

MEMORANDUM OF UNDERSTANDING BETWEEN THE  
ENVIRONMENTAL PROTECTION AGENCY AND THE DEPARTMENT OF THE INTERIOR

RELATING TO

RELATIONSHIPS IN ACTIVITIES RELATED TO THE PROTECTION  
OF THE NATION'S GROUND-WATER QUALITY

The purpose of this memorandum is to formalize cooperation and document agreements between the Environmental Protection Agency (EPA) and the Department of the Interior (DOI) in the area of ground-water quality.

The memorandum is divided into two parts: Part I pertains to the water-quality activities of EPA and the U.S. Geological Survey (USGS), and Part II pertains to the interactions between EPA and DOI relating to activities authorized by P.L. 98-434, the High Plains States Groundwater Recharge Demonstration Program Act of 1983.

Part I--Water-Quality Activities of EPA and USGS

With regard to water-quality activities of the EPA and USGS, this memorandum is based on the following premises: (1) USGS is responsible for developing basic scientific information on the ground-water environment through research, investigations, and data collection, including base line information on hydrologic, geochemical, and biologic processes, distribution and composition of water-bearing materials, artificial recharge potential and impacts, and the sources, quantities, qualities, distribution, and behavior of the ground-water resources; these responsibilities derive from the statutory authorities defining the USGS and its mission, including the Organic Act of 1879 and the subsequent annual appropriation acts authorizing USGS programs; and (2) EPA is responsible for carrying out its statutory authority over sources of ground-water contamination. Those authorities cover a wide range of responsibilities which include, for example, (1) establishing standards for treatment, storage, and disposal of hazardous waste (RCRA); (2) responding to releases or substantial threats by releases into the environment, including ground water, of any hazardous substance, pollutant, or contaminant which may present an imminent and substantial danger to the public health and welfare (CERCLA); (3) setting maximum contaminant levels and monitoring requirements for public water systems, and regulating uses of underground injection wells to protect underground sources of drinking water (SDWA); (4) controlling the use of pesticides (FIFRA); (5) restricting or prohibiting the manufacture, distribution, and use of products presenting an unreasonable risk of injury to health in the environment (TSCA); (6) regulating cleanup and disposal related to uranium mill tailings (UMTRCA); (7) establishing standards related to certain radioactive materials (AEA); and (8) promoting the development of State plans for ground-water protection (CWA). Each of these acts seeks to protect ground water at a principal or subsidiary point of vulnerability. As an integral part of its mission, EPA conducts research and other support activities.

This memorandum is a statement of mission, intent, capability, and implementation process. The Chief Hydrologist will coordinate the provisions of Part I of this MOU for the USGS. The Director, Office of Ground-Water Protection, will coordinate the provisions of Part I of this MOU for the EPA. Issues that cannot be resolved at this level will be elevated to higher levels.

#### SCOPE AND RELATION OF AGENCY PROGRAMS

The EPA, as a regulatory agency, and the USGS, as a natural resource research and investigation agency, are involved in a number of related activities. Coordination of certain of the two agencies' activities is vital to the achievement of national environmental and resource management goals and to the efficient and effective acquisition of resource data. Those activities of particular concern include research, data collection, and technical assistance related to ground-water quality protection.

The EPA has the Federal responsibility for implementing various statutory programs, eight of which relate substantially or in part to the detection, cleanup, or protection of ground water. Many of these programs are implemented largely through the States, and they involve the development and enforcement of nationwide regulations, the conduct of investigations and surveillance, support for planning and technical assistance, and State grant support. EPA recently issued its Ground-Water Protection Strategy (August 1984), which recognizes the growing concern over ground-water contamination, and the role of the States in protecting the resource. The strategy addresses four major areas: (1) strengthening State capacity to carry out their responsibility, (2) controlling currently unaddressed sources of ground-water contamination, (3) achieving consistency among the various ground-water protection efforts in the agency taking the value of the resource into consideration, and (4) creating an organizational focus for ground-water protection at Headquarters and the Regions.

The Ground-Water Protection Strategy also recognizes the need to incorporate USGS hydrologic expertise and capability in activities relating to ground-water quality protection. Relevant USGS activities related to ground-water quality protection include basic research, areal investigations at the local, regional, and national levels, the collection and analysis of water-quality data in support of research investigations, and technical assistance. Some of these activities are funded entirely through appropriations to the USGS under its Federal Program; others are funded jointly by the USGS and by State or local governments under the USGS's Federal/State Cooperative Program; still others are funded by other Federal agencies.

