



OKLAHOMA

water news

MONTHLY NEWSLETTER OF THE OKLAHOMA
WATER RESOURCES BOARD

Gerald E. Borelli, Chairman

Earl Walker • Ervin Mitchell • Bill Secrest • Ralph G. McPherson • Gary W. Smith • Ernest R. Tucker • Robert S. Kerr, Jr. • R.G. Johnson

Water Quality Division Staff Collects Input on Standards

At a June 12 strategy meeting, the Water Quality Division of the OWRB began discussing new techniques for developing 1985 Water Quality Standards.

Every three years, the OWRB is required to set water quality standards which are practical and define the best present and future uses of Oklahoma's ground and surface waters.

At the meeting, staff discussed simplifying the wording in the standards while more clearly defining acute and chronic toxicity along with fishery and non-fishery designations. The staff also exchanged viewpoints on laboratory and field testing procedures and unnamed stream designations.

"Creating these standards is one of the most important things this agency does," says Ron Jarman, chief of Water Quality. "In addition, they guide what other state agencies do."

Jarman emphasizes that the standards must be an effective water quality management document.

"Previously, the standards have been unrealistic in not taking into account the natural variations of water conditions across the state and in impeding the construction of wastewater facilities," Jarman points out.

The Board designs standards to secure and maintain the quality of the waters, to protect their beneficial purposes, and to aid in the prevention, control and abatement of water pollution.

Beneficial use is defined as the use of stream or ground water when reasonable intelligence and diligence are used in its application for a lawful purpose and is economically necessary for that purpose. These uses include Primary and Secondary Warm Water Fisheries, Public and Private Water Supplies, Agriculture, Industrial and Municipal Cooling Water, Primary and Secondary Body Contact Recreation and Aesthetics.

The Water Quality Division has developed a methodology for establishing the standards beginning with a 'pencil draft' which will be examined by the seven standards review committees and the general public. The first draft, which is scheduled for completion by the end of July, will again be

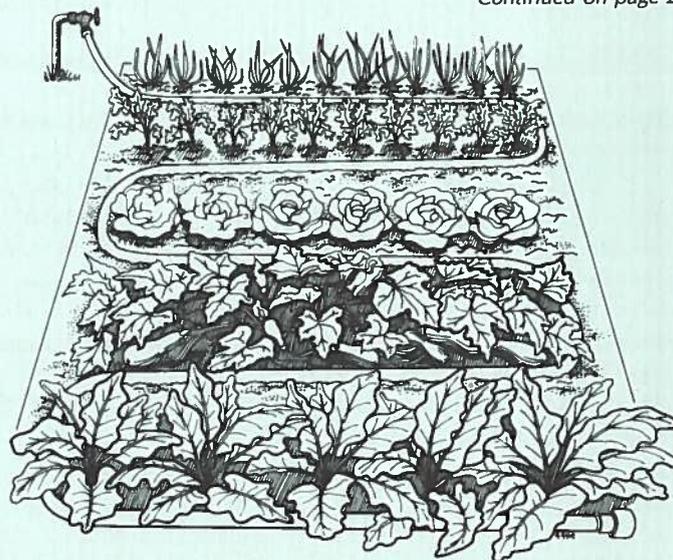
aided by public response and committee recommendations. The second, and hopefully last, draft will be subject to requested changes made at upcoming public and committee involvement meetings. Then more meetings and hearings will be held and 'on-site' surveys will be conducted to determine beneficial uses of 89 streams. These beneficial use studies will include 52 fish and wildlife surveys, 35 primary body contact surveys and two intensive studies. The final draft is scheduled for completion in November. Follow-

Continued on page 2

Here are Conservation Hints for a Backyard Vegetable Patch

Since some part of Oklahoma labors under drought half the time, home gardeners need all the help they can get in stretching short rations of water. As a rule of thumb, most vegetables require about an inch of water a week for healthy growth, but that is not to say that one cannot raise a successful garden in a dry year. Dry spells and droughts are simply challenges to be met with a strategy of water conservation.

Continued on page 2



A flexible sprinkler hose placed face down and snaked along garden rows is a pretty good substitute for a conventional drip irrigation system. A word of warning: Turn water on gently to soak garden slowly.

Water Quality Standards, continued from page 1

ing approval by the EPA, proposed revisions will be submitted to the Board for final confirmation in January, 1986.

Oklahoma law provides for standards modification on an as-needed basis, while federal law, through the Clean Water Act, prescribes a schedule for public hearings, standards review and modification at least every three years.

The Board prescribes stringent narrative and numerical criteria in order to fully protect the beneficial uses of Oklahoma waters.

