CHAPTER 7 EDUCATIONAL PROGRAMS

The active participation and cooperation of all Texans is necessary to safeguard Texas' natural resources. Everyone who lives or works in a watershed can potentially contribute to nonpoint source problems. Public education and awareness is essential to involving citizens in learning about their environment and taking appropriate actions to prevent pollution. Implementation programs typically include an education component to enhance public understanding and encourage participation. In addition, a number of state, regional, and local agencies and organizations have developed stand alone programs to educate and inform the public on environmental issues which promote stewardship and protection of natural resources.

Education Through Assessment

One of the most effective ways citizens can learn about water quality and the problems associated with nonpoint source pollution is by conducting assessment activities. Learning about watersheds and how water quality is assessed leads to an understanding of city planning, waste treatment, land use and its effects on water quality, and environmental practices that lessen the impacts of urban growth, development, and agricultural practices on water quality. Volunteer monitoring and assessment programs that make data readily available and easy to understand gives citizens a sense of ownership and responsibility for their watersheds. Below is a discussion of some of the volunteer monitoring and assessment programs in place throughout the state that address nonpoint source pollution.

Texas Watch Volunteer Environmental Monitoring & Education Program

The Texas Watch Program serves as a valuable resource for educating the public about water quality issues and fostering citizen participation in monitoring and protecting water quality. The Texas Watch Program is administered through a cooperative partnership between Texas State University, the TCEQ, and the EPA. The Texas Watch Program supports NPS and other environmental education and volunteer monitoring activities throughout the state. Texas Watch provides assistance to participating partners by promoting and maintaining environmental education activities, such as:

- statewide/regional meetings and workshops
- a centralized volunteer water quality database
- a comprehensive Web site
- quarterly newsletters
- a toll free information line

- NPS and environmental education materials
- certified monitoring training protocols and materials

The Texas Watch Program, through its varied outreach activities, encourages individuals to adopt activities and behaviors which contribute to the improvement of water quality and prevention of NPS pollution. The Texas Watch Program trains and certifies students, volunteers, and other partners to collect quality assured data that can contribute to environmental decision making. Volunteers monitor a wide variety of habitats from rivers, creeks, ponds, and lakes to bays, bayous, and estuaries. In addition, Texas Watch forms watershed-based partnership networks to help citizens identify and address local water quality issues and concerns. The Texas Watch Partners Program solicits public and private entities to help train, equip, manage, and offer general support to the growing number of volunteer monitors across the state. This program is establishing strong ties between citizens, industries, river authorities, councils of governments, water districts, cities, local, state, and federal agencies, students at all grade levels, and private foundations.

The Lower Colorado River Authority— Colorado River Watch Program

The Lower Colorado River Authority (LCRA) is a participating Texas Watch partner. Protecting water quality in the lakes and rivers is a vital part of the LCRA's mission. In 1988, a handful of Austin citizens, teachers, and students began sampling water along a tributary of the Colorado River. Within two years, their program had expanded to about twenty sites along the Colorado. In 1992, the LCRA began to manage the Colorado River Watch Network program, and helped expand monitoring sites along the river from Brownwood to the Gulf of Mexico. The success of the program has earned grants from the National Science Foundation and the EPA. The Colorado River Watch Network has been honored by the EPA, the State of Texas, the City of Austin, and many other organizations.

LCRA ensures that Network monitors are well-trained. Certified monitors must complete a 10-hour training process provided by LCRA. Instructors show volunteers how to use the testing equipment and monitors their practice of new data collection skills in the river. Volunteers then visit their designated testing site along with the instructor to test for several water quality indicators.

Every year to coincide with Earth Day, the Colorado River Watch Network joins with other volunteer monitors to test rivers, creeks, and coastal waters along the Colorado River watershed. Hundreds of volunteers participate in 20 counties along the Upper and Lower Colorado River Basin. This one-day monitoring event provides LCRA with a

snapshot of the water quality along the river. The Network continues to support environmental stewardship of dedicated teachers, students, and other citizens who perform volunteer monitoring throughout the river basin.

The Aquatic Experience

Public education and outreach has been an integral part of the Upper Colorado River Authority's (UCRA) efforts to educate the public about NPS and urban runoff abatement. The UCRA has developed an on-going program, "The Aquatic Experience" that offers assistance to area public schools by providing opportunities for teachers and students to be exposed to every aspect of the aquatic environment. All topics involve "hands on" activities to promote general water education and emphasize local water quality issues.

