

WATER QUALITY



WATER QUALITY RESPONSIBILITIES... A FLOOD OF **ACTIVITIES** FOR DEQ

There is a flood of program responsibilities that fall under the category of Water Quality Priorities at DEQ. The Water Quality Division (WQD), Customer Services Division (CSD) and Environmental Complaints and Local Services Division (ECLS) carry out these responsibilities. The Divisions work together to address many program areas and solve overlapping problems.

Both WQD and ECLS play large roles in protecting ground and surface waters to ensure the designated beneficial uses as established in Water Quality Standards and in safeguarding the public by ensuring safe drinking water. These roles consist of licensing, permitting, enforcement and technical assistance.

The Operator Certification Section of the WQD conducts training sessions and administers examinations for water, wastewater and laboratory operators. This process allows for the continuing education and advancement of personnel. This education and licensing program helps to ensure that only qualified people are making decisions about the treatment of drinking water and wastewater. These properly trained individuals contribute to the protection of the environment and the health of the citizens of Oklahoma.

Permitting has been simplified in recent years by the use of general permits, permits by rule and the inclusion of state of the art technology in rules to reduce the need for variances. The enforcement activities have been prioritized to ensure that the most serious violations are addressed in a timely manner to protect the environment or those drinking the water. Orders with penalties are issued in response to environmental damage to Oklahoma's water.

Public Water Supply engineers and ECLS staff make more than 3,800 facility visits each year to public water supply systems.



Additionally, the Municipal and Industrial District Representatives and ECLS staff make more than 2,600 facility visits. These visits verify compliance, evaluate complaints and offer technical assistance.

CSD and WQD have teamed up many times to educate the regulated public about new or changing regulations. The most recent efforts include pollution prevention, pretreatment, fat, oil and grease training and concrete batch plant outreach. Additionally, the two divisions work together on grant projects with CSD providing the sample analysis and WQD providing technical evaluations and report generation. ★

DEQ FINDS

SOLUTIONS FOR UNDERSIZED WASTEWATER SYSTEMS AT STATE PARKS

The story of environmental woes at three of Oklahoma's State Parks is an old one. DEQ has been working for years with the Department of Tourism to find solutions for the undersized wastewater systems at the Sequoyah, Tenkiller and Texoma Parks. Each Park has its own unique problems, but also has a number of important items in common. The wastewater systems do not have enough capacity to manage the wastewater generated by the visitors to the Parks. The lack of capacity often results in discharges of wastewater to the nearby lake and the locations puts them of the wastewater facilities in danger of being flooded. Underscoring these common items is the lack of money to build environmentally sound solutions.

Finally, after years of much effort and no progress, DEQ issued an order in June 2002 to its sister agency to either fix the wastewater problems that are a health and environmental concern or reduce the flow to the systems at the three Parks to reduce impact on the environment. In many situations, that meant a reduction of 90% of the waste



Aerial photograph of Sequoyah State Park shows proposed enhancements.

stream, which led to the closure of many of the campgrounds in the summer of 2002. Some campgrounds remained opened through the use of portable toilets.

DEQ worked with Tourism to develop interim measures to keep some of the crucial areas open to the public. One example is the Western Hills Lodge at Sequoyah State Park. The Lodge and nearby cabins were served by an undersized three-cell lagoon system. DEQ

worked with Tourism to once again begin to use an old irrigation site, install disinfection and begin the removal of sludge from the cells. The sludge had accumulated over the years and had further decreased the capacity. The sludge removal was not a cheap endeavor. DEQ enlisted the help of Oklahoma City, since that community had an outstanding debt for past violations in its wastewater system. Oklahoma City had the

equipment, expertise and the desire to help. Due to this united effort, the Lodge was able to remain open.

The plight at the Parks sparked Legislative interest. However, during poor economic times and looming budget cuts, inexpensive long-term solutions were a must. At Legislative request, DEQ used its engineering expertise to propose the combination of large centralized systems and smaller self-contained sys-

tems at individual campgrounds. The Water Quality and Environmental Complaints & Local Services Divisions of DEQ joined hands in developing specific designs for the smaller systems to assist Tourism. The use of small system design resulted in good environmental solutions at a significant cost reduction over the original estimates. Tourism worked through its consultants with

assistance from Water Quality engineers to develop and finalize the design of the large centralized portions of the project. The completion of designs by Tourism is targeted for the end of summer 2003.

All that remains are the dollars to bring the solutions into reality. Budget cuts made state appropriations infeasible. DEQ, being very familiar with assisting others in finding money to construct needed

water and wastewater improvements, suggested securing a low interest loan available from the State's Clean Water Act Revolving Loan Fund. The Legislature passed a statute during the last session to facilitate Tourism repaying such a loan. Tourism is busy satisfying all the requirements to obtain the loan.

The stage is set to bring down the final curtain on the

closing act of the story. Inexpensive and sound environmental designs have been chosen and dollars to construct those improvements have been found. With the continued resolve and cooperation of DEQ and Tourism, supported by the State Legislature, Oklahomans will have a happy ending for this once tragic story to enjoy at Sequoyah, Tenkiller and Texoma Parks next summer. ★

WATER QUALITY DIVISION DEVELOPS CONCRETE BATCH PLANT GENERAL PERMIT

With the expiration of the concrete batch plant general permit, the WQD evaluated the need for the permit. This review determined that there could be approximately 150 unpermitted facilities, which would increase the total number of regulated facilities to about 300. In an effort to provide a less intimidating atmosphere, DEQ offered an amnesty program that deferred any enforcement action against an unpermitted facility until April 1, 2003 for those facilities that attended outreach meetings.

During the course of the development of the new permit, several major revisions of the expired permit were incorporated. These include the in-

clusion of stormwater conditions that allow a single permit to cover both wastewater and stormwater, the addition of conditions that allow underground tanks to be used to manage wastewater and the extension of the overall coverage of the permit to include those facilities manufacturing pre-cast concrete products. In addition, the permit was revised to incorporate changes in the rules that resulted from the adoption of OAC 252:616 "Industrial Wastewater Systems."