Both USGS and EPA have extensive formal and informal working relationships with State and local governments, e.g., the Federal/State Cooperative Program of the USGS, and the delegation of program and regulatory authority to the States by EPA.

## AREAS OF CONSIDERATION

### I. Data Collection and Areal Investigation

Both the USGS and EPA obtain ground-water quality data and conduct areal investigations related to the ground-water resource, although EPA's efforts relate principally to its regulatory mandate. Each agency's area of responsibility is described below. Neither agency can fulfill its mission without maintaining in-house activity in water-quality data collection and analysis and areal investigation, nor, particularly in the case of EPA, without maintaining the capacity to contract effectively for this type of work. Coordination between the two agencies is maintained at all levels to ensure that no unnecessary duplication of effort occurs and that the activities of the two agencies are fully complementary.

#### Responsibilities--USGS

The USGS collects basic data on the quantity and quality of the Nation's ground-water resources, both on a broad scale and on a local or site-specific scale where particular problems have been identified. On the national scale, each District Office of the Water Resources Division (WRD) of the USGS collects and maintains records of water levels in a network of observation wells throughout its area of responsibility. Data on ground-water quality are collected as opportunities arise or as needed in specific areas, and records are maintained both in District and national files. In addition, a USGS program is underway to assemble information on shallow ground-water quality as related to land use in typical hydrogeologic settings throughout the country. On the local or site-specific scale, many USGS District Offices conduct ground-water quality data collection and analysis programs in the vicinity of hazardous waste sites or water-supply wells, particularly as a follow-on activity after completion of an areal hydrogeologic investigation of the site.

The USGS conducts areal hydrogeologic investigations to evaluate and describe the ground-water resource, or to analyze particular problems related to ground-water quantity or quality. In recent years, these problem-oriented investigations have focused increasingly on ground-water contamination, both from point and nonpoint sources. In many Districts, highly advanced studies have been undertaken, involving simulation of the movement of contaminants away from a waste site, and analysis of possible chemical reactions affecting the contaminants. These studies, while focused on specific sites or areas, are commonly supported by research activities that are essential to the development of hydrologic understanding. The scope of USGS research activities is explained in a later section.

#### Responsibilities--EPA

EPA has a statutory responsibility for monitoring ground-water quality relating to (1) the development and enforcement of standards and regulations under the agency's statutory responsibilities, such as those pertaining to the permitting of hazardous waste disposal and storage facilities,

and the protection of drinking water delivered by public systems; (2) determining existing or potential contamination problems to assess the need for new or modified programs, regulations, and corrective actions necessary to protect public health and the environment; and (3) maintaining an awareness of the degree and seriousness of the ground-water contamination problem, and of the types and levels of human activities that impact the quality of the ground water.

These responsibilities will require that EPA undertake special studies relating to the types, sources, distribution, and magnitude of contaminants posing threats to the quality of the ground water of the Nation.

### Cooperative Activities

- USGS will make available to EPA data collected in its water programs which are useful to EPA--for example, data pertaining to the nature and extent of ground-water systems, sources of contamination, waste management operations, and appraisal of subsurface injection or burial sites. Similarly, EPA will make available to USGS data and other information collected in its programs which are pertinent to studies being conducted by USGS.
- As provided in the Interagency Agreement between USGS and EPA (Office of Waste Programs Enforcement), dated October 1, 1983, USGS will perform geologic, geochemical, and geohydrologic investigations of specific areas to provide information needed by EPA for evaluating, monitoring, controlling, and abating ground-water contamination at existing and proposed waste storage, treatment, and disposal facilities.
- USGS will as mutually agreed upon provide assistance in the development of monitoring studies and guidelines, and the conduct of related technical studies.
- USGS will participate with EPA in the development of the EPA Ground-Water Monitoring Strategy as a member of the EPA sponsored Ground-Water Monitoring Work Group.

### II. Technical Assistance

Both EPA and USGS provide extensive assistance to State, local, and Federal agencies. USGS focuses on the scientific understanding of the ground-water resource. EPA focuses on carrying out its statutory and regulatory mandates in an effective and scientifically sound manner.

