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EDITORIAL

Exercise Authority?
By Neil S. Grigg

There has been considerable controversy about the announced EPA initiatives to put in place high-level regional managers for environmental programs. I noticed in two national newspapers during the week of October 15 advertisements for directors of the different divisions of the regional offices, including among others a position entitled "Director, Water Division" for the Cities of Boston, New York, Philadelphia, Atlanta, Chicago, Dallas, Kansas City, Denver, Seattle, and San Francisco.

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The advertisements read as follows: "direct the Regional Water Program, which encompasses water quality management, municipal waste treatment (including grants), and liaison with other water resource agencies. *Exercise authority* over state programs and *help states implement* their elements of the water programs." (Emphasis added.)

We are aware that EPA "exercises authority over state water programs," but this advertisement is downright blatant in its suggestion that EPA will practically run the state water programs. We hope that EPA will be careful about its relationships with the states and take care to ensure that state autonomy is maintained and that good working relationships between the federal government and the states can be maintained on an equal-partner basis.

EDITORIAL

PLEXIGLAS MANHOLE COVERS?

By Neil S. Grigg

Why do local water officials seem to be reluctant to pay for operation and maintenance? Although they are at the heart of water pollution problems, new facilities seem to be approved much more readily than do badly needed payments for operation and maintenance.

A local official at the annual convention of the American Public Works Association was heard to suggest that maybe we should start using plexiglas manhole covers. The idea is that local officials would then be able to see the results of their appropriated expenditures; that is, maintenance on the sewer system, although it is underground, would show up as a smoothly functioning sewer.

Perhaps this is not a bad idea. It has long been a problem with water, sewage, and drainage systems that the results of the expenditures are not highly visible and are not favored from the standpoint of local elected officials.

Those large federal grants for AWT plants are also causing second thoughts. Operation and maintenance requirements require big chunks of the annual budget.

Let's start giving more credit to water officials and operators with track records in operation and maintenance.

SOUTHEAST GROWTH TAXES WATER SUPPLY

findings of a Conference of state water officials and university researchers held in Atlanta November 8-9. The purpose of the Conference was to focus on "Water Conservation and Alternative Water Supplies" and to seek ways to improve water management in the region.

The Conference was organized and sponsored by state water resources research institutes and agencies from the states of Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia. Financial support was from the U.S. Office of Water Research and Technology. Principal organizers were James R. Wallace and Bernd Kahn of Georgia Tech. Regional Coordinator was David Howells of the North Carolina WRRRI.

The plentiful and "abundant" water supply of the Southeast may be a myth, according to

Typical of the problems cited were factors identified by J. Leonard Ledbetter, Director of Georgia's Environmental Protection Division. He stated that there were five factors that served to puncture the myth of Georgia's abundance of water: unavailable supplies due to pollution, conflicting demands caused by growth, lack of water for new industries in areas needing jobs, great increases in irrigation demands, and localized shortages due to inadequate treatment and distribution facilities.

The State of Florida also faces severe water problems. The following factors help to explain these: mismatch of water demands with supplies, both in time and location; vast evapotranspiration water losses (near 70% of the rainfall), concentrated in South Florida where population is highest; ground-water problems due to mismatch of supply and demand and to saline water intrusion; the great distances between the State's rivers and population centers; and the depletion of natural water storage

due to human intervention. Problems in the states of Alabama, Mississippi, Tennessee, South Carolina, and Virginia are similar to those identified for Florida and Georgia. In North Carolina, we are faced with different problems in the different areas of the State, but the same types of problems persist. Heavy water demands by users such as the Hampton Roads area, the Perkins Nuclear Power Plant, and phosphate mining operations threaten North Carolina water supplies. Without storage, the Perkins Plant, for example, could be using 50% of the river flow during periods of low flow.

Dan Beard, Deputy Assistant Secretary of Interior, told the group that the President's Water Policy is founded on conservation and emphasizes that the future will stress water management rather than water development. He also emphasized that the Policy points toward state primacy in water management and seeks improved state-federal relations in the future.

Dale Jones, Director of the Virginia Bureau of Water Control Management, said that we have lost confidence in the traditional scientific and engineering approaches to water development. He said that there may never again be easy technical solutions to water problems in Virginia; solutions will be political.

