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2003 Annual Report:

Texas Nonpoint Source Pollution Management Program

A Joint Publication of the

Texas Commission on Environmental Quality

in Cooperation With the

Texas State Soil and Water Conservation Board

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April 2004

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LETTER FROM THE EXECUTIVE DIRECTORS

The direction of implementation of the Clean Water Act (CWA) has changed significantly over the past 10 years. The "watershed approach" has been almost universally accepted as the best method of handling pollution of our nation's waters. Where we once looked almost exclusively at point source causes of water pollution, the focus has now shifted toward nonpoint sources (NPS). Two EPA publications, the fiscal year 2003 "Supplemental NPS Guidance," and the fiscal year 2004 "EPA Nonpoint Source Program and Grants Guidelines for States and Territories," have placed further emphasis on using CWA Section 319(h) grants to improve those NPS impaired waters noted on the state's CWA Section 303(d) list of waters what do not meet one or more of their applicable standards for use.

Many states are facing a considerable challenge as a result of these changes. EPA guidelines and priorities may differ from state priorities and the relative timing of planning, assessment, and implementation efforts. NPS pollution prevention requires appropriate timing and the combined and coordinated activities of many organizations at both the state and local levels. The success of a program or project is normally contingent upon multi-agency, multi-jurisdictional, multi-party approaches. In such cases, public participation, partnerships, and stakeholder involvement are crucial. Fortunately, Texas has many programs to address nonpoint source pollution abatement with many state agencies involved in the process.

The Texas Commission on Environmental Quality (TCEQ) and the Texas State Soil and Water Conservation Board (TSSWCB) share leadership for the abatement of nonpoint source pollution within Texas. The TCEQ is responsible for managing urban and other nonpoint source pollution. The TSSWCB is responsible for controlling agricultural and silvicultural nonpoint source pollution. In addition, other state agencies have programs and responsibilities which play integral parts in managing nonpoint sources of pollution. TCEQ and TSSWCB may contract for some aspects of the state's program, such as best management practice implementation, water quality monitoring, and some TMDL projects. TCEQ and TSSWCB contract with research institutions, private consulting firms, or state or local government agencies to accomplish these activities.

The following report describes current projects and the progress of programs in our state for fiscal year 2003. Included are highlights from efforts that reduce or prevent NPS pollution, so that we may ensure the quality of our water resources for future generations of Texans.

Margaret Hoffman
Executive Director
Texas Commission on Environmental Quality

Rex Isom
Executive Director
Texas State Soil and Water Conservation Board

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CHAPTER 1
INTRODUCTION

What is Nonpoint Source Pollution?

Rainfall, like this in downtown Austin, helps create nonpoint source pollution.

Nonpoint source (NPS) pollution results when exposed contaminants, debris, and soil are carried by rainfall runoff into streams, lakes, or bays. For example, pollutants may be washed off lawns, construction areas, farms, or highways during heavy rain, and carried to nearby creeks. Nonpoint source pollution is difficult to control because it comes from everyday activities, such as fertilizing a lawn, using a pesticide, or constructing a road or building. Pollution alters the chemical, physical, biological, aesthetic, or radiological integrity of water. Impairment occurs when the rate at which pollutant materials entering water bodies or groundwater exceeds the water bodies' natural capacity to assimilate them.

The Texas Approach to NPS Management

Who Manages NPS Pollution in Texas?

Because nonpoint sources are numerous and largely unregulated, voluntary and preventive efforts are essential to address NPS pollution in Texas. NPS management requires the combined activities of many organizations at both a state and local level.

Management of NPS pollution in Texas is shared by two agencies. The Texas State Soil and Water Conservation Board (TSSWCB) is responsible for controlling agricultural and silvicultural NPS pollution. The Texas Commission on Environmental Quality (TCEQ) is responsible for managing urban and other NPS pollution.

Other state agencies have programs and responsibilities in managing nonpoint source pollution in Texas. Some aspects of the state's program, such as construction of Best Management Practices (BMPs) and water quality monitoring and assessment, may be performed under a contract with these agencies, research institutions, private consulting firms, or state or local government agencies.

How We Manage NPS Pollution in Texas

The mission of the Texas NPS program is to protect the quality of the state's water resources from the adverse effects of NPS pollution. This protection is provided through cooperative implementation of a diverse range of strategies emphasizing pollution prevention, a watershed approach, and a community-based perspective. The states mission and priorities, and the NPS programs conducted by numerous state, regional, and local entities are incorporated in the *Texas Nonpoint Source Assessment Report and Management Program*. This report to the EPA serves as the state's "road map" for managing the Texas NPS program over a five year period.

Adopting a Watershed Approach

To consider all potential sources of pollution in a watershed when protecting and restoring water quality, and to effectively allocate resources to protect and restore water quality, Texas works with organizations and local residents who have a vested interest in water quality in the watershed. The watershed serves as the focus for monitoring, assessing, and implementing water quality protection and restoration activities. This approach, known as a watershed approach, is also how the state carries out its nonpoint source management practices.

Section 303(d) of the Clean Water Act (CWA) requires states to develop a list of water bodies which do not meet, or are not expected to meet, state water quality standards. Those waters identified on the Section 303(d) list as affected wholly or in part by NPS pollution comprise the state's list of NPS-affected waters required under CWA Section 319(a). Section 319 created the national NPS prevention and control program and a grant program to assist in implementing it.

Encouraging Public Participation

The Texas NPS Program has established a statewide workgroup of stakeholders, including members of the Clean Rivers Program (CRP) Stakeholder Workgroup, as well as representatives from organizations directly affected by and interested in the Texas NPS Program. Membership includes representatives of about 130 state, regional, and local government agencies, along with citizen, environmental, and industry groups.

The TCEQ and the TSSWCB meet with stakeholders at least annually to present information on statewide NPS goals, showcase Section 319 grant projects, and discuss new opportunities for coordination and project collaboration. The workgroup reviews progress, provides feedback on whether the accomplishments are adequate, identifies stakeholder priorities, and suggests options for the direction of the NPS program.

