

COLORADO'S

NONPOINT SOURCE

MANAGEMENT PROGRAM

January 10, 2000

prepared by the
Water Quality Control Division
Colorado Department
of
Public Health and Environment

in cooperation with the
Colorado Nonpoint Source Council



Colorado Department
of Public Health
and Environment

FORWARD

COLORADO'S APPROACH TO NONPOINT SOURCE MANAGEMENT

The overall goal of Colorado's nonpoint source program is to restore to full use those waters, both surface and ground water, 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.

Inherent to this goal is a multi-phase, iterative process that leads to accomplishment of the goal.

- The process begins with assessment and clear identification of the pollution currently causing impairments, or potential impairments, to Colorado's waters. Stream segments known to be impaired are listed in the state's 303(d) list. Streams with potential for impairment may be identified in the state's 305(b) report, 208 water quality plans, or other agency plans and assessments. Categories of pollution sources were identified in the *1988 Nonpoint Source Assessment Report*, and include agriculture, silviculture, urban and construction runoff, inactive and abandoned mines, and hydrologic modification.
- Targeting then takes those impaired streams and further refines the level of knowledge to quantify the pollution causing the impairment and characterizing the contribution and contributing activity or location of each identified source. Targeting on potentially impaired streams similarly characterizes the potential sources of impairment.
- The next phase, prioritizing the pollution sources for treatment, considers a number of inter-related criteria, including but not limited to: severity of the contribution, feasibility of proposed treatment, level of improvement expected from the treatment, and willingness of the land owners and managers to make the necessary changes to minimize pollutant loading.
- Remediation or treatment plans are developed for the prioritized treatment sites. These plans may be developed at the watershed scale or on an individual, site-specific basis, depending on the nature of the pollution, as well as other factors such as the best management practices selected for the effort. Within the plan will be identified the best management practices or measures that will be used to reduce pollutant loading. The plan will also include quantified treatment goals, i.e., how much of each BMP is required to reduce pollutant loading and accomplish the goal of the plan.
- Appropriate funding sources are identified after the treatment plan is formulated.

- Implementation commences, based on the schedule outlined in the plan.
- Evaluation and monitoring, including reassessment of the stream segment or other water body to determine if the impairment has been corrected, are part of the iterative process.

Ideally, a local stakeholder group is established very early in the process, along with identifying an entity who meets state contracting requirements, and can act as a contracting party for the stakeholders, if necessary. Local stakeholder involvement is critical to the success of a voluntary program for improving water quality in the state.

While it is the long term goal of Colorado's Nonpoint Source Management Program to improve and protect the quality of water in Colorado, the attainment of that goal, for many stream segments, extends over a long period of time. Although the impairments have been identified for a number of stream segments, as noted in the 303(d) list, further assessment is needed to characterize the situation, develop the appropriate treatment options, establish stakeholders, etc. Currently, the level of assessment in Colorado does not lend itself to highly specific, short term remediation goals on many impaired stream segments.

Colorado's program is divided into several chapters. Chapter One is the overall program document. This section describes the history of nonpoint source management in Colorado as well as outlines the updated program for future activity. It provides the framework into which the other sections fit.

The remaining chapters are individual, categorical management plans for the major NPS pollutant categories and important programmatic activities such as information and education. Each section contains a description of the NPS concerns, and describes the priority activities that will be conducted to address those concerns. These sections also contain the best management practices identified by the NPS program that may be used to remediate NPS pollutants.

Following the categorical chapters is the Appendix, which contains the major reference documents that relate to the program.

Acknowledgments

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Chapter 1

Overview of the Nonpoint Source Management Program

January 10, 2000

I. INTRODUCTION

A. History of the Colorado Program (1987 - 1998).

With the amendments to the Clean Water Act in 1987, Section 319 authorized the creation of the Nonpoint Source Program. Nonpoint source (NPS) pollution typically comes from dispersed sources such as sediment from construction sites or nutrient rich runoff from agricultural lands, as contrasted with point source pollution which comes from a discrete conveyance such as a pipe from an industrial facility.

The Water Quality Control Division (Division) of the Colorado Department of Public Health and Environment was given primary responsibility to administer the nonpoint source program. In May 1987 the Division established an NPS Task Force (now called the NPS Council) to serve as an advisory group and work group and assist the Division in creating the NPS program.

Section 319 required two major activities to initiate the program: an assessment report that describes the impact of nonpoint sources on the water resources of a state, and a management program that outlines how the state proposes to address the impacts identified in the assessment report.

- ! *Colorado Nonpoint Assessment Report* was originally approved in 1988, and updated in November 1989. This assessment is superceded by the *Status of Water Quality in Colorado 305(b)* report.
- ! *Colorado Nonpoint Source Management Program* was originally approved in 1989, and updated in October 1990. This updated management program replaces the 1990 document.

Colorado's NPS program is two tiered:

- ! The program level identifies and prioritizes NPS issues, coordinating resources and partners to address these issues, and tracking progress in water quality improvement.
- ! 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.

B. Accomplishments of the Original Program

Over the years Colorado's NPS program has been successful in addressing both the milestones and priority watersheds identified in the original management program.

For example:

- The Natural Resources Conservation Service developed standards and specifications for nutrient and pest management, as well as a soil/pesticide interaction table.
- A memorandum of understanding was developed between the Bureau of Land Management and the WQCD for addressing nonpoint sources on BLM lands.
- The U.S. Forest Service revised its Watershed Conservation Practices to provide guidance on how to accomplish water quality goals during the various activities on federal lands.
- 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 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 have had some level of activity initiated. The level of activity ranges from full-scale watershed remediation efforts, to additional assessment to better define the NPS problem, to the establishment of stakeholder organizations.

In addition, we are beginning to see the results of the investments made in controlling nonpoint sources. While the "long-view" is required to see measurable improvements in water quality, several projects have produced incremental improvements.

The Badger Creek Watershed Project is an example of the difficulty in measuring improvements across a broad geographic area. The goal of this agricultural project is to improve water quality in the Arkansas River, to which Badger Creek is a tributary, and improve brown trout habitat. After the implementation of a number of range management practices, a number of ecological indicators show a trend toward improvements. For instance:

- ▶ monitoring indicates a general upward trend in vegetation, soil, stream channel geometry in areas where land management changes were implemented;
- ▶ vegetation changes include increase cover and frequency of species, plant diversity and a general increase in plant vigor;
- ▶ early data indicates a reduction in sediment transport per volume of water, which infers more sediment is remaining in the watershed;
- ▶ riparian restoration efforts have allowed more willows to appear, and improved their vigor;
- ▶ the channel of Badger Creek itself is deepening and narrowing in some areas, indicating its transition to a more stable channel.

An example of improvements resulting from treatment of abandoned mine sites is demonstrated by the impact of the Sunbank Mine Closure project on Placer Gulch in the Animas River Watershed. Mine waste dumps were removed from Placer Gulch and consolidated and revegetated on the adjacent hillside, and five settling ponds/wetlands were constructed where the mine dumps were removed.

- ▶ The pre-project pH of water in Placer Gulch downstream was 4.87, compared to more than 6.0 in recent samples.
- ▶ Iron and zinc loading from the mine was reduced between 1994 and 1997.
- ▶ Acid rock drainage is reduced by the consolidation and stabilization of the waste materials, reducing the ingress of oxygen and water, which reduces sulfide oxidation.

Another example of mining-related improvements is in the Chalk Creek Watershed, in the Upper Arkansas River Basin. A 1998 report prepared by the Hazardous Materials and Waste Management Division described the impact of an early nonpoint source project.

In 1991, the Division of Minerals and Geology coordinated an effort to consolidate tailings piles related to the Mary Murphy Mine, and route the acid drainage from the Golf Tunnel through a constructed wetland before it flowed into Chalk Creek. Data collected between 1990 and 1994 indicates that below the consolidated tailings site during first flush flows (March and April), copper loading decreased by 97%; iron loading was reduced by 93%; manganese loading decreased by 99%; and zinc loading was reduced by 94%. During high flows (May and June) aluminum loading decreased by 47%; iron loadings were reduced by 62%; manganese decreased by 69%; and zinc loading was reduced by approximately 30%. During low flow periods (August to October) copper loading decreased by 41%; iron decreased by 70%; manganese was reduced by 92%; and zinc decreased by 25%.

In addition, biotic sampling conducted by the Division of Wildlife following implementation of the tailings consolidation, in 1994 and again in 1997 indicates the recovery zone has moved further upstream, from 12 miles to approximately 4 miles below the mining activity, with greater number of individuals, greater species diversity, and more age classes represented when compared with the baseline data.

Table 1 summarizes the nonpoint source project activity, either completed or underway, with funding from Section 319(h).

Table 1. Projects Funded with 319(h) Funds, 1990 through 1998

PROJECT TITLE	YEAR	PROJECT SPONSOR	STATUS	PROJECT CATEGORY	PROJECT TYPE	319(h) Expense
BADGER CREEK WATERSHED	1990	SANGRE DE CRISTO RC & D	complete	Agriculture	Watershed Projects	\$106,600
BOULDER CREEK PROJECT - PHASE III	1990	CITY OF BOULDER	complete	Flow Regulation/Modification	Watershed Projects	\$43,200
EAST WILLOW CREEK	1990	DIVISION OF MINERALS & GEOLOGY	complete	Resource Extraction	Watershed Projects	\$114,000
NW COLORADO RIPARIAN TASK FORCE	1990	TROUT UNLIMITED	complete	Agriculture	Watershed Projects	\$5,090
NONPOINT SOURCE MONITORING	1990	COLORADO DEPARTMENT OF HEALTH	complete	Cross Cutting NPS Category	Watershed Projects	\$126,639
TECHNICAL ASSISTANCE FOR AGRICULTURE	1990	COLORADO SOIL CONSERVATION BOARD	complete	Agriculture	Watershed Projects	\$31,867
WELLHEAD PROTECTION	1990	COLO WATER QUALITY CONTROL DIV	complete	Agriculture	Groundwater	\$62,452
ANIMAS TARGETING	1991	WATER QUALITY CONTROL DIVISION		Placer Mining	Water Quality Monitoring	\$96,252
BASE PROGRAM	1991	COLORADO WATER QUALITY DIVISION	complete	Cross Cutting NPS Category	Other	\$113,276
CHATFIELD LEMNA	1991	DENVER REGIONAL COUNCIL OF GOVTS.	complete	Urban Runoff	Watershed Projects	\$84,000
DMG TECHNICAL ASSISTANCE	1991	DIVISION OF MINERAL AND GEOLOGY	complete	Abandoned Mining	Technical Assistance	\$46,700
DRUID MINE-SOUTH WILLIS GULCH	1991	SOLUTION GOLD, LTD.	complete	Resource Extraction	Watershed Projects	\$51,000
LONGMONT COMPOSTING PROJECT	1991	LONGMONT SOIL CONSERVATION DISTRICT	complete	Feedlots - All Types	Demonstration Projects	\$17,087
LOWER S. PLATTE WATER QUALITY BMP'S	1991	COLORADO STATE UNIV. - COOP. EXT.	complete	Irrigated Crop Production	Technical Assistance	\$123,392
N. FORK OF REPUBLICAN RIVER BMP'S	1991	YUMA COUNTY SOIL CONSERVATION DIST.	canceled	Agriculture	Watershed Projects	\$8,750
NORTHWEST RIPARIAN EDUCATION PROJECT	1991	NORTHWEST COLORADO RIPARIAN TASK FORCE	complete	Range Grazing - Riparian	Preparation of Materials	\$8,450
SMALL LOT GRAZING BMP'S AND COMPOSTING	1991	BOULDER VALLEY SOIL CONSERV DIST.	complete	Agriculture	Water Quality Monitoring	\$44,164
WEST SLOPE GROUNDWATER MONITORING	1991	DIVISION OF WATER RESOURCES - DNR	complete	Other	Groundwater	\$42,482
CLEAR CREEK WATERSHED FORUM	1992	DEPT. OF HEALTH - WATER QUALITY DIV	on schedule	Cross Cutting NPS Category	Watershed Projects	\$30,000
COLORADO CONSERVATOR - PHASE II	1992	COLO. ASSOC. OF SOIL CONSERV. DIST.	complete	Cross Cutting NPS Category	Statewide I&E	\$53,720

