



# Colorado Nonpoint Source Program 2012 Management Plan



Colorado Department  
of Public Health  
and Environment

Colorado Department of Public Health and Environment  
Water Quality Control Division  
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**Authority:**

Section 319(b) of the Federal Water Pollution Control Act (Clean Water Act) as amended by P.L. 100-4 on February 4, 1987. Colorado Water Quality Control Act (CWQCA), part 3, 25-8-301 through 25-8-308 of the Colorado Revised Statutes.

**Policy:** The 2012 *Colorado Nonpoint Source Management Program* outlines the Division's plan to address nonpoint source (NPS) pollution through 2017. This document supersedes and replaces Division's 2000 and the 2005 Supplement NPS Management program plan that was approved by EPA in 2000.

**Purpose:** CWA Section 319 requires each state to prepare an assessment report and a management plan in order to be eligible for funding from the EPA to implement the provisions of the management plan. This document addresses this requirement and also establishes the overall strategy the WQCC adopted to implement nonpoint source activities for the next five years.

**Roles and Responsibilities:** The Water Quality Control Commission (WQCC) and the Water Quality Control Division (Division) as staff to the WQCC have the primary responsibility for water quality control in Colorado. Both the WQCC and the Division are located within the Colorado Department of Public Health and Environment (CDPHE).

The WQCC is a nine-member citizen body appointed by the Governor and confirmed by the state Senate. The WQCC is responsible for developing and maintaining a comprehensive and effective program for prevention, control and abatement of water pollution and for water quality protection throughout Colorado. The duties of the WQCC are stated in part 2 of the CWQCA and described in sections 25-8-202 through 25-8-209. The WQCC fulfills the legislative intent of the CWQCA with the exercise of its authority to establish policy and adopt rules and regulations governing the quality of the State's surface water and groundwater. Duties include classifying all waters, assigning water quality standards and promulgating regulations, including control regulations to implement the classifications and standards. In 2007 all water quality related duties of the State Board of Health's were transferred to the WQCC. The WQCC approves every year the NPS program's project proposals funding recommendations, prior to the annual CWA 319 grant application.

The Division's overall responsibilities are stated in part 3 of the CWQCA, in sections 25-8-301 through 25-8-308 of the Colorado Revised Statutes. The Division also has administrative responsibility for the federal Safe Drinking Water Act (SDWA) and Clean Water Act (CWA) including the Nonpoint Source program in Section 319.

**Other Institutions with Roles and Responsibilities:**

**Regional/Areawide Planning Agencies**

The Colorado Continuing Planning Process, as required in section 303(e)(2) and 205(j) of the Clean Water Act and (40 CFR 130.5) and as implemented through the Colorado Water Quality Control Act (CRS 1973, 25-8-101) and further specified in the rules, regulations and policies of the Water Quality Control Commission define elements of areawide 208 plans for Colorado. Areawide planning agencies are designated by the Governor to produce and maintain water quality management plans for designated areas. As of January 1, 2011, the council of governments (COG) for region 3 elected to withdraw from 208-related water quality planning, leaving four remaining Governor-designated planning associations or COGs. 208 planning for the 10 non-designated planning and management regions is the responsibility of the Division.

**Local Governments and Health Departments**

Organized local health departments exist in many areas of Colorado. These agencies are authorized by state law to provide health and environmental protection services at the local level. Local governmental entities can be cities, towns, water and irrigation districts, conservation and conservancy districts and counties; they participate on a voluntary basis in watershed planning efforts, in local coordination and partnering in the implementation of nonpoint source projects.

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# 2012 Colorado Nonpoint Source Management Plan

## Executive Summary

The amendments to the federal Clean Water Act in 1987 authorized Section 319 and created the Nonpoint Source Management Program. Nonpoint source pollution typically comes from dispersed sources such as nutrient-rich runoff from agricultural lands or metals-laden sediments from mine waste or tailings. This diffuse nature distinguishes nonpoint source pollution from point source pollution, which in contrast requires some form of a discrete conveyance, such as a pipe.

The Water Quality Control Division (the Division) of the Colorado Department of Public Health and Environment is the lead agency for monitoring and reporting on the quality of state waters, preventing water pollution, protecting, restoring and enhancing the quality of surface and groundwater, and assuring that safe drinking water is provided from all public water systems. The Division also has primary responsibility to administer the Nonpoint Source Management Area (NPS program).

The Division, working closely with a group of stakeholders, updated the Statewide Water Quality Management Plan (SWQMP) which was approved in June of 2011. The SWQMP provides an overall framework for water quality planning and is based on section 130.6 of title 40 of the *Code of Federal Regulations* (40 CFR 130.6). The framework is watershed-based and presents comprehensive information about current *statewide* water quality to assist water policymakers, managers, and others in setting priorities, developing strategies, and evaluating the progress of water quality protection and restoration efforts. The plan is comprised of nine elements: water quality management agencies, effluent limitations, total maximum daily loads, municipal and industrial waste treatment, ***nonpoint source management and control***, basin plans, water quality management plan implementation measures, dredge and fill, and groundwater.

CWA Section 319 required two major activities to initiate the program: an assessment report describing the impact of nonpoint sources on the water resources of a state; and a management program outlining how the state proposed to address the impacts identified in the assessment report. Colorado prepared the Nonpoint Source Assessment Report and submitted it to the US Environmental Protection Agency EPA in April of 1988. The first Colorado Nonpoint Source Management Plan was prepared and submitted to EPA in October of 1990. The initial plan was updated twice, in 2000 and 2005. CWA Section 319 requires that the NPS Management Plans be updated regularly. The preparation of the 2012 NPS Management Plan addresses this requirement. This document supersedes the 2000 plan and also establishes the overall strategy Colorado will use to implement nonpoint source activities during the next five year period.

In May of 1987, the Division established a NPS Task Force to serve as an advisory group to the NPS program. In 2006 the NPS Task Force was re-organized into the NPS Alliance (Alliance) that continues to fulfill this advisory role. The Alliance participation is described in more detail in chapter 5.

Colorado's NPS program has two overarching objectives. These two objectives, which originate from the Division's strategic goals, are:

- To restore nonpoint source water quality impacts in impaired waterbodies, and
- To protect existing water quality from future nonpoint source pollution.

A summary of the causes of impairments, derived from the 2010 The Integrated Water Quality Monitoring and Assessment Report (IR), indicates that the main pollutant causing water quality impairment in Colorado rivers and streams is selenium, followed by metals (if adding all metals impairments, with copper, iron, zinc and cadmium the highest) and followed by pathogens. In lakes, the pollutants are mercury, selenium and low levels of dissolved oxygen. The great majority of the Total Maximum Daily Loads (TMDLs) developed by the Division

(89%) addresses mine-related impairments, mostly due to legacy mining. These impairments are considered nonpoint sources because they are related to runoff and drainage from Abandoned Mine Lands (AML) sites for which there are no remaining financially viable “responsible parties”. Legacy mining problems are a logical priority for the NPS Management Plan over the next 5 years, followed by selenium impacts. The NPS program will be developing a framework to address anthropogenic selenium impacts, based on the work currently being undertaken by Colorado State University and the Selenium Task Force.

National priority pollutants – sediment, phosphorus and nitrogen – will continue to be addressed by the NPS program via implementation of stream restoration projects, outreach and education efforts targeted to the agricultural community, and in monitoring and assessing paths of nonpoint sources of pollution related to excessive sediment loading and nutrients.

In addition to restoring impaired waters, the NPS program will continue to implement and fund activities that lead to protection of water quality. Education and public outreach remains a cornerstone of the NPS program and a requirement in every implementation project and watershed plan. Working collaboratively with project sponsors and program partners continues to be a priority. This will ensure that surface and groundwater resources will be protected and the public and partner organizations will gain an increased understanding of water quality issues, goals and responsibilities.

To achieve these objectives, this version of the NPS Management Plan establishes a plan that is intended to be flexible and responsive to changing conditions and situations. Successful implementation of the plan will lead to measurable improvements in water quality in segments currently impaired by nonpoint sources of pollution. Additionally, efforts to protect existing good water quality will continue whenever nonpoint source related opportunities are identified.

The Plan is organized into eight chapters.

- Chapter 1 **Introduction** - NPS program background, goals and objectives including the program’s relation to the Water Quality Control Division;
- Chapter 2 **Program Strategy and Action Plan - Program** strategy and objectives for the next 5 years to address key NPS pollution of concerns;
- Chapter 3 **Nonpoint Source Categories** - Categories of land use and activities posing potential threats to water quality as sources of NPS pollution and the strategy to address them;
- Chapter 4 **Project Development and Implementation** – Information about processes to take **projects** from conception to implementation and evaluation;
- Chapter 5 **Partners** - Agencies, organizations and other entities active in addressing nonpoint sources of pollution and serving as program partners;
- Chapter 6 **Implementation** - Summary of accomplishments of current and recent projects to establish baseline information for future planning to meet program priorities;
- Chapter 7 **Plan and Program Effectiveness Evaluation** - Evaluation approach to measure accomplishment and effectiveness; and,
- Chapter 8 **Challenges** - Challenges the NPS program faces and how to address them.

The appendices provide detailed information about priority watersheds and streams, guidance for watershed-based plans, best management practices, and potential sources of funding for project and BMPs implementation.



## Chapter 1 – Introduction

Colorado has 105,344 river miles and more than 249,787 lake acres. There are seven major river basins in Colorado: the Arkansas, Rio Grande, San Juan, Colorado, Green, Platte and Republican. The majority of Colorado's rivers originates in the high alpine environment of the Rocky Mountains and flows downstream through the high desert or high plains regions before leaving the state. Within the interior of the Rocky Mountains are several high broad basins. Just south and west of the Continental Divide is Middle Park, drained by the Colorado River. The Western Slope is generally drained by the Colorado River and associated tributaries. In the north, on the east side of the Continental Divide is North Park. North Park is drained by the North Platte River, which flows north into Wyoming and ultimately to the Missouri River. South Park is the headwaters of the South Platte River that also drains to the Missouri. The Republican River rises in the far eastern part of the state and flows through Kansas and Nebraska. To the south lie the San Luis Valley and the headwaters of the Rio Grande that drains into New Mexico and ultimately to the Gulf of Mexico. Across the Sangre de Cristo Range, to the east of the San Luis Valley lie the Wet Mountain Valley and the headwaters of the Arkansas River that ultimately drains into the Mississippi River. The headwaters of the Republican River, which is the only river basin in Colorado that doesn't originate in the Rocky Mountains, originate on the western edge of the High Plains and generally flows east, exiting into northwestern Kansas.

Nearly half of the state is relatively flat in contrast to Colorado's rugged Rocky Mountains. East of the Southern Rocky Mountains are the Colorado High Plains, the section of the Great Plains within Colorado. Most of the plains is sparsely populated with most population centers located near the mountains along the South Platte or Arkansas Rivers. Numerous dams and water diversion, storage and delivery projects provide water for irrigation, hydroelectric power generation, and municipal and industrial use. The Colorado-Big Thompson and the Frying Pan-Arkansas projects are two of the largest such projects that divert water from the Western Slope, to the Eastern Slope, where most of the State's population and farmland are concentrated.

### ***Statewide Water Quality Management Plan***

The SWQMP was approved by the WQCC on June 1<sup>st</sup>, 2011. It provides a framework for water quality planning based on federal regulations at section 130.6 of title 40 of the *Code of Federal Regulations* (40 CFR 130.6). Within this framework, comprehensive information about current statewide water quality is presented to assist water policymakers, managers, and others in setting priorities, developing strategies, and evaluating the progress of water quality protection and restoration efforts. The water quality information is based on readily available, peer reviewed water quality information, particularly the data in the 2010 IR. In addition to the statewide aggregation of data, the SWQMP also presents water quality data at a basin scale. This information is incorporated into the 40 CFR 130.6 framework as Basin Plans. The other elements defined in 40 CFR 130.6 complete the foundation for the SWQMP and provide information about water quality management agencies, effluent limitations, total maximum daily loads, municipal and industrial waste treatment, nonpoint source management and control, water quality management plan implementation measures, dredge and fill, and groundwater. These elements are primarily discussed at a programmatic level, with focus placed on summarizing Division activities. The element discussions are based on information in existing documents such as the Nonpoint Source Management Program, and these existing documents are incorporated in the SWQMP by reference<sup>1</sup>.

### ***Integrated Water Quality Management***

The following integrated program elements form a complete water quality management program for ground water and surface water:

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1 - This Statewide Water Quality Management Plan represents a compilation of internally and externally-derived information, including information produced by a variety of public and other outside sources. As such, the Colorado Department of Public Health and Environment makes no representations or warranties of any kind, express or implied, about the completeness, accuracy, reliability, or suitability with respect to any information derived from such outside sources. In no event shall the Colorado Department of Public Health and Environment be liable to anyone for special, incidental, consequential, or exemplary damages incurred due to reliance on such information.

- *Monitoring* provides data to form a picture of the current status and trends in this state’s water quality.
- *Assessment* evaluates the monitoring data and provides the scientific support for establishing the framework for water quality including standards for surface water and groundwater.
- *Water Quality Management Planning and TMDL Development* is the process of translating the standards framework into specific terms for identified water bodies in relation to the threats and impacts presented by point source discharges and nonpoint source discharges, which result in non-attainment of water quality standards. Water quality management planning may also result in source water protection strategies to ensure the safety of drinking water supplies while minimizing the costs for required treatment and monitoring.
- *Permits and Control Mechanisms* translate the standards framework (including total maximum daily loads along with applicable technology-based requirements, into very specific terms and conditions for regulated entities.
- *Compliance Assurance* includes all of the activities that go into assuring regulated drinking water and pollution control facilities know what requirements must be met and have the necessary facilities and operational capabilities to maintain compliance with regulatory requirements.
- *Water Quality Restoration and Enhancement Efforts* result in actual improvements to water quality through nonpoint source projects and voluntary cleanup projects, and through education and outreach efforts.
- *Financial Assistance Programs* provide funds through grants and low interest loans to drinking water systems and publicly owned pollution control facilities.

## **1.1 – Water Quality Control Division and Watershed Program Mission, Goals and Results Measures**

The Water Quality Control Division (the Division) has the following mission statement:

“Protect and restore water quality for public health and the environment in Colorado.”

The Division will achieve its Mission by pursuing the following Clean Water Program goals:

- Prevent waterborne disease and reduce chronic public health risks from drinking water through improved implementation of the federal Safe Drinking Water Act and Colorado’s drinking water statutes and regulations
- Protect all designated uses by fully attaining water quality standards through improved implementation of the federal Clean Water Act and Colorado Water Quality Control Act and their associated regulations
- Restore impaired water quality to attainable standards through improved implementation of the federal Clean Water Act and Colorado Water Quality Control Act and their associated regulations

The Division is comprised of four large programs: Operations, Water Pollution Control, Safe Drinking Water and Watershed. These programs are responsible for achieving the Division’s mission. The Operations Program is responsible for providing fiscal and business support and by managing the information system for the Division. The Water Pollution Control Program is primarily responsible for providing permitting, compliance assurance and technical and financial support services to regulated entities. The Safe Drinking Water Program implements the Safe Drinking Water Act.

The purpose of the Watershed Program is to provide information, planning, financial, and scientific support services to the Water Quality Control Commission, government agencies, Division programs, sections and units, customers, and performance partners so they can protect, improve, and restore water quality in Colorado. The Program is comprised of three units that execute various regulatory and non-regulatory functions on a small to large watershed-scale across Colorado. The Environmental Data Unit is primarily responsible for collecting water quality data and assessing the quality of Colorado’s surface waters to determine protection of public health, classified uses, and associated water quality standards. The Standards Unit acts as primary staff to the Water Quality Control Commission to develop surface and groundwater quality standards. The Restoration and Protection Unit is primarily responsible for non-regulatory implementation of the CWA and

focuses on restoring waters to full attainment of applicable standards, and protecting the quality of those waters that are in attainment. NPS management activities are addressed within the Restoration and Protection Unit of the Watershed Program.

Grant requirements under the CWA Section 319 stipulate that nonpoint source projects for on-the-ground restoration and remediation activities report measurable results. EPA defines measurable results as “restoring waters to partial or full uses and standards, or as a minimum, reducing pollutant loads such as nutrients and sediment.” To accomplish this, existing nonpoint source impacts must be quantified in order to provide water quality baseline from which to measure improvements. Project sponsors are required to provide water quality baseline data and subsequent post-project data to substantiate project outcomes. These monitoring requirements are part of NPS implementation projects. Nonpoint source monitoring needs are also addressed within the basin-monitoring schedule used to collect water quality data in support of the triennial review of basin classifications and standards.

## **1.2 – Nonpoint Source Management Area (NPS program) Overview**

The Division’s NPS program was established in 1988, following the enactment of the 1987 CWA Amendments. The 1987 CWA amendments created section 319 and the Nonpoint Source Program. Two items needed to be completed by the states so that the States’ NPS programs could start receiving grants to address NPS pollution: a State Assessment Report and a State Management Program. In April of 1988, Colorado released the first Colorado Nonpoint Source Assessment Report; this assessment is now superseded by the IR. Following that document, the state was required to develop a NPS Management Program (now referred to as the Nonpoint Source Management Plan). The Division’s first Nonpoint Source Management Plan was released in October of 1990, and has been updated twice, in 2000 and 2005.

The original assessment report included the impact of nonpoint source pollutants on the seven Colorado major basins, the magnitude of the effect of human activity to streams, and the degree of severity of the NPS impact per basin. Overall, the assessment concluded that rivers and streams were impacted primarily by sediment, followed by salinity, metals, nutrients and bacteria. Agriculture was found to impact about 58% of total river and stream miles assessed, followed by resource extraction (35%), urban/construction runoff, silviculture and hydrologic modification.

More recently, the State Assessment Report has been superseded by the IR, which includes the 303(d) list and the 305(b) report. The IR identifies the waterbodies in the state that are not meeting water quality standards, and the suspected causes and sources of impairments. For impaired waters in Colorado, the leading cause of impairment is metals including selenium in rivers and mercury in lakes. Selenium issues are widespread mainly due to the prevalence of Cretaceous aged marine sedimentary rock formations in the state. These rock formations can naturally liberate selenium, and some activities, such as irrigation or construction, can increase the amount of selenium that is liberated. The major source or contributor of mercury in Colorado is still unknown, as it is mostly airborne deposition from diverse sources. Where the source of other metals has been identified, it is primarily associated with resource extraction – “legacy mining”. Review of the completed and approved TMDLs indicates that approximately 90% are addressing legacy mining issues. Of this total, approximately 55% have been written to address cadmium, copper and zinc impairments, all of which is associated with legacy mining impairments. The remaining 10% of completed TMDLs address a range of issues, including sediment, nitrates and mercury-related fish consumption advisories. Although the Division develops and updates the list of impaired waters regularly, there are many segments and waterbodies that may still be impacted by other factors, such as hydromodification, and are not included in the impaired waters list. There are other cases where waters could be impaired but because there is a plan to address that impairment, they are not placed on the impaired waters list. The universe of nonpoint source-related impaired waters may be larger than the 303(d) list of impaired waters.

The 1990 Management Program established the initial framework for the NPS program and also established the Nonpoint Source Task Force, formed in May of 1987, and subsequently known as the NPS Council, and now

reorganizes as the NPS Alliance. Twenty years ago, with the NPS Task Force, the program identified the four most prominent NPS categories as Agriculture/Silviculture, Urban/Construction Runoff, Abandoned/Inactive Mining and Hydrologic Modifications. The initial Nonpoint Source Management Plan also identified education as an important component of program implementation.

This update to Colorado's Nonpoint Source Management Program is, in part, to position the program to address more fully the national performance expectations established by EPA. In addition, the program has moved from the targeting provided by the Unified Watershed Assessment to priorities linked specifically to a state's List of Waters Still Needing TMDLs, also known as the 303(d) list. More than half of the funds allocated to Colorado in the past three years can be used only to implement watershed-based plans in watersheds where streams or lakes are identified on the 303(d) list.

The long-term goal of the Colorado's nonpoint source program is to restore to full use those waters, both surface and groundwater, impaired by nonpoint sources, and to prevent future impairments to Colorado's waters, using an effective, efficient and open process that fully involves the public and brings together the necessary regulatory and non-regulatory authorities, agencies and programs.

A short-term goal for this update is to reposition the Colorado Nonpoint Source Program from one focused on implementation based on pollutant categories to one where the categories are integrated on a sub-river basin basis. This will allow the program to address NPS needs on a watershed basis, regardless of pollutant category.

Since its inception, the NPS program has worked collaboratively with many outside partners and funded many projects such as production of educational materials and implementation of demonstration projects. The program progressed to funding more planning activities and implementation projects that addressed targeted priorities identified in the planning documents. Over the past 6 years, 20 watershed plans, 7 watershed characterization/assessment projects and 27 implementation projects have been funded.

From 2005 to 2010, the NPS program awarded 67% of the total grant amount to subcontractors, mostly for on-the-ground BMP implementation and document preparation; approximately 13% of the total grant amount was awarded to statewide and local education and outreach efforts.

### **1.3 – Nonpoint Source Program Strategy**

Although it is the leading cause of water quality problems in Colorado, controlling NPS pollution remains a challenge. Sources are difficult to characterize and the effects of NPS pollutants on specific waters vary spatially and temporally, and may not always be fully assessed. However, these pollutants can impact water supply, recreation, aquatic life, and agriculture classified uses. Below is a description of the approach the Division takes to characterize and control nonpoint sources of pollution.

The program is implemented at two tiers:

1. The program level identifies and prioritizes NPS issues, coordinating resources and partners to address these issues, and tracking progress in water quality improvement.
2. The project level addresses state program priorities through on-the-ground watershed restoration efforts and information/educational campaigns to broaden public awareness of NPS issues.

