

OKLAHOMA WATER NEWS

Bimonthly Newsletter of the Oklahoma Water Resources Board

State and Local Governments Emphasize Wellhead Protection

Protection and management of Oklahoma's water supplies are fundamental goals of the OWRB and other state environmental agencies. That responsibility is being shared with an increasing number of conscientious Oklahoma communities and rural water districts who are choosing to participate in the federal Wellhead Protection Program.

The program, based upon the premise that activities around a public water supply well directly affect its quality, was set up by 1986 amendments to the federal Safe Drinking Water Act. That law requires states to identify potential sources of groundwater contamination to drinking water supplies and delineate vulnerable zones around the wells which deserve additional protection. The program also directs appropriate state agencies to work with system operators to develop management plans aimed at reducing or eliminating the risk of pollution.

According to Bob Fabian, of the OWRB's Groundwater Division, the national wellhead protection strategy is typical of EPA's new philosophy.

"The program is a direct result of EPA's increased interest in the prevention of groundwater pollution and reflects a federal initiative to give state and local governments a freer rein in managing their pollution problems," he said.

Oklahoma's Wellhead Protection Program has taken off, primarily due to the huge reliance Oklahomans have on groundwater supplies.

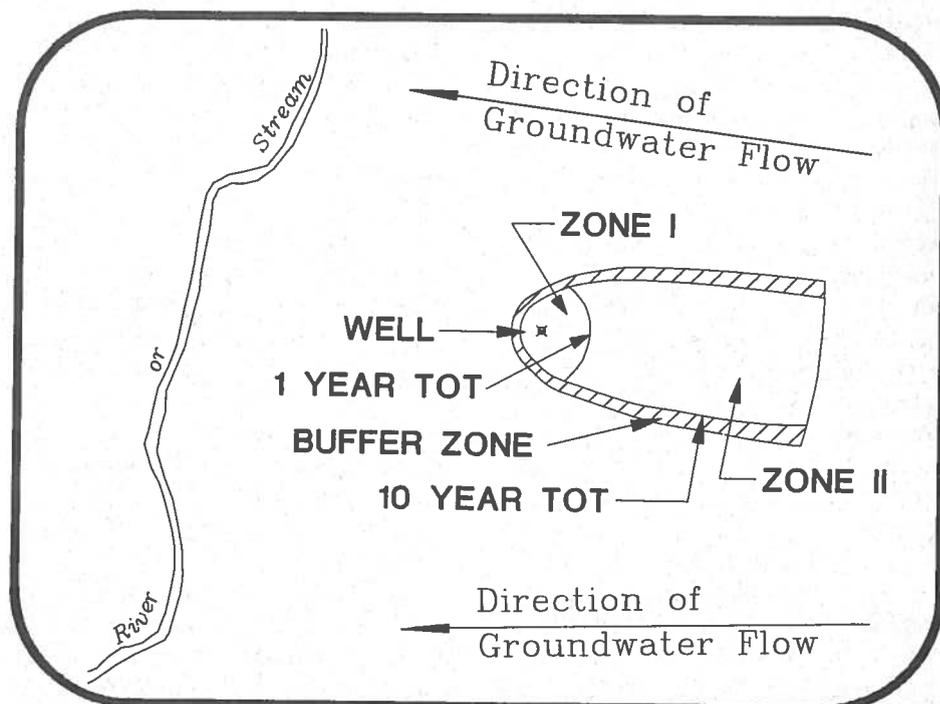
Groundwater is the source for 600 community public water supplies in Oklahoma, 1,200 non-community public water supplies and approximately 125,000 private wells. The voluntary nature of the program has also made it popular with communities and rural water districts, Fabian said.

"Most local water systems realize that they bear the ultimate responsibility for protecting their water source," he says. "Once we identify areas in need of protection, communities may employ any options they believe are necessary to safeguard their groundwater supplies, such as

zoning regulations," Fabian points out.