PROJECT TITLE	YEAR	PROJECT SPONSOR	STATUS	PROJECT CATEGORY	PROJECT TYPE	319(h) Expense
EAST WILLOW CREEK (CREEDE)	1992	DIVISION OF MINERALS AND GEOLOGY	complete	Resource Extraction	Watershed Projects	\$13,163
NONPOINT SOURCE MINING RESOURCE CENTER	1992	COLORADO SCHOOL OF MINES	complete	Resource Extraction	Statewide I&E	\$31,151
PENNSYLVANIA MINE	1992	BOULDER INNOVATIVE TECHNOLOGIES	complete	Resource Extraction	Watershed Projects	\$54,972
S. PLATTE BASIN NONPOINT MONITORING	1992	CITY AND COUNTY OF DENVER	complete	Urban Runoff	Watershed Projects	\$152,878
SAN LUIS VALLEY WATER QUALITY DEMO	1992	CENTER SOIL CONSERVATION DISTRICT	complete	Agriculture	Groundwater	\$107,818
STRAIGHT CREEK	1992	COLORADO DEPT. OF TRANSPORTATION	complete	Road Construction/ Maintenance	Watershed Projects	\$123,909
URBAN WATER QUALITY FACT SHEET	1992	JEFFERSON SOIL CONSERVATION DISTRICT	complete	Urban Runoff	Statewide I&E	\$18,986
COORDINATED RESOURCE MANAGEMENT	1993	COLO. ASSOC. OF SOIL CONSERV. DIST.	complete	Range Land	Statewide I&E	\$30,000
IRRIGATION & NUTRIENT MANAGEMENT	1993	NORTHERN COLORADO WATER CONSERVANCY	complete	Irrigated Crop Production	Statewide I&E	\$129,000
LONDON EXTENSION MINE	1993	DIVISION OF MINERALS AND GEOLOGY	continued to FY98 grant	Subsurface Mining	Watershed Projects	\$138,300
LOWER S. PLATTE GROUNDWATER MONITORING	1993	LOWER S. PLATTE WATER CONSERVANCY	complete	Irrigated Crop Production	Groundwater	\$84,300
NONPOINT SOURCE BASE PROGRAM	1993	DEPT. OF HEALTH - WATER QUALITY DIV	complete	Cross Cutting NPS Category	Other	\$289,880
ST. KEVIN'S GULCH	1993	DIVISION OF MINERALS & GEOLOGY	canceled	Resource Extraction	Watershed Projects	\$73,380
ST. MARY'S MINING PROJECT	1993	COLORADO DIV. OF MINERALS & GEOLOGY	complete	Subsurface Mining	Technology Transfer	\$44,100
STATEWIDE NONPOINT SOURCE EDUCATION	1993	DEPT. OF HEALTH-WATER QUALITY DIV.		Cross Cutting NPS Category	Statewide I&E	\$117,728
AGRICULTURAL PESTICIDES RECOVERY	1994	COLORADO STATE UNIVERSITY COOP EXT.	complete	Hazardous Waste	Demonstration Projects	\$75,000
ANIMAS RIVER FEASIBILITY STUDY	1994	WATER QUALITY CONTROL DIVISION	complete	Subsurface Mining	Problem Identification	\$20,000
BENT/PROWERS BEST MANAGEMENT PRACTICES	1994	PROWERS SOIL CONSERVATION DISTRICT	on schedule	Irrigated Crop Production	Watershed Projects	\$156,738
COLORADO CONSERVATOR NEWSLETTER-PHASE 3	1994	CO. ASSOC. OF SOIL CONSERV. DIST.	complete	Cross Cutting NPS Category	Statewide I&E	\$61,950

PROJECT TITLE	YEAR	PROJECT SPONSOR	STATUS	PROJECT CATEGORY	PROJECT TYPE	319(h) Expense
FARMERS INDEP/WESTERN MUTUAL DITCH BMP'S	1994	CEN. COLORADO WATER CONSERV DISTR.	cancelled	Irrigated Crop Production	Watershed Projects	\$125,150
FRENCH GULCH MINE WASTE ENCAPSULATION	1994	DIVISION OF MINERALS AND GEOLOGY	complete	Resource Extraction	Watershed Projects	\$84,000
GAMBLE GULCH II - PERIGO MINE	1994	DIVISION OF MINERAL AND GEOLOGY	complete	Resource Extraction	Watershed Projects	\$78,384
NPS MINING PROJECT TECHNICAL ASSISTANCE	1994	DIVISION OF MINERALS AND GEOLOGY	complete	Resource Extraction	Technical Assistance	\$59,482
PENNSYLVANIA MINE PROJECT - PHASE 2	1994	DIVISION OF MINERALS AND GEOLOGY	expired	Resource Extraction	Watershed Projects	\$206,935
S. PLATTE WATERSHED NPS TARGETING- CONT.	1994	CITY AND COUNTY OF DENVER	complete	Urban Runoff	Watershed Projects	\$6,422
SNAKE RIVER WETLANDS	1994	KEYSTONE/ INTRAWEST, L.L.C.	on schedule	Commercial	Statewide I&E	\$124,725
ST. MARY'S NPS PROJECT	1994	DIVISION OF MINERALS AND GEOLOGY	complete	Surface Mining	Watershed Projects	\$12,840
TECHNICAL ASSISTANCE FOR AGRICULTURE	1994	USDA - NRCS	complete	Agriculture	Technical Assistance	\$24,000
ANIMAS BASIN-MINERAL CREEK FEASIBILITY	1995	DIVISION OF MINERALS & GEOLOGY	complete	Subsurface Mining	Watershed Projects	\$15,000
BADGER CREEK WATERSHED MONITORING	1995	SANGRE DE CRISTO RC&D COUNCIL	on schedule	Agriculture	Monitoring	\$27,690
BASE PROGRAM TECH. ASSISTANCE FOR MINING	1995	DIVISION OF MINERALS & GEOLOGY		Resource Extraction	Technical Assistance	\$67,427
DRY CREEK BASIN PROJECT	1995	SAN MIGUEL BASIN SOIL CONSERV DIST.	complete	Stream Bank Erosion	Trend Assessment	\$128,500
EVALUATION OF INDIV. SEWAGE DISPOSAL SYS	1995	DENVER REGIONAL COUNCIL OF GOVTS.	on schedule	Septic Tanks	Statewide I&E	\$47,000
MINING BMP'S INFO. & EDUCATION	1995	DIVISION OF MINERALS & GEOLOGY	complete	Resource Extraction	Statewide I&E	\$106,500
NONPOINT SOURCE CONTINGENCY PROJECTS	1995	WATER QUALITY CONTROL DIVISION	complete	Cross Cutting NPS Category	Statewide I&E	\$9,740
NONPOINT SOURCE POLLUTION EXHIBIT	1995	DENVER CHILDREN'S MUSEUM	complete	Cross Cutting NPS Category	Statewide I&E	\$75,000
NONPOINT SOURCE TARGETING - S. PLATTE	1995	DENVER DEPT. OF HEALTH & HOSPITALS	complete	Commercial	Problem Identification	\$21,419
OWL MOUNTAIN WATERSHED PROJECT	1995	COLO. WILDLIFE HERITAGE FOUNDATION	complete	Range Land	Watershed Projects	\$75,000

PROJECT TITLE	YEAR	PROJECT SPONSOR	STATUS	PROJECT CATEGORY	PROJECT TYPE	319(h) Expense
PLACER GULCH MINING REMEDIATION	1995	MINING REMEDIAL RECOVERY COMPANY	complete	Subsurface Mining	Watershed Projects	\$96,300
SAN LUIS VALLEY WQ DEMONSTRATION PROJECT	1995	CENTER SOIL CONSERVATION DISTRICT	complete	Irrigated Crop Production	Watershed Projects	\$125,000
ST. MARY'S MINING PROJECT	1995	DIVISION OF MINERALS & GEOLOGY	complete	Subsurface Mining	Watershed Projects	\$72,485
STATE NPS MONITORING - LABORATORY COSTS	1995	WATER QUALITY CONTROL DIVISION	complete	Resource Extraction	Trend Assessment	\$23,055
TELLURIDE URBAN RUNOFF MITIGATION	1995	TELLURIDE INSTITUTE	complete	Other	Statewide I&E	\$15,270
URBAN CONSTRUCTION BMP'S EDUCATION	1995	DENVER REGIONAL COUNCIL OF GOVTS.	complete	Urban Runoff	Statewide I&E	\$69,000
WELLHEAD PROTECTION GUIDEBOOK	1995	COLORADO WATER QUALITY CONTROL DIV.	complete	Cross Cutting NPS Category	Dissemination of Information	\$75,000
ANCHOR/POZO MILL TAILINGS RECLAMATION	1996	DIVISION OF MINERALS & GEOLOGY	on schedule	Mill Tailings	Demonstration Projects	\$30,000
ANIMAS BASIN MINE WASTE CONTROL PROJECT	1996	SAN JUAN RESOURCE CONSERV. & DEVEL.	on schedule	Mine Tailings	Watershed Projects	\$89,475
ANIMAS TARGETING PROJECT - CEMENT CREEK	1996	COLO. DIV. OF MINERALS AND GEOLOGY	complete	Mill Tailings	Problem Identification	\$46,200
BRUSH CREEK STABILIZATION & RESTORATION	1996	TOWN OF SNOWMASS VILLAGE	on schedule	Residential	Watershed Projects	\$142,500
BUFFALO CREEK BIOSOLIDS ECOSYSTEM	1996	COLO. STATE UNIVERSITY TESTING SERV		Harvesting, Reforestation	Watershed Projects	\$20,000
COLORADO ANIMAL FEEDING OPERATIONS	1996	COLORADO LIVESTOCK ASSOCIATION	on schedule	Animal Holding/ Management Areas	Statewide I&E	\$42,900
CREATED WETLAND HABITAT	1996	OVERLAND TRAIL MIDDLE SCHOOL	complete	Cross Cutting NPS Category	Statewide I&E	\$2,500
DEMO. OF BMP'S FOR IRRIGATED AGRICULTURE	1996	NO. COLORADO WATER CONSERVANCY DIST	complete	Irrigated Crop Production	Demonstration Projects	\$112,000
GOLF COURSE BMP'S	1996	WRIGHT WATER ENGINEERS	complete	Cross Cutting NPS Category	Statewide I&E	\$2,000
HARVEY PARK LAKE EDUCATION PROJECT	1996	KUNSMILLER MIDDLE SCHOOL	complete	Cross Cutting NPS Category	Statewide I&E	\$1,500
LOWER GUNNISON BMP'S EDUCATION	1996	SHAVANO SOIL CONSERVATION DISTRICT	complete	Agriculture	Statewide I&E	\$22,650
OUTDOOR CLASSROOMS FOR URBAN WATERSHEDS	1996	CITY OF FORT COLLINS	on schedule	Urban Runoff	Statewide I&E	\$25,000

PROJECT TITLE	YEAR	PROJECT SPONSOR	STATUS	PROJECT CATEGORY	PROJECT TYPE	319(h) Expense
OWL MOUNTAIN WATERSHED PROJECT	1996	COLO. WILDLIFE HERITAGE FOUNDATION	on schedule	Stream Bank Erosion	Watershed Projects	\$80,000
PERIGO MINE WETLAND	1996	THE LOGAN SCHOOL	complete	Subsurface Mining	Demonstration Projects	\$3,000
THE COLORADO CONSERVATOR NEWSLETTER	1996	CO. ASSOC. OF SOIL CONS. DISTRICTS	complete	Agriculture	Statewide I&E	\$109,227
URBAN TURF NUTRIENT & IRRIGATION BMP'S	1996	NO. COLO WATER CONSERVANCY DISTRICT	on schedule	Commercial	Statewide I&E	\$40,000
WATERWISE COLORADO	1996	UNIVERSITY OF NORTHERN COLORADO	canceled	Cross Cutting NPS Category	Statewide I&E	\$91,819
WETLANDS EVALUATION & ANALYSIS PROJECT	1996	CHERRY CREEK VALLEY W & S DISTRICT	on schedule	Urban Runoff	Demonstration Projects	\$19,000
YOUTH CONSERVATION WORKSHOP	1996	W. GREELEY SOIL CONSERVATION DIST.	complete	Cross Cutting NPS Category	Statewide I&E	\$1,000
BONANZA MILL TAILINGS REMEDIATION	1997	SLV EARTH MOVERS, INC.	complete	Mill Tailings	Demonstration Projects	\$46,500
FRASER RIVER NONPOINT SOURCE PROJECT	1997	WINTER PARK RESORT	on schedule	Commercial	Watershed Projects	\$114,000
RIO BLANCO RIVER RESTORATION PROJECT	1997	SAN JUAN WATER CONSERVANCY DISTRICT	on schedule	Hydrologic Modification	Watershed Projects	\$96,000
SILVICULTURE BEST MANAGEMENT PRACTICES	1997	COLORADO STATE UNIVERSITY	on schedule	Silviculture	Technology Transfer	\$67,500
319 INFORMATION PROCESS AND DISSEMINATION	1998	Ozac Enterprises	on schedule	Cross Cutting NPS Category	Statewide I&E	\$17,303
ANIMAS RIVER TARGETING CONTINUATION	1998	DIVISION OF MINERALS AND GEOLOGY	on schedule	Resource Extraction	Water Quality Monitoring	\$64,500
ANIMAS TMDL FRAMEWORK DEV.	1998	SAN JUAN RC&D	on schedule	Resource Extraction	Technical Assistance	\$86,400
CHALK CREEK MINE GROUND WATER SOURCE CONTROLS	1998	DIVISION OF MINERALS AND GEOLOGY	on schedule	Resource Extraction	Watershed Projects	\$98,000
COLORADO CONSERVATOR CONTINUATION	1998	COLORADO ASSN. OF SOIL CONSERVATION DISTRICTS	on schedule	Cross Cutting NPS Category	Statewide I&E	\$37,800
CONTINGENCY I&E PROJECTS	1998	VARIOUS	on schedule	Other	Statewide I&E	\$21,036
DRIVING GUIDE TO RIPARIAN AND WETLAND RESTORATION IN COLORADO	1998	COLORADO RIPARIAN ASSOCIATION	on schedule	Cross Cutting NPS Category	Statewide I&E	\$12,000
DRY CREEK BASIN CRMP CONTINUATION	1998	SAN MIGUEL BASIN SOIL CONSERV DIST.	on schedule	Agriculture	Watershed Projects	\$125,000

PROJECT TITLE	YEAR	PROJECT SPONSOR	STATUS	PROJECT CATEGORY	PROJECT TYPE	319(h) Expense
IMPROVED NUTRIENT AND IRRIGATION MANAGEMENT PRACTICES FOR URBAN TURF CONTINUATION, PHASE 2	1998	NORTHERN COLORADO WATER CONSERVANCY	on schedule	Urban Runoff	Demonstration Projects	\$37,600
INNOVATIVE TREATMENT SYSTEMS	1998	TOWN OF TELLURIDE	on schedule	Urban Runoff	Watershed Projects	\$102,145
LONDON EXTENSION	1998	DIVISION OF MINERALS AND GEOLOGY	on schedule	Resource Extraction	Watershed Projects	\$53,160
MOUNTAIN DRIVEWAYS BMPs	1998	WRIGHT WATER ENGINEERS	on schedule	Road Construction/Maintenance	Technical Assistance	\$7,200
NPS MONITORING	1998	WATER QUALITY CONTROL DIVISION	on schedule	Other	Water Quality Monitoring	\$18,000
SLV AGRICULTURAL MANAGEMENT PRACTICES EFFECTIVENESS ASSESSMENT	1998	CENTER SOIL CONSERVATION DISTRICT	on schedule	Agriculture	Groundwater	\$37,576
WATER AND NUTRIENT MANAGEMENT DEMONSTRATION AND EDUCATION	1998	IRRIGATION RESEARCH FOUNDATION	on schedule	Irrigated Crop Production	Demonstration Projects	\$93,013
WHERE DOES THE WATER GO AFTER SCHOOL	1998	THE CHILDREN'S MUSEUM	on schedule	Cross Cutting NPS Category	Statewide I&E	\$91,400

C. Major Trends Shaping the Future of NPS Management (1999 - 2000 and beyond)

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. New "top down" and "bottom up" influences, as well as the reorganization of the Division, led to major changes in the NPS program.