Curriculum and workshops have been developed focusing on volunteer water quality monitoring, water conservation, aquatic life, and brush control. Assistance is provided to individuals or groups of students wishing to plan and implement long range investigations, research, studies, or water pollution abatement projects. "Aquatic Experience" activities take place primarily at the UCRA offices and the adjacent North Concho River; alternative locations, such as classrooms, or school sponsored events are also utilized.

Future plans for the program include development of an on-site educational facility along the North Concho River for hands-on experiences that will allow for the collection and identification of aquatic organisms, identification of aquatic plants, and demonstration of an aquatic environment. The site will contain a native and invasive plant identification plot that will demonstrate both proper and improper conservation practices of area water resources. The site will also contain numerous BMPs located on existing stormwater outlets to the river.

The City of Denton Watershed Protection Program

The City of Denton Watershed Protection Program was initiated as part of a plan to reduce the overall pollutants within the surface waters of Denton and to ensure compliance with the National Pollution Discharge Elimination System Storm Water Phase II rule. The Watershed Protection Program monitors water quality around the city and the results are made available to the public. The City of Denton received initial funding from the EPA Environmental Monitoring for Public Access and Community Tracking (EMPACT) grant to get the program started. Through the grant, physical and chemical water quality data is measured and the results are telemetered to the University of North Texas for additional analysis. Information on water quality, including realtime water quality data, is compiled and displayed in an easily understood format and made available to the public via the internet. The Watershed Protection Program has used

EMPACT data and additional watershed monitoring data to establish a preliminary baseline for the condition of the city's surface water resources. This preliminary baseline data will be used to evaluate future changes in water quality.

Education Through Implementation

Everyday activities that go on in a watershed have a direct impact on the quality of water in the watershed. By learning how everyday activities affect water quality, Texans can change habits to protect water resources. The voluntary and preventive efforts of citizens, businesses, service organizations, and other groups are an essential part of the effort to address NPS pollution. The key to successful NPS management is making citizens aware of the existing voluntary and preventive efforts available to the public. The following is a discussion of the education programs in place to make citizens aware of the activities and practices that contribute to NPS pollution and their role in NPS management.

Nonpoint Source Consumer Education

The TCEQ has developed a variety of educational outreach materials to increase general awareness of nonpoint source (NPS) water pollution and stimulate actions which can be undertaken by citizens to reduce NPS pollution. Outreach materials developed under this program target primarily urban nonpoint issues such as pet waste, yard care, household hazardous waste, and used motor oil. Campaign materials include radio and television public service announcements, pet waste posters, bilingual NPS bookmarks and door hangers, NPS fact sheets, and a Clean Water for Texas brochure. Many of the materials can be downloaded and adapted by organizations for local use.

Storm Drain Marking

Many Texas communities are working to reduce nonpoint source pollution by labeling storm drain inlets with messages warning citizens not to dump polluting materials. TCEQ has developed a how-to guide for communities interested in starting a storm drain marking program to reduce nonpoint source pollution. The manual covers a range of methods for labeling storm drain inlets and offers examples of programs operating in selected Texas cities. The purpose of the manual is to give cities and community groups the tools to launch a successful citizen-education effort to reduce dumping and protect local water supplies. To order this manual (GI-212), send your request to educate@tceq.state.tx.us or call 512/239-0028.

Backyard Composting and Xeriscaping

Backyard mulching, composting, and xeriscaping not only reduce waste, but also benefit yards and the environment by producing healthier soil and reducing water and fertilizer demands. Other benefits include reduced

erosion, run-off, and pollution. The TCEQ has developed a program to help citizens and communities (through a network of regional and local coordinators) teach their residents practical waste reduction and pollution prevention through environmentally responsible yard care practices, including grass-cycling, composting, xeriscaping, and integrated pest management. TCEQ staff provides training programs, technical assistance, literature, audiovisual resources, and networking opportunities that promote voluntary diversion of yard trimmings, food scraps, clean wood material, unrecyclable paper, and other easily composted materials from landfills.