Numerical standards are developed for mineral content, bacteria, turbidity, color, temperature, dissolved oxygen, nutrients, radioactive materials, polychlorinated biphenyls (PCB's), pesticides, pH levels, diversity of benthic macroinvertebrates and some toxic substances.

Narrative standards set limits on oil and grease content, settleable and suspended solids, color, taste, odor, nutrients, pesticides and other toxic substances.

There are many toxic substances which may affect Oklahoma's waters for which not enough data exist to determine viable concentration limits. Also, laboratories are incapable of measuring some pollutants to desired levels. For these parameters, the OWRB sets goals rather than standards. Unlike standards, goals have no enforceability under the law. They serve as notice of intent by the State to pursue additional data and technological improvements so that these goals may be incorporated by the OWRB into the Water Quality Standards.

In the event of a standards violation, the OWRB notifies the violators and works with them to bring them back into compliance. Otherwise, the Board may seek legal action against the nonconforming group in the form of hearings and subsequent court orders.

Conservation Hints, continued from page 1

Ideally, conservation begins in the planning stages, while the garden layout is still on paper. If the garden is not located near a building that provides some shade and windbreak, consider other means of sheltering it. Shades constructed by stretching and tacking burlap over frames of 1 x 1-inch boards are effective in slowing moisture loss to sun and wind. They have the further advantage of being portable so they can be moved about the garden and easily stored at season's end.

If water supply to the garden is a problem, avoid plants which use water inefficiently such as corn, which requires 54 gallons of water over the growing season to produce just two ears. Be aware of drought-sensitive vegetables such as lettuce, cauliflower, onions and corn; plant with greater confidence watermelons, sweet potatoes and pumpkins. You'll probably be happier with your garden if you invest in drip irrigation equipment at the outset, and your choice of vegetables will be unlimited.

Plants have particular periods of moisture sensitivity during their development. Critical periods for beans and peas are during flowering and pod development; broccoli and cabbage, during head formation and enlargement; corn, tasselling through silking and ear-filling; onions, during bulb formation; potatoes, after initial tuber formation; and toma-

atoes from blossom-setting through fruit enlargement.

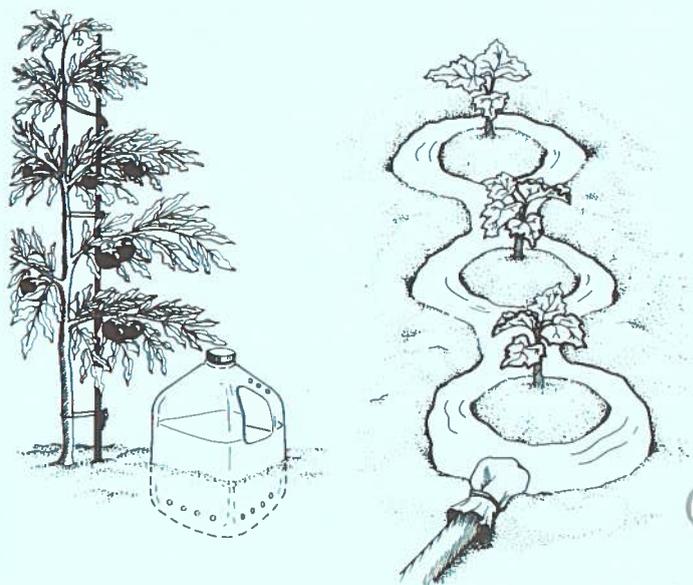
For easier watering, group together plants with similar moisture requirements. Plant short crops next to tall ones so that tall ones will shade the smaller plants. For the greatest water efficiency, plant in wide rows, where seeds are cast over rows at least one foot wide (two feet is better). Such wide, thickly sown bands of vegetation provide a living mulch to retain moisture and produce more vegetables.

An analysis of garden soil is important in showing what nutrients are needed, whether the soil is within the optimum pH (acidity/alkalinity) range of 5.5 to 7.5, and if it contains sufficient organic and other materials to retain moisture. Covering seeds with fine compost then carpeting planted areas with deep mulch creates an ideal environment—rich in nutrients and protected against heat, moisture loss and invasion by weeds. Pull weeds promptly to prevent their stealing water from productive plants. Hardly enough can be said in favor of generous mulching as a water conservation measure. Half-inch layers of fine textured mulch are as effective as a foot of coarse straw.

Inorganic mulches such as black plastic sheeting or aluminum foil are effective, but organic materials such as straw, pine needles, peat moss, leaves, bark and newspapers (except for color sheets) have the advantage of adding nutrients to the soil. Spreading mulch after a good rain retains moisture even more effectively.