From the "top down" perspective, the major influences for change were:

- ! **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 are now impacted by regulatory processes, making it clear that the management of NPS pollution encompasses both voluntary and regulatory approaches. For example:

Stormwater management became a permitted requirement for cities over 100,000 and for selected industries, such as mining and construction sites over five acres, in 1992. With stormwater regulatory requirements for cities between 100,000 and 50,000 scheduled to go into effect in 2002, and stormwater

requirements also being applied to abandoned mine lands (AML), it is clear that the trend is continuing.

- ! Unified Watershed Assessment (UWA). The Clean Water Action Plan (CWAP) of 1998 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 activity in the near term, the first two years. A key feature of the Clean Water Action Plan prescribes any "new" NPS funds appropriated by Congress are to be used only in high priority Category 1 watersheds.

- ! Renewed Emphasis on Targeting Tools. It is apparent that the UWA and CWAP emphasis on Category 1 watersheds constitutes a significant targeting tool. Additionally, the 1998 303(d) list constitutes another targeting tool. The 303(d) listed segments are those that are "impaired" and require development of total daily maximum daily loads (TMDLs). The Total Maximum Daily Load (TMDL) approach will quantify both point, nonpoint and background loadings for impaired segments so that specific water quality improvement strategies can be developed.

From the bottom up perspective, the major influence was:

- ! 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 increases yearly. Most western states are modifying both regulatory and non-regulatory programs to work with local watershed initiatives. These efforts are significant since those stakeholders most intimate with and impacted by the processes in a watershed are at the table in an effort to influence the outcome of those processes, whether natural or human-induced.

Water Quality Control Division Reorganization

In 1997 the Division reorganized around the watershed approach. The two major benefits for the NPS program were the (1) functional linking of related programs such as the Water Pollution Control Revolving Fund which can fund NPS projects, and (2) creation of four new regional watershed coordinator positions. The watershed coordinators represent each of the major basins/quadrants in the state: Arkansas/Rio Grande, Lower Colorado, Upper Colorado, and South Platte. A significant portion of

each watershed coordinator's time is earmarked to the NPS program, providing a strong hands-on, field capability to the program.

D. The Nine Key Elements

The "Nine Key Elements" were 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, and strongly influenced the update of Colorado's 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 ground water.
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.

E. Nonpoint Source Pollution and Water Quality in Colorado

The supporting data for the 1998 Status of Water Quality 305(b) report indicates nonpoint sources are a significant portion of the source of impairment in surveyed streams, rivers and lakes in the state.

Rivers and Streams in Colorado

Total River and Stream miles in Colorado	107,403
Miles surveyed	29,363 (27%)
Miles fully supporting uses	28,083 (96%)
Miles impaired (partially supporting uses, not supporting uses, or uses not attainable)	1,280 (4%)

Leading sources of pollution impairing surveyed river and stream miles	
Resource Extraction	625
Agriculture	418
"Other" unspecified nonpoint sources	291
Municipal point sources, including industrial point sources	238
Urban Runoff/Storm Sewers	58
Hydrologic Modification	26
Silviculture	11
Leading pollutants and processes impairing surveyed river and stream miles	
Metals	963
Siltation	240
"Other" inorganics	173
Pathogens	122
Biodiversity impacts	85
Ammonia	53
pH	50
Oxygen-depleting substances	12

Colorado Lakes

Total significant lakes acres	164,029
Number of significant lakes	1533
Significant lake acres surveyed	59,660 (36%)
Surveyed lake acres fully supporting uses	52,672 (88%)
Surveyed acres partially supporting uses, not supporting uses, or uses not attainable	6988 (12%)

Leading sources of pollution impairing surveyed lake acres	
"Other" unspecified nonpoint sources	6053

Agriculture	615
Resource Extraction	300
Municipal and Industrial point sources	20

Leading pollutants and processes impairing surveyed lake acres	
Metals	6512
Pathogens	476
Ammonia	476
pH	300
Pesticides	20

II. ORGANIZATION OF PROGRAM

A. Institutional Responsibilities

Environmental Protection Agency

The EPA has an active role in the nonpoint source program. This role includes a variety of activities involved in CWA section 319 grant oversight and administration, and technical assistance. EPA reviews and approves the management programs under section 319 and work plans for section 319 funding. As the nonpoint source program becomes more mature, more emphasis is being placed on technical assistance and collaboration to enhance the program. This involves assistance on training, community-based/watershed environmental initiatives, development of total maximum daily loads (TMDLs), best management practices, design of monitoring plans, and special assistance in working with other federal agencies.

Where necessary and appropriate, EPA will provide assistance with other federal agencies where federal activities may not be consistent with the State nonpoint source management program. Within its resource constraints, EPA will provide more sophisticated assistance such as advanced modeling and monitoring tools to assist watershed projects. EPA also provides funds other than section 319, that can assist the nonpoint source program, such as water quality management planning under CWA section 604(b), CWA State Revolving Loan Funds (SRF), and a variety of wetlands and water quality protection efforts under CWA section 104(b)(3).

Water Quality Control Division

The Division has primary responsibility for conduct of the nonpoint source program in Colorado. Included in these responsibilities are preparation and updating of the nonpoint source assessment and management program, maintain the statewide manual of best management practices, prepare lists of nonpoint source funding priorities and any necessary contract administration to achieve the goals of Section 319.

The Division carries out these responsibilities within the framework of both state and federal laws and regulatory requirements. The Division serves as staff to the Water Quality Control Commission in both a regulatory and policy framework.

Water Quality Control Commission

As part of its role in developing and maintaining a comprehensive and effective water quality protection program in Colorado, the Commission approves the major updates of the Nonpoint Source Management Program, and approves the annual priority project list for Section 319 funding.

Nonpoint Source Council

The Division is assisted in nonpoint source decision-making by the Colorado Nonpoint Source Council. The NPS Council (formerly the NPS Task Force) consists of 25 members comprised of agencies and groups involved in efforts to manage these sources and interests which may be affected by these efforts. It was formed in May 1987 at the request of the Division, and serves as a combination advisory and work group to the Division. Although membership is limited, the Council encourages the participation and input of interested individuals and entities.

The first key advisory function of the Council is input to Colorado's NPS Management Program. One means to accomplish this was through an "Oversight Group" comprised of a representative from each Technical Committee (described below). The Oversight Group assisted the Division in developing the goal and general direction for the NPS Management Program. The full NPS Council reviews and inputs to the Draft NPS Management Program report prior to submission to the Commission and to EPA.

The second key advisory function is to evaluate and rank the 319 proposals for funding. This is accomplished through a joint process involving the Division, Council, Technical Committees and Watershed Coordinators. The 319 grant process is described in Section III.

A third key advisory function is to assist in developing coordinated approaches among the entities, including Council member constituencies, interested and involved in addressing NPS water quality problems.

Mission. The Colorado NPS Council proactively promotes a voluntary and cooperative NPS water quality management program for the citizens of Colorado and functions as an advisor to the Colorado Water Quality Control Division related to the Colorado nonpoint source program and

Goal. The goal of the NPS Council is to promote an effective nonpoint source program designed to achieve and maintain beneficial uses of the waters of Colorado.

The Council meets bi-monthly, beginning in January of each year. Meetings are noticed in the Water Quality Newsletter, distributed by the Water Quality Control Commission.

Technical Committees

The Nonpoint Source Technical Committees were organized by the Council around the specific nonpoint source categories within the State of Colorado. Membership on committees is open, and consists of recognized experts in their subject areas. The review and input of these committees ensures that the management program and individual NPS project proposals address specific categorical issues from a technically sound point of view.

The implementation strategy for Colorado's nonpoint source program is embedded within the programs for each of the technical areas and is described in the chapters authored by each of the Technical Committees.

<i>Current NPS Council Technical Committees</i>
Agriculture and Silviculture
Hydrologic Modifications
Information & Education
Mining
Urban & Construction

The categorical committees play a significant role in implementing the management program. Examples of their role include:

- ★ Evaluate best management practices for inclusion in the management program.
- ★ Identify potential project sponsors to address priority action items.
- ★ Provide guidance to potential project sponsors in developing proposals.
- ★ Evaluate technical adequacy of NPS project proposals and recommend on appropriateness for funding.
- ★ Provide input on the updates of each categorical program.

The Division participates on each committee, to serve as a link to the administrative aspects of the program, communicate state programmatic priorities, and advise on emerging issues that may impact implementation of the categorical programs. Membership on the committees is open to the public, and the involvement of industry groups is especially encouraged. The committee meeting schedule is less structured than the Council's, but are typically held bi-monthly, as well.

Other Federal Agencies

With the introduction of the UWA/Category 1 targeting tool and its influence on 319 funding, other federal agencies such as the USDA Natural Resources Conservation

Service (NRCS) now have a more direct role in the nonpoint source program. More detail on the participation of the various agencies is included in *Section V. Partnerships*.

B. Authorities for Managing Nonpoint Sources

Federal Legislation

The amendments to the Clean Water Act in 1987 provided the basis for nonpoint source management. Among the requirements included in Section 319 for state implementation were development of an assessment of waters impacted by nonpoint sources, identification of the categories of nonpoint sources, identification of best management practices and measures that may be used to reduce pollutant loadings. However, several other sections in the Clean Water Act are also used in NPS management.

Section 303(d) requires states to list “Waters Still Needing Total Maximum Daily Loads (TMDLs),” that is, those surface waters not fully supporting their beneficial uses. In Colorado, a large number of the stream segments on the list are impacted by nonpoint sources.

In addition, states are required, in Section 305(b), to report to EPA every two years on the status of water quality within the state. Nonpoint source assessment information is now included in the 305(b) report rather than the separate Nonpoint Source Assessment.

Reauthorization of the Clean Water Act, at this point in time, is not imminent. Therefore, in an effort to refocus federal programs and agency activities to nonpoint source issues, the Administration developed the “Clean Water Action Plan (CWAP)” in 1998. The CWAP outlined a number of significant goals, action items and deadlines for the federal agencies and states.

Colorado Legislation

Primary responsibility for water quality control in Colorado is invested in the Water Quality Control Division and the Water Quality Control Commission, both located within the Colorado Department of Public Health and Environment (CDPHE). The responsibilities of these two agencies are contained in the Colorado Water Quality Control Act (CWQCA).

Water Quality Control Division (WQCD)

The WQCD has administrative responsibility for the federal Safe Drinking Water Act (SDWA) and Clean Water Act (CWA), including Section 319 and the Nonpoint Source Program, and the CWQCA. The Division's overall responsibilities are stated in part 3 of the CWQCA, 25-8-301 through 25-8-308 C.R.S.

Water Quality Control Commission (WQCC)

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. The WQCC has not adopted rules for selection or ranking of nonpoint source projects.

One important provision that must be stated with regard to the promulgating of control regulations is as follows:

25-8-204 (5) C.R.S. "The commission shall not adopt control regulations which require agricultural nonpoint source dischargers to utilize treatment techniques which require additional consumptive or evaporative use which would cause material injury to water rights. With regard to nonpoint source water pollution control related to agricultural practices, the commission and division shall pursue incentive, grant, and cooperative programs in preference to the promulgation of control regulations. When interested water conservation districts, water conservancy districts, and soil conservation districts recommend nonpoint source control activities related to agricultural practices to the division and commission, the division and commission, after consultation with such districts, shall give substantial weight to the recommendations of such districts into the approved program. Except as provided by section 25-8-205.5, control regulations related to agricultural practices shall be promulgated only if incentive, grant, and cooperative programs are determined by the commission to be inadequate and such regulations are necessary to meet state law or the federal act. This subsection (5) does not allocate wasteloads or relieve any source from participation in wasteload allocations determined necessary under any duly promulgated regulations established by the water quality control commission under this section."

Board of Health

The State Board of Health is responsible for adopting rules and regulations and general policies to administer the public health laws of the state. The Board of Health adopts guidelines on individual sewage disposal systems (ISDS). These guidelines establish minimum standards for the location, construction, performance, installation, alteration and use of ISDSs in Colorado. These guidelines are implemented principally through rules and regulations adopted by local boards of health. The accumulative loading of nutrients from ISDSs within specific watersheds has been identified as a nonpoint source issue. Consequently, water quality concerns associated with ISDSs have been included in the urban and construction portion of the Colorado nonpoint source management plan.

Other Institutions with Roles and Responsibilities

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. Issues related to individual sewage disposal systems (ISDS) can be a responsibility of local health departments. Accumulative loading of nutrients from ISDSs at a watershed level has been identified as a nonpoint source issue.

Regional/Areawide Planning Agencies

The Colorado continuing planning process required in section 303(e)(2) of the Clean Water Act and (40 CFR 130.5) 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. Colorado has 14 planning and management regions with five active planning associations or council of governments.

Water quality management plans produced by areawide planning agencies identify management agencies necessary to carry out the water quality management plan and provision for adequate authority for intergovernmental cooperation in accordance with sections 208(b)(2)(D) and 303(e)(3)(E) of the Act. Management agencies recommended by areawide planning agencies (40 CFR 130.9) must demonstrate the legal, institutional, managerial and financial capability necessary to carry out their responsibilities in accordance with section 208(c)(2)(A) through (K) of the Clean Water Act.

Water quality management plans consist of initial plans produced in accordance with sections 208 and 303(e) of the federal Clean Water Act and certified and approved updates to those plans. Continuing water quality planning is based upon local management plans and water quality problems identified in the latest Status of Water Quality report, also known as the 305(b) report. These plans draw upon water quality

assessments to identify priority point and nonpoint water quality problems, consider alternative solutions and recommend control measures, including the financial and institutional measures necessary for implementing recommended solutions.