The first tier is specific to the NPS program's ongoing commitment to address the national performance expectations established by EPA, which are established annually between the EPA and Division, in the Performance Partnership Agreement (PPA). The PPA includes several NPS-specific Program Activity Measures (PAMs) related to the Division's implementation of the NPS program. These PAMs relate to two broad requirements related to overall water quality improvement. These include reporting on the annual reduction of NPS related phosphorus, nitrogen, and sediment loads as well as the restoration of impaired waterbodies<sup>2</sup>. The

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2 - For more information about the PPA and PAMs, please consult the EPA's National Water Program Guidance at [http://water.epa.gov/resource\\_performance/planning/FY-2012-National-Water-Program-Guidance.cfm](http://water.epa.gov/resource_performance/planning/FY-2012-National-Water-Program-Guidance.cfm)

intent of this management plan is to further focus the implementation of the NPS program on achieving these broad requirements.

Tier two activities represent the implementation of the tier one goals. These activities include outreach, technical assistance, and funding for local groups to plan, design, and implement various efforts to address NPS issues that are causing or contributing to degraded water quality. In most cases, the NPS program's annual project solicitation process is directed toward fostering and developing tier two activities. By establishing priorities based on the Division's identification of impaired waterbodies, the NPS program is actively pursuing local support and development of projects that will address the tier one objectives.

For the next 5 years, the NPS program will continue improving how the program is implemented and focusing the efforts toward achieving restoration through water quality improvements and attainment of standards for impaired segments. A recent analysis of the Division's completed TMDLs and the most recent list of impaired waters indicate that the universe of impaired waters in the state is comprised mostly of waters impaired by NPS pollution, most specifically impairments associated with historical mining activities (legacy mines). The Colorado Division of Reclamation, Mining and Safety (DRMS) has the authority to address mine-related activities and as such, is an active partner with the NPS program. The program will focus on working collaboratively with the DRMS in implementing TMDL-based mine reclamation projects. Other causes of impairment and other types of projects will also be addressed and continue to be funded, such as projects addressing selenium impacts, stream restoration projects, agriculture-related projects and others. Outreach and education efforts will be emphasized as a task in every NPS implementation and watershed plan project. This new approach is addressed in more detail in Chapter 2.



## Chapter 2 – Strategy and Action Plan

This chapter describes the objectives and strategies that the NPS program will follow for the next five years to protect surface and groundwater from nonpoint sources of pollution. This strategy is aligned with the Division and with the Watershed Program (Program) overarching strategy and will guide the implementation of the NPS program. It will also support the Division and the Program in realizing the goals of restoring and protecting water quality. This chapter describes the action plan that will implement the NPS program, the milestones and outputs expected from the implementation of each strategy and the desired outcomes expected at the end of this planning period.

This update to Colorado’s Nonpoint Source Management Program (the Plan) is, in part, to position the program to address more fully the national performance expectations. In addition, the program has moved from the targeting provided by the Unified Watershed Assessment to priorities linked specifically to a state’s List of Waters Still Needing Total Maximum Daily Loads (TMDLs), also known as the 303(d) list. More than half of the funds allocated to Colorado in the past three years can be used only to implement watershed-based plans in watersheds where streams are identified on the 303(d) list.

The long-term goal of the Colorado’s nonpoint source program is to restore to full use those waters, both surface and groundwater, impaired by nonpoint sources, and to prevent future impairments to Colorado’s waters, using an effective, efficient and open process that fully involves the public and brings together the necessary regulatory and non-regulatory authorities, agencies and programs.

A short-term goal for this update is to reposition the Colorado Nonpoint Source program from one focused on implementation based on pollutant categories and demonstration projects to one where the focus is restoration of impaired waterbodies.

### 2.1 Background

#### 2.1.1 History of the Colorado Program

##### 2.1.1.1 1987 - 2000

The 1987 amendment to the Clean Water Act authorized the creation of Section 319, which addresses Nonpoint Source Management Programs. In order for a state to be given authority to implement a NPS program and receive federal grants, two major activities were required: an assessment report that described the impact of nonpoint sources on the water resources of a state, and a management program that outlined how the state proposed to address the impacts identified in the assessment report.

*Colorado’s Nonpoint Assessment Report* was originally approved in 1988 and updated in November 1989. Since then, the nonpoint assessment reports have been incorporated in the *Status of Water Quality in Colorado* 305(b) reports, which are generated biennially.

*Colorado’s Nonpoint Source Management Program* was originally approved in 1989 and updated in October 1990. The Division was given primary responsibility to administer the nonpoint source program.

##### 2.1.1.2 2000 - 2010

In 1998, the Clinton administration announced a major Clean Water Initiative to achieve clean water by strengthening public health protections, targeting community-based watershed protection efforts at high priority areas, and providing communities with resources to control polluted runoff. The Clean Water Action Plan (CWAP), as it became known, built on existing clean water programs and proposed actions to strengthen efforts to restore and protect water resources by: 1) Supporting locally led partnerships that included a broad array of Federal agencies, States, tribes, communities, businesses, and citizens to meet clean water and public health goals; 2) Increasing financial and technical assistance to States, tribes, local governments, farmers, and others; and 3) Helping States and tribes restore and sustain the health of aquatic systems on a **watershed basis**.

*Unified Watershed Assessments (UWA)* - The CWAP re-established the watershed as the organizational unit for focusing water quality restoration activities. The *Colorado Unified Watershed Assessment (11/98)* identified 42 8-digit hydrologic unit watersheds as Category 1 - watersheds in need of restoration. Of those, 18 were identified as priorities for the first two years. A key feature of the CWAP prescribed that any new NPS funds appropriated by Congress were to be used only in high priority Category 1 watersheds.

*Watershed Approach, Local leadership and Empowerment* - One of the most significant characteristics of water quality management in the 1990s was a renewed emphasis on watersheds as the preferred administrative unit. Also notable was the formation of numerous local watershed initiatives to address water quality and other resource issues. In 1996, for example, there were six stream-based local watershed initiatives in Colorado (plus the various basin authorities); in 1998 there were 40 stream-based local watershed initiatives, and the number increased yearly.

*Emphasis on Targeting Tools* – During this period, the UWA and CWAP emphasis on Category 1 watersheds constituted significant targeting tools. Additionally, the Colorado 1998 list of impaired and threatened stream segments constituted another targeting tool. The 303(d) listed segments required development of TMDLs and helped identify specific water quality improvement strategies to be implemented.

*Programmatic Updates* - During this period, the NPS program updated the Nonpoint Source Management Program (the Plan) twice: once in 2000 and again in 2005. The 2000 document was a significant update to the original document developed in 1990 and included the CWAP new requirements and the watershed approach strategies. The 2005 document was a minor update, only addressing significant modifications from the 2000 plan.

### **2.1.1.3 2010 - current**

*Renewed Emphasis on Targeted Watershed Approach* - The reorganized Watershed Program in the Division has in fact formalized the targeted watershed approach. The Nonpoint Source program priorities are now aligned with the results from water quality assessments that identify impaired segments and with the consequent development of TMDL studies. This alignment has resulted in NPS incremental funds being used to restore impacted priority watersheds.

*EPA Nine Elements* - as guidelines from EPA require, the NPS program is ensuring that new watershed plans address the EPA Nine Elements of a watershed plan and that older watershed plans are updated with those elements. Restoration projects are identified, prioritized and implemented in the context of a watershed-based plan.

*Measurable Results Project (MRP)* – EPA guidelines also require that NPS programs report on results; the Colorado NPS program has developed a process to evaluate projects, gather data and thus, report on measurable results from the implementation of the NPS program.

## **2.1.2 Past Accomplishments and Major Trends of the NPS Program**

### **2.1.2.1 1987 - 2000**

During the initial years, Colorado's NPS program was successful in addressing both the milestones and priority watersheds identified in the original management program. Many NPS projects were best management practices demonstration projects. The following examples highlight the accomplishments during this period:

- A memorandum of understanding was developed between the Bureau of Land Management (BLM) and the Division for addressing nonpoint sources on BLM lands.
- The U.S. Forest Service (USFS) revised its Watershed Conservation Practices to provide guidance on how to accomplish water quality goals during the various activities on federal lands.
- The Natural Resources Conservation Service (NRCS) developed standards and specifications for nutrient and best management, as well as a soil/pesticide interaction table.



- Projects to demonstrate techniques for controlling NPS in urban areas or construction sites were initiated on Shop Creek, Soda Creek and others.
- The Denver Regional Council of Governments (DRCOG) developed NPS control strategies for various basins within the metropolitan Denver area.
- BMPs were demonstrated on a number of abandoned or inactive mine sites, including Peru Creek, Gamble Gulch, Chalk Creek, and the Animas River.

Nearly all watersheds identified in the original management program had some level of activity. The level of activity ranged from full-scale watershed remediation efforts, to additional assessments to better define the NPS problem, to the establishment of stakeholder organizations.

### **2.1.2.2 2000 - 2010**

A number of significant trends began to take shape in the 1990s culminating in 1998 with a year of dramatic change for Colorado's NPS program. The major influences for change were:

**A) Regulatory Expansion** - Historically the NPS program has been a voluntary program. While it is still predominantly a voluntary program, several categories of pollution traditionally considered to be nonpoint sources were impacted by the regulatory processes, making it clear that the management of NPS pollution encompasses both voluntary and regulatory approaches. For example:

#### *A.1 Stormwater Management in Colorado:*

On November 16, 1990, EPA issued a final regulation on the control of stormwater from municipal and industrial stormwater discharges. The regulation (40 CFR122.26) is meant to reduce the amount of pollutants entering streams, lakes and rivers as a result of runoff from residential, commercial and industrial areas. The regulation was implemented in two phases: phase I regulated specific types of industries and storm sewer systems for municipalities with more than 100,000 population. Municipalities develop a Stormwater Management Program, which in general addresses controls on cross-connections and illicit discharges to the storm sewer system, developing policy on such things as street sweeping, roadway deicing, erosion control during construction, and establishing long-term monitoring programs. Stormwater Management Plans also involve developing educational programs, such as one to raise the awareness level of residents about where their used oil or antifreeze goes if they dump it in the storm drain.

Since March 2001, municipalities with less than 100,000 population and meeting certain other criteria have been brought in under Phase II of the program, but with simpler application and permit requirements than for the large municipalities. Some municipalities are required to have permit coverage, while others must be evaluated by the Division to determine whether permit coverage is needed.

Industrial facilities which discharge industrial stormwater either directly to surface waters or indirectly, through municipal separate storm sewers, must be covered by a permit. The industries covered by the program include most manufacturers, mining, transportation facilities, power plants, landfills, auto recyclers, and construction projects that disturb five or more acres of land. The regulations allow all industrial categories except construction to opt out of permit coverage if they do not have any industrial materials or activities exposed to stormwater. The "no exposure" waiver includes a requirement for certification of "no exposure".

Since July 1<sup>st</sup>, 2002, construction projects disturbing one acre or more need permits. There is provision for the waiver of a permit for small (under five acres) construction sites, if the rainfall erosivity factor is less than 5 (usually short-term projects in dry areas). More details on the various options under this section, such as a description of the waiver, and a discussion on Qualifying Local Programs, are in the Division's guidance document entitled "Stormwater Fact Sheet – Construction." It is available at [www.cdphe.state.co.us/wq/PermitsUnit](http://www.cdphe.state.co.us/wq/PermitsUnit) or by calling 303-692-3517.

*Nexus with the NPS program:*

The NPS program requires that all necessary and applicable permits be secured before a project is implemented; as such, stormwater construction permits are required for projects disturbing one acre or more. The types of projects include streambank restoration projects.

The NPS program will continue to consider eligible a) stormwater-related projects that do not require a permit and b) watershed-based plans that might include stormwater permitted areas (for example urban areas under an MS4 permit).

#### *A.2 Animal Feeding Operations Management in Colorado:*

Animal Feeding Operations (AFOs) are places where animals are kept and raised in confined situations. AFOs that meet the regulatory definition of a concentrated animal feeding operation (CAFO) may be regulated under EPA's National Pollution Discharge Elimination System (NPDES) permitting program. This program helps ensure that animal waste and wastewater are properly managed and do not enter water bodies from spills or breaks of waste storage structures and the non-agricultural application of manure to crop land.

An AFO is defined as a lot or facility where the following conditions are met: 1) Animals have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and 2) Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility. AFOs that meet the regulatory definition of a CAFO may be regulated under the NPDES permitting program.

CAFOs are defined as point sources of pollution under the Colorado Water Quality Control Act. As such, CAFOs in Colorado are required to have a discharge permit prior to discharging pollutants to waters of the U.S (Colorado Water Quality Control Commission Regulation No. 61). A CAFO that decides not to apply for a permit is required to protect surface water by adhering to the surface water protection elements of Regulation No. 81 and register with the Environmental Agriculture Program at CDPHE. All CAFOs in Colorado, whether permitted or not, are required to adhere to the groundwater protection elements of Regulation No. 81.

#### *Nexus with the Nonpoint Source Program*

The NPS program considers eligible activities related to AFOs but not with CAFOs. The program will continue to support activities related to education and outreach, information dissemination, capacity building and technical assistance with implementation of best management practices.

**B) EPA Nine Key Elements** - The Nine Key Elements are major considerations in developing new or updated NPS management programs. They were developed jointly by the Association of State and Interstate Water Pollution Control Administrators (ASIWPCA) and EPA. All elements are reflected in the update of Colorado's 2012 Nonpoint Source Management Program.

The Nine Key Elements describe broad expectations for nonpoint source management, in particular:

1. Explicit short- and long-term goals, objectives and strategies to protect surface and groundwater.
2. Strong working partnerships and collaboration with appropriate State, interstate, Tribal, regional, and local entities (including conservation districts), private sector groups, citizens groups, and Federal agencies.
3. A balanced approach that emphasizes both State-wide nonpoint source programs and on-the ground management of individual watersheds where waters are impaired or threatened.
4. The State program (a) abates known water quality impairments resulting from nonpoint source pollution and (b) prevents significant threats to water quality from present and future activities.
5. An identification of waters and watersheds impaired or threatened by nonpoint source pollution and a process to progressively address these waters.
6. The State reviews, upgrades and implements all program components required by section 319 of the Clean Water Act, and establishes flexible, targeted, iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable.
7. An identification of Federal lands and objectives which are not managed consistently with State program objectives.

8. Efficient and effective management and implementation of the State's nonpoint source program, including necessary financial management.
9. A feedback loop whereby the State reviews, evaluates, and revises its nonpoint source assessment and its management program at least every five years.

**2.1.2.3 2010 - current**

*Nine Elements of a Watershed Based Plan* – The NPS program is actively working with watershed groups to incorporate these elements in watershed plans. The latest effort is the development of specific guidance for watershed groups on the development of complete and satisfactory plans that address all these elements.

*“Legacy Mining”*- The NPS and the TMDL programs have collaborated on defining priority watersheds for the state. Priority watersheds are defined as areas where the NPS program has had some type of activity, ideally an active watershed group with a watershed plan addressing all EPA Nine Elements and where the TMDL program has an EPA approved TMDL study. Priority watersheds are areas with the greater opportunity for success for both Division programs, and identify areas where the impaired water quality can be returned to meeting standards if the NPS program can fund implementation of the TMDL. During the process of defining priority watersheds, it became apparent that most of these areas were impacted by mine-related pollution, such as metals and low pH; also, most of the TMDL studies developed to date by the TMDL program are related to legacy mining impacts. As a consequence, the NPS program will be focusing on implementation of BMPs that address implementation of legacy mining related TMDLs, in partnership with DRMS.

The NPS program continues to focus on restoration of impaired waters, and these will be a priority for the next five years. The primary focus will be addressing impacts from legacy mine-related activities, but the program will continue to consider other restoration activities, especially ones that support TMDL implementation. The program will also continue to implement activities related to protection of water quality. For more discussion on this, consult Part III – Nonpoint Source Program Strategy.

**2.1.3 Water Quality in Colorado**

The IR provides a current assessment of all surface waters of the state that have been assessed. The CWA at Section 101(a)(2) requires that all waters be suitable for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water unless it is demonstrated that the use is not attainable. Classified use classifications have been assigned to waterbodies based upon the actual, and anticipated, uses occurring in the waterbody. Water quality standards are then assigned based on those assigned uses. In Colorado, when a narrative or numeric standard is exceeded, the associated use is determined to be in non-attainment and the cause and source affecting the water body are determined. The cause is the pollutant that contributes to the non-attainment. For example, if the aquatic life standard for zinc is exceeded, then the aquatic life use would be in non-attainment and the cause would be zinc. The source is the activity or facility that contributes the pollutant. An example of a source is resource extraction when metal exceedances are found in a historic mining district.

The table excerpted below from the 2010 IR summarizes the *sources of impairments* in Colorado.

<b>Table 2.1 - Summary of Sources Affecting Water Bodies Not Fully Supporting Classified Uses</b>		
Source Categories	Colorado Rivers (miles affected)	Colorado Lakes (acres affected)
Agriculture Related Sources	1,835.30	216
Contaminated Groundwater	29.90	5.49
Highway/Roads/Bridge Runoff (non-construction related)	16.30	0
Mining Related Sources	565.26	141.60

Table 2.1 - Summary of Sources Affecting Water Bodies Not Fully Supporting Classified Uses		
Source Categories	Colorado Rivers (miles affected)	Colorado Lakes (acres affected)
Natural Sources	19.08	141.60
Sources Unknown	7,884.11	48,327.58
Upstream Sources	47.17	0
Notes: 1) Source means the activities, facilities or conditions that contribute pollutants or stressors 2) Sum of acres or miles affected does not equal the total non-attained acres or miles since non-attainment may have more than one cause.		

A summary of the causes of impairments, also derived from the 2010 IR, indicates that the main pollutant causing water quality impairment in Colorado rivers and streams is selenium, followed by metals (if adding all metals impairments, with copper, iron, zinc and cadmium the highest) and followed by pathogens. In lakes, the causes are mercury, selenium and low levels of dissolved oxygen.

Dissolved metals and acidity (pH) from legacy mining AML and background sources comprise 89% of the total number of impaired stream segments where a TMDL has been written in Colorado (Fig. 1). These impairments are considered nonpoint sources because they are related to runoff and drainage from AML sites for which there are no remaining financially viable responsible party.

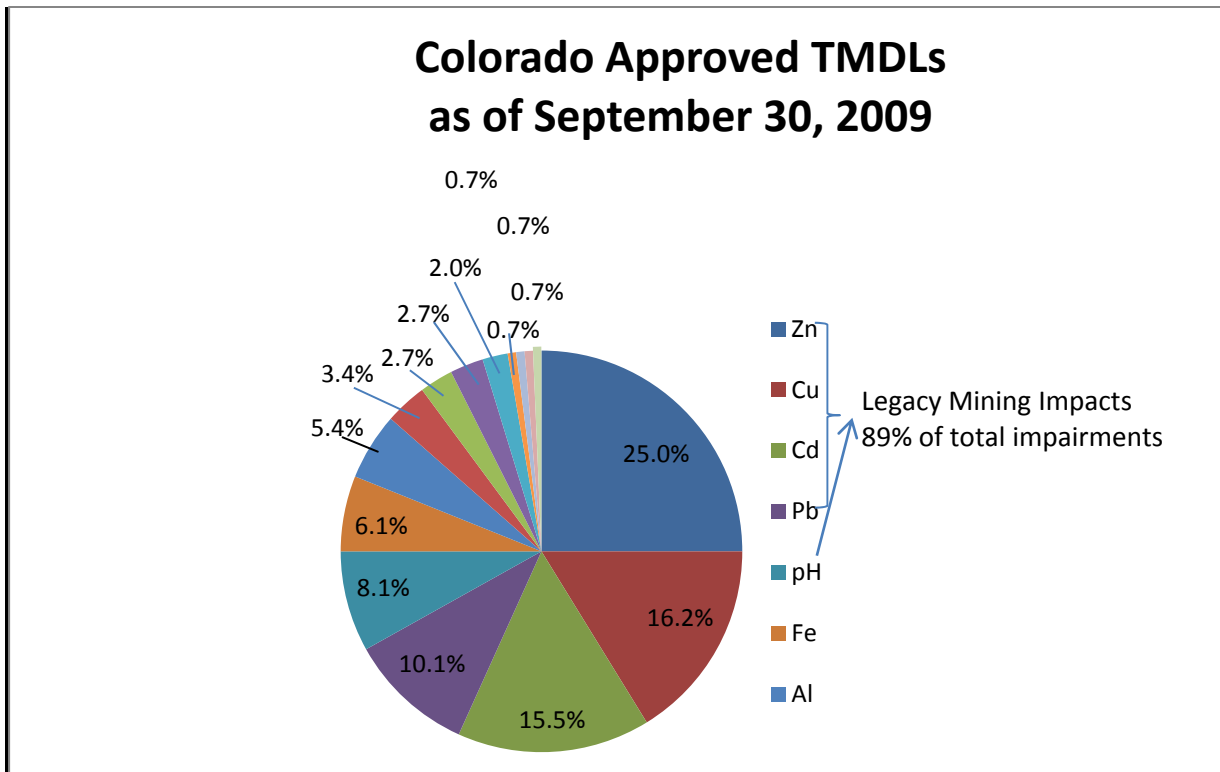


Figure 2.1 – Colorado Approved TMDLs – 09/30/2009

The water quality impairments in Colorado have provided the basis for the strategic approach to implementing the updated NPS program priorities. In addition to addressing the impaired segments, the NPS program will continue to address the more traditional nonpoint sources of pollution, namely nutrients and sediment.

### **2.1.3.1 Waterbody Impairments and TMDLs**

The Division, through the biennial 303(d) list (Regulation № 93), identifies those waterbodies within the State that are not attaining the standards associated with an assigned use. These waterbodies are consequently considered impaired. A single waterbody can, and often has multiple impairments that result from more than one standard being exceeded. In preparing the 303(d) list, the Division also identifies those waterbodies that have data that indicate a potential problem exists, but direct evidence of an actual impairment is lacking. These waterbodies are then placed on the Monitoring and Evaluation list, which lists those waterbodies that are potentially impaired but additional data are needed before an actual impairment can be determined. Once a waterbody is identified as impaired on the 303(d) list, the Division, in most cases, is required to complete a TMDL that identifies the pollutant reduction that would be necessary to once again have that waterbody meet the assigned standards. Once a TMDL has been submitted by the Division for EPA approval, that waterbody is removed from the 303(d) list, but is still considered impaired until water quality data demonstrate that the standard(s) associated with the assigned uses are met.

