

REGION IV
GROUND WATER PROTECTION

THE STORY



REGION IV
GROUND WATER PROTECTION

THE STORY

U. S. EPA, Region IV
Ground Water Protection Branch
Atlanta, Georgia 30365

January 31, 1993

CONTENTS

I. Legislative History.....	1
Safe Drinking Water Act.....	1
Underground Injection Control Program....	2
Sole Source Aquifer.....	15
Wellhead Protection Program.....	16
Emergency Powers.....	16
Clean Water Act.....	17
Resource Conservation and Recovery Act.....	17
Underground Storage Tanks.....	17
Land Disposal Restrictions.....	18
II. Ground Water Protection Branch Organization.....	21
Underground Injection Control Section.....	21
Compliance & Enforcement Unit.....	21
Permitting Unit.....	24
Underground Storage Tank Section.....	24
State Programs Group.....	24
Compliance Team.....	24
Ground Water Technology & Management Section...	24
Ground Water Technology Unit.....	24
Ground Water Management Unit.....	25
III. Ground Water Protection Programs.....	29
Underground Injection Control Program.....	29
Goals.....	29
Accomplishments to Date.....	30
Accomplishments Vs. Resources.....	31
Projections.....	31
Anticipated Resource Needs.....	36
Underground Storage Tank Program.....	36
Goals.....	36
Accomplishments to Date.....	37
State Authorization.....	37
Corrective Action.....	38
Closure Activities.....	38
Confirmed Releases.....	38
Funding.....	43
Release Detection Compliance.....	46
Projections.....	46

CONTENTS (Continued)

Ground Water Technology & Management Programs.	47
Ground Water Technology Programs.....	47
Goals.....	47
Accomplishments to Date.....	48
Accomplishments Vs. Resources.....	48
Projections.....	51
Anticipated Resource Needs.....	52
Ground Water Management Programs.....	52
Goals.....	52
Accomplishments to Date.....	53
Accomplishments Vs. Resources.....	55
Projections.....	55
Anticipated Resource Needs.....	64
IV. EPA's Ground Water Protection Strategy for the Future.....	66
Need and Goal.....	66
Policy.....	66
Principles.....	67
Conclusion.....	67

FIGURES

Number	Page
1. Public Ground Water Facilities.....	3
2. Region IV Drinking Water by Population.....	4
3. Alabama Drinking Water by Population.....	5
4. Florida Drinking Water by Population.....	6
5. Georgia Drinking Water by Population.....	7
6. Kentucky Drinking Water by Population.....	8
7. Mississippi Drinking Water by Population.....	9
8. North Carolina Drinking Water by Population.....	10
9. South Carolina Drinking Water by Population.....	11
10. Tennessee Drinking Water by Population.....	12
11. Region IV Sole Source Aquifer Map.....	17
12. Ground Water Protection Branch Organization Chart.....	24
13. Underground Injection Control Section Organization Chart.....	25
14. Underground Storage Tank Section Organization Chart.....	27
15. Ground Water Technology & Management Section Organization Chart.....	28
16. Orders Issued By Region IV Compared to All Other Regions.....	34
17. Proposed Orders.....	35
18. Permit Actions by State.....	36
19. UIC Permit Actions.....	37
20. UST Tank Closures Region IV.....	42
21. UST Tank Closures by State.....	43
22. UST Region IV Confirmed Releases.....	44
23. Clean-Ups, UST-Region IV.....	45
24. Corrective Action Activity thru 1992.....	46
25. UST Clean-Ups Region IV.....	47
26. Projects Completed by the Ground Water Technology Unit.....	52
27. Projects Completed by the Ground Water Technology Unit.....	53
28. 106 Ground Water Grants Region IV, Totals by Year.....	59
29. 106 Ground Water Grant Selected Expenditures, 1985-1990.....	60
30. AL 106 Ground Water Grant Selected Program Elements 1985-1990.....	61
31. FL 106 Ground Water Grant Selected Program Elements 1985-1990.....	62
32. GA 106 Ground Water Grant Selected Program Elements 1985-1990.....	63

FIGURES (Continued)

Number	Page
33. MS 106 Ground Water Grant	
Selected Program Elements 1985-1990.....	64
34. NC 106 Ground Water Grant	
Selected Program Elements 1985-1990.....	65
35. SC 106 Ground Water Grant	
Selected Program Elements 1985-1990.....	66
36. TN 106 Ground Water Grant	
Selected Program Elements 1985-1990.....	67

TABLES

Number	Page
I. Safe Drinking Water Act Amendments.....	1
II. Description of UIC Injection Well Classes.....	2
III. Injection Wells Located in Region IV.....	13
IV. UIC Section Accomplishments.....	31
V. GWTU Workload by Fiscal Year.....	48

Introduction

EPA Region IV and its States have been active for many years in the business of protecting the southeastern groundwater resource. The results of these efforts benefit all who live and visit here. There has been, however, no single source of information that documents the comprehensive nature of this work, its accomplishments, and its goals.

The Story is an attempt to be a source of such information. It is the product of a joint effort of staff from all Ground-Water Protection Branch programs. This record charts the history of groundwater protection in Region IV, documents our organization, describes our accomplishments and resources, and relays a vision of future needs and activity.

It is intended to be a living document that is periodically updated, expanded, and improved. It should be a valuable source of information for persons familiar with groundwater protection as well as those new to such activity. We welcome comments and suggestions.

I. LEGISLATIVE HISTORY

I. LEGISLATIVE HISTORY

A. Safe Drinking Water Act (SDWA)

Protection of the nation's public drinking water supplies from harmful contaminants has been a major concern of Congress for many years. Prior to 1974, Title XIV of the Public Health Service Act -- Safety of Public Water Systems provided the legal authority for ensuring safe drinking water supplies. With the increased public awareness of the potential for contamination of ground water sources from underground injection operations, Congress undertook a major revision to Title XIV to expand its coverage to provide authority to regulate underground injection to ensure that underground sources of drinking water would be protected from contamination. The newly amended Title XIV was enacted on December 16, 1974, and was renamed the Safe Drinking Water Act (SDWA). Congress has amended the SDWA several times since 1974 as shown in Table I.

Table I. SAFE DRINKING WATER ACT AMENDMENTS

<u>Year</u>	<u>Act</u>	<u>Public Law</u>
1974	Safe Drinking Water Act (SDWA)	P.L. 93-523
1977	SDWA Amendments of 1977	P.L. 95-190
1979	SDWA Amendments of 1979	P.L. 96-63
1980	SDWA Amendments of 1980	P.L. 96-502
1986	SDWA Amendments of 1986	P.L. 99-339
1988	Lead Contamination Control Act of 1988	P.L. 100-572

The SDWA directs the EPA Administrator to develop:

1. National primary drinking water regulations that set maximum contaminant levels or treatment techniques;
2. Underground injection control regulations to protect underground sources of drinking water; and
3. Ground Water protection grants for wellhead protection programs.
4. Programs for the administration of sole source aquifer demonstration projects.

The SDWA provides that each of these activities be carried out by a state. The EPA Administrator must first determine that the state has developed appropriate regulations that enforce the

requirements of the SDWA.

Underground Injection Control Program

Ground water is water that flows through and is stored in soil and rock formations beneath the ground's surface. It is a major source of drinking water and of water used for agricultural purposes in the United States. Over sixty percent (60 %) of the people in the United States rely on ground water for some or all of their drinking water (See Figures 1 through 10). In the past, ground water was thought to be relatively free from contaminants. However, since the early 1970's there has been increasing concern over the threat to public health due to underground injection of fluids. This injection could result in the degradation of underground sources of drinking water if done in an unsafe or unregulated manner.

As a result of this concern, Congress included in the SDWA a statutory mandate for establishing minimum requirements for effective state programs. These requirements are designed to protect underground sources of drinking water from injection. In December 1980, Congress amended the SDWA to allow states to show the effectiveness of their regulatory programs for Class II wells (see Table II for well class descriptions), instead of proving that they met the minimum requirements specified in the UIC regulations (Section 1425). Later amendments to the SDWA gave EPA the authority to issue administrative orders, required EPA to submit to Congress a report on Class V wells and to issue regulations for underground injection practices on Indian lands.

Table II. DESCRIPTION OF UIC INJECTION WELL CLASSES

<u>Class</u>	<u>Definition</u>
I	Injection of municipal or industrial waste (including hazardous waste) below the deepest underground source of drinking water.
II	Injection of fluids associated with oil or natural gas production or liquid hydrocarbon storage.
III	Injection for mineral recovery.
IV	Injection of hazardous or radioactive waste into or above an underground source of drinking water. (Prohibited)
V	All injection practices that are not included in the other four classes.

Public Ground Water Supplied Facilities* In Region IV States

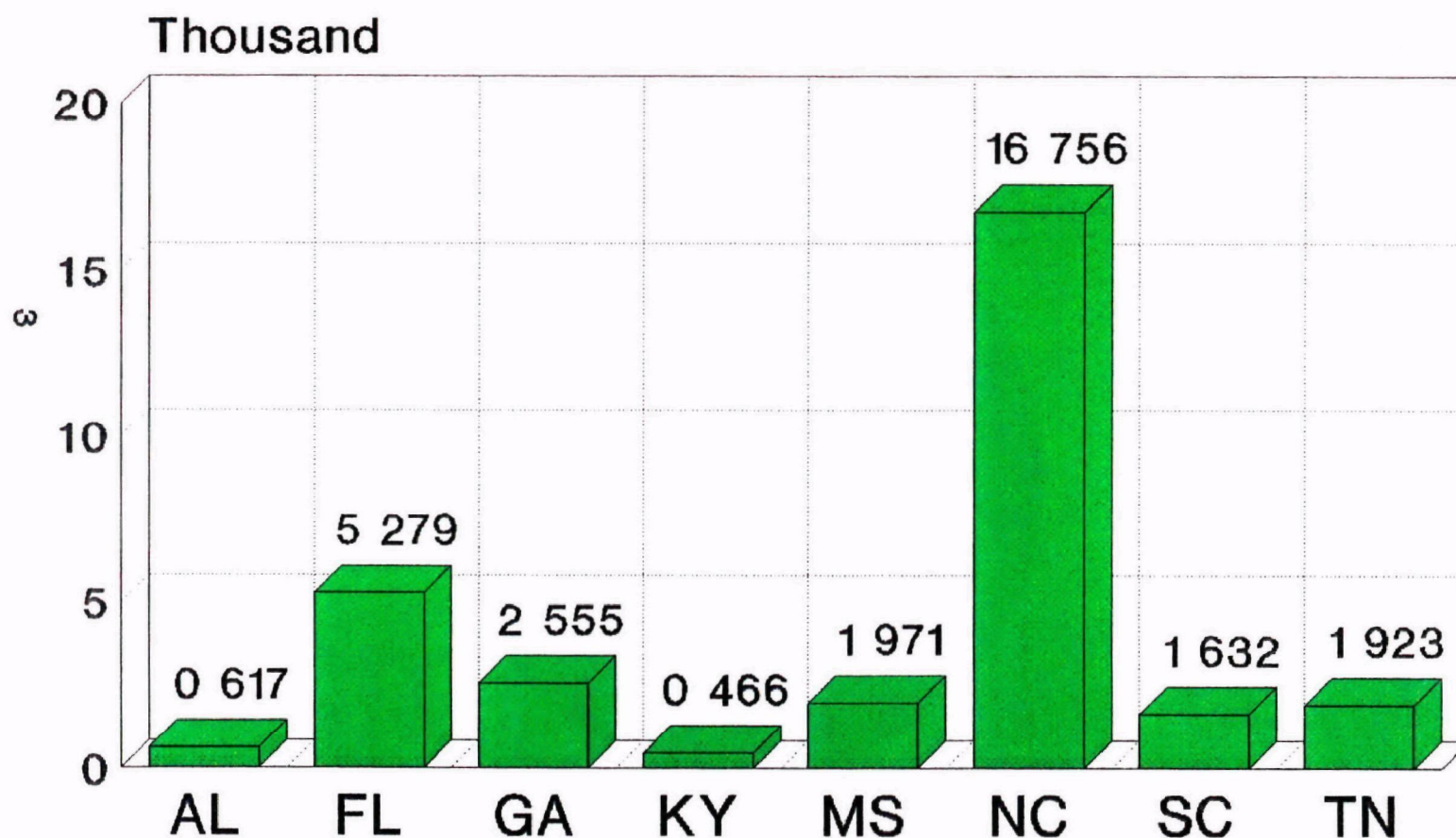


Figure 1

* From FRDS 1990

Region IV Drinking Water by Population*

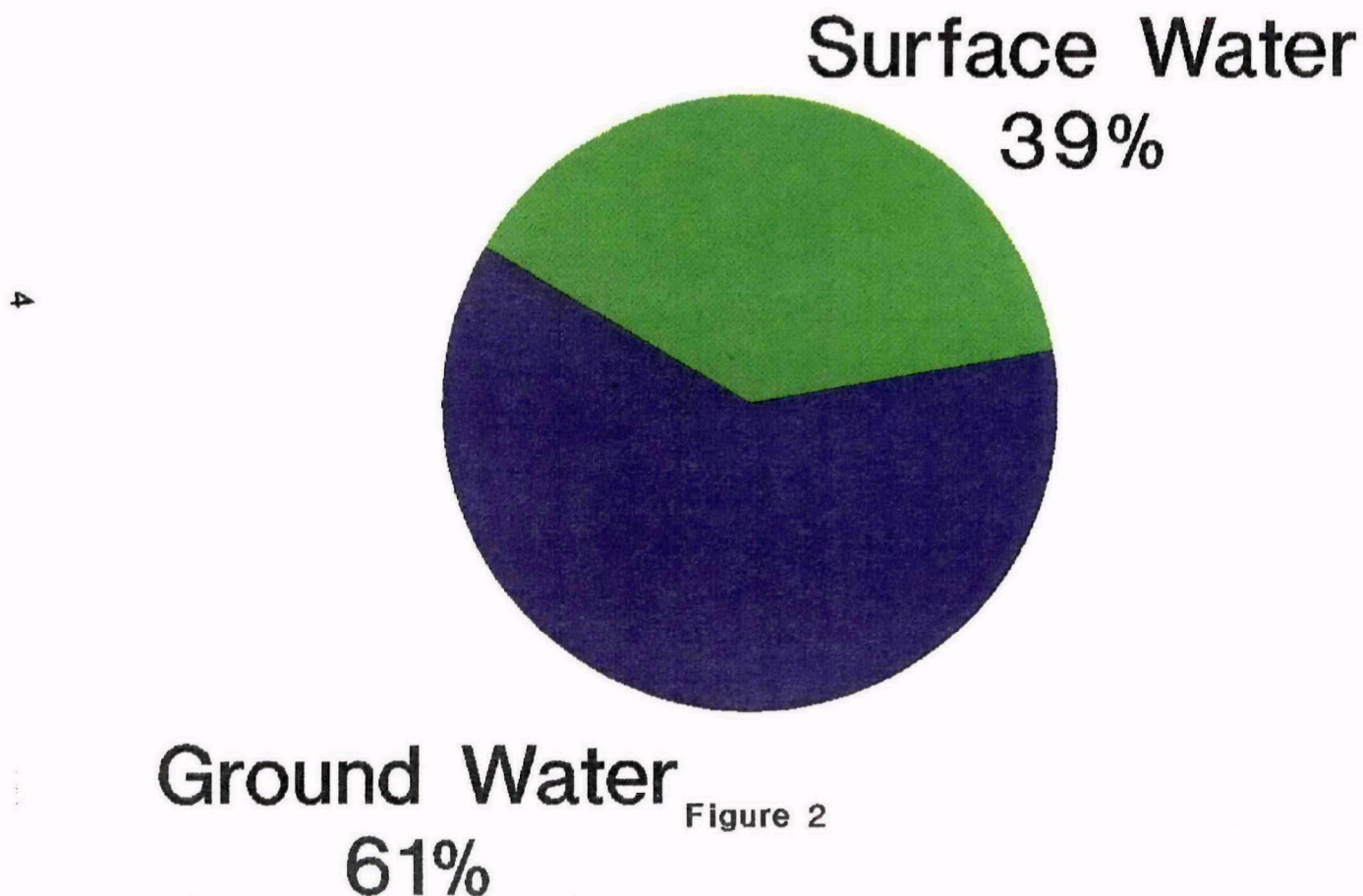


Figure 2

* 1980 Census (1990 data not available)