Clifford Russell of the Washington think tank, "Resources for the Future," challenged the participants to consider planning for deficits. He acknowledged that this will introduce difficulties due to several factors. These include: water deficit planning requires explanations involving probability, and these are difficult to explain. Also, decision will be required about how to distribute or share the shortages and these are always unpopular. Dr. Russell concluded his provocative discussion with suggestions that deficit planning be more carefully considered.

Ralph Heath, North Carolina District Chief of the USGS, recommended that groundwater be more seriously considered as a water source in the Piedmont and Mountain regions. By placing well fields along streambeds, Heath stated that substantial additional supplies could be developed.

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ENVIRONMENTAL MANAGEMENT COMMISSION TAKES STEPS IN WATER CONSERVATION

a resolution calling for additional bonus priority points in State grant regulations for those applicants which practice water conservation measures.

In its November meeting, the Environmental Management Commission passed

Applicants for Clean Water Bond Act funds may receive a maximum of 15 bonus points for meeting the following criteria as applicable:

1. Applicant demonstrates it has a continuing I/I program in its wastewater sewer maintenance program. (Wastewater Projects Only) 5 points
2. Applicant demonstrates it has a continuing water loss program in its water supply system program. (Water Supply Projects Only) 5 points
3. Applicant has a continuing program of water conservation education and information. 5 points
4. Applicant has adopted and is effectively enforcing the State plumbing code within the applicant's jurisdiction. 5 points

The 15-point bonus points would be added to the 100 points now being used to determine the applicant priority for funding. The Commission action will affect approximately one-third of North Carolina's communities and was considered as a minimum first step by some Commission members.

The Commission also approved a move to request that the Building Code Council be asked to revise the State Plumbing Code to require water conservation closets and shower heads and that all buildings, residential and commercial, be required to use such fixtures by January 1, 1980, or not later than one year from its adoption by the Building Code Council.

The Committee appointed to develop the conservation measure will be asked by the Commission to continue to review conservation progress of communities in North Carolina.

E. WALTON JONES APPOINTED NRC D DEPUTY SECRETARY

Development. Jones was formerly Vice-President for Research and Public Service Programs with The University of North Carolina system. He began his new job November 13 replacing H. A. "Jack" Smith, who resigned in July.

Dr. E. Walton Jones has been appointed Deputy Secretary of the Department of Natural Resources and Community

WATER CRISES FACE MOUNTAIN COMMUNITIES

A lack of rain in September and October brought water supply problems for dozens of western North Carolina communities. Boone, Robbinsville,

Brevard, Black Mountain, Sylva, Weaverville, Woodfin, Andrews, Franklin, and Murphy were among the communities suffering from dry weather and had to ask customers to conserve water.

Brevard, for example, had to impose strict conservation measures including no watering of lawns and gardens, no car washing, and reduction in the time laundromats could remain open. Brevard College closed several days ahead of a planned holiday schedule because of the water crisis.

Most of the communities facing water shortages have small reservoirs or must depend upon mountain streams for their supply.

A 200-plus-word editorial in the October 19 *Transylvania Times* told the story by repeating over 100 times "save water."

25,000 FISH KILLED IN FRENCH BROAD RIVER

In two major fish kills, an estimated 25,000 catfish were lost along a section of the French Broad River from a point

near Craggy Prison. Separate investigations were conducted by representatives of the Division of Environmental Management and the Wildlife Commission to determine the source of possible toxic substances.

Some overflows from a manhole on a Metropolitan Sewerage District sewer line occurred during the same period; however, no direct link between that problem and the fish kill has been established.

WORKSHOP ON WASTEWATER USER CHARGES DECEMBER 5

A December 5 workshop is designed to provide detailed information required to develop EPA approvable systems of industrial cost-recovery charges and user charges.

This workshop will focus on the user charge requirements of EPA and the issues that must be addressed by 201 grantees in developing a wastewater system. A step-by-step methodology will be provided by which municipalities, professional engineers, and accounting and management consulting firms can understand and address all elements of user charge systems development. Included will be the structuring and interrelationship of the following components of a required user system:

- Rate setting
- Billing and collection
- Monitoring of high-strength pollutants
- Appeals procedure
- Legal authority

The workshop would also be helpful in assisting anyone in structuring water and sewer charge systems in general.