Completed TMDLs and the most recent 303(d) list (effective date: April 30, 2010) provide a summary of the universe of currently impaired waters in Colorado. In general, most of the impaired waterbodies are impacted by NPS related pollutants, or by a combination of both NPS and point-source pollutant sources. Therefore, a summary of impairments based on the 303(d) list and completed TMDLs provides a starting point for characterizing NPS categories that are producing impairments in Colorado.

The current 303(d) lists (effective date: April 30, 2010) list a total of 338 waterbodies and a total of 489 impairments due to multiple standards being exceeded on the same waterbody. Broad categorization of these impairments indicates that 49% are due to exceedences of the metals standards, or low pH, associated with legacy mining impacts. The next largest category involves selenium impairments accounting for 17% of the 303(d) listed impairments. Impairments due to pathogens (*Escherichia coli*) accounted for 10% of the total. Similarly, 10% of the impairments involved low dissolved oxygen levels (DO), nitrates, or pH on lakes throughout the state. Fish consumption advisories issued due to high levels of mercury and other identified aquatic life impacts accounted for 6% of the impairments. All other impairments (e.g. uranium, temperature, sediment) accounted for 10% of the impairments. Review of the completed and approved TMDLs indicates that approximately 90% are addressing legacy mining issues. Of this total, approximately 55% have been written to address cadmium, copper and zinc impairments, all of which is associated with legacy mining impairments. The remaining 10% of completed TMDLs have addressed a range of issues, including such impairments as sediment, nitrates and mercury related fish consumption advisories.

From a national perspective, EPA continues to focus on restoration of impaired waterbodies. A number of TMDL and NPS Performance Partnership Agreement (an agreement between EPA and the Division regarding ongoing work priorities) objectives specifically address this overarching goal. Restoring impaired waterbodies is also a key Division strategic planning objective. In Colorado, based on impairments identified within Regulation № 93 and completed TMDLs, legacy mining issues are clearly the main contributor to impairments, and thus, are a primary restoration goal.

When a TMDL is completed, the contributions of point sources and various nonpoint sources are identified. Upon EPA approval, the Division is required to ensure that all permit requirements are consistent with any point sources identified in the TMDL. Thus, any TMDLs that are due solely to point source discharges are addressed by the implementation of permit conditions. In cases where combinations of point and nonpoint sources are included in the TMDL, the Divisions again address the point source contributions through implementation of permit conditions. For TMDLs that are solely the result of nonpoint sources, the Division has no regulatory authority to address the issue, and thus the voluntary approach of the NPS program. Therefore, for cases where TMDLs have been approved and the waterbody still does not attain standards, the vast majority of these is awaiting some type of nonpoint source controls.

Other waterbody impairments include a number of different pollutants, and many of these involve localized, site-specific assessments. The NPS program will continue to prioritize restoration activities within the context of all

statewide impairments, the degree of interest of local communities or watershed groups, and potential impacts to human health or aquatic life.

## 2.2 Nonpoint Source Program Strategy

Two of the Division strategic goals have direct bearing on the 2012 NPS Management Plan: protection of all designated uses and restoration of impaired water quality to assigned standards. These two strategic goals parallel EPA's intended use of the section 319 grant funds to implement NPS activities. The 319 grant, awarded to the State to address NPS pollution issues, is divided into two components. The first component is the base allocation which is available to broadly address multiple NPS categories. The incremental allocation consists of additional funding created in the 1990s, under the CWAP to be utilized addressing restoration activities on impaired waterbodies that have been identified in a watershed plan meeting all EPA Nine Elements. The intent of the 2012 NPS Management Plan is to identify those activities that lead to the protection of assigned uses, and thus eligible for 319 grant base funding, and prioritize the utilization of 319 grant incremental funding to address the restoration of impaired water quality.

Colorado's NPS program is implemented at two levels: 1) The program level identifies and prioritizes NPS issues, coordinating resources and partners to address these issues, and tracking progress in water quality improvement and 2) The project level addresses state program priorities through on-the-ground watershed restoration efforts and information/educational campaigns to broaden public awareness of NPS issues. Colorado's NPS program aims to achieve the greatest public health and environmental benefit using the limited resources available. The 2012 Management Plan recognizes this and describes the strategy to prioritize and target resources.

Nationally, the first 20 years of the NPS program were activity-based, with many projects involving a BMP demonstration but with little emphasis on achieving or reporting on measurable results. Since then, there has been an increasing expectation to documenting and reporting actual water quality improvements and environmental results. EPA has also modified the criteria for how 319 grant funds can be used, creating a stronger emphasis on implementation projects that address impaired waters. Approximately one-half of each year's 319 grant funds is reserved for addressing impaired segments or watersheds containing impaired segments. The other half can be used in development of watershed plans, implementation projects in non-impaired water bodies, and other statewide nonpoint source protection and/or restoration activities.

In response to EPA's changes to 319 grant funds, this NPS Management Plan is shifting the emphasis of the program from an activity-based strategy to an outcome-based approach. This shift to environmental outcomes aligns with the Division strategic plan and places the focus squarely on restoring impaired waters but recognizing that protecting existing high quality waters is also vital.

The NPS program is closely connected to other Division watershed programs and related documents such as the IR with its associated list of impaired waters (i.e. 303(d) list), TMDL reports, Source Water Protection Plans and the SWQMP. The SWQMP provides a watershed framework for water quality planning. Comprehensive information about current *statewide* water quality is presented to assist water policymakers, managers, and others in setting priorities, developing strategies, and evaluating the progress of water quality protection and restoration efforts. The SWQMP provides a comprehensive information resource for water policymakers and managers to serve as a foundation for setting priorities, developing strategies, and evaluating the progress of water quality restoration, maintenance, and protection activities previously undertaken. Data generated from the NPS implementation projects are incorporated in the IR. The list of impaired segments and TMDL reports guide the identification of priority watersheds for NPS project implementation projects. Source Water Protection Plans are a key watershed plan link for the protection of raw drinking-water supplies and for associated contingency planning. All of these reporting and planning mechanisms have public notice and participation processes built into their procedures. Results of these assessments, updated regularly, guide program management strategies and serve as initial references for NPS project sponsors.

The program rotates incremental funds around the state, one river basin per year, so that it takes 5 years to complete a full cycle. This rotation follows the schedule for water quality standards triennial review defined by the Water Quality Control Commission. During the fifth year the Commission reviews Statewide Basic Standards and Methodologies and the program does not define a target basin for the incremental funds (see Appendix A for the Target Basin Rotation Plan table). This strategy ensures that the NPS program is using the most updated information and latest assessments to address impaired waters while focusing the use of limited resources.

## **2.3 Tools for Implementing the Nonpoint Source Program**

One of the primary tools that the NPS program utilizes to address water quality issues on a watershed scale is the development of a watershed plan that meets the EPA Nine Key Elements. These watershed plans are critical water quality management tools because they engage stakeholders within the watershed to generate local support for water quality planning and the associated priorities needed to restore or maintain a healthy watershed. Development of a watershed plan that meets EPA Nine Key Elements within an impaired watershed is also a prerequisite for qualifying for incremental funds.

Ideally, watershed plans should naturally lead to implementation projects that address the prioritized issues. The NPS program funds implementation of BMPs that control nonpoint sources of pollution so that water quality can be protected or restored. During this planning period, the NPS program, in conjunction with project sponsors and program partners, will be developing a library of existing BMPs (See Appendix E for the Colorado NPS program BMP Library) to adapt the BMPs to Colorado hydro-geomorphic characteristics and to ensure that the best practices are being used to address the NPS categories.

The NPS program works collaboratively with many program partners to promote outreach and education activities to raise awareness of pollution generated from nonpoint sources and its impact on water quality. These partners vary from Federal land management agencies to locally organized watershed groups. Chapter five describes the various partnerships with whom the NPS program works in greater detail.

### **2.3.1 The Watershed Approach in Colorado**

#### **2.3.1.1 -- Watershed Groups**

The Watershed Approach is one of the major environmental trends of the 1990s and which continues to this day. As an example, in 1996 in Colorado there were six stream-based local initiatives (in addition to the basin authorities). Currently, there are over 70 watershed groups in Colorado, with different degrees of organization. The focus for many of these groups, and the reason they were started, is often water quality.

The formation of these local watershed groups reflects current social and technological trends: local leaders are demanding more control in planning and implementing the environmental agenda, and the technology, including both GIS and the Internet, provide ready access to a wide range of information, including technical information.

#### **2.3.1.2 -- Programs**

The ramifications of the watershed approach are observed in the NPS program in several ways:

- **Targeting:** with the historical Unified Watershed Assessment of the 2000's, the NPS program started the informational tool providing information about what areas of the state are likely to be targeted for restoration activities. Over time, this has developed into an outreach program that delivers focused information at the local level.
- **Stakeholder involvement:** the establishment of local stakeholder groups is usually a critical part of generating the local support needed to implement a voluntary watershed improvement plan. The watershed approach provides a defined framework that works with the natural systems and allows the stakeholders to focus on a workable land unit.
- **Watershed Partnerships:** the NPS program champions the collaboration of key organizations and agencies to address environmental issues that include nonpoint source water quality impacts by promoting and implementing BMP systems. For example, the NPS program partners with lead agencies in responding to

wildfire area treatment, especially in implementing BMPs to protect public water systems source water areas. Additionally, the NPS program works closely with the DRMS in addressing nonpoint source pollution resulting from AMLs.

- With GIS tools and water quality information being updated to include precise latitude/longitude locations, targeting tools are being developed and refined. Examples include: the IR with the 303(d) list, TMDL scheduling, and the Priority Watersheds (See Appendix B for the Colorado NPS program Priority Watersheds) outreach effort. These tools help identify impaired segments and watersheds in need of restoration.
- NPS Requirements and Funding: new NPS opportunities and requirements have been initiated to reflect the targeting of problem areas. One example is the Watershed Restoration Action Strategy (WRAS) which required that projects proposed for NPS Section 319 funding identify their issues within the context of their local watershed. The Unified Watershed Assessments and Watershed Restoration Action Strategies represent the early history of watershed planning and led to the watershed-based plan requirements used today.
- Another example is the additional funding made available through the CWAP which essentially doubled the Section 319 appropriation available to invest in NPS projects. This funding is still available and is referred to as incremental money and is used in implementing watershed-based plans and TMDLs.

The watershed approach has increased in significance in water quality management. US EPA has issued various pieces of guidance in the past five years that promote a watershed approach, including:

- [Watershed-based National Pollutant Discharge Elimination System Permitting Implementation Guidance, December 2003, including NPDES Permitting for Environmental Results Strategy, August 2003](#)
- [US EPA Final Water Quality Trading Policy, January 2003](#)
- [Nonpoint Source Program and Grant Guidelines for States and Territories, October 2003](#)
- Handbook for Developing Watershed Plans to Restore and Protect Our Waters, 2008  
[http://water.epa.gov/polwaste/nps/handbook\\_index.cfm](http://water.epa.gov/polwaste/nps/handbook_index.cfm)

### **2.3.1.3 -- Watershed Planning**

The emphasis on watershed-based plans in US EPA's NPS program activity measures has raised the awareness and increased the need for a coordinated effort to manage the resources of a geographic locale. Watershed planning has been a major component of NPS activity since the 1999/2000 CWAP, which required the development of a watershed restoration action strategy prior to using incremental NPS funds.

A watershed plan is a living document, developed in an iterative process that includes a wide variety of watershed stakeholders, such as land owners and managers, local governments and special interest groups, as well as land users such as recreationists. The planning process usually begins with a group of concerned citizens who come together around a particular resource issue.

Watershed planning is not new. Planning for water quality purposes was established with Section 208 of the CWA in 1972. The US Department of Agriculture has used watershed planning for years in its Small Watershed Program. There are many similarities between the minimum NPS planning elements and other planning efforts. Those efforts can compliment planning for nonpoint source purposes.

### **2.3.2 Monitoring**

The NPS program requires determination of measurable results for all on-the-ground activities funded with NPS funds. Measurable results enable the NPS program to evaluate the success of on-the-ground activities by comparing pre- and post-restoration conditions. Coordination between the NPS program and project proponents is important in collecting the appropriate data to obtain measurable results, as well as determining what the measurable results of the project are. Whenever practical, monitoring should be conducted through a cooperative arrangement among the various local stakeholders, state and federal agencies. In some cases, state or federal agencies may have data that could supplement data collected per requirements in a project implementation plan.



The NPS program has developed a template for Sampling and Analysis Project Plans (SAPPs) which template will form the basis for all data collection efforts. The NPS program and stakeholders need to collaborate on selecting monitoring approaches, measurement and sampling methods, and overall monitoring design, including frequency and locations of sampling and measurements to evaluate success. It is recommended that project sponsors consult with the NPS program prior to submitting an on-the-ground project proposal to improve project objectives, design, and monitoring guidelines and ensure the approach is appropriate for the watershed and follows the Watershed Program's overall sampling guidelines.

The NPS program also coordinates monitoring efforts with other entities. For example, the River Watch program works with local volunteers, teachers and schools to monitor water quality and other indicators of watershed health. Local watershed groups are able to coordinate their monitoring efforts with River Watch volunteers to collect data and assess the water quality results from implementing BMPs. The NPS program also works collaboratively with the Environmental Data Unit (EDU) gathering and sharing data. EDU collects environmental data following the schedule described in Appendix A; depending on available resources, EDU includes NPS site locations in the yearly sampling schedule. NPS and River Watch data are incorporated in basin water quality assessments.

### **2.3.3 Information and Education**

NPS Information and Education (I&E) efforts to date have been successful in increasing the awareness and knowledge of the general public. More citizens know that pollution from diffuse sources can impair waterways just as pollution from a point source can. However, at the same time a survey conducted by the League of Women Voters of Colorado Education Fund (2008) found less than 25% of urban residents knew they lived in a watershed. Clearly, additional efforts are needed.

It takes time for awareness to evolve into action or behavior change, which in turn will result in a direct water quality improvement. Many changes are generational, that is, the small changes take a full generation or more to have a cumulative, measurable impact. This is difficult to measure in a 5 to 10 year time span.

As Colorado's NPS program moves toward an integrated watershed approach to NPS management, new I&E work will be focused on achieving NPS program goals. The core I&E program activities will be retained, for instance, the coordination of outreach activities, information dissemination, and website maintenance. New I&E activities will be integrated within implementation projects activities, so that local community involvement can be leveraged to include not only implementation activities but also all the associated education and information activities as well. This is predicated on the thinking that as stakeholders get involved at the local level implementing projects within their watershed, it results in a higher level of awareness and also a change in behavior toward a more desired and educated approach to protection and restoration of water quality and habitat integrity.

### **2.3.4 The NPS Alliance**

The Colorado Nonpoint Source Alliance (Alliance) is a main component of the Colorado NPS program's effort to collaborate with and engage local and government entities in its efforts. This voluntary group fulfills some of the consultation requirements of the CWA and provides opportunities for public input concerning the program to both the Division and the WQCC. The Alliance meets quarterly to provide the NPS program technical advice and coordination with NPS efforts from other agencies such as US Geological Survey, US Department of Agriculture, BLM, Colorado agencies and local and regional entities like Pikes Peak Council of Governments, Colorado River Water Conservation District and North Front Range Water Quality Planning Association. These efforts promote NPS activities and reduce redundant efforts. As of December 2010, over 61 participants were involved in the Alliance, from over 50 organizations including federal, state and local government, nonprofit organizations, universities and private citizens.

The Alliance developed outreach matrices to assist in the identification of appropriate projects likely to be successful in each priority river basin. Members, with NPS program staff, populate these matrices and target selected areas for project promotion in the priority established by the WQCC.

Each year the Alliance meets for consultation day to discuss abstracts of proposal ideas and offer technical advice to project proponents. The Alliance also meets each year to review proposals submitted during the yearly grant cycle to provide comments to the Division and to the WQCC.

## **2.4 NPS Program Strategy for Managing Certain Waterbodies**

### **2.4.1 Lakes and Reservoirs**

Colorado's IR references more than 1,500 lakes and reservoirs in Colorado that are over 10 surface acres in size. These lakes are classified for beneficial uses such as aquatic life, recreation, water supply and agriculture. Many lakes and reservoirs are impacted by nonpoint sources, to one degree or another. The pollution sources of concern include nutrients (phosphorus and nitrogen), sediment, acidity, and in some cases, toxics such as metals or organics, which may affect fish or human health.

Lake protection and restoration activities are eligible for nonpoint source funding to the same extent, and subject to the same criteria, as activities to protect and restore other types of waterbodies from nonpoint source pollution. In particular, the Environmental Protection Agency has established guidance that limits the amount of Section 319 grant funds used for all assessment activities in a state, including lakes assessments, to no more than 20% of a state's total 319 allocation. In using the watershed approach, NPS Program recognizes all surface waters, and the same set of targeting tools may be applied to streams, rivers, lakes or reservoirs.

### **2.4.2 Wetland & Riparian Areas**

Wetlands cover about 1 million acres of Colorado, approximately 0.1 percent of the State's land cover. Wetlands occur in all ecoregions and climatic zones, from the high mountains to the arid plains and plateaus. Wetland types in Colorado include forested wetlands, willow carrs, fens, marshes, alpine snow glades, and wet and salt meadows. Wetlands are vital to wildlife in the State, particularly in the arid regions. Colorado's wetland area has decreased by about one-half over the last two centuries, and losses are continuing due to a variety of land-development pressures. However, irrigation and changes in land-use practices have resulted in the formation of new wetlands.

Wetlands and riparian areas typically occur as natural buffers between uplands and adjacent water bodies. They act as natural filters of nonpoint source pollutants, including sediment, nutrients, pathogens, and metals, to waterbodies, such as rivers, streams, and lakes. The preservation and restoration of damage to wetlands and riparian areas is important because these areas can play a significant role in managing adverse water quality impacts. Wetlands and riparian areas help decrease the need for stormwater and flood protection facilities.

The NPS program addresses protection and restoration of wetlands and riparian corridors in the context of many types of implementation projects. These projects can be streambank restoration, aquatic habitat improvement, sediment load control projects and education and outreach projects.

### **2.4.3 Groundwater**

Groundwater quality in Colorado varies significantly, depending on geography and geology. Shallow, unconfined aquifers in Colorado are susceptible to contamination from surface activities. Overall, groundwater provides 18% of the water beneficially used in the state. However, in some localities it is the sole source of domestic and irrigation water.

The Colorado Agricultural Chemicals and Groundwater Protection Act (SB90-126) took effect on July 1, 1990, and established the Groundwater Protection Program. The goal is to prevent groundwater contamination before it occurs by improving agricultural chemical management. Agricultural chemicals covered under this legislation include commercial fertilizers and all pesticides. The program employs three primary functions to protect groundwater in Colorado: a) program oversight and regulation; b) groundwater monitoring; and c) education and training.

Groundwater protection in Colorado has been delegated to the Department of Agriculture, the Colorado State University – Extension and the Department of Public Health and Environment through legislation and statutory responsibilities. The agencies and several other members, also form the Groundwater Protection Program Advisory Committee. The groundwater standards and classifications adopted by the Water Quality Control Commission are implemented through the rules and regulations of the individual agencies.

The NPS Program interaction with groundwater issues is primarily through the Agricultural Chemicals and Ground Water Protection Program of the Colorado Department of Agriculture, through participation in an advisory committee, supporting education and outreach efforts and recommending or implementing the best management practices developed or recommended by the Groundwater Protection Program.

#### **a) Program oversight**

The mission of this program is *"To protect groundwater and the environment from impairment or degradation due to the improper use of agricultural chemicals while allowing for their proper and correct use..."* The Colorado Department of Agriculture, Colorado State University - Extension and CDPHE are cooperating agencies in the implementation of this program.

#### **b) Monitoring**

The Groundwater Protection Program monitoring program's purpose is to evaluate possible impacts to groundwater quality from current and past use of agricultural chemicals and provide accurate data to: determine if agricultural chemicals are present; determine if trends in water quality exist; provide monitoring data in an annual report to help the Commissioner of Agriculture to identify potential agricultural management areas; evaluate the effectiveness of BMPs; and assess groundwater vulnerability. The program has developed a database that holds all groundwater quality data collected by this program since monitoring began in 1992. It provides groundwater quality monitoring results by year and geographic location for pesticides and inorganic compounds including nitrate–nitrogen. All queried reports are printable summaries of the requested information.

#### **c) Education and training**

Colorado State University - Extension is required to work with the Colorado Department of Agriculture to develop best management practices for Colorado farmers, landowners and commercial agricultural chemical applicators. Because of the site-specific nature of groundwater protection, chemical users must ultimately select the BMPs appropriate for their situations. The local perspective is necessary to evaluate the practices' feasibility and economic impact. For these reasons, the Groundwater Protection Program Advisory Committee recommends a significant level of local input be solicited before BMPs are accepted. Numerous educational materials, extensive groundwater monitoring, and BMP demonstrations have been accomplished within the Groundwater Protection Program.

#### **2.4.4 Source Water Assessment and Protection**

The 1996 Safe Drinking Water Act Amendments required each state to develop a Source Water Assessment and Protection (SWAP) Program. The SWAP program uses a two-phase process.

The assessment phase involves understanding where each public water system's source water comes from, what contaminant sources potentially threaten the source, and how susceptible each water source is to potential contamination. A source water assessment consists of delineation of source water assessment areas, inventory of potential sources of contamination, susceptibility analysis and reporting the assessment results to the public. The assessment methodology may be found at

[http://www.cdph.state.co.us/wq/sw/pdfs/SW\\_SWAPAssessmentMethodology\\_v6.pdf](http://www.cdph.state.co.us/wq/sw/pdfs/SW_SWAPAssessmentMethodology_v6.pdf)

The protection phase is a voluntary, ongoing process where the public water system and local community initiate preventive measures to protect the water supply from the potential sources of contamination. State and federal law do not require the development or enforcement of source water protection measures, though some protection measures may fall under other existing state or federal laws.