Public water supplies are exposed to many contaminants, including substances in landfills and surface impoundments, fertilizers and pesticides from croplands and lawns, and by-products of oil and gas activities. Groundwater, upon which approximately 95 percent of the country's rural population depends, is particularly vulnerable because pollution is often detected too late for inexpensive and quick remediation. Complicating the vulnerability of public water supply wells is their proximity to the populations they benefit and, therefore, the pollution sources which threaten them. Potential for contamination and subsequent human health problems have spawned the enact-

Continued on page 2



Shown is a typical delineation for one public water supply well. Note one- and ten-year time of travel lines along with delineations for the three protective zones.

Wellhead, continued from page 1

ment of numerous state laws and other efforts to protect wells from contamination.

The Water Board has been working to establish the state program for more than two years and is responsible for three of the four completed and approved delineations—the Towns of Fairview and Seiling and Major County Rural Water District #1. Once delineations are performed, they are considered for approval by the State Pollution Control Coordinating Board. The OWRB—which created the standard delineation methodology adopted throughout Oklahoma—is currently developing protection plans for wellfields in Noble and Weatherford.

The first major step in establishing a wellhead protection program involves delineation of the surface and subsurface areas surrounding a well or wellfield through which contaminants are likely to pass. Areas surrounding wells are particularly susceptible because pollutants within a pumping well's recharge area may be drawn to and down the well through its cone of depression in the groundwater surface. The cone of depression may vary from a few feet to several thousand feet around the well.

Currently, the Oklahoma State Department of Health (OSDH) dictates where public water supplies may be located by requiring a 300-foot separation between wells and possible pollution sources. Many proponents of the program agree that this buffer may be inadequate to protect shallow or vulnerable aquifers. Expanding this radius through the wellhead protection program provides an opportunity for water systems to provide an enhanced level of protection. The program complements the Water Board's other groundwater efforts, such as the well drillers licensing program set up to ensure that wells are properly constructed to prevent infiltration of pollutants.

Boundaries for wellhead protection areas are determined by well pumping rates, time of travel of groundwater flowing to the well, aquifer boundaries and degree of confinement. The OWRB and OSDH assist communities and rural water districts with

this initial task.

One of the most critical facets of any delineation is to discover what is known about the hydrogeology of the area around the wellfield, Fabian pointed out. Data gathered from hydrogeologic studies—such as aquifer characteristics and parameters and groundwater flow and time-of-travel data—are utilized in an OWRB-developed computer program which then delineates the area to be protected. The computer program, on a 5½- or 3½-inch diskette, is available from the OWRB.

Initially, an interim wellhead protection area is identified; later, a two-phase site-specific delineation is conducted. Phase I targets wells in Oklahoma's major aquifers on which sufficient hydrogeologic data and other background information exist. OWRB computers maintain an inventory of all state wells, including location and depth of wells, geology and hydrology of the water-bearing formation

and date of well completion. The second delineation phase includes wells on which less specific data exist.

Wells and wellfields have a 3-tiered level of protection

Zones identified during site-specific delineations protect supplies from various contamination threats. All three zones may be administered by communities who choose to provide ultimate protection against pollution of groundwater supplies. Zone I provides an area of protection against direct infiltration of pollutants and microbial contamination. Zone II protects against chemical contaminants. Finally, a buffer zone provides additional protection against chemicals which have the potential for infiltrating the wellhead protection area through runoff. Zone boundaries are based on groundwater flow charac-

Continued on page 5

Rain Gage Installed, Driller to Begin Test Holes at Blaine Recharge Site

Following several years of study and funding concerns, state and federal hydrologists and other researchers will at last begin work on the Blaine Aquifer Recharge Project which will test means to channel surface runoff into southwest Oklahoma's Blaine Gypsum Aquifer.