Teaching Environmental Sciences

TCEQ's Teaching Environmental Sciences (TES) is a graduate credit course developed through local resources. Since 1994, TCEQ and its collaborators have presented classes at local colleges and universities throughout Texas. Each summer, the TCEQ sponsors this program for 200–400 teachers who will use information learned in the course to instruct K-12 students on the importance of air, water, and waste issues and their impact on communities. Each course is led by a professor of science or education and is tailored to the region in which it is offered. Typically, much of the forty hours of instruction is spent outside the classroom, as teachers take tours and perform field tasks, such as water sampling and analysis. Teachers visit local industries, environmentally sensitive sites, water and wastewater plants, air monitoring stations, landfills, and/or recycling centers. They also hear from representatives of regulatory agencies, businesses, and community organizations.

Several teacher workshops are held each summer for teachers interested in conservation and natural resource issues. The workshops are held in various parts of the state in cooperation with the TSSWCB. The Texas Environmental Education Advisory Committee of the Texas Education Agency approves the content of the TSSWCB sponsored workshops. As an approved Environmental Education Professional Development Provider, teachers are able to get credit hours toward their required continuing education units, while experiencing nature and the outdoors.

Environmental News You Can Use

The TCEQ offers subscribers a free service called Environmental News You Can Use. This monthly newsletter highlights information on a particular theme to be used to educate customers, suppliers, employees, or students about why and how they can improve the environment. To subscribe, send your name, mailing address, and e-mail address to educate@tceq.state.tx.us or call 512/239-3150.

Publications and Videos

The TCEQ has many publications available to provide assistance on everything from pollution prevention to regulatory guidance. Each year over 30,000 books, posters, and teacher guides are ordered for school classrooms. Among the items most in demand are posters and coloring books. In addition to publications, almost a dozen videos are available on school recycling, waste reduction and management, and pollution prevention. The agency's publications and videos have caught the attention of educators and environmental agencies outside of Texas.

The Association of Texas Soil and Water Conservation Districts has established and updates a conservation related video library that is maintained by the TSSWCB staff on their behalf for the benefit of local districts and educators. Currently, there are over 180 conservation-related videos in the library available to districts and teachers at no charge. Videos can be ordered through local soil and water conservation districts or the TSSWCB.

Environmental Information Line

The 1-800-CLEANUP information line is a partnership with the private sector, the EPA, and other states to provide citizens an environmental information system that can be customized for each community. The system provides a single source of community-specific environmental and recycling information. Texans can call the hotline or go to www.1800clenup.org and enter their five-digit ZIP code to find information on local recycling, household hazardous waste collections, and environmental events.

Small Spill Prevention Program

The GLO's small spill prevention program works with marinas and other interested parties to educate the public on ways to properly dispose of oil and reduce small spills. Small amounts of petroleum products may not kill fish and other marine organisms, but they can affect the vision, sense of smell, growth, and reproductive ability of marine wildlife. While small petroleum spills may impact marine wildlife, multiple small spills have the potential to impact entire water bodies. The Small Spill Prevention Program is an effective way to educate the public about ways to reduce spills and protect our marine resources.

The Texas Cooperative Extension Agricultural Outreach Program

The Texas Cooperative Extension (TCE) is a partnership between the USDA, Texas A&M University, and County Commissioners Courts. The basic mission of the TCE is education and dissemination of information relating to agriculture, home economics/consumer sciences, community

development, and 4-H/youth. County Extension Agents deliver most of the educational programs of the TCE. These county agents, supported by specialists based at Texas A&M University in College Station and 12 regional centers throughout Texas, provide technical information, respond to individual problems and questions, conduct educational meetings, and establish and evaluate demonstrations to show the benefits of using practices based on the latest scientific research. They also provide educational information through radio and television programs, newspapers, newsletters, and bulletins. Water quality and conservation is one of six major program issues being addressed by agents and specialists on an interdisciplinary basis.

The TCE has the organizational framework and outreach capabilities to help implement the informational and educational programs essential to any voluntary pollution abatement effort. The TSSWCB works with the TCE to develop educational programs concerning agricultural nonpoint source pollution.