The General Permit was 'public noticed' on April 8, 2003 and both formal and informal public meetings were held. The final permit was issued June 23, 2003.



Bob James, Executive Director of Oklahoma Ready Mix Concrete Association and Afsaneh Jabar, Water Quality Engineering Manager, sign and deliver the General Permit.

The use of the General Permit will allow DEQ staff to more quickly issue permits for these facilities. Addition-

ally, the facilities will benefit from reduced permit fees as two permits were combined into one General Permit. ★

2002 INTEGRATED WATER QUALITY ASSESSMENT REPORT

The Water Quality Division announced the release of the 2002 Integrated Water Quality Assessment Report (Integrated Report) on May 28, 2003. The Integrated Report is the culmination of efforts involving more than a dozen state and federal agencies and represents a significant improvement in the State's process of assessing the quality of its waters. The report combines the 305(b) Water

Quality Assessment Report and the 303(d) Impaired Waters List.

During the 2001/2002 reporting cycle, 3,970 water bodies were designated into the Oklahoma Assessment Database (ADB). These waters include approximately 34,142 of 78,788 total river and stream miles and 625,896 of 1,041,884 total lake acres. Of the 3,970 water bodies, approximately 1,042 water bodies were assessed using monitoring data, professional evaluation and citizen input.

This report exemplifies the cooperation of several state

and federal agencies and represents a significant improvement in the State's process of assessing the quality of its waters due to the fact that the current process is science based, while previous efforts were more speculative. DEQ is committed to improving the 305(b) and 303(d) reporting processes. Using EPA's Integrated Reporting guidance is a step in that direction.

Each beneficial use of an assessed water body was evaluated based on real data according to the State's well-formed, science-based assessment methodology. This method



ology categorizes waters into one of five categories. A summary of the assessment results is shown below. ★



2002 WATER QUALITY ASSESSMENT SUMMARY

Type	Cat 1	Cat 2	Cat 3	Cat 4	Cat 5
Lakes(acres)	—	241,692	151,652	—	232,552
Rivers/Streams(miles)	—	2,327	24,385	158	7,272
All(# water bodies)	—	208	3310	16	436

- Category 1 - Attaining the water quality standard and no use is threatened.
- Category 2 - Attaining some of the designated uses; no use is threatened; and insufficient or no data and information is available to determine if the remaining uses are attained or threatened.
- Category 3 - Insufficient or no data and information to determine if any designated use is attained.
- Category 4 - Impaired or threatened for one or more designated uses but does not require the development of a Total Maximum Daily Load (TMDL).
 - 4a - TMDL has been completed.
 - 4b - Other pollution control requirements are reasonably expected to result in the attainment of the water quality standard in the near future.
 - 4c - Impairment is not caused by a pollutant.
- Category 5 - The water quality standard is not attained. The water body is impaired or threatened for one or more designated uses by a pollutant(s) and requires a TMDL. This category constitutes the Section 303(d) list of waters impaired or threatened by a pollutant(s) for which one or more TMDL(s) are needed.

DEQ UNDERTAKES STORMWATER PHASE II

On December 8, 1999 the EPA published the Storm Water Phase II regulations. In these regulations, DEQ, through the Water Quality Division, was given the job of reviewing potential Small Municipal Separate Storm Sewer System (MS4) owner/operators and identifying those Small MS4s that will need to be regulated under the Phase II rules by December 9, 2002.

The definition of a Small MS4 is any town with a population of at least 10,000 people and at least 1,000 people per square mile, or any town that is not regu-

lated under Phase I rules that is located in an Urbanized Area (UA). A total of 60 MS4s were identified for regulation under the Phase II Storm Water Small MS4 program. The rule automatically selected as MS4s 47 towns that were located in an Urbanized Area such as Oklahoma City suburbs. DEQ informed 12 additional towns that they met the required 10,000 population and 1,000 density and would require permitting.

As required, DEQ used the 2000 U.S. Census, the impaired streams and water body list and Geographic Information System (GIS) to determine



Storm water run-off

that 13 towns met Phase II Small MS4 waiver requirements. These 13 towns were granted a waiver from Phase II Small MS4 permitting requirements. The towns that were automatically selected

and did not receive a waiver had to apply for coverage by March 10, 2003. The towns that were identified for permitting by DEQ had to apply for coverage by June 10, 2003.

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Designated Storm Water Phase II Small MS4s

Altus	Jenks	Oklahoma Department of Transportation (ODOT)
Bartlesville	Lawton	Oklahoma Turnpike Authority (OTA)
Bethany	McAlester	Owasso
Bixby	Miami	Ponca City
Broken Arrow	Midwest City	Rogers County
Catoosa	Moore	Sand Springs
Choctaw	Muskogee	Sapulpa
Claremore	Mustang	Spencer
Comanche County	Nichols Hills	Stillwater
Coweta	Nicoma Park	Tahlequah
Creek County	Noble	The Village
Del City	Norman	Tinker AFB
Edmond	Oakhurst	Turley
Fort Sill Army Base	Okmulgee	Wagoner County
Hall Park	Oklahoma County	Warr Acres
		Yukon



Storm water control installation.



Storm water regulations address environmental concerns created by urban development.

By following these measures, the storm water pollutant discharge from the MS4s will be reduced. DEQ is recommending a seventh, optional, Minimum Control Measure for municipal construction activities. This control measure would reduce the amount of paperwork involved when meeting all storm water regulations.