### Responsibilities--USGS

The USGS carries out extensive technical assistance efforts to local, State, and other Federal agencies in the field of ground water, particularly by providing information on (1) the available quantity and quality of ground water and the current uses of the resource; (2) the probable impacts of various ground-water development scenarios; (3) the movement and fate of contaminants in ground water; and (4) the significance of research results to

water management and water-quality protection. Much of this assistance is provided through the previously mentioned Federal/State Cooperative Program of the USGS. The information is disseminated through reports, computerized information services, training programs, and direct interaction between USGS personnel and personnel of State and local governments or of other Federal agencies.

### Responsibilities--EPA

EPA is responsible for providing technical assistance to State and local governments in support of its regulatory efforts. This includes assistance (1) on the provisions of regulations, permits, pesticide labels, and other program requirements that relate to ground water, (2) on the development of State ground-water protection programs under the Clean Water Act authorities, (3) in the cleanup of hazardous waste sites under Superfund, (4) under the emergency provisions of various laws, and (5) under other statutory provisions.

### Cooperative Activities

- USGS will provide access to ground-water data and information in office and central computer files (WATSTORE and GWSI) to State, local, and Federal agencies. Information in report form will be made available through established assistance centers such as those maintained by NAWDEX. As part of its training program, available data services and assistance will be described to trainees, and access to USGS facilities will be arranged. EPA will provide access to STORET and other sources of data and information.
- EPA and USGS jointly will explore avenues for improving access to information; e.g., direct access to computer files via terminals, joint information service centers for disseminating data and program products, and training sessions that incorporate information transfer activities of both organizations. For example, EPA and USGS will establish a joint review of the use of a geobased information system (GIS) for use in ground-water protection efforts at the Federal, State, and local levels.
- EPA and USGS will develop an arrangement at each EPA regional office to promote cooperative efforts among USGS, EPA, and the States. For example, USGS will cooperate with States as they develop State ground-water protection programs including the development of State guidelines and regulations, monitoring and mapping efforts, and other technical activities identified by States as high priorities in their State ground-water protection strategies, State plans, or State grant reports to EPA. In general, requests for such assistance will be initiated by the States and conducted under the USGS Federal/State Cooperative Program.
- USGS will prepare reports for each State describing the availability of published information on ground water, and describing ongoing ground-water investigations.

- USGS will identify activities in the ongoing water-use program that will contribute to State ground-water protection efforts.
- USGS will make their training program on ground water and related subjects available to EPA personnel and personnel from State ground-water protection programs.
- EPA will foster the use by States of hydrologic assistance from the USGS through the USGS Federal/State Cooperative Program.
- USGS will support the preparation of standards, guidelines, and regulations through the provision of data, geohydrologic information, and information on water-bearing characteristics of ground-water flow systems. For example, USGS will participate as a member of the EPA Task Group which is developing EPA Ground-Water Classification Guidelines.
- USGS will provide data, technical assistance, and advice, as appropriate, under the terms of the USGS/EPA interagency agreement dated October 1, 1983, in support of EPA enforcement actions under its statutory provisions.

### III. Research

The EPA's statutory mandates to protect ground-water quality frequently involve EPA and the States in complex technical questions. These questions deal with the entire range of processes affecting ground-water contamination; they arise, for example, during the development of regulations, during the course of litigations, and during the design of remedial actions. Thus, in carrying out regulatory functions, the EPA and the States must frequently operate at the limits of scientific knowledge. Scientific and engineering expertise is necessary to permit rapid and flexible adjustment to shifting priorities, to provide a source of technical advice to management, to provide guidance in planning and evaluating extramural research, and to ensure that the agency remains in full communication with new developments throughout the scientific community including those carried out by other Federal agencies such as USGS. EPA's internal research necessarily occurs in many fields in which the USGS and other Federal agencies have traditionally maintained extensive programs. Coordination to assure complementarity of programs is maintained at all levels, from a formal Interagency Coordinating Committee at Headquarters to informal personal contact among individual scientists working in the field. The present state of the science is such that the need for research far outstrips the total resources which are currently brought to bear by government, the academic community, and private industry. A major task of the interagency effort is to stretch combined resources so that all topics are covered, in addition to avoiding unnecessary duplication.