The Texas A & M University On-Site Wastewater Treatment Training Center

The On-Site Wastewater Treatment Training Center was established in 1997 to provide an educational mechanism for training inspectors, installers, site evaluators, home owners, elected officials, and others involved in the on-site wastewater treatment industry. The Texas Agricultural Extension Service, Texas On-Site Wastewater Association, Texas Engineering Extension Service, Texas Agricultural Experiment Station, Texas Commission on Environmental Quality, local installers and businesses, Texas On-Site Wastewater Treatment Research Council, and Hidalgo County Health Department played vital roles in the planning and construction of the South Texas International On-Site Wastewater Treatment Training Center. Texas currently has three training centers. The Training Centers demonstrate treatment units and land application systems for management of wastewater. The Cooperators believe that training centers meet the need for hands-on training concerning on-site wastewater treatment systems.

There are five types of wastewater processing techniques taught and demonstrated at the Training Center. These concepts include septic tanks, anaerobic treatment, sand filters, trickling filters and constructed wetlands. These techniques are described later in this document as examples of best management practices.

Don't Mess With Texas

The Texas Department of Transportation (TxDOT) maintains more acres of right-of-way than any other state department of transportation in the U.S. After years of collecting an increasing amount of trash from state

highways, the agency realized that a public service campaign was needed to educate Texans about litter prevention. Two of the main components in the campaign include the Adopt-a-Highway (AAH) program and the Don't Mess with Texas (DMWT) program.

The AAH program is implemented statewide to teach Texans about litter prevention by allowing citizens to pick up litter along Texas highways. The program encourages litter pick-up by establishing sections of the highway to be adopted by individuals or groups for clean-up. Upon adopting a section of the highway, a sign will be posted along the highway naming the individual or group who has adopted the section of the highway. The program concept has been adopted by 47 other states and several foreign countries.

In 1986, TxDOT secured a local, award-winning, advertising agency to develop a litter prevention campaign to encourage motorists to stop littering. Better known as "Don't Mess with Texas" (DMWT), this program was the first of its kind in the world. Research was completed to determine what groups were contributing the most litter. This group became the target of the litter prevention campaign. The target audience was men under the age of 35 who predominantly drove pickup trucks. Television and radio public service announcements featuring these targeted Texans were created. Research allows the program to reinvent itself periodically based upon changes in the target audience. The DMWT Partners program was established to allow entities to donate in-kind goods and services to the campaign.

Keep Texas Beautiful

The vision of the Keep Texas Beautiful (KTB) organization was designed to make Texas the most beautiful state in the nation. KTB seeks to achieve this goal through partnerships involving government, business, civic groups and volunteers to address litter prevention, solid waste management, recycling, composting, beautification, and general community improvement. KTB programs empower Texans through education to take responsibility for enhancing their community's environment.

Any Texas community can become a Keep Texas Beautiful Affiliate. Affiliates receive a variety of services to improve their effectiveness in mobilizing grassroots volunteers to beautify their communities. KTB has established an annual certification and recognition program for communities with ongoing programs for litter prevention, beautification, community improvement, and the minimization of solid waste.

Keep Texas Beautiful sponsors and coordinates many of its education and cleanup programs in cooperation with state agencies including the TxDOT and the TCEQ. Keep Texas Beautiful (KTB) is currently under contract

with the TCEQ to operate the River and Lakes Cleanup Program. Each year, KTB helps sponsor dozens of cleanups across the state in partnership with local governments, concerned citizens, community and nonprofit groups, schools, scout troops, businesses and companies. Volunteers pick up litter and debris along the shores and banks of Texas lakes and rivers. In return, participants receive, free of charge: trash bags, posters, T-shirts, press releases, and volunteer incentives.

KTB has also taken a leadership role on the issue of illegal dumping and litter law reinforcement by offering seminars and conferences, and forming a statewide task force to share information, discuss the issue, and develop solutions.

The Texas Wildscapes Program

The Texas Wildscapes Program emphasizes providing the basics for good habitat: food, water, and cover. With approximately 95 percent of Texas land use practices in the hands of private landowners, the importance of education toward a common bond is evident. The Wildscapes Program provides educational materials for the Texas urban residential landowner to promote a better-educated population which is more supportive of wildlife and conservation issues. The Texas Wildscapes Program can also be applied to community, rural, and corporate properties. The program introduces the concept of habitat, and provides information to the public regarding wildlife needs and the importance of landscaping with native plants. The program also promotes minimizing the use of pesticides and fertilizers, xeriscaping, mulching, composting, and watering practices to conserve water.