For registration information, contact the North Carolina State University Division of Continuing Education, P. O. Box 5125, Raleigh, NC 27650, or call Kelly R. Crump, 919/737-2261.

TRIANGLE J COUNCIL OF GOVERNMENTS WORKSHOP ON ALTERNATIVE INDI- VIDUAL WASTEWATER SYSTEMS DECEMBER 11

A target audience of planning officials, elected representatives, and interested citizen groups is

invited to the December 11 workshop on Alternative Individual Wastewater Systems. Triangle J Council of Governments is sponsoring the conference, to be held from 9:00 to 4:00 at the McKimmon Center, N.C. State University in Raleigh. Lunch is included in the registration fee.

Agenda segments are directed at the particular soil and groundwater problems encountered in Region J (Chatham, Durham, Johnston, Lee, Orange, and Wake Counties). The following speakers are tentatively scheduled:

- Introduction - Bob Heater, Wake County Commissioner
- Balanced Growth and Public Health Considerations - Anne Taylor, N.C. Department of Administration
- Regulation and Management - Institute of Government
- Water Conservation - Bob Rubin, N.C. State University
- Overview of Triangle J "Summary of Alternative On-Site Treatment and Disposal Methods" (Task B Report) - Triangle J Staff.
- Specific Criteria of Most Feasible Alternatives - Dr. Bobby Carlile, N.C. State University
- Statewide Septic Disposal Problems - Steve Steinbeck, Division of Health Services

For registration information or comment, contact Triangle J Staff members Dave Reynolds, Ed Holland, or Sue Snaman, 919/549-0551 (P.O. Box 12276, Research Triangle Park, NC 27709).

WATER QUALITY MONITORING

An article on Water Quality Monitoring in the September issue of *Clearwaters*, a

publication of the New York Water Pollution Control Association, concludes that:

"Gaps and deficiencies in monitoring programs have made it difficult to control toxic substances and to gauge the impact of nonpoint pollution. In addition, past monitoring efforts have not provided us with the kinds of information necessary to establish effective water quality programs."

The authors, Robert Hennigan and Paul Babiarz, are Director and Assistant Director respectively of the New York Water Quality Management Program.

In commenting on ambient monitoring, Hennigan and Babiarz report that a great deal of the data that has been collected is unused and, in some instances, unusable. Although one of the roles of monitoring is to feed back information that can be used as the basis for future policies for environmental management, there is no national or state program to review monitoring information and incorporate it into future policy. Ambient monitoring has also failed to provide information useful in assessing nonpoint contributions and toxic substances.

The most important deficiency is reported to be the lack of a requirement for systematic review, interpretation, and publication of data. Another "glaring gap in the ambient monitoring program (is) the lack of a toxic substances monitoring network."

"What we need," said the authors, "is a cost-effective program in which we decide what to look at and for...we need to insure that what we spend on monitoring is well spent by having periodic review, interpretation, and publication of the information. Publishing the information in terms understandable by the lay person will increase public understanding of water quality problems and lay the basis for ...public participation...and...support."

The New York situation parallels that in North Carolina and many other states. There is urgent need for reassessment and realignment of resources to increase the efficiency of monitoring programs.

VIRGINIA SETS LAW FOR WATER EMERGENCIES

A new Virginia State law authorizes a three-person committee to allocate water supplies during an emergency, such as flood or drought.

Under the new law, a locality with a declared water emergency may adopt an ordinance to restrict the use of water, and it may apply to the State Water Control Board for assistance. If the SWCB determines that an emergency exists and that water and connections are available in a neighboring jurisdiction, it will notify the governor, who will then appoint a committee to allocate supplies during the emergency.

The law will take care of temporary shortages between jurisdictions with water connections, but will not solve long-term water supply problems, according to Dale F. Jones, director of the SWCB Bureau of Water Control Management.

.....*Water News*
Virginia Water Resources
Research Center

MATCHING GRANT PROPOSALS DUE DECEMBER 8

Matching grant proposals will be received at the Water Resources Research Institute until 5:00 p.m., December 8. After review

by State and federal agencies and a technical committee, the approved proposal will be forwarded to the Office of Water Research and Technology by February 1, 1979, with the Institute's commitment of State funds and endorsements. Among the research areas of particular interest to OWRT are the focused areas of water conservation, land/water problems of urbanization, and floods and droughts.