Coordinating Water Quality Programs

The TCEQ established the Water Quality Coordination Team (WQCT) with representatives from each of the agency's water quality programs. The team meets biweekly to coordinate and communicate a multitude of water quality issues and activities, including assessment, standards, total maximum daily loads (TMDLs), permitting, watershed initiatives, and grant priorities. Members evaluate and recommend water quality priorities for the TCEQ and discuss options for how those priorities might be addressed. They also evaluate grant proposals based on state water quality priorities and provided funding recommendations to TCEQ executive management.

Funding NPS Prevention and Control (NPS Grant Program)

Section 319(h) of the CWA established a grant which is awarded annually by Congress to the Environmental Protection Agency (EPA). The EPA then allocates these funds among the states to implement activities supporting the congressional goals for the act. In Texas, the grant is further divided between the TSSWCB and the TCEQ. These agencies are responsible for maintaining a statewide management program to satisfy federal requirements.

For each grant cycle, the TSSWCB and the TCEQ target NPS grant funds toward assessment, implementation, and education projects within the watersheds of NPS-affected water bodies included the state's most current CWA §303(d) list. Grant funds are also used to develop total maximum daily loads (TMDLs) and to implement management practices supporting the restoration goals established in TMDLs.

Update on Texas' Management Plan

The *Texas Nonpoint Source Assessment Report and Management Program* is currently being revised with input from a new advisory committee, established in 2003. The Nonpoint Source Assessment Report and Management Program Advisory Committee is designed to help the state establish a comprehensive list of the programs and priorities to be included in the document.

Specifically, the advisory committee will:

- review and comment on the management program,
- provide input to ensure NPS-related programs throughout the state are represented, and
- provide input on the long and short term goals for NPS management in the state.

CHAPTER 2
ASSESSMENT

Texas focuses TMDL and other water quality assessment activities in high priority NPS-impaired watersheds or other areas where additional information is needed. The TCEQ coordinates assessment activities conducted by appropriate federal, state, regional, and local entities, and ensures input from both private sector and citizen groups.

Coordinated Water Quality Monitoring

The runoff flowing into this creek from an unknown area contributes to nonpoint source pollution.

The TCEQ Surface Water Quality Monitoring (SWQM) Team ensures monitoring efforts are coordinated and make efficient use of limited resources, as required by CWA Section 106. This duty is accomplished by conducting annual meetings for each river basin, coastal basin, bay, and estuary in Texas to ensure that data is collected sufficient for assessment and permitting purposes. These meetings incorporate local, regional, and state water quality monitoring priorities and allocate resources to address these priorities.

The CRP Planning Agencies prepare materials, invite monitoring entities from throughout the basin, host the meetings, and prepare the final approved monitoring schedule outlining commitments. Attendees include river authorities, water districts, state agencies, TCEQ's staff, municipalities, industry, and other local monitoring partners. All of these groups agree to meet the quality assurance requirements of the TCEQ.

The TCEQ and participating entities collect water quality data, and the TCEQ uses it to develop the *Texas Water Quality Inventory and 303(d) List.* The 2002 Inventory and List was approved by the EPA in 2003. Water quality data collected in 2003 will be used for TMDL development, determining site specific stream standards and BMP effectiveness, and for developing permits.

Total Maximum Daily Load (TMDL) Program

A TMDL is a technical analysis that determines the maximum amount of a specific pollutant a body of water can receive and still meet water quality standards. After a TMDL is completed, a state implementation plan is developed describing the regulatory and nonregulatory or voluntary activities necessary to achieve the pollutant reductions identified in the TMDL. There are currently 49 active TMDL projects in Texas. Of these, 41 show NPS as one source of impairment.

Developing and implementing successful TMDLs depends upon cooperation among the general public, businesses, educators, agricultural producers, universities, and others. TCEQ and TSSWCB do not have the authority to implement all of the activities which may be needed to achieve the TMDL goals and restore water quality. Partnerships with other agencies, such as the Texas Department of Agriculture (TDA), the Texas Parks and Wildlife Department (TPWD), and the Texas Department of Health (TDH), are critical to the development of many TMDLs and TMDL implementation plans.

Early on, the TMDL program focused on water quality problems which were better understood and which originated from known sources. Today the state is focusing on more complicated issues, such as impairments from toxic substances, metals, organics, bacteria, and salts, and the link between dissolved oxygen concentrations and healthy aquatic communities. For example, dioxin and mercury impairments both have complex interactions with the environment and can be traced to diverse, widespread sources. The results of developing TMDLs for these more complex problems will be an improved understanding of their origin and of how scientifically sound solutions can restore water quality and protect human health. However, the TCEQ expects many of these complex TMDLs will take a long time to complete, and may be expensive to implement.

Arroyo Colorado Legacy Project

The Arroyo Colorado extends about 90 miles from Mission, Texas, to the Laguna Madre in the Rio Grande Valley. Water quality and fish tissue analyses conducted between 1980-1998 identified DDE, chlordane, toxaphene, and PCBs in fish tissue at concentrations warranting a fish consumption advisory upstream from the Port of Harlingen (Segments 2202 and 2202A).

TCEQ conducted a TMDL project to address these legacy pollutants. The maximum allowable daily load is zero since no additional loading should occur beyond current background levels. Legacy pollutants are substances whose use has been banned or severely restricted by the EPA. No use-related loading of legacy pollutants is allowed or expected due to the EPA restrictions.

The ultimate goal of these TMDLs was to reduce fish tissue contaminant concentrations to levels which constitute an acceptable risk to consumers. Recent sediment core and fish tissue samples collected from the watershed show concentrations of pesticides have declined. This suggests the levels of these pollutants is diminishing.

Clear Creek Project

The Clear Creek watershed drains portions of Fort Bend, Harris, Brazoria, and Galveston Counties. In 1993, a fish consumption advisory was issued for portions of Clear Creek due to elevated fish tissue concentrations of two volatile organic compounds (1, 2-dichloroethane and 1, 1, 2–trichloroethane) and the pesticide chlordane. Nonpoint sources are believed to be the main contributors of chlordane to Clear Creek. Numerous studies have been conducted to determine the extent of contamination and the possible health effects in the watershed.

The environmental goal of this TMDL project has been achieved. Although chlordane concentrations have remained steady or increased in some test data, volatile organic compounds (VOCs) in fish tissue samples are down 90 percent. The health risk from consuming fish has been reduced to acceptable levels, despite the lingering concentrations of chlordane. The TCEQ is continuing to monitor Clear Creek to ensure that water quality improvements will continue. The TMDL Program will fund another risk assessment by the TDH in 2005 to verify that fish caught in Clear Creek are still safe to eat.