Source water protection is an important consideration in any watershed plan, as nonpoint sources have the potential to impact drinking water. NPS funds may be used for on-the-ground activities that reduce potential sources of contamination, within the context of other program priorities. Source Water Protection and nonpoint source planning activities contain similar components, which make them candidates for a coordinated development and implementation approach. Because of this nexus, NPS project coordinators and the SWAP program work together disseminating information and providing outreach to local watershed groups and to local groups involved in source water protection about the 2 programs. In many cases and whenever possible, the tasks to address implementation of both programs are addressed in the documents and in the related activities, using the watershed approach.

## **2.5 NPS Priorities for the Next Five Years**

The NPS program addresses protection and restoration of water quality and aquatic habitat under the influence of nonpoint sources of pollution. This naturally encompasses a large universe of issues and priorities, and requires much more funds than are currently available to the program, even with available funds being leveraged with several partners. This situation has necessitated a system of prioritization of issues and of the funds available. The following describes how the program will be implemented during the next 5 years and presents a rationale for the years following that. Even though the priorities have been defined very clearly, that does not imply that the program will not take into consideration implementation of other projects that also address nonpoint sources of pollution. The program will continue to address the NPS categories that are described in Chapter 3 and that define the universe of the national program.

Due to the preponderance of mining related impairments and to the limited resources available to the program, the NPS program intends to focus efforts over the coming five years toward addressing these issues. Since the majority of completed TMDLs address legacy mining impairments, the focus of the NPS program efforts will be directed toward implementing activities that address the NPS-related load (load allocation) reductions. NPS-related implementation efforts can also be directed toward addressing priority watersheds and segments (see Appendix B for the Nonpoint Source program Priority Watersheds) even in places where a TMDL may not have been developed yet. To further address legacy mining situations, the NPS program will work closely with the Inactive Mine Reclamation Program of the DRMS to identify priorities regarding restoration and implementation activities. The NPS program will also work with local watershed groups that have identified legacy mining impacts in approved watershed plans, with extra emphasis toward priority basins and watersheds.

Throughout the process, the NPS program will weigh these priorities with available funding and adjust the project solicitation process to address demands in the most efficient manner. It is important to note that although the focus of the program for the next five years will be implementation of mine-related TMDLs, this does not preclude funding for other types of projects that also address impairments and that show merit and potential for success.

The NPS program has several ongoing projects (Chapter 6) designed to assess various approaches to addressing selenium impairments. Since selenium impairments occur in a wide variety of settings, the NPS program plans to assess each major river basin separately. This approach allows the program to tailor future restoration efforts to those unique circumstances of a particular river basin. For example, in the Gunnison and Uncompaghre River basins the NPS program has worked with local water providers to pipe open irrigation channels thus reducing water loss and subsequent selenium transport to these rivers. This type of approach is not feasible for the lower Arkansas River basin due to Colorado's ongoing river compact requirements. These types of unique situations mandate, at a minimum, a river basin approach to addressing selenium impairments. Over the next five years the NPS program will continue to investigate potential basin-specific selenium restoration efforts in Colorado's major river basins.

### **2.5.1 Legacy Mining - Metals**

Colorado's heritage is mining; it is what has brought many people to the state since 1859, even before Colorado was a state and was an important economic activity for many years. However, all those years of mining have left approximately 1,300 miles of streams impacted by metals from these legacy mines. Legacy mines are sites that were operated prior to 1977 during a time when mining permits were not required and have no pre-existing reclamation responsibility. DRMS has identified more than 3,000 hazardous abandoned mines in Colorado.

DRMS is responsible for statewide reclamation efforts aimed at reducing hazardous situations and environmental problems associated with past mining activities. The DRMS, in partnership with other entities, provides for the reclamation and restoration of land and water resources degraded by the adverse effects of past mining practices by characterizing environmental problems associated with mine waste, mill tailings, and acid mine drainage and providing reclamation options to address them.

The majority of completed and approved TMDLs is related to legacy mining pollutants (zinc, copper, cadmium, lead, low pH, iron, aluminum and manganese). Very few of these TMDLs have been implemented. The program recognizes the need to address water quality impacts caused by this legacy activity and intends to address those impacts as the highest priority for the next five years. Under this new priority, the program will be partnering with the TMDL program and with DRMS to implement existing TMDLs and address other mining related water quality impairments.

Appendix C – Reclamation of Water Quality Impairments at High Priority Abandoned Hardrock Mine Sites in Colorado - contains a list of priority AML sites and associated work plan. This list is a sub-set of a more comprehensive list of AML sites. The NPS program will be addressing the priority list of AML sites but that doesn't preclude the program from working on the other mine sites as well.

### **2.5.2. Selenium**

Impairments due to selenium represent the second largest impairment category. Selenium impairments occur where there is the presence of Cretaceous-aged geologic formations, such as the Mancos and Pierre shales. Due to this relationship with a geologic source, selenium has broad, statewide impacts and impaired waterbodies occur in both urban and rural portions of the state. Currently, very few TMDLs have been completed that address selenium, so the majority of the impairments remain on the 303(d) list. EPA guidance dictates that once a waterbody is listed on the 303(d) list the Division is required to submit a TMDL within 13 years. As several of these 303(d) listings for selenium have been on the 303(d) list for almost 10 years, the Division will be actively developing TMDLs for these listings. Given the number of selenium impairments, as well as the short term need to address these impairments with TMDLs, the NPS management plan considers these selenium listings as the second priority that will need to be addressed over the coming five years.

### **2.5.3 Other NPS program priorities**

Other impairment categories with NPS components include pathogens (*Escherichia coli*), lake related low dissolve oxygen, nitrates, and pH, aquatic life and mercury-related fish consumption advisories. These categories have been identified in the IR as impacting water quality in rivers, streams and in lakes. Although considered a lower priority for funding purposes in this planning period, projects addressing these impairments will continue to be funded by the NPS program. During this five-year period, the State's primary strategy to address mercury will be to continue to participate in on the CDPHE Multi-media Pollutants Task Force.

The NPS program will continue to fund watershed plans the meet all Nine Elements for Watershed Planning identified in the *Nonpoint Source Program and Grants Guidelines for States and Territories, EPA 2003*. An important benefit of watershed based planning - whether conducted as part of a locally produced watershed action plan or in conjunction with a TMDL study - is that it requires characterizing and evaluating the watershed as a whole. It is also an important tool for identifying and prioritizing the impairments affecting water quality within the watershed. Watershed plans will guide project sponsors and the NPS program in implementing projects that are focused, results oriented, and that realize the best benefit given the limited resources.

The NPS program will emphasize implementation projects with clear results oriented objectives and implementation strategies. Projects will be required to include a methodology to gather and report on measurable results. Ultimately, the NPS program will either develop or adopt a watershed assessment tool that will enhance the program's ability to monitor and assess water quality as it relates to implementation of BMPs.

Sediment and nutrient load reductions are national programmatic priorities. As such, the NPS program will continue to fund implementation projects that address sediment and nutrient load reduction. Emphasis will be given to projects that provide measurable results and supporting data analysis showing load reductions.

Education and outreach is an important component of Colorado's NPS Program. In the past, the NPS program has funded many education and outreach projects that had a statewide or generic approach through the project solicitation process. This has helped the State identify the most important statewide outreach activities for program success, which will now be State programmatic activities and will no longer be competed. These activities are a high program priority, and include the annual NPS Workshop and other training, the development of a watershed assessment tool, and maintenance of the NPS Colorado website and news service. More information about key State outreach activities for this 5-year planning period may be found in the matrix in Appendix D. For this planning period, the NPS program will de-emphasize the generic approach for solicited projects and will primarily be funding education and outreach activities as part of implementation projects. This should help raise awareness of nonpoint source pollution and issues at the local level, with the intent of better results and with a more support of the local community. Statewide outreach and education activities remain eligible for funding, but are a lower priority than other project types and will be considered for funding only after all higher priority projects have been selected.

The NPS program is actively engaged in assisting local governments and watershed groups by providing funding for local watershed planning and restoration projects. Collectively, these efforts result in a united effort to protect and restore rivers and streams, and lakes.

## **2.6 Lessons Learned**

Lessons learned from working with partners in implementing NPS projects are evaluated and applied using an adaptive management approach. Several common themes have emerged and evolved from the more than 150 projects funded thus far.

*Lesson 1: Evaluation and monitoring – Projects still struggle with developing a water quality outcomes approach with sufficient monitoring and evaluation. With an increased emphasis on restoration of water bodies, project partners benefit from development and understanding of the common assessment tools ranging from Total Maximum Daily Load reports to pre-and post-project monitoring. Projects with clear methodologies and outcomes are stronger projects.*

*The NPS program has used this lesson to develop a template for SAPPs, develop and implement the Measurable Results project and improve Section 5.0 of the PIP – Evaluation and Monitoring Plan.*

*Lesson 2: A capable on-site project manager is critical. Successful projects are those where someone at the local level is dedicated to seeing the project completed. This person does not necessarily need to be a technical expert, but needs to be able to follow the project plan, keep it on track. Having a back-up plan in cases where the project manager departs greatly increases the probability of project completion.*

*The NPS program continues to encourage and support the presence of a project manager who takes the lead at the local level.*

*Lesson 3:* Established business practices help projects run smoothly. Since it has become more challenging to contract with the state over the years, adequate time tracking, billing, subcontracting, and insurance coverage make a big difference.

*The NPS program has developed a Business Ready Checklist and instructions to help project sponsors implement appropriate business practices.*

*Lesson 4:* Adequate technical assistance is necessary to develop technically sound projects. Project managers and local partners will provide valuable assistance, but specialized expertise in assessing water quality data and project evaluation can be very beneficial.

*The NPS program continues to partner with several technical experts, mostly via the Alliance members participation in the program.*

*Lesson 5:* The local community must be convinced the project is necessary and will provide benefits not only to the watershed but also to the community itself. Even more importantly, the landowners and other stakeholders impacted by a watershed plan must be included in the process, and given the opportunity to help identify the practices for implementation. Ultimately on-going financial support by local sources is crucial for sustainability and on-going implementation of priority projects.

*The NPS program and the Alliance members continue to develop outreach and education materials and presentations to raise awareness and to involve the local community in implementing projects and seeking sustainable long-term solutions.*





## Chapter 3 – NPS Categories

Section 319(a)(1)(B) of the 1987 CWA requires each state to identify the categories and subcategories of nonpoint sources that contribute pollutants in amounts such that water quality standards are not met. Colorado’s original NPS assessment report identified the following major categories of nonpoint sources: Agriculture; Silviculture; Construction Runoff; Urban Runoff; Resource Extraction; Land Disposal; Hydrologic Modification and Other.

Several categories were combined in the original NPS plan, as many of the most appropriate management measures (best management practices) to control pollutants were similar between categories. In the 2012 NPS plan update, another category is added, “Marinas and Boating”. This section of the NPS plan describes the impact of each category on Colorado’s waters, the NPS program strategy to address each category and the main areas of focus for the next five years.

Section 319 also requires states to identify the BMPs and measures that may be used to reduce pollutant loadings for each nonpoint category of pollutant sources. Implementation of BMPs to correct nonpoint source water quality problems, where such BMPs are identified solely as part of the state NPS program, is voluntary in Colorado.

### 3.1 Implementing the NPS Categories

#### 3.1.1 Abandoned Mine Drainage (Acid Mine Drainage issues in Colorado)

Although the original 1989 NPS program assessment identified the category of resource extraction in general, the issues have been refined to address mainly the historic and inactive mine sites in Colorado<sup>3</sup>. The majority of adverse impacts from mining occur in historic mining districts within the mineral belt of Colorado, which extends from Boulder south and southwest to Silverton. These areas have significant reserves of metals such as gold, silver, lead, zinc and copper and these same areas typically have high concentrations of materials such as sulfur, arsenic and other elements that can contribute to the release of heavy metals.

The legacy of hard rock mining is obvious in many Colorado streams. Heavy metals leach from mine waste piles or drain from old mine tunnels and adits. A statewide inventory of abandoned mines estimates that over 23,000 abandoned mines exist in Colorado. Approximately 400 of these mines are adversely impacting, or have the potential to impact rivers and streams. Sediment related to past mining and milling activities also contributes to the contamination of the state’s waters. Many stream segments on the state 303(d) list are impaired by heavy metals from inactive and legacy mines. Pollutant metals include zinc, cadmium, manganese, iron, and lead.

Mine reclamation projects must be prioritized in a local watershed plan. Source controls show promise in dealing with acid mine drainage and also may be eligible for funding. Source control eliminates the creation of polluted mine drainage by intercepting and diverting clean water away from contact with heavily mineralized zones. Inactive mine land reclamation projects that are designed to restore water quality are eligible for Section 319 funding except where funds are used to implement specific requirements in a draft or final discharge permit. NPS funds may not be used to build treatment systems required by a discharge permit for an inactive mine, but they may be used to fund a variety of other remediation activities at the same mine. Examples of activities that are eligible for funding include:

- Mapping and planning remediation at inactive mine land sites.
- Monitoring needed to design and evaluate the effectiveness of implementation strategies.
- Technical assistance to State and local abandoned mine land programs.
- Information and education programs.
- Technology transfer and training.

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3 - For NPS program purposes, an inactive mine is one that has not operated since the passage of the 1972 Clean Water Act.

- Development and implementation of policies to address inactive mine lands.
- Moving, consolidating, capping and re-vegetating tailings piles, and diverting clean water around waste piles

### 3.1.2 Agriculture

Agriculture accounts for the majority of private land use in Colorado. Colorado has 32 million acres of land in farms, with the average farm size of approximately 1,000 acres. Cropland acreage totals 11.5 million with three million of these acres under irrigation. Agricultural activities that can contribute to nonpoint sources of pollution include animal feeding operations, rangeland production and grazing, soil tillage, weed and pest management, irrigation and soil nutrient management. The major agricultural NPS pollutants are increased sediment, pesticides, nitrate and phosphate, animal wastes, bacteria, dissolution of metals (e.g. selenium), and total dissolved solids. Agriculture activities can contribute to several nonpoint sources of pollution:

- Agricultural activities can damage habitat and stream channels. Surface disturbance with loss of natural vegetative cover associated with overgrazing or location of cropland fields can increase the upland, riparian, and stream channel erosion. This can lead to excessive sediment loads, loss of aquatic life habitat, higher water temperature, lower dissolved oxygen and general degradation of water quality and habitat.
- Colorado urban growth projections continue to show increases for the next twenty years. As urban growth increases, naturally there is a decrease on agricultural acreage and forestlands. These projections also indicate an increased urban need for water posing a further impact on agriculture, especially irrigated agricultural production. Change in water quantity management can lead to severe water quality impacts such as temperature, habitat degradation, aquatic life impacts and other impairments.
- The IR has routinely identified stream segments impaired due to selenium. Many areas in Colorado have soils that naturally contain elevated levels of selenium. Many agriculture irrigation practices can increase the leaching of selenium from these soils, contributing to selenium loading to surface waters.
- The presence of livestock manure and process wastewater does not denote pollution, but may, when improperly stored, transported or disposed of, create adverse impacts upon public health and the environment. Animal feeding operations not included in the concentrated animal feeding operations category are encouraged to take measures to protect surface water, groundwater and soil resources, through proper application of “best management practices” based upon existing physical conditions and constraints at the facility site.
- Phosphorus and nitrogen are used commonly in agriculture and can pose a threat to water quality. Over-application of fertilizers and animal waste to cropland can lead to runoff and/or leaching problems. Increased nitrate levels in groundwater as drinking water sources pose health concerns. Nutrient-enriched surface runoff may stimulate the growth of algae or nuisance weeds in lakes and reservoirs. Impairments due to pH and bacteria can also result from agricultural activities.
- Another pollutant often associated with agriculture is excessive sediment. This pollutant occurs naturally due to erodible soils and an arid climate but human activities can greatly increase the rate of erosion and lead to siltation of streambeds, as well as lakes and reservoirs. Siltation can lead to loss of aquatic habitat in both streams and standing water bodies.

The NPS program will continue to support the following activities related to the Agriculture category:

- Implement selenium management efforts (including related salinity reduction practices) to reduce loading in the Arkansas, Gunnison, Colorado and South Platte watersheds.
- Support animal agriculture in managing adverse animal impacts to water quality.
- Reduce sediment loads that impair surface waters or pose a significant threat to public drinking water supplies, e.g. wildfire burn area rehabilitation.

- Prevent impairment of ground and surface water due to nonpoint source contamination by agricultural chemicals.
- Partner with organizations and agencies to promote the inclusion of water quality management in their programs; support technology transfer and implementation related activities through grant and technical assistance.

### **3.1.3 Forestry / Silviculture**

Colorado has approximately 22.6 million acres of forestland, with nearly 68 percent in federal management. An estimated 200,000 private landowners control 28 percent of the state's forest; the remaining forest is managed by other units of government or other non-federal entities.

Silvicultural activities can impact the flow and sediment delivery process through the removal of forest canopy and road construction. Wild fires can have similar impacts with the addition of greater landslide potential. Forestry activities that impact water quality including removal of streamside vegetation, road construction and use, timber harvesting, and mechanical preparation for the planting of trees contribute to the transport of sediment and other pollutants to adjacent surface water. Road construction and road use are significant sources of NPS impacts, often causing the majority of the total sediment impacts associated to forestry operations. Additional concerns include soil disturbance, compaction, loss of riparian areas and disrupted stream channels. Loss of trees can cause loss of sufficient shade for forestland waterbodies resulting in harmful impacts to aquatic life.

Various environmental conditions in the last decade including drought and mountain pine beetle infestation have increased the potential for wildfires. Colorado forested lands are also experiencing severe impacts from continuing population increases. Increased development and associated road and structure construction increases the risk of wildfire. Colorado experienced the most intense wildfire season in its history in 2002 with 3,072 wildfires burning over 600,000 acres. The resulting loss of vegetation, soil erosion and loss of habitat was severe, impacting many water resources.

Since 1996, the mountain pine beetle killed 1.5 million acres of lodgepole pine in Colorado alone. In 2007 the beetle infestation killed an estimated 3.9 million acres of lodgepole pine across the entire Rocky Mountain region. The extent of beetle kill has raised concerns about the risk of catastrophic fires.

Management of the forest stands, including use of controlled wildfires, has been identified as one method of promoting the health of the forest ecosystem. Effective management responses to severe forest impacts are also vital to returning a forest to a healthy equilibrium and protecting the associated water bodies.

The NPS program will continue to support the following activities related to the Forestry / Silviculture category:

- Reduce sediment loads that impair surface waters or pose a significant threat to public drinking water supplies, e.g. wildfire burn area rehabilitation.
- Prevent impairment of ground and surface water due to nonpoint source contamination.
- Partner with organizations and agencies to promote the inclusion of water quality management in their programs
- Support technology transfer and implementation related activities through grants and technical assistance.

### **3.1.4 Hydromodification and Habitat Alteration**

Hydromodification activities include channelization and channel modification, dams, and streambank and shoreline erosion. A frequent result of channelization and channel modification activities is a diminished suitability of instream and streamside habitat for fish and wildlife. Another result is altered instream patterns of water temperature and sediment type, as well as the rates and paths of sediment erosion, transport and deposition. Hardening of banks along waterways increases the movement of nonpoint source pollutants from the upper reaches of watersheds into lower reaches, including reservoirs.

The erosion of shorelines and streambanks can be a natural process that can produce beneficial or adverse impacts on riparian habitat. Excessively high sediment loads can smother submerged aquatic vegetation, impact spawning areas, fill in riffle pools, and contribute to increased levels of turbidity and nutrients. Although accomplishments have been made in improving water quality through various environmental programs and outreach, Colorado's streams and rivers are still being impacted from current and past land use. An ongoing water quality issue related to current hydrologic modification in Colorado is the impact of increased or decreased flows in a natural stream channel

Properly functioning stream and riparian areas are critical in maintaining water quality, water quantity, riparian habitat, fish populations and species diversity, downstream beneficial uses, and the social and economic viability of Colorado. For the purposes of the NPS program, stream restoration/rehabilitation can be defined as the measurable improvement of stream and riparian ecosystem processes. Following restoration and rehabilitation activities, streams must be able to convey the sediment and flow produced by the upstream watershed to attain the designated uses without excessive aggradations or degradation of bed and banks.

The NPS program is very active supporting stream restoration and habitat integrity protection; it will continue to actively fund protection and restoration activities related to the protection of aquatic life and its habitat. Appendix D contains a technical document addressing the Colorado approach to stream restoration.

### **3.1.5 Urban Areas**

Colorado faces significant challenges due to pressures of increasing population trends. Colorado population was estimated to be 5.1 million in 2010. The Front Range urban corridor contains the greatest proportion of Colorado's population. However, there are areas in the state with one or fewer persons per square mile. Between the years 2008 and 2050, the state of Colorado is projected to grow from approximately 5.1 million people to 9.1 million people, an increase of 78% (Colorado Water Conservation Board CWCB 2010).

Urbanization increases the variety, timing, and amount of pollutants carried into receiving waters. Urban, suburban, and other densely developed areas typically have land surfaces covered by buildings, pavement and compacted landscapes. These surfaces limit the infiltration of rain and snowmelt greatly increasing the volume and velocity of stormwater runoff.

Pollutants from urban runoff can include: sediment; oil, grease and chemicals from motor vehicles; pesticides and nutrients from lawns and gardens; viruses, bacteria and nutrients from pet waste and failing septic systems; road salts; heavy metals from roof shingles; motor vehicles and other sources; and thermal pollution from dark impervious surfaces such as streets and rooftops.

Stormwater management is regulated under CWA provisions administered by the WQCD, Stormwater Permit Program. These regulations apply to storm water runoff once the water enters the streets in heavily populated urban areas (at least 50,000 people and density of 1,000 people per square mile).