The regional water quality management planning agencies serve as the local link in the overall Colorado water quality management program. The actions of these agencies, and their associated collective local governments, in regard to nonpoint source management provide essential information to ensure that local water quality goals and objectives are considered in state and federal water quality decision making. Areawide planning agencies have taken an active role in nonpoint source management through involvement on the *Nonpoint Source Council* and they will continue to proactively serve the *Water Quality Control Division* and associated programs.

Analysis of Enforceable State Control Laws

In 1998 the Environmental Law Institute completed a state-by-state summary of enforcement-based laws that are potentially applicable to nonpoint source pollution. The Institute found that:

“Colorado’s Water Quality Control Act. . . . does not have a general enforceable prohibition that directly applies to nonpoint sources. Instead, the Act confers authority on the Water Quality Control Commission to adopt regulations, which may include nonpoint source regulations. The Act specifically requires the use of non-regulatory mechanisms before regulatory approaches may be used for agricultural nonpoint source discharges. It also places express limitations on the use of permits or other control regulations against agricultural nonpoint source discharges.”

III. MANAGEMENT STRATEGY

A. Strategies for Managing Nonpoint Sources

The Watershed Approach in Colorado

The Watershed Approach is one of the major environmental trends of the 1990s. As an example, in 1996 in Colorado there were six stream-based local initiatives (in addition to the basin authorities). By 1998 forty local watershed initiatives had started. Nationally there are between 800 and 1,100 of these locally led stakeholder organizations. The focus for many of these groups, and the reason they were started, is often water quality.

The formation of these local watershed initiatives 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.

The Colorado Water Quality Forum, in their working paper titled “*Colorado Watershed Protection Approach*, (1994)” defined the watershed protection approach as:

an integrated, holistic strategy to protect or attain the desired beneficial uses of waters within a watershed, including, where appropriate, protection of human health and aquatic ecosystems.

The Water Quality Control Division recognized the importance of the watershed approach in 1997 during its reorganization. A key feature of the reorganization was the formation of watershed teams for each of the four major river basins in the state, and the assignment of a “watershed coordinator” for each basin. The teams consist of at least one staff person from each of the functional units within the Division. Through the teams, the organizational structure of the Division now utilizes the watershed approach in two major ways:

- ▶ Program Integration: By creating watershed teams within the Division, individual program activities are better communicated between units and sections, which provides all staff the opportunity to see how their activities relate to a larger, ecological context, and provide the framework for programs to cooperate in on-the-ground activities.
- ▶ Geographic Integration: A geographic focus allows team members to integrate their programs to address needs within a specific geographic boundary, and raises the emphasis from programmatic goals to water resource goals: that is, how can the various tools available to the Division be used cooperatively to improve and protect water quality.

The ramifications of the watershed approach are observed in the Nonpoint Source (NPS) Program in several ways:

- Targeting: With the development of the Unified Watershed Assessment, the state now has an informational tool the public can use to get a “first cut” at what areas of the state are likely to be targeted for restoration activities. In addition, since many of the primary priorities include streams currently identified as impaired, it provides a geographic framework to the 303(d) list, which deals with specific stream segments. Currently, because the UWA map uses the 8-digit USGS Hydrologic Unit Code (HUC) Map, watershed targeting is at a scale of approximately 500 square miles or greater and not highly locally specific. As the map is refined to the 11- and 14-digit levels, these targeting tools will become more meaningful for locally based watershed planning.

- Stakeholder involvement: As stated earlier, the establishment of a local stakeholder group 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.
- Coordination and cooperation: by working within a defined, natural framework, efforts can be combined in such a way as to provide the most “bang for the buck.” Synergism, pooling limited resources, and reaching multiple constituencies can accomplish more than any single effort.
- 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 303(d) list, Total Maximum Daily Load (TMDL) scheduling, and the Unified Watershed Assessment (UWA) priority watersheds. These tools 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 requires that projects proposed for NPS Section 319 funding identify their issues within the context of their local watershed. Another example is the additional funding made available through the Clean Water Action Plan (CWAP) which essentially doubles the Section 319 appropriation available to invest in NPS projects. This funding is referred to as “incremental” money and is intended to be invested in implementing WRASs developed for UWA priority watersheds.

Coordination between NPS Categorical Programs

The watershed approach helps to coordinate activities as necessary between the categorical programs. Priorities for on-the-ground nonpoint source activities are largely established geographically, rather than categorically, which allows the project sponsor to use the appropriate categorical program, or combine categorical programs to address issues within a watershed.

No one categorical program is considered to have pre-eminence over another. The watershed approach allows consideration of both programmatic goals, many of which are identified and included in the categorical programs, as well as environmental goals, which are framed in the overview chapter.

Coordination with the NPS Council

The relationship between the Division and the NPS Council and its committees is the primary implementation mechanism for the nonpoint source program. As the advisory committee for the program, the Council reviews all management program updates, BMP recommendations, and applications for NPS Section 319 grant funding. The categorical committees provide the technical review necessary to assure that the actions and BMPs in the management program, as well as applications for funding, are technically sound and represent the current knowledge in each category.

Working in concert, the committees, Council and Division represent the path a project must travel to obtain a recommendation for funding and approval by the Water Quality Control Commission. Likewise, the committees, Council and Division represent the process for updating the management program, prior to approval by the Commission and submission to the Environmental Protection Agency.

Best Management Practices: How they are selected, used, modified, etc.

Best management practices (BMPs) are both structural and nonstructural techniques which either prevent or reduce pollution from nonpoint sources. Section 319 requires states to identify the BMPs and measures which may be used to reduce pollutant loadings for each nonpoint category of pollutant sources. A list of recommended practices and technologies is included within each of Colorado's categorical chapters.

Implementation of BMPs to correct nonpoint source water quality problems, where such BMPs are identified solely as part of the state Section 319 program, is voluntary in Colorado. Thus, in the absence of independent statutory or regulatory authority, reference in other state and federal enactments to Colorado's Section 319 program, including BMPs developed thereunder, shall not establish an enforceable requirement that BMPs be implemented other than voluntarily.

The recommendation of BMPs is a complex issue, due to the interaction between various natural resources. A watershed as a whole must be considered, to determine true cause and effect for a nonpoint source concern and 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.

B. Federal Consistency

Federal agencies own, manage or otherwise influence a significant portion of Colorado's land area. In fact, 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.

Colorado no longer participates in the "Single Point of Contact (SPOC)" process, as described in Executive Order 12372 which 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 best management practice (BMP) audit process was developed for use in evaluating U.S. Forest Service and Bureau of Land Management activities. A schedule for reviewing activities in each federal forest and BLM resource area in Colorado is currently being developed.

The BMP audits are conducted by the Division 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 Division and agency on the audit tours. BMPs are evaluated for a number of activities, for example, timber sales, road construction, grazing allotments, and ski run stabilization. Should an audit identify areas of concern in how a BMP is implemented, the Division would notify the agency of the findings, and strongly encourage a collaborative process, including the agency, public lands users and the Division, to identify options for improving the use of a particular practice in protecting water quality.

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.

Due to limited resources the WQCD does not aggressively pursue review opportunities for most federal programs. The Division has found it to be far more effective to work with individual agencies on the ground, rather than reviewing documents in a formal, anonymous manner. The following table identifies the federal programs which could have water quality impacts in Colorado.

In the event the Division finds it difficult to achieve the program goals for federal consistency, assistance from the Environmental Protection Agency will be requested to resolve issues.

Table 3: Federal Assistance Programs or Federal Actions with Potential Water Quality Impacts

U.S. Department of Agriculture

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

Department of Transportation

Highway Planning and Construction

U.S. Department of Interior

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
Colorado River Salinity Control Program

Department of Defense

Flood Plains Management Services
Flood Control Projects
Planning Assistance to States
Defense Installations Land Management Plans

C. Hydrologic Modification

In 1992, the Environmental Protection Agency Region 8 approved a separate NPS management program for Hydrologic Modification. The program described a process to assist an individual or entity in identifying and developing programs to minimize nonpoint source water quality impacts resulting from hydrologic modifications.

While evaluating the original hydrologic modification program in preparation for updating it, however, it became apparent there are already a number of statutory authorities that address the operation of water projects, the construction of new water development projects, and the potential impact on water quality.

New water development projects, regardless of size or scope, may trigger a wide range of regulatory processes arising under both state and federal laws. At a minimum, most new water storage or diversion projects need a Clean Water Act Section 404 permit and Section 401 certification. Some projects may require land use authorizations from a federal land management agency such as the US Forest Service or the US Bureau of Land Management. Some county and local governments also have regulatory permitting requirements.

Larger projects require the performance of a NEPA (National Environmental Policy Act) analysis (either an environmental assessment or an environmental impact statement) that describes the affected environment and contains an alternatives analysis and mitigation plan. The NEPA analysis includes consultation with all appropriate federal, state, and local governments in the process of identifying the impacts. Subject to appropriate statutory or regulatory provisions, any adverse water quality impacts associated with these hydrologic modifications will be identified, studied, monitored, and either avoided or mitigated. The bottom line is that for new water development projects, the water quality impacts relating to the construction and operation of these facilities will be identified, evaluated, monitored, and minimized as a result of existing regulatory processes.

In Colorado, the exercise of a water right is protected in the state constitution and reinforced in numerous state statutes. Existing water storage and diversion projects are largely exempt from the regulatory processes described above. However, there are circumstances that could bring an existing water storage or diversion project into a regulatory process: major reconstruction activities, license renewal processes (such as hydropower re-licensing activities under the jurisdiction of FERC), land use authorization renewal actions, master plan revisions (e.g., ski area master plan revisions/expansions), and re-operation of federal water developments projects. As described above, most of these activities trigger a regulatory process that will identify, evaluate, monitor, and minimize or mitigate any water quality impact caused by the permitted activity.

The primary water quality issue related to current hydrologic modification in Colorado is the impact of increased or decreased flows in a natural stream channel. The Hydrologic Modification Program found in Chapter 3 describes Colorado's approach to Hydrologic Modification nonpoint source issues.

D. Ground Water and NPS Management

The "*Profile of Ground Water Protection Program*," published by the Water Quality Control Division in 1998, is included as Appendix D of this Management Program. The Profile provides an in-depth description of Colorado's groundwater protection program.

The State's policy on the preservation and protection of ground water quality for beneficial use is found in Section 25-8-102, of the state Water Quality Control Act. It declares it to be the policy of the State to "prevent injury to beneficial uses made of State waters, to maximize the beneficial uses of water, and to develop waters to which Colorado and its citizens are entitled and, within this context, to achieve the maximum practical degree of water quality in the waters of the State consistent with the welfare of the State." The declaration further states that the "prevention, abatement, and control of water pollution are matters of statewide concern."

In 1984 an effort to establish a statewide ground water quality protection goal, and to identify a strategy to implement the goal was completed. In 1985, an executive order establishing a state goal for ground water quality protection, and an accompanying memorandum of agreement assigning the CDPHE lead responsibility for coordinating ground water protection efforts in the State was established. Fourteen other state agencies were directed to cooperate in the protection of this resource as their statutory authorities and resources allowed.

Colorado's ground water protection priorities are set by the WQCC and the WQCD using information assembled through sources cited in the *Profile* document. Factors considered in setting priorities include the vulnerability of the aquifer, the actual and potential use as a drinking water source, the overall demand, and the severity of the threat.

The Commission and Division have established as their first priority the adoption of standards and classifications to protect shallow, unconfined aquifers that are used heavily as drinking water sources.

Second priority is assigned to shallow, unconfined aquifers with lower demand, followed by deeper, confined aquifers and fractured, bedrock aquifers. The Commission and Division have also set a significant priority on the cleanup of major contaminated sites which have polluted or threaten to pollute area ground water.

Agricultural Chemicals and Ground Water Protection Act, SB90-126

One major component of the NPS program as it relates to ground water is the interaction with the "Agricultural Chemicals and Ground Water Protection Act, SB90-126." This program, whose goal is *"to protect ground water and the environment from impairment or degradation due to the improper use of agriculture chemicals while allowing for their proper and correct use . . ."* This amendment to the Colorado Water Quality Control Act identifies the WQCD, Colorado Department of Agriculture (CDA) and Cooperative Extension as partners in this effort, with CDA being the lead agency.

Numerous educational materials, extensive ground water monitoring, and BMP demonstrations have been accomplished within the SB126 program. Most of the current understanding of ground water quality, especially in major agricultural areas, results from the SB126 monitoring program. The best management practices developed and localized by the SB126 program are incorporated into the Agriculture and Silviculture Management Program.

The NPS Program will work with the SB126 Advisory Committee to develop an incentive program for irrigated crop producers to upgrade their management practices in areas where nutrient and/or pesticide levels are elevated in the ground water.

Generic Groundwater Pesticide Management Plan

The State of Colorado, Department of Agriculture is developing a “Groundwater State Management Plan for Pesticides (SMP),” to prevent pesticide contamination of all groundwater sources of the state through effective management policies and appropriate regulations, and to protect all groundwater as drinking water, including surface water hydrologically connected to groundwater. The plan will include information on groundwater sensitivity and vulnerability, best management practices and program evaluation for effectiveness.

A statewide sensitivity analysis was completed in 1998; it considered four primary factors:

- conductivity of exposed aquifers;
- depth to water table;
- permeability of materials overlaying aquifers; and
- availability of recharge for the transport of contaminants.

This information will be combined with land use data, management practices and pesticide use data to generate groundwater vulnerability rankings. This ranking can then be used to prioritize monitoring efforts, based on the degree of vulnerability.

The Water Quality Control Division, and potentially the Water Quality Control Commission, play an active role in the implementation of this management plan. The Division is required by state statute to actively perform ground water monitoring, vulnerability assessment, and determining if any pesticide detections have exceeded any water quality standard or whether there is a likelihood that a pesticide will in the future exceed any water quality standard.