DEQ has been working with several groups to assist the towns that must meet MS4 regulations. An example Storm Water Management Plan (SWMP) has been developed to help these towns reach the requirements within the five-year period as stated in the regulations. On October 25, 2002, a seminar was held for the affected towns to provide in-depth details on what would be required of them. ★

Regulated Storm Water Phase II Small MS4s must develop and use a Storm Water Management Plan that addresses six Minimum Control Measures

- 1. Public Education and Outreach;**
- 2. Public Involvement and Outreach;**
- 3. Illicit Discharge and Elimination;**
- 4. Construction Site Storm Water Runoff Control;**
- 5. Post-construction Storm Water Management in New Development and Re-development; and,**
- 6. Pollution Prevention and Good Housekeeping for Municipal Operations.**

CAPACITY | MANAGEMENT | OPERATION | MAINTENANCE

Capacity, Management, Operation and Maintenance, or CMOM, is not a new concept in wastewater management, at least not in Oklahoma. Since its inception, DEQ, through the Water Quality Division, has required that wastewater treatment plants, pumps and pipes be properly sized, operated and maintained. However, most other states and EPA have been slow to acknowledge the pumps and pipes, known as collection systems, in regulations. EPA argued it didn't have specific authority and most states simply adopted the federal regulation.

Oklahoma is different. State statutes clearly stipulate that all wastewater discharges must

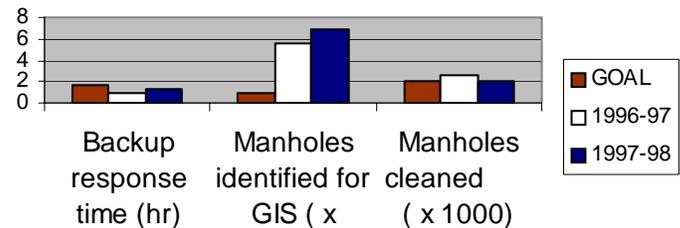
have a permit. Consequently, DEQ and predecessor state agencies enacted rules and established programs to address those non-permitted discharges known as sanitary sewer overflows (SSOs).

Because Oklahoma already had a program for addressing SSOs in place when EPA began to evaluate the need for a national standard, DEQ was asked to assist in its development. This assistance was in the form of providing details of how DEQ's program operated, attending work group meetings with EPA and their consultants and reviewing and commenting on proposed draft regulations.

The draft of the federal regulations that EPA released to the public includes all elements of the Oklahoma program, plus some additional requirements. These rules are currently under review and may be released in 2004.

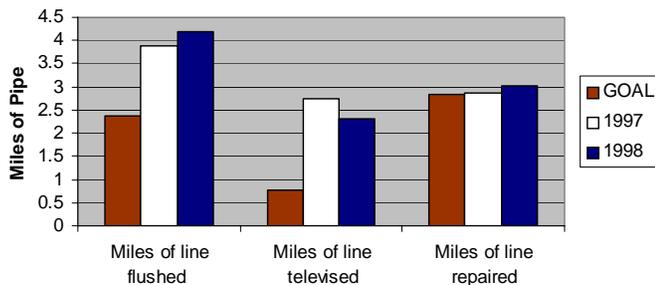
Many states and regulated facilities will be forced to spend large sums of money to comply with the regulation. For DEQ and Oklahoma facilities, programs will have to be expanded, but are already in place. ★

Results of Performance Measures Implementation



Results of Performance Measures Implementation: By implementing performance measures, Oklahoma City has reduced response time to complaints, identified most manholes to add to its GIS system and cleaned many manholes to improve performance.

Maintenance Performance



Maintenance Performance: Oklahoma City has implemented a maintenance schedule for collection lines.

Failure to properly operate and maintain a collection system can cause breaks or overflows that may result in a fish kill.



OKLAHOMA AREA-WIDE OPTIMIZATION PROGRAM (AWOP)

AWOP is an EPA-sponsored program that focuses on improving and optimizing individual surface water treatment plants in a particular state or area, with the goal of maximizing public health protection. AWOP provides a framework for each individual state to achieve the goal of maximizing public health protection through optimization. The AWOP model consists of four components, as shown below.

An Oklahoma/EPA Region

6 AWOP team was formed in March of 1999. The members are from the Water Quality Division and EPA Region 6.

The **Status** component of AWOP consists of adopting optimized performance goals, prioritizing systems based on public health risk, monitoring and assessing performance data and developing professional relationships with water utilities. DEQ team members have established optimized turbidity performance goals for surface water treat-

ment plants in Oklahoma and prioritized all community surface water systems in the state of Oklahoma based on public health risk by ranking criteria. Optimized disinfection by-product goals are under development.

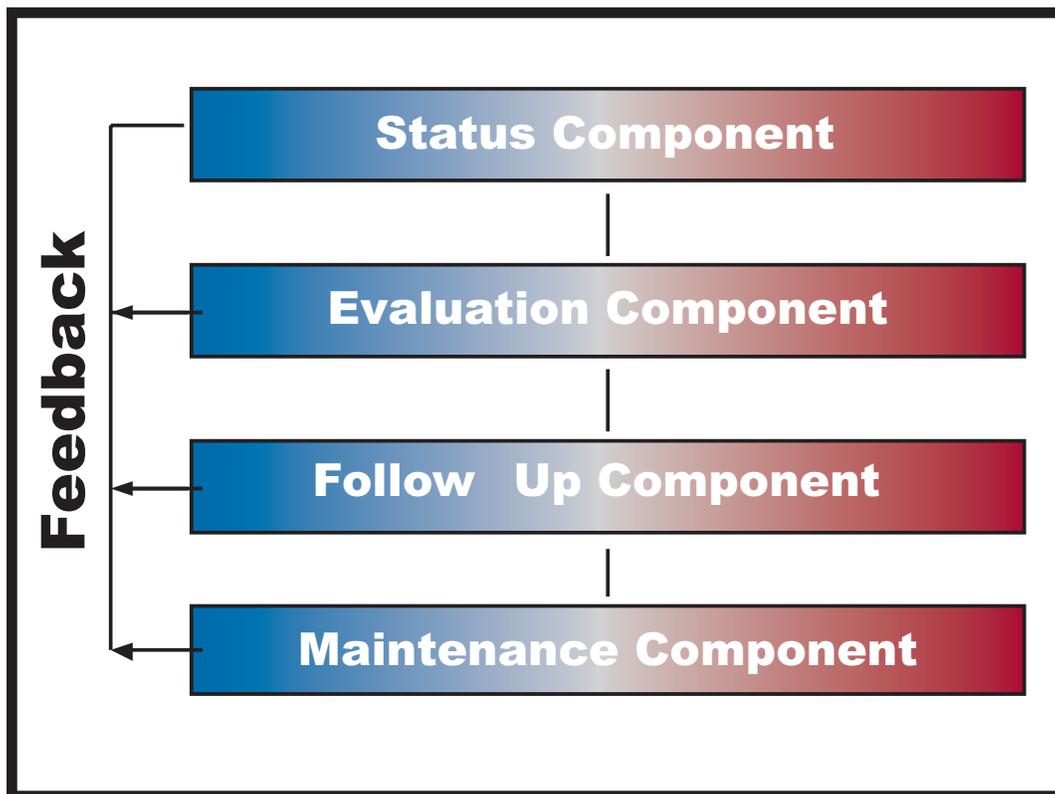
The **Evaluation** component of AWOP consists of implementing ways to evaluate surface water treatment plants. In Oklahoma, Comprehensive Performance Evaluations (CPEs) have been used as an evaluation tool to iden-