To reduce negative impacts from storm water, the NPS program works with numerous agencies such as county flood control agencies, municipalities, the Stormwater Permit Program, and other watershed partners. The program can also:

- Support implementation of best management practices that control stormwater in areas not covered by a permit, such as small towns and rural areas
- Support development of urban watershed plans, irrespective of the regulatory framework
- Support outreach and education programs

### **3.1.6 Roads, Highways and Bridges**

Runoff controls are essential to preventing polluted runoff from roads, highways and bridges from reaching surface waters. Erosion from roads, highways and bridges can contribute large amounts of sediment and silt to adjacent waterbodies, which can then deteriorate water quality, lead to fish kills, as well as other ecological

problems. Heavy metals, oils, other toxic substances and debris can be absorbed by soil and carried with runoff water to lakes, rivers and bays.

The Colorado Department of Transportation (CDOT) reports the state has a 9,144 mile highway system, including 3,429 bridges. Each year, this system handles over 28 billion vehicle miles of travel. Although the Interstate system accounts for only about 10 percent (913 miles) of the total mileage on the state system, 40 percent of all travel takes place on our Interstate highways.

To reduce negative impacts from runoff, the NPS program works with numerous agencies such as CDOT, counties, municipalities, the Stormwater Permit Program and other watershed partners. The program can also:

- Support implementation of best management practices that control runoff in areas not covered by a permit, such as small towns and rural areas
- Support development of watershed plans, irrespective of the regulatory framework
- Support outreach and education programs

### **3.1.7 Marinas and Boating**

Marinas and recreational boating activities are very popular uses of lakes and reservoirs. The growth of recreational boating, as a result of growth of development in general, has led to a growing awareness of the need to protect the environmental quality of our waterways.

Individual boats and marinas usually release only small amounts of pollutants. Yet, when multiplied by thousands of boaters and marinas, they can cause distinct water quality problems in lakes, rivers, and coastal waters. The U.S. Environmental Protection Agency has identified the following potential environmental impacts from boating and marinas: high toxicity in the water; increased pollutant concentrations in aquatic organisms and sediments; increased erosion rates; increased nutrients, leading to an increase in algae and a decrease in oxygen (eutrophication); and high levels of pathogens. In addition, construction at marinas can lead to the physical destruction of sensitive ecosystems and bottom-dwelling aquatic communities.

Water pollution from boating and marinas is linked to several sources. They include poorly flushed waterways, boat maintenance, discharge of sewage from boats, storm water runoff from marina parking lots, and the physical alteration of shoreline, wetlands, and aquatic habitat during the construction and operation of marinas. When caring for boats, a significant amount of solvent, paint, oil, and other pollutants potentially can seep into the ground water or be washed directly into surface water. The chemicals and metals in antifouling paint can limit bottom growth. Many boat cleaners contain chlorine, ammonia, and phosphates -- substances that can harm plankton and fish. Small oil spills released from motors and refueling activities contain petroleum hydrocarbons that tend to attach to waterborne sediments. These persist in aquatic ecosystems and harm the bottom-dwelling organisms that are at the base of the marine food chain.

Zebra and Quagga mussels are non-indigenous species that have recently colonized Colorado reservoirs. The mussels pose a real threat for their bio-fouling capabilities by infiltrating water supply pipes of hydroelectric, public water supply plants and industrial facilities. The spread of mussels is strongly tied to boats moving from one lake to another.

The NPS program funds mainly outreach and education activities associated with the marinas and boating category, for the protection of lakes and reservoirs. This includes the development and dissemination of information related to best management practices or other messages, influences or communications focused on water pollution prevention and reduction in the marina and boating community. The goal is for marinas to adopt clean practices for their operations and delivering this message to their boating customers.

### **3.1.8 Other Nonpoint Source areas of concern:**

#### ***3.1.8.1 Wildfire and other catastrophic events***

Colorado's landscape changed significantly in 2002 with a massive wildfire season. More than 379,287 acres burned in Colorado; an estimated 6.9 million acres burned in the western states. It was Colorado's most extensive wildfire season in recorded history. Colorado's NPS program responded in two ways. First, part of the 2002 grant was reallocated immediately from selected projects to burn area restoration activities in watersheds where additional work was needed to protect public drinking water supplies and systems. More than \$700,000 was allocated to protect water supplies in Douglas County and La Plata County.

Pending availability of funds, the NPS program may set aside annually, a "rapid response" fund, which will allow the program to respond to catastrophic events more quickly than through the regular grant cycle. The funds can be used first to remediate catastrophic events that create conditions considered to be an imminent threat to the public health. The Division and Commission may identify other uses of the funds. EPA requires specific project implementation plans for the use of the rapid response funds; the PIPs must be negotiated and approved by EPA prior to the release of the funds, in the same manner as the other NPS projects.

### ***3.1.8.2 Drought and water quality***

In a semi-arid environment, drought is a regular occurrence. Colorado's worst wildfire season coincided with a severe drought that has continued in varying degrees, depending on the part of Colorado in question. Drought reduces the available dilutional flows in streams, rivers, lakes and reservoirs, which may increase the concentration of various pollutants in those water bodies. Drought can also cause pollutants typical in storm water flows to build up on the ground surface, which then may increase the initial concentrations when precipitation finally does occur. In addition, prolonged drought reduces aquifer recharge, which increases aquifer drawdown. Well failure is possible if pumping continues in a depleted aquifer.

The impacts to the NPS Program are observed in project implementation, especially in those projects that involve irrigation and nutrient management, and those that involve revegetation. Project implementation may be delayed when precipitation and stream flows are reduced.

### ***3.1.8.3 Stormwater Management***

An objective of the urban and construction nonpoint source management is to link the efforts of the NPS program to those of the phase I and II municipalities or others working under Colorado Discharge Permit System stormwater permits. Linking these programs to the maximum extent practicable provides for more effectiveness since both deal with the problems of precipitation related (stormwater) pollution. Most water quality issues, including stormwater management, will benefit from watershed based solutions.

The following six objectives of the urban and construction NPS program parallel the six program elements of the stormwater permit:

1. Support public education efforts regarding the impacts of stormwater pollution on receiving water bodies and steps that can lessen or eliminate those problems.
2. Support public involvement efforts in watersheds that include urbanized areas.
3. Support a reduction of illicit discharges to urban waterways.
4. Support the control of construction site runoff from construction activities on a statewide basis.
5. Support the control of runoff from developed lands post construction activities.
6. Support efforts of entities to improve runoff quality from facilities and processes used in performing their work.

Permits for stormwater runoff from Municipal Separate Storm Sewer Systems require the six programs above to control the discharge of pollutants to the maximum extent practicable. In meeting permit requirements owners of municipal storm sewer systems have flexibility in defining the measurable goals for each of these six programs. While supportive of the stormwater program elements, NPS funds may be used only for stormwater management activities not specified in a stormwater permit, within the context of annual program and funding priorities.

### **3.1.8.4 Animal Feeding Operations**

Colorado is a significant beef producing state, generally ranking fourth in the nation for the number of beef cattle on feed. There are approximately 13,300 farms in Colorado with cattle (2002 Census of Agriculture), including 981 with “cattle on feed”. The vast majority of farms, nearly 10,000, carry fewer than 100 head of cattle. Slightly more than 41% of Colorado’s cattle and calves are considered to be “on feed”. An animal feeding operation (AFO) is defined by CDPHE WQCC Regulation No. 81, June 30, 2004 as a lot or facility (other than an aquatic animal production facility where:

- Animals (other than aquatic animals) have been, are, or will be stabled or confined and fed or maintained for a total of 45 days or more in any 12-month period, and
- Crops, vegetation, forage growth, or post-harvest residues are not sustained in the normal growing season over any portion of the lot or facility.

A concentrated animal feeding operation (CAFO) means a medium or large sized animal feeding operation AFO or that is designated by the WQCD as a CAFO, pursuant to Regulation 81, Section 81.4. CAFOs are determined by the number and type of animals stabled or confined on the facility, or if either of the following is met:

- Pollutants are discharged into surface waters of the state through a man-made drainage system; or
- Pollutants are discharged directly into surface waters of the state that originate outside of and pass over, across or through the facility or otherwise come into direct contact with the animals confined in the operation.

NPS interaction with AFOs is limited to those that fall outside CAFOs. The livestock feeding industry is active in providing their membership with both technical and financial assistance for those facilities not identified as CAFOs. Also, the off-site management of wastes that have been generated by a CAFO and then transported to an off-site facility that is not subject to discharge permit requirements is considered part of Colorado’s NPS program.

NPS grant funding used to assist AFOs may only be used with those facilities that have and will implement a comprehensive nutrient management plan (CNMP). Aspects of a CNMP that are not directly related to water quality, for example dust or odor suppression, are not eligible for grant funding.

### **3.1.8.5 Onsite wastewater systems**

Onsite wastewater systems, also known as septic systems or individual sewage disposal systems (ISDS) are used to treat and dispose of domestic wastes in relatively small volumes of wastewater, usually from houses and businesses that are not served by central wastewater treatment plants. The installation of septic systems normally is regulated at the local level, except that systems with a design capacity of 2,000 gallons or more per day must obtain site location approval and a discharge permit from the Division.

Septic systems generally are considered potential nonpoint sources. In Colorado, 33% of all homes are served by onsite wastewater systems, a trend that continues to grow. Millions of gallons of septic tank effluent percolate into the soils of the state annually. Ensuring compliance with wastewater treatment performance requirements that protect human health, surface waters, and groundwater resources is difficult due to the dispersed nature of septic systems. Proper placement, operation, and maintenance of onsite wastewater systems are critical to minimize potential pollutant problems.

Historically, the NPS program has not actively funding ISDS-related activities, as the majority is under the jurisdiction of local county health departments. As NPS program funding becomes more limited, the NPS program will continue to consider ISDS projects as a low priority.

## **3.2 Best Management Practices**

Best management practices (BMPs) are both structural and nonstructural techniques that either prevent or reduce pollution from nonpoint sources. BMPs are defined as:

*A practice or combination of practices, as determined by a responsible group after examination of alternative practices and appropriate public participation, to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water/stream quality goals. They include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures.*

The recommendation of BMPs is complex, due to the interaction between various natural resources. The watershed as a whole must be considered, to determine true cause and effect for a nonpoint source concern and to identify the most appropriate BMP for the situation. Off-site impacts of BMP implementation must also be considered.

In addition, the selection of specific BMPs will require the involvement and coordination of many parties and interests. Prior to selecting BMPs, a decision must be made on the level of land management to be continued after treatment. Complex systems with high maintenance requirements, although they may be effective initially, will be useless if they are not maintained in the long term.

Selected BMPs may not control all nonpoint loading, but will be installed as necessary to reduce nonpoint loading to the desired level. Reasonableness of implementation costs must be considered with each proposed application of BMPs but cost will not be used as a sole determining factor to preclude BMPs in a particular location.

*Appendix E – Colorado Nonpoint Source Program Best Management Practices Library* contains a summary of several BMPs that the NPS program has identified as applicable to address NPS pollution in Colorado and the NPS BMP Table of approved BMPs for Colorado. The NPS program also recognizes a variety of technical references and guides that provide guidance in site-specific planning, design, implementation or construction, operation and maintenance of a practice or components of a practice. The following list is not all-inclusive, but provided for information.

- [www.npscolorado.com/BMPs.html](http://www.npscolorado.com/BMPs.html)
- USDA Natural Resources Conservation Service Field Office Technical Guide
- U.S. Forest Service Watershed Conservation Practices Handbook and other technical references
- USDI Bureau of Land Management Technical References
- Colorado State University Cooperative Extension
- Urban Drainage and Flood Control District, Urban Storm Drainage Criteria manual: Volume 3
- Stream Corridor Restoration: Principles, Processes and Practices (The Federal Interagency Stream Restoration Working Group, 1998). See [http://www.nrcs.usda.gov/technical/stream\\_restoration](http://www.nrcs.usda.gov/technical/stream_restoration)
- Colorado Timber Industry Association Silviculture BMPs
- Colorado Division of Minerals and Geology Best Practices in Abandoned Mine Land Reclamation.

The NPS program will, during the time frame of the management plan, compile and continue to develop a library of Colorado-related BMPs, using the template presented in Appendix E as an example. This library eventually will serve to catalogue many of the BMPs commonly used in Colorado and several associated pieces of information relating to each BMP. The objective of this library is to provide a single resource for NPS BMP planning and implementation.

Each BMP will be captured in a template containing the following information:

- **BMP Name** - The commonly used term that identifies the BMP
- **NPS Category** - The NPS pollution category that the BMP addresses
- **NPS Sub Category** - Further refinement of a sub type of pollution category that the BMP addresses
- **Purpose** - The narrative description of the BMP and a general overview of how the BMP affects load reduction of a particular pollutant.
- **Appropriate Stream Type** - They type of channel (often based of Rosgen Classification System [http://www.epa.gov/owow/watershed/wacademy/acad2000/stream\\_class/](http://www.epa.gov/owow/watershed/wacademy/acad2000/stream_class/)) in which the BMP is suited or expected to perform at highest efficiency



- **Pollutants Addressed** - The pollutant(s) the BMP is expected to address
- **Load Reduction Potential** - Ranked as Low, Medium or High, this section intends to describe the potential for the BMP to reduce the loading for the pollutant addressed
- **Estimated Time for Reduction** - Ranked as immediate, months-2 years, greater than 2 years, this section intends to describe the time in which load reductions are expected to occur following the completion of the BMP
- **Expected Maintenance** - Ranked as Low, Medium or High, this section intends to describe the expected amount of maintenance required on the BMP.
- **Monitoring Strategy** - This section captures how the BMP will be evaluated and compared to pre project or other data sets.

This template will be included in assessment and implementation project plans and adopted consistently in every project that gathers, assesses and reports on data.



## Chapter 4 – Nonpoint Source Project Development and Implementation

The main purpose of this chapter is to provide information and resources for potential project sponsors. It provides a summary of processes from project conception to project evaluation and completion. Although more detailed and updated information is regularly provided during the annual project solicitation process and available at [www.npscolorado.com](http://www.npscolorado.com), the information below serves as a general reference for partnering with the NPS program.

NPS funds are used at the local level to implement projects that protect and restore water quality, to develop watershed-based plans, and for education and dissemination of information related to nonpoint sources of pollution. Colorado awards the NPS funds to local sponsors who can be local watershed groups, government entities, nonprofit organizations, and other entities. Sponsors are required to contribute with 40% of the total project amount in cash and/or in-kind match.

Although the majority of the NPS funds is awarded competitively, the NPS program may set aside a portion of the base funds to support programmatic activities such as update and maintain the [npscolorado](http://npscolorado.com) website, provide monitoring, assessment and reporting of measurable results, and support information dissemination efforts.

The NPS program continues to sponsor the website [www.npscolorado.com](http://www.npscolorado.com) as a key means for program communication and for reference information regarding NPS pollution. Site contents include this management plan, NPS program annual reports, the latest proposal solicitation information, project reporting information, and outreach and education resources. Please utilize this site for Colorado specific NPS information and to provide feedback. The site also provides many other types of water quality and nonpoint source news, information and links, at the state, national and global levels.

### 4.1 Project Focus

Colorado continues to implement the NPS program according to the *EPA Nonpoint Source Program and Grants Guidelines for States and Territories*, October 2003, which can be found at <http://www.epa.gov/owow/nps/cwact.html>. The implementation of the program will be adjusted according to new and updated EPA Guidance as they change or are updated. We are expecting a new guidance in time for FFY2013 funding cycle. As discussed in Chapters 2 and 6, the overall focus for streams and rivers for the next five years is on, in priority order: 1) legacy mining, 2) selenium and 3) other priorities including pathogens. For lakes and reservoirs: 1) low dissolved oxygen, nitrates and pH, and 2) aquatic life and mercury-related fish consumption advisories. These priorities will support implementation of completed TMDLs and ultimately, restoration of impaired waterbodies.

The WQCC has established the following regulation basins for the purposes of implementing the five-year schedule to review water quality classifications and standards: the San Juan/Gunnison, the Arkansas/Rio Grande, the Colorado and the South Platte. Each year one of the four basins is reviewed; during the fifth year, the WQCC addresses Basic Standards and statewide issues (see Appendix A). The table in Appendix A captures the schedule of on-going Watershed Program efforts that are implemented in tandem with the WQCC review schedule. The NPS program is also implemented in a 5-year cycle, in tandem with the WQCC review schedule. NPS project implementation priorities follow monitoring and rulemaking to capitalize on the availability of the most current data and assessments. The table also shows that the NPS funds are awarded from two sub-sets: 1) incremental funds for the development and implementation of watershed-based plans to achieve TMDLs; and 2) base funds for all other activities. The fifth year NPS priority is general statewide funding, which may emphasize watershed plan development or priorities to be determined.

The NPS program further prioritizes watersheds in the state using the water quality standards segmentation of waterbodies as approved by the WQCC. The criteria for selecting priority watersheds are: 1) identify segments listed in Regulation № 93 – Section 303(d) List of Water Quality Limited Segments Requiring TMDLs and 2)

identify watersheds containing those segments that are or have in the past used NPS funds. Priority watersheds are defined at the 8 or 10-digit Hydrologic Unit Code (HUC). During the proposal solicitation process, the NPS program awards extra points for proposals that aim to work in these priority watersheds because they generally present good opportunity for success in achieve water quality improvements and / or attainment of water quality standards. Watershed Program staff periodically revises the List of Priority Watersheds (see Appendix B).

## **4.2 Watershed Partnerships & Planning – Getting Started**

All watershed management initiatives need to start with partnerships. Water quality and other water resource issues involve many different federal, state and local agencies, private landowners, special interest groups, recreationists, and the general public. All these partners have an interest in how the watershed is managed. Involving all parties with a vested interest in the watershed is a crucial early step in the development of watershed based initiatives.

Development of a watershed plan is typically the first project for watershed partnerships. A watershed plan is a living document, developed in an interactive process that includes a watershed specific combination of stakeholders. The planning process usually begins with a group of concerned citizens who come together around particular issues; these issues are then researched, evaluated, prioritized and captured in a watershed plan. Completion of the planning process is a significant undertaking and usually requires a multi-year effort to establish the framework for protecting and restoring the watershed.

EPA has identified nine elements of a watershed plan, which must be addressed if projects affect streams not meeting water quality standards and utilize incremental funds. Plans are recommended as a key supporting document for all projects, irrespective of the status of the water quality. A watershed-based plan should address not only water quality impairments, but also any sources of pollution and reductions necessary to assure the long-term health of the watershed. Watershed plans should also incorporate any TMDL reports and load reduction recommendations that may have been completed for the watershed or for segments in the watershed.

A holistic or comprehensive watershed plan addresses the EPA nine elements of a watershed plan (see Appendix F) and other water resource-related needs that are important to the community such as recreation, riparian habitat, endangered species habitat needs and water supply. Thus, plans incorporate a balance of broad characterizations of key resource concerns and a thorough assessment of water quality. For eventual nonpoint source implementation project purposes, plans address water quality restoration and protection needs and include a list of water-quality priority projects and implementation strategies.

Locally identified, priority projects that are potentially eligible for NPS funding may fall into the following groups:

**4.2.1 Watershed Plans and Assessment Projects** produce a planning document that brings together the issues, data, stakeholders and solutions in an organized manner, using the watershed approach. All projects using incremental funds need to satisfy the EPA nine elements of a watershed plan, which should be addressed in a fully developed watershed plan. The nine elements of a watershed plan are not necessarily required for implementation projects using base funds, but are common sense for a watershed plan that addresses water quality. There are two guidance documents available to assist in watershed plan development: the “*Colorado’s Watershed Cookbook: Recipe for a Watershed Plan*” and “*EPA’s Handbook for Developing Watershed Plans to Restore and Protect Our Waters.*” Colorado’s Cookbook contains a number of helpful forms and documents, including an outline that addresses all nine elements along with state identified elements of a watershed plan. EPA’s Handbook provides more in-depth reference material. Colorado’s Cookbook and EPA’s nine elements of a watershed plan checklist can be found at <http://www.npscolorado.com/watershedplan.htm> and EPA’s Handbook can be found at [http://www.epa.gov/owow/NPS/watershed\\_handbook/pdf/ch08.pdf](http://www.epa.gov/owow/NPS/watershed_handbook/pdf/ch08.pdf).

Additional helpful documents are: the Integrated Report, the CWA Section 303(d) list of impaired waters, completed TMDLs and Statewide Water Quality Management Plan; they can be found on the WQCC website.

Examples of funded activities within the context watershed plan development include outreach and education through stakeholders' meetings and other outreach activities, collecting, gathering and analyzing data for a comprehensive watershed characterization and assessment, writing the watershed plan, and prioritizing watershed issues and restoration activities for future implementation projects.

**4.2.2 Implementation Projects** conduct on the ground water quality restoration or protection activities, implementing best management practices. If the implementation project will be using NPS incremental funds, a watershed plan addressing EPA's nine elements for a watershed plan is required. Implementation projects require involvement from a wide range of stakeholders ranging from private landowners to federal land managers. They involve implementation of best management practices (BMPs) for restoration and protection activities. Some examples of implementation projects include stream bank restoration, in-stream habitat improvements, agricultural runoff control, erosion abatement, and capping of abandoned mine waste. Project sponsors must include an outreach and education component in the implementation projects to facilitate and leverage broader application of BMPs and to raise awareness of water quality and nonpoint source issues. A Biological Evaluation is required BEFORE project implementation can start; this process is coordinated with EPA and they provide the required approval.

**4.2.3 Information and Education Projects** educate communities about water quality and nonpoint sources of pollution; they also promote practices that prevent pollution and restore water quality and aquatic habitat. I&E projects directed solely at information and education are now considered low priority for the NPS program. Information and education is still emphasized as an important element of every watershed plan and every implementation project.

**4.2.4 Groundwater Projects** protect and/or restore groundwater resources that, if contaminated, may pose human health and ecological risks. In Colorado, there are many issues of pollutant loading to surface water from shallow groundwater. This is a major concern with selenium loading. Projects addressing groundwater-surface water interaction are likely to become more important as the selenium priority moves forward.