Alabama Drinking Water by Population*

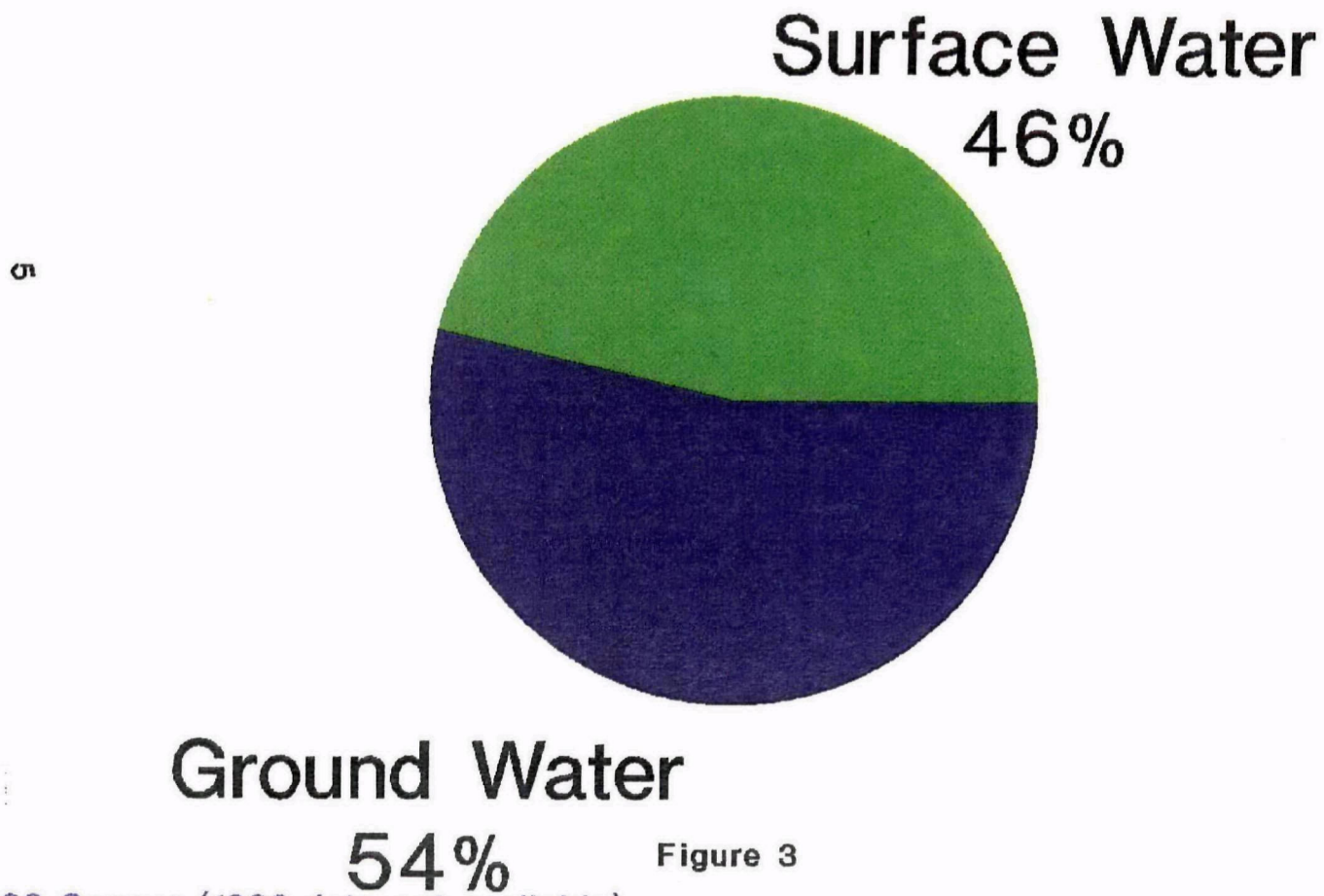


Figure 3

* 1980 Census (1990 data not available)

Florida Drinking Water by Population*

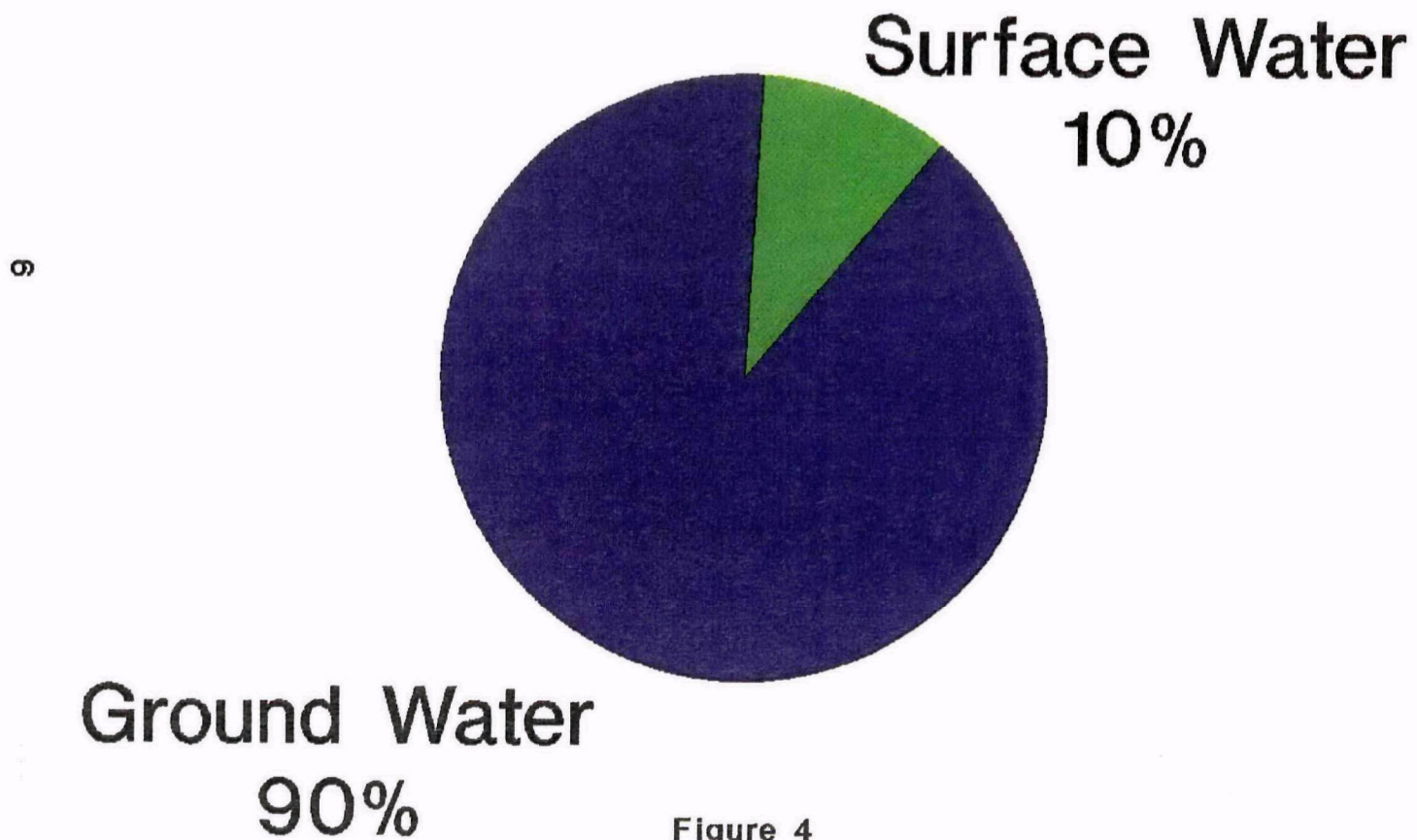
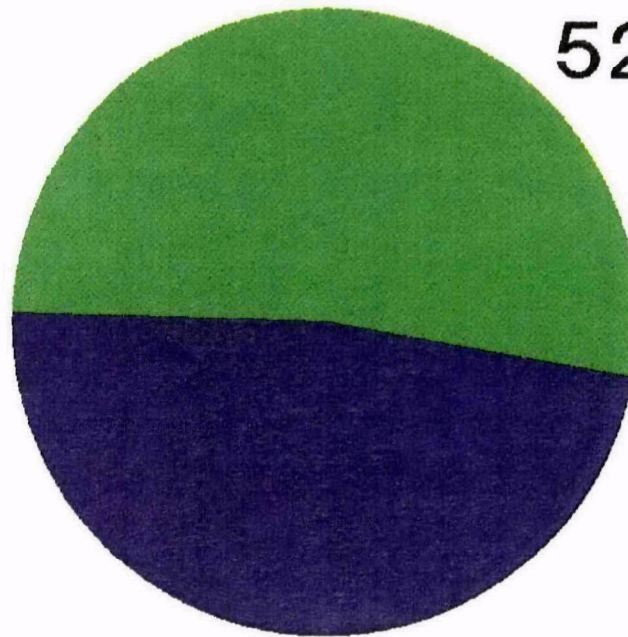


Figure 4

* 1980 Census (1990 data not available)

Georgia Drinking Water by Population*

Surface Water
52%



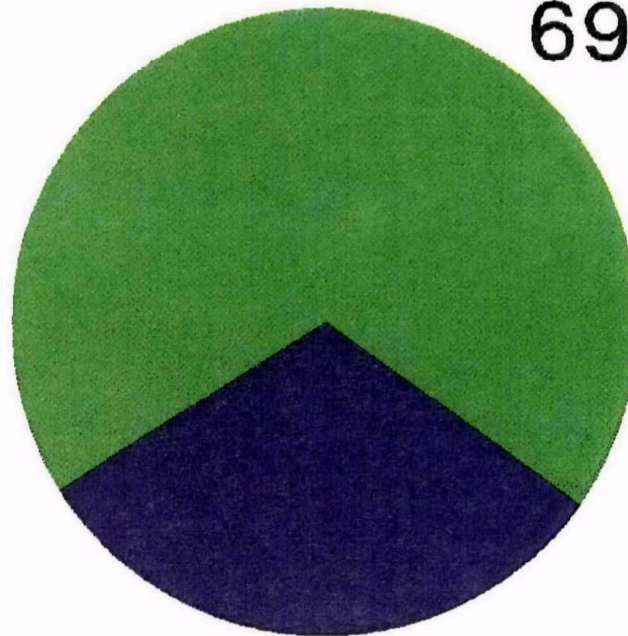
Ground Water
48%

Figure 5

* 1980 Census (1990 data not available)

Kentucky Drinking Water by Population*

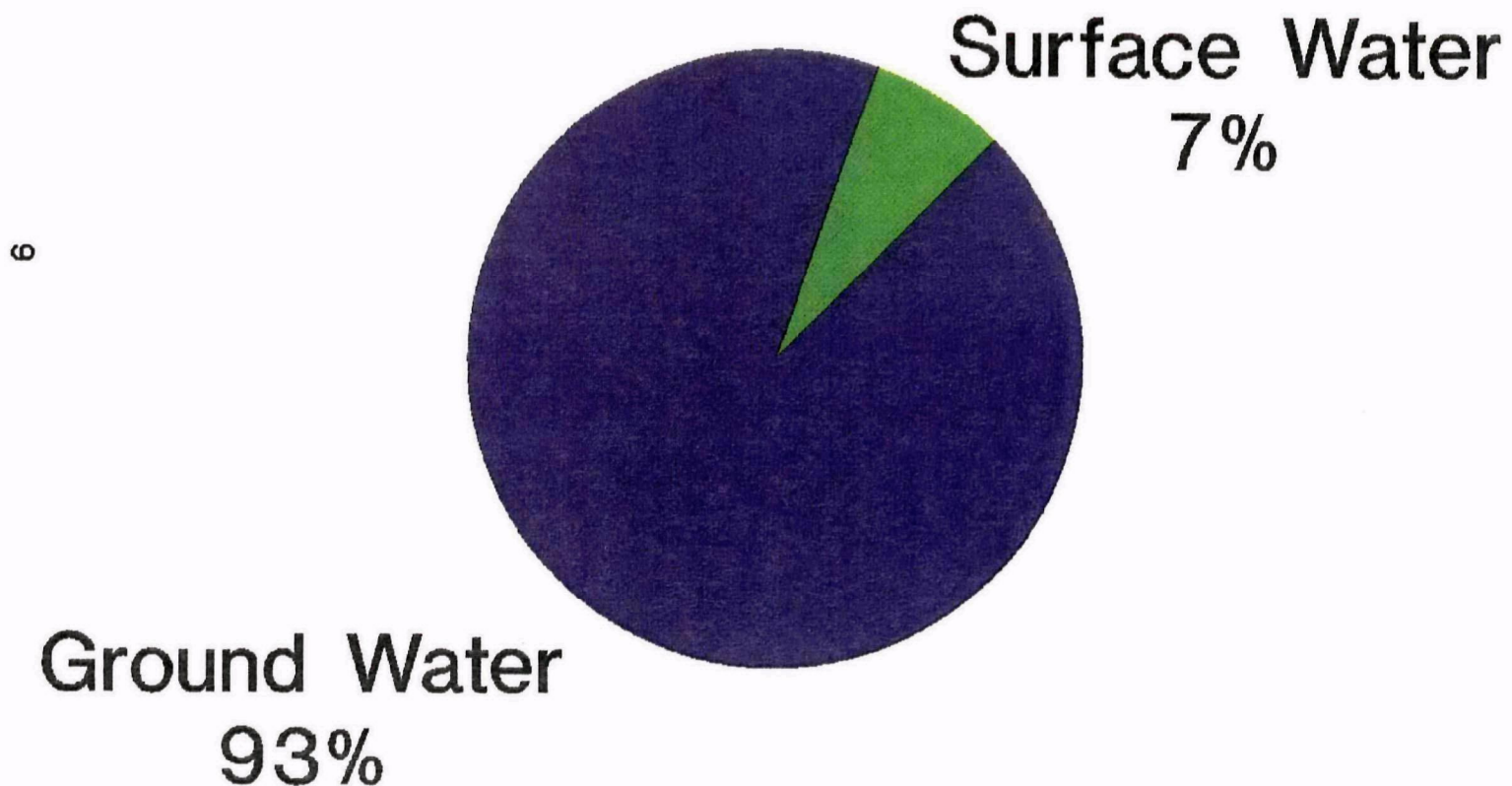
Surface Water
69%



Ground Water
31%

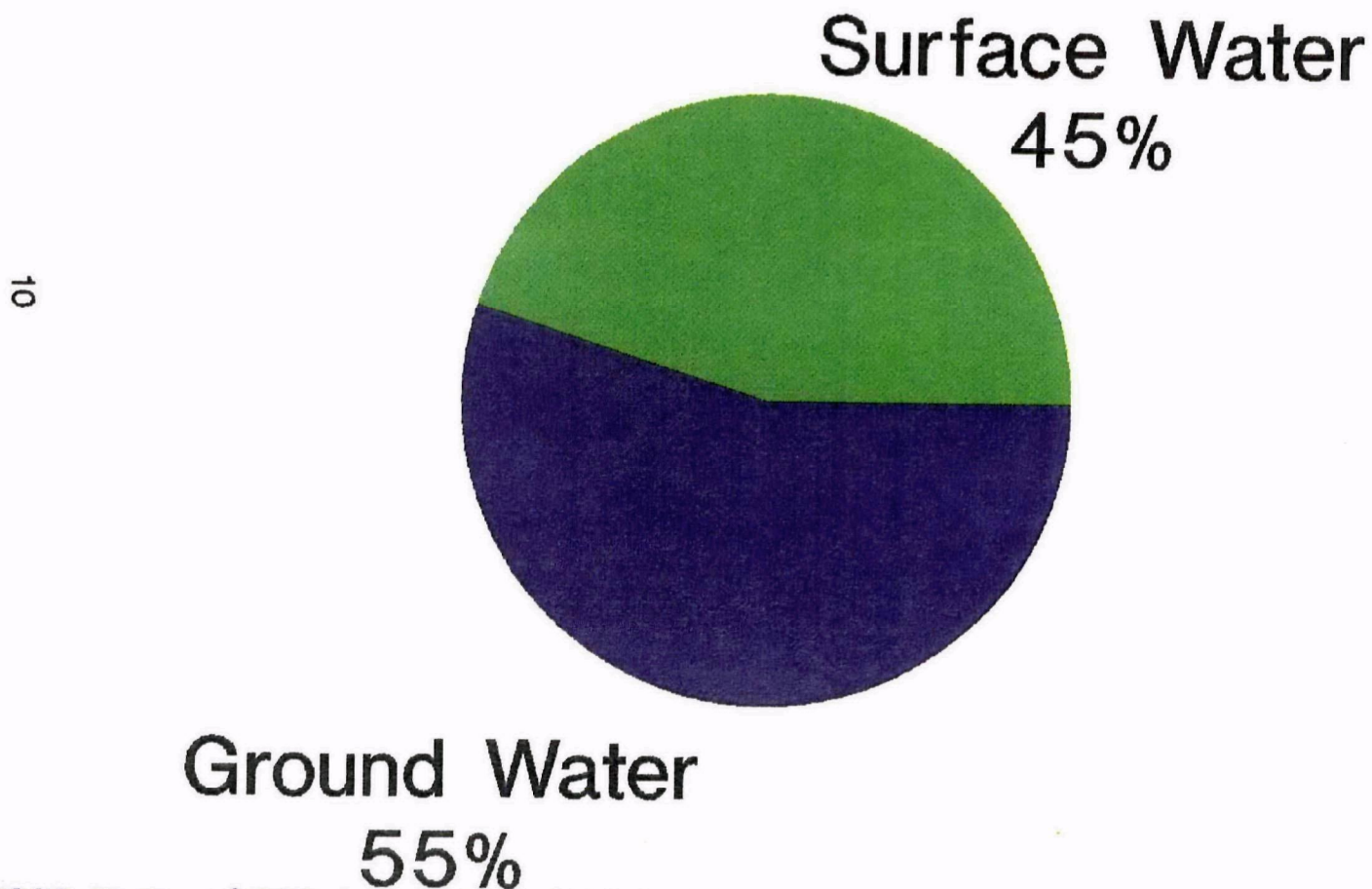
* 1980 Census (1990 data not available) Figure 6