Source Water Assessment and Protection Program

The Source Water Assessment and Protection (SWAP) Program has two components: Source Water Assessment and Source Water Protection. The SWAP Program assesses public drinking water sources which may be susceptible to contaminants. SWAP works with local Public Water Supply (PWS) systems to voluntarily implement source water protection projects.

SWAP was created by the 1996 Safe Drinking Water Act (SDWA) amendments to determine how susceptible public drinking water sources are to contaminants. SWAP also shares that information with the public, and implements source water protection activities at the local level.

Specific elements include the location, intrinsic characteristics, contaminant occurrence, point and nonpoint source pollution, and construction. These elements are compared with database records to produce a technically defensible assessment product. The goal of the SWA component is to lead to local Source Water Protection (SWP) implementation.

The nonpoint source component of an assessment involves a statewide investigation to develop statistical relations between known occurrences of nonpoint source contaminants in ground water and the natural and anthropomorphic factors or activities within the capture zone contributing the water.

To supplement existing TCEQ and USGS contaminant occurrence databases, 160 PWS wells are sampled. The PWS wells selected for sampling are located primarily in shallow, unconfined aquifers (those most susceptible to nonpoint source contamination) and have characteristics representative of a range of environmental variables that may influence source water susceptibility.

Washing roadway grime off your car with soapy water will create nonpoint source pollution as it flows down the street and into a waterway.

CHAPTER 3
IMPLEMENTATION

The NPS Program coordinates state, regional, and local programs to reduce NPS pollution. The NPS Program also works closely with the TMDL Program to identify, plan, and often fund practices which support TMDL Implementation Plans in waters affected by NPS. It manages all Section 319 funds efficiently and effectively to target the areas identified as affected by NPS pollution in the latest state-approved Water Quality Inventory required by CWA Section 305(b) and CWA Section 303(d) List.

Specific implementation objectives include:

- Utilize state-approved TMDL Implementation Plans developed to restore and maintain water quality in impaired water bodies identified as impacted by nonpoint source pollution.
- Work with local entities to determine priority areas and develop and implement strategies to address NPS pollution in those areas.
- Facilitate development and implementation of BMPs to address constituents or impairments of concern in watersheds identified as impacted by NPS pollution.
- Provide oversight of contractors' performance to ensure contracts consistently provide quality services and Section 319 funds are spent efficiently, effectively, and in compliance with regulations.
- Ensure monitoring procedures meet quality assurance requirements and are in compliance with TCEQ's and TSSWCB's Quality Management Plans, both of which are approved by the EPA.

Bosque River Restoration Initiative

In December 2002, the TCEQ and the TSSWCB adopted "An Implementation Plan for Soluble Reactive Phosphorus in the North Bosque River Watershed" to implement two TMDLs approved by the EPA in December 2001.

Three practices for controlling nonpoint sources of phosphorus were identified in the plan: 1) phosphorus application rates in waste application fields; 2) reduced phosphorus diet for dairy cows to reduce the phosphorus content of dairy wastes; and, 3) removing approximately half of the dairy-generated manure from the North Bosque River watershed for use or disposal outside the watershed.

Reducing Phosphorus Application Through WQMPs and CNMPs

In order to achieve phosphorus application rates, the TSSWCB provides technical and financial assistance for the development and implementation of Water Quality Management Plans (WQMPs) and Comprehensive Nutrient Management Plans (CNMPs) to abate or reduce NPS nutrient losses to the North Bosque River. WQMPs are site-specific plans designed to control NPS pollution from agricultural and silvicultural activities, such as animal feeding operations (AFOs). AFOs are not permitted facilities and are considered nonpoint sources. CNMPs are designed specifically to deal with water quality concerns associated with concentrated animal feeding operations (CAFOs). CAFOs are permitted facilities, and as such, are considered point sources of pollution.

Water quality management plans (WQMPs) have been implemented in the North Bosque River watershed since 1993. Since fiscal year 1994, 148 WQMPs have been certified in the Bosque River watershed, 23 funded through the Section 319 Grant Program and 125 funded through the TSSWCB state-funded WQMP Program. The state- and federally-funded WQMPs are identical, regardless of funding source.

In fiscal year 2001, two Section 319 projects were initiated to provide technical and financial assistance to landowners toward the development and implementation of 133 certified plans (WQMPs and CNMPs) for any agricultural operation that applies animal waste to land. The first CNMP is near completion.

Manure Composting and Export from the Watershed

The TCEQ's Composted Manure Incentive Project (CMIP) and the TSSWCB's Dairy Manure Export Support (DMES) Project form a partnership for composting and exporting manure from the North Bosque and Leon River watersheds. Section 319 funds from the EPA provide the primary support for both projects. The CMIP provides incentives for government purchases of composted manure. The DMES provides hauling reimbursements to help transport manure from dairies to the CMIP-approved compost facilities.

DMES funding was provided by three Section 319 grants (1999, 2000, and 2002 fiscal years) totaling $2,696,885 and an appropriation of $1,131,726 from the 77th Texas Legislature. The initial target amount of manure to be exported from dairy farms participating in the project was 300,000 tons during a 36-month project period from November 2000 through October 2003. As of October 31, 2003, more than 685,500 tons of manure, or more than double the target amount, have been hauled under this project.

As the project has ramped-up production and sales activity, the percentage of manure exported has accelerated significantly. In fiscal year 2001, only 3 percent of the solid dairy manure generated was exported as compost. In fiscal year 2002, 9 percent was exported. Preliminary estimates indicate that 43 percent was exported in fiscal year 2003. If this growth trend continues, the region's composting industry will meet the TMDL target of exporting 50 percent of the watershed's solid dairy manure generated in fiscal year 2004 and in subsequent years.

Table 3.1. Removing Dairy Solid Manure from the Leon & North Bosque Watersheds*.