PRESIDENT SIGNS WATER RESEARCH AND DEVELOPMENT ACT OF 1978

The bill (S. 2704) aimed at promoting a more adequate and responsive national program of water research and development has been signed into law (P.L.95-467)

by the President. The new law authorizes and directs the Secretary of the Interior to assist in carrying on the work of a competent and qualified water resources research and technology institute, center, or equivalent agency at one college or university in each state. Funds are provided for each of the fiscal years 1979 and 1980.

The law also provides funds for water research and development for saline and other impaired waters and includes provisions for a research assessment and technology transfer program to make research and development results available to other organizations and individuals for further development and practical application to water and water-related problems.

LEGISLATION CONTINUING WATER RESOURCES COUNCIL SIGNED

President Carter September 30 signed a bill (S. 2701) to amend the Water Resources Planning

Act and to continue operation of the Water Resources Council for another year.

The bill authorizes \$8.83 million in funding for the council for fiscal 1979. The President wants the council to establish a new national water policy.

**"NEW APPROACH"
AIMS TO BOOST
SOIL CONSERVATION**

A new approach to conservation assistance that will mean fewer detailed planning documents--but more applied conservation measures--is in

the future for North Carolina farmers and other land users who take advantage of available Soil Conservation Service assistance.

Jesse L. Hicks of Raleigh, head of SCS in North Carolina, said that Administrator R. M. Davis has endorsed the new procedure which began October 1 and which "will be tailored to meet the most immediate needs of land users."

The new approach will allow SCS professional employees "to be far more flexible in conservation planning. Our conservationists will be able to be more responsive to increased demand from land users for more direct planning and application assistance."

In recent years, while requests for assistance have steadily increased, fewer professional SCS employees have been available to meet the requests. The SCS Administrator added that "conservation planning is very important, but it should only be as detailed as the land user wants or needs it to be. Its aims should be the same as the land user's; to apply and maintain conservation practices on the land."

SCS conservationists serve every county in North Carolina, working through 92 local soil and water conservation districts to provide technical assistance to farmers and others, including planners and other local government officials.

**WATER CONSERVATION
THROUGH ELECTRONIC
ANALYSIS**

The "SEBA Dynatronic Water Network Service Van," placed into service in Austria earlier this year,

provides using communities with exact data on water losses through faulty pipelines and couplings. In some instances these losses run into hundreds of thousands, even millions, of dollars over the years. The "dynatronic" analyzer establishes the size and location of leaks and determines the extent of the annual financial loss based on the measurements. There is no interruption of service while the analysis is taking place. The network is investigated section by section with the sector under analysis blocked off at the gate valves. Delivery into the sector is maintained through the hose-equipped SEPA service van. Pressure and volume flow recordings, made electronically in the van's instrumentation console, indicate the extent of the loss and other data pertinent to the analysis, like bottlenecks, deposits, seal tightness, etc. Factors reported to the community include: actual water loss in cubic meters/hour, translation of these data into a financial loss statement, a rating of the state of the conduits and fittings, a checking of the network charts, the pinpointing

of leaks and faults, proposals for network servicing and an analysis of user consumption patterns.

.....*Urban Innovation Abroad*
October 1978

**BENEFITS
WORTH COST?**

According to a decision reached by the Texas Water Quality Board in August, treatment standards can be too high. In a case involving the Dallas/Fort Worth area, the Texas Water Quality Board heard findings that the cost of achieving a higher quality wastewater effluent could produce only 15 cents' benefits for each \$1.00 of cost. The new information caused the Board to reverse an earlier decision setting high effluent limits of 5 mg/l BOD, 5 mg/l TSS, and 3 mg/l ammonia-nitrogen.

Presentations at the hearing indicated that there was little relationship between economic and social costs and the benefits which could be obtained from the higher effluent limit. As a result of the evidence presented, the Board modified its decision and granted a permit requiring effluent standards of 10 mg/l BOD and 15 mg/l TSS to the City of Dallas for the 20 mgd expansion of its southside plant.

**RESIDENTS OF
VIRGINIA TOWN
PROTEST WATER
RATE HIKE**

Rate increases of up to 500% for water and sewer bills brought protests and refusals to pay bills from some families in Manassas Park, Virginia. In some instances, water and sewer bills jumped from \$11 to about \$86 per month. Part of the increase in monthly bills was attributed to the high cost for a new sewage treatment plant which was originally expected to cost \$42 million, but actually cost \$82 million.