Mississippi Drinking Water by Population*



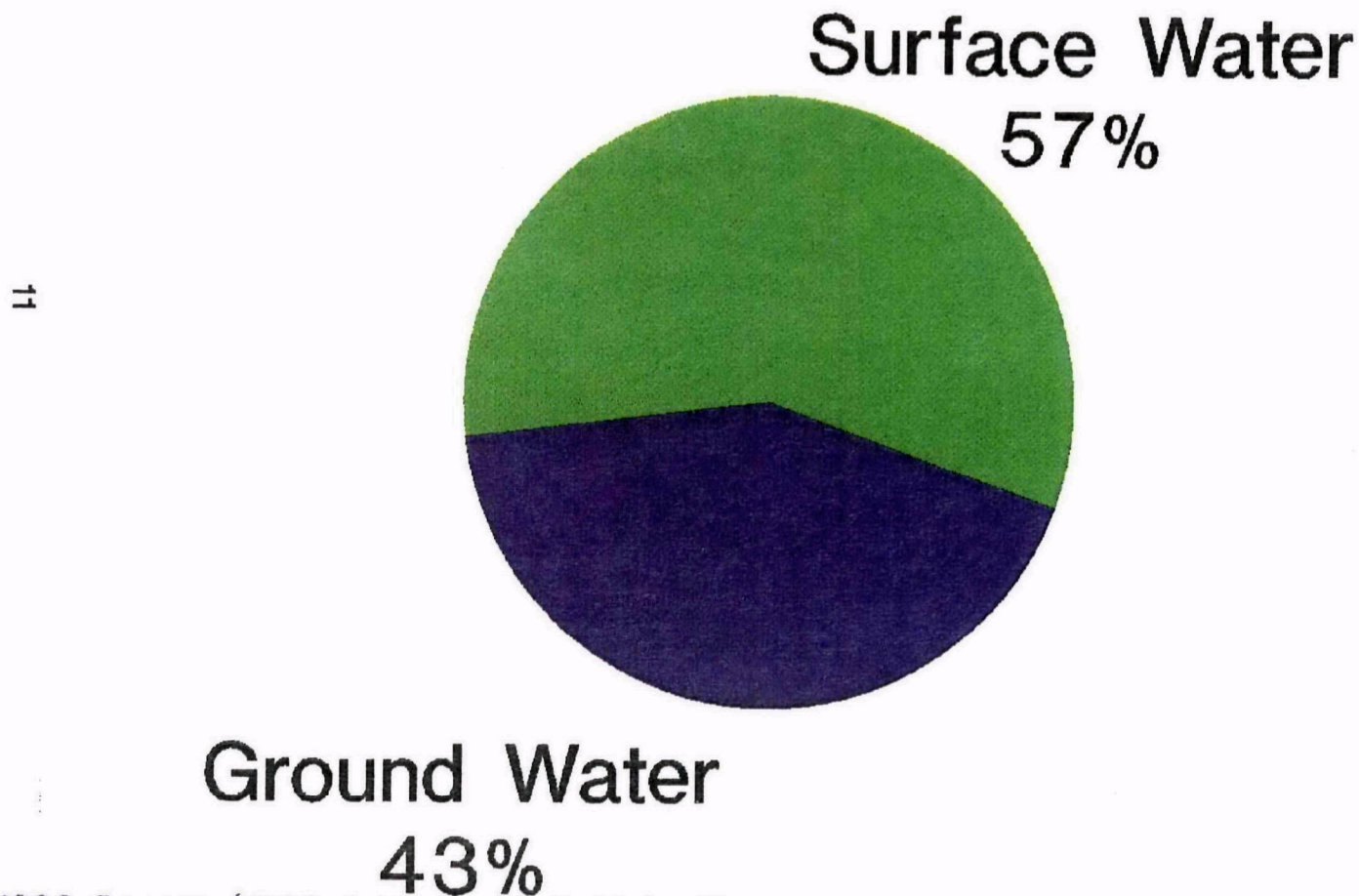
* 1980 Census (1990 data not available) Figure 7

North Carolina Drinking Water by Population*



* 1980 Census (1990 data not available) Figure 8

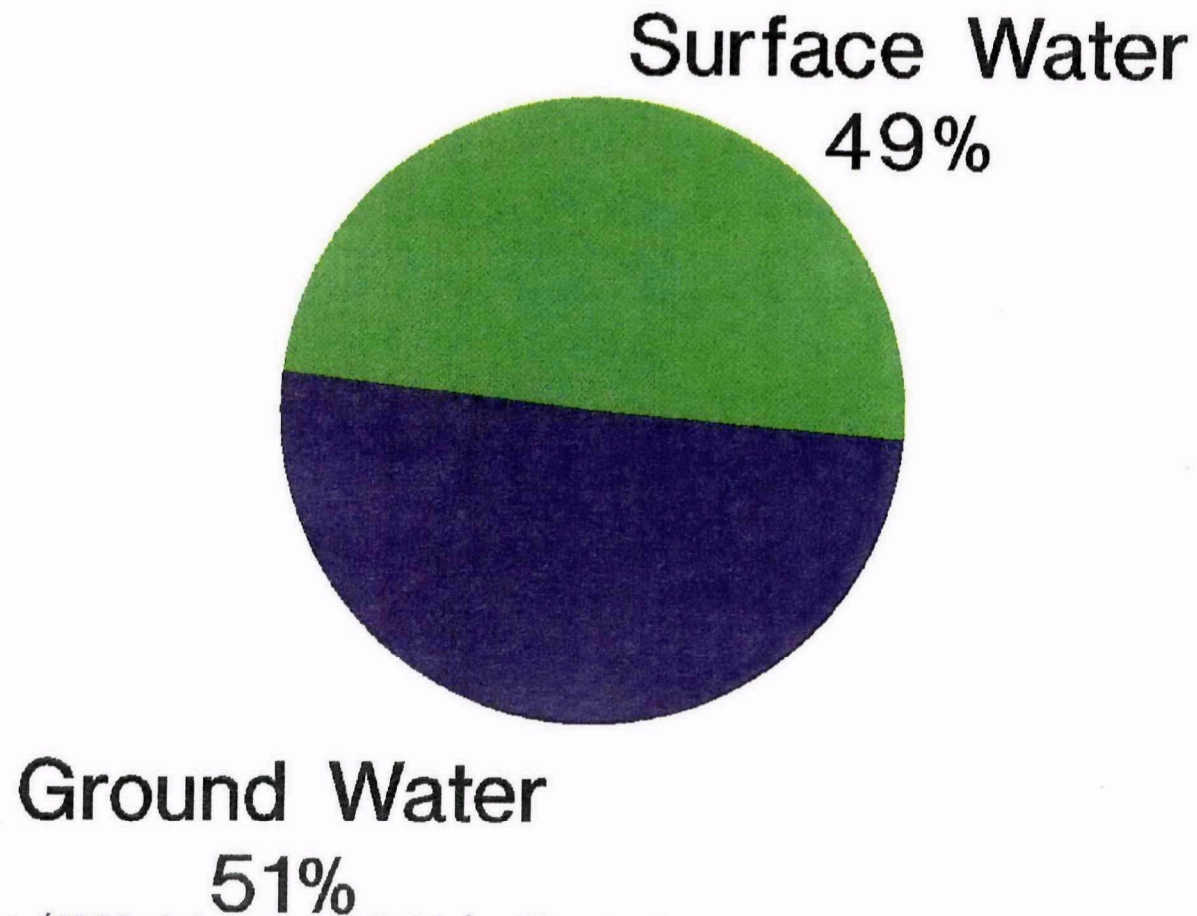
South Carolina Drinking Water by Population*



* 1980 Census (1990 data not available) Figure 9

Tennessee Drinking Water by Population*

12



* 1980 Census (1990 data not available) Figure 10

EPA estimates that perhaps as many as 500,000 injection wells are in operation nationwide. In Region IV there are more than 22,700 injection wells. Table III shows the number of wells by class for each of the eight states in Region IV.

Table III. INJECTION WELLS LOCATED IN REGION IV

<u>State</u>	<u>Well Class</u>	<u>Number of Wells</u>
Alabama	I	7
	II	362
	III	10
	V	275
Florida	I	136
	II	87
	V	7745
Georgia	V	215
Kentucky	I	4
	II	5984
	V	510
Mississippi	I	8
	II	1745
	V	3579
North Carolina	V	256
South Carolina	V	1747
Tennessee	II	13
	V	55

* From Fiscal Year 1992 state inventory reports.

Under the SDWA, EPA is required to:

1. Publish minimum national requirements for effective state Underground Injection Control (UIC) programs.
2. List states that need UIC programs.
3. Make grants to states for developing and implementing UIC programs.
4. Review proposed state programs and approve or disapprove them.

5. Issue regulations for and enforce UIC programs in listed states if the states choose not to participate or do not develop and operate a UIC program that EPA can approve.

To meet the requirements of the SDWA, the EPA Administrator issued regulations that established the minimum requirements for state programs. These requirements include:

1. The prohibition of underground injection that has not been authorized by permit or by rule;
2. Requiring applicants for permits to prove that their underground injection activities will not endanger underground sources of drinking water; and
3. Inspection, monitoring, record keeping, and reporting requirements.

The sole purpose of the UIC regulations is to protect underground sources of drinking water from contamination by injection.

An aquifer or its portion:

- (a)
 - (1) Which supplies any public water system; or
 - (2) Which contains a sufficient quantity of groundwater* to supply a public water system; and
 - (i) Currently supplies drinking water for human consumption; or
 - (ii) Contains fewer than 10,000 mg/l total dissolved solids; and
- (b) Which is not an exempted aquifer.

* A flow rate of at least 2 gallons per minute (gpm) is being used by Region IV.

Definition of Underground Source of Drinking Water (USDW)
[40 C.F.R. §144.3]

On August 31, 1976, the proposed regulations for the State Underground Injection Control Programs appeared in the Federal Register. It was the intent of these regulations that the state agencies control the programs. On April 20, 1979, EPA re-proposed regulations in the Federal Register. These regulations still addressed the states as being the primary regulatory

authority. On May 19, 1980, EPA issued the Consolidated Permit Regulations, which included requirements for Underground Injection Control.

On June 24, 1980, EPA issued the final rule for State Underground Injection Control Programs. After that date, many states applied for and received authority to control the federal UIC program for some or all classes of wells in their state. On August 2, 1982, Alabama became the first state in Region IV and the sixth in the nation to receive authority to control the federal UIC program in their state. Alabama, Georgia, Mississippi, North Carolina and South Carolina have received primacy for all classes of wells in their respective states. Florida has authority to regulate all classes of wells except Class II.

For those states that did not seek or obtain primacy, EPA proposed and issued regulations for direct implementation of the UIC program. In Region IV, Kentucky and Tennessee have not received primacy for any class of wells. EPA regulation of underground injection practices in Kentucky and Tennessee became effective on June 25, 1984.

In states with programs delegated for all classes of wells except for Class II wells, the EPA implemented program for Class II wells became effective on December 30, 1984.

The effective date for most EPA administered underground injection control programs for Indian lands is November 25, 1988.

Sole Source Aquifer

Two new sections added to the 1986 amendments to the Safe Drinking Water Act, Sections 1427 and 1428, focus on ground water protection. Section 1427 established procedures for development, implementation, and assessment of demonstration projects located in critical aquifer protection areas designated as Sole Source Aquifers (SSA). The SDWA established the Sole Source Aquifer Program which provided EPA with the authority to designate aquifers as Sole Source Aquifers.

A Sole Source Aquifer is an aquifer designated by EPA as the "sole or principal source" of drinking water for a given aquifer service area. Within this area, the aquifer must supply at least 50 percent of the drinking water with no alternate drinking water source reasonably available should the aquifer become contaminated.

Any individual, corporation, company, association, partnership, state, municipality or Federal agency may petition their EPA Regional Administrator for SSA designation. Such a designation requires EPA to review all proposed federally funded

projects within the defined SSA area to ensure that such projects do not adversely impact public health. The 1986 SDWA amendments authorized EPA to fund SSA demonstration projects within designated SSA's, however, funds were never appropriated for the demonstration projects.

Region IV currently has 3 sole source aquifer areas designated in the southeast, the Biscayne and Volusia-Floridan Aquifers in Florida, and the Southern Hills Regional Aquifer in Mississippi and Louisiana (see Figure 11).

Wellhead Protection Program

The 1986 amendments also created Section 1428 establishing the State Wellhead Protection (WHP) program. The WHP was designed to protect the areas around public water supply wells (wellhead areas) and provide Federal funds to support state efforts to protect the ground water in these areas. Section 1428 requires each state to develop and submit to EPA a Program designed to protect a state's public water supply wellhead areas from contaminants.

At a minimum each state must adopt and submit to EPA a WHP Program that includes the following provisions:

1. Duties of state and local agencies
2. Delineations of Wellhead Protection Areas (WHPA)
3. Source identification
4. Management approaches
5. Contingency plan
6. New Wells
7. Public participation

Subsection 1428(k) authorized EPA to make grants to the states for up to 90 percent of the costs a state incurs in developing and implementing its WHP program. The state WHP development grants were contingent upon Congressional appropriations, but Congress failed to appropriate the funds. Therefore, WHP development funds have been extremely limited. The absence of funding, however, does not excuse a state from the requirements for program development and implementation. If a state does not develop a WHP program, it will forever lose the opportunity to obtain such funding.

As of the end of FY (fiscal year) 1992, three Region IV states (Alabama, Georgia and South Carolina) have received EPA

Region IV

Sole Source Aquifers

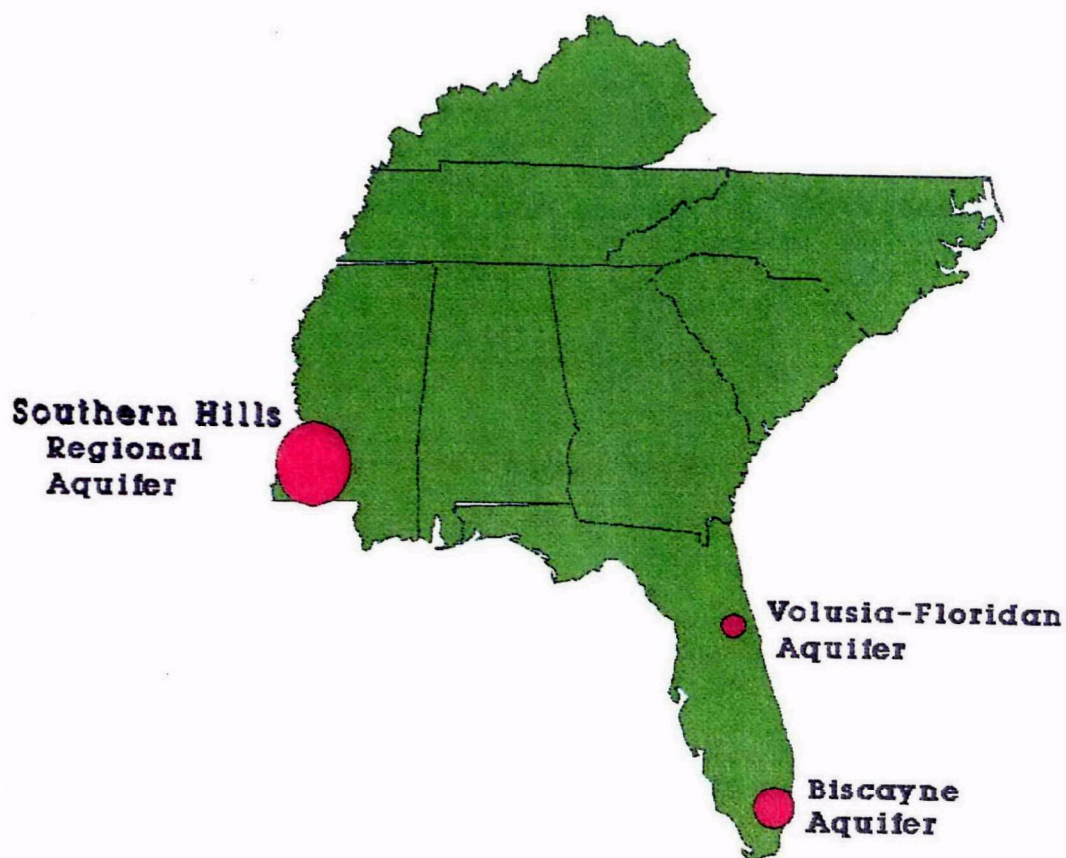


Figure 11

approval for their WHPPs. The remaining states are currently developing state programs with submittals scheduled during FYs '93 and '94.

Funding of local WHP demonstration projects has occurred since FY 1990. The WHP demonstration grant is made available to municipalities interested in pursuing WHP activities. Region IV has made over \$400,000 available to 10 local governments since FY 1990.

Emergency Powers

The 1986 amendments to the Safe Drinking Water Act also expanded the scope of Part D, Section 1431, Emergency Powers. These amendments allow the use of emergency powers whenever a contaminant that is present in or likely to enter a public water system or an underground source of drinking water may present an imminent and substantial endangerment to the health of persons, and appropriate State and local authorities have not acted to protect the health of such persons, the Administrator may take whatever actions he thinks are necessary to protect human health.

These actions, which the Administrator may take, includes issuing such orders as may be necessary to protect the health of persons who are or may be users of an endangered system. These orders may include requiring the provision of alternate sources of water by the person(s) who caused the endangerment. The Administrator may also begin a civil action for appropriate relief, including a restraining order and permanent or temporary injunction. The amendments specified that any person who violates, fails, or refuses to comply with the Administrator's order may be fined up to \$5000 per day for each day of violation.

B. Clean Water Act

The principal law governing pollution of the Nation's waterways is the Clean Water Act (CWA). Originally enacted in 1948 as the Federal Water Pollution Control Act, the Clean Water Act has undergone many amendments and revisions. The goal of the Act is the restoration and maintenance of the chemical, physical, and biological integrity of the Nation's waters.

