personal care products are mentioned as contaminants, no information is provided about the ability of septic systems to treat these products.*

DEQ Response: Thank you for the comment. Section 3.1.7 has been revised in response to the comment.

Comment: *Section 3.1.7. Will the strategy to “...develop TMDLs that address pollutant loading from septic systems, and provide technical and financial assistance for projects that focus on specific septic system issues” include new TMDLs that address this relatively new concern [PCPs]? This strategy should be specific enough to provide a common understanding of what it entails. There also could be additional strategies, besides TMDLs, for addressing these pollutants.*

DEQ Response: DEQ does not intend to develop TMDLs for Personal Care Products (PCPs) at this time. PCPs are an emerging issue and national standards are only now being developed. Montana relies on the science used in the development of national standards for our state standards. Until such time as Montana has water quality standards for PCPs, and lists state waters as impaired as a result of standard exceedances, TMDLs are inappropriate. DEQ recognizes the potential for negative effects on beneficial uses from personal care products and that there is justified concern of the potential effects of these compounds on human health and aquatic life. In recognition of this concern, it should be noted that Strategy 2 in Section 3.1.7 allows for addressing this area of emerging concern.

Comment: *Section 3.1.7. A strategy for Residential Waste Disposal should address the current problem of siting septic systems in areas of shallow groundwater with porous soils (and therefore, good percolation) next to surface water bodies, which can contribute to both groundwater and surface water pollution.*

DEQ Response: Septic systems located in shallow groundwater areas with porous soils pose an increased risk of contaminating groundwater and surface water. In these cases additional

precautions beyond the allotted septic mixing zone are likely to be necessary to prevent water quality degradation by septic systems. Montana's subdivision regulations and minimum wastewater standards require nondegradation analysis of every septic system installed in Montana. Design standards require additional treatment, such as pressure-dosing and sand-lining in areas of coarse soils and shallow groundwater to ensure that proper treatment is achieved. The siting of septic systems is primarily addressed through Montana's subdivision review process and through septic system permitting by county sanitarians.

The NPS Plan focuses mainly on non-regulated activities that result in NPS pollution. Although not specifically mentioned in the plan, DEQ believes that Strategy 2 in Section 3.1.7 encompasses the site-specific concerns expressed in the comment, since Montana's programs that address residential septic systems (e.g., mixing zone rules set forth in ARM 17.30.501 through 518) include mechanisms for addressing the site-specific water quality protection issues expressed in the comment. Appropriate planning through the above processes is intended to prevent impairment of beneficial uses from septic systems. Where septic systems are identified as impairing surface water quality, Montana can address pollutant load reductions through the TMDL process.

Comment: *Section 3.2.1, Atmospheric Contributions. This section does not propose any real control strategy, but mostly proposes supporting monitoring and identifying sources and recommending actions. To justify this, perhaps the document should include an explanation of why it cannot recommend and prioritize actions to reduce atmospheric pollution at this time and any plans for developing strategies in the future.*

DEQ Response: The last sentence in the first paragraph provides some justification. DEQ will provide additional language in the final document.

SECTION 4.0 NPS POLLUTION EDUCATION AND OUTREACH

Comment: *Section 4.2, Program Priorities. This section outlines nine actions the E&O program could take to improve education/outreach. It would be valuable if DEQ did an evaluation of its NPS E & O activities (action #9) and other programs to assess how effective they are at the watershed level, and communicate the findings to groups implementing programs in that watershed, including what projects are being implemented, by whom, effectiveness, and gaps and additional needs. Having some type of education clearinghouse on projects that includes effectiveness evaluations, would also be helpful.*

DEQ Response: The E&O program is continually adapting and improving through informal program and project evaluation. DEQ is currently working with the Montana Watershed Coordination Council (MWCC) to build a clearinghouse for educational efforts. Some portions of this clearinghouse are already available at www.mtwatersheds.org, including an Educational Directory and Publications Directory. To increase coordination and limit duplicative efforts, tools will be added to this website as they become available; in many cases they may be used by other groups, including effectiveness evaluations. Notice of effectiveness evaluations may also go out through the MWCC listserv; to join please visit: <http://mtwatersheds.org/GetInvolved/Membership.html>