The Colorado Department of Agriculture and Colorado State University Cooperative Extension are advised of the ground water quality data gathered by the Division regardless of whether a pesticide was detected. If a pesticide is detected which meets or exceeds, or is likely to meet or exceed any water quality standard, the Division notifies the Commissioner of Agriculture. An exceedance or likely exceedance that results from normal pesticide use is considered to be a nonpoint source issues, and triggers a series of responses. The responses are listed below, in order of increasing stringency.

Action	Responsible Agency
Determination of detection	Water Quality Control Division
Continue prevention actions	CSU Cooperative Extension
Increase BMP education	CSU Cooperative Extension
Develop a public wellhead protection area	local municipalities in conjunction with division
Designate an Agricultural Management Area (AMA)	Colorado Department of Agriculture
Require an Agricultural Management Plan (AMP)	Colorado Department of Agriculture
Limit use of the pesticide in affected areas	Colorado Department of Agriculture
Prohibit use of the pesticide in affected areas	Colorado Department of Agriculture
Control regulations on pesticide use	Water Quality Control Commission

Nonpoint source funding through Section 319 grants may be appropriate in several of the early action items.

E. Animal Feeding Operations

As part of the national implementation of the Clean Water Action Plan, the U.S. Department of Agriculture and Environmental Protection Agency developed the “Unified National Strategy for Animal Feeding Operations, 3/9/99.” The national strategy presents USDA and EPA’s plan for addressing the water quality and public health impacts associated with animal feeding operations, with a goal being for AFO owners and operators to take actions to minimize water pollution from confinement facilities and land application of manure. Achieving the goal is based on the national performance expectation that all AFO’s should develop and implement technically sound, economically feasible, and site-specific Comprehensive Nutrient Management Plans (CNMPs) to minimize the impacts of AFOs on water quality and public health. Both the goal and performance expectation depend upon voluntary participation by animal feeding operations.

An animal feeding operations is defined in EPA regulations as:

a lot or facility where 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.

Colorado's Confined Animal Feeding Operation Control Regulation (Regulation No. 81) defines AFO's as

a confined animal or poultry growing operation (facility) for meat, milk, or egg production or stabling wherein livestock are fed at the place of confinement for 45 days or longer in any 12 month period and crop or forage growth is not maintained in the area of confinement, and the facility does not meet one of the criteria for a concentrated animal feeding operation.

An AFO is a CAFO, or concentrated animal feeding operation if:

there are more than 1,000 animal units confined at the facility; or more than 300 animal units are confined at the facility and 1.) pollutants are discharged into navigable waters through a manmade ditch, flushing system, or other similar man-made device; or 2.) pollutants are discharged directly into waters that originate outside of and pass over, across, or through the facility or come into direct contact with the confined animals.

Colorado's CAFO Control Regulation identifies CAFOs similarly, although it only addresses operations with 1,000 or more animal units, and adds an additional criteria for the case-by-case considerations:

The animal feeding operation in a location which reasonably could be expected to adversely affect a hydrologically sensitive area would also be considered a CAFO.

Colorado is a significant beef producing state, generally ranking fourth in the nation for the number of beef cattle on feed. Colorado Agricultural Statistics indicates approximately 2,200 animal feeding operations in Colorado, including feed, dairies and swine. There are also approximately 9,000 ranches not included in the previous number, many of which also raise livestock.

The Water Quality Control Division will develop a state approach to implementation of the National AFO strategy consistent with the CAFO control regulation, which identifies a number of best management practices which are to be utilized by AFOs. This work will address the NPS needs surrounding AFOs. The approach of the Nonpoint Source Program in dealing with AFOs includes several considerations:

1. NPS interaction with AFOs is limited to those that fall outside the requirements for permitting, that is, operations that are not considered concentrated animal feeding operations (CAFOs), and recognizes the voluntary nature of participation in the nonpoint source program.
2. It is critical that the livestock feeding industry be an integral part of developing a state strategy. This approach is analogous to watershed planning; the impacted stakeholder must be included in defining the problem and

identifying the solutions. Industry-led initiatives can significantly increase voluntary adoption of Comprehensive Nutrient Management Plans.

3. A framework for a voluntary, incentive-based approach must be included in the state strategy, including identification of sources of technical and financial assistance. Financial opportunities to explore include Section 319 grants, USDA programs, State Revolving Loan Funds, and state legislative appropriations.

F. Lakes and Reservoirs -- interaction with Clean Lakes Objectives

Colorado's 305(b) report, Status of Water Quality, references more than 1500 lakes and reservoirs in Colorado which are over 10 surface acres in size. These lakes are classified under the state's standards 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 generally 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, Colorado's NPS Program recognizes all surface waters; the same set of targeting tools may be applied to either streams, rivers, lakes or reservoirs.

IV. Program Implementation

A. NPS Program Goal, Objectives and Action Strategies

The goal of Colorado's nonpoint source program is to restore to full use those waters, both surface and ground water, 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.

In order to accomplish the long-term goal of restoring Colorado's waters, the major emphasis of the NPS Program will be to

- a.) complete 38 total maximum daily load allocations for 434 stream miles identified in the 1998 303(d) list as impacted primarily by nonpoint source, by 2006;
- b.) initiate restoration activities in each watershed within two years of TMDL approval, or by 2008 at the latest; and
- c.) attain standards and uses in each identified stream segment by 2015.

It should be noted that this schedule is contingent upon continued Congressional support for appropriations to the Nonpoint Source Program, and also assumes that state and local contributions to the program will continue at current levels. Should funding and resource allocations change significantly, the schedule would also change.

To accomplish the long-term goal of preventing future impairments, the NPS Program will further utilize the Unified Watershed Assessment, cooperating with the Natural Resources Conservation Service to refine the UWA to the 11- and 14-digit levels, as appropriate. This refined assessment will provide the means to

- a.) more accurately target resources in watersheds needing restoration;
- b.) identify watersheds which are currently achieving aquatic resource goals but need attention to prevent impairment;
- c.) more specifically delineate watersheds considered to be truly high quality, or "pristine," and identify any special needs to maintain that high quality; and
- d.) identify those watersheds where additional assessment is needed to quantify the current water quality.

Objective 1: Reduce pollutant loading and/or restore waters where impairments due to nonpoint sources are known, or where problems from nonpoint sources have been identified and reasonably quantified.

Action 1.1: Based on schedule from the 1998 303(d) list, develop TMDLs for waters impaired primarily by nonpoint sources.

- 1.1.1 Straight Creek, source to Blue River: by 6/30/2000

- 1.1.2 Animas River above Durango: by 6/30/2002
- 1.1.3 South Platte River, from 11 Mile Dam to Cheeseman Reservoir: by 6/30/2002
- 1.1.4 Box Canyon, San Juan Basin: by 6/30/2002
- 1.1.5 Trout Creek and tributaries in the South Platte: by 6/30/2004
- 1.1.6 Big Springs Creek in Houselog Creek Watershed, Rio Grande Watershed: by 6/30/2004
- 1.1.7 Boulder Creek from S. Boulder Creek to St Vrain Creek: by 6/30/2004 for aquatic life
- 1.1.8 St. Vrain Creek, Hygiene Road to South Platte River: by 6/30/2004, for aquatic life
- 1.1.9 Lower Rio Blanco River: by 6/30/2006
- 1.1.10 North Fork of the Republican River: by 6/30/2006

Action 1.2: Initiate restoration activities within the watershed of each water body identified in Action 1.1.

- 1.2.1 Within two years of approval of each TMDL identified in Action 1.1, develop at least one restoration project in the contributing watershed or in a contributing subwatershed for those stream segments, to accomplish attainment of standards and uses for each stream segment by 2015.

Action 1.3: Reduce impact to ground water from nonpoint sources.

- 1.3.1 By August 1, 2000 establish an incentive program to encourage producers on irrigated farm land within SB90-126 identified areas to upgrade nutrient, irrigation and pesticide management practices and reduce nutrient and pesticide loading to ground water.

- 1.3.2 By 3/1/2000 develop a draft strategy for “Animal Feeding Operations and the Nonpoint Source Program,” including considerations for comprehensive nutrient management planning. Finalize strategy by 12/31/2000.

- 1.3.3 By 6/30/2004, and using recommendations from the Individual Sewage Disposal Systems Task Force, develop a strategy for quantifying the potential threat to ground water from ISDSs in Colorado. Items identified by the Task Force which should be considered include:

- how to complete an inventory of ISDS by county or watershed;
- a review minimum protective distances between water supply wells and on-systems under the wide-ranging conditions in Colorado;
- how to define watershed carrying capacity.

Action 1.4: Reduce impact to surface water from nonpoint sources, or restore watersheds impaired by nonpoint sources, including implementation of TMDLs

- 1.4.1 Utilize targeting tools such as the Unified Watershed Assessment and the list of TMDLs in Action 1.1 to prioritize and target outreach and planning efforts

on an annual basis, including an annual announcement of the priority needs to be addressed by Section 319 grants.

Objective 2: Increase the understanding of the impacts of nonpoint sources in state waters through assessment.

Action 2.1: Conduct assessment and targeting on specific waters to determine impact of nonpoint sources.

2.1.1 By 12/31/2002, complete selenium targeting activities on the Gunnison River.

2.1.2 By 12/31/2003, complete metals characterization and targeting activities on Willow Creek in the Upper Rio Grande Basin.

2.1.3 By 6/30/2004, begin to assist local stakeholders to organize and coordinate selenium allocation activities in the lower Arkansas River basin.

2.1.4 By 6/30/2000 complete the watershed plan for the North Fork of the Gunnison River, which will identify water quality problems, pollution sources and possible solutions.

Action 2.2: Coordinate monitoring and evaluation (M&E) activities on streams identified in the M&E section of the 1998 303(d) list to determine if stream impairments exist.

2.2.1 By 1/15/2000 complete the MOU with the USFS to provide an individual to the Water Quality Control Division to assist with TMDL issues, coordinate M&E on federal lands and address federal consistency.

Action 2.3: Refine the Unified Watershed Assessment (UWA) as a tool for targeting future restoration, protection and prevention activities. Refinement activities will be coordinated with, and as much as possible facilitated by interested local stakeholder organizations, including soil conservation districts.

2.3.1 By 3/1/2000 complete 11- and 14-digit hydrologic unit digitization, to create a common map layer for future refinements of the UWA.

2.3.2 By 6/30/2000 and in cooperation with the Natural Resources Conservation Service, establish a process for local entities to “nominate” watersheds for inclusion in the Unified Watershed Assessment.

2.3.3 By 3/1/2001 catalog high priority category 1 watersheds from the Unified Watershed Assessment, at 11 or 14 digit basis, to compile record of issues, concerns and activities in each watershed.

2.3.4 By 3/1/2001 and every two or five years thereafter, based on the updates to the 303(d) list and 305(b) report, refine the 1998 Unified Watershed

Assessment to identify the high priority category 1 at the 11- or 14-digit level, as appropriate.

2.3.5 By 3/1/2003 and every two or five years thereafter, based on the updates to the 303(d) list and 305(b) report, refine the category 2, 3, and 4 watersheds identified in the 1998 UWA to categorize sub-watersheds at the 11- or 14-digit level, as appropriate.

2.3.6 Annually, beginning in 4/1/2000, utilize the UWA and other targeting tools to develop grant proposal guidance on programmatic priorities to assist potential 319 project sponsors in project proposal development.

Objective 3: Prevent future impairments of water resources by encouraging locally-led pollution prevention actions on a broad scale, and providing training and tools to prevent NPS pollution.

Action 3.1: Work with local entities to address local water quality concerns.

3.1.1 Utilize the Unified Watershed Assessment, list of category 2 and 3 watersheds to annually prioritize and target outreach and planning efforts with local entities to maintain watersheds that are currently meeting aquatic resources goals, or that support high quality waters.

Action 3.2: Raise the awareness in specific issue areas of the impact urban and suburban development can have on water quality.

3.2.1 By 12/31/2000, develop a BMP manual for small community (non-permitted) stormwater management.

3.2.2 By 12/31/2000 develop a BMP manual for small lot construction practices.

3.2.3 By 12/31/2002, develop a BMP manual for development of large-lot subdivisions.

3.2.4 By 12/31/2002, conduct workforce training in stormwater BMPs.

Action 3.3: Provide training to staff, partners, project sponsors and others in NPS issues.

3.3.1 By 9/30/2001, and biennially thereafter, conduct an inventory of training needs to determine what knowledge or expertise is called for by program participants. Focus on:

- technical training needs, including new technology;
- programmatic needs, i.e., how to focus activities to accomplish program goals;
- administrative needs, i.e., how to manage NPS projects to assure accomplishment of project goals.

3.3.2 Based on inventoried needs, identify or establish appropriate training opportunities.

Objective 4: Determine benefit to the water resource and the NPS Program through monitoring, evaluation and assessment of completed NPS projects.

Action 4.1: Project level sample and analysis plans.

4.1.1 By 2/1/2000, identify the different levels of data collection needed in a project, based on project type and project goals.

4.1.2 By 4/1/2000, develop sample and analysis plan templates for project sponsors to use, based on the different levels of data collection.

4.1.3 By 6/30/2000 complete a Division-wide Quality Assurance Project Plan.

Action 4.2: Post-project monitoring

4.2.1 By 6/30/2000 develop a process to go back to completed NPS watershed projects and determine long-term impacts of BMP implementation.

Action 4.3: Project process total quality improvement process.

4.3.1 By 6/30/2001, and every two years after that, conduct a “debriefing” of the 319 project sponsors who completed projects within that two year period, to determine what worked, what didn’t, and obtain recommendations for continuous improvement.

Objective 5: Raise the level of awareness among the general public of the impact of their activities on the environment, in particular on the water resources.

Action 5.1: Provide a coordinated approach to the NPS information and education strategy.

5.1.1 By 10/1/99 cooperate with Colorado State University Cooperative Extension to provide a staff coordinator for information and education activities.

5.1.2 By 12/31/99 complete a work plan for the Information and Education NPS Program, including short term goals and milestones.