Before amendment in 1987, programs in the Clean Water Act were primarily directed at point source pollution. These are wastes discharged from discrete and identifiable sources, such as pipes and outfalls. Very little attention had been given to non-point source pollution and the issue of ground water pollution.

The 1987 amendments directed states to develop ground water protection activities as part of their overall water pollution

control efforts. Under the amendments, ground water became recognized as a part of the Nation's waterways. Funds were authorized to support states in the development and operation of a ground water protection program. These funds are awarded by EPA under the authority of Section 106 to assist states in administering programs for the prevention, reduction, and elimination of pollution (see Figure 27, page 56).

C. Resource Conservation and Recovery Act (RCRA)

Underground Storage Tanks

Since the early 1900's, petroleum and chemical products have been stored underground in bare steel tank systems that are very vulnerable to corrosion. According to recent estimates, as many as fifteen to twenty percent of underground petroleum storage tanks may be leaking. Because more than 116 million people rely on ground water as a source of drinking water in the United States, leaking underground storage tanks (USTs) pose a major health risk. Even small quantities of released petroleum are sufficient to contaminate drinking water. It takes only one (1) gallon of gasoline to contaminate one million (1,000,000) gallons of water according to EPA drinking water standards. Two components of gasoline, benzene and ethyl dibromide, are suspected carcinogens. Leaking USTs can also contaminate surface waters, cause fires and explosions, and generate toxic fumes that can seep into homes and businesses.

Except in a few instances, Federal regulations prior to 1984 did not address USTs. The Resource Conservation and Recovery Act of 1976 (RCRA) only regulated tanks containing hazardous wastes, not tanks storing petroleum or hazardous products. The Clean Water Act of 1972 required only owners of very large USTs which were potentially direct sources of pollution into navigable waters to take preventive measures against corrosion and leaks. The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), known as Superfund, authorizes EPA to respond to hazardous substances releases. However, petroleum is specifically excluded from the list of hazardous substances defined under RCRA.

In 1984, Congress was preparing to pass environmental legislation pertaining to management of hazardous substances. The UST problem received political attention due to several highly publicized incidents. A bill was introduced to address the problem of leaking USTs. In November 1984, a final version of the Hazardous and Solid Waste Amendments (HSWA) to RCRA was signed into law. Title VI of the Amendments added Subtitle I (sections 9001 to 9010) which specifically provided for regulation of underground storage tanks.

In 1986, Congress passed the Superfund Amendments and Re-authorization Act (SARA). Section 205 of SARA amended Subtitle I of RCRA to provide Federal funds for corrective actions on petroleum leaks and spills from USTs, with priority given to those that present the greatest threat to human health and the environment. These funds allowed more immediate action in those situations where the owners could not be found or were unwilling or unable to conduct corrective action.

On September 23, 1988, EPA published the final UST technical regulations. On October 26, 1988, EPA published its financial responsibility regulations. These regulations set forth the minimum level of insurance UST owners and operators are required to have in order to ensure they could take "corrective action" in response to any leaks and to compensate anyone harmed by a leak.

Land Disposal Restrictions

The Hazardous and Solid Waste Amendments (HSWA) to RCRA, enacted on November 8, 1984, imposed substantial new responsibilities on those who handle hazardous waste. The amendments prohibit the continued land disposal of untreated hazardous waste beyond specified dates, unless the Administrator determines that the prohibition is not required in order to protect human health and the environment for as long as the waste remains hazardous (RCRA section 3004(d)(1), (e)(1), (f)(2), (g)(5)). The statute specifically defines land disposal to include any placement of hazardous waste in an injection well (RCRA section 3004(k)). After the effective date of prohibition, hazardous waste can be injected under two circumstances:

1. When the waste has been treated in accordance with the requirements of 40 CFR Part 268 pursuant to section 3004(m) of RCRA. EPA has adopted the same treatment standards for injected wastes in 40 CFR Part 148, Subpart B; or
2. When the owner/operator has demonstrated that there will be "no migration" of hazardous constituents from the injection zone for as long as the waste remains hazardous. Applicants seeking an exemption from the ban must demonstrate either:
 - (a) That the waste undergoes a chemical transformation so as to no longer pose a threat to human health and the environment; or
 - (b) That fluid flow is such that injected fluids would not migrate vertically upward out of the injection zone or to a point of discharge or interface with an underground source of drinking water as defined in 40 CFR Part 146 in a period of 10,000 years by

use of mathematical models (40 CFR §148.20(a)).

EPA was required to promulgate land disposal prohibitions and treatment standards by May 8, 1990, for all wastes that were either listed or identified as hazardous at the time of the 1984 amendments, a task EPA completed within the statutory time-frames. HSWA directs EPA to promulgate prohibitions and treatment standards for wastes identified or listed after the date of the 1984 amendments within six months after the listing or identification takes place. These wastes are referred to as "newly identified" or "newly listed" wastes.

On October 24, 1991, EPA published an advanced notice of proposed rule-making (ANPRM) for treatment standards for many of the newly listed and newly identified wastes, including characteristic hazardous wastes generated by the mining and mineral processing industries which are no longer exempted from being hazardous wastes.

II. GROUND WATER PROTECTION BRANCH ORGANIZATION

II. GROUND WATER PROTECTION BRANCH ORGANIZATION

The Ground Water Protection Branch consists of 3 sections: the Underground Injection Control Section, the Underground Storage Tank Section, and the Ground Water Technology & Management Section (Figure 12).

A. Underground Injection Control Section

The Underground Injection Control (UIC) Section was created to implement the requirements of the Underground Injection Control program. The UIC Section consists of the Compliance & Enforcement and Permitting Units (Figure 13).

Compliance & Enforcement Unit

The Compliance & Enforcement (C&E) Unit's primary responsibility is to serve as the field presence of the Underground Injection Control program in Region IV, and is responsible for taking appropriate enforcement action whenever violations of UIC regulations are discovered.

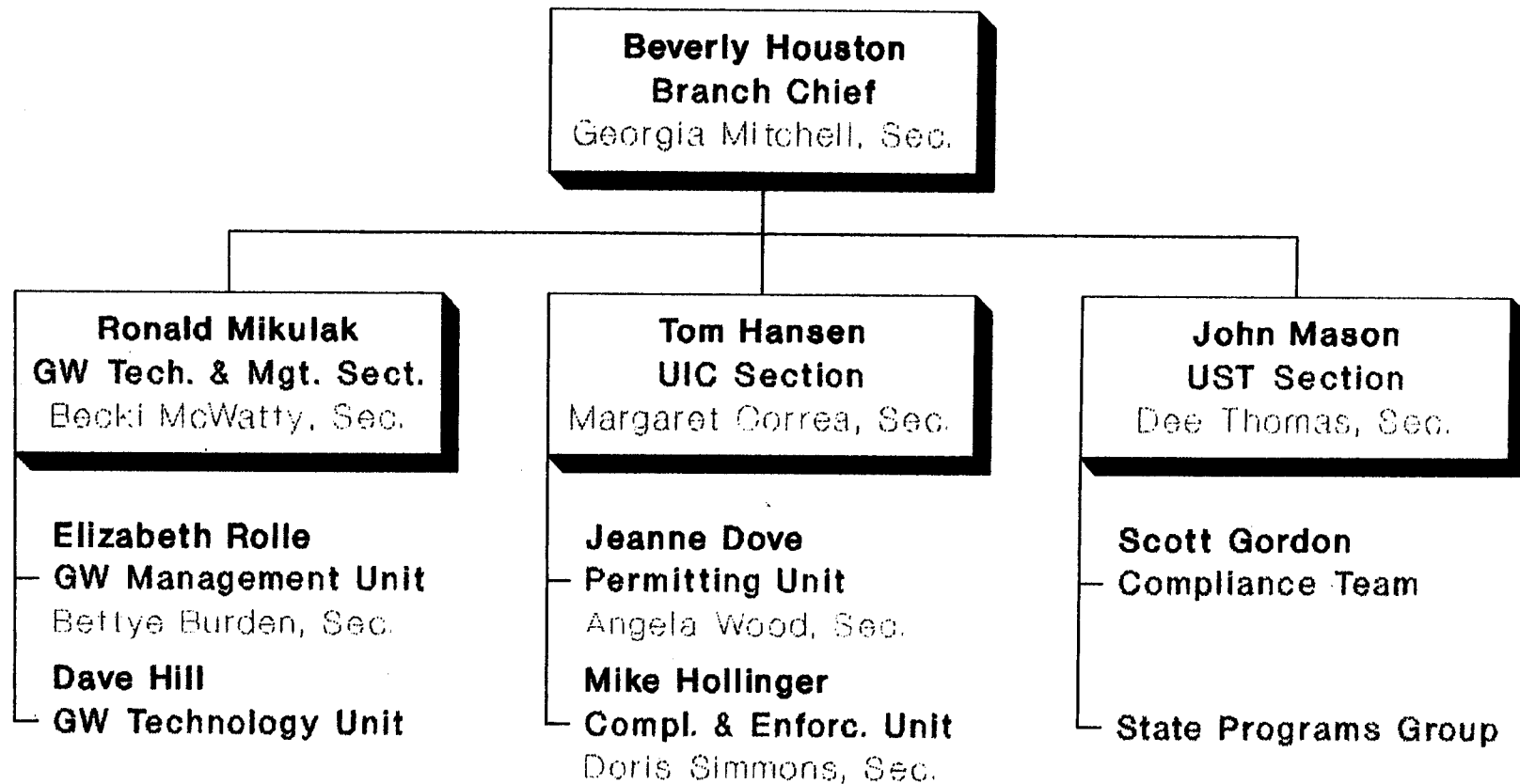
In order to maintain a presence in those states where EPA has implemented the UIC program, C&E staff routinely perform compliance inspections of as many facilities in those states as possible. Allegations of non-compliance with the UIC regulations are thoroughly investigated. C&E staff work closely with the Office of Regional Counsel to ensure that appropriate enforcement actions are taken whenever a violation is discovered. These actions may include the issuance of administrative orders, referral to the U. S. Department of Justice for civil prosecution, and referral to the U. S. Attorney for criminal prosecution.

The C&E staff perform a review of state UIC programs to ensure that the states are adequately tracking compliance with state UIC regulations. C&E staff also review state enforcement actions to ensure that violations are treated in an appropriate manner.

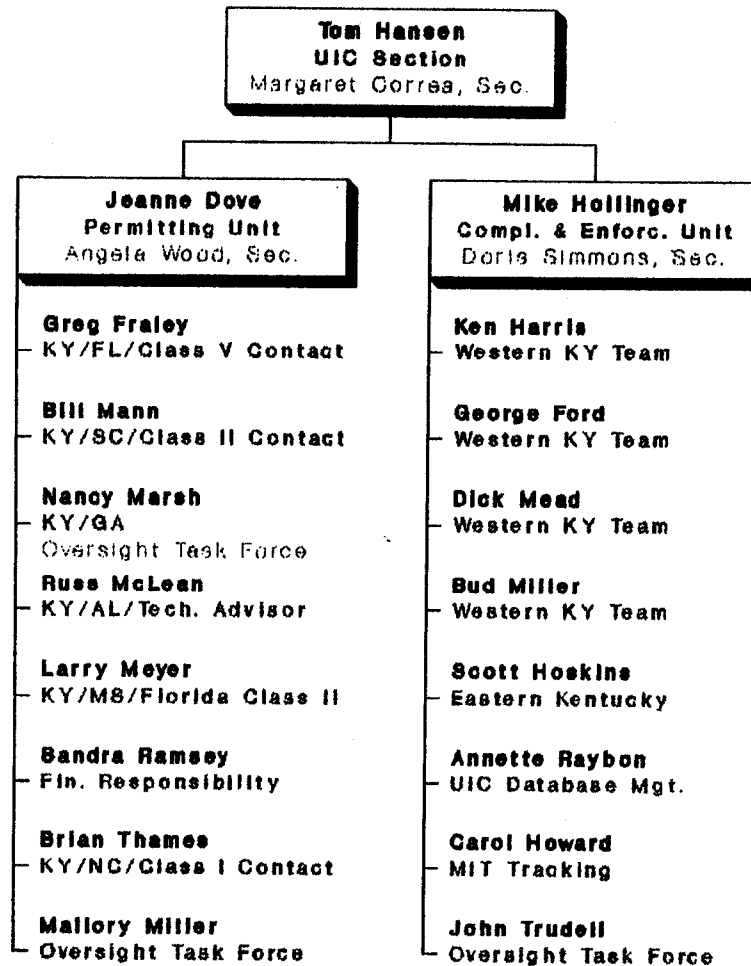
Disciplines within the C&E staff include but are not limited to geology, hydrogeology, petroleum engineering, environmental engineering, data management and clerical. Most of the C&E staff have received very specialized training including several courses in underground injection practices, injection well construction and testing techniques, ground water monitoring and modeling, field observation and evidence collection methods. Some staff members have received specialized training in the investigation and prosecution of criminal violations.

Ground Water Protection Branch

EPA Region IV



Ground Water Protection Branch EPA Region IV



26

January 1993

Figure 13

Permitting Unit

The Permitting Unit's primary responsibility is to protect Underground Sources of Drinking Water through the permitting process. The Permitting Unit is responsible for overview of the delegated state permitting programs and for administering the grants that help fund the delegated state programs. They also serve as technical advisors for special projects and/or initiatives that include UIC wells or concerns.

The Permitting Unit staff consists of geologists, environmental scientists, environmental engineers, an environmental protection assistant and a clerk-typist.

B. Underground Storage Tank Section

The Underground Storage Tank Section operates through the State Programs group and the Compliance Team (Figure 13).

State Programs Group

The State Programs group works with the individual state UST programs. They assist the states with training, technical issues, and program development. The State Programs group advises the states during the development of a complete application for program approval and works with the Office of Regional Counsel to obtain final approval. Also, the LUST Trust Fund grants are allocated to the states for remediation of sites with leaking USTs where the owner is unknown, recalcitrant, or insolvent. These funds can also be used for administration and enforcement of corrective action.

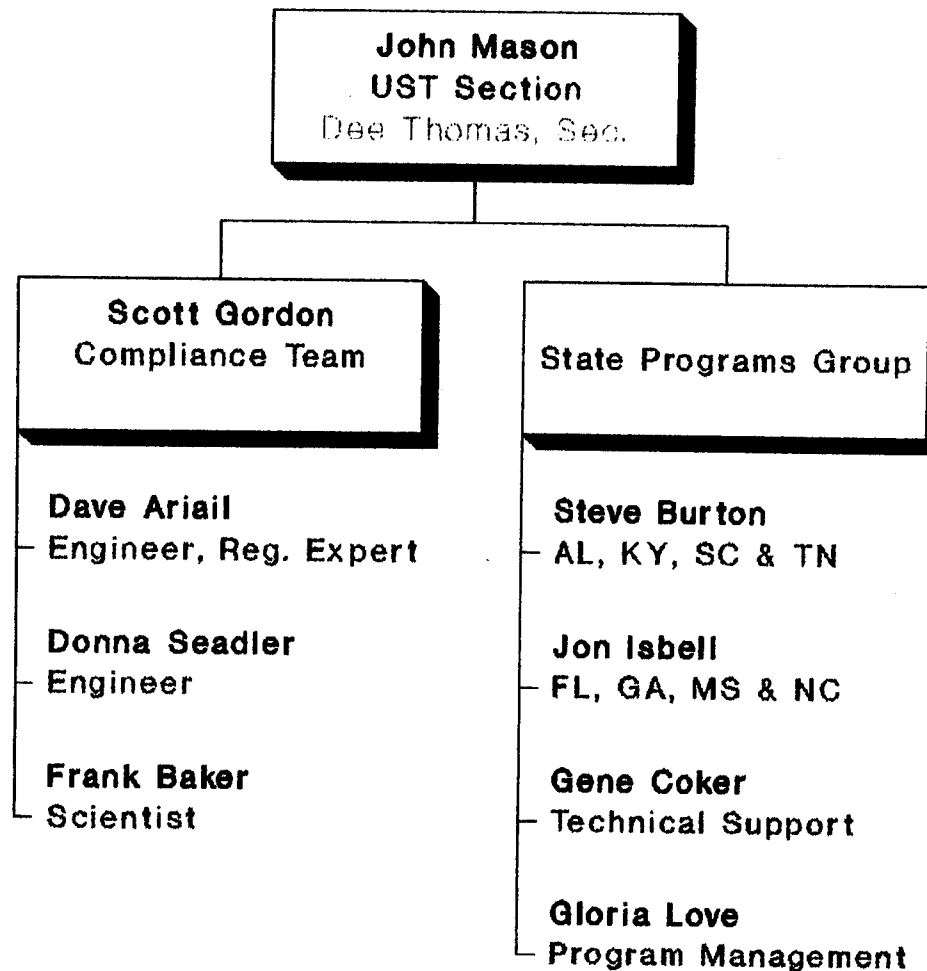
Compliance Team

The Compliance Team enforces Federal law pertaining to USTs, conducts facility inspections, assists Region IV states in developing enforcement programs, and also assists in the technical training of state program employees. Because the Tennessee UST program has not yet taken the responsibility for implementing the regulations in regard to hazardous substance USTs, the Compliance Team implements this program directly. This includes reviewing closure and corrective action plans in addition to the duties already mentioned.

C. Ground Water Technology & Management Section

The Ground Water Technology & Management Section is made up of a Ground Water Technology Unit and a Ground Water Management Unit (Figure 14).