### 4.3 NPS Program Alignment

As with most environmental programs, nonpoint source actual needs far outweigh available resources. The NPS program has identified priorities for particular projects in this plan that are refined during the annual project solicitation announcement. Some important considerations:

- 1) *All projects must have a minimum of 40% cash and in-kind match of the total project amount.*
- 2) *Projects that address compliance with a Colorado Discharge Permit System (CDPS) permit are not eligible.*
- 3) *Projects that involve an actual or potential National Priority List site will be reviewed for eligibility on a case-by-case basis.*
- 4) *Competitive projects fit well with the strategies laid out in Chapters 2 and 6 and address the general, topic-based guidelines below:*

**4.3.1 Watershed Planning** includes the EPA nine elements for a watershed plan and the TMDL report, if available. A watershed plan should implement the TMDL, if one is completed. Plans must address a large enough geographic area to include the majority of the key sources and causes of impairments to the water body. If the watershed plan is done according to a HUC-8 or a combination of multiple HUC 8s, then more detailed analyses can be done at a smaller land area and larger scale such as HUC 12 or WQCD segment-specific watershed. This improves probability of addressing all of the EPA nine elements for a watershed plan dealing with source identification, load reductions, and best management practices implementation. The plan implementation strategy includes a list of priority projects, yearly action plans, and proposed updates every five years.

**4.3.1.1 Interpretation and Use of TMDLs** characterize the pollutant specific loadings and load reductions necessary to meet stream water quality standards. Key uses for these reports are in watershed and restoration planning and for project implementation addressing TMDL recommendations. The content and analysis of TMDLs may be further refined during the watershed planning process to address implementation.

**4.3.2 Implementation Projects** restore impaired waters by the implementation of TMDLs and/or by addressing impaired segments identified on the 303(d) list. The NPS program intent is to focus on larger projects within target basins and priority watersheds to support measurable improvements in water quality.

Restoration projects are required to clearly document a water quality issue(s) that is addressed by the proposed management strategy or BMP implementation. Other demonstrated water quality issues may also be justified by:

1. Documented water quality restoration needs based on stream water quality standards violations or documented trend that indicates declining water quality. The documentation of the potential site-specific water quality impacts should be derived using WQCD analytical tools. This helps establish the benchmarks so that water quality results can be evaluated with post-project data. Sponsors are encouraged to review historical data sets, photographs, comparable research, modeling etc., to establish water quality conditions.
2. Projects are identified in a local watershed plan that is 10 years old or less (preferably 5 years) and which satisfies EPA's nine elements for a watershed plan, to qualify for incremental funds.

Protection projects are not required to have a watershed plan or the documentation of water quality impairments, but the NPS program will consider a higher priority projects that are able to document water quality-related impacts and benefits.

Estimating and reporting pollutant load reductions, such as metals, selenium, nitrogen, phosphorus and sediment, are critical to document project success. These reductions are assessed through pre- and post-project concentration and discharge based data or through modeling. EPA requires each implementation project to report on load reductions on sediment, total nitrogen and total phosphorus.

#### **4.3.2.1 Best Management Practices - selection, design, long-term effectiveness**

Proposed BMPs focus on TMDL implementation and restoration. Proposed BMPs should clearly address the area-specific water quality needs. The BMPs are: (1) designed for maximum water quality improvement, (2) based on previously demonstrated effectiveness, and (3) economical and sustainable with low risk of failure and reasonable operation and maintenance. See BMP library as a reference (Appendix E).

Demonstration and research-based BMPs implementation projects are discouraged. NPS will consider assessment of BMPs implementation projects, should they be part of a larger project or effort closely connected to watershed restoration. BMP implementation projects for protection from or prevention of negative impacts from nonpoint source pollution are also eligible for funding using base funds.

#### **4.3.2.2 Legacy Mining Projects**

Legacy mining or resource extraction related projects are a current priority. Sponsors should work with the Division of Reclamation, Mining and Safety regional representatives to target projects in their respective watersheds that will lead to measurable water quality improvements.

#### **4.3.2.3 Selenium Projects**

Projects that address selenium loading are the second priority for the NPS program. Approaches are watershed specific and should be targeted to achieve the greatest reduction potential for the investment. Currently, the NPS program is supporting the implementation of two large selenium-related projects: a large watershed plan development in the Lower Arkansas Basin and a large implementation project in the Grand Valley addressing minimization of selenium leaching via piping of irrigation ditches. Lessons learned from these two projects will help guide future actions for the NPS program regarding selenium issues. Also, within the next few years, more

selenium TMDL reports will be developed. The timing will allow the NPS program to define a strategy to address selenium within the next five years.

#### ***4.3.2.4 Stream Restoration***

Proposed stream restoration BMPs are identified in a watershed plan with clear assessments, including geomorphology, water quality, and/or aquatic life analyses, which demonstrate the anthropogenic impacts on water quality. Sources of instability or other pollution must be addressed to treat the cause of the impairment, not only the symptom (i.e., upland revegetation to control weathering and erosion of sediment as opposed to a catchment basin that will not address the source). The project leads to measurable water quality benefits including aquatic, riparian/wetland habitat improvements. BMPs design should be designed to withstand flood events of a determined magnitude and not to prevent bank instability or water quality problems elsewhere. Long-term revegetation for source control is a significant component of most stabilization projects and should be addressed in a comprehensive manner that addresses appropriate vegetation for source control, planting depth commensurate with connectivity to the water table, maintenance and periodic monitoring to determine project success. See Appendix G (Colorado NPS Stream Restoration and Stabilization Guidance) for complete guidance.

#### ***4.3.2.5 Stormwater***

The NPS program will continue to consider eligible: a) stormwater-related projects that are not required by a permit and b) watershed-based plans that might include stormwater permitted areas (for example urban areas under an MS4 permit).

**4.3.3 Other issues** such as emerging issues, private lands, information and education, and project management are addressed under guidelines developed by the Colorado NPS program (on-going and may change – always check the [www.npscolorado.com](http://www.npscolorado.com) for updates).

#### ***4.3.3.1 Emerging Issues***

Given the diversity of nonpoint source pollution sources and innovative strategies to manage them, the NPS program recognizes the need to understand the program fit before awarding funding to potential projects. This may lead to unintentional delays or declined funding for projects addressing needs not mentioned in this plan.

#### ***4.3.3.2 Private Landowner Involvement and Support***

Projects on private land may require land owners to be a party to an environmental covenant, conservation, operation and maintenance, and/or access agreements. Projects on private land must demonstrate the positive impact of those projects on water quality in the adjacent segment. Cash and/or in-kind match from landowners is recommended to demonstrate cooperation and commitment at the segment scale.

#### ***4.3.3.3 Information and Education***

The core I&E program activities are retained, for instance, the coordination of outreach activities, information dissemination and website maintenance. New I&E activities are integrated within implementation projects activities, so that local community involvement can be leveraged to include not only implementation activities but also all the associated education and information activities as well. This is predicated on the thinking that as stakeholders get involved at the local level implementing projects within their watershed, it results in a higher level of awareness and also a change in behavior toward a more desired and educated approach to protection and restoration of water quality and habitat integrity. Information and education efforts, as part of watershed planning and implementation projects, are a priority. Statewide I&E projects are low priority.

#### ***4.3.3.4 Project Management***

The project manager serves as the point of contact for the project. Project managers should have a background in water quality or an environmental field. Salary range limitations apply so please check [npscolorado.com](http://npscolorado.com) for the OMB Circulars that govern compensation. Funds may be requested for part-time or up to 50% of a full time equivalent. Sponsors are usually limited to one project that has significant project management support such as a watershed plan. In subsequent projects, support is limited to implementation of project tasks and administration and reporting to meet grant requirements.

#### 4.3.3.5 Assessment and Monitoring

The program limited on the amount of funds available for assessment work. Assessments as part of watershed plan development or TMDL related implementation projects are more likely to be funded. Assessments purely to evaluate current conditions or to conduct research are not likely to receive funding.

#### 4.3.3.6 Project Sponsorship

All sponsors must have involvement and accountability in completion of project tasks. Sponsors need to have fiscal accountability, including necessary insurance and sub-contracting procedures in order to meet state contracting requirements. Please check the latest “business ready” checklist created by the NPS program at the [npscolorado.com](http://npscolorado.com) site.

#### 4.3.3.7 Administration and Indirect Costs

Funding limitations of no more than 10% of the project contract amount applies to administration and project reporting.

### 4.4 Project Implementation Process

The funding process begins in early fall with the release of the project solicitation announcement letter describing proposal guidance and priorities. The deadline for proposals submittal is usually near the end of the calendar year. After reviewing, with participation and comments from the NPS Alliance, and ranking all proposals, NPS program staff develops a draft funding recommendation list that is presented to the WQCC for approval. Project sponsors, NPS and EPA staff negotiate the final project implementation plan with final approval provided by EPA. Sponsors then begin contracting with the state and may begin reimbursable work once the contract is fully executed.

Because the NPS program is implemented through federal and state cooperation there are several layers to the funding process. The life-cycle of a project is typically 3-5 years and can be broken out into the following 10 major phases or steps:

**Table 4.1 – Project Implementation Process**

<b>Project Steps</b>	<b>General Timing</b>	<b>EPA or State Process</b>	<b>Guidance</b>
1) Development of the Project Concept	Summer or prior to annual solicitation process	NPS program staff and NPS Alliance members	Sponsors submit a short concept paper for technical and programmatic feedback on the basic project idea. Although the process is optional, it does help sponsors create more competitive proposals. Announcement is on <a href="http://npscolorado.com">npscolorado.com</a> in early summer. Project ideas may be discussed with program staff at any time during the year.
2) Project Solicitation Process	Fall – Three month period	NPS program staff	The solicitation packet, posted on <a href="http://npscolorado.com">npscolorado.com</a> , allows approximately three months for proponents to finalize project proposals. Projects require 40% in-kind and/or cash match of total project cost. All updated guidance is posted each year.
3) Proposal Selection	Beginning of calendar year – Three month period	NPS program staff with input from EPA and NPS Alliance members	Multi-step process culminating with WQCC approval.



**Table 4.1 – Project Implementation Process**

<b>Project Steps</b>	<b>General Timing</b>	<b>EPA or State Process</b>	<b>Guidance</b>
4) Project Implementation Plan (PIP)	Final draft due in June or July – negotiations may take several months	EPA approval is a requirement	Sponsors with projects selected for funding must complete a complete draft PIP/work plan. Submission of a draft PIP leads to negotiations with NPS program staff and EPA for final approval. This can be an involved process that takes at least a few months.
5) Contracting with the State	Upon PIP Approval - Two month process	NPS program staff	Sponsors work with NPS program staff to prepare contracting materials including final contract scope of work and insurance certification. <i>No reimbursable work can be conducted prior to contract execution.</i>
6) Sampling and Analysis Project Plan (SAPP) and Biological Evaluation (BE)	In tandem with PIP development and contracting	SAPP – NPS program approval required BE – EPA approval required	Sponsor is responsible for completing the SAPP, with NPS program staff support. Expenses are eligible if accrued after contract execution or they may be considered match if done before the contract but after the federal grant has been awarded <sup>1</sup> . EPA preparation of the BE, with input from sponsors, commences with submission of the draft PIP. The BE must be completed before construction starts – federal requirement.
7) Fiscal Management / Billing	Start of Project	Sponsor	Cost Reimbursement. The additional provisions in the contract contain important information about invoicing. Sponsors are responsible for keeping all project documents on file; match documentation is required to be kept on file for 10 years.
8) Milestones / Deliverables	Defined by final Scope of Work	Sponsor	Sponsors performance is defined by the contract and scope of work. Any proposed changes must be negotiated with the NPS program staff and EPA in advance.
9) Evaluation and Close-out	Semi-annually and at contract completion date	NPS program staff and EPA	Sponsors capture project status and accomplishments in semi-annual reports. The final report, submitted in draft form by contract expiration, includes a full project evaluation.
10) Project data upload to STORET	At the end of the project	Sponsor (Data Sharing Network may provide technical support)	Project data have to be uploaded into STORET (EPA grant requirement). This process may be facilitated via the Data Sharing Network (DSN).

1 – Contact the NPS program staff for information regarding this date as it varies from year to year.

## 4.5 Project Monitoring & Evaluation

Project monitoring and evaluation are a high priority for overall project design as measurable water quality benefits are a key aspect of effectively managing watershed restoration and protection. The monitoring and evaluation strategy is outlined in the proposal and then developed further in the PIP as briefly described in item 4 in the table above. The SAPP is a key pre-implementation project document that formalizes how the project will be evaluated from start to finish. Monitoring designs reflect the objectives of the specific project, and concentrate on demonstrating the effectiveness of the project. Monitoring timelines will continue until sufficient data are gathered to determine effectiveness of the BMP and satisfaction of the objectives. There are templates that lay out the step by step process for the PIP and the SAPP on [npscolorado.com](http://npscolorado.com). All projects gathering data are required to have a SAPP.

The Measurable Results Project (MRP), initiated by the NPS program, is designed to facilitate more consistent project evaluation for the program. The MRP does not supplant the need for project sponsors to monitor their project within the period of the contract. The NPS program requires the project sponsors to be actively engaged in the monitoring of their projects, therefore project sponsors are actively involved in the design and implementation of monitoring plans.

The MRP will scientifically document the effects of restoration efforts on water bodies in Colorado that receive restoration funding from the NPS program. The documentation of these benefits will help the program report on those results and identify and prioritize the most cost effective measures to achieve water quality improvement. To meet the objectives of the project, the MRP will:

- Assist the project sponsor in NPS project SAPP development;
- Collect pre-project data on NPS projects;
- Provide technical assistance to Sponsors while they monitor the project during the contract period;
- Provide post-contract monitoring of the project, as deemed necessary by the NPS program staff.

The types of data generated through the MRP are diverse and will be selected with the ultimate goals of the project in mind. Projects can be evaluated at four analytical levels:

1. Chemical - Water and sediment chemistry may be used to determine concentrations of pollutants in the environment.
2. Biological – Aquatic benthic macroinvertebrate surveys maybe conducted to indicate overall river system health. Riparian and upland vegetation surveys may also be conducted to investigate bank stability and sediment erosion loadings.
3. Physical - Measured changes in channel dimension, sediment size, riffle/pool ratio and others may document how the system is changing over time in response to restoration. Other physical parameters such as stream flow, temperature, dissolved oxygen levels and pH may also be collected.
4. Remote Sensing - Aerial photos, modeling and Geographic Information Service GIS technology may be used to study changes in the system at the landscape level or model results that can't be measured traditionally in the field.

Data generated by the MRP will be used to select effective restoration techniques for future projects targeting NPS pollution in Colorado. The data generated in this study may also have significant research value for the education sector, or for those that seek to better understand baseline and altered state conditions of a given body of water.

## 4.6 Project Reporting & Tracking

Project reporting falls into three main categories: 1) work summary with each reimbursement request, 2) semi-annual reports, and 3) final reports. The budget table for the PIP serves as an excellent tool for budgeting as well as overall project management. The budget table forms the structure for the reimbursement request and tracks the project budget for the life of the project. It is also a reminder of what and when deliverables are due. The

semi-annual reports document progress toward reaching the deliverables. The final report, a requirement of every project, includes a 360 degree evaluation of all project processes and results. Guidance provided by EPA is comprehensive and offers a great opportunity to tell the full project story. Authors use the final report to not only document project-specific outcomes, outputs and BMP effectiveness, produce the project specific Fact Sheets, but also lessons learned and recommendations for future work.

The Office of the State Controller, has implemented a policy to conduct regular contractor performance evaluations as part of all State Agency's routine contract administration activities. CDPHE has instituted an evaluation process designed to comply with this requirement and provide feedback to the public and project sponsors about compliance with contract requirements and obligations. Outcomes of the final review are captured in a statewide database open to all state agencies and the public.

The Grants Reporting and Tracking System (GRTS) is a national database that stores the data and reports generated for each and every project. NPS staff is responsible for uploading these project data throughout the year. EPA Headquarters evaluates the completeness of the database and progress toward meeting nitrogen, phosphorus and sediment load reductions on an annual basis; project and grant information is also evaluated for completeness every year.



## Chapter 5 – Partners

The Clean Water Act Section 319 describes the responsibility of the State Nonpoint Source Programs to engage, solicit and consider the input of local, State, and Federal organizations in the creation of a Nonpoint Source Management Plan. The guidance also dictates that:

*“Utilization of local and private experts in developing and implementing a management program under this subsection, a State shall, to the maximum extent practicable, involve local public and private agencies and organizations which have expertise in control of nonpoint sources of pollution.”*

In 1996, the EPA issued national guidance that contained specific requirements and instructions for updating State NPS Management Plans. This guidance described nine key elements for effective management of NPS pollution. The second element of this guidance states: *The State strengthens its working partnerships and linkages with appropriate State, Tribal, regional, and local entities (including conservation districts), private sector groups, citizens groups, and federal agencies.*

Colorado understands the intent of these mandates and the importance of integrating partners into a successful NPS program. Differing viewpoints, new technologies and strategies for addressing NPS pollution, cost/resource sharing, and local knowledge are some of the benefits enjoyed through collaboration to achieve the ultimate goal of water quality restoration and protection.

### 5.1 Colorado NPS Program Strategy on Partnerships

The NPS program maintains and cultivates numerous relationships with local, State and Federal partners. These relationships are dynamic and respond to the NPS needs of the partnering agency and the NPS program. The NPS program relies on partnerships to develop, maintain and enhance its program and move forward to accomplish its goals. The importance of quality partners in the NPS program is most overtly recognized in that Colorado must partner with project sponsors to implement on-the-ground and planning efforts designed to protect or restore water quality. Beyond this project level partnership, the NPS program is assisted by many groups that provide feedback to the NPS program on ways to improve application/reporting aspects of the program, trends in NPS work statewide and provide technical expertise on NPS BMP implementation/planning. Table 5.1 (Colorado NPS Partnership Benefits) captures many of the benefits the Colorado NPS program receives through its partnerships with project sponsors, partnering agencies and nongovernmental organizations. Table 5.2 (Action Items to Maximize the Benefits of Participation) details the means in which Colorado NPS program will maintain and improve the benefits yielded from partnering with others outside of the Program. Appendix H highlights many of the partnerships in which Colorado NPS is currently involved.

<b>TABLE 5.1 - COLORADO NPS PARTNERSHIP BENEFITS</b>	
<b>Program Area</b>	<b>Benefit to Colorado NPS Program and Partners</b>
Development	Provide insight on emerging NPS issues.
	Local knowledge of issue and affected area.
	Shared mission and goals of NPS reduction/water quality improvement.
	Insight on how Colorado NPS application process/actions/decisions affect other organizations.
	Feedback on how Colorado NPS process/actions/decisions can be improved or modified.
	Ability to assist in NPS outreach efforts to increase participation.

<b>TABLE 5.1 - COLORADO NPS PARTNERSHIP BENEFITS</b>	
<b>Program Area</b>	<b>Benefit to Colorado NPS Program and Partners</b>
	Insight on Federal level NPS priorities and actions that lead to consistency between the levels as well as to jointly partner for complementary activities and programs.
	Assistance in resolving potential inconsistencies between Federal and State NPS programs.
Implementation	Practitioner point of view/lessons learned.
	Cost/Resource sharing.
	Technical expertise to refine restoration plans.
Monitoring and Evaluation	Ability to conduct long term monitoring to assess project effectiveness.
	Ability to promote and enforce environmental covenants.
	Development of BMP efficiencies for use in technical review of project plans.
Reporting	Accurate measurement of load reductions to meet EPA reporting requirements.
	Lessons learned section in final report allows the sponsor to review the project and the process.

<b>TABLE 5.2 – ACTION ITEMS TO MAXIMIZE THE BENEFITS OF PARTICIPATION</b>	
<b>Program Area</b>	<b>Action item</b>
Development	Reach out and invite new members that bring differing viewpoints and perspectives to NPS management to participate in the Alliance or other means to contribute to NPS.
	Maximize the Alliance ability to perform outreach to potential project sponsors by providing the Alliance with target communities/impairments derived from internal prioritization efforts.
	Focus internal project area/impairment prioritization efforts to provide clear direction of the NPS program and our areas of importance to better inform partners of NPS goals and Program Direction.
	Further engage local governments in the collaborative approach to addressing NPS issues in Colorado.
	Continually update the NPS Colorado Website to provide for better information sharing of our program and provide a tool with which consumers of the information may provide feedback to the NPS program.
Implementation	Maximize benefits derived from the establishment and continued participation in technical committees or subgroups such as the Sediment Task Force.

**TABLE 5.2 – ACTION ITEMS TO MAXIMIZE THE BENEFITS OF PARTICIPATION**

<b>Program Area</b>	<b>Action item</b>
Monitoring and Evaluation	Engage academic institutions to support the scientific-based evaluation of BMP effectiveness in NPS programs.
Reporting	Continue to ensure Project Sponsors provide to Colorado Data Sharing Network or EPA Ambient Water Quality Monitoring System (AWQMS).

## **5.2 - Collaboration with the United States Environmental Protection Agency**

The Agency (EPA) provides funding for the NPS Programs via cooperative agreements with the States. Under CWA Section 319, states, territories and tribes receive grant money to support a wide variety of activities including technical assistance, financial assistance, education, training, technology transfer, demonstration projects and monitoring to assess the success of specific nonpoint source implementation projects. EPA also supervises the implementation of the NPS program according to the Nonpoint Source Program and Grant Guidelines for States and Territories, October 2003 and approves individual PIP. Other EPA programs also sometimes provide support for watershed efforts or individual projects, though other EPA funds cannot be counted as match. Examples include Brownfields site assessments at legacy mine sites, Brownfields grants for remediation of priority legacy mine sites identified in watershed-based plans, and direct monitoring support from the Region 8 laboratory. EPA also provides a national database to track and report NPS grants and projects.