The Edwards Aquifer Authority

The Edwards Aquifer Authority, a member of the Texas Alliance of Groundwater Districts, is a regulatory agency charged with preserving and protecting the Edwards Aquifer in an eight-county region including all of Uvalde, Medina and Bexar counties, plus portions of Atascosa, Caldwell, Guadalupe, Comal and Hays counties. The Authority was created by the Texas Legislature in 1993 with the passage of the Edwards Aquifer Authority Act to preserve and protect this unique groundwater resource. The Act created a 17-member board of directors which sets policy to manage, conserve, preserve, and protect the aquifer; works to increase the recharge; and prevent waste or pollution of the aquifer. The Act also established the South Central Texas Water Advisory Committee made up of representatives from downstream counties to interact with the Authority when issues related to downstream water rights are discussed.

The goals of the Edwards Aquifer Authority are designed to fully implement the requirements of the Edwards Aquifer Authority Act; develop an effective, comprehensive management plan based on sound,

consensus-based scientific research and technical data; maintain continuous spring flow; protect and ensure the quality of ground to surface water in the Authority's jurisdiction; forge solutions that ensure public trust; promote healthy economies in all parts of the region; research and develop additional sources of water; and provide strong, professional management for the Authority.

The Barton Springs/Edwards Aquifer Conservation District

The Barton Springs/Edwards Aquifer Conservation District (BSEACD) is an underground water conservation district created for the purpose of conserving, protecting and recharging the underground water bearing formations within the District, and for the prevention of waste and pollution of such underground water, particularly the waters in the formations known as the Edwards Limestone and Associated Formations in Northern Hays and Southern Travis Counties. The BSEACD, a member of the Texas Alliance of Groundwater Districts, initiates and administers clean up events within its district.

The BSEACD Staff contact local schools, scouting troops, neighborhood groups, and place ads in local papers to request volunteers for the event. Creek clean ups are typically held on a Saturday morning in the fall or spring when temperatures are comfortable. Volunteers meet to share safety information, distribute bags and gloves, and pair off in groups of two or three people to pick-up trash. Large items such as old tires, lumber, metal signs, fencing, and appliances are collected by adult volunteers and BSEACD staff for special pick-up and disposal.

Since many caves and sinkholes are located in rural areas which do not have trash collection, they become the target of illegal dumping. Cave cleanups are less frequent and require a special team of volunteers depending on the type of cave. Removal of debris from caves is labor and time intensive. Hoisting systems are used to remove debris from the cave. Final phases of cave cleanup include removal of sediment laden with broken glass and leached chemicals from debris.

In addition to cleanup events, the BSEACD administers the Aquifer Watch Program. The Aquifer Watch Program links junior high/middle school students with a well near their school which is appropriate for water quality sampling. Students visit their "adopted well" four times during the school year. Prior to the well visit, a staff member visits the class to provide hands-on demonstrations and training the various pieces of equipment. During the well visit, District staff accompanies the group and assists with measurements of the aquifer level, water sampling, and on-site chemical analysis using titrators and spectrophotometers. Students test their groundwater samples for temperature, pH, conductivity, alkalinity, chlorides and nitrates. In addition to time spent in the field collecting

water samples and measuring water levels, District staff works with the teachers and students to help them learn more about their "adopted" well.

The City of Austin's "Grow Green" and "Earth Camp"

Recognizing that one of the most effective ways to protect water quality is through pollution prevention, the City of Austin sponsors a variety of educational programs designed to encourage environmentally responsible behavior. One of the most comprehensive programs is "Grow Green" which is a partnership between the City of Austin, the Texas Cooperative Extension (TCE), and local nurseries. This program is a model for how local government can work with the horticulture industry to protect water quality.

The concepts developed under this program are a result of sound science and research. The program stresses planting native and adapted plants which require little water and few pesticides to survive in Texas. One strategy, stressed by the City of Austin, includes reducing the use of turf grass. Turf grass can be a high maintenance yard material, often requiring fertilizing, disease control, and supplemental watering. Consideration of options such as increased native and adapted plant beds or mulched or native areas to reduce the need for additional chemicals, watering, and mowing is emphasized.