Ground Water Protection Branch EPA Region IV



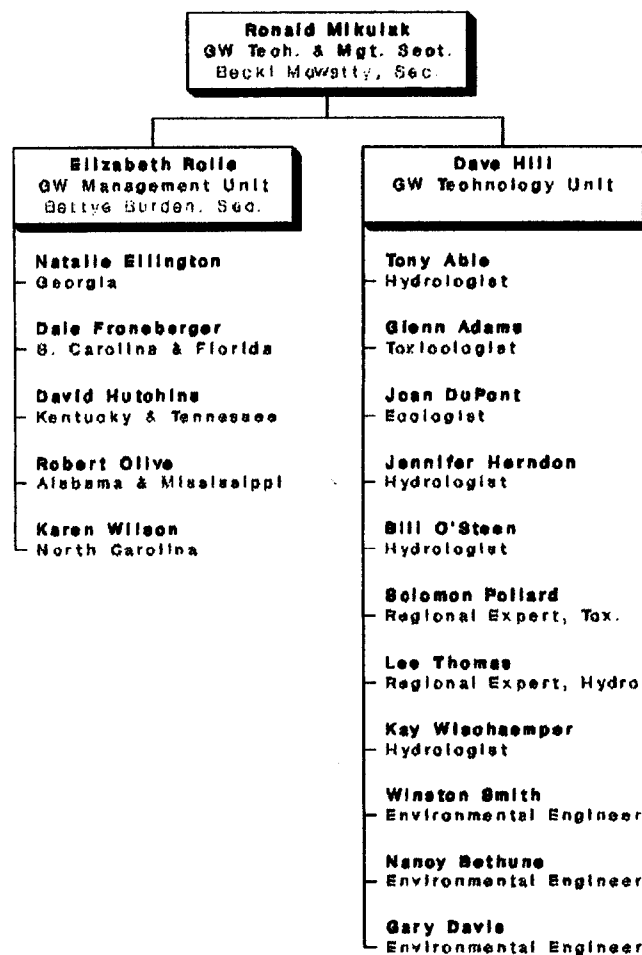
27

January 1993

Figure 14

Ground Water Protection Branch

EPA Region IV



28

Ground Water Technology Unit

The Ground Water Technology Unit (GWTU) serves as a technical support group to regional programs on ground water and related environmental issues. The primary clientele are CERCLA and RCRA project managers; but they also include UIC permitting staff, UST program staff, NEPA project officers, NPDES permit writers, GWMU state coordinators and other EPA personnel as they have need of technical, ground water related assistance. The staff includes an interdisciplinary mix of engineers, ground water hydrologists, toxicologists, and a biologist, all of whom specialize in providing needed, up-to-date technical assistance to achieve the environmentally protective, regulatory goals of the Agency.

Ground Water Management Unit

The Ground Water Management Unit is involved with a variety of activities and programs. The Staff manages the 106 Ground Water Grant, Wellhead Protection Program (WHPP), National Pesticide Survey, Sole Source Aquifer Program, Ag Chemicals in Ground Water Strategy, Ground Water Strategy implementation and several other programs for all eight (8) States in Region IV. The unit is staffed with professionals from various disciplines such as engineering, geology, and chemistry who provide technical and administrative support to the States and other programs within EPA.

III. GROUND WATER PROTECTION PROGRAMS

III. GROUND WATER PROTECTION PROGRAMS

A. Underground Injection Control

Goal

The primary goal of the UIC program is the protection of underground sources of drinking water. The UIC Section meets this goal by taking the following actions:

1. Identification of any existing injection into underground sources of drinking water.
2. Enforcement action(s) to stop unauthorized injection into underground sources of drinking water.
3. Review of permit applications for existing or new wells in a timely manner to assure that permit decisions, both issuance or denial, are protective of underground sources of drinking water.
4. Delegation of the UIC program to states in the Region with the requirement that the state programs assure protection of underground sources of drinking water.
5. Award grant funds to states in conformance with national policy to aid states in carrying out delegated programs to protect underground sources of drinking water.
6. Review of delegated programs to assure that state programs effectively prevent pollution of underground sources of drinking water.
7. Maintain a strong field compliance and enforcement presence to assure that injection operations do not endanger underground sources of drinking water and that operators know that EPA is evaluating their operations on a regular basis.
8. Assure that EPA meets the national commitments for determining that all wells pass the federally mandated mechanical integrity tests.
9. Develop and implement outreach programs to inform the regulated community and the public about the regulatory requirements and responsibilities associated with the UIC program.
10. Take appropriate enforcement action (administrative order, civil and/or criminal prosecution) against

violators which impose fines and establish compliance schedules for returning to compliance with the UIC program.

11. Issue public notices for proposed enforcement and permitting actions that offer interested parties an opportunity to comment on the proposals.
12. Conduct public hearings and public meetings as necessary to encourage public participation in the permitting and compliance/enforcement decision-making processes.
13. Review well logs, tests, and monitoring reports submitted by well operators in compliance with permit or program requirements.
14. Develop regional policy and guidance for implementing the UIC program to assure fair and equitable treatment for the regulated community and to assure that all underground sources of drinking water are protected from contamination.
15. Participate in the development of national policy and guidance for implementing the UIC program.

Accomplishments to Date

Throughout the life of the UIC program, Region IV has been the bench mark by which all other Regional UIC programs are compared. Table IV summarizes the major accomplishments of Region IV's UIC program.

Table IV. UIC SECTION ACCOMPLISHMENTS

<u>Year</u>	<u>Accomplishment</u>
1984	First Class I UIC permit to be issued in the country.
1985	First Emergency Administrative Order in the country to be issued under authority of Section 1431 of the SDWA.
1985	First Consent Order to be issued by a UIC program under authority of Section 7003 of the Solid Waste Disposal Act.
1988	First fully functional UIC database to be developed in the country.
1991	First felony conviction in the country for violation of the UIC provisions of the SDWA.
1988 to Present	Region IV has lead the country in the issuance of Administrative Actions (see Figures 16 & 17).
1984 to Present	Region IV has taken 1410 permit actions (i.e. issuance, denial, retraction, major modification, etc.) resulting in the issuance of 587 permits in four states (see Figures 18 & 19).

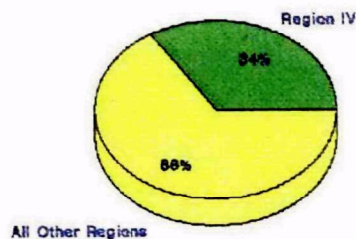
Accomplishments Vs. Resources

When Region IV began implementing the UIC program in 1984, the national emphasis was to bring Class I and Class II wells into regulation. With a staff of eight technical personnel and one clerk-typist, Region IV began developing a UIC program with an estimated well universe of 10,000 Class II wells and approximately 100 Class I wells.

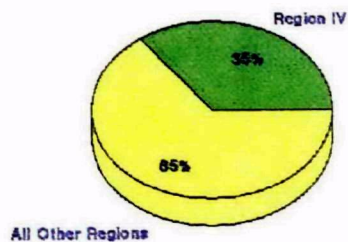
Although Region IV's accomplishments continue to grow, the UIC staff consists of only fifteen technical personnel and two clerk typists.

ORDERS ISSUED BY REGION IV COMPARED TO ALL OTHER REGIONS

FY 1989



FY 1990



FY 1991

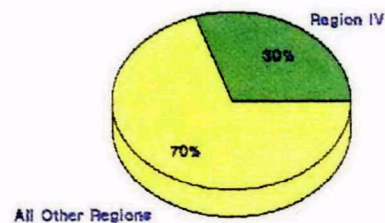


Figure 16

PROPOSED ORDERS

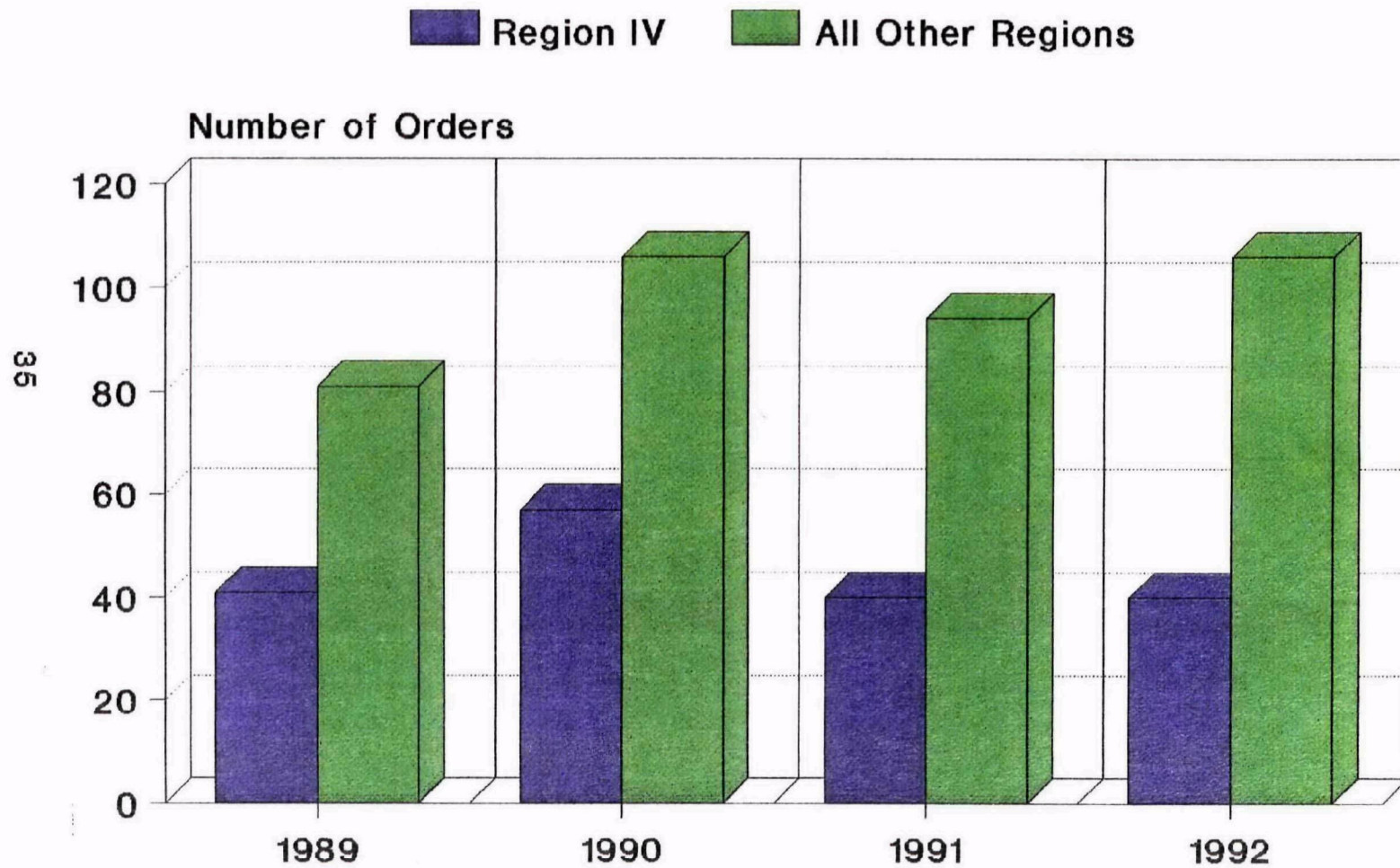


Figure 17

PERMIT ACTIONS* BY STATE

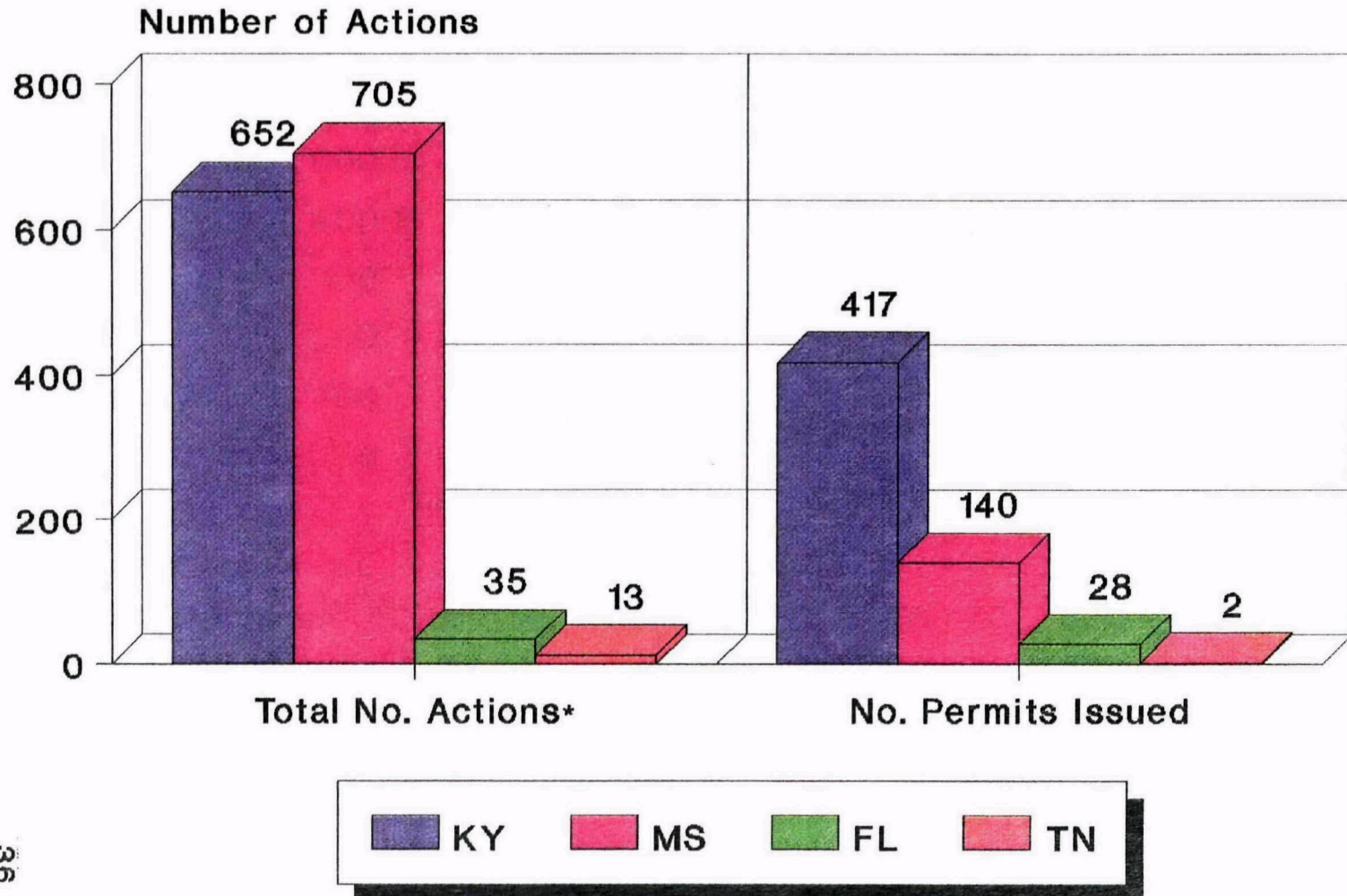
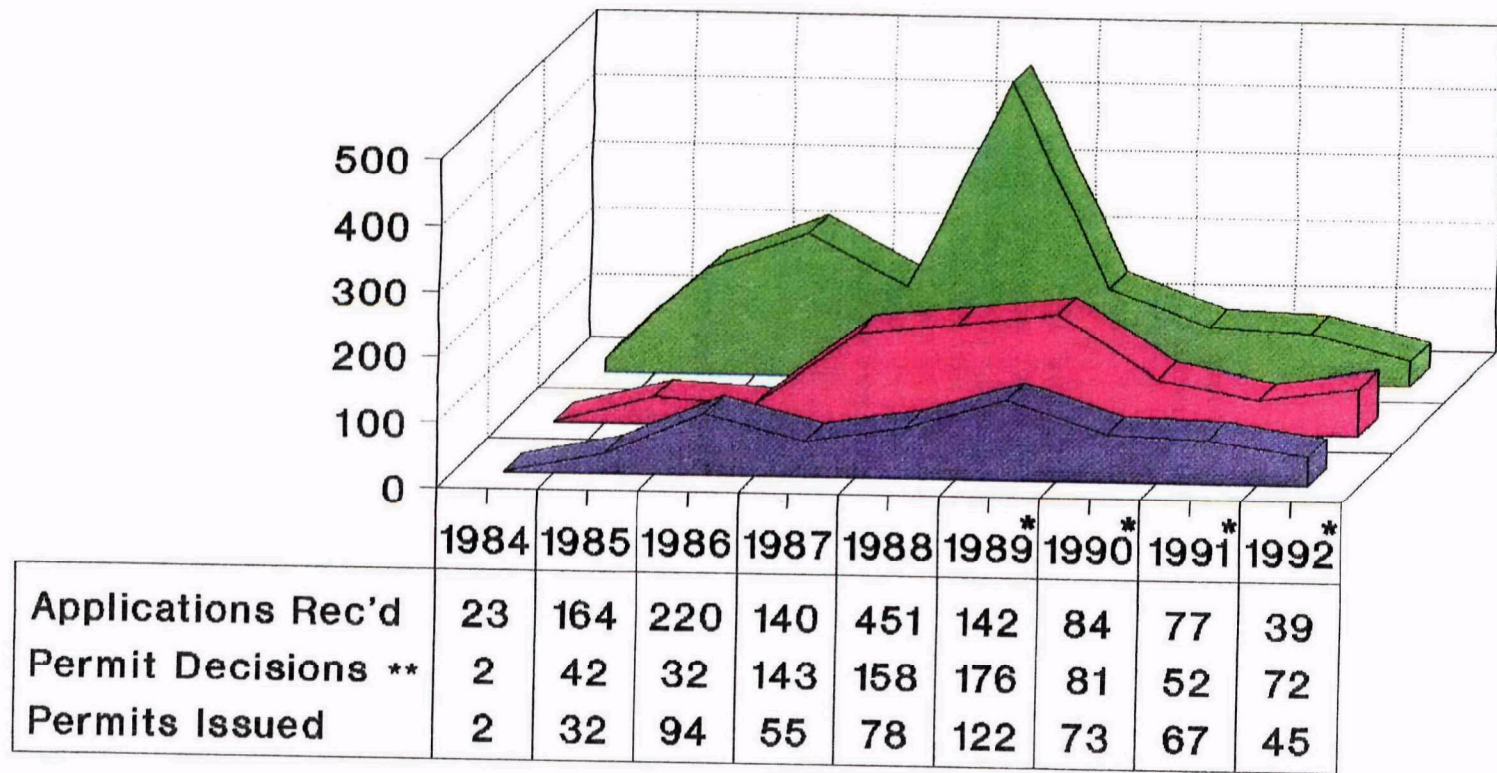


Figure 18

* issuance, denial, retraction, major modification, etc.