SECTION 5.0 WATER QUALITY ASSESSMENT AND MONITORING

Comment: *Section 5.0. DEQ is creating the expectation that volunteer participation will play a significant role without the supporting structure to allow such data to be a meaningful contributor to the process.*

DEQ Response: Numerous volunteer water quality monitoring activities receive DEQ technical and financial support. Although not described in great detail in the NPS Plan, DEQ-funded volunteer monitoring efforts are required to develop monitoring plans that meet quality assurance and control (QA/QC) requirements. Volunteer data that does not meet DEQ QA/QC protocols is not used as primary data in decision-making processes that result in water quality impairment determinations. This is also true for data collected by other organizations, such as state and federal agencies. There are many examples of how DEQ helps provide structured support for volunteer monitoring efforts that are not provided in the Plan; they were omitted for the sake of brevity. Appendix C provides information on many of the organizations that provide supported structure for volunteer monitoring. For example, DEQ participates in MWCC and its workgroups, which support volunteer monitoring. DEQ also funds and works extensively with Montana Watercourse and MSU Water Quality Extension to provide support for volunteer monitoring efforts. To improve the supporting structure, as well as meet ongoing data needs, DEQ has an identified goal P12 in Section 8.1 for developing additional opportunities to collaborate with volunteer monitoring efforts.

Comment: *Section 5.0. The Draft Plan should include basic requirements and standards to be applied to volunteer monitoring programs.*

DEQ Response: Some QA/QC requirements are in place but were not included in the draft Plan. DEQ has revised Section 5 in response to the comment.

Comment: *Section 5.0. Table 5.1 should have NRCS listed in this table since NRCS planners address NPS issues at the field level when farm planning and at the watershed scale when working with area plans. A1, A2, B1, B2, C1. These assessments are not regulatory in nature but are part of the conservation planning policy and process to address all Soil, Water, Air, Plant, and Animal (SWAPA) resource concerns through resource management system –level conservation plans.*

DEQ Response: Table 5.1 has been revised in response to the comment.

Comment: *Section 5.0. Table 5.1 should refer back to Figure 5.1*

DEQ Response: DEQ has revised Section 5 in response to the comment.

Comment: *Section 5.2, Water Quality Monitoring. The significant role of the University of Montana Flathead Lake Biological Station (FLBS) in collecting water quality data and monitoring long-term trends in Flathead Lake and its tributaries is not mentioned (merely glossed over in 7-2). MSU's role in training is listed in 8-4, but UM FLBS's role in data collection and assessment is missing. Considering that DEQ sets a priority for monitoring water quality trends, the role the UM FLBS plays should be mentioned.*

DEQ Response: Thank you for the comment. The water quality assessment and monitoring activities undertaken by Montana's universities and colleges was inadvertently overlooked. This has been corrected in the Plan.

Comment: *Section 5.2, Water Quality Monitoring. The monitoring discussion should address the inadequacy of funding for monitoring, including long-term trend monitoring that can provide an early warning and essential information about new problems. Strategies for addressing this lack of funding should be identified and included in the Draft Plan.*

DEQ Response: Section 5.2 has been revised in response to the comment. The strategies identified in Section 5.2 encompass the formation of potential partnerships between the state and local stakeholder groups in meeting shared water quality protection goals. Also, the 5-year goal, P12 in Section 8.1, specifically addresses the concern expressed in the comment, and the asterisk next to the goal indicates that it has been identified as a high priority for Montana's Nonpoint Source Program.