Fate of N. Bosque and Leon Manure During CMIP Project	Cumulative Sept 01 to Aug 03	Fiscal Year 01	Fiscal Year 02	Fiscal Year 03
Manure Received by Compost Facilities (Tons)[1]	669,677	381,441	180,493	107,743
Total Compost Sold (Cubic Yards)[2]	205,038	13,142	53,538	138,358
Compost Exported Outside Both Impacted Watersheds (Cubic Yards)[2]	167,419	8,523	44,296	114,600
Phosphorus Exported Outside Both Impacted Watersheds (Pounds)[3]	553,583	28,126	146,177	378,180

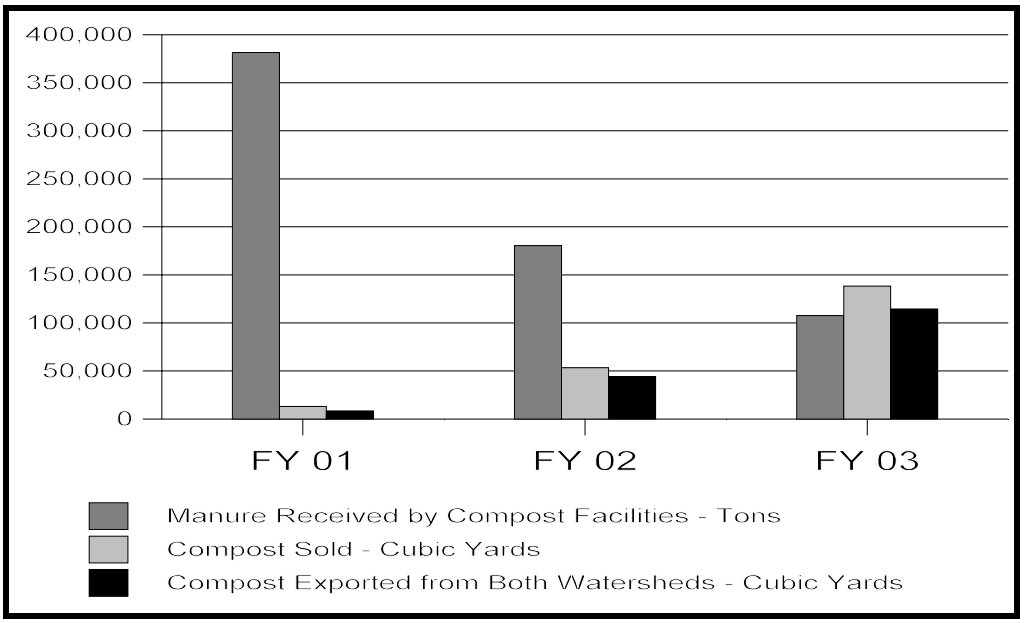
* All numbers in this table except for the last row are equivalent to “wet tons” of manure. One wet ton of manure at 50 percent moisture content yields about one cubic yard of compost, so all the numbers in the first 4 rows are roughly equivalent to wet tons of manure. The last row represents the 3.3 pounds of phosphorus exported from the watershed with each cubic yard of compost exported. The chart below puts this table’s information into graphic form.

[1] Manure is reported in (wet) tons. The manure received by compost facilities is documented by weight tickets from certified scales for each delivery authorized by the DMES office. Note that in fiscal year 01, the manure hauled to compost facilities was greater than the total manure generated that year. This was made possible by stock-piling of manure on dairies in anticipation of this project. Accelerating sales are beginning to clear out this backlog.

[2] Compost is reported in cubic yards as documented in sales receipts and monthly reports. The second row shows total sales of composted manure from the N. Bosque; the third row only includes such composted manure delivered to destinations that are outside both the N. Bosque and Leon watersheds.

[3] Compost analysis in 2002 indicated the composted manure contained an average of 3.3 pounds phosphorus per cubic yard of compost. This average was applied to cubic yards of compost exported.

Table 3.2. CMIP manure removal, compost sales and export, and P export.



Atrazine Remediation Initiative

Atrazine is an inexpensive, effective herbicide used by many corn and sorghum producers to control weeds. It is also an ingredient in many residential lawn and garden products. In 2002, the EPA stated that exposure to atrazine produces potential human health effects, but also found that atrazine is not likely to be carcinogenic to humans.

Texas has used a comprehensive, collaborative approach to reducing atrazine impairments and threats to sources of drinking water with the assistance of state and federal agencies. Agricultural producers responded effectively to a water quality problem with the potential to affect people's health and the environment. Atrazine concentrations in Aquilla Reservoir have been reduced to safe levels meeting TCEQ water quality standards. The TMDL, prepared jointly by the TCEQ and TSSWCB, served an essential coordinating function, helping to focus limited resources to meet water quality restoration needs.

A suite of BMPs for the prevention and reduction of atrazine pollution in surface water was developed and tested during the Aquilla TMDL project. These BMPs have been effectively used in nine other watersheds around the state and can be used throughout Texas to prevent further threats to surface water from atrazine pollution.

Through 13 Section 319 grant projects initiated by the TSSWCB, funding was provided for soil and water conservation districts (SWCDs) to employ 14 technicians to provide technical assistance to agricultural producers. Cost share was also provided through these Section 319 grant projects to

help agricultural producers implement the practices scheduled in their WQMPs. As a result of this effective partnership between the TSSWCB, SWCDs, EPA, and the Natural Resource Conservation Service (NRCS), a total of 382 WQMPs have been developed to address atrazine runoff, 38 of which were developed in the Lake Aquilla watershed. This level of WQMP development exceeded all expectations. Project work plans provided for the development of only 270 WQMPs.

Drinking Water Source Use Restored for Aquilla Reservoir

In 1998, tests of treated drinking water by the Aquilla Water Supply District found the herbicide atrazine at levels in excess of state drinking water quality standards. Aquilla Reservoir is the source of drinking water for more than 18,000 residents of Hill County. The lake was added to the state's list of impaired waters in 1998.

The state and federal standards for drinking water require atrazine concentrations in treated water should not exceed a running annual average of 3.0 micrograms per liter (µg/l) or lower. The running annual average at the Aquilla Water Supply District's treatment plant for the second quarter of 1997 through the first quarter of 1998 was 4 µg/l. This triggered initiation of watershed restoration projects by the TCEQ, the TSSWCB, and other agencies to address urban and agricultural sources of atrazine and to restore water quality in Aquilla Reservoir.