UIC PERMIT ACTIONS

37



■ Permits Issued
■ Applications Rec'd

■ Permit Decisions **

Figure 19

* Mississippi received primacy 3/29/89

** issuance, denial, retraction, major modification, etc.

Projections

Currently, the national emphasis has changed. The Regions and delegated states are now being directed to bring Class V injection wells into compliance. It is estimated that Region IV's Class V well universe is over 10,000 wells. This will bring Region IV's total well universe to over 20,000 wells - more than double the current workload.

Anticipated Resource Needs

UIC is evolving into a program that is continuing with the goals and objectives that formed its foundation while taking on new challenges and their ensuing responsibilities. As the workload increases the first challenge will be to maximize existing resources to deal with prioritized activities. With the anticipated doubling of the well inventory, it is inevitable that additional resources in the form of FTE's and funding will be required. Region IV currently enjoys a position of leadership with an outstanding reputation and record of accomplishment. Without appropriate consideration as to UIC's place in the larger Regional and Agency picture, it will become more and more difficult to maintain our exemplary record of environmental achievements.

B. Underground Storage Tank Program

Faced with the mandate of Subtitle I, EPA recognized several unusual aspects of the regulated universe that have created special problems in developing an effective regulatory approach:

1. The regulated universe is immense, including over two (2) million UST systems, which include tanks and associated piping, located at more than 700,000 facilities nationwide.
2. More than 75% of the existing systems are made of unprotected steel, the type of tank system proven to be the most likely to leak and thus create the greatest potential for health and environmental damage.
3. Most of the regulated facilities are owned and operated by very small businesses not accustomed to dealing with complex regulatory requirements.
4. Numerous technological innovations and changes are underway in various sectors of the UST system service community.

GOALS

In response to the unique aspects of the regulated community, and the clear need for comprehensive management of USTs during their operating life, EPA has identified several operating principles:

1. The UST program must be based on sound national standards that protect human health and the environment.
2. The UST regulatory program must be designed to be implemented at the state and local levels. State and local governments have been and continue to be the authorities most capable of effective oversight of UST systems and response to releases.
3. The regulations must be kept simple, understandable and be easily implemented by the owner and operator in order to facilitate voluntary compliance.
4. New UST technologies must not be inhibited.
5. To encourage the utmost voluntary compliance, the UST program should build upon current industry practices and standards.

Even if a UST is not being used, a potential threat to the environment is still present. Prior to the implementation of the regulatory requirements in September 1988, UST owners commonly abandoned those tanks not being used, in order to avoid the expense of removing the tank. Currently, there are 322,469 UST systems in Region IV. This represents 23% of the total tank universe in the United States. However, the total number of USTs in Region IV has declined since the implementation of the regulatory requirements.

In approaching the basic challenge of how to protect the environment from thousands of potentially leaking USTs, EPA determined that the only solution was a franchising approach to management. Traditionally, EPA programs which were delegated to the state level were products of a "command and control" regulatory system. However, in the case of USTs, there already existed a large number of state, county and local programs for regulating USTs before the Federal regulations were implemented. In order to encourage innovation in both regulatory methods and technology, the regulations contained the flexibility to allow these pre-existing programs to be incorporated into the overall regulatory scheme. Using this approach, EPA primarily focuses on building and supporting strong state and local programs.

Accomplishments to Date

With an average of 10 workyears staff time and a total investment of approximately 8 million dollars in grant funds, the UST Program has accomplished the following:

1. State Authorization

- a. On April 16, 1990, the Mississippi Underground Storage Tank program became the first state program in the country to obtain approval to operate the UST program in lieu of the federal program.
- b. On July 9, 1991, the Georgia Underground Storage Tank Management Program became the third state program in the country to obtain approval to operate the UST program in lieu of the federal program.
- c. As of March 1992, only six states have obtained this authorization nationwide. Mississippi and Georgia account for 33% of the authorized programs in the country.
- d. All Region IV states have developed state UST regulations and are successfully implementing the regulation of new and existing tanks and cleaning up releases from USTs.

2. Corrective Action

Each owner and operator of UST systems who confirms a release from the system must initiate a response to the release in accordance with the corrective action requirements, thus triggering the corrective action authorities of the UST program. Releases may be documented through a facility's release prevention mechanisms, i.e. any one of the release detection methods contained in 40 C.F.R. §§280.43 and 280.44, or through visual confirmation during closure activities.

3. Closure Activities:

As individual UST programs within the Region develop, they are able to increase the amount and methods of enforcement they use. Until 1993, the regulations will affect mostly older tanks. Therefore, stronger programs force UST owners to evaluate the need for replacing, removing and/or upgrading their older tanks. Region IV's states' progress in developing their individual programs can be seen in the following:

- a. As depicted in Figure 20, there has been a steady increase in the number of tank closures in Region IV. Most USTs closed have been relatively older tanks.
- b. Each of the Region IV states has seen a steady increase in the number of tanks removed. (Figure 21).
- c. Region IV leads the nation in the volume of tanks which have been closed (102,573 or 28.4%).

4. Confirmed Releases:

- a. With the high number of USTs in the Region coupled with the highest volume of UST closures, there should be little surprise that Region IV ranks third among regional offices in confirmed releases. To date 20,495 confirmed releases have been documented in the Region.
- b. Rapid growth has been seen in all sectors of the regulated community related to the level of understanding needed in dealing with a confirmed release. The number of documented releases has swelled from 4,150 in December 1989 to the 20,495 today. The distribution of these confirmed releases in the states (Figure 22) illustrates a significant problem in Florida, one of the most sensitive ground water states in the Region.
- c. Region IV states have responded to these confirmed releases by initiating nearly 9,500 cleanups at petroleum and hazardous substance facilities (Figure 23).
- d. Of these initiated cleanups, 2596 or 27.3% have been completed (Figure 24). Figure 25 illustrates that most completed cleanups have been conducted using the funds of individual responsible parties. Only 138 clean ups have been funded by Trust fund monies.

5. Funding

- a. In the RCRA amendments, Congress sought to provide Federal funds to clean up leaks and spills from underground storage tanks. This was accomplished by creating the Leaking Underground Storage Tank (LUST) Trust Fund. The Fund is intended to strengthen current cleanup and enforcement efforts of many states and localities.