The five-year, \$2 million project is funded by the Bureau of Reclamation, Oklahoma Water Resources Board and Southwest Water and Soil Conservation District. For decades, the cavernous formation—formed by percolating waters which dissolved gypsum and limestone deposits—has experienced declining water levels which impair the region's vital cotton, grain and livestock industries. The project will utilize diversion structures and recharge wells to augment irrigation water supplies.

Project Manager Bob Fabian, an OWRB geologist, announced in July that a Clinton well drilling firm, A.W. Pool, Inc., has been awarded a state contract to drill test holes which will locate ideal locations for the recharge

structures and monitoring wells to judge the project's effectiveness. The firm will begin work in August and expects to be finished within two months.

Already, Water Board staff have in-



Bob Fabian, coordinator of the Blaine Recharge Project, and Dannie Spiser mix concrete which will form the base of a rain gage near Eldorado, in Jackson County.

stalled an automated rain gage near Eldorado close to the Oklahoma-Texas border in Jackson County. Rainfall data recorded by the instrument will be combined with information garnered from monitoring wells and stream gages to measure runoff and recharge water channeled into the aquifer.

Once A.W. Pool concludes its reconnaissance work, the OWRB will initiate a survey to identify any archaeological sites in the project area which could be endangered by construction of wells and diversion structures.

The Blaine Gypsum Aquifer is one of 21 sites in 12 states west of the Mississippi River included in the federal High Plains States Groundwater Demonstration Program, which will test various artificial methods of supplementing groundwater supplies. The Blaine project is unique in that it



Gary Glover levels out the gage base. The PVC pipe houses an automated data recorder which records and stores information on precipitation at 15-minute intervals.

is the first known attempt to artificially recharge a karst aquifer in the U.S. Oklahoma also has one other project proposed in the federal recharge program. That proposal, involving alluvium and terrace deposits of the North Canadian River near Woodward, is currently undergoing feasibility studies.

Eaton Launches ReDirectory

Patty Eaton, OWRB executive director and Oklahoma Secretary of Environment, launched Oklahoma City's Project ReDirectory on June 19

at downtown Kerr Park. Eaton was the keynote speaker at the kickoff of the



city's second annual drive to collect used phone books for recycling.

In 1990 Project ReDirectory collected 1,279,200 pounds of paper in 213,000 used directories. Eaton pointed out that the 1990 drive saved 10,653 trees and 1,650 cubic yards of landfill space.

"It is clear Oklahoma City residents care about the environment and the future of their city and planet," Eaton said. She said she is confident that growing environmental awareness will push this year's collection figures far beyond 1990 totals.

Paper collected in the drive, which ended July 31, was delivered to Fort Howard Paper Company in Muskogee for recycling into bathroom tissue and paper towels.

"Atlas" Receives ALA Award

The Governor's Commendation recognizing the OWRB "Oklahoma Water Atlas" was presented to Assistant Director Mike Melton last month by Vicki Sullivan of the Oklahoma Department of Libraries. Melton accepted the award on behalf of the OWRB publications staff.

The "Atlas," a 1990 publication of the Water Resources Board, was named one of the year's best publications by the Notable Documents Panel of the American Library Association Government Documents Roundtable.

Documents are considered and chosen based on the extent to which they conform to the criteria of contributing to the expansion of knowl-

edge, giving evidence of innovation in presentation, or demonstrating a creative approach; enhancing the quality of life; providing inspiration or pleasure in its information; and being generally pleasant to browse through because of physical appearance, typography, design, quality of illustration/maps, etc. Federal, state, local and international documents published in 1989 and 1990 were eligible.

Drafters James Leewright, Mike McCaugh and Brad Nesom, Photographer Barry Fogerty and Public Information Reps Mary Whitlow and Brian Vance were presented individual cer-



tificates recognizing their contributions to the "Oklahoma Water Atlas" in the July 9 Board meeting.

EPA Lauds Edmond, Crescent

The Cities of Edmond and Crescent are the 1991 winners of the U.S. Environmental Protection Agency's Regional Administrator's Environmental Excellence Award.