#### Responsibilities--USGS

The USGS has traditionally carried out a broad range of investigative activities which have direct bearing on questions of ground-water quality. In the

area of generic research, USGS scientists have investigated chemical and biological reactions affecting contaminants in the subsurface, have studied the mechanics of flow, dissolved contaminant transport, and immiscible contaminant movement in fully saturated and partially saturated porous media, have developed computer-based models simulating flow, transport, and chemical reaction in the subsurface, have developed parameter estimation techniques for determining the hydraulic characteristics of aquifers, and have developed borehole and surface geophysical techniques for evaluating the characteristics of geologic materials and subsurface fluids. Areal investigations have been discussed previously; but as already noted, such investigations grade continuously into research. In terms of areal hydrology, USGS personnel have evaluated many regions of the Nation as to aquifer characteristics, regional ground-water flow, and general ground-water quality, and have conducted studies of nonpoint-source ground-water contamination. In terms of site-specific field research, USGS scientists have conducted investigations at a number of waste disposal sites, evaluating the degree and extent of contamination, determining through simulation the rates and directions of contaminant movement, and studying the chemical and biological processes affecting the contaminant plumes. The investigative activities outlined above have been funded under the USGS's appropriated programs, or through cooperative arrangements with State and local governments, or to some extent by other Federal agencies. In the future, the USGS will continue to pursue all of the lines of research and investigation described above, and will direct its efforts as needed to accommodate evolving scientific needs related to ground-water quality. At the same time, close coordination with EPA will be maintained to ensure that all needed research areas are adequately covered within respective agency resources and plans.

#### Responsibilities--EPA

As part of its statutory mandates to protect ground-water quality, EPA pursues a research program directed toward the development and demonstration of suitable waste disposal options; development of the scientific basis for adequately and accurately assessing degree and extent of damage of ground-water quality; and development and demonstration of effective procedures for remedial actions. In this regard, EPA manages both internal and extramural research, development, and demonstration programs in: (1) determining the fate, transport, and transformation rates and mechanisms of pollutants in the subsurface environment including both the unsaturated soil profiles and the saturated zones, (2) defining the processes to be used in characterizing the subsurface environment as a receptor of pollutants, (3) developing techniques for predicting the effects of pollutants on soil and indigenous organisms, (4) defining and demonstrating the applicability and limitations of using natural processes, indigenous to the subsurface environment, for the protection of this resource from municipal, industrial, and agricultural activities entailing the release of pollutants to the soil or deeper regions of the subsurface, (5) developing and demonstrating methodologies and technologies

for sampling and monitoring ground-water quality from site specific to national scale, and (6) developing and demonstrating engineering alternatives and options for excluding contaminants from the subsurface including process modifications, waste stream control technologies, disposal site liners, and waste encapsulation procedures.

In contrast with USGS's broad mission responsibilities relating to appraising the quality and quantity of the Nation's water resources, EPA's ground-water research is focused on matters related to ground-water contamination.

### Cooperative Activities

- EPA and USGS will share research and related information through such mechanisms as the exchange of research plans, budgets, progress reports, project summaries, and research products.
- EPA and USGS will undertake discussions to arrange interchange of scientists, both short and long-term, to the extent feasible.
- USGS and EPA will undertake joint research activities of mutual interest. This could include, for instance, joint funding of contracts and cooperative agreements, transferring personnel or funds on specific projects, or participating together on specific field sites.
- Research plans will be monitored and coordinated through existing formal mechanisms such as the EPA/USGS Coordinating Committee.

### IMPLEMENTATION AND COORDINATION

Implementation of this MOU will be as follows:

1. Overall implementation will be coordinated by the Chief Hydrologist, USGS, and the Director, Office of Ground-Water Protection, EPA. Issues unresolved at this level will be referred to higher levels. To the extent possible, coordination of the activities described by this MOU will be achieved at the lowest practical level.
2. The Chief Hydrologist, USGS, and the Director, Office of Ground-Water Protection, EPA, will use the Ground-Water Policy Subcommittee of the standing EPA/USGS Coordinating Committee, established under the MOU dated August 5, 1981, as a forum for coordination, information exchange, and, as appropriate, resolution of issues. At least once annually, this Subcommittee will review relevant budget initiatives and significant accomplishments.
3. A further point of coordination will be the EPA Interagency Committee on Ground-Water, of which the USGS will be a member.
4. Within the overall framework established by the MOU, more detailed implementation of specific cooperative actions will be the responsibility of various operating units of both agencies. For example, for those activities conducted

in support of the EPA Office of Waste Programs Enforcement, the coordinators identified in the interagency agreement of October 1, 1983, will be responsible. Research coordination will be the responsibility of EPA's Office of Research and Development and the USGS's Ground Water Branch.