This database, the Grants Tracking and Reporting System provides a framework for the NPS program to track and monitor progress on sponsors projects. In addition, GRTS is a tool for developing summary reports critical to demonstrating fiscal accountability, project focus on NPS issues, load reductions, and associated reports for each project. These documents are used internally by the State to track progress, by EPA to report to Congress and for the NPS coordinators to share information with project sponsors. The database has a public access portal, where the public at large can login as guests and read grant and project-specific information.

## **5.3 – Collaboration with the Colorado NPS Alliance**

A main component of Colorado NPS program to collaborate with and engage local and government entities is accomplished through the Colorado Nonpoint Source Alliance (Alliance). The Alliance is a volunteer advisory group that meets quarterly and for consultation on proposal abstracts and proposal review. The primary function of the Alliance is to provide technical input on implementation activities, watershed planning and education/outreach projects. It serves the NPS program by providing technical assistance, practitioner point of view, and collaboration with NPS efforts from other agencies and through the promotion of NPS activities to colleagues and the general public. The Alliance provides comments to the WQCC and interacts with watershed groups and other stakeholders as part of the state program’s public outreach. As of December 2010, over 61 participants were involved in the Alliance, from over 50 organizations including federal, state and local government, nonprofit organizations, universities and private citizens





## Chapter 6 – Implementation

In order to address the NPS program restoration and protection priorities defined in Chapter 3, an evaluation was performed of project-level accomplishments from 2005 – 2010 specific to each priority category. Where applicable, the evaluation results summarize how the NPS program activities address the action plan identified in the 2005 Supplement to the 2000 Colorado Nonpoint Source Management Plan, August 8, 2005. However, the primary purpose of the evaluation is to provide baseline information that helps identify planned activities over the next 5 years for each priority category.

### 6.1 Legacy Mining

#### 6.1.1 Current Activities

The 5 year action plan defined in the 2005 Supplement to the 2000 Colorado Nonpoint Source Management Program, August 8, 2005, identifies a number of actions related to legacy mining activities:

- Action 1.2: Provide technical assistance to NPS-funded remediation projects with the results of watershed plans and remediation actions initiated in important watersheds;
- Action 1.4: Build long-term partnerships to enhance cooperation between industry, environmental groups, and government in restoration of inactive mined lands and other lands with the results of watershed plans and remediation actions initiated in important watersheds;
- Action 2.1: Annually, in consultation with the Water Quality Control Division Total Maximum Daily Load (TMDL) program and others, establish priorities for monitoring and evaluation activities to support the TMDL program needs with a substantial nonpoint source component, resulting in sufficient data to develop approvable TMDLs or to delist stream segments;
- Action 3.1: Increase the number of important watershed plans developed by funding up to eight planning efforts each year with the result of prioritized implementation of restoration/protection actions leading to improved water quality;
- Action 4.1: Identify those watersheds with adequate watershed plans and encourage stakeholders to implement those plans; provide financial support to those stakeholders implementing water quality restoration measures with the result of prioritized implementation of restoration/protection actions leading to improved water quality; and
- Action 5.6: Assess the impacts of BMPs in those areas where significant restoration and protection efforts have occurred, including selenium management and heavy metal mitigation from mining with the result of documented changes in water quality.

As shown in Table 6-1, over 3.4 million dollars of NPS funding was planned for legacy mining projects over the reporting period, with NPS funds plus non-federal match budgets exceeding 5.6 million dollars. Ten of the 25 projects (40%) designed/implemented best management practices to address legacy mining issues (Actions 1.2, 1.4, and 4.1). Six of the 25 projects (24%) developed watershed plans (Actions 1.2, 1.4 and 3.1). One of the 25 projects (4%) addressed TMDLs (Action 2.1), and one of the 25 projects (4%) monitored BMP effectiveness (Action 5.6). The 25 projects were undertaken by 15 different sponsors (Action 1.4). Additional project summary information is provided in Table 6-1.

**TABLE 6.1: LEGACY MINING ACTIVITIES 2005 – 2010**

<b>Year</b>	<b>Basin</b>	<b>Total # of Projects Per Functional Category</b>	<b>BMPs</b>	<b>Partnerships<sup>2</sup></b>	<b>NPS Funds Requested</b>	<b>NPS Funds + Non-Federal Match</b>
2010	Colorado	1 BMP Design/Implementation	Diversion; Land Reconstruction, Abandoned Mined Land	Coal Creek Watershed Coalition	\$166,943	\$331,893
2010	Platte	1 Watershed Planning	NA	St. Vrain and Left Hand Water Conservancy District	\$60,984	\$110,252
2010	Rio Grande	1 Watershed Planning	NA	Trout Unlimited	\$25,000	\$52,500
2010	Statewide	1 Other Water Quality Assessment/Monitoring	NA	Division of Reclamation, Mining and Safety	\$272,741	\$295,056
Subtotals					\$525,668	\$789,701
2009	Arkansas	1 BMP Effectiveness Monitoring	NA	Colorado Mountain College	\$163,951	\$275,258
2009	Colorado	1 BMP Design/Implementation	Closure of Waste Impoundments; Diversion; Stream Channel Restoration	Northwest Colorado Council of Governments	\$170,250	\$283,750
2009	Colorado	1 Watershed Planning	NA	Hinsdale County	\$235,475	\$405,875
Subtotals					\$569,676	\$964,883
2008	Arkansas	1 BMP Design/Implementation	Diversion; Limestone Open Channel; Pond	Colorado Mountain College	\$172,500	\$287,500
2008	Colorado	1 Watershed Planning	NA	Shavano Conservation District	\$49,500	\$87,900
2008	Statewide	1 Technical Assistance to State/Local <sup>3</sup>	NA	Division of Reclamation, Mining and Safety	\$150,000	\$50,000
Subtotals					\$372,000	\$425,400

Year	Basin	Total # of Projects Per Functional Category	BMPs	Partnerships <sup>2</sup>	NPS Funds Requested	NPS Funds + Non-Federal Match
2007	Arkansas	1 Other Restoration/Protection/Prevention	Reclamation of Waste Piles	Division of Reclamation, Mining and Safety	\$96,000	\$160,000
2007	Colorado	1 Other Restoration/Protection/Prevention <sup>3</sup>	Check Dams; Riprap; Stream Channel Restoration	Town of Crested Butte	\$141,296	\$256,490
2007	Platte	2 BMP Design/Implementation	Land Reconstruction, Abandoned Mined Land; Diversion; Drainage Water Management; Mulching	James Creek Watershed Initiative; Division of Reclamation, Mining and Safety	\$348,150	\$628,027
2007	Rio Grande	1 BMP Design/Implementation	Fence; Fishpond Management; Stream Habitat Improvement Management	Trout Unlimited	\$413,000	\$688,955
2007	San Juan	1 BMP Design/Implementation <sup>3</sup>	Reclamation of Waste Piles	San Juan Resource Conservation and Development	\$345,143	\$458,989
Subtotals					\$1,343,589	\$2,192,461
2006	Arkansas	1 Watershed Planning	NA	Colorado Mountain College	\$25,000	\$57,748
2006	Colorado	1 Watershed Planning	NA	Blue River Watershed Group	\$25,000	\$42,000
2006	Platte	1 BMP Design/Implementation <sup>3</sup>	Runoff Management System; Sediment Basin; Stream Corridor Improvement; Vegetative Buffer Strips	Clear Creek Watershed Foundation	\$242,813	\$362,813
2006	San Juan	1 BMP Design/Implementation	Reclamation of Waste Piles	San Juan Resource Conservation and Development	\$26,756	\$44,594
Subtotals					\$319,569	\$507,155

Year	Basin	Total # of Projects Per Functional Category	BMPs	Partnerships <sup>2</sup>	NPS Funds Requested	NPS Funds + Non-Federal Match
2005	Colorado	1 TMDLs	NA	Northwest Colorado Council of Governments	\$40,500	\$67,500
2005	Colorado	1 Other Water Quality Assessment/Monitoring	NA	Town of Crested Butte	\$45,693	\$81,033
2005	Platte	1 Watershed Assessments	NA	Lefthand Watershed Oversight Group	\$50,000	\$83,300
2005	Rio Grande	1 BMP Design/Implementation	Land Reclamation; Reclamation of Waste Piles; Limestone Open Channel (Lined Channel); Diversion	San Luis Valley Resource Conservation and Development	\$197,723	\$485,191
2005	San Juan	1 Water Quality Problem Identification	NA	Anglo-Saxon Properties Ltd	\$14,023	\$23,371
Subtotals					\$347,939	\$740,395
<b>Totals</b>					<b>\$3,478,441</b>	<b>\$5,619,995</b>

<sup>1</sup>Source of information: EPA Grants Reporting and Tracking System. If information was missing in GRTS, final, approved project implementation plans (PIPs) and NPS Project Coordinators were consulted. For 2010 projects still being negotiated, draft PIPs, draft budget spreadsheets, proposals, and NPS Project Coordinators were used as information sources.

<sup>2</sup>For this analysis, the partnerships category identifies the project sponsor only.

<sup>3</sup>For projects utilizing funds from multiple years, the projects are listed in the year identified as the Master in GRTS, but the NPS Funds Requested and the NPS Funds Plus Non-Federal Match reflect the total amounts over all years funding the project within the reporting period of 2005 – 2010.

### 6.1.2 Planned Activities

As discussed in Chapter 3, the highest priority for the NPS program over the next 5 years is to address water quality impacts from legacy mining. At a project level, the NPS program will:

- Continue work with the Division of Reclamation, Mining and Safety and WQCD Programs (EDU, TMDL) to define priority segments for implementation efforts.
- Continue work with the Division of Reclamation, Mining and Safety, WQCD Programs (EDU, TMDL, Financial Services Unit), and other stakeholders to define priority implementation projects;
- Implement priority legacy mining projects identified in existing watershed plans;
- Monitor and catalog effectiveness of BMPs used to control legacy mining impacts;
- Evaluate water quality changes in receiving waters as a result of project implementation; and
- Engage public through targeted, project-specific outreach and education efforts

## 6.2 Selenium

### 6.2.1 Current Activities

The 5 year action plan defined in the 2005 Supplement to the 2000 Colorado Nonpoint Source Management Program, August 8, 2005, identifies actions related to selenium activities:

- Action 1.4: Build long-term partnerships to enhance cooperation between industry, environmental groups, and government in restoration of inactive mined lands and other lands with the results of watershed plans and remediation actions initiated in important watersheds;
- Action 2.1: Annually, in consultation with the Water Quality Control Division TMDL program and others, establish priorities for monitoring and evaluation activities to support the TMDL program needs with a substantial nonpoint source component, resulting in sufficient data to develop approvable TMDLs or to delist stream segments;
- Action 3.1: Increase the number of important watershed plans developed by funding up to eight planning efforts each year with the result of prioritized implementation of restoration/protection actions leading to improved water quality;
- Action 4.1: Identify those watersheds with adequate watershed plans and encourage stakeholders to implement those plans; provide financial support to those stakeholders implementing water quality restoration measures with the result of prioritized implementation of restoration/protection actions leading to improved water quality;
- Action 4.4: Implement selenium management efforts, including partnerships with other programs, to reduce loading in the lower watersheds of the Arkansas, Colorado, Gunnison, Uncompahgre, and South Platte Rivers; and
- Action 5.6: Assess the impacts of BMPs in those areas where significant restoration and protection efforts have occurred, including selenium management and heavy metal mitigation from mining with the result of documented changes in water quality.

As shown in Table 6-2, over 1.3 million dollars of NPS funding was requested for selenium projects over the reporting period, with NPS funds plus non-federal match budgets exceeding 2.1 million dollars. One of the five projects (20%) implemented selenium management efforts (Actions 4.1 and 4.4), and two of the five projects (40%) developed watershed plans (Actions 1.4 and 3.1). Predictive assessments were completed in one of the five projects (20%) (Action 5.6), and one of the five projects (20%) addressed TMDLs (Action 2.1). Projects were undertaken by 4 different sponsors (Action 1.4). Additional project summary information is provided in Table 6-2.

**TABLE 6.2: SELENIUM ACTIVITIES 2005 – 2010**

Year	Basin	Total # of Projects Per Functional Category	BMPs	Partnerships <sup>2</sup>	NPS Funds Requested	NPS Funds + Non-Federal Match
2010	Colorado	1 TMDLs	NA	NFRIA-WSERC Conservation Center	\$26,171	\$46,223
2010	Colorado	1 Watershed Planning	NA	Uncompahgre Valley Water Users Association	\$37,500	\$106,586
Subtotals					\$63,671	\$152,809
2007	Arkansas	1 Watershed Modeling <sup>3</sup>	Irrigation System – Surface and Subsurface	Colorado State University	\$501,735	\$525,746
2007	Colorado	1 BMP Design/Implementation <sup>4</sup>	Irrigation Water Conveyance; Modular Polyethylene Ditch and Canal Lining	Uncompahgre Valley Water Users Association	\$800,000	\$1,445,269
Subtotals					\$1,301,735	\$1,971,015
2006	Colorado	1 Watershed Planning <sup>3</sup>	NA	Colorado River Water Conservation District	\$15,134	\$26,784
Subtotals					\$15,134	\$26,784
<b>Totals</b>					<b>\$1,380,540</b>	<b>\$2,150,608</b>

<sup>1</sup>Source of information: EPA Grants Reporting and Tracking System. If information was missing in GRTS, final, approved project implementation plans (PIPs) and NPS Project Coordinators were consulted. For 2010 projects still being negotiated, draft PIPs, draft budget spreadsheets, proposals, and NPS Project Coordinators were used as information sources.

<sup>2</sup>For this analysis, the partnerships category identifies the project sponsor only.

<sup>3</sup>For projects utilizing funds from multiple years, the projects are listed in the year identified as the Master in GRTS, but the NPS Funds Requested and the NPS Funds Plus Non-Federal Match reflect the total amounts over all years funding the project within the reporting period of 2005 – 2010.

<sup>4</sup>To address an accounting artifact, an exception was made for this project's budget reporting. The total NPS Funds Requested and the total NPS Funds Plus Non-Federal Match reflect all funding over all years; there is no overlay of the 2005-2010 reporting period accounted for in the funding information.

### **6.2.2 Planned Activities**

The NPS program will focus on selenium by:

- Continuing identification and characterization work, especially in those basins where information gaps exist;
- Continuing work with WQCD Programs (EDU, TMDL) to define priority segments for implementation efforts;
- Continuing work with Selenium Task Forces and other stakeholder groups to identify and prioritize projects that may be eligible for NPS funding;
- Assisting in the development and implementation of NPS aspects of TMDLs;
- Utilizing watershed plan results to assist in prioritizing basin-specific needs;
- Implementing BMPs that are targeted at those needs; and
- Engaging public through targeted, project-specific outreach and education efforts.

## **6.3 Escherichia coli**

### **6.3.1 Current Activities**

There are no E. coli activities reported from 2005-2010.

### **6.3.2 Planned Activities**

The NPS program will focus on E. coli by:

- Continuing to refine the NPS Program's role in addressing E. coli;
- Continuing to work with WQCD Programs (EDU, TMDL) and others to identify, characterize, and prioritize NPS projects;
- Coordinating with the Urban Waters Federal Partnership and others to identify NPS projects in developed areas; and
- Engaging public through targeted, project-specific outreach and education efforts.

## **6.4 DO, Nitrates, pH**

### **6.4.1 Current Activities**

The 5 year action plan defined in the 2005 Supplement to the 2000 Colorado Nonpoint Source Management Program, August 8, 2005, identifies actions related to DO, Nitrates, pH activities:

- Action 1.4: Build long-term partnerships to enhance cooperation between industry, environmental groups, and government in restoration of inactive mined lands and other lands with the results of watershed plans and remediation actions initiated in important watersheds;
- Action 2.1: Annually, in consultation with the Water Quality Control Division TMDL program and others, establish priorities for monitoring and evaluation activities to support the TMDL program needs with a substantial nonpoint source component, resulting in sufficient data to develop approvable TMDLs or to delist stream segments;
- Action 3.1: Increase the number of important watershed plans developed by funding up to eight planning efforts each year with the result of prioritized implementation of restoration/protection actions leading to improved water quality;
- Action 4.1: Identify those watersheds with adequate watershed plans and encourage stakeholders to implement those plans; provide financial support to those stakeholders implementing water quality restoration measures with the result of prioritized implementation of restoration/protection actions leading to improved water quality; and
- Action 5.6: Assess the impacts of BMPs in those areas where significant restoration and protection efforts have occurred, including selenium management and heavy metal mitigation from mining with the result of documented changes in water quality.

As shown in Table 6-3, over \$480,000 dollars of NPS funding was requested for DO, Nitrate, pH projects over the reporting period, with NPS funds plus non-federal match budgets exceeding 1.9 million dollars. All three of the projects developed watershed plans (Action 1.4), and one of the three projects (33%) developed a priority watershed plan as defined in the 2005 Supplement (Action 3.1). One of the three projects (33%) supported TMDL development (Action 2.1). Projects were undertaken by 2 different sponsors (Action 1.4). Additional project summary information is provided in Table 6-3.



**TABLE 6.3: DO, NITRATES, PH ACTIVITIES 2005 – 2010**

Year	Basin	Total # of Projects Per Functional Category	BMPs	Partnerships <sup>2</sup>	NPS Funds Requested	NPS Funds + Non-Federal Match
2005	Platte	1 Watershed Planning/TMDLs	NA	Barr Lake/Milton Reservoir Watershed Association	\$301,900	\$1,588,504
Subtotals					\$301,900	\$1,588,504
2006	Platte	1 Watershed Planning <sup>3</sup>	NA	Colorado Department of Agriculture	\$100,000	\$167,300
Subtotals					\$100,000	\$167,300
2010	Platte	1 Watershed Planning	NA	Colorado Department of Agriculture	\$85,500	\$220,000
Subtotals					\$85,500	\$220,000
<b>Totals</b>					<b>\$487,400</b>	<b>\$1,975,804</b>

<sup>1</sup>Source of information: EPA Grants Reporting and Tracking System. If information was missing in GRTS, final, approved project implementation plans (PIPs) and NPS Project Coordinators were consulted. For 2010 projects still being negotiated, draft PIPs, draft budget spreadsheets, proposals, and NPS Project Coordinators were used as information sources.

<sup>2</sup>For this analysis, the partnerships category identifies the project sponsor only.

<sup>3</sup>For projects utilizing funds from multiple years, the projects are listed in the year identified as the Master in GRTS, but the NPS Funds Requested and the NPS Funds Plus Non-Federal Match reflect the total amounts over all years funding the project within the reporting period of 2005 – 2010.

### 6.4.2 Planned Activities

The NPS program will focus on DO, Nitrates, pH by:

- Continuing to work with WQCD Programs (EDU, TMDL) and others to identify and address high priority, NPS-impaired lakes;
- Coordinating with the Urban Waters Federal Partnership and others to identify NPS projects in developed areas; and
- Engaging public through targeted, project-specific outreach and education efforts.

## 6.5 Mercury

### 6.5.1 Current Activities

The 5 year action plan defined in the 2005 Supplement to the 2000 Colorado Nonpoint Source Management Program, August 8, 2005, identifies actions related to mercury activities:

- Action 1.4: Build long-term partnerships to enhance cooperation between industry, environmental groups, and government in restoration of inactive mined lands and other lands with the results of watershed plans and remediation actions initiated in important watersheds;
- Action 2.1: Annually, in consultation with the Water Quality Control Division TMDL program and others, establish priorities for monitoring and evaluation activities to support the TMDL program needs with a substantial nonpoint source component, resulting in sufficient data to develop approvable TMDLs or to delist stream segments;
- Action 3.1: Increase the number of important watershed plans developed by funding up to eight planning efforts each year with the result of prioritized implementation of restoration/protection actions leading to improved water quality;
- Action 4.1: Identify those watersheds with adequate watershed plans and encourage stakeholders to implement those plans; provide financial support to those stakeholders implementing water quality restoration measures with the result of prioritized implementation of restoration/protection actions leading to improved water quality; and
- Action 5.6: Assess the impacts of BMPs in those areas where significant restoration and protection efforts have occurred, including selenium management and heavy metal mitigation from mining with the result of documented changes in water quality.

Table 6-4 identifies the one NPS project funded in the reporting period that addresses mercury. The project supports TMDLs (Action 2.1) and continues the NPS program partnership with Colorado State University (Action 1.4). Additional project summary information is provided in Table 6-4.

**TABLE 6.4: MERCURY ACTIVITIES 2005 – 20101**

<b>Year</b>	<b>Basin</b>	<b>Total # of Projects Per Functional Category</b>	<b>BMPs</b>	<b>Partnerships<sup>2</sup></b>	<b>NPS Funds Requested</b>	<b>NPS Funds + Non-Federal Match</b>
2010	Green, Platte	1 TMDLs	NA	Colorado State University	\$243,242	\$598,075
Subtotals					\$243,242	\$598,075
<b>Totals</b>					<b>\$243,242</b>	<b>\$598,075</b>

<sup>1</sup>Source of information: EPA Grants Reporting and Tracking System. If information was missing in GRTS, final, approved project implementation plans (PIPs) and NPS Project Coordinators were consulted. For 2010 projects still being negotiated, draft PIPs, draft budget spreadsheets, proposals, and NPS Project Coordinators were used as information sources.

<sup>2</sup>For this analysis, the partnerships category identifies the project sponsor only.

## 6.5.2 Planned Activities

The NPS program will:

- Continue evaluation of opportunities to address cross media issues;
- Assist in the development and implementation of NPS aspects of TMDLs; and
- Engage public through targeted, project-specific outreach and education efforts.