tify factors that limit performance. DEQ team has conducted a total of 10 optimization CPEs and one regulatory CPE.

During the **Follow-up** component of AWOP, DEQ team members help seek solutions to the problems that limit plant performance. The goal is to transfer priority-setting and problem-solving skills to the plant operators through technical assistance.

The **Maintenance** component of AWOP consists of making changes in the state program to complement AWOP objectives. DEQ team initiates and sustains quality control activities during this stage, which supports continual improvement.

With such a large number of surface water systems in the state of Oklahoma (approximately 240 out of 1,800 systems), AWOP will aid DEQ in assisting systems to meet regulatory requirements along with optimized requirements. This should help reduce the number of violations from surface water systems in the state and maximize public health protection. ★



This is an example of one of the special studies that is performed during a CPE. The persons in this picture are checking the expansion of the media during a filter backwash.



DEQ team members learn how to conduct a compliance performance evaluation at the Altus drinking water treatment plant.

FISH KILL ORIENTATIONS



DEQ investigates a fish kill.

The Industrial Wastewater Enforcement Section of the Water Quality Division, purchased 70 sets of colorimetric water sampling kits for use by the Environmental Complaint and Local Ser-

vices (ECLS) personnel during field investigations of fish kills. The water sampling kits were available for ECLS use during field investigations to evaluate waters in the vicinity of fish kills

Ralph Johnson explains points on fish kills.





Water lab instruction and information regarding fish kills.

and to identify environmental factors that may have contributed to fish kills. The sampling kits included supplies for water-samples for pH, chlorine, cyanide and ammonia. The kits were to help ECLS personnel identify possible causes of fish kills would assist in the rapid resolution of fish kill complaints.

Wayne T. Craney, P.E., Ralph Johnson and other Industrial Wastewater Enforcement Section staff conducted training for using

the water sampling kits during five fish kill orientations in Oklahoma City, Lawton, Ada, McAlester and Wagoner at regional meetings of ECLS personnel during October 2002. Approximately 75 ECLS personnel and supervisors attended these meetings where the orientations were conducted and other topics discussed.

The orientation objectives were to introduce ECLS personnel to Industrial Wastewater Enforcement Section personnel,



Class receives instruction on water sampling for a fish kill.

review DEQ's procedures for investigating and reporting fish kills and provide an explanation of the use and limitations of the water sampling kits. Literature distributed during the orientations included reference materi-

als for reporting fish kills, sample checklists for investigating fish kills and extracts from a "Field Manual for the Investigation of Fish Kills" produced by the U.S. Department of Interior. ★

WASTEWATER PERMITTING REORGANIZATION

On September 1, 2000, DEQ's Water Quality Division took steps to further improve the OPDES permitting process. The large Permitting Section was divided into what are now the Municipal Permits Section and the Industrial Permits Section. This is beneficial to the staff as the amount of time the supervisor has to provide guidance and training has increased. Additionally, this split has been beneficial

to the regulated community as permit review time is now divided between two sections.

The manager of the Industrial Permits Section is Afsaneh Jabbar. Her section is responsible for completing all wastewater permits for industrial facilities and includes nine permit writers assigned to three districts (west, central and east). The manager of the Municipal Permits Section is

Ed Dührberg. His section is primarily responsible for completing wastewater discharge permits for municipal facilities, but it also writes some industrial permits on an "as needed" basis. There are seven permit writers assigned to three districts (west, central and east) in the Municipal Permits Section.

The new organization scheme has been working well. It is hoped that re-

ducing the number of permit writers interacting with each supervisor will help make the permitting process more effi-

cient as there will be more time available for manager assistance and permit review time is shortened. ★

MUNICIPAL PERMITS SECTION EDWARD DIHRBERG, ENGINEERING MANAGER

Permit Responsibilities:

- Major Municipal Discharge Permits
- Minor Municipal Discharge Permits
- General Permit for Filter Backwash at Drinking Water Plants
- General Permit for Discharging Municipal Lagoons
- Industrial Permits as Needed

INDUSTRIAL PERMITS SECTION AFSANEH JABBAR, ENGINEERING MANAGER

Permit Responsibilities:

- Major Industrial Discharge Permits
- Minor Industrial Discharge Permits
- Industrial General Permits (Car Washes, Coal Mines, Concrete Batch Plants, etc.)
- Industrial User Permits

The above chart shows the new organization scheme for wastewater permitting currently in place at DEQ



PROGRESS CONTINUES ON PERMIT BACKLOG

When a permit expires and isn't issued within six months of the expiration date, it is considered to be a "backlogged" permit. The EPA's goal was for all the states to reduce the backlog of major discharge permits to below 10% by the end of 2001. For Oklahoma DEQ, that means no more than 10 permits expired for more than six months.