UST TANK CLOSURES

REGION IV

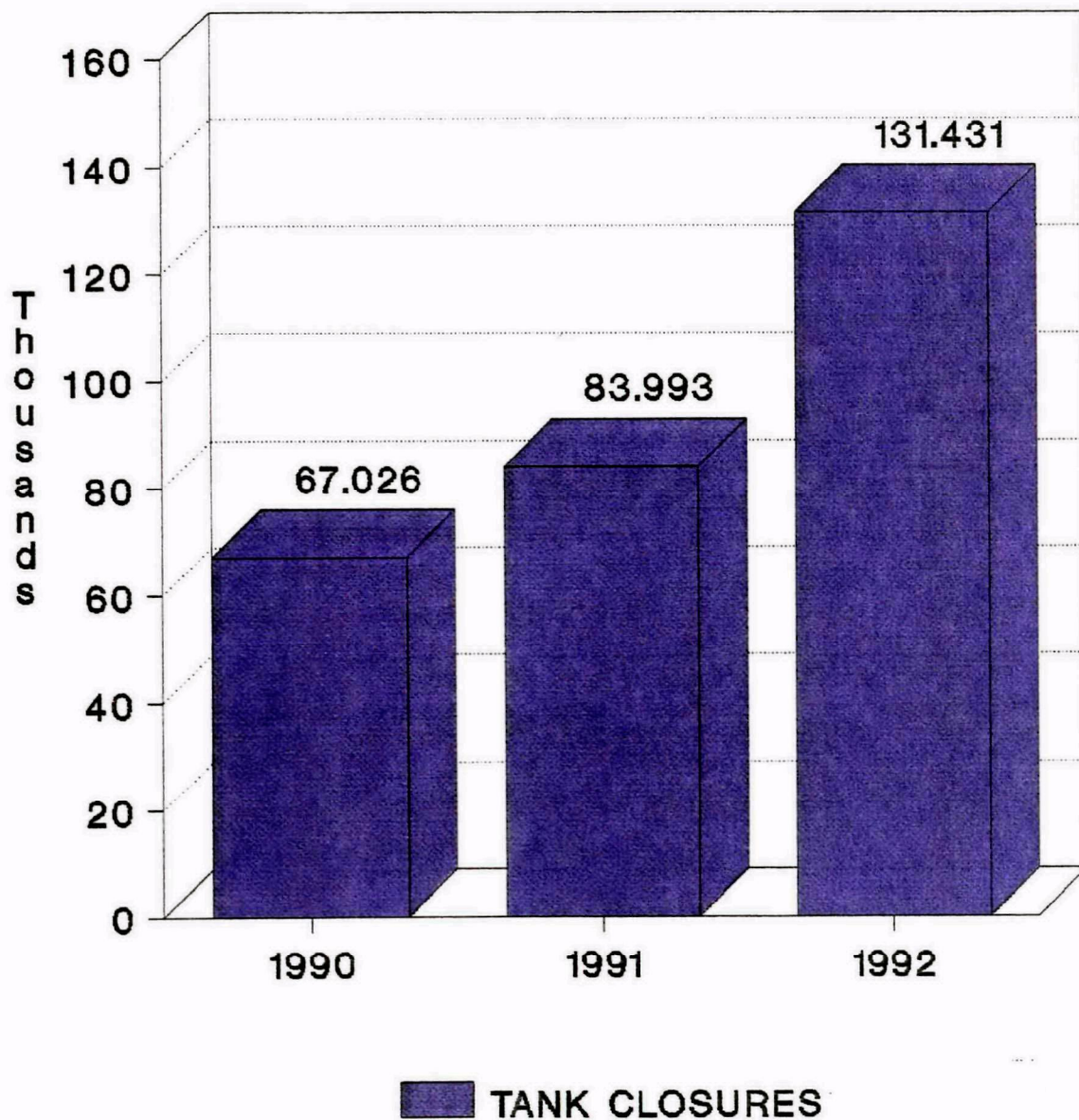


Figure 20

UST TANK CLOSURES

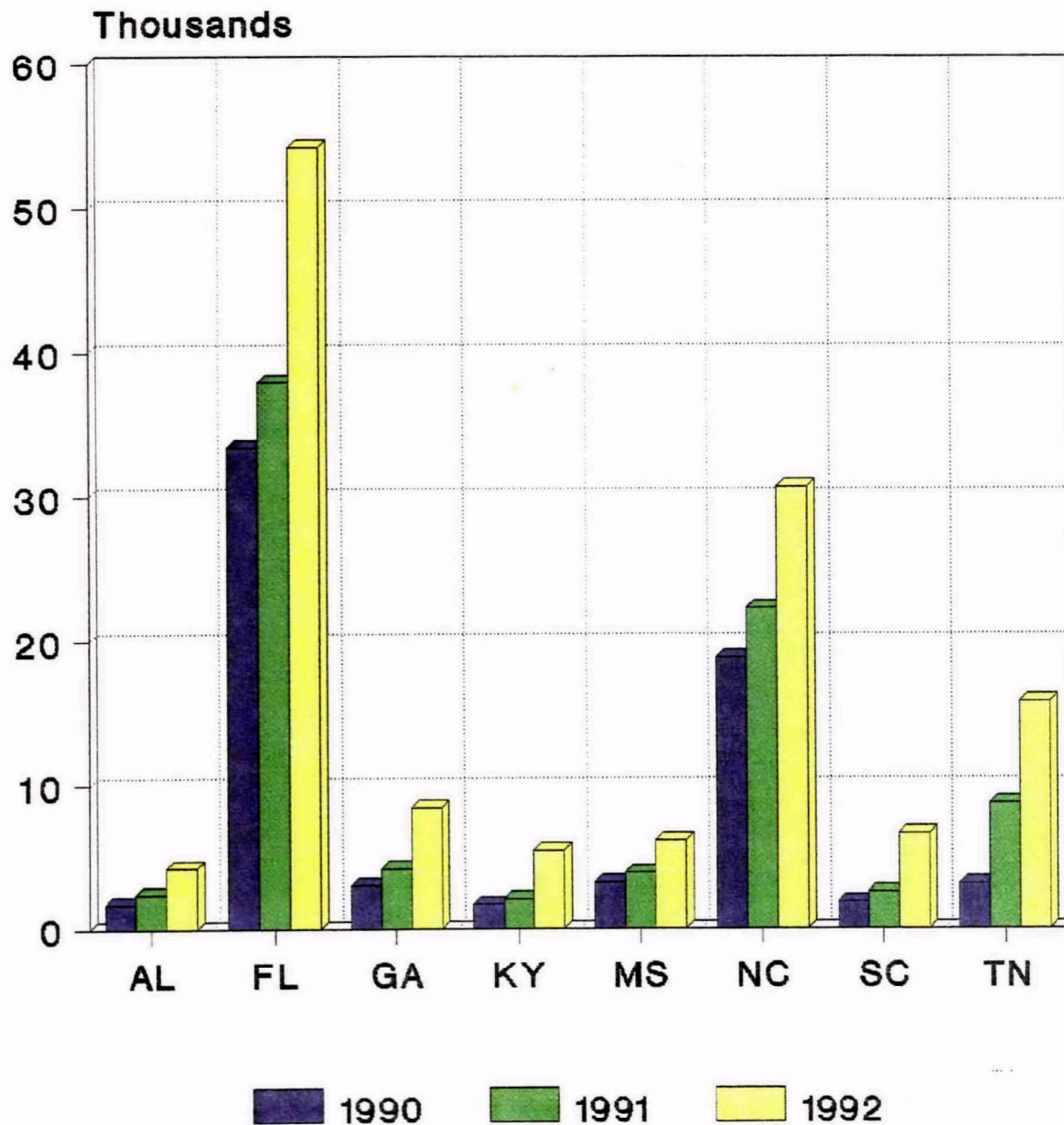


Figure 21

UST - REGION IV CONFIRMED RELEASES

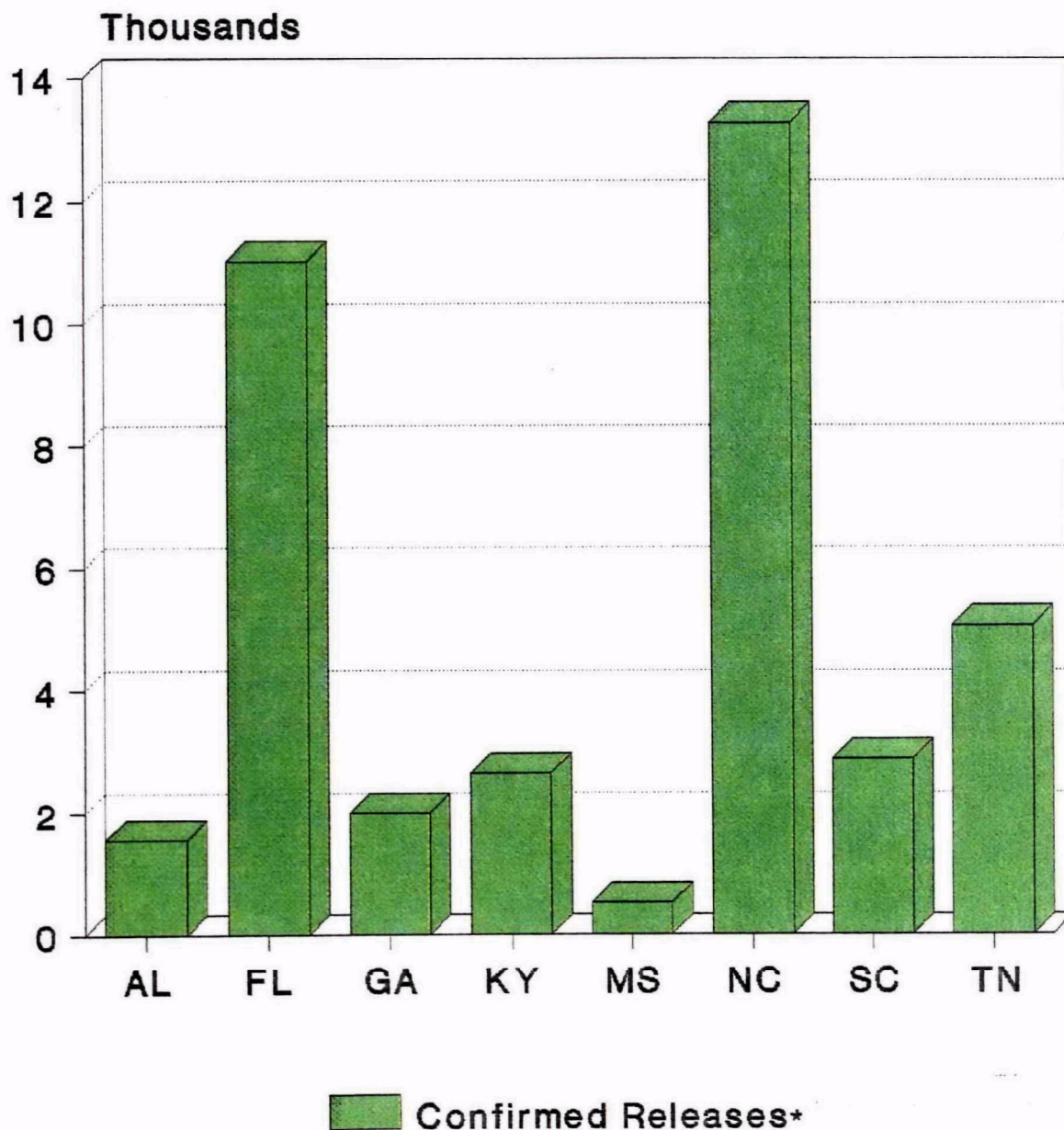
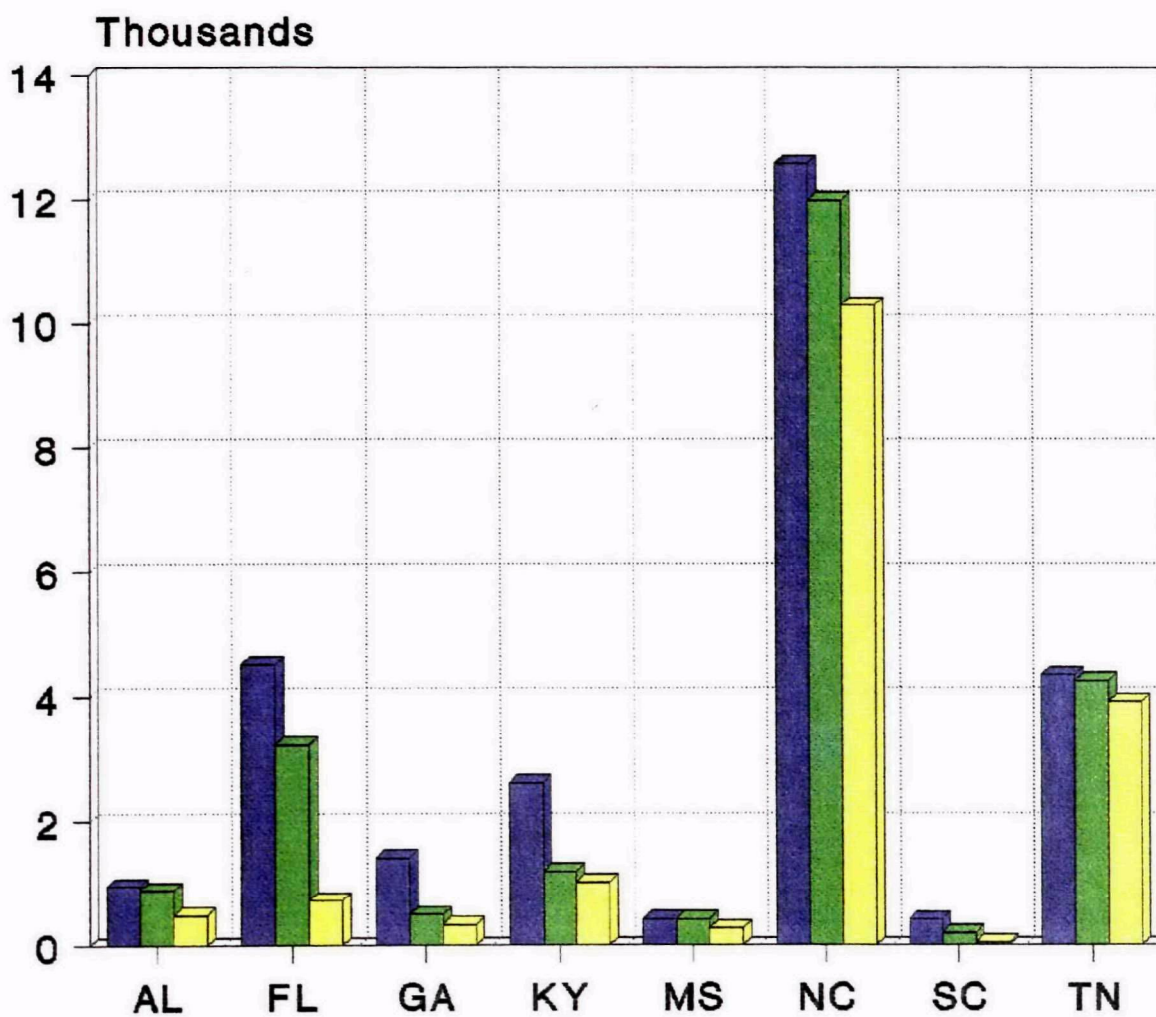


Figure 22

* By end of FY '92

UST CLEAN-UPS REGION IV



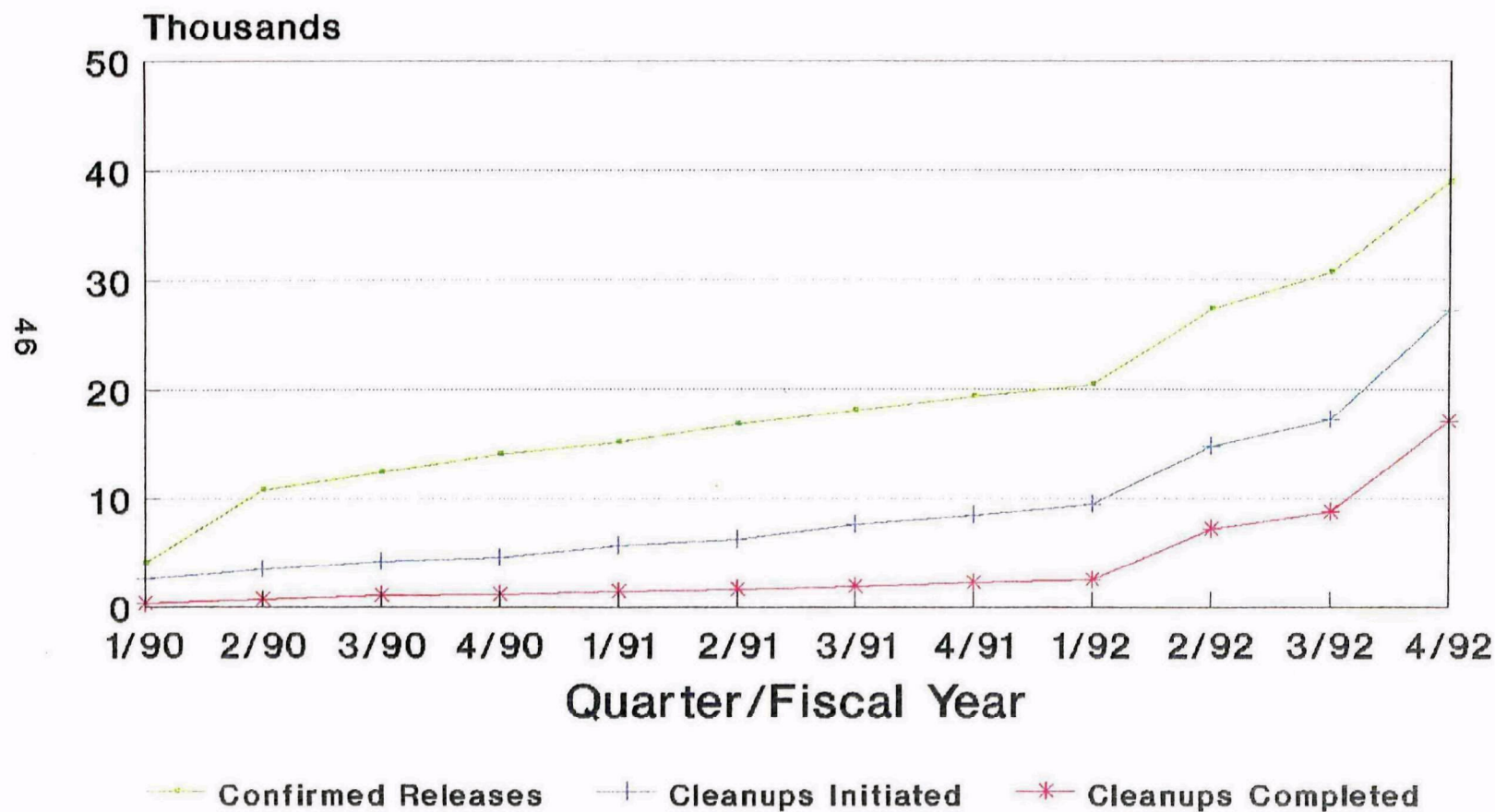
Clean-ups*

Initiated Under Control Complete

Figure 23

* By end of FY '92

CORRECTIVE ACTION ACTIVITY THRU 1992



Based on Quarterly reports.

Figure 24

UST CLEAN-UPS

Region IV, FY'92

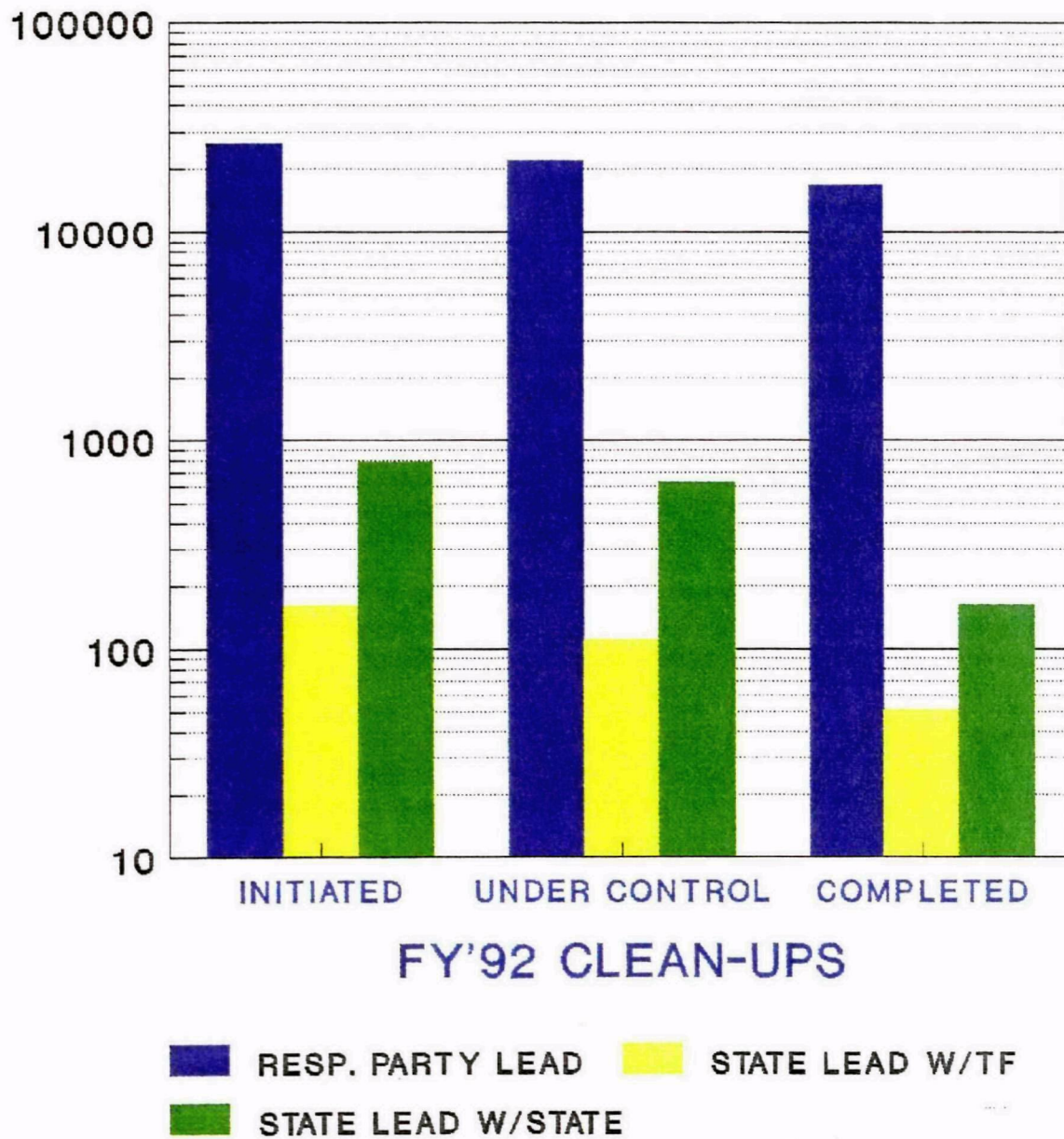


Figure 25

- b. The LUST Trust Fund is being financed by a tax of 1/10 of one cent per gallon on motor fuels.
- c. Distribution of the LUST Trust Fund dollars to state programs for FY 1987 through FY 1992 was based on the number of confirmed releases and on the number of tanks in the individual states, the percentage of ground water usage in the states, and the states' capacity to utilize the money.
- d. From FY 1987 to present, Region IV states have received \$35,279,030, including \$8,247,073 in FY 1992 alone.
- e. Distribution of funds varies from state to state, with North Carolina being the largest single recipient.
- f. Of the \$14,428,917 spent to date by the states, the distribution of these funds are:
 - (1) Enforcement Costs - \$1,200,013 (8.3%);
 - (2) Site Clean Up Costs - \$7,255,903 (50.3%); and
 - (3) Administrative Costs(*) - \$5,973,001 (41.4%).

* The costs associated with oversight of site clean-ups performed by responsible parties are included in the administrative costs.

Additional funding is provided to each state program for the development of the UST regulatory program. Funding began in FY 1986. Region IV states have received a total of nearly 8 million dollars.

Funding mechanisms have been developed in all Region IV states to assist tank owners and operators with the cost of cleaning up releases from petroleum USTs.

6. Release Detection Compliance

Release detection requirements began to be phased in on December 22, 1989 and will continue to be phased in until December 22, 1993. Evaluation and enforcement at Region IV facilities required to comply with these regulations can only be accomplished with a concerted inspection effort at both the state and Federal level. An enforcement presence in the field will also benefit the states in establishing their own authorized programs.

In FY 1990, the Office of Underground Storage Tanks began to emphasize the importance of an increased level of enforcement of

UST regulations by both the states and EPA. The new emphasis on federal enforcement represented a fundamental change in the Agency's implementation strategy. The level of direct federal enforcement actions has steadily increased since that time and is expected to continue to rise. Active enforcement is now recognized as a vital element of the UST program implementation strategy.

A clear signal will be sent to the regulated community that the Region is serious about compliance with the UST regulations. By initiating field activities, an accurate appraisal of the level of noncompliance can be made and acted upon.

Projections

At the current rate of increase, the following projections illustrate potential barriers facing the UST program in just ten years (by the year 2002):

- a. The number of confirmed releases documented in Region IV will reach nearly 78,000, roughly 25% of the tank universe.
- b. The number of initiated clean ups will reach nearly 39,000; less than half of the total facilities will be addressed.
- c. The number of completed clean ups will only be 9,000, slightly more than 11% of releases.

In order for all Region IV states to develop and implement strong, comprehensive UST programs, state staffs need to be substantially increased. Enforcement of the regulations and remediation of a greater number of releases cannot take place without this increase.

States continue to request that additional training be provided to them. In order to provide this, EPA staff needs both additional manpower and resources.

EPA needs additional staff in order to continue enforcement efforts within the Region and to assist the states with enforcement and enforcement training.

Although huge numbers of releases are reported each year, only a small fraction of these are remediated. Increased clean-up funds are essential for protecting human health and the environment.

It is essential that EPA provide support for research in the areas of monitoring (both for leak detection and during

corrective action) and clean-up technology. Developing technology and encouraging it's use can result in faster clean-up to higher standards. A faster clean-up would also be much less costly. If resources can be provided to achieve this, corrective action could be completed on a much larger percentage of those sites needing remediation, resulting in a savings of resources in the future and better protection of the environment.

C. Ground Water Technology and Management Programs

1. Ground Water Technology Programs

The Ground Water Technology Unit (GWTU) provides in-house, technical support to regional programs on ground water and related environmental issues. CERCLA and RCRA project managers are the primary clientele. Others include UIC permitting staff, UST program staff, NEPA project officers, NPDES permit writers, and other EPA personnel who need assistance with technical, ground water related issues. The staff includes an interdisciplinary mix of engineers, ground water hydrologists, toxicologists, and a biologist. All work is intended to support the environmentally protective, regulatory goals of the Agency.

Goals

The first goal of the unit is to provide a service that is useful and sought after. This service must be solution-oriented, timely, helpful, and technically competent. By focusing on technical competence the GWTU frequently sets the standards to which contractors and outside consulting firms must adhere as they provide products to the Agency. These standards include issues of technical accuracy and completeness for both investigation methods and remedial goals and ensuring that the Agency's environmental protection goals are met. Maintaining this ability to provide a useful service and to set technical standards is the basic rationale for continuing to develop the technical expertise of the GWTU.