5. Regular meetings between USGS Regional Hydrologists and EPA Regional Directors or their representatives will be held to assist in implementing cooperation between the agencies.

6. Annually, the two agencies will develop an agenda outlining the activities to be conducted in the following fiscal year, and will prepare reports on activities carried out during the current fiscal year under the terms of this MOU.

7. If the USGS carries out a program as part of its mission, it will provide its support to EPA gratis. If EPA requests special assistance such as site-specific assessments from the USGS, such assistance will be arranged for and reimbursed through an interagency agreement. In meeting its scientific and technical needs, EPA will consider the capabilities of the USGS and utilize its assistance to the extent feasible and appropriate. Such assistance would include cooperative studies with the USGS and review of study plans through the Ground-Water Policy Subcommittee to assure that unnecessary duplication of efforts does not occur.

Part II--Activities Related to P.L. 98-434,  
the High Plains States Groundwater Demonstration Program Act of 1983

Section 5 of P.L. 98-434, the High Plains States Groundwater Demonstration Program Act of 1984, requires that "The Secretary, acting through the Bureau, and the Administrator of the Environmental Protection Agency . . . shall enter into a memorandum-of-understanding to provide for an evaluation of the impacts to surface water and groundwater quality resulting from the ground-water recharge demonstration projects constructed . . . ." Sec. 5 also stipulates that "The Administrator shall consult with the United States Geological Survey and shall make maximum use of data, studies and other technical resources and assistance available from State and local entities in conducting the evaluation." This section of the MOU addresses this requirement; the purpose of this section is to define the agency roles of the U.S. Bureau of Reclamation (USBR), USGS, and EPA, and to identify mechanisms for achieving effective coordination of the interagency efforts. The purpose of this agreement is to carry out the mandate contained in Section 5 of the High Plains States Groundwater Demonstration Program Act of 1983 only, and does not address the respective responsibilities of the National Environmental Policy Act, Section 309 of the Clean Air Act, the Underground Injection Control Program as established under the Safe Drinking Water Act, or any other statutory authorities or responsibilities.

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Background--The act requires a minimum of 21 ground-water recharge demonstration sites in the 17 Reclamation Act States. Phase I of the demonstration activity entails planning, evaluation of recharge technology,

and site selection, and is to be completed within 24 months after enactment of an appropriation act. Phase II of the demonstrations will begin when an appropriation for construction is signed and will entail design, engineering, construction, operation, evaluation, and analysis of the recharge projects. Phase II will have a duration of 5 years, at the end of which time the Secretary will submit a final report to Congress detailing the results of the studies. Section 5 of the act states that ". . . the evaluation of water-quality impacts shall be completed so as to be included in the Secretary's final report to the Congress . . . ."

#### SCOPE AND RELATION OF AGENCY ACTIVITIES

The USBR has primary responsibility for the provisions of the act, including site selections, project design, construction, and operation of the demonstration projects. As a consequence of Sec. 5 of the act, the USBR will also be responsible for the installation of suitable observation wells at each site, and will provide access to natural or engineered structures for obtaining samples of recharge water or installing automatic recording devices. In addition, the USBR will make available records of the quantities of water actually recharged, together with such technical information as injection pressures or rates, infiltration rates, physical or chemical specifications of recharge-water treatment, and other information as may become necessary for the evaluation of water-quality impacts.

The USGS will consult with the USBR and EPA on the design of suitable monitoring systems at each site, and on the specifications of observation wells, including material, size, and depth. As mutually agreed upon, the USGS will operate the monitoring networks, provide laboratory analyses of water samples, and conduct scientific studies that are relevant to the assessment of water-quality impacts. Examples of such studies would include evaluation of the effects of treated and untreated recharge water on the permeability of the aquifer, and studies to assess the physical, chemical, and biological impacts of the recharge projects on the receiving aquifers and surface waters.