## 6.6 Information and Education

### 6.6.1 Current Activities

The 5 year action plan defined in the 2005 Supplement to the 2000 Colorado Nonpoint Source Management Program, August 8, 2005, identifies actions related to information and education activities:

- Action 6.1: Increase the knowledge level of partner organizations, stakeholder groups and interested entities on the technical aspects of water quality management, including topics such as water quality standards and the development of TMDLs by developing and producing a “Colorado water quality academy,” resulting in key stakeholders, partners, and others understanding and appropriately applying Colorado water quality principles in their locales;
- Action 6.2: Cooperate with Colorado State University (CSU) Cooperative Extension to provide a staff coordinator for I&E Core Responsibilities with the result of increased public awareness of polluted runoff issues as measured by statewide survey conducted in 2006 and 2010;
- Action 6.3: Support specific NPS outlets/approaches with proven success (NPS annual forum, Webpage, electronic newsletter, NPS message consistency and mascot use, I&E BMP guidance/training, NPS information clearing house/resource, targeted youth education, manage outreach grant and cultural diversity) with the result of increased public awareness of polluted runoff issues as measured by statewide survey conducted in 2006 and 2010;
- Action 6.4: Hold an animal agriculture summit to communicate resources and methods available to reduce animal impact to water quality with the result of improved/protected water quality as related to animal agricultural operations;
- Action 6.5: Manage Outreach Mini-Grant to support overall NPS objectives with the result of increased public awareness of polluted runoff issues as measured by statewide survey conducted in 2006 and 2010;
- Action 6.6: Compile existing guidance for urban BMP needs into relevant guides for Colorado use with the result of improved/protected water quality as related to urban and construction activities;
- Action 6.7: Conduct a statewide symposium on urban and construction practices, updates and implementation strategies, as well as advances in sediment and erosion control specific to Colorado hydrologic conditions with the result of improved/protected water quality as related to urban and construction activities; and
- Action 6.8: Continue support for the development and dissemination of low impact development technology with the result of improved/protected water quality as related to urban and construction activities and land use decisions.

As shown in Table 6-5, over 1.8 million dollars of NPS funding was requested for information and education projects over the reporting period, with NPS funds plus non-federal match budgets exceeding 3.6 million dollars. Twelve of the 18 projects (67%) supported specific NPS outlets/approaches with proven success (Action 6.3). Outreach mini-grants were distributed in 5 of the 6 years during the reporting period (Action 6.5), and the NPS program continued its partnership with the Colorado State University Water Institute to coordinate information and education activities (Action 6.2). Additional project summary information is provided in Table 6-5.

**TABLE 6.5: INFORMATION AND EDUCATION ACTIVITIES 2005 – 20101**

Year	Basin	Total # of Projects Per Functional Category	BMPs	Partnerships <sup>2</sup>	NPS Funds Requested	NPS Funds + Non-Federal Match
2010	Statewide	1 Local (Specific Target) Education/Information Programs <sup>3</sup>	NA	Colorado Watershed Assembly	\$158,400	\$264,001
2010	Statewide	1 Statewide Education/Information Programs	NA	Colorado Foundation for Agriculture	\$193,490	\$506,690
Subtotals					\$351,890	\$770,691
2009	Statewide	1 Certification Activities	NA	Colorado Marina Association	\$203,260	\$402,651
2009	Statewide	1 Local (Specific Target) Education/Information Programs	NA	Various Sponsors	\$25,000	\$41,667
Subtotals					\$228,260	\$444,318
2008	Statewide	1 Statewide Education/Information Programs	NA	League of Women Voters Education Fund	\$32,000	\$53,350
2008	Statewide	1 Local (Specific Target) Education/Information Programs	NA	Various Sponsors	\$24,000	\$40,000
2008	Statewide	1 Technical Assistance to State/Local <sup>3</sup>	NA	Colorado State University	\$353,695	\$575,207
Subtotals					\$409,695	\$668,557
2007	Statewide	1 Statewide Education/Information Programs	NA	Coalition for Urban River Evaluation	\$72,354	\$407,760
2007	Statewide	1 Local (Specific Target) Education/Information Programs	NA	Various Sponsors	\$25,000	\$41,667
Subtotals					\$97,354	\$449,427
2006	Statewide	2 Statewide Education/Information Programs	NA	League of Women Voters Education Fund; Colorado Foundation for Agriculture	\$206,069	\$488,122

Year	Basin	Total # of Projects Per Functional Category	BMPs	Partnerships <sup>2</sup>	NPS Funds Requested	NPS Funds + Non-Federal Match
2006	Statewide	1 Local (Specific Target) Education/Information Programs	NA	Various Sponsors	\$35,358	\$63,844
Subtotals					\$241,427	\$551,966
2005	Platte	1 Local (Specific Target) Education/Information Programs	NA	Watershed Approach to Stream Health Project	\$25,000	\$38,000
2005	Statewide	1 Local (Specific Target) Education/Information Programs	NA	Various Sponsors	\$23,435	\$42,169
2005	Statewide	4 Statewide Education/Information Programs	NA	League of Women Voters Education Fund; Colorado Foundation for Agriculture; Colorado Watershed Assembly	\$431,850	\$721,420
Subtotals					\$480,285	\$801,589
<b>Totals</b>					<b>\$1,808,911</b>	<b>\$3,686,548</b>

<sup>1</sup>Source of information: EPA Grants Reporting and Tracking System. If information was missing in GRTS, final, approved project implementation plans (PIPs) and NPS Project Coordinators were consulted. For 2010 projects still being negotiated, draft PIPs, draft budget spreadsheets, proposals, and NPS Project Coordinators were used as information sources.

<sup>2</sup>For this analysis, the partnerships category identifies the project sponsor only.

<sup>3</sup>For projects utilizing funds from multiple years, the projects are listed in the year identified as the Master in GRTS, but the NPS Funds Requested and the NPS Funds Plus Non-Federal Match reflect the total amounts over all years funding the project within the reporting period of 2005 – 2010.

### **6.6.2 Planned Activities**

As discussed in Chapter 3, the NPS program will refocus its Information and Education efforts from the program level to the project level. The NPS program will:

- Develop or support a watershed assessment tool that identifies or helps identify water quality trends
- Update BMPs library and create field BMPs template
- Provide educational and information material to interested entities and project partners on a variety of water quality issues
- Communicate Nonpoint Source program successes and lessons learned
- Promote targeted outreach and education through project tasks
- Maximize use of meetings, conferences, and workshops as opportunities to educate about the NPS program

Programmatic Information and Education approaches have been an important mechanism for the NPS program to promote protection activities. The focus over the next 5 years on project-level outreach and education will continue to emphasize protection opportunities, and the NPS program will also evaluate EPA's Healthy Watersheds Initiative for opportunities to focus attention on protection.

## **6.7 Other Accomplishments**

### **6.7.1 Current Activities**

From 2005-2010, the NPS program funded 19 projects in addition to those already discussed in Sections 6.1 – 6.6. Of the 19 projects, 15 addressed sediment/hydromodification issues with 12 of the projects constructing BMPs for sediment or erosion control. One of the 19 projects conducted forest audits resulting in BMP field manuals, and three of the 19 projects initiated planning exercises to better define and address NPS pollution at both watershed and regional scales.

### **6.7.2 Planned Activities**

The NPS program will:

- Continue identifying and prioritizing projects to address sediment/hydromodification;
- Continue through its solicitation process the evaluation and prioritization of projects that address a wide-range of NPS pollution; and
- Engage public through targeted, project-specific outreach and education efforts.





## Chapter 7 – Plan and Program Effectiveness Evaluation

This chapter describes how the different NPS program implementation elements will be evaluated for effectiveness. Certain elements of the Management Plan contribute directly to the accomplishment of the Plan while others are in a supportive role. For evaluation purposes, these elements can be sorted in four groups: program, process, projects and partnerships. The basis for measurement is the accomplishment of the series of outcomes associated to each element, as shown in Table 7.1

The **program** component evaluates how the NPS Management Plan is being implemented and is based on the EPA Nine Key Elements to administer the program. Program reporting measures, which actually direct NPS program strategies to a significant degree, are formalized in the Colorado/EPA performance partnership agreement (PPA) and associated program activity measures (PAMs) (see Chapter 1 for more discussion and reference on the PPA and PAMs). The NPS program also creates an annual report and highlights success stories as part of the overall reporting obligations.

**Process** components evaluate internal and external processes that ensure the quality and accuracy of program implementation. They encompass mostly administrative elements such as compliance with contracting and reporting requirements, fiscal tracking, etc. **Projects** are evaluated at several levels such as technical implementation of the PIP, administrative and financial. The basis for measurement is the accomplishment of the series of outcomes associated to each element as shown in Table 7.1.

Evaluation outputs noted in the table below are used to evaluate current status of the program and also to refine objectives, tasks, timeframes, and evaluation processes, thus building a feedback mechanism to keep the program updated.

Table 7.1 – Evaluation of NPS Program Elements					
Element Group	Plan Elements	Outputs	Evaluation Frequency		
			Every Month	Every Six Months	Yearly
Program					
	<i>Management Plan</i>	Progress in Implementing Tasks			✓
	<i>Planning</i>	Workable and Current Plan			✓
	<i>Annual Report</i>	Up-to-Date Report Status			✓
	<i>Measurable Results</i>	Load Reduction Reports		✓	
	<i>Measurable Results</i>	NPS Assessments			✓
	<i>Success Stories</i>	PPA Commitments Met			✓
	<i>Fiscal Management</i>	Grants Properly Managed			✓
	<i>Administrative Management</i>	Grants Properly Managed			✓
Process					
	<i>Project Solicitation</i>	Completed Process			✓
	<i>PIP Development</i>	Completed PIPs			✓
	<i>Contracting</i>	Completed Contracts			✓

Table 7.1 – Evaluation of NPS Program Elements					
Element Group	Plan Elements	Outputs	Evaluation Frequency		
			Every Month	Every Six Months	Yearly
Projects					
	<i>Progress Reports</i>	Up-to-Date Project Files	✓		
	<i>EPA GRTS</i>	All Updates Done by Deadlines		✓	
	<i>Construction Inspect</i>	Implementation According to PIP			✓
	<i>Field Review</i>	Implementation According to PIP			✓
	<i>Fiscal Review</i>	Projects are Properly Managed		✓	
Partners					
	<i>NPS Team</i>	Program Staff	✓		
	<i>WQCD Management</i>	Informed Supportive Management	✓		
	<i>EPA</i>	Support and Review			✓
	<i>Alliance</i>	Technical Support			✓
	<i>Watershed Groups</i>	Open Communication			✓
	<i>Universities/Colleges</i>	Staff Communication			✓
	<i>State Government</i>	Staff Communication			✓
	<i>Federal Government</i>	Staff Communication			✓
	<i>Federal Consistency</i>	Annual Review Complete			✓

## 7.1 Reporting

The annual report presents accomplishments of NPS Management Plan implementation milestones, including but not limited to the following examples:

- Grant status by grant year with updates on active projects and on project closures;
- Project status on data collection and reporting;
- Federal grant expenditure and match accrual totals updates;
- Colorado Success Story Report identification;
- Information dissemination regarding NPS activities including the funding application process;
- Request for Proposals (Project Solicitation) process implementation and results;
- Other state and federal agencies and the general public involvement on nonpoint source pollution issues through the Nonpoint Source Alliance; and,
- Outreach activities include the [www.npscolorado.com](http://www.npscolorado.com) website.

Colorado has taken great strides to improve the NPS contract completion practices. Project closing instructions and expectations, such as final invoice, match reconciliation and final reports, are being communicated clearly and systematically to project sponsors.

EPA National Program has developed a series of PAMs intended to demonstrate the accomplishments of NPS program management. PAMs are incorporated into the PPA, developed between EPA Region 8 and CDPHE. The PAMs for the Colorado NPS program are:

- Report actual total nitrogen, total phosphorus and total sediment load reductions in GRTS as project-specific information.
- Completed NPS Success Stories of water segments for which water quality is restored and / or fully restored.
- Number of water segments for which water quality restoration planning is complete.
- Number of 12-digit HUC watersheds where water quality improvements have been demonstrated by completion of a watershed success story.

## **7.2 Grant Reporting and Tracking System (GRTS)**

One of the mandated elements for implementation of the NPS program is that every state enter project data in the EPA National Database, the state records (GRTS). GRTS data are reviewed annually by the EPA national office. Reviews for the last few years have been satisfactory for Colorado with very few if any errors. This accomplishment is the result of a concerted staff effort for being current in use of GRTS and utilizing the system for managing information, as well as, reporting to EPA on project status and documentation. GRTS is now used as a reference and in trend analysis of past projects to assist in program planning and management. Colorado continues to develop a process and protocols to better gather sediment and nutrient load reduction data from projects to report in GRTS.

## **7.3 Financial**

Financial records for each project have three levels of records, allowing for thorough checks and balances. The project financial documentation is kept in both hard copy and electronic files by the project coordinator. The program coordinator and the WQCD fiscal office have databases with current balances on all projects. This system has proven consistently valuable at project and grant closure. All balances of grant funding and all sources of match are managed with this system.

## **7.4 Gauging Effectiveness**

Project evaluation throughout the duration of the project and at its conclusion has been given greater emphasis for the last five years. The result is an improvement in the final reports regarding impact of the project and when applicable more usable data. This background created an expectation for project proposals to provide an evaluation matrix to explain clearly the basis and approach for evaluating project outcomes and related impacts. Semi-annual reporting is expected to follow these evaluation approaches to assure progress and determine if any adjustments are necessary for project success.

The NPS program staff and CWCB's Watershed Restoration Program have partnered with Colorado Watershed Assembly to establish the Measurable Results Project (MRP). The MRP will scientifically document the effects of restoration efforts on water bodies in Colorado that receive restoration funding from the NPS program and the WRP. The MRP systematically and quantitatively measures the changes in river systems and, characterizes the aquatic and surrounding terrestrial environment at project sites.

Annual resurveys of these established sites documents the environmental impact benefits of the restoration activities over time. The documentation of these benefits will help the program report on those results and identify and prioritize the most cost effective measures to achieve water quality improvement. Cost-benefits and savings of pollution prevention versus pollution cleanup are additional intended analyses.

## **7.5 Periodic Assessment of Water Quality and Impairments**

Staff from the TMDL and NPS programs collaborate in applying the watershed prioritization criteria and analyze the list of segments that are included in Regulation № 93 Section 303(d) list of Water Quality-Limited Segments Requiring TMDLs. Listed segments are identified for potential implementation projects that meet TMDL needs and leverage NPS resources toward restoration of the water quality-impaired segments.

Colorado regularly reports on load reductions associated with the regulations that govern loading of nutrients (total phosphorus and total nitrogen) into lakes and reservoirs. Colorado also reports on sediment loads into rivers, streams and lakes that are reduced or minimized based on BMPs implemented by the Colorado Department of Transportation.

In order to enhance and expand on current load reduction reporting, the NPS program has a task force to develop protocols to capture load reduction data and meet the required GRTS reporting minimum elements in a more comprehensive manner. This task force is made up of NPS program staff and members of the Alliance.

The objectives of the task force are 1) to develop protocols to capture sediment and nutrients load reduction data associated with NPS BMPs implemented with Section 319(h) funds; and 2) to develop a simple system that allows project sponsors and other users to capture and submit those data to the NPS program. These data will be used to fulfill the minimum reporting requirements in GRTS and to help the NPS program evaluate success, through measurable results.

## **7.6 Annual Report Shows Progress**

The NPS annual report describes the ongoing implementation of the watershed approach, which incorporates the use of EPA's Nine Elements for watershed planning components with NPS implementation activities. The WQCD is committed to the coordination of the Water Quality Programs including NPS, TMDLs, Integrated Reporting, Source Water Protection, Groundwater, Clean Water State Revolving Loan Fund and 319 projects to accomplish this ongoing work.

The annual report fulfills the requirements of CWA Section 319(m). The NPS program prepares this report to inform the public, the U.S. Congress and EPA on the state's progress in the area of NPS water pollution abatement. Although this report should not be considered a complete enumeration of all nonpoint source activities, it describes the most important features of Colorado's NPS program.

## **7.7 Federal Consistency**

Federal agencies manage a significant portion of Colorado's land area: nearly 37% of the surface land and water of the state is federally owned, largely in headwaters areas. Consequently, federal consistency with state water quality standards is critical to achieving water quality goals in all river basins in the state.

The NPS program has developed MOUs with the US Forest Service and with US BLM (see Appendices I and J) to create a framework within which the agencies involved can effectively cooperate on projects of mutual concern to protect water quality<sup>4</sup>. As part of these collaborative efforts, the NPS program conducts annual tours and discussions with BLM and FS staff to review BMP implementation on projects and activities on selected managed lands. EPA is invited to be on the review team. In the course of over a decade, this review has been a positive exchange of information and support without any need for type of enforce action or intervention by EPA.

The US Department of Agriculture has several programs that can be used for NPS activities. For example, the Small Watershed Program may provide local land operators with significant cost-share assistance. The

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4 - The NPS program recognizes BMPs from US Forest Service and BLM as acceptable for use in Colorado.

Environmental Quality Incentive Program, established in the 1995 Farm Bill, also provides the opportunity for locally identified priorities to receive cost-share assistance. Farm Bill programs offer potential coordination opportunities for Selenium reduction strategies in some basins, and are also important for sediment, bacteria and nutrient management.

In addition to the federal land management agencies, the Water Quality Control Division, as well as several NPS Council agencies, participate on the USDA State Technical Committee, and provide input to the USDA agencies on a variety of programs including the Environmental Quality Incentive Program (EQIP), Wetland Reserve Program, and Farmland Protection Program

Colorado no longer participates in the “Single Point of Contact (SPOC)” process, as described in Executive Order 12372 that discusses the intergovernmental review process for federal assistance programs and development projects. In addition, Colorado currently does not have the resources to review each forest plan, grazing allotment plan and other routine management tools developed by the different agencies. Therefore, a somewhat informal process, which will be further refined and improved, has evolved with various federal partners. For example, a BMP review process was developed to evaluate US Forest Service and Bureau of Land Management activities.

BMP reviews are conducted by the NPS program staff and intended to evaluate the effectiveness of an individual practice or set of practices on water quality. Lessees, permittees, and other public lands users are invited to accompany the WQCD and other agencies on the review tours. BMPs are evaluated for a number of activities, for example, timber sales, road construction, grazing allotments, and ski run stabilization. Should a review identify areas of concern in how a BMP is implemented, the WQCD would notify the appropriate agencies and EPA of the findings, and strongly encourage a collaborative process to identify options for improving the use of a particular practice in protecting water quality.

**Table 7.2 –Federal Assistance Programs or  
Federal Actions with Potential Water Quality Impacts**

<b>US Department of Agriculture</b>	Emergency Conservation Program
	Environmental Quality Incentive Program
	Forestry Incentive Program
	Wildlife Habitat Incentive Program
	Wetland Reserve Program
	Conservation Reserve Program
	Watershed Protection and Flood Prevention
	River Basin Surveys
	Revisions or Amendments to Land and Management Programs, including timber sales and grazing allotments
	Colorado River Salinity Control Program
<b>US Department of Transportation</b>	Highway Planning and Construction
<b>US Department of Interior</b>	Abandoned Mine Reclamation Program
	Mineral Development
	Revisions or Amendments to Land and Management Programs, including timber sales and grazing allotments
	Irrigation Systems Rehabilitation or Development
	Management of National Wildlife refuges and proposed acquisitions
	National Park Management Plans and proposed acquisitions
<b>US Department of Defense</b>	Colorado River Salinity Control Program
	Flood Plains Management Services
	Flood Control Projects
	Planning Assistance to States
	Defense Installations Land Management Plans

## Chapter 8 – Challenges

The voluntary nature of NPS management is also its greatest challenge. With few regulatory requirements, improvements to streams impaired by nonpoint source pollutants are dependent upon a group of local stakeholders recognizing a problem and voluntarily acting upon it. A strong local stakeholder group can make a measurable difference in the streams of their watershed. The resources of those volunteers are strained, however. It is becoming increasingly difficult to find either funding or time to make the match required for a nonpoint source grant.

In addition, the amount of available funding is far over-shadowed by the magnitude of the water quality impact. For example, Colorado's allocation of the national nonpoint source appropriation is approximately \$1.9 million per year. However, the estimate to clean up just the Upper Animas River Basin is \$30 million dollars. The cost to restore water quality impacted by legacy mining issues statewide is estimated to cost nearly \$314 million. Similarly, an analysis conducted by Colorado State University found that upgrading all agricultural irrigation management, including nutrient and pest management, would cost \$45 million annually.

Selenium remains a ubiquitous issue in Colorado's waterbodies. In some cases, ongoing human-related activities are exacerbating the problem, but in others the impairments may be a result of Colorado's geologic history. The Watershed Program will have ongoing challenges in determining the appropriate cause, whether natural or man-induced, of the selenium impairments. An analysis conducted by the Grand Valley Selenium Task Force concluded that costs to address selenium impairments in the Colorado River basin are estimated between \$300 million to \$1.3 billion.

The interaction between nonpoint sources and point sources of pollution (those that require a discharge permit) is more apparent, in particular with stormwater runoff and inactive mine sites. In a watershed such as the Upper Animas or Willow Creek, it is likely not possible to restore streams without active treatment of draining adits and mine tunnels. For draining abandoned mines, the lack of a Good Samaritan Provision in the CWA hinders groups from addressing critical restoration activities due to potential long-term liability. Alternatives, such as active treatment of abandoned mine discharges involves large upfront capital expenditures, ongoing operation and maintenance costs, and requires a discharge permit. Such an approach involves significant resources, and due to the associated Colorado Discharge Permit System (CDPS) permit requirements, falls outside the purview of the nonpoint source program.

Finally, the need for data continues to challenge the program. In many instances, it may be possible to develop a TMDL for an impaired stream segment using existing data. But the data may be insufficient to prioritize the specific actions necessary to restore the segment, or be sufficient to effectively plan and design potential BMPs to address the impairment. Often, additional data collection and analysis is needed to effectively develop TMDLs or watershed implementation plans.

Continued coordination with the Environmental Data Unit and TMDL groups within the Division continues to provide valuable data regarding NPS priorities, so that limited 319(h) funds can be put to the greatest benefit. The MRP continues to collect pre- and post-project data to provide additional data needed to document water quality improvements. The Division will also continue to work with DRMS, the Colorado Water Conservation Board and other state and federal partners to leverage multiple sources of funds to maximize water quality benefit.