In dry spells and drought, there are other ways of conserving precious moisture. In such times, don't stake or radically prune tomatoes, but rather, allow them to sprawl along the ground to shade roots and soil. Likewise, let squash, cucumbers and other vines spread along the ground instead of training to a trellis.

When water is in short supply, plant tomatoes in large plastic trash bags. Dig a hole big enough to accommodate the bag filled with soil. Saturate the soil, insert the young plant deeply inside the bag, stripping away all but the top leaves and covering the rest of the stem with earth. Secure



A water-filled plastic milk jug pierced near the bottom and inset five inches in the soil near plants releases water slowly. A small square of cloth secured over the hose end with a stout rubber band tames the flow of water to the irrigation basin that encircles several large plants.

the bag around the stem. Tomatoes planted in this fashion require only a few waterings during the growing season.

For small gardens, the jug system of watering is ideal. Make small holes near the bottom of a gallon plastic milk or juice jug, (and a few near the top to vent the jug and allow the water to trickle slowly) then inset it five inches in the soil. Set jugs about two feet apart and fill once a week to keep ground moist.

Use a rain gauge in the garden to give you an accurate measure of rain, then supplement rainfall with watering to give plants an inch of moisture a week. When it's necessary to water, loosen the soil so it can absorb the most water. Apply water slowly and evenly so it can penetrate deeply. Constant moisture encourages continuous growth and maximum yields. Deep, less frequent watering allows greatest absorption and is more efficient than frequent shallow waterings that feed evaporation. Water in the morning when the air is still, the humidity is highest and the temperature is lowest. Watering when it's hot gives up too much water to evaporation, while evening watering encourages fungus disease.

Watering by drip irrigation is 40 to 60 percent more efficient than sprinkling or flooding, and has the further advantage of eliminating runoff and diminishing weed problems. Parts for a drip irrigation system constructed of PVC (Polyvinylchloride pipe) cost roughly \$50 for a modest backyard garden—little more than a long-lasting high quality garden hose. Water in a drip system moves through the soil by gravity, each emitter wetting an area the size of a quarter on the surface but moistening the underlying soil to a depth of two-and-a-half to three feet.

If you don't want to invest in PVC pipe and fittings, devise your own drip system by turning a flexible sprinkler hose face down and applying water very slowly. Other means of watering the home vegetable patch include trenches (a foot wide and six inches deep) prepared before the garden is planted and connected irrigation basins surrounding individual plants on small islets of soil.

This article is condensed from "Drought Gardening" by Sue Hakala. Copyright 1981 by Garden Way, Inc.



Noble Foundation Sponsors August Seminar

Anyone who has an interest in ponds, whether it be fishing, hunting, conservation, fish farming, weed control, landscaping; developing water supply for homes, crops or livestock; swimming, boating or developing another source of income will find topics of interest at the Pond Management Symposium August 23–24 at the Lincoln Plaza in Oklahoma City.

The Samuel Roberts Noble Foundation, sponsor of the meeting, has invited nationally recognized speakers to discuss various aspects of pond management. The Oklahoma chapters of the American Fisheries Society and the Wildlife

ACTIVE CONSERVATION STORAGE IN SELECTED OKLAHOMA LAKES AND RESERVOIRS AS OF JUNE 18, 1985

PLANNING REGION LAKE/RESERVOIR	CONSERVATION STORAGE (AF)	PERCENT OF CAPACITY
SOUTHEAST		
Atoka	123,500	99.5
Broken Bow	903,845	98.4
Pine Creek	77,700	100.0
Hugo	157,600	100.0
CENTRAL		
Thunderbird	105,925	100.0
Hefner	76,500	100.0
Overholser	16,000	100.0
Draper	79,400	79.4
SOUTH CENTRAL		
Arbuckle	62,571	100.0
Texoma	2,637,700	100.0
Waurika	203,100	100.0
SOUTHWEST		
Altus	37,944	28.5
Fort Cobb	71,187	90.7
Foss	146,932	60.3 ²
Tom Steed	70,992	79.8
EAST CENTRAL		
Eufaula	2,329,700	100.0
Tenkiller	627,500	100.0
Wister	21,833	100.0
Sardis	302,500	100.0
NORTHEAST		
Eucha	79,567	100.0
Grand	1,491,800	100.0
Oologah	544,240	100.0
Hulah	30,594	100.0
Fort Gibson	365,200	100.0
Heyburn	6,600	100.0
Birch	19,200	100.0
Hudson	200,300	100.0
Spavinaw	30,000	100.0
Copan	43,400	100.0
Skiatook	—	— ¹
NORTH CENTRAL		
Kaw	428,600	100.0
Keystone	616,000	100.0
NORTHWEST		
Canton	87,522	89.7
Optima	3,000	— ¹
Fort Supply	13,900	100.0
Great Salt Plains	31,400	100.0

STATE TOTALS 12,043,752³ 95.4³

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

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.