The TCEQ's and TSSWCB's TMDL Programs initiated a project which established a total maximum daily load of atrazine which could be assimilated by the reservoir. Subsequently, they developed an Implementation Plan to reduce atrazine loading. The TMDL found a load reduction of approximately 25 percent would result in attainment of the water quality standards. The TSSWCB led a coordinated effort to change agricultural practices which were contributing to atrazine loading in the lake. The TCEQ's Source Water Protection Program worked with cities and agricultural producers in the area to develop plans designed to prevent pollution of their source of drinking water.

The goal of those efforts has been met—atrazine concentrations in the reservoir have been reduced to below 3 µg/l. Between 1998 and 2003, atrazine concentrations in the reservoir were reduced by approximately 60 percent, to concentrations lower than those required for treated drinking water. There have also been no atrazine concentrations higher than allowable at the Aquilla Water Supply District's drinking water treatment plant.

Improving Threatened Water Bodies

A number of water bodies in Texas have been listed as threatened because of atrazine concentrations. A water body is classified as threatened when data indicate one or more of its uses—in this case, as a source of drinking water—is not actually impaired, but may soon be.

The water bodies identified as threatened were: Marlin City Lake, the Bardwell Reservoir, Big Creek Lake, Joe Pool Lake, Lavon Lake, Lake Tawakoni, Richland–Chambers Reservoir, Waxahachie Reservoir, and Little River.

The activities developed and implemented for the Aquilla watershed were used to reduce atrazine pollution in these nine watersheds. Excluding the Bardwell and Waxahachie reservoirs, monitoring by the TCEQ indicates atrazine concentrations in these water bodies have been reduced. These water bodies are no longer classified as threatened.

The Bardwell and Waxahachie Reservoirs are still being monitored. However, trends in those two reservoirs indicate they will attain their designated use as sources of drinking water within the next six months.

Oil and Gas Well Plugging Program

The Texas Railroad Commission (RRC) has long been active in regulating the exploration, development, and production of oil and gas in Texas. This includes protecting the environment and maintaining public safety. The RRC began regulating oil and gas exploration and production operations in 1919 and over time has adopted increasingly stringent plugging standards and procedures.

The RRC has utilized the fee and penalty based Oil Field Clean Up (OFCU) Fund to plug more than 15,000 wells; however, thousands of additional abandoned wells remain open. To ensure effective and efficient use of the OFCU Fund, the RRC has implemented a well plugging priority system to plug the wells posing the greatest risk to the environment.

TCEQ and RRC have leveraged the OFCU with CWA §319 funds to plug abandoned wells in watersheds impaired by total dissolved solids and chlorides. The original goal of the E. V. Spence Reservoir project was to plug 171 wells; however, the RRC plugged 197 wells. The goal for the Red/Canadian project was to plug 55 wells; but again, the RRC exceeded its goal and plugged a total of 87 wells.

Water quality data for the E. V. Spence Reservoir from the Colorado River Municipal Water District indicates chloride concentrations and total dissolved solids levels have declined during the life of the project. The extent to which climate conditions may have influenced the changes in observed concentrations cannot be evaluated.

However, in October 2002, the measured chloride concentration at the E. V. Spence Reservoir was 1,000 mg/l, a reduction from 1,500 mg/l in March 2000. The total dissolved solids measurement in October 2002 was 2,608 mg/l, a reduction from 4,136 mg/l in March 2000. The E. V. Spence project concluded August 31, 2002, and the Red/Canadian project is pending a QAPP for Acquired Data. A Final Report is due by August 31, 2004.

Source Water Protection

The Source Water Protection (SWP) Program is the implementation portion of the SWAP Program. It is a voluntary, pollution prevention program implemented at the local level. Participation in this program is available to all public water supply systems.

The TCEQ SWAP team provides SWP services to PWS without charge. The TCEQ provides technical assistance and guidance to local public water supply systems that implement recommended BMPs. Where applicable, the SWAP team coordinates BMP recommendations or implementation with other agencies/organizations with expertise and/or jurisdiction. BMPs may include signs to increase public awareness, educational programs, site-specific protection plans, and local ordinances. The TCEQ recommends communities participating in the program, voluntarily implement BMPs based upon the results of their potential contaminant source inventory.

Most SWP participants have implemented their programs by working cooperatively with community members and via public education. The costs associated with implementing an SWP program are much lower than cleaning up a contaminated water source.

Poultry Initiative

In 1994, the TSSWCB began working with poultry operations in the Northeast Texas–Senate Bill (SB) 503 Cost-share Area. Since 1995, the TSSWCB has focused $5.3 million in §319 funding and more than $3 million in state funding to assist poultry operations in abating NPS pollution. Nine of the 16 §319(h) funded projects are ongoing. Another $2.9 million in Environmental Quality Incentives Program (EQIP) funding was obligated to assist poultry producers in Northeast Texas and Gonzales County from 2000 to 2003.

SB 1339, which became effective on September 1, 2001, requires all poultry facilities in Texas to operate in accordance with a WQMP certified by the TSSWCB. The new law provided a staggered schedule of deadlines by which each producer, depending on their initial date of operation, must have requested the development of a WQMP from their SWCD. Along with SB1339, the legislature has appropriated $250,000 annually to the TSSWCB for additional administrative costs associated with the preparation of WQMPs for poultry operations.

Through an effective partnership with SWCDs, NRCS, and poultry integrators, 504 poultry WQMPs have been certified since the effective date of Senate Bill 1339. That brings the overall total of certified poultry WQMPs to 1,215 out of an estimated 1,459 poultry farms. Therefore, approximately 83 percent of all known poultry farms in Texas currently operate under a certified WQMP. The vast majority of the remaining operations are not yet required to possess a certified WQMP according to the schedule specified in SB1339.

Work continues to develop WQMPs for the remaining poultry operations and to provide periodic reviews and updates of the existing poultry WQMPs. Currently, status reviews are conducted on a minimum of 10 percent of the WQMPs each year.

CHAPTER 4
EDUCATION

NPS Education efforts are aimed at increasing awareness of NPS pollution and encourage NPS pollution prevention activities. Everyone who lives or works in a watershed can potentially contribute to nonpoint source problems. Public education and awareness are essential to encourage citizens to learn about their environment and take appropriate actions to prevent pollution. A number of state, regional, and local agencies and organizations have developed programs to educate and inform the public on environmental issues promoting stewardship and protection of natural resources.