Water was turned off to some customers who refused to make their payments.

**ASSESSING THE FACTORS
THAT INFLUENCE WATER
QUALITY IN A RIVER BASIN**

The U.S. Geological Survey has been engaged in studies to find

out what one needs to know about a river basin to maintain or improve the water quality, and what procedures are needed to obtain this information. The principal objective of the studies is to provide a sound technical basis for assessing water quality problems and evaluating management alternatives in a river basin.

A four-year study of the Willamette River Basin in Oregon, the first river chosen for the program, has

recently been completed. Findings from similar studies in the Upper Chattahoochee River Basin, Georgia, and the Yampa River Basin, Colorado, will soon be available.

What did USGS find out from the Willamette River Basin studies that may be of significance for other river basins?

1. The need to assess each river basin individually is one of the broad implications of the Willamette study. Special relationships were found between river flow, nutrient concentrations, and algal growth in the Willamette River. USGS concluded that "the application of rigid nationwide standards might have resulted in expenditures, unnecessary in this basin, to reduce the loading of nitrogen and phosphorus."

2. Existing water quality data for river basins is generally inadequate for defining pollution sources and the manner in which they affect water quality. (It should be noted that better water quality data existed for the Willamette River than for most rivers, one of the reasons it was selected for the study.) Intensive surveys are required to develop adequate information for resolving river quality problems.

3. Although discharges from waste treatment plants play an important role in stream water quality, more and more treatment is not necessarily the answer to pollution problems. The Willamette study showed that other things must also be considered; for example, low-flow augmentation, industrial processing of wastes, and better control of nonpoint sources of pollution (land runoff) and urban runoff.

4. In the Willamette River Basin, only about half of the organic substances entering the river, withdrawing dissolved oxygen from the water as they decompose by bacterial action, came from waste water discharges. The other half comes from natural sources in "essentially pristine streams and cannot be reduced by pollution control programs."

.....Lyle S. Raymond, Jr.
Water Resources Inf. Specialist
Center for Environmental Research/
Cooperative Extension
Cornell University

**ONGOING RESEARCH
PROJECT SUMMARIES
NOW COMPUTERIZED**

annual *Water Resources Research Catalog*, is now available for computer searching from remote terminals that are tied in to the RECON system at Oak Ridge, Tennessee. This file complements the existing data bank of published research (*Selected Water*

The file of active research projects in water resources, which had previously gone into the publication of the

Resources Abstracts) to present a more complete record of research in water resources. There are over 12,000 project descriptions in the file which will be updated quarterly.

This latest addition to computerized information supersedes the *Water Resources Research Catalog*, whose annual series ceased with the publication of Volume 11.

REQUEST FOR PUBLICATIONS ON FLOOD FLOW ESTIMATION FOR URBAN AREAS

The Hydrology Committee of the U.S. Water Resources Council will initiate in the near future a study of techniques

for determining flood flow frequency estimates at unengaged urban locations. In order to develop a set of guidelines that will provide some uniformity in flood flow estimates, a review of the literature describing techniques and results of their application is currently being undertaken. The Committee would like to have as much input as possible from anyone involved in making flood flow estimates at unengaged urban locations, and thus is soliciting both published and unpublished reports that describe such techniques. Anyone having such reports is requested to forward them as soon as possible to Dr. Walter J. Rawls, Hydrologist, USDA-SEA-FR, Room 139, Building 007, BARC-West, Beltsville, Maryland 20705.

DISCOUNT RATE SET AT 6-7/8%

Leo M. Eisel, Director of the U.S. Water Resources Council, announced that the interest rate to be used by federal

agencies in formulating and evaluating plans for water and related land resources is 6-7/8 percent for the period October 1, 1978, through September 30, 1979.

The new rate is to be used by all federal agencies in plan formulation and evaluation of water and related land resources projects for the purpose of discounting future benefits and costs to a common time basis.

The rate is based on the average yield during the preceding fiscal year on interest-bearing marketable securities of the United States which have terms of 15 or more years remaining to maturity. However, the rate may rise by no more than a quarter percent in any year.