For the second time in its three-year history, Edmond's water treatment plant was honored for excellence in operation. The Arcadia Lake facility was cited for its state-of-the-art treatment plant and superior administrative, financial and maintenance programs.

Crescent received the award for outstanding wastewater treatment operations and management. The City was commended for its consistency in meeting effluent limitations and its dedicated operation and maintenance personnel.

Dispose of Hazardous Waste Properly

The term "hazardous waste" usually conjures up the image of men in "moon suits" probing around mysterious, closed-down industrial sites, trying to avoid contamination from exotic materials with long, unpronounceable names. Do any of these ingredients exist in products beneath your kitchen sink? Any product in your home that has written on its label the words TOXIC, CORROSIVE, FLAMMABLE, POISONOUS, CAUSTIC or DANGER is considered a hazardous material. A definite link exists between household hazardous waste and water pollution from rainfall runoff, and you can help break the chain.

How we use and dispose of the

numerous common household products containing hazardous ingredients has a corresponding effect on the world around us. You reap what you sow. Overuse or improper disposal of automotive, paint, lawn and garden products and other household materials can allow them to wash into water supplies on which we are heavily dependent. Shelf life doesn't die in water. "Dispose of properly" is no longer a request which we can ignore. It is guidance for survival on a very populated planet.

The list can include cleaners, polishes, batteries, petroleum and oil products, solvents, mineral spirits, rodent poisons, bug sprays and aerosol

cans. The hazardous qualities of each product may differ, and much has been written concerning responsible use and disposal. Of course, the easiest way to get rid of potentially dangerous materials is to not acquire them in the first place.

Releasing these materials into the environment is unwise, but it may be just as foolish to pour them down the drain. It has been estimated that residents in an average city of 100,000 pour nearly 3.5 tons of used motor oil alone down city sewer drains each month!

Wastewater treatment plants can't handle hazardous materials

Sewage treatment plants are not designed to treat motor oil and other hazardous materials and, as a result, many of them pass through the process and return untreated to our water supplies. If you throw them in the trash, these corrosive or caustic materials can not only leach through protective landfill liners, but destroy them altogether. Such incidents pose an enormous threat to groundwater.

Because there are so many hazardous materials in everyday use, and because they are so lethal to the environment, it is imperative that we learn which products are hazardous, how to use them safely and how we can dispose of them properly.

Texas Water Commission



Derek Smithee of the OWRB Water Quality Division explains to high school students of the OSU Summer Academy for Environmental Science how his division responds to pollution complaints. The Water Board hosted a program for the 25 students at Board offices on June 12. Secretary of Environment Patty Eaton welcomed the students, who also heard representatives of the Corporation Commission, State Health Department and Conservation Commission explain their agencies' role in preventing and abating pollution. Coordinator of the OSU Summer Academy for Environmental Science is Chris Mosely.

Seasonal employees assisting the Water Board during the summer of 1991 are Christina Gonzalez, Sandra Gosnell, Daphne Nickish, Monty Gray, Shawn Brown, Ricky High, John McClain, Matt Primm and Jason Peterson. Not pictured is legal intern, Kelley Wolf.



Wellhead, continued from page 2

teristics, location of aquifer recharge areas and estimated time of potential contaminant travel.

Special consideration is given to karst, or limestone, aquifers due to increased flow velocities and time-of-travel criteria. Many wellhead protection areas will have to be reviewed periodically to incorporate new data, wells, contamination sources and other changes.

Once wellhead protection areas are identified, methods are pursued to safeguard and manage them. Wellhead management activities often adopted by communities include regulation of land use through ordinances and zoning, imposing bans on potentially harmful activities and protection through land acquisition. Education and best management practices, rather than actual land use restrictions, are the ideal measures which can be drawn on to protect drinking water supplies. The program encourages public water supplies to have a wellhouse or an enclosed fenced area around each wellhead, thereby protecting individual wells from direct introduction of contaminants.