The program recommends such practices as having soil tested to ensure that only nutrients missing are added, leaving grass clippings on the lawn instead of bagging them to reduce the need for fertilizer, using organic fertilizers, and minimizing the use of pesticides and other chemical treatments. The "Grow Green Plant Guide" was created to help residents select beautiful native plants which are drought tolerant and resistant to pests and diseases. In doing so, it is easier to adhere to the principles outlined in the Grow Green Program.

Now in its ninth year, Earth Camp is the City of Austin's four-day, outdoor, watershed education program for fifth-grade elementary school students. The primary focus for Earth Camp Austin is educating students about the many things necessary to the preservation of water quality in Austin watersheds. The lessons entail study of the geography and natural history of Austin's watersheds, water quality, wildlife in our watersheds, hydrology and geology of the Barton Springs/Edwards Aquifer, green gardening, and other related topics. The approach is based on field trips with hands-on scientific investigations. Participating students are expected to do some homework that includes family involvement and group work.

The camp runs during the school year, from September through June. Participating teachers attend training, teach the Earth Camp curriculum before the students attend camp, and manage and assist the students during

camp. The City of Austin provides the environmental expertise, teacher training, field trips, tours, lessons, and equipment.

The City of Houston's WET in the City Program

Water Education for Teachers (WET), is a nationally recognized training for urban educators that includes an interdisciplinary activity and curriculum guide for kindergarten through 12th grades. The program helps students learn about their local environment and how to conserve precious natural resources.

Students, educators, and administrators in Team WET Schools make a commitment to increase environmental education and stewardship in their community. Each school's Team WET Coordinator receives technical assistance from the City of Houston Water Conservation staff and a Team WET Kit that includes a water test kit, guides for planning water festivals, instructions for conducting water quality audits, and other materials for successful student and community projects. First through 8th grade students create their own water conservation messages to help educate their peers and increase public awareness of conservation issues with the "Design-a-T-Shirt Contest".

Every year, the Mayor of Houston declares the month of May "Water Conservation Awareness Month". The two-day event features conservation skits, a conservation scavenger hunt, and booths sponsored by environmental organizations, city, and county departments. Public Works Engineering also conducts an annual program called "Water Wise and Energy Efficient." This two-week education/retrofit program focuses on water and energy conservation.

In addition to the education and outreach activities, Public Works Engineering also targets water use customers by distributing more than 20,000 "water saver" kits to citizens to help them reduce their water consumption and water bills. The kits contain a displacement bag (½ gallon) for the toilet tank, dye tablets to test for leaks, a "tankee clipper", a flow restrictor, and an instruction sheet.

The City of Houston actively participates in other special events such as National Drinking Water Week, Earth Day events, Bay Day, Home & Garden Shows, school health fairs, and other environmentally focused festivals and community events in order to implement a comprehensive water conservation program for residents of all ages.

The City of Fort Worth Environmental Education Programs

The City of Fort Worth's Environmental Management Department has established a Public Education division that offers adult information presentations, student programs, publications, and special events about

environmental concerns in Fort Worth. Program components include composting, environmentally friendly lawn care practices, storm water and wastewater instruction curriculum, and waste reduction through recycling demonstrations.

The Department of Environmental Management has also launched a pilot Environmental Mapping Education web site for the Fort Worth ISD. The web site incorporates environmental science with the digital mapping of Geographic Information Systems. Students can log onto the site and work through online mapping, water quality, air quality, and spill response lessons. Students interactively map local area rivers, streets, parks, and watersheds. Each lesson poses a problem, and explains a step-by-step mapping process to find a solution.

The City of San Antonio's Curbside Recycling Program

The City of San Antonio's recycling program is the largest curbside recycling program in the State of Texas. In 1995, the program was initiated in a quadrant of the city and full implementation citywide was completed in three years. The program created "Binny" the Recycling Bin as their mascot and an advertising mechanism for the public. The program's ultimate success is a result of public and private cooperation.

The program provides service once a week, and recyclables are collected using an 18-gallon green recycling bin which the City has distributed to all residents at no cost. The recyclables are collected curbside for ease of collection. The City accepts newspaper, glass jars and bottles, aluminum cans, plastic household jars and bottles, aerosol cans, and steel and tin household containers.