Action 5.2: Improve awareness among the general public within urban and suburban areas.

5.2.1 Conduct a major media campaign in urban and suburban areas to inform residents of their contributions to water quality, by 7/1/2000.

5.2.2 Annually, coordinate with the stormwater permits program to identify educational activities and opportunities which are not covered by permits.

Objective 6. Provide the public with the information they need to change behavior and improve impact on water resources.

Action 6.1: Utilizing results from projects, assure technology transfer of project results.

6.1.1 By 12/31/99 develop a template for NPS project sponsors to use to communicate results and findings of projects.

6.1.2 By 9/39/2001 identify need, and if needed, conduct a "Surge Irrigation Symposium," to bring together the variety of projects and share information.

Objective 7: Develop a productive partnership with the public land management agencies and users of public lands, in a mutually beneficial framework that improves and protects the water resources in the state.

Action 7.1: Improve federal consistency with state water quality goals.

7.1.1 By 2/1/2000 establish an interagency personnel agreement with the U.S. Forest Service, which will provide a USFS staff person to the Division to help the Division coordinate federal lands issues, including monitoring, TMDL development, and best management practice audits.

7.1.2 Annually seek cooperation of appropriate federal land management agencies in monitoring activities in stream segments identified in the 1998 303(d) list and Monitoring and Evaluation (M&E) list, and future 303(d) and M&E lists.

7.1.3 By 6/30/2000, establish a five-year, rotating, best management practice (BMP) audit schedule among the U.S. forests and BLM resources areas, and perform scheduled audits by 9/30 of each year, beginning with 9/30/2000.

7.1.4 By 9/30/2000 evaluate the BMP audit process by using it in the 2000 field audits. By 3/1/2001 modify the audit process, if necessary, to reflect current on-the-ground and programmatic needs.

Objective 8: Conduct a well managed NPS Program.

Action 8.1: Over-all program and management.

8.1.1 By November 1 of each year, unless otherwise negotiated, assure the Grant Reporting and Tracking System (GRTS) is up-to-date for all 319-funded projects. GRTS will be used to track project progress reports, reimbursement requests, match accrual, and overall project management items.

8.1.2 Work with project sponsors to assure their semi-annual reports are submitted on time, and loaded into GRTS by the Division.

8.1.3 By November 1 of each year, unless otherwise negotiated, provide the NPS Annual Report to EPA.

8.1.4 Annually, assure public notification of the 319 grant availability and process occurs in a timely manner, based on the overall schedule, which may change from year to year.

Action 8.2: NPS project contract and fiscal management.

8.2.1 Annually, to the extent extenuating circumstances are not a factor, assure that project implementation plans are approved by the time the annual 319 grant is awarded.

8.2.2 Draft contracts for 319 projects within 14 days of grant award.

8.2.3 Reimbursement requests from projects are approved and submitted for processing within 7 days of receipt from the project sponsor.

Objective 9: Conduct overall program evaluation and iteration.

Action 9.1: Evaluate progress in implementing and accomplishing program goals and objectives.

9.1.1 Beginning in January 2005, and every 5 years thereafter, complete a total management program review, including all categorical programs.

9.1.2 By 9/30/2000 and annually thereafter, complete a review of annual action items, both in the Management Program and Performance Partnership Agreement, record progress and completion on items, and reschedule any items as necessary.

9.1.2 By 9/30/2001, and every two years therefore, complete a review of categorical BMPs and update as necessary.

Action 9.2: Evaluate impact of NPS program on water quality within the state.

9.2.1 Annually, assure NPS considerations are included in basin-wide synoptic sampling and WQCD monitoring plans.

9.2.2 Annually, through the 319 project, assure individual projects have well-designed sample and analysis plans which can determine project success, and identify potential and realized water quality improvements.

9.2.3 Biennially, through the 303(d) listing process and the 305(b) report, report on water quality progress as it relates to nonpoint sources.

B. Nonpoint Source (319) Grant Program

319 Grant Program Guidelines

With the renewed emphasis on the 303(d) List, the advent of the Unified Watershed Assessment, and the increased emphasis on measuring outcomes, the NPS/319 program is becoming much more focused. To assist project sponsors in submitting proposals which meet both program and project criteria, an annual “319 Grant Proposal Guideline” will be prepared jointly by the Division and the Council for project sponsors, to highlight the needs for the coming year.

Annual Grant Proposal Guidance on Priorities for:

Restoration Activities

- UWA Category 1 Watersheds
- 303(d) Impaired Segments List

Protection or Prevention Activities

- High Quality Segments/Watersheds
- UWA Category 2 and 3 Watersheds

Monitoring & Assessment needs:

- Requirements at the project level, or
- Needs that may exist at the watershed level

Information, Education or Demonstration needs

Project Types

Watershed: Watershed projects are those that go beyond demonstrating technology to actually dealing with restoration or prevention in a defined geographic area. They should be comprehensive and address all the major sources of nonpoint source pollution affecting water quality in a watershed. The primary objective should be to reduce the pollutant load from entering the water resources. Watershed projects can be of several types:

- (1) planning if it leads to a watershed management plan with prioritized NPS project sites;
- (2) area-wide on-the-ground projects, which would cover a large portion of the watershed or the entire watershed;

(3) site-specific on-the-ground projects, which would cover a small localized area, if it addresses an issue of widespread concern in the watershed, and whose accumulated effects would result in an improvement to the water resource. These projects are not demonstrations of new or existing technology and are not intended to serve a major information or education purpose, but use existing technology to address a known, identifiable pollution site. One example may be the clean-up of a single mine site using known BMPs. Another example may be implementation of BMPs at a small or medium sized animal feeding operation which is not covered by permit requirements.

Groundwater: Groundwater projects focus on protecting those ground water resources that, if contaminated, would pose significant risks to human health or the environment.

Information & Education (Demonstration): I&E projects usually fall into one of several categories: the production of a distinct information tool such as a brochure or video; educational tools such as curriculum or “units;” training of a particular audience in an NPS topic, such as BMP workshops; demonstration of a particular best management practice or set of practices.

Contingency: Contingency projects are small dollar efforts funded from a set-aside fund that targets NPS information and education efforts; the first priority for these funds are public or non-profit educational institutions. Annually about \$10,000 is available for these projects.

319 Grant Process

The actual process for applying for 319 funds is dynamic and changes to the process may occur annually. The following description is provided for information; contact the State NPS Coordinator for the actual annual deadlines.

Historically 319 proposals were submitted to the State’s NPS Coordinator who distributed them to the five Technical Committees for review. Upon completion of the technical review and the preparation of a proposal report card, the proposals were reviewed by the NPS Council and ranked for funding. With the advent of the watershed approach, the process has been modified to incorporate the Division’s Watershed Coordinators.

Step 1: The Draft Proposal

Draft proposals are due to the state Nonpoint Source Coordinator by April 30 of each year.

Draft Proposal Review. Draft proposals are reviewed concurrently by the Technical Committees, Watershed Coordinators along with regional workgroups, and EPA from their respective points-of-view.

Feedback to Sponsors. Project sponsors are notified by mid-June that:

- project is appropriate for 319 funding, meets the basic guidelines but needs to address issues as outlined in written comments; or

- project is appropriate for 319 funding but is judged not able to meet proposal requirements this funding cycle and should reapply next year after proposal requirements have been met; or

- project is not appropriate for 319 funding or does not fit the NPS program guidelines.

Step 2: Final Proposal Submission

Final proposals are submitted to the NPS Coordinator by July 31 of each year.

Final Proposal Review. A Project Review Committee comprised of a representative from each NPS Council Technical Committee (5), the Council co-chairs, the Watershed Coordinators (4), EPA (1), and the NPS Coordinator (1) will review all final proposals, develop report cards, and forward funding recommendations to the Colorado Nonpoint Source Council. Final proposals are reviewed by the Project Review Committee from an integrated point-of-view.

Any project which (1) does not fit the NPS program guidelines, or (2) is judged not able to meet proposal requirements this funding cycle will be so advised and may be asked to reapply next year.

Step 3: Coordination of Final Project Proposal Ranking

The NPS Coordinator will compile all eligible proposals and their report cards in August and submit them to the NPS Council and EPA for review before the final ranking.

Final Proposal Ranking. The NPS Council will meet in September and review all proposals forwarded by the Project Review Committee. Project sponsors will be invited to make a presentation before the Council. Council will rank projects and recommend to the WQCD a priority list for funding.

Step 4: Approval by the Water Quality Control Commission

The Water Quality Control Division will present the recommended priority project list to the Water Quality Control Commission for their approval. The division will then submit the approved list to the Environmental Protection Agency with the application for nonpoint source grant funding.

General Project Guidance

Projects funded from Section 319 allocations may cover a broad range of activities within the project types listed above. The following guidance for the Colorado program is provided for potential project sponsors to consider.

Coordinators: The NPS program recognizes the need for individual projects to be well-coordinated and managed. A request to cover costs related to a project coordinator would be appropriate within the context of implementing a nonpoint source project. However, “watershed coordinators” outside the context of nonpoint source project implementation would not be eligible.

Monitoring and Assessment Activities: EPA guidance states that no more than 20% of a state’s 319 allocation may be used for assessment activities, including monitoring. Therefore, general monitoring activities will not be considered for 319 funding. However, in some instances, monitoring may be eligible if the data collection leads to load allocation or the targeting and implementation of appropriate best management practices to restore an impaired water body or prevent future impairment.

Evaluation and Monitoring: All projects are required to provide a plan for evaluating whether the 319 project accomplished its identified goals. Projects which utilize funds from the 319 allocation to conduct evaluation and monitoring activities, whether for pre-, mid-, or post- project monitoring or for assessment purposes, will be required to submit a detailed sample and analysis plan (SAP), which reflects the state’s Quality Assurance Project Plan. Guidance is available from the Division on what is required in a SAP. Projects which conduct monitoring or evaluation as part of the match for a 319 grant are also required to submit a SAP; however, the format is somewhat different.

C. Other Tools to Implement the Nonpoint Source Program

One feature of the NPS program is the broad spectrum of ownership and opportunity. While the Colorado Department of Public Health and Environment has primary responsibility for the program overall, many other entities have either a statutory role in improving water quality or a mission-related desire to see improvements occur. Consequently, there are several other opportunities to fund NPS improvement work.

USDA Funding

The U.S. Department of Agriculture has several programs which may be used for nonpoint source activities. For instance, the Small Watershed Program, commonly referred to as the PL566 Program, may provide local land operators with significant cost-share assistance. The Environmental Quality Incentive Program, established in the 1995 Farm Bill, also provides the opportunity for locally identified priorities to

receive cost share assistance. A complete description of USDA programs is included in the Agriculture - Silviculture chapter.

Water Pollution Control Revolving Loan Fund

The State Revolving Loan Fund program provides low interest loans to public entities for the purpose of funding major water quality improvement or protection projects. Nonpoint source projects are eligible, and several changes to the program are pending, which would simplify the process for local NPS project sponsors.

Great Outdoors Colorado (GOCO)

In 1992 Colorado voters approved creation of the Great Outdoors Colorado Trust Fund (GOCO), which receives a portion of Colorado Lottery proceeds to award grants for outdoor recreation, wildlife, and open space. A 15-member Board of Trustees appointed by the Governor oversees the Trust Fund. While nonpoint source projects are not mentioned specifically, several categories of GOCO projects frequently have NPS implications, in particular when considering aquatic habitat and environmental education.

Types of projects eligible for GOCO funds include:

- planning projects that will directly advance the Great Outdoors Colorado Trust Fund's mission of preserving, protecting, enhancing and managing the state's wildlife, park, river, trail and open space heritage.
- capacity building grants for projects that support a new organization or new services of an existing organization which further the Great Outdoors Colorado Trust Fund's mission of preserving, protecting, enhancing and managing the state's wildlife, park, river, trail and open space heritage.
- mini-grants, where applicants may request up to \$10,000 for projects with a total cost of \$20,000 or less that involve acquiring, expanding or enhancing parks, outdoor recreation facilities and environmental education facilities.

D. Lessons Learned and Considerations for Future Projects

There are a number of lessons learned from the projects implemented in the nonpoint source program so far. In more than 100 projects directly funded with nonpoint source grant funds or other agency funds, several common themes have emerged from the best projects.

Lesson 1: The monitoring plan -- and all projects need a monitoring plan, even education projects -- may be the most important part of the plan. Although “moving dirt,” i.e., the actual implementation of the remedial measures, is important to a successful project and certainly must be well-thought out, what matters to policy makers, regulators and Congressional appropriators is whether the project made a measurable difference in water quality. Unfortunately, this determination may literally take years to see in a watershed, especially if the area is large with many different (and potentially competing) land uses. And if the monitoring plan is added as an afterthought, the parameters necessary to actually measure improvement may not be properly identified. The result is an inconclusive project, where it cannot be determined if a difference was made.

Lesson 2: An on-site project manager is critical to the success of a project. Successful projects are those where someone on the local level is dedicated to seeing the project completed. This person doesn't necessarily need to be a technical expert, but needs to be able to follow the project plan, keep it on track, watch out for the details, and generally be sure nothing falls through the cracks.

Lesson 3: The local community must be convinced the project is necessary and will provide benefits not only to the watershed but to the community itself. Even more importantly, the landowners impacted by a watershed plan must be included in the process, and given the opportunity to help identify the practices they will be asked to implement.

Lesson 4: Coordination, cooperation and communication among a broad range of stakeholders, including both the “obvious” participants (e.g. the landowners) and the “less obvious” (e.g. the part-timers or recreationists) will enhance the planning process. Each participant brings different strengths and knowledge to the table, which broadens the base of understanding for all participants, and provides the opportunity for a solution that is unique yet workable for that particular location.

Lesson 5: Coordination, cooperation and communication between similar projects is also very important to project success. It prevents duplication of effort, and allows new projects to learn from earlier ones. Effective new technologies can be more quickly transferred and adopted, pitfalls can be avoided, and “reinventing the wheel” is minimized.