COURSE IN HYDROGEOLOGY OFFERED

GY 565, Hydrogeology, is to be offered at North Carolina State University in Spring 1979. In

addition to classic considerations of groundwater

exploration, management, and evaluation, the course will cover topics related to groundwater pollution and the hydrogeology of subsurface disposal of waste materials. For further information contact the instructor, Charles W. Welby, Dept. of Geosciences, 202 Withers Hall, NCSU, Raleigh, NC 27650.

INTERNATIONAL SYMPOSIUM ON URBAN STORM RUNOFF

An invitation has been extended for abstracts (250 words or less) of papers to be presented at the Sixth International Symposium on Urban Storm Runoff to be held

July 23-26, 1979. Abstracts on the following topics are invited:

1. Quantifying rainfall, runoff, sediment production, and non-point source water quality in urban areas.
2. Case studies and innovative methods for controlling urban storm water runoff and sediment.
3. Hydraulics and hydraulic structures used in urban drainage facilities.
4. Legal implications and socio-economic trade-offs associated with urban storm water management.

This symposium is intended to provide practicing engineers with usable information. Papers reporting research results, design, and analysis techniques are encouraged. A limited number of theoretical papers will be accepted. The subject of waste water treatment will not be included.

Mail abstracts and papers by January 3, 1979, to Ms. Elizabeth R. Haden, Coordinator, Office of Continuing Education, College of Engineering, University of Kentucky, Lexington, KY 40506. Attention: International Symposium. Telephone: 606/257-3971.

SOUTHEAST GROWTH... (cont.'d from p. 3)

Milton Heath of UNC-CH and William Walker of VPI&SU discussed the thorny question of interbasin transfer. Gerald Steinwell of the U.S. Water Resources Council stated that reallocation of water impounded in federal reservoirs will be very difficult. John English of the Environmental Protection Agency stated that reuse of water should be considered under the right conditions.

Robert McGarry, General Manager of the Washington Suburban Sanitary Commission, stated that their 1.2 million-customer water and sewer agency adopted conservation policies because they had no choice. Furthermore, by adopting conservation, they fell in

line with public desires and they were able to save capital.

Dan Okun of UNC-CH stressed that it makes a lot of sense to consider using protected sources of water rather than to try to clean up polluted sources. To achieve this, Okun stated that some solution must be found to the problem of fragmentation in the water industry.

Gerald Zachariah, Chairman of Agricultural Engineering, pointed out that irrigation demands will continue to increase in the Southeast. Florida alone currently irrigates over three million acres.

In the wrap-up session, conferees agreed that action programs must involve new legislation and public education programs.

WATER RESOURCES CONDITIONS IN NORTH CAROLINA

Exceptionally dry weather caused streamflows to decline below normal levels over most of the State.

The only significant rainfall occurred during the first week of October and dry weather prevailed through the rest of the month. Many towns in western North Carolina, including Andrews, Boone, Brevard, Robbinsville, and Sylva, experienced minor to critical water shortages as a result of low streamflows. By the 31st, several had taken emergency actions to curb water usage until the drought ends. Throughout most of the State, flows during the latter part of October declined to the 7-day, 2-year minimum level or lower.

Mean-monthly flow at the USGS index-gaging stations ranged from 40 percent of normal in the Neuse River near Clayton to about 90 percent of normal in the South Yadkin River near Mocksville.

Ground-water levels declined and were below long-term averages in the Coastal Plain region and slightly above in the Piedmont and Mountains. No shortages of ground-water supplies were reported during the month.

.....U.S. Geological Survey

POSITIONS AVAILABLE

Six positions have been announced for the Desert Research Institute in Nevada. The positions are:

1. Analytical Chemist
2. Water Resource Economist
3. Environmental Engineer
4. Water Resources Engineer
5. Hydrogeologist (geothermal)
6. Soil Scientist

For details or to send resume, write:

Mrs. T. Harrison
Desert Research Institute
University of Nevada System
P. O. Box 60220
Reno, Nevada 89506.

WATER RESOURCES
LEGISLATION IN
THE CONGRESS

NEW PUBLIC LAWS

Senate

S. 2701 Water resources.
S. 2704 Water research.

NEW PUBLICATIONS RECEIVED BY THE INSTITUTE

(Residents of North Carolina may borrow these from the Institute for a two-week period. Where individual copies are desired, readers are encouraged to request copies from the organization issuing the publication. The addresses are provided by the *News* for this purpose.)

