

Oklahoma

Water
News

MONTHLY NEWSLETTER OF THE OKLAHOMA WATER RESOURCES BOARD

Gerty Sand Report Complete

A two-year study of the Gerty Sand Formation by the Oklahoma Water Resources Board and Oklahoma State University has determined the maximum annual yield of the south central Oklahoma groundwater basin. The study — supervised by Dr. Douglas C. Kent of OSU's School of Geology — investigated the hydrogeology of the Gerty, an isolated terrace aquifer, as a means of developing a pilot groundwater management strategy.

The Gerty Formation consists of a shallow sand deposit, the origin of

which may be erosion of the nearby Arbuckle Mountains or an ancient Canadian River stream channel. The aquifer serves as an important water supply source for local towns and for peach and peanut production.

The annual yield determination was based on a computer model making use of a mathematical model which simulated pumping rates for 20 years. Conclusions of the study found the maximum annual yield to be 12,800 acre-feet per year, or 0.65 acre-feet per acre. These results will be used by the OWRB to set regular

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EDITORIAL

Diane Pedicord, Attorney
Oklahoma Municipal League

Cities and towns, rural water districts farmers and industry stand to lose water supplies due to a recent decision of the Oklahoma Supreme Court. The plurality opinion, authored by Justice Kauger, sharply alters existing ground and stream water management policies in the state.

The ruling may force Oklahoma to allow more water to flow outside of its borders into Texas, Louisiana and other neighboring states. It also may dry up individual water wells since large water users now must plan to use up their groundwater supplies.

The Court's opinion has three main holdings: (1) All available water rights, including groundwater rights, must be considered in the determination of the applicant's present or future need for stream water. (2) Proposed use of stream water outside the stream system of origin is permitted only to the extent to which it is not required by persons residing in the area of origin. Local requirements must be reviewed every five years. (3) Certain individual riparian landowners have priority to the use of stream water.

Although the full impact of the Court's decision is still under review, it is clear that municipalities holding

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OWRB Geologists
Mark Belden and
Norma Aldridge re-
view the new
report.



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stream water permits are subject to new challenges. Such challenges may occur if the municipality (1) has groundwater rights or legal claims or (2) transfers stream water for use outside of the stream system of origin, even if the use is inside the corporate limits or (3) any downstream riparian wants to use the water.

A preliminary list of cities and towns transferring stream water outside the originating stream system includes: Hugo, Ada, Ardmore, Marlow, Anadarko, Frederick, Altus, Norman, Edmond, Holdenville, Tecumseh, Ponca City, Coweta and Wagoner, whose sources lie partially outside.

Also Valliant, Konawa, Oklahoma City, Duncan, Madill, Comanche, Altus, Spiro, Stilwell, Siloam Springs, Chickasha, Bessie, Clinton, New Cordell, Hobart, Lawton, Temple, Frederick, Midwest City, Del City, Porum, Warner, Checotah, Guthrie, Okemah, Prague, Shawnee, Enid, Newkirk, Perkins, Stillwater, Tonkawa, Ochelata, Sand Springs, Sapulpa, Broken Arrow, Owasso, Chelsea, Claremore, Collinsville, Tulsa, Muskogee, Coweta, Sallisaw and Walters, whose water sources lie entirely outside.

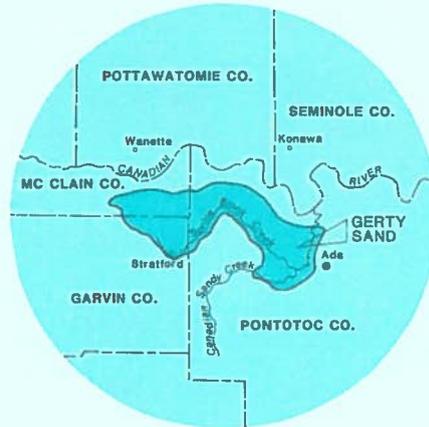
Gerty Sand, continued from page 1

permits for the Gerty Formation. In the past, two-year temporary permits have been issued to those withdrawing water from the Gerty — and all other aquifers for which studies are pending. Oklahoma Statutes require the OWRB to conduct hydrologic investigations to determine groundwater permit allocations.

The maximum annual yield determination — as well as Dr. Kent's computer model — was based on five parameters: the total land area overlying the basin; the amount of water in storage in the basin; the rate of natural recharge and total discharge; transmissivity of the basin; and the possibility of pollution of the basin from natural sources.

The hydrogeologic study determined only a slight potential for

groundwater pollution from withdrawal due to a lack of induced recharge from area streams. Oil well drilling and pumping were also not considered a threat to groundwater quality because of limited ongoing production within boundaries of the Gerty Sand.



Darker area shows extent of the aquifer in south central Oklahoma.

Copies of the report are available upon request from the OWRB in Oklahoma City.



OSU Offers Short Course

Shari Dunn, coordinator for OSU's School of Geology, announces a short course entitled "Practical Approaches to Groundwater Hydrology and Contamination" to be held July 13-17.