Texas NPS Pollution education projects attempt to:

- Enhance existing outreach programs at the state, regional, and local levels to maximize the effectiveness of NPS education.
- Facilitate development of programs to educate citizens about water quality and their potential role in causing NPS pollution.
- Where applicable, facilitate development of technology transfer activities to be conducted upon completion of BMP implementation in CWA §319(h) funded projects.
- Conduct outreach through the Clean Rivers Program, Texas Cooperative Extension, Soil and Water Conservation Districts, the TMDL Program, and others to facilitate broader participation and partnerships.
- Enable stakeholders and the public to participate in decision-making and provide a more complete understanding of water quality issues and how they relate to each citizen.

Dairy Outreach Initiative

Dairy cows on a ranch in Central Texas.

Some areas of the State have been identified as having water quality problems and concerns resulting from NPS pollution as a result of animal feeding operations (AFO). These areas are involved in the TCEQ's Dairy Outreach Program (DOP) and include Erath, Bosque, Hamilton, Comanche, Johnson, Hopkins, Wood, and Rains counties. The TCEQ conducts various NPS-related activities under the DOP including: presentations to producer groups on water quality protection and the NPS program; review of permit applications for dairies and feedlots

facilities; and information on CAFO rules. The TCEQ and TSSWCB also assist in the education and training of producers on NPS issues such as land application of manure.

In fiscal year 2003, TCEQ inspected 339 dairy operations. This resulted in 75 notice of violations and six notice's of enforcement being issued. Of the total inspections, 278 were conducted as annual inspections, the others were visited due to complaints or other compliance issues. The DOP has four dedicated dairy inspectors and two others inspectors who conduct real-time water quality reviews in the Bosque River and Leon River watersheds.

Texas Watch Volunteer Environmental Monitoring and Education Program

The Texas Watch program serves as a valuable resource for a variety of NPS education and training activities. Texas Watch is administered through a cooperative partnership between Texas State University, the TCEQ, and the EPA. This program supports NPS and other environmental education activities, and potential and active volunteer monitoring data collection programs throughout the state.

The Texas Watch program, through varied outreach activities, encourages individuals to adopt behaviors which contribute to the improvement of water quality and prevention of NPS pollution. Volunteer environmental monitoring is only one vehicle used to achieve this objective.

Texas Watch also provides assistance to participating partners and develops, promotes, and maintains environmental education activities. These activities include statewide and regional meetings and workshops, a centralized volunteer water quality database, a comprehensive Web site, a quarterly newsletter, a toll-free information line, NPS and environmental education materials, and certified monitoring training protocols and materials.

Training students to monitor water quality.

Abandoned Water Well Notification and Compliance Program

Numerous state and local programs have identified abandoned water wells as significant, or potentially significant sources of groundwater contamination in the state. Abandoned water wells exist in every county and have the potential to impact all of the State's aquifers. It is conservatively estimated that 150,000 of the wells drilled since 1965 are abandoned or deteriorated. Abandoned water wells not only serve as conduits or channels for contamination to reach groundwater, but large diameter wells can be hazardous to both humans and animals.

Recognizing the dangers to human health and groundwater quality that abandoned water wells pose, the Texas Groundwater Protection Committee (TGPC) initiated efforts to develop educational materials to promote low-cost, landowner-initiated closure (capping or plugging) of abandoned water wells. The technical guidance document, entitled Landowner's Guide to Plugging Abandoned Water Wells is available on the TGPC home page. The TGPC, in cooperation with the TCE and TCEQ, with EPA funding, also designed and produced a video highlighting landowner closure of abandoned water wells. The video has been distributed to member agencies and TCE field personnel, and copies are available from the TDLR.

The Aquatic Experience

The Aquatic Experience is an education and outreach program which informs the public about nonpoint source and urban runoff abatement in the Upper Colorado basin that encompasses Tom Green, Coke and the surrounding counties.

The Upper Colorado River Authority's (UCRA) urban nonpoint source education efforts began in the early 1990's with the purchase of a "Storm Sewer in a Suitcase" demonstration model, and active participation in both the Clean Rivers Program and CWA §319(h) grant Program. This simple hands-on education tool has been taken to hundreds of schools and service organizations in an effort to provide education about nonpoint source pollution prevention, as well as water conservation and preservation practices.

One notable success story was the "Project Red Arroyo." Under UCRA sponsorship, four students from San Angelo initiated a project to address nonpoint source pollution in the Red Arroyo watershed. The students conducted water quality monitoring in the stream, participated in local outreach, clean ups, public events, and area symposiums. This project was selected as one of the top 10 in the nation by the National Science Foundation Competition in Florida. In Spring 2003, the students received a Texas Environmental Excellence Award from Governor Perry and TCEQ.

The Aquatic Experience and UCRA have formed partnerships with the EPA, TCEQ, TSSWCB, Lower Colorado River Authority, Texas Watch, the City of San Angelo, The San Angelo Art Museum, school groups from San Angelo Catholic School, San Angelo Independent School District, Water Valley and Grape Creek, the Girl Scouts, The City of Brady, and The Red Arroyo Group.

Letter to the editor:

UCRA staff does good work

I would like to thank all the staff at the Upper Colorado River Authority.

My daughter and three of her friends have been involved in a project over the past two years that has been fostered and sponsored by the staff at the UCRA. Project Red Arroyo has won awards at the local, state and national levels, and most recently won an Environmental Excellence Award from the Texas governor's office.

The project could not have had the success it has had and continues to have without the support from the UCRA. Melinda Bertelson, the education outreach facilitator, has been a vital part of the project and continues to assist with monitoring the water testing that the girls do on the Red Arroyo. She also works with other individuals to educate and certify volunteer water monitors to test water, which is then submitted to the state data bank providing vital data on the quality of Texas water.

At a time when water quality and conservation are of major importance to all of us, the staff at the UCRA is hard at work monitoring our water sources and providing important data about our water.

We are grateful to the staff for taking the time (much of which was after hours) to meet with and work with these girls on this worthwhile project, and for all the other educational and outreach services the agency is providing to San Angelo and the surrounding area.

Penny Calcavecchia
Volunteer Water Monitor
San Angelo

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The Great Non-event of 2003

People in West Texas take their rivers and waterholes seriously. So when folks in San Angelo looked around for some kind of annual celebration forty years ago, they chose the most important thing in town to center everything around: the North Concho River.