Communities in the program are responsible for implementing activities at the local level to protect drinking water wells from pollution sources identified in earlier studies. Each system is asked to generate contingency plans, including identification of alternate water supplies, in case of long-term water shortages. The Water Board and State Department of Health are supervising the bulk of the management plans developed by public water supply entities.

"We hope to delineate all public water supplies serving more than 100 people and to have in place management and contingency plans for these systems by 1995," Fabian says.

While this seems to be an ambitious goal, he believes the program will receive staunch support at the local level. "Because the expense of cleaning up groundwater pollution is often prohibitive, communities and rural water districts are beginning to recognize that protection is not only a human health or environmental issue, but it makes economic sense."

Governor Approves State Negotiations For Sale of Surplus Sardis Water

In June, Governor David Walters signed legislation authorizing the OWRB to negotiate a contract for the sale of surplus water from Sardis Lake to North Texas Municipal Water District.

According to OWRB Executive Director Patty Eaton, the intent of section three of HB 1743 is to allow negotiations for the sale of water to alleviate Oklahoma of annual storage costs that it must pay the U.S. Army Corps of Engineers.

"We have been exploring options for relieving state taxpayers of the burden of repaying annual water supply storage costs averaging about \$450,000. Soon, those payments are expected to increase to \$2 million," Eaton pointed out. "The sale of surplus Sardis water appears to be the most logical solution because Texas seems to have a desperate need for the water while there is little local demand for it in southeast Oklahoma." HB 1743 directs that any proceeds from the sale be deposited in the Statewide Water Development Revolving Fund, which is the source of water storage payments to the Corps. The Revolving Fund is also the nucleus of Oklahoma's program for funding community water and sewer improvements.

According to Mike Melton, OWRB assistant director, water in Sardis Reservoir has not been utilized to the extent envisioned by state and federal water planners.

"Sardis was authorized as a munic-

ipal and industrial water supply source for central Oklahoma, but construction of McGee Creek in 1988 provided additional supply for Oklahoma City as part of its southeast supply system. In addition, local demand for the water has proven to be less than that forecast," he said.

Early conversations with officials of the North Texas Municipal Water District indicate that they want to buy a significant share of the Sardis dependable yield. The large District, which serves some 800,000 people in 55 communities, has grown rapidly and now faces few alternatives for developing new water supplies. If a contract is executed, plans call for the release of water down the Kiamichi River to Hugo Reservoir, where it would be transmitted via pipeline to Cooper Reservoir, one of the District's current water sources. The price and amount of Sardis water and length of contract will be addressed during negotiations.

Still, Melton emphasized, any contract must first recognize the long-term water needs of southeastern Oklahoma. "Only surplus water would be sold to Texas and the OWRB will reserve ample supply for unanticipated growth in the region."

If negotiations for the water sale are successful, HB 1743 authorizes up to \$3 million for use in a water-based economic development plan in the Kiamichi River Basin.

Sardis Lake was completed by the Corps of Engineers in 1982.

FINANCIAL ASSISTANCE PROGRAM UPDATE

Approved at June Board Meeting

Grants	Loans
Nicoma Park Development Authority—\$100,000	(current rate—4.892%; 28-year max. term)
McIntosh County RWD #5—\$55,000	Calumet PWA—\$345,000
Calumet PWA—\$60,000	Arapaho PWA—\$70,000
Arapaho PWA—\$25,000	Logan County RWSG&SWMD #3—\$2,650,000
Logan County RWSG&SWMD #3—\$60,000	Pocola Municipal Authority—\$270,000
Pocola Municipal Authority—\$55,000	Waurika PWA—\$600,000
Geronimo PWA—\$49,880	