The EPA will be responsible for the overall evaluation and reporting to the Bureau of Reclamation on the impacts of recharge activities on ground-water quality using data and interpretive information provided by the USBR, USGS, and State and local water agencies. USGS and USBR will ensure that data are collected, stored, and managed in a form that will allow efficient analysis and manipulation of data by EPA so as to fulfill EPA's water-quality evaluation responsibilities.

#### Implementation and Coordination

By necessity, the conduct of the water-quality evaluations will parallel the course of the recharge demonstrations. Due to restricted funding only limited new field work will be possible during much of the Phase I site selection process. As the recharge sites are identified, and the recharge mechanisms selected, a preliminary sampling for ambient ground-water quality will be conducted prior to the start of recharge activity. The agencies

will develop a mutually acceptable monitoring program for each site, tailored to the particular characteristics of the site and to the nature of the aquifer and recharge water. USBR and USGS will ensure that EPA is fully consulted in the site-selection process of Phase I, and that the concepts of EPA's Ground-Water Protection Strategy are considered when reviewing candidate recharge sites.

The design, construction, and long-term maintenance or closure of monitoring wells will be integrated with the overall site engineering effort of the USBR, and initiation of the monitoring program will be coincident with the start of recharge.

Data collected during the course of the recharge program will be made available to each agency on a regular basis, and where warranted, modifications of the existing monitoring program may be made as mutually agreed. All water sampling and laboratory analysis will be conducted by USBR, USGS, and State and local agencies as appropriate.

As appropriate, the USGS and USBR will assist EPA in the preparation of the final report to Congress.

Owing to the 2-year lead time before the recharge sites are identified, and the complex overlapping of EPA, USBR, and USGS regional jurisdictions, coordination of the joint activities will be at two levels corresponding to Phases I and II of the act. During Phase I, two or more representatives of each agency will be appointed, respectively, by the Administrator, EPA; the Commissioner, USBR; and the Director, USGS. The responsibilities of that group will be to make recommendations to the Assistant Secretary for Water and Science in the following three areas:

- To define the scope of each agency's technical and reporting responsibility, and to establish basic technical requirements (including quality assurance and quality control considerations) that will be common to all sites.
- To develop mechanisms for coordination at the recharge demonstration site level. Such mechanism should involve the USBR site manager, the USGS District Chief, and the responsible EPA technical person.
- To determine agency resource needs for both Phase I and Phase II.

During Phase II, all coordination will be achieved at the site level, with semiannual progress reports provided to the senior coordinating group.

#### Other Project Involvement

In addition to this specific effort in response to the High Plains States Groundwater Demonstration Program Act of 1983, the previously mentioned 6-member group may, as appropriate, set up coordinating mechanisms between EPA and USBR, for other USBR projects involved with ground-water recharge.

FINANCIAL ARRANGEMENTS

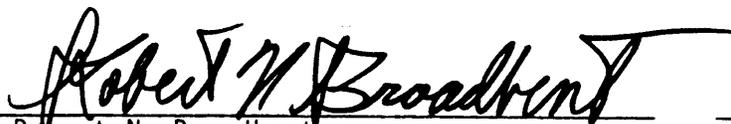
Each year, EPA and USBR will negotiate a reimbursable agreement for EPA's work on the High Plains and other ground-water recharge projects based on resource needs projected by the interagency work group.

APPLICABILITY, MODIFICATION, AND TERMINATION

This memorandum of understanding shall cover activities of EPA and DOI that are of mutual interest and that pertain to the use and protection of the ground-water environment. This memorandum shall become effective upon signature of both parties and may be amended by mutual consent or terminated by either party upon 60 days' written notice.

APPROVING PERSONNEL

U.S. Department of the Interior:

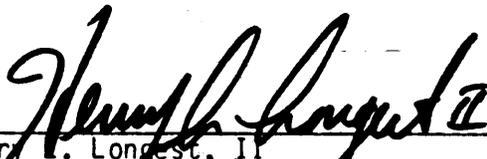


Robert N. Broadbent  
Assistant Secretary  
for Water and Science

JUN 21 1985

Date

The Environmental Protection Agency:



Henry L. Longest, II  
Acting Assistant Administrator  
for Water, Land  
Chairman, EPA Ground-Water  
Oversight Committee

JUN 21 1985

Date