It was a lot of fun - but not always. Likely as not, the city would experience some kind of thunderstorm in late May or early June. By the middle of June, the North Concho River would be black, odiferous and littered with thousands of putrefying dead fish.

It seems that no one in those days could connect the obvious effect of the stormwater on the river. After all, rainwater is supposed to be clean, right? Eventually most people came to recognize the source of the "curse" as being from nonpoint source water pollution from urban stormwater runoff.

During one of the last years that the celebration was held, the festivities followed a nasty storm on Memorial Day. The river--and thousands of fish--died a few days later, and by the last weekend of the event, it was particularly ripe.

Needless to say, the hopefuls manning the food booths and the craft booths were disappointed with sales that year. River buffs, however, were elated at the opportunity and set up a booth on the north shore of the Celebration Bridge to pass out literature explaining the effects of nonpoint source water pollution on urban streams.

In 1993, the Upper Colorado River Authority applied to the TCEQ for grants to address the problems in the North Concho. After receiving the funds, the city of San Angelo was enlisted as a partner and a citizens advisory group was appointed. The work of the committee resulted in a master plan for water pollution abatement within the urban watershed.

A priority system established for construction of facilities that would lessen the load of organics and nutrients entering the river during storms. This process began in 1993, but it was not until 2002 that funding allowed the construction of facilities on the worst offending storm water stream.

A large, normally dry retention pond was constructed on a major waterway that drained a significant portion of the city. A large excavation was made on a vacant area owned by the city. The retention pond was closed by a gabion (rocks enclosed in wire baskets) dam located at a point just prior to entry of the water into the river.

What a difference the facility made when completed and the storms finally came! The quantity of debris and trash retained by the structure during a single storm was staggering.

So, for the first time in anyone's memory, the late May and early June storms came and went and the only thing that was the same as before was the insurance adjusters. It was a non-event as far as the river was concerned. A non-event that should be a cause for . . . celebration. What are the chances?

Fred Teagarden, San Angelo, TX
Senior Hydrologist, UCRA

CHAPTER 5
FINANCIAL INFORMATION

Texas State Soil and Water Conservation Board

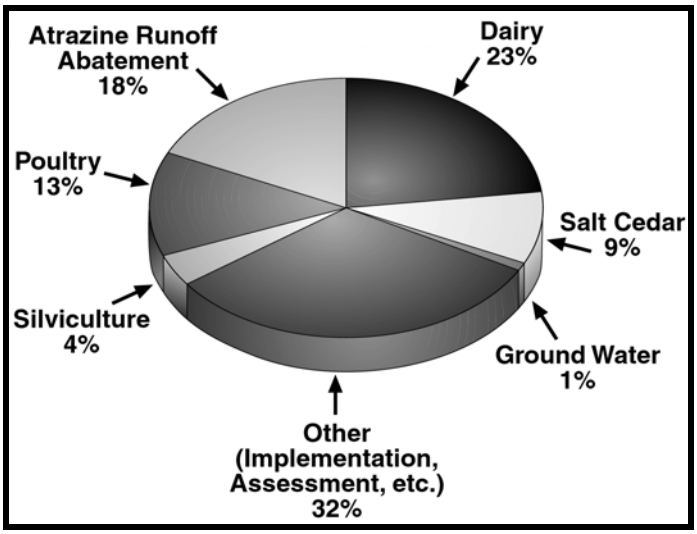

Figure 5.1 FY 03 TSSWCB active CWA 319(h) grants.

The TSSWCB NPS program is supported by Clean Water Act 319(h) federal funds. The chart above lists all active state and federal 319(h) grants for FY 1999, FY 2000, FY 2001, FY 2002, and FY 2003.

Activities in Fiscal Year 2003:

Dairy:	$ 10,332,722
Atrazine Runoff Abatement:	$ 8,064,058
Other: Implementation, Assessment, etc.	$ 14,520,355
Poultry:	$ 6,006,802
Salt Cedar:	$ 3,779,989
Silviculture:	$ 1,929,619
Groundwater:	$ 311,944
Total	$44,945,489

Texas Commission on Environmental Quality

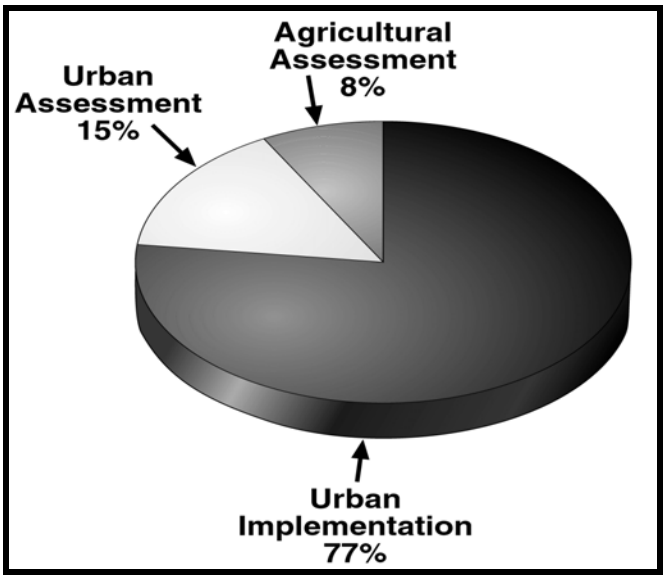

Figure 5.2 FY 03 TCEQ active CWA 319(h) grants.

The TCEQ NPS Program was supported with Clean Water Act, Section 319(h) federal funds from the fiscal year 2003 Performance Partnership Grant (PPG), and three multi-year categorical grants for FY 2000, FY 2001, and FY 2002.

Amounts calculated below represent total federal and state dollars allocated to projects and summed according to the three categories of activity illustrated in the chart.