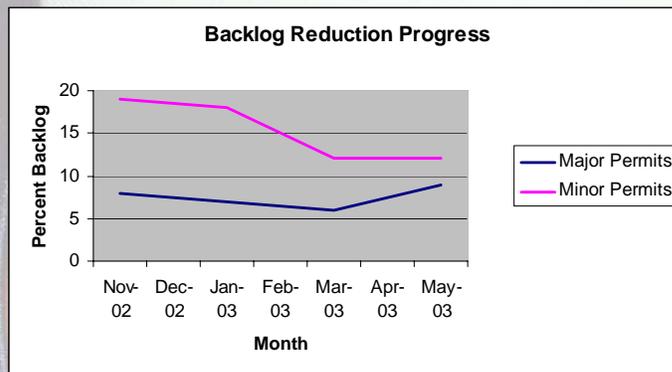
DEQ worked hard in 2001 to meet this goal. Many permit writers worked overtime to complete their major permits. General Permits were utilized

to an increasing degree to reduce the time spent working on other permits. As a result of these efforts, Oklahoma was the only state in EPA Region 6 to meet this goal.

The next step is to reduce the backlog of minor permits. EPA's goal is to reduce the backlog of minor permit to below 10% by the end of 2004. This translates into no more than 69 permits expired for more than six months. DEQ is making good progress towards that goal. In April 2003 the minor permit backlog was

down to 11%. DEQ plans to meet this goal for minor permits while keeping the major

permit backlog from going above 10%. ★



Permit Backlog Status for DEQ as of April 2003

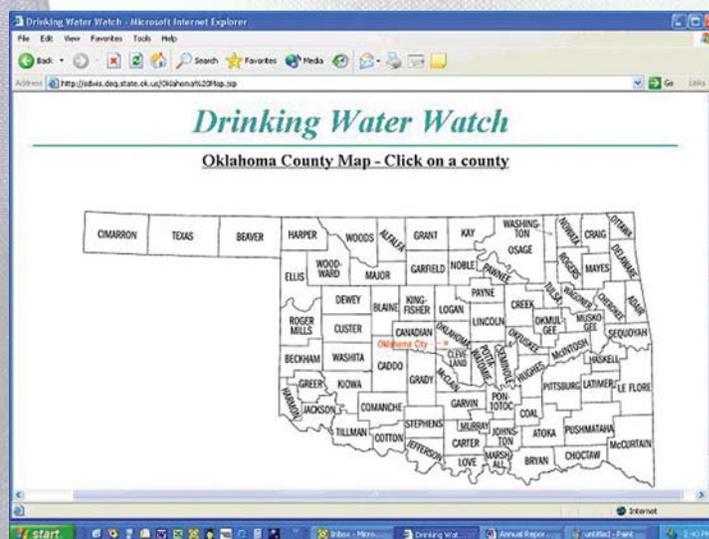
DRINKING WATER WATCH

An Internet software application called Drinking Water Watch that provides the public with access to water system information available in the Safe Drinking Water Information System (SDWIS) has been developed for customer use. Information regarding inventory data, sample results, violations and enforcement actions will be available to view.

Drinking Water Watch can be accessed at <http://sdwis.deq.state.ok.us> and will have a link from DEQ Water Quality website soon. The user can search by Public Water Supply ID number, system

name, or by county. County listings of water systems can be accessed by typing in the county name or by clicking on the county on an Oklahoma map. This will bring up a list of all water systems in that county and then the user may select the specific water system of interest and view specific information about that system.

The user-friendly interface of the Drinking Water Watch application makes it easy for the general public, legislators and DEQ local offices to have direct access to drinking water data for public water systems anywhere in Oklahoma. ★



County listings of water systems can be accessed from this Oklahoma map at the Drinking Water Watch web site.

DEQ PARTICIPATES IN **CLEAN** WATER FESTIVAL

October 2002 marked the 30th anniversary of the enactment of the Clean Water Act, which set the goal of “fishable and swimmable” water bodies. To commemorate this historic piece of legislation and renew public awareness and involvement, DEQ joined the City of Oklahoma City, Office of the Secretary of Environment, Oklahoma Water Resources Board, Oklahoma Conservation Commission and U.S.