Water Resources Planning

- "An Overview of Benefit-Cost Analysis for Water Resources Projects--Improvements Still Needed," 8/78, (CED-78-127), by Comptroller General of U.S., avail. from USGAO, Distribution Sec., Room 1518, 441 G St., Wash. DC 20548. (06C)
- "Environmental Impact Statement," (Draft), Greensboro-Guilford County, N.C., Horsepen Creek Interceptor, (EPA 904/9-78-021), 10/78, avail. from EPA, Region IV, 345 Courtland St., N.E., Atlanta, GA 30308. (EIS)
- "Non-Federal Financing of Water Resources Development (Proceedings)," 8/78, OR St. U., Corvallis, OR 97331. (06C)
- "Modelling the Dynamic Response of Floodplains to Urbanization in Eastern New England," (#83), 1/78, by D. O. Doehring, *et al.*, CO St. U., Env. Resources Ctr., Ft. Collins, CO 80523. (04A)
- "A Model for Evaluating the Effect of Land Uses on Flood Flows," (#85), 10/78, by B. B. Ross, *et al.*, VA WRRC, VPI & SU, Blacksburg, VA 24060. (04A)
- "Legal and Administrative Systems for Water Allocation and Management (Proceedings)," 4/19-20/78, ed. by W. E. Cox, VA WRRC, VPI & SU, Blacksburg, VA 24061. (06E)
- "Resource Analysis: Water and Energy as Linked Resources," (#134), 8/78, by M. Lounsbury, *et al.*, U. of IL, WRC, 2535 Hydrosystems Lab., Urbana, IL 61801. (W&E)

Water Quality Management

- "User's Manual for Agricultural Runoff Management (ARM) Model," (EPA-600/3-78-080), 8/78, by A. S. Donigian, Jr., *et al.*, for EPA, avail. from NTIS, Springfield, VA 22161. (05B)
- "The Selenastrum Capricornutum Printz Algal Assay Bottle Test," (EPA-600/9-78-018), 7/78, by W. E. Miller, *et al.*, Special St. Br., Corvallis Environmental Research Lab., Corvallis, OR 97330. (05A)
- "Analysis of State Laws and Regulations Impacting Animal Waste Management," (EPA-600/2-78-155), 7/78, by G. A. Whetstone, *et al.*, for EPA, avail. from NTIS, Springfield, VA 22161. (05B)
- "Entrainment at a Once-Through Cooling System on Western Lake Erie, Vol. I," (EPA-600/3-78-070), 7/78, by R. A. Cole, for EPA, avail. from NTIS, Springfield, VA 22161.
- "Data Base System for State Water Quality Management Information System," (EPA-600/5-78-007), 5/78, by H. C. Torno, for EPA, avail. from NTIS, Springfield, VA 22161. (10A)
- "An Evaluation of the Effect of Drawdown on the Trophic Status of a Small Reservoir," 1/78, by E. H. Barman, Jr., *et al.*, Env. Resources Ctr., GA Inst. of Tech., Atlanta, GA 30332. (02H)
- "John H. Kerr Reservoir, Limnological Study," 5/78, by C. M. Weiss, *et al.*, Dept. of ESE, UNC, Chapel Hill, NC 27514. (05A)
- "Land Application of Wastewater: A Cost Analysis," 9/78, (TB #1594), by C. E. Young, Nat. Resource Econ. Div., Econ., Statistics, & Cooperative Serv., U.S. Dept. of Ag., Wash. DC 20250. (05D)
- "Land Application of Wastewater and State Water Law, State Analyses, Vol. II," (EPA-600/2-78-175), 8/78, by D. W. Large, for EPA, avail. from NTIS, Springfield, VA 22161. (05D)

- "Livestock and the Environment, A Bibliography with Abstracts, Vol. V," (EPA-600/2-78-137), 6/78, by M. L. Rowe, *et al.*, avail. from NTIS, Springfield, VA 22161. (05B)
- "Pollution in Runoff from Nonpoint Sources," (#42), 6/78, by K. L. Campbell, WRRRC, U. of FL, Gainesville, FL 32611. (05B)
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