The course includes as topics groundwater hydrology, groundwater contamination, soil as an influence on groundwater properties and as an indicator of groundwater conditions, unsaturated flow and solute transport, monitoring requirements under federal regulations, groundwater monitoring worldwide, flow and mass transport impact analysis and low-temperature geochemistry.

Cost of the course is \$350. Further information is available by calling Dunn at (405) 624-6358.

Corps to Study Caney Flooding

The Tulsa District of the U.S. Army Corps of Engineers announced that it has received funds to examine potential solutions to flooding and erosion problems in the Caney River Basin in Kansas and Oklahoma.

The Corps will work one year on preliminary plans for the Caney, then determine if more detailed studies are necessary, according to Col. Frank M. Patete, district engineer. Further studies would require a non-federal sponsor to share in the cost of the project. Patete said the key to the project is direct and early involvement of those potential project sponsors.

Beware, Monitor Well Drillers

Numerous cases of unsealed or poorly sealed monitoring wells and related problems have prompted the OWRB to remind state drillers constructing such wells of their responsibility to obtain a water well driller's license. Cited as the most frequent offenders are engineering firms involved in monitoring underground storage tanks and oil and gas exploration companies, according to OWRB Senior Hydrologist Gary Glover.

"Many companies and individuals don't believe they need a license to drill a monitoring well or they say they'll get a license later. As a result, a large number of these hit-and-miss operations leave holes that are either poorly sealed or lack a seal altogether. This allows easy access for contaminants, such as animal waste and agricultural chemicals, to reach groundwater. Also, abandoned open wells are an accident just waiting to happen," Glover said.

OWRB Rules and Regulations mandate licenses for all persons engaged in the drilling or reconditioning of wells, installing monitoring wells, drilling geothermal or heat sink wells, or test drilling for groundwater. The Board also sets construction standards for water wells; for example, cement grouting is required to a depth of 10 feet.

Those seeking a well driller's license should contact the OWRB in Oklahoma City at 271-2576.

EPA, State, Local Agencies Meet to Address Metro River Pollution

On May 20, officials from the OWRB, U.S. Environmental Protection Agency, Department of Pollution Control, state municipalities and sub-state planning districts met to coordinate studies which they hope will answer remaining questions on Oklahoma's Water Quality Standards. At the heart of the matter are proposed beneficial uses for three Oklahoma watercourses: the North Canadian River, the Arkansas River and Crutcho Creek.

"The meeting was generally constructive," said James Barnett, OWRB executive director. "We made agreements, set study dates and all sides came away with a better understanding of what needs to be done to determine beneficial uses for the waters in question. Given the diverse interests of those involved and the extreme environmental and economic implications of assigning beneficial uses, this meeting was a landmark."

A controversial dissolved oxygen (DO) standard for a heavily impacted segment of the North Canadian River dominated the initial part of the meeting. In 1986, EPA denied the state's DO standard for the North Canadian. They recommended a standard of 5.0 milligrams per liter (mg/L) for the river, except from the Oklahoma/Lincoln County line to the Portland Street bridge where a lower DO standard may be allowed due to channelization which has lowered habitat quality. Organic effluent, such as sewage, normally lowers a stream's oxygen-carrying capacity.

Representatives of the Association of Central Oklahoma Governments (ACOG) have proposed a use attainability analysis (UAA) to scientifically evaluate standards for beneficial uses on the North Canadian River. A UAA is performed on a stream when a one-day survey is insufficient. This detailed study — which sometimes takes months to complete — determines current and potential beneficial uses by investiga-

ting the stream's physical, biological and chemical characteristics along with impacts which may affect those factors. The UAA was endorsed by EPA during the meeting contingent upon the state's submittal of an adequate workplan which guarantees the accuracy and scope of the study.

"Studies which assess beneficial uses must be properly conducted," Barnett said. "If they are carelessly done or inaccurate, EPA can intervene and promulgate standards of its own. And promulgation, especially on the North Canadian River, is not in anyone's best interest," he stressed.

In conjunction with the ACOG North Canadian River study, EPA tentatively agreed that a UAA should also be performed on Crutcho Creek which merges with the North Canadian River near Midwest City. Crutcho Creek receives two discharges of treated domestic sewage from Midwest City. In addition, industrial effluents from Tinker Air Force Base are discharged into Soldier Creek — a major tributary of Crutcho. In a 1984 study performed by the OWRB, these effluents were judged to be acutely toxic.

"A proposed expansion of Midwest City's sewage treatment facilities is a step in the right direction, but accurate and comprehensive water quality standards are still necessary to direct proper management of those facilities," Barnett pointed out.