In addition to the lessons learned in Colorado, the Riley Memorial Foundation identified successful projects across the nation in which public agencies were working cooperatively and efficiently to address significant natural resource issues within the context of competitive agricultural production systems. This survey of projects and agency efforts identified several other common characteristics in successful projects.

Successful projects:

- ✧ tend to be organized around geographic areas and a broad common objective;
- ✧ are locally planned and managed;
- ✧ are led by strong, local leadership;
- ✧ applied available programs to achieve a community goal; were not motivated by the need to “implement a national program;”
- ✧ frequently used funds from non-traditional sources.

V. PARTNERSHIPS

While the Water Quality Control Division is administratively responsible for the Nonpoint Source Program, the success of the program is significantly dependent on the interest and on-the-ground participation that currently occurs across a broad range of stakeholders and partners. The Division anticipates continuing assistance from other entities, and will continue to encourage local leadership and participation in implementing NPS program activities. The Division's watershed coordinators are a key component of the state - local interface.

A. NPS Council

The first level of partnership for the nonpoint source program is the Nonpoint Source Council. Table 2 identifies the entities represented on the 25-member Council. While every entity with an interest or responsibility in nonpoint source management or control is not a member of the Council, the broad base of membership covers a large portion of those active

TABLE 2. NPS COUNCIL -- MEMBER AGENCIES AND ORGANIZATIONS

Bureau of Land Management	Denver Regional Council of Governments
Colorado State Soil Conservation Board	Division of Minerals and Geology
Colorado Department of Transportation	Division of Wildlife
Colorado Association of Stormwater and Flood Plain Managers	League of Women Voters
Colorado Cattlemen's Association	Natural Resources Conservation Service
Colorado Corn Growers Association	North Front Range Water Quality Planning Association
Colorado Riparian Association	Northern Colorado Water Conservancy District
Colorado Association of Soil Conservation Districts	Northwest Council of Governments
Colorado Livestock Association	Pikes Peak Area Council of Governments
Colorado River Water Conservation District	Sierra Club
Colorado Department of Agriculture	U.S. Geological Survey
Colorado Mining Association	Water Quality Control Division
CSU Cooperative Extension	Environmental Protection Agency (ex officio)
	Water Quality Control Commission (ex officio)

B. Watershed associations/authorities/forums

The watershed-based approach has been adopted by a number of local and regional initiatives with diverse organizational models and functional roles. Initiatives have focused on site-specific control regulations for targeted pollutants, information-sharing focus, and consolidation of water quality monitoring efforts, source water protection, special stream classification reviews and a wide variety of remediation and restoration projects.

These local watershed groups are expected to play a critical role in implementing the nonpoint source management program. The Water Quality Control Division has

focused attention on these groups and incorporated or invited their membership to participate on the Council's categorical committees. Local involvement in nonpoint source management is recognized as an essential component of the overall Colorado nonpoint source management program. Local groups also serve the valuable function of outreach to the general public.

Water Quality Forum

The Colorado Water Quality Forum was created in 1992 as an informal organization representing a broad spectrum of stakeholder interests. Participants in the Forum include representatives of water suppliers, industrial and municipal dischargers, environmental groups, and federal, state and local government agencies. Its mission is to achieve solutions to Colorado water quality issues through communication and understanding, balancing use and protection of the resource.

Several members of the Forum also serve on the NPS Council. This common membership provides a valuable communication mechanism on nonpoint source issues. Common members increase the distribution of information on important nonpoint source issues, and expand the opportunity for public participation beyond what could be achieved through a single entity.

C. Relational Analysis

The entities referenced above are analyzed relationally in Table 4, *“Agencies and Nongovernmental Organizations, Roles and Current and Potential Partnerships and Interactions.”* The intent is to identify the broad, overall participation in the Colorado NPS Program. The table also identifies several areas where partnerships may be improved or expanded. The Division will work with those entities to determine how to mutually enhance the relationships.

TABLE 3. AGENCIES and NONGOVERNMENTAL ORGANIZATIONS, ROLES AND INTERACTIONS WITH THE NPS PROGRAM

With few exceptions, the information in the table was recorded verbatim from each organization,

ORGANIZATION	SOURCE OF INTEREST IN NONPOINT SOURCE	CURRENT ROLE IN THE NPS PROGRAM	PROGRAMS WHICH ARE BEING USED OR COULD BE USED TO ACCOMPLISH NPS OBJECTIVES	EXISTING INTERACTION OR PARTNERSHIP	OPPORTUNITY TO EXPAND OR ENHANCE INVOLVEMENT WITH NPS PROGRAM
Aquatic and Wetland Company	As a private company, works with clients to help them comply with Clean Water Act requirements.	Technical assistance and on-the-ground implementation of BMPs.	Not applicable.	Current interaction is limited.	Opportunity exists to assist in BMP design and implementation for stream and/or wetland related NPS demonstration or pilot projects.
Central Colorado Water Conservancy District	Provide nitrate data to producers for their nutrient management programs.	Collect nitrate and pesticide data from surface and ground water in Adams, Weld, and Morgan Counties.	Unknown at this time.	Monitor activities of program to maintain awareness.	Unknown at this time.
Colorado Association of Soil Conservation Districts	Mission of the association; also represent 78 local soil conservation districts.	Education assistance and information.	- Teacher conservation workshops - Youth conservation camp - District supervisor training sessions - Grazing Land Conservation Initiative	Member of NPS Council; produced statewide NPS newspaper as the "Colorado Conservator" for a number of years.	Unknown at this time.
Colorado Cattlemen's Association	Belief in "doing the right thing;" legislative and regulatory requirements.	Education assistance.	- State and local information and education efforts.	Member of NPS Council and Agriculture/Silviculture Committee.	Many opportunities to expand, willing to mutually develop enhanced partnership
Colorado Corn Growers Association	Represent many corn producers in the state, who may be impacted by the program.	Education assistance	- State and local information and education efforts	Member of NPS Council and Agriculture/Silviculture Committee Project Sponsor	Continue education and demonstration efforts

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Colorado Department of Agriculture	Legislative requirement, SB90-126.	Technical assistance in SB126 responsibilities.	- BMP publications and programs regarding fertilizer, pesticide and water management - Monitoring program to determine impact of agricultural chemicals on ground water throughout the state.	Member of NPS Council.	- Continue efforts at BMP education, monitoring as well as possible future regulatory aspects. - Potential to use Section 319 funding as incentive to promote BMP adoption in priority areas.
Colorado Department of Transportation	Legislative requirements.	Technical assistance internally to construction personnel on CDOT construction roadway projects regarding erosion control and water quality issues.	Provide education assistance in teaching the "Stormwater Management During Construction" course at Red Rocks community College. Course is required for Erosion Control Supervisor certification on construction projects that require coverage under NPDES permits.	Member of NPS Council.	Continue to provide educational assistance internally, as well as to the Red Rocks course.
Colorado Division of Minerals and Geology	Mission of inactive mine program is to reclaim and restore inactive and abandoned mines, which considers water quality impacts and benefits.	Technical assistance on abandoned mine projects; solicit and encourage project sponsors.	Colorado Inactive Mine Reclamation Program.	Member of NPS Council and chair of Mining Committee.	Currently operating at optimum level with NPS program.
Colorado Division of Wildlife	Mission includes habitat management for wildlife, including aquatic species	Technical assistance in a variety of projects, as well as to private landowners; monitoring assistance in projects through River Watch Program.	Several may provide benefits to water quality: Wetlands Initiative Legacy Project ; Habitat Partnership Program; Riverwatch Program	Member of NPS Council and several committees, including chair of Information and Education Committee; project partner.	Continued participation in Council, committees, and projects.

ORGANIZATION	SOURCE OF INTEREST IN NONPOINT SOURCE	CURRENT ROLE IN THE NPS PROGRAM	PROGRAMS WHICH ARE BEING USED OR COULD BE USED TO ACCOMPLISH NPS OBJECTIVES	EXISTING INTERACTION OR PARTNERSHIP	OPPORTUNITY TO EXPAND OR ENHANCE INVOLVEMENT WITH NPS PROGRAM
Colorado Division of Local Governments	<ul style="list-style-type: none"> - EPA initiative to expand Water Pollution Control Revolving Fund (SRF) financing to NPS projects. - Assist local governments achieve goals, which may include water quality. 	Technical, financial, and education assistance to local governments, including those which may have NPS projects.	<ul style="list-style-type: none"> - Water Pollution Control Revolving Fund, jointly managed with WQCD - Community Development Block Grant program - Energy Impact Assistance Fund 	Current interaction is limited.	<p>Possibilities may include:</p> <ul style="list-style-type: none"> - coordination of 319 funding with SRF funding - making know NPS projects eligible for SRF by adding them to the eligibility list - utilize DLG staff to help plan administrative structures or financing strategies for NPS projects
Colorado Mining Association	Legislative requirements, mission of organization, and watershed responsibility.	Technical assistance in BMP planning and implementation; education.	Provide mining BMPs, information and education products, overall reclamation practices.	Member of NPS Council and Mining Committee.	"Open door" for expansion of partnership.
Colorado Riparian Association	Mission is to protect and enhance the riparian resources of the state.	Participates on NPS Council; has served as chair of Hydrologic Modification technical committee; provides project monitoring.	Information and education projects, e.g., riparian trailers, Driving Guide; sponsor for demonstration projects.	NPS Council member; committee participation.	Opportunities exist in private landowner partnerships for projects that restore or enhance riparian zones.
Colorado State Forest Service	Agency mission is to support forest management efforts to state and private landowners. Water quality is an associated benefit.	Technical assistance on forestry practices with potential nonpoint impacts. Conduct training sessions for loggers and natural resource professionals.	BMP program was funded through Section 319 grant; program will be continued with a series of workshops on specific practices.	Current partnership consists of BMP training program.	Continue to work together on distribution of information to clientele and look for additional needs.
Colorado State University Cooperative Extension	Involvement is related to organization's mission as well as state and federal policy directives.	Educational assistance, especially addressing the agricultural sector.	Statewide Water Quality Education program, with special emphasis in local areas of intense agricultural production.	Member of NPS Council and several technical committees; provide technical support as appropriate to local sponsors; employer for NPS Information and Education Coordinator.	Opportunity to create additional educational partnerships with the NPS program or individual project sponsors.

ORGANIZATION	SOURCE OF INTEREST IN NONPOINT SOURCE	CURRENT ROLE IN THE NPS PROGRAM	PROGRAMS WHICH ARE BEING USED OR COULD BE USED TO ACCOMPLISH NPS OBJECTIVES	EXISTING INTERACTION OR PARTNERSHIP	OPPORTUNITY TO EXPAND OR ENHANCE INVOLVEMENT WITH NPS PROGRAM
Colorado Timber Industry Association	Mission related, as well as personal interest.	Technical and education assistance.	Cooperated with State Forest Service to publish BMP booklet for protecting water quality in timber activities; provide training to membership and other interested individuals.	Project sponsor. Committed to providing and supporting education and training.	Willing to continue current partnership, would like more information to enhance partnership.
Colorado Water Conservation Board	General interest in water quality as it relates to beneficial uses of the water and the Board's statutorily based mission: "to promote the protection, conservation and development of Colorado's water resources in order to secure the greatest utilization of those resources for the benefit of present and future generations . . . "	<ul style="list-style-type: none"> - directly involved in Colorado River Basin Salinity Control Program - funding for several small irrigation BMP demonstration projects - cooperative agreement with U.S. Bureau of Reclamation to provide water conservation planning services to local irrigation districts 	<ul style="list-style-type: none"> - Office of Water conservation demonstration projects and educational programs - CRBSCP and Endangered Fish Recovery Programs could be coordinated to meet other water quality goals, such as the current joint salinity/selenium control demonstration project in the Montrose area. - Irrigation improvement/ rehabilitation projects financed through the construction loan program could incorporate BMP features to facilitate NPS objectives. 	current interaction is minimal.	<ul style="list-style-type: none"> - coordination with CWCB's new Office of Water Conservation and Drought Planning, and CWCB's Instream Flow Protection Program - technical assistance and coordination with the CRBSCP, including financial coordination with Section 319 funding - possible cost-share funding with CWCB Construction Fund Program where water conservation and nonpoint source objectives can be coordinated
Colorado Water Resources and Power Development Authority	Clean Water Act, Water Pollution Control Revolving Fund.	Financial assistance in low interest loans.	Loans to governmental agencies through the Revolving Fund and Small Water Resources Projects.	Current interaction is limited.	Expand the WPCRF loan program to address some of the needs unique to NPS projects.
Councils of Governments	Areawide 208 planning agencies; interest of each organization's management and members.	Technical assistance; implementation and/or monitoring of NPS controls; potential project sponsors; assist member governments in project planning.	Programs related to 208 planning such as listing of problem areas and recommending solutions.	Existing or potential member of NPS Council and committees.	Expand support of locals entities in developing projects for 319 program grants.

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North Front Range Water Quality Planning Association	Areawide 208 planning, correction of NPS problems, and personal interest by organization's management and members.	Technical assistance, implementation and/or monitoring of NPS controls.	Programs related to 208 planning such as listing of problem areas and recommending solutions.	Member of NPS Council and several committees.	Expand support of locals in developing projects for 319 program grants.
Resource Conservation and Development Councils	Interest of member organizations; generally focused on local natural resource and economic needs within a community.	Technical assistance, current and prospective project sponsors, in some instances financial assistance; local project coordination.	Varies among the RC&Ds.	At this time, three RC&Ds have sponsored NPS projects.	Potential to expand involvement to additional RC&Ds in southeast and western Colorado.
Sangre de Cristo Resource Conservation and Development	Purpose of the RC&D is conservation and development of natural resources to provide economic opportunities to the people of the RC&D area.	Coordination of a NPS watershed project and administration of a monitoring program.	- Badger Creek project - Upper Arkansas Watershed Council - Arkansas River Restoration Project	Current interaction is administering 319 funds for monitoring of Badger Creek.	Upper Arkansas Watershed Council may provide leadership to update Upper Arkansas 208 Water Quality Plan. Also continue monitoring of Badger Creek.
Sierra Club, Rocky Mountain Chapter's Water Quality Committee	Interested in any subject related to the purview of the Clean Water Act, and any subject that relates to protection of water quality and stream health in practice. NPS pollution is a "new frontier" for progress in cleaning up the nation's streams.	Involved to some extent in TMDL process and provides comment on NPS grant applications. Also follow federal and state land management issues as they may affect stream health through NPS discharges.	Educating Club members and the public about NPS issues.	Currently a NPS Council member and member of I&E Committee.	Ability to expand involvement is limited due to finite resources.
Soil Conservation Districts	Local initiatives and interest, legislative requirements.	Local project sponsors; technical assistance and possibly financial assistance.	Several SCDs are or have been project sponsors.	Interaction varies among the SCDs.	Potential to increase the number of SCDs who become project sponsors.
State Engineer	Quality and Quantity Relationships.	Information as necessary to assist the Nonpoint Source Council, Division, and project sponsors.	Assistance in the Hydrologic Modification Program.	Interaction as necessary for specific project needs.	Potential to be either a NPS Council member, or member of Hydrologic Modification Committee.