Society will hold their fall meetings in conjunction with the symposium. The Noble Foundation will also sponsor a trade show exhibiting pond management products and services as well as hunting gear and fishing tackle.

Participants are asked to pre-register by writing to the Samuel Roberts Noble Foundation, P.O. Box 2180, Ardmore, Oklahoma 73402 or by calling (405) 223-5810.

There is a \$2 registration fee which covers admission to the trade show, programs and meetings August 23-24.

More Drink Ground Water than New Coke®?

According to the 467-page National Water Summary published by the U.S. Geological Survey in June, ground water use has more than doubled in the nation since 1950, from 34 billion gallons a day (bgd) to over 88 bgd today. The second annual summary says the nation's ground water resources provide 35 percent of the total municipal water supply, 97 percent of the rural drinking water, 40 percent of irrigation water and 26 percent of the water used by industry (excluding thermonuclear power uses). Ground water is drunk by more than 50 percent of the nation's population.

Closer to home, the USGS tells us that ground water accounts for 56 percent of the fresh water used in Oklahoma. It is the principal source of irrigation water, supplying 76 percent of the total, or 730 million gallons a day. The bad news is that excessive pumping has caused intrusion of saline water in some areas, and water level declines as great as 100 feet in some western aquifers used for irrigation.

Perhaps the OWRB is Nearer Than You Know

Often, long distance calls come to the Board's Oklahoma City headquarters concerning a matter that could be better handled by one of the OWRB's branch offices and save the cost of a call. Jim Barnett, executive director of the OWRB, wants to remind Oklahomans there are branches strategically located in Tulsa, McAlester and Lawton to be of service in answering questions and helping solve problems.

Boundaries of the quadrants served by branch offices are roughly Highways I-40 (east and west) and I-35 (north and south). Since the northwest quadrant does not yet have a branch office in its boundaries, services to the area are provided by the Lawton branch and the Board's Oklahoma City headquarters. Barnett said budget constraints have pre-

cluded a northwest office. However, ground water problems, pollution from oil and gas activities and shrinking water supplies in some western areas warrant a staff and office to attend to local problems.

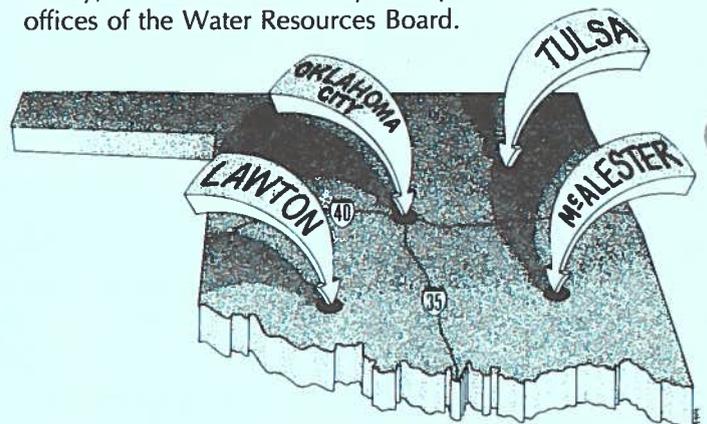
Barnett pointed out that staff of the branch offices can assist with the completion of applications for stream water or ground water use or for the discharge of industrial wastes; investigate pollution complaints; conduct hearings; examine and license water well drillers; accept applications for the OWRB financial assistance program; enforce the Board's Rules and Regulations; conduct stream and ground water studies and hydrologic surveys; and provide information on all OWRB programs.

The Tulsa branch is located in Room 2 of the Kerr State Agencies Office Building at 440 South Houston and may be called at (918) 581-2925. The manager's name is Art Cotton.

In McAlester, the OWRB office is at 235 East Choctaw, Suite 126, and may be phoned at (918) 426-5435. The branch office is managed by James Adams.

The Lawton branch office is at 601 "C" Avenue, Suite 101, and the phone number is (405) 248-7762. Branch manager is Dave Dillon.

Office hours are 8 a.m. to 4:45 p.m., Monday through Friday, for the Oklahoma City headquarters and all branch offices of the Water Resources Board.



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.

MARY E. WHITLOW, Editor

BRIAN VANCE, Writer

BARRY FOGERTY, Photographer

MARIE WELTZHEIMER, Layout

OKLAHOMA WATER NEWS

Oklahoma Water Resources Board
1000 N.E. Tenth, P.O. Box 53585
Oklahoma City, Okla. 73152

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