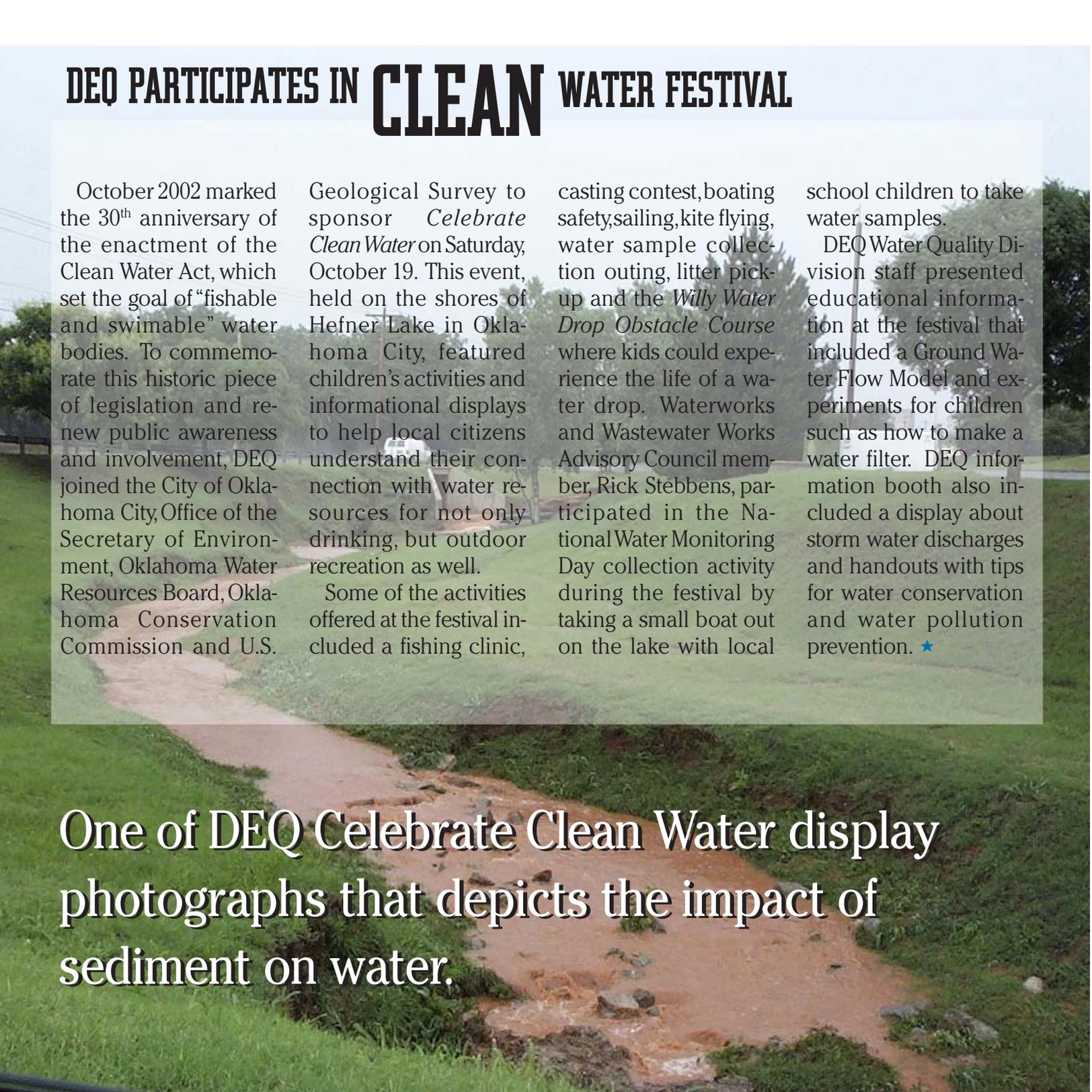
Geological Survey to sponsor *Celebrate Clean Water* on Saturday, October 19. This event, held on the shores of Hefner Lake in Oklahoma City, featured children’s activities and informational displays to help local citizens understand their connection with water resources for not only drinking, but outdoor recreation as well.

Some of the activities offered at the festival included a fishing clinic,

casting contest, boating safety, sailing, kite flying, water sample collection outing, litter pick-up and the *Willy Water Drop Obstacle Course* where kids could experience the life of a water drop. Waterworks and Wastewater Works Advisory Council member, Rick Stebbens, participated in the National Water Monitoring Day collection activity during the festival by taking a small boat out on the lake with local

school children to take water samples.

DEQ Water Quality Division staff presented educational information at the festival that included a Ground Water Flow Model and experiments for children such as how to make a water filter. DEQ information booth also included a display about storm water discharges and handouts with tips for water conservation and water pollution prevention. ★



One of DEQ Celebrate Clean Water display photographs that depicts the impact of sediment on water.

WATER QUALITY MONITORING DATA WAREHOUSE

The Oklahoma Legislature designated DEQ as the repository for environmental monitoring data collected by state agencies. Under this law, DEQ is required to maintain Oklahoma water quality data in a computerized information system that is accessible to both state environmental agencies and the public. In support of this effort, all state environmental agencies are

submitting the results of monitoring they have performed to DEQ for inclusion in this unique repository. This cooperative effort has allowed DEQ to compile multi-source monitoring data for the state into a centralized database that is accessible to all through web-based applications.

It was recognized that the goal of providing a user-

friendly tool for accessing monitoring data could best be achieved by modifying an existing DEQ web-based Geographic Information System (GIS) application, "DEQ Data Viewer," by taking advantage of its visually oriented tools to provide access to monitoring data. The Data Viewer can be accessed through DEQ's main web page at: www.deq.state.ok.us

This application provides a unique query-building tool that allows users to query by data provider, program, sample source, analyte category (i.e. organics), specific analyte and period of record. In addition to monitoring data, the Data Viewer will continue to provide access to information concerning regulated activities and geographical features relative to environmental issues.

By selecting the "To See Oklahoma DEQ GIS Maps" option, users gain access to a very robust system designed as a platform for content specific applications such as the utilization of water quality monitoring data.

In support of efforts to provide environmental information to all, DEQ will continue to evaluate the changing data needs of those groups with environmental interests and work toward the development of those applications and processes necessary to effectively meet those needs. ★



Screen view of the DEQ Data Viewer.

Right: Screen View of the Water Quality Analysis Query Tool within DEQ Data Viewer.

A screenshot of the 'Water Quality Monitoring Data' query tool interface. The title is 'Water Quality Monitoring Data'. Below the title, there is a note: 'Please choose the criteria for your data selection. NOTE: Questions marked with an (*) are required.' The interface contains four numbered steps for data selection:

1. (*) Choose Agency and Program Source: Two dropdown menus are shown, with 'OWRB' selected in the first and 'BLUMPS' in the second.
2. (*) Choose ground water, surface water or water system source data: A dropdown menu is shown with 'SURFACE WATER' selected.
3. (*) Select analyte Category: A dropdown menu is shown with 'INORGANICS' selected. A note next to it says '(must select a specific category)'. There is a small asterisk icon to the right of the dropdown.
4. Select the specific analyte: A dropdown menu is shown with 'NITROGEN, NITRATE AS N' selected.

COMPLETION OF SWAP PROGRAM

The Safe Drinking Water Act (SDWA) Reauthorization of 1996 required states to develop a Source Water Assessment and Protection (SWAP) program to assess the drinking water sources that serve public water systems for their susceptibility to contamination. The goal for SWAP programs is to evaluate all drinking water sources that provide service to public water systems (PWSs). These assessments are only for raw water sources for public drinking water and are not evaluations of performance or compliance of public water systems.