Activities in Fiscal Year 2003:

Urban Implementation	$ 15,993,184
Urban Assessment	$ 3,084,457
Agricultural Assessment	$ 1,552,427
Total	$ 20,630,068

Acronyms

AFO–animal feeding operation

BMP–best management practice

CAFO–concentrated animal feeding operation

CMIP–Composted Manure Incentive Project

CRP–Clean Rivers Program

CWA–Clean Water Act

DDE–dichlorodiphenyldichloroethylene

DMES–Dairy Manure Export Support

EPA–Environmental Protection Agency

EQIP–Environmental Quality Incentives Program

MTBE–methyl tertiary butyl ether

NPS–nonpoint source

NRCS–Natural Resource Conservation Service (a division of USDA)

OFCU–oil field clean up

PCB–polychlorinated biphenyl

PWS–Public Water Supply

RRC–Railroad Commission

SDWA–Safe Drinking Water Act

SWA–Source Water Assessments

SWAP–Source Water Assessment and Protection

SWP–Source Water Protection

SWQM–Surface Water Quality Monitoring

TCEQ–Texas Commission on Environmental Quality

TDA - Texas Department of Agriculture

TDH–Texas Department of Health

TDLR–Texas Department of Licensing and Registration

TDS–total dissolved solids

TGPC–Texas Groundwater Protection Committee

TMDL–Total Maximum Daily Load

TPDES–Texas Pollutant Discharge Elimination System

TSSWCB–Texas State Soil and Water Conservation Board

UCRA–Upper Colorado River Authority

USGS–United States Geologic Survey

VOC–volatile organic compounds

WQCT–Water Quality Coordination Team

WQMP–Water Quality Management Plan

Web Sites

Other State Agencies

General Land Office–Coastal NPS Program
http://www.glo.state.tx.us/coastal.html

Railroad Commission–Upper Colorado Salt Minimization Project
http://www.rrc.state.tx.us/divisions/og/fops/river/river.htm

Texas Department of Transportation–Compost Project
http://www.dot.state.tx.us/insdtdot/orgchart/des/landscape/compost/topsoil.htm

Texas Forest Service
http://txforestservice.tamu.edu/

Texas Parks & Wildlife (TPWD)
http://www.tpwd.state.tx.us/

Conservation Programs: http://www.tpwd.state.tx.us/conserve/

BMP Resources

Street Edge Alternatives Project
http://www.ci.seattle.wa.us/util/SEAstreets/default.htm

Low Impact Development Center
http://www.lowimpactdevelopment.org

Texas Nonpoint Source Book
http://www.txnpsbook.org

Water Quality and BMPs for Loggers
http://www.usabmp.net/launch.html

Educational Resources

Building Environmental Education Solutions, Inc.
http://www.beesinc.org/

Bullfrog Films
http://www.bullfrogfilms.com/

Cyberways Waterways
http://www.cyberwaysandwaterways.com/en/CW3Home/

Texas Watch
http://www.texaswatch.geo.swt.edu/

Wet in the City
http://www.wetcity.org

Conservation Organizations

Ducks Unlimited–Wetlands Conservation
http://www.ducks.org/

Izaak Walton League of America / Save Our Streams Program
http://www.iwla.org/sos/

National Wildlife Federation–Gulf States Region
http://www.nwf.org/gulfstates/

Sierra Club–Texas
http://texas.sierraclub.org/

The Trust for Public Lands–Texas
http://www.tpl.org/tier2_rl.cfm?folder_id=264

Estuary and Marina Programs

Clean Texas Marinas Program
http://www.cleanmarinas.org

Coastal Bend Bays and Estuaries Program
http://www.cbbep.org/

Galveston Bay Estuary Program
http://gbep.tamug.tamu.edu/

Partnership for Environmental Safety and Outreach
http://www.tamucc.edu/~outreach/peso

Clean Rivers Program Partner Agencies

Angelina & Neches River Authority
http://www.anra.org

Brazos River Authority
http://www.brazos.org/index.htm

Canadian River Municipal Water Authority
http://www.crmwa.com

Colorado River Municipal Water District
http://www.crmwd.org

Guadalupe–Blanco River Authority
http://www.gbra.org

Houston–Galveston Area Council
http://www.hgac.cog.tx.us/intro/introwater.html

International Boundary and Water Commission
http://www.ibwc.state.gov/CRP/Welcome.htm

Northeast Texas Municipal Water District (Cypress Creek)
http://www.netmwd.com/index.html

Red River Authority
http://www.rra.dst.tx.us

Lower Colorado River Authority (LCRA)
http://www.lcra.org

Lower Neches Valley Authority (LNVA)
http://www.lnva.dst.tx.us/

Sabine River Authority
http://www.sra.dst.tx.us

San Antonio River Authority
http://www.sara-tx.org

Sulphur River Basin Authority
http://www.sulphurr.org/

Trinity River Authority
http://www.trinityra.org/

Upper Colorado River Authority (UCRA)
http://www.ucra-tx.org/index.html

Councils of Governments and Regional Agencies

North Central Texas Council of Governments (NCTCOG) Nonpoint Source
http://www.dfwinfo.com/index.asp

Stormwater Management: www.dfwstormwater.com/index.html

Lower Rio Grande Valley Development Council
http://www.lrgvdc.org/

Texas Association of Regional Councils
http://www.txregionalcouncil.org/

Cities

City of Austin–Watershed Protection
http://www.ci.austin.tx.us/watershed/

Fort Worth–Environmental Management Department
http://www.fortworthgov.org/dem/

San Antonio Water System, Watershed Protection
http://www.saws.org/our_water/Source_Water_Watershed_Protection/

Universities and Research Organizations

Center for Research in Water Resources
http://www.crwr.utexas.edu

Texas Agricultural Extension Service Resource Center
http://texaserc.tamu.edu/catalog/

Texas Institute for Applied Environmental Research (TIAER)
http://tiaer.tarleton.edu

Texas Water Resource Institute
http://twri.tamu.edu/

Federal Agencies

Environmental Protection Agency–Wetlands, Oceans, and Watersheds
http://www.epa.gov/OWOW/

Funding Opportunities Polluted Runoff (Nonpoint Source Pollution)
http://www.epa.gov/owow/nps/funding.html

Best Nonpoint Source Documents:
http://www.epa.gov/owow/nps/bestnpsdocs.html#nps

USDA - Natural Resource Conservation Service (NRCS)
http://www.nrcs.usda.gov/

United States Army Corps of Engineers
http://www.usace.army.mil/index.html

United States Fish and Wildlife Service
http://www.fws.gov/

United States Geological Survey (USGS) in Texas
http://tx.usgs.gov/