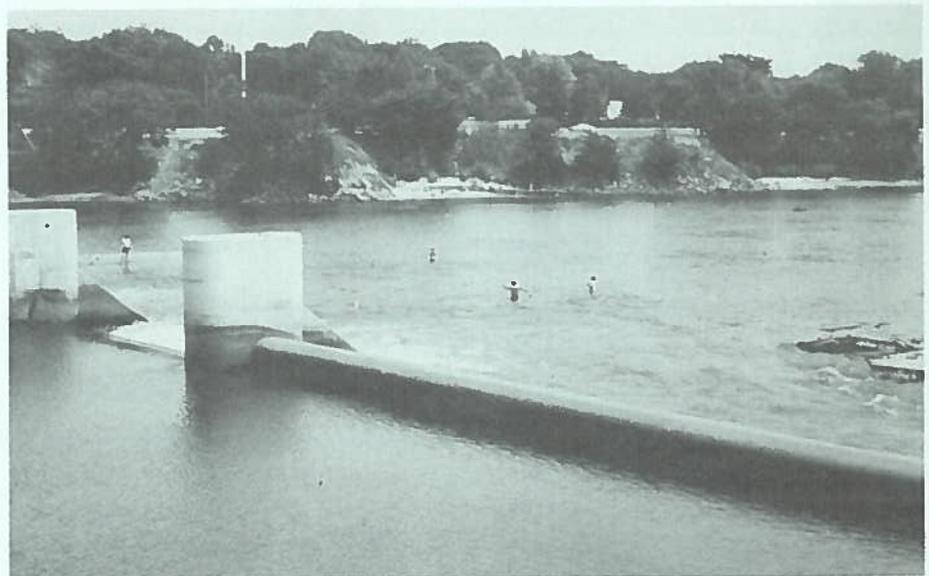
Fecal coliform limits on the Arkansas River were another major topic of the May meeting. For years, high levels of coliforms have been found in the river. Many studies have traced the primary source to Tulsa storm sewers, but finding the exact contributor has proven to be much more difficult.

Fecal coliform (associated with waste material of warm-blooded animals, including man) can give rise to numerous water-borne diseases, such as hepatitis. Consequently, EPA has expressed its wish for

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ABOVE: Footprints show oily sludge from a nearby refinery in Arkansas River sediment. **BELOW:** People wade near low water dam on the Arkansas River near Tulsa. Local officials doubt the safety of swimming in the river, while EPA seeks to have it assigned the beneficial use of primary body contact recreation, or swimming.



Pollution, continued from page 3

tougher standards on the Arkansas River, specifically requesting that primary body contact recreation, or swimming, be designated as an attainable use there. But cities along the Arkansas River which belong to the Indian Nations Council of

Governments (INCOG) question the safety of swimming in the river.

Two studies proposed to deal with the coliform problem were related to EPA at the standards meeting. The City of Tulsa Water and Sewer and Stormwater Management Departments will attempt the difficult

task of locating the source of fecal coliforms (which one EPA official described as "renegade sewage") while in a second report due in May 1988, INCOG will investigate potential sources of coliforms to the river.

**ACTIVE CONSERVATION STORAGE IN SELECTED OKLAHOMA LAKES AND RESERVOIRS
AS OF MAY 27, 1987**

PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY	PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY
SOUTHEAST			NORTHEAST		
Atoka	121,731	98.0	Eucha	79,567	100.0
Broken Bow	864,206	94.0	Grand	1,309,600	87.7
Pine Creek	77,700	100.0	Oologah	544,240	100.0
Hugo	157,600	100.0	Hulah	30,594	100.0
CENTRAL			Fort Gibson	365,200	100.0
Thunderbird	105,925	100.0	Heyburn	6,600	100.0
Hefner	75,355	100.0	Birch	18,425	95.9
Overholser	15,935	100.0	Hudson	200,300	100.0
Draper	80,990	80.9	Spavinaw	30,000	100.0
SOUTH CENTRAL			Copan	43,400	100.0
Arbuckle	62,571	100.0	Skiatook	295,900	100.0
Texoma	2,626,455	99.5	NORTH CENTRAL		
Waurika	203,100	100.0	Kaw	428,600	100.0
SOUTHWEST			Keystone	616,000	100.0
Altus	130,219	98.0	NORTHWEST		
Fort Cobb	78,423	100.0	Canton	97,500	100.0
Foss	186,901	76.2 ²	Optima	3,000	— ¹
Tom Steed	88,971	100.0	Fort Supply	13,900	100.0
EAST CENTRAL			Great Salt Plains	31,400	100.0
Eufaula	2,256,005	96.8	STATE TOTALS		
Tenkiller	618,199	98.5		12,185,110	94.2³
Wister	18,098	66.7			
Sardis	302,500	100.0			

Data courtesy of U.S. Army Corps of Engineers, Bureau of Reclamation, Oklahoma City Water Resources Department, and City of Tulsa Water Superintendent's Office.

1. In initial filling stage
2. Temporarily lowered for maintenance
3. Conservation storage for Lake Optima not included in state total

This monthly newsletter, printed by the Central Printing Division of the Office of Public Affairs, Oklahoma City, Oklahoma, is published by the Oklahoma Water Resources Board as authorized by James R. Barnett, executive director. Ten thousand copies are printed and distributed monthly at an approximate cost of 20 cents each.

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OKLAHOMA WATER NEWS

Monthly Newsletter of the
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