Comment: *Section 5.2.4, Water Quality Monitoring by Citizens. The Draft Plan describes volunteer monitoring as "rapidly expanding," but there is no mention of a comparable role for industry or the use of industry-developed data.*

DEQ Response: It is important to distinguish between monitoring conducted as a permit requirement and monitoring conducted on a voluntary basis. Monitoring required under a permit is not volunteer monitoring. The primary focus of the NPS Plan is upon NPS pollution associated with non-regulated activities, which is why monitoring conducted as a permit requirement is not addressed. Nevertheless, Montana State law requires DEQ to consider all readily available data during the assessment of beneficial-use support of individual waterbodies. This includes data collected by industry, whether the data addresses point- or nonpoint sources of pollutants to state waters. DEQ considers data collection efforts by industry on a voluntary basis to be volunteer monitoring, and industries are encouraged to collaborate with DEQ to perform such monitoring. DEQ also encourages industries, as members of a local community and watershed, to play a role in supporting local volunteer monitoring. For example, sponsoring efforts undertaken by local watershed groups, providing technical and financial assistance, engaging in site-specific research on various topics of interests, etc., in order to fill gaps in important information that cannot be bridged solely through partnerships with state and federal agencies.

SECTION 6.0 ENFORCEABLE REGULATORY PROGRAMS

Comment: *Section 6.0. Previous efforts and programs (at both the state and the federal level), have lacked the specificity (associated with process, coordination and implementation) needed to address nonpoint sources with the same level of effectiveness as the regulation of point sources. Reliance on voluntary participation of non-point source stakeholders is disconcerting. This plan should establish a basis for greater accountability and required participation of nonpoint source stakeholders.*

DEQ Response: DEQ appreciates the concern expressed regarding the lack of effectiveness and accountability in a voluntary program. Nevertheless, nationally, and within Montana, the overall perspective has not supported a more regulatory approach for addressing nonpoint source pollution.

Comment: *It might be good to include mention of the Spill Prevention, Containment, and Countermeasures Program (SPCC).*

DEQ Response: A short summary of this program will be provided in Section 6.2 – Other Discharge Limitations.

SECTION 7.0 PARTNERSHIPS AND FUNDING

Comment: *Section 7.2, Partners. The Sonoran Institute is listed. Do they still have an office in MT? Why not list Trout Unlimited, Nature Conservancy, Blackfoot Challenge, etc. as well?*

DEQ Response: The non-governmental organizations listed in section 7.2 are examples of groups that devote resources to address NPS pollution in Montana. These lists are not comprehensive. The Sonoran Institute currently has an office in Bozeman, Montana. Blackfoot Challenge is not listed specifically because it is captured as a local watershed group.

SECTION 8.0 MONTANA’S NONPOINT SOURCE PRIORITIES AND ACTION PLAN

Comment: *Section 8.1, Table 8-1, Item R10. Remove item R10 in the table, and merge this with R9, and specifically mention the BMP Working Group facilitated by DNRC as the mechanism for adaptive management of BMPs and SMZs. List DNRC as the responsible party in Column 2 on this activity.*

DEQ Response: The final document will reflect the suggested changes to modify R9 and identify DNRC as the responsible party for R9. DEQ notes that assessments for ensuring that BMPs are protecting riparian and wetland functions is different than current BMP assessment methodology, which provides a snapshot in time.

Comment: *Section 8.1, Table 8-1, Education Section: You could consider a couple of inclusions to this table related to forestry. First, DNRC and the Montana Logging Association conduct annual BMP/SMZ education workshops for loggers and landowners. Second, Montana State University Forestry Extension also coordinates a forest stewardship program targeting small landowners throughout Montana.*

DEQ Response: The final document will add the suggested forestry-related education actions.