Approved at July Board Meeting

Grants

South Coffeyville PWA—\$50,000

Totals as of 7/9/91

	FAP Loans	Grants	SRF Loans
Approved Amount	79	234	2
	\$61,925,000	\$14,549,335	\$26,659,500
Funded Amount	67	213	2
	\$54,445,000	\$12,963,862	\$26,659,500

**STORAGE IN SELECTED OKLAHOMA LAKES & RESERVOIRS
AS OF JULY 19, 1991**

PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (acre-feet)	PRESENT STORAGE (acre-feet)	PERCENT OF STORAGE		PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (acre-feet)	PRESENT STORAGE (acre-feet)	PERCENT OF STORAGE	
			conservation	flood				conservation	flood
SOUTHEAST					EAST CENTRAL				
Atoka	124,100	118,824	95.8	N/A	Eufaula	2,314,600	2,213,918	95.7	0.0
Broken Bow	918,070	892,058	97.2	0.0	Tenkiller	654,100	647,288	99.0	0.0
Hugo ¹	187,603	181,494	96.7	0.0	Wister ¹	58,601	43,123	73.6	0.0
McGee Creek	113,930	112,960	99.2	0.0	NORTHEAST				
Pine Creek ¹	73,346	70,927	96.7	0.0	Birch	19,200	17,570	91.5	0.0
Sardis	274,330	269,912	98.4	0.0	Copan	43,400	41,049	94.6	0.0
CENTRAL					Eucha	79,600	71,300	89.6	N/A
Arcadia	27,520	27,520	100.0	0.6	Fort Gibson	365,200	361,647	99.0	0.0
Hefner	75,400	73,563	97.6	N/A	Grand	1,672,000	1,565,160	93.6	0.0
Overholser	15,900	15,858	99.7	N/A	Heyburn	7,105	6,807	95.8	0.0
Stanley Draper	100,000	82,278	82.3	N/A	Hudson	200,300	200,300	100.0	1.6
Thunderbird	119,600	117,560	98.3	0.0	Hulah	31,160	29,639	95.1	0.0
SOUTH CENTRAL					Oologah	553,400	525,008	94.9	0.0
Arbuckle	72,400	72,400	100.0	1.3	Skiatook	322,700	313,747	97.2	0.0
Texoma	2,643,300	2,643,300	100.0	2.1	Spavinaw	30,590	30,590	100.0	N/A
Waurika	203,100	119,565	58.9	0.0	NORTH CENTRAL				
SOUTHWEST					Kaw	428,600	426,584	99.5	0.0
Altus	132,830	101,800	76.6	0.0	Keystone	557,600	557,600	100.0	0.8
Ellsworth	72,490	59,470	82.0	N/A	NORTHWEST				
Fort Cobb	80,010	76,547	95.7	0.0	Canton	111,310	87,909	79.0	0.0
Foss ²	256,220	173,842	67.9	0.0	Fort Supply	13,900	13,719	98.7	0.0
Lawtonka	56,574	51,407	90.9	N/A	Great Salt Plains	31,420	30,525	97.2	0.0
Tom Steed	88,970	86,809	97.6	0.0	STATE TOTALS 13,130,479 12,531,577 95.4 0.2				

¹ Seasonal pool operation

² Conservation pool lowered to enhance project operation
N/A—not applicable; no flood storage allocation.

Data courtesy of the U.S. Army Corps of Engineers, Bureau of Reclamation, Oklahoma City Water Resources Department, City of Tulsa Water Superintendent's Office, City of Lawton, City of Altus, Altus Irrigation District, Foss Reservoir Master Conservancy District and Fort Cobb Master Conservancy District.

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MARY E. WHITLOW, Editor

BRIAN VANCE, Writer

BARRY FOGERTY, Photographer

BRAD NESOM, Layout Artist

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This is the first bimonthly issue of the Oklahoma Water News printed on recycled paper in biodegradable soybean oil-based ink. In doing so, the Oklahoma Water Resources Board declares its dedication to a cleaner, safer environment for all Oklahomans. It is a beginning . . .