Many of the protocols established in DEQ's Wellhead Protection Program have been used as the foundation for DEQ SWAP program. For example, the methodology used in the delineation of surface water supplies, mirrors DEQ's EPA approved Wellhead Protection Program. Furthermore, Oklahoma has used all reasonably available hydrogeologic information, water flow, recharge and discharge and any other information available to accurately delineate the source water assessment areas.

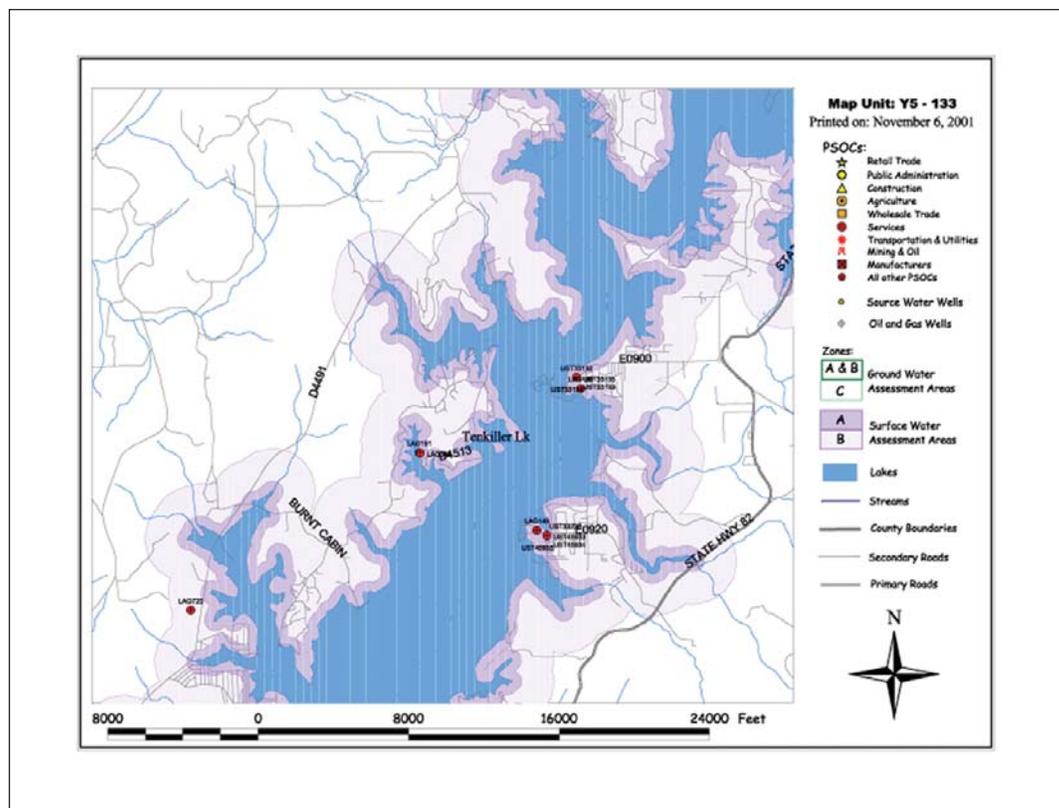
The end result of developing source water assessments

was that determining the potential risks to water supplies would assist the suppliers in protection programs to minimize these risks. Ultimately the success of the program is determined by the steps each community puts into place to protect its drinking water sources. Public participation, one of the most important

aspects, is required at every step of the program not only to ensure that accuracy is maintained, but also to promote the program through involvement and cooperation.

In January 2003, Oklahoma completed an initial source water assessment for the 3,200 groundwater sources and 129

surface water sources. However, the individual reports will be updated on an annual basis to insure that the information remains as accurate as possible and provide a reasonable starting point for water supplies to develop protection or management programs to minimize risks to our drinking water supplies. ★



The above image shows a typical map developed for the Source Water program.

THREE DWSRF PROJECTS COMPLETED

The Safe Drinking Water Act (SDWA) Amendments of 1996 authorized the Drinking Water State Revolving Fund (DWSRF) program, a low interest loan program, to assist public water systems in financing the cost of replacement and repair of drinking water infrastructure to achieve or maintain compliance with the SDWA requirements and to protect public health. This program is financed through an EPA grant and is jointly managed by DEQ and the Oklahoma Water Resources Board. The DWSRF program will help insure that drinking water supplies remain safe and affordable and that the systems that receive funding will be properly operated and maintained.

Recently three projects have been completed and are in operation:

- Okeene Public Works Authority completed its \$336,611 project in September 2002. This project included rehabilitation of an existing well, improvements to existing pump stations and replacement of 5.5 miles of existing 6-inch water lines with 12-inch lines. The project increased the capacity from a maximum of 600,000 gallons per day (gpd) to 1,000,000 gpd.

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New 24 inch raw water transmission line (left), installed by Bartlesville, next to an old transmission line.



Granulated Activated Carbon Filters (GAC) at Edmond's Water Treatment Plant.



Purcell's new 1.5 million gallon storage tank.

- In October 2002, Bartlesville Municipal Authority completed the installation of a 24 inch raw water transmission line. The raw water line was needed to help meet present and future demand. The cost of this project was \$1,858,978.
- Purcell Public Works Authority's \$1,990,000 project completed in March 2003, included the construction of a new water storage tank, drilling of new wells and miscellaneous improve-

ments to the pump stations and water lines. This project was needed to correct problems with low pressure, inadequate flow and insufficient storage during drought conditions.

In addition to these projects, Edmond, Hennessy, Tonkawa and El Reno will complete construction in the coming months. ★



New controls for pump stations and wells at Okeene.



Trench with a portion of Tonkawa's water line visible.