Comment: *Section 8.1, Table 8-1, column headings. The information under the third heading contains more outputs and what might be considered milestones, as compared to outcomes. Outcomes are typically the environmental or program result/improvement. An environmental outcome could be an improvement in water quality or other characteristic and a program outcome could be the ability to better track and manage projects. The third column might be better labeled as Outputs and Milestones. If outcomes are included, those could be starred and footnoted, rather than creating a new table. It would be good to include measurable outcomes, but it is understood that they are often hard to measure. The outputs and milestones could perhaps be indicators to making gains on identified outcomes. For environmental outcomes, any information that indicates improvements in water quality is useful for monitoring program effectiveness. This could be at the project, water body segment, or watershed scale.*

DEQ Response: DEQ appreciates the clarification of terms. The final document will change the column titled “Measurable Outcome” in Table 8-1 to “Outputs, Objectives, Outcomes, and Milestones”. The final document will identify additional actions and outputs, objectives, outcomes, and milestones as appropriate.

Comment: *Section 8.1, Table 8-1. Please consider including interim milestones for the items that only show 2017 milestones, if appropriate. For example, item P3 could indicate that one or two MOUs would be completed prior to 2017 (i.e. 2014). This would help gauge success with coordinating with other agencies prior to the next plan update. Section 8.1, Table 8-1, No. P13. Estimated completion dates could be added for each milestone in this item.*

DEQ Response: The final document will identify annual (interim) milestones as appropriate.

Comment: *Section 8.1, Table 8-1, No. P15. The nutrient trading policy is already in the process of being developed, if not completed. EPA has had some concerns with the policy and those concerns are being addressed. It may be better to indicated finalization of the policy in the table and provide an approximate date.*

DEQ Response: The final document will reflect that the action associated with P15 is the finalization of the Nutrient Trading policy.

Comment: *Section 8.1, Table 8.1. Please include using demonstration projects for encouragement of adoption of new technology.*

DEQ Response: DEQ will add an additional resource action with the following language: Encourage and fund WQIP and WRP-directed NPS watershed restoration projects, including demonstration projects for encouragement of adoption of new technology.

Comment: *Section 8.1, page 8-3. P12 should include watershed groups and CDs to help with the monitoring program.*

DEQ Response: The responsible parties identified in P12 include MWCC, whose members include watershed groups and conservation districts. It is fully intended that developing a long-term monitoring system will include these local groups and entities.

Section 9.0 Measuring Success

Comment: *Section 9.2, Other Resource and Policy Measures of Success. This section adequately describes examples of what can be measured to determine success. It would also be helpful to describe the process that will take place for performing the measurements. One idea could be to use a spreadsheet that includes the measurable items, the estimated target and date, then a brief statement about progress toward meeting that item. This format could also be useful if stating why certain items were not achieved to the estimated extend needed for success. EPA can send examples from other states if this option is something worth pursuing for the MT NPS Plan.*

DEQ Response: Thank you for the comment. Section 9.2 has been revised in response to the comment. DEQ will consider using a spreadsheet tool for tracking progress on measurable items but believes this can be done without specifying its use within the NPS Plan.

SECTION 10.0 ADDITIONAL INFORMATION RESOURCES

No comments.

SECTION 11.0 REFERENCES

No comments

APPENDICES

Comment: *Appendix A – Forestry BMPs. The DNRC should have an update to the BMPs made in 2011. Rob Ethridge at DNRC would be the contact here.*

DEQ Response: The most recent DNRC Forestry BMPs were published in 2006.

Comment: *Appendix A – Best Management Practices. Please include some mention and discussion of using a systems approach or combination of practices. Most practices do not work effectively unless they are used within a system of practices.*

DEQ Response: DEQ views BMPs as measures that can be taken to reduce nonpoint source pollution. Best Management Practices, collectively applied in a systematic fashion constitutes what Montana law and administrative rules refer to as “reasonable land, soil, and water conservation practices”. The Administrative Rules of Montana (ARM) define reasonable land, soil, and water conservation practices as “methods, measures, or practices that protect present and reasonably anticipated beneficial uses. These practices include, but are not limited to, 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** [bold added]. This clarification will be added to Section 3.0 under the **Best Management Practices** heading.

Comment: *Appendix C, page C-32. Updates to Page C-32 relative to Plum Creek are as follows: Note that these changes are not shown as strikeout and underline due to the number of edits.*

DEQ Response: DEQ will update Plum Creek’s description as requested.