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State Soil Conservation Board	Represent 78 soil conservation districts who have identified water quality as a major concern in their long range programs and annual plans of work.	Sponsored various projects; assist SCDs in preparation of proposals and implementation of projects; liaison between SCDs and other units of government.	<ul style="list-style-type: none"> - Natural Resources Conservation Matching Grants - HB 1041 Funds, to gather natural resource information - Irrigation water management program in the Ogallala Basin -Colorado River Salinity Program cost-share 	NPS Council and committee member; encourage SCDs to develop watershed plans which may become applications for cost share programs.	Act as a sponsor of additional projects, especially information and education.
U. S. Bureau of Reclamation	Federal land management issues, quality and quantity relationships and irrigated agriculture.	NPS Council Member	Assistance to 319 project sponsors.	Technical assistance in agriculture, mining and project selection.	Assistance in Hydrologic Modification Committee.
U. S. Bureau of Land Management	Federal lands issues in regards to nonpoint sources. TMDL's and Federal Consistency	NPS Council Member	Federal Consistency, TMDL's, and Clean Water Action Plan.	Assistance in project selection, and audits of BMP's. Also identification of nonpoint source problem areas.	Update MOU with WQCD, Schedule field audits of BMP's for Federal Consistency.
U.S. Fish and Wildlife Service	Regulatory responsibility for endangered species, migratory birds and their habitat. Mission is: "working with others to conserve, protect and enhance fish and wildlife and their habitats for the continuing benefit of the American people." This includes water quality.	Technical assistance with source identification and habitat restoration.	Environmental Contaminants Program is focused on identifying and preventing harmful contaminant effects on fish and wildlife and restoring resources degraded by contamination.	Current interaction is limited due to staff limitations.	Agency funding is not specific to NPS work so opportunity is limited to technical assistance unless specific fish and wildlife resources are affected.
U.S. Forest Service	Federal lands management issues, TMDL's, Federal Consistency	Federal Consistency Audits, IPA for NPS/TMDL issues.	Federal Consistency, Clean Water Action Plan, TMDL's.	Audits of Best Management Practices.	Become member of NPS Council/Committees of Council.

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U.S. Geologic Survey	Legislative and programmatic mandates	Through cooperative agreements, work with other federal agencies, state and local agencies to study agriculture and silviculture issues that affect earth resources; also larger water quality studies, such as national Water Quality Assessment program.	Data and interpretations are available to the public and can be used to manage water, biological, energy and mineral resources; enhance and protect quality of life; and contribute to wise economic and physical development.	Member of NPS Council; provide assistance to numerous projects.	Continue involvement in new projects.
Urban Drainage and Flood Control District	Interest in NPS is legislative; District was formed in 1967 by the State Legislature for multi-jurisdictional drainage and flood control problems.	Developed technical guidance and criteria on urban best management practices, which are used in the Urban and Construction Management Program.	Municipal stormwater, which is the major focus of the District, was designated as a point source in the 1987 Clean Water Act. However, many District programs have NPS benefits. <ul style="list-style-type: none"> - Master planning on a watershed basis - funding of design and construction projects with local government matching funds - implementation of master planned facilities over long-term times frames - commitment to maintain facilities - preparation of educational materials 	Participates on Urban and Construction Committee of NPS Council; also participates in WQCD 401 Certification/BMP Work Group.	Willing to explore opportunities, but due to the impact of stormwater regulations within the district, expansion of involvement is limited.

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USDA Natural Resources Conservation Service	Legislative requirements.	Technical assistance in planning and on-the-ground BMP implementation.	<ul style="list-style-type: none"> - Environmental Quality Incentives Program - Small Watershed Program - Conservation reserve Program - Emergency Watershed Protection Program - Forestry Incentives Program 	Active partner since 1987, as a member of NPS Council and Agriculture/Silviculture Committee. Coordinate water quality projects with state program priorities.	Continue current partnership.

VI. TRACKING PROGRESS

A. Evaluation of Programmatic Progress

It is the commitment of the Division to monitor progress in accomplishing the broad goals and objectives of this management program. This will be conducted in several ways.

Beginning in 2000, and annually thereafter, the Division and Council will complete a review of the action items scheduled for that year, including items which may be identified in the Colorado Department of Public Health and Environment/Environmental Protection Agency Performance Partnership Agreement, record the progress and completion of scheduled items, and reschedule any items as necessary.

To maintain currency with changing technology, the categorical best management practices will be reviewed every two years, and updated as necessary.

Every 5 years, beginning in January 2005, the entire management program will be reviewed, to document progress in accomplishing the overall objectives and identify changes in policy, program guidance or resource condition which may impact how the program is managed in the future.

B. Monitoring and Evaluation of Water Quality

In addition to programmatic evaluation, it is the intent of the Division to identify the impact of the NPS Program in improving water quality. Recognizing this is a long-term effort, the Division will continue to integrate NPS measurements in its monitoring and assessment activities.

Changes in water quality, which may be attributed to nonpoint source activities, will be documented in each biennial update of the *Status of Water Quality (305b) Report* or the *(303d) List of Water Quality Limited Segments*, as appropriate.

It should be noted that the state's water quality monitoring and assessment activities are dynamic, and additional information is collected each year. Although the Management Program itself will only be updated each five years, each new iteration of the biennial 305(b) and 303(d) reports will be evaluated to identify high priority issues which may need attention by the Nonpoint Source Program prior to its scheduled update. As necessary, newly identified high priorities will be incorporated into interim work plans or the Performance Partnership Agreement, as appropriate, for the NPS Program, and fully incorporated in each management program update.

VII. THE 9 KEY ELEMENTS

as they relate to the Colorado Nonpoint Source Management Program

The 2000 update to Colorado's Nonpoint Source Management Program has incorporated the nine key elements developed jointly by the Association of State and Interstate Water Pollution Control Agencies and the Environmental Protection Agency. The responses detailed below refer primarily on Chapter 1 of the Management Program document, unless otherwise noted.

1. *The State program contains explicit short- and long-term goals, objectives and strategies to protect surface and ground water.*

Colorado's program responds to this key element primarily in *Part IV-A* and includes:

- a vision statement in the form of the overall program goal of restoring impaired waters and preventing future impairments;
- a long-term goal of achieving water quality standards and uses by 2015 for streams identified in Objective 1;
- specific action items with defined products, scheduled over the next several years;
- the use of the biennial 305(b) report and 303(d) list to report statewide changes in water quality as a result of nonpoint source program activity.

2. *The State strengthens its working partnerships and linkages with appropriate State, Tribal, regional and local entities (including conservation districts), private sector groups, citizen groups, and Federal agencies.*

Partnerships are discussed in *Part II-A* and *Part V*. The Colorado Nonpoint Source Council was established early in the Nonpoint Source Program as an advisory group and work group, to assist the Division in developing and implementing program elements.

- The Council consists of 25 members from a wide variety of organizations, including all levels of government, commodity organizations, and public interest groups.
- Council meetings are bi-monthly, and publicly noticed in the Water Quality Newsletter published by the Water Quality Control Commission.
- The Council has several categorical, technical committees with open membership, who serve as work groups to address issues related to specific categories of nonpoint sources, including agriculture, mining, hydrologic modification and urban.
- A matrix outlining the numerous partners and their role in the NPS Program is included.

3. The State uses a balanced approach that emphasizes both State-wide nonpoint source programs and on-the-ground management of individual watersheds where waters are impaired and threatened.

- The action items in *Part IV-A* contain a number of specifically listed watersheds where NPS loads will be allocated and restoration efforts initiated.
- The State will use the EPA Grant Reporting and Tracking System to manage individual projects, and create annual work plans for use with the NPS Council, to track the action items scheduled for any given year.
- The watershed approach, described in *Part III-A*, forms the organizational basis for all activities within Division, including the nonpoint source program.

4. The state program (a) abates known water quality impairments from nonpoint source pollution and (b) prevents significant threats to water quality from present and future activities.

- *Part I-E* describes the supporting data for the 1998 305(b) report. This data indicates nonpoint sources are a significant portion of the source of impairments to Colorado's surveyed streams.
- The 1998 303(d) list and its associated Monitoring and Evaluation List, as well as the 1998 305(b) report, describe the current and potential impairments to Colorado's waters as a result of nonpoint sources.
- The Unified Water Assessment also identified potential future areas of concern related to nonpoint sources.
- The State program included four categorical chapters which address the major categories of nonpoint source pollution in Colorado: agriculture and silviculture; mining; hydrologic modification; and urban and construction. In addition, by including a separate chapter for Information and Education, the program recognizes the need for communicating with the public on the nature of nonpoint sources, and how to address them at the personal level.

5. The State program identifies waters and their watersheds impaired by nonpoint source pollution and identifies important unimpaired waters that are threatened or otherwise at risk. Further, the State established a process to progressively address these identified waters by conducting more detailed watershed assessments and developing watershed implementation plans, and then by implementing the plans.

- *Part I-E* and *Part IV-A* describe how existing assessments form the basis of the State's NPS activities. In addition, the action items in Objective 1 are directly related to the TMDL lawsuit settlement agreement.
- Allocating nonpoint source loads in priority watersheds is scheduled over a 10 year period, with restoration activities in each watershed to begin within two years of load allocations.
- Public participation on nonpoint source issues is handled in large part through the NPS Council and its committees, as described in *Part II-A*. In addition, the

Water Quality Control Commission holds informational hearings on key parts of the NPS program.

- The updated program calls for public notification, on an annual basis, of programmatic priorities for funding in the coming year, as described in Part IV-B. This will include notice of targeted restoration activities, targeted protection or prevention activities, as well as monitoring and assessment needs, and information, education or demonstration needs.
- The program establishes a five year programmatic review process, with biennial reviews of best management practices.

6. The State reviews, upgrades, and implements all program components required by section 319 (b) of the Clean Water Act, and established flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable. The State programs include:

**(A) A mix of water-quality based and/or technology-based programs designed to achieve and maintain beneficial uses of water; and
(B) A mix of regulatory, non-regulatory, financial and technical assistance as needed to achieve and maintain beneficial uses of water as expeditiously as practicable.**

- Best management practices are identified and described in each of the categorical chapters, including information and education.
- In addition, each chapter, as well as Chapter 1, identifies technical and financial resources that may be used in implementing nonpoint source objectives.
- The NPS Council is the primary mechanism for coordinating with other programs that may be used to implement NPS controls in the State; its role is described *Part II-A* of Chapter 1.
- It was determined that a new certification from the State Attorney General was not necessary, since no new authorities have been added to the responsible entities.
- *Part IV-C* describes some of the other resources that may be used in NPS control.
- *Part III-B* describes the process for federal consistency in Colorado, and includes a list of federal programs and actions that may impact water quality.
- Monitoring and evaluation is discussed in several places, including Objective 9 of *Part IV-A* and *Part VI*, Tracking Progress.
- The program also establishes a significant link to the state Agricultural Chemicals and Ground Water Protection Act, which is the primary state law (SB90-126) for addressing nutrient and pesticide use on agricultural lands.

7. The State identifies Federal lands and activities which are not managed consistently with State nonpoint source program objectives. Where appropriate, the State seeks EPA assistance to help resolve issues.

- *Part III-B* identifies the federal programs which could impact water quality in Colorado. This part also describes the process and approach Colorado will use in addressing federal consistency issues. It includes seeking the assistance of EPA to resolve difficult issues.
- The State has developed, and will refine, a process for evaluating best management practice use on federal lands.
- Several federal agencies, including land management agencies, are members of the NPS Council or participants in technical committees. In addition, the Division's watershed coordinators are in regular contact with land management agencies in their respective watersheds. Finally, the establishment of a USFS liaison with the Division, described in *Part IV-A*, Objective 7, provides a crucial link to attaining federal consistency in Colorado.

8. The State manages and implements its nonpoint source program efficiently and effectively, including necessary financial management.

- *Part IV-B* discusses projects in the context of 319 funding. *Part IV-A* identified specific watersheds where restoration activities will be initiated after TMDL development and approval.
- Objectives 8 and 9 in *Part IV-A* describes the State's use of the Grant Reporting and Tracking System and internal performance goals for program management. This includes financial management, both on a project basis and programmatically.
- *Part IV-B* describes the requirement for monitoring and evaluation, and recognizes the importance of M&E in the "Lessons Learned" section.

9. The State periodically reviews and evaluates its NPS management program using environmental and function measures of success, and revises its NPS assessment and management program at least every five years.

- *Part IV-A*, Objective 9 describes the iterative process for evaluating programmatic progress. It is also discussed in *Part VI*.

APPENDICES

The documents included in the Appendix are major references and generally updated on a regular basis. While the NPS Management Program will be updated at five-year intervals, these documents may be updated more frequently. Subsequent documents will also be included as references.

- A. Water Quality Limited Segments Still Requiring TMDLs (303(d) List)
- B. Status of Water Quality in Colorado (305(b) Report)
- C. Profile of Ground Water Protection Program
- D. Unified Watershed Assessment, 11/98