WATER QUALITY RECEIVES NEW WASTEWATER PLANT MODELING PROGRAM

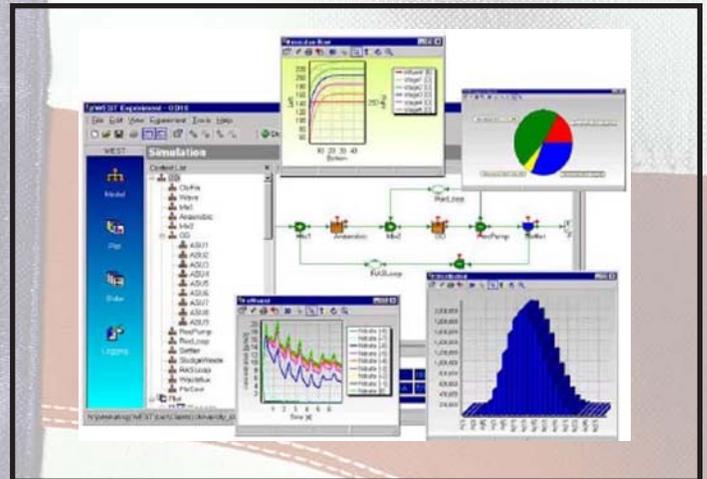


The Water Quality Division has recently purchased wastewater treatment modeling software. WEST® offers a user-friendly method to model and simulate different processes or systems such as wastewater treatment plants, rivers, sewers, etc. This approach uses mathematical models that represent a reliable image of the existing system. Once the model is built, the user can input different variables and get instant feedback on how the changes may affect the effluent leaving the plant.

Combined with accurate wastewater characterization, WEST is needed to evaluate proposed wastewater treatment plants and examine and compare different alternatives to select the best configuration for new treatment facilities. It also can be used to measure the impact of process modifications and upgrades on effluent characteristics.

DEQ's construction standards have proven to be a reliable tool when designing a new wastewater treatment facility or upgrading an existing one. However, design engineers are constantly introducing new solutions that may not fall within DEQ design guidelines. The use of this software to analyze these processes will provide additional information to DEQ staff when determining the adequacy of new technology.

Finally, the use of this tool will aid the review of plans and reduce many of the questions that facilities or their consulting engineers are currently asked to submit. This change should help shorten the time between plan submittal and approval. ★



Mosaic of different screen-shots available to the modeler.

STATE ENVIRONMENTAL LABORATORY INITIATES VOLUNTEER WATER MONITORING PROGRAM

In celebration of the 30th Anniversary of the Clean Water Act, the Customer Services Division initiated an internal volunteer water-monitoring program. Employees were encouraged to participate by collecting surface water samples from areas of personal interest or concern. Sample kits and collection instructions were assembled and distributed to the volunteers by CSD staff throughout the months of October and November 2002. Overall, DEQ employees collected a total of 64 samples from 18 counties throughout the state.

Paramount to the program's success was the State Environmental Laboratory's extensive water testing capabilities. All incoming samples were categorized either as rivers, streams, lakes, or ponds and analyzed by the General Chemistry/Metals Section for a variety of minerals and nutrients. Analytical data was statistically evaluated relative to current water quality standards and potential environmental impact. In most cases basic collection information was supplemented by local observations relative to vegetation, aquatic life, land use and weather. Sample collectors were also encouraged to use the Agency's GIS mapping program located on our website to chart sample collection sites by latitude and longitude. At the conclusion of the program, indi-

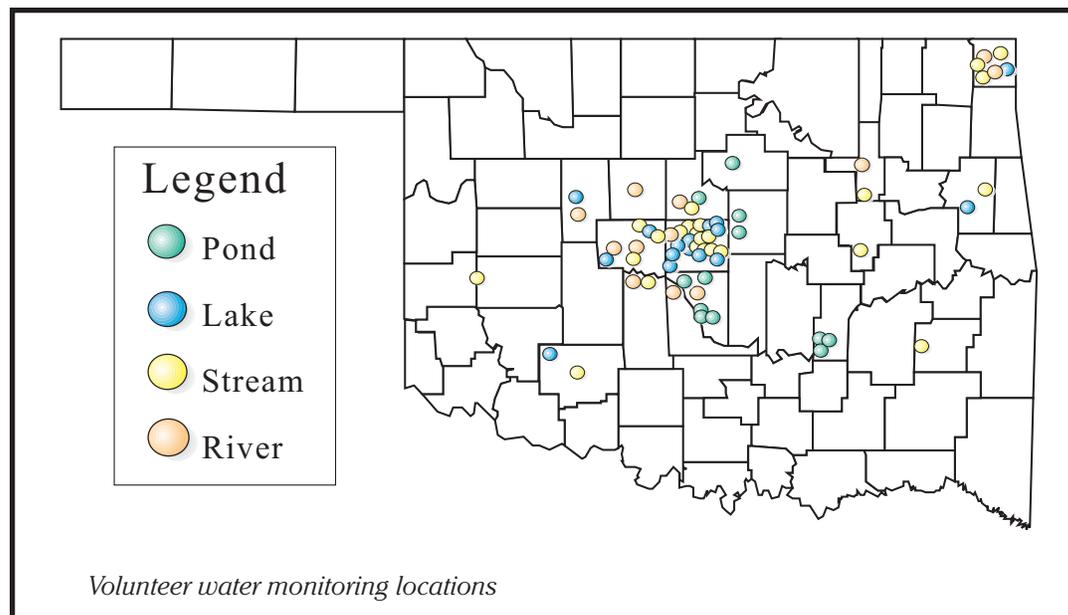
vidual sample data were returned to each participant and the overall study data was submitted to the National Water Monitoring Program.

Results of the program were presented by Erin Lovelady at the 12th annual Oklahoma Clean Lakes Association Symposium April 9-11, 2003 at Beaver's Bend State Park.

This same program was also presented internally to all participants. The results of our study indicate that surface water in Oklahoma is impacted and in some cases impaired by nutrient and sediment run-off. ★



Erin Lovelady analyses water samples from DEQ's volunteer monitoring program



Volunteer water monitoring locations