Accomplishments to Date

As the Remedial Project Managers (RPMs) and other Regional personnel have come to rely on the unit's assistance, they have found it both helpful and essential. The GWTU staff has become closely involved in all aspects of the hazardous waste cleanup process. This includes initial review of work plans, public hearings, assistance with the technical design of remediation efforts, and other steps along the process. The GWTU has become the arbiter of ground water remedial goals for almost all ground water related corrective and remedial actions in Region IV.

Accomplishments versus Resources

As shown in Table V, the workload of the GWTU has continued to grow.

Resources have increased over the years from 7 professionals and 1 clerk-typist in 1986 to 10 professionals and 1 half-time clerk typist in 1992.

Table V. GWTU WORKLOAD BY FISCAL YEAR

<u>Fiscal Year</u>	<u>Number Projects Reviewed</u>
1986	91
1987	269
1988	273
1989	276
1990	289
1991	320
1992	577

(For more detail, see Figures 26 & 27)

In addition to an increasing number of projects to review, the unit's workload often includes extensive computer modeling efforts by the staff. GWTU reviewers must often check other ground water modeling results by running an independent model. Modeling is also frequently needed as the basis on which to provide technical recommendations. Some of the models used recently by the GWTU include:

MINTEQ A geochemistry speciation model, useful for understanding and predicting the fate of metals in ground water contamination and remediation.

MODFLOW and MOC Ground water flow and transport numerical models developed by USGS.

MULTIMED A multimedia flow and transport model which couples transport through the vadose zone with ground water transport.

WHPA A set of four modules for delineating capture zones around pumping wells. These modules were initially designed for the Wellhead Protection program, but they are also very useful for developing recommendations for hazardous waste remediation.

SUMMERS MODEL A simplified model that couples infiltration with ground water flow, useful for

PROJECTS COMPLETED GROUNDWATER TECHNOLOGY UNIT

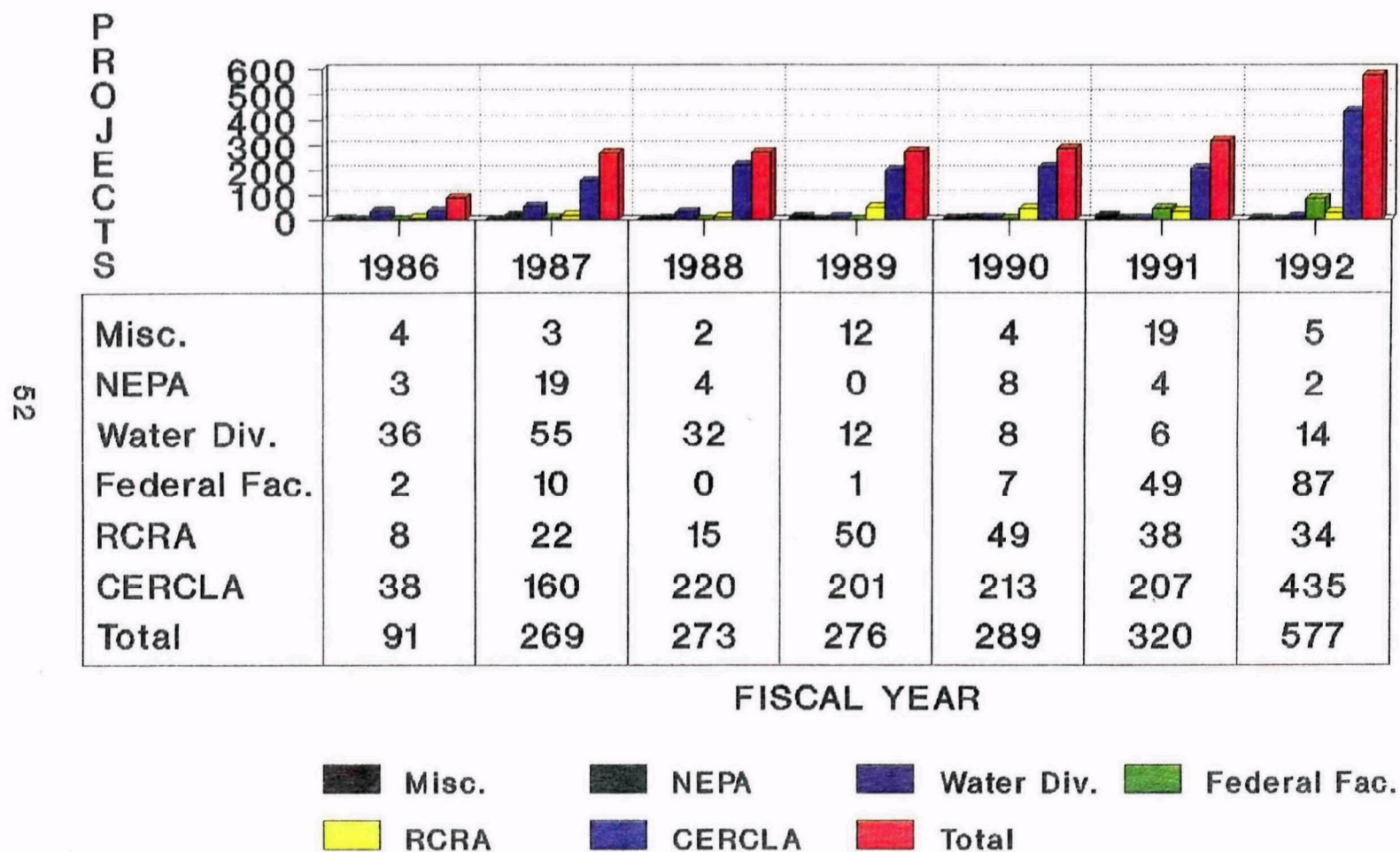


Figure 26

PROJECTS COMPLETED GROUNDWATER TECHNOLOGY UNIT

FISCAL YEAR

53

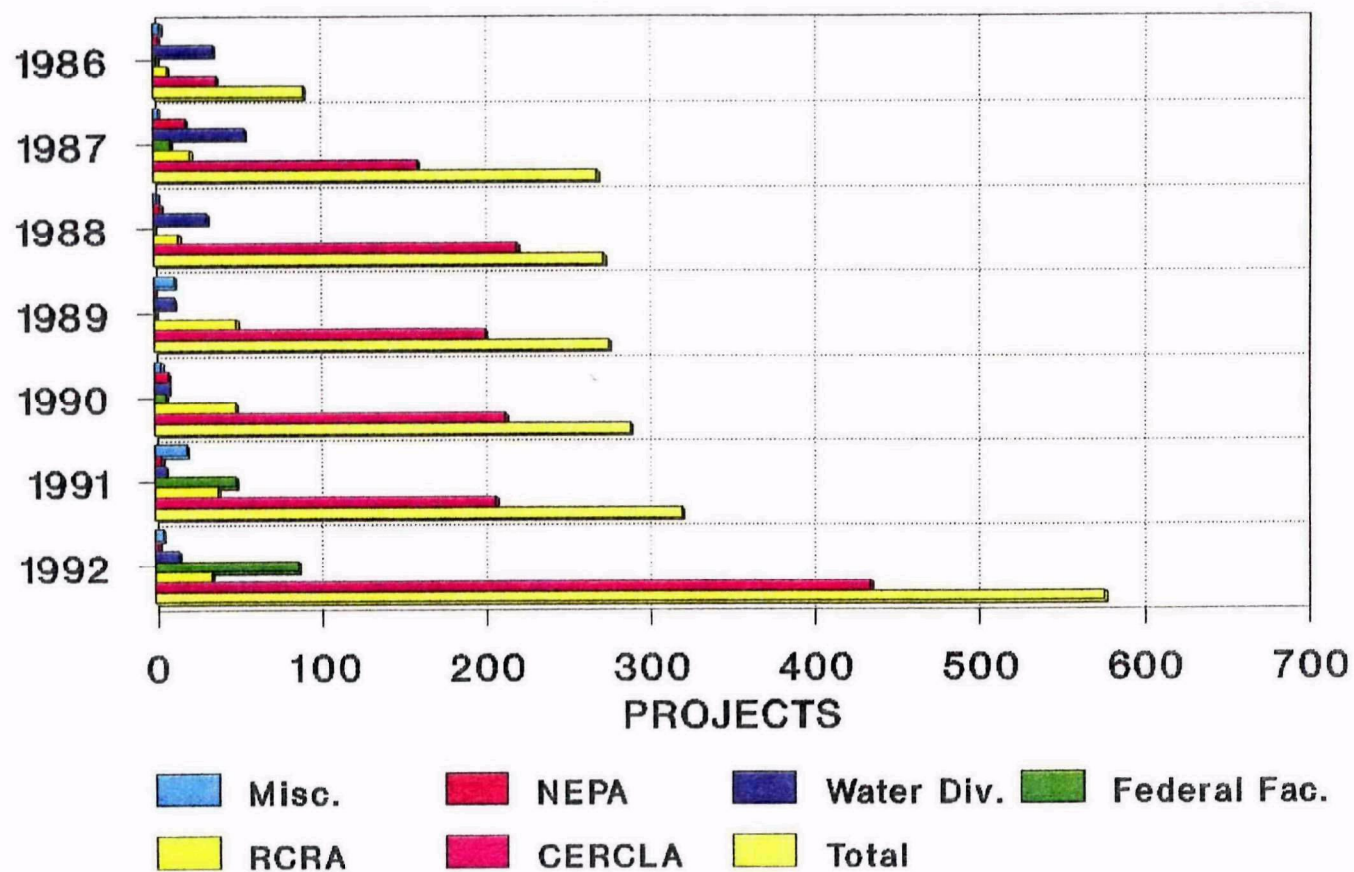


Figure 27

approximating needed soil cleanup levels.

PLUME A two- or three-dimensional program for calculating point concentrations from a variety of sources.

PLASM A one- or two-dimensional ground water flow and transport model.

A variety of other ground water analytical models are also used, such as Thiem's method, Theis's method, Hantush-Jacob's method, etc.

UPTAKE/BIOKINETIC MODEL FOR LEAD A method of predicting blood lead levels in populations exposed to lead in air, diet, drinking water, indoor dust, soil, and paint.

RISK ASSISTANT A program to assist in preparing Risk Assessments.

RISK ASSESSMENT AND CHEMICALS OF CONCERN PROGRAM A spreadsheet developed by the GWTU Toxicologist to quickly delineate chemicals of concern from a balanced toxicological basis.

Projections

Projections indicate a continuing increase in the demand for GWTU reviews and assistance. This demand is expected to outstrip the ability of the Water Management Division to provide additional staff resources needed to meet the increasing workload. In the absence of additional staff, there is increasing short-term pressure to provide quick reviews with less intensive modeling and analysis, potentially having an adverse impact on the quality of product. A balance must be maintained between providing this assistance and allowing the GWTU staff time to maintain professional expertise and to learn new models. Management assistance may be needed to maintain this balance between short-term goals and long-term competence.

Anticipated Resource Needs

In priority order, projected needs for GWTU include:

- a. Additional technical staff.
- b. Training resources, especially for courses and workshops in specialized ground water technology.
- c. Additional PC software such as new models; hardware, such as high-capacity hard disks to allow storage and quick access to complex models; and both hardware and software for graphical

capabilities.

2. Ground Water Management Programs

The Ground Water Management Unit is involved with a variety of activities and programs. The Staff manages the 106 Ground Water Grant, Wellhead Protection Program (WHPP), National Pesticide Survey, Sole Source Aquifer Program, Ag Chemicals in Ground Water Strategy, the Ground Water Strategy and several other programs for all eight (8) States in Region IV. The Unit is staffed with professionals from various disciplines such as engineering, geology, and chemistry who provide technical and administrative support to the States and other programs within EPA.

Goals

The overall goal for the Ground Water Management Unit is to prevent adverse effects to human health and the environment and to protect the environmental integrity of the nation's ground water resources. It is our aim to establish prevention practices and techniques as the preferred means of protecting ground water resources from degradation, adverse health risks, and to preserve the resources for present and future generations' usage.

In order to accomplish this goal, the Unit has responsibility for managing the 106 Ground Water Protection Grant Program, overseeing state program development and implementation, managing the Wellhead Protection Program (WHPP), coordinating and integrating ground water activities through the Agency's Ground Water Strategy, implementing the Sole Source Aquifer Program and providing ground water technical support to the Water Division and other Regional programs by establishing realistic clean-up objectives and initiating and completing clean-up actions to reduce risks to acceptable levels. Also, it is our plan to enhance the education of the public and regulated community on the uses and importance of ground water, the risks of contamination, and prevention techniques.

The Ground Water Management Unit is comprised of a variety of technical and administrative resources such as administrative management and negotiation of state grants, analysis of state accomplishments regarding ground water grant activities, information and technology sharing, identification of research needs, work with states to develop comprehensive state ground water protection strategies, and other activities.

Accomplishments to Date

When the Agency was created in 1970, there was no specific program which managed the ground water resource. During the

1980's, it was recognized that the authority to protect ground water resources was fragmented among many different statutes and the resource was largely undefined. In 1984, EPA adopted a Ground Water Protection Strategy in which the federal and state roles were more clearly defined. The 1984 Strategy targeted several items for action: 1) Increase state capacity and capability; 2) Develop a framework for consistent decision-making; 3) Address previously unaddressed sources of contamination; and 4) Strengthen EPA's internal ground water framework.

An initial step in building state capacity was the requirement for States to develop state strategies that described their program, authorities, gaps and recommendations for filling those gaps. Each Region IV state has developed a ground water protection strategy which defines an approach that best addresses their particular needs. Several of the eight (8) Region IV state strategies were updated as new programs were introduced.

As a result of the 1984 Strategy, the 106 Ground Water Protection Program Grant was made available to the states in support of their program development efforts. The first 106 Ground Water Grant was awarded in 1985. The ground water portion of the grant is awarded annually to each state to develop and implement state programs to comprehensively protect ground water. Each state is required to submit annual 106 Ground Water Workplans to EPA for review and approval. Presently, all region IV states are meeting this requirement.

The Wellhead Protection Program (WHPP), an important element of an overall ground water program, was authorized by the Safe Drinking Water Act Amendments of 1986. This program was designed to protect the public water supply systems from possible contamination. Each state is required to develop and submit to EPA a WHPP which includes the roles and responsibilities of implementing state and local agencies, methods for delineation of wellhead protection areas (WHPAs), approaches to inventorying and managing sources of contamination, contingency plans, managing new wells and public participation. Although the Safe Drinking Water Act authorized the WHPP, no funding to support the program was ever appropriated. The program had to be funded from a portion of the 106 grant. Presently, Alabama, Georgia and South Carolina have an approved WHPP in place. The other states are in the development and review phase. Also, the Region has conducted several workshops and training courses over the past few years to aid state and local agencies in developing their WHPP programs.

In recent years, several other strategies and efforts have been initiated in the ground water protection area that interact with many other programs. They include: Ag Chemicals in Ground Water Strategy, National Pesticide Survey, Nitrogen Strategy, Non-point Source (319) program, Ground Water Task Force, and the

National Water-Quality Assessment (NWQA) Studies. Most recently, the Agency published the Ground Water Task Force Report which describes and outlines EPA's new Ground Water Strategy. Under the Strategy, the Agency has focused its efforts on four major objectives: 1) Building State capacity; 2) Addressing sources of contamination; 3) Establishing ground water policy direction and program consistency; and 4) Coordinating EPA programs.

The outcomes of this strategy are policy and implementation principles that are intended to set forth an aggressive approach to protecting the nation's ground water resources. The approach is in seven (7) steps. The first step is to set a clear statement of Agency policy which will serve as a decision-making framework for all Agency programs relating to the ground water resource. The second step is to focus on comprehensive resource management which builds on current State activities by providing financial incentives for filling in gaps in protection efforts and building comprehensive protection programs on the State level. Third, the Agency will place an increased emphasis on prevention of ground water contamination and strive to achieve a greater balance between prevention and remediation activities.

The fourth step is to clearly define the EPA and State relationship in ground water protection. The next step relates to the adequacy of a State program. The Agency's new policy describes EPA's intention to refine over the next year the definition of the elements of a State Ground Water Protection Program, and how each of the elements must be addressed to develop a program that is "adequate" to comprehensively protect a State's resource. Also, EPA will strive to provide greater flexibility to a State in implementing Agency programs when that State has achieved an "adequate" ground water protection program which affords comprehensive protection of the resource.

The final two steps involves EPA oversight role and coordinating funding. EPA oversight in the Agency's ground water related programs will shift from a program-specific basis to a cross-program, resource-based approach which will be further defined over the coming years. Concerning funding, EPA will use the coordinated management of current ground water related grants and the incentive of increased funding for States showing progress with comprehensive protection of the resource.

Accomplishments versus Resources

Since 1985 the Ground Water Management Unit has been involved with a variety of activities and programs, most of which did not exist at that time. Some of the major GWMU activities and programs are: 106 Ground Water Management; Wellhead Protection; State Profiles; State Ground Water Protection Strategies; National Pesticide Survey; Ag Chemicals in Ground Water Strategy; Nitrogen Strategy; Non-point Source Program; Sole

Source Aquifer Program; and the Ground Water Task Force Report (the new Ground Water Strategy).

In the past, emphasis was placed on building state capacity and capability through developing and implementing state ground water protection strategies, conducting ground water investigation, data management, wellhead protection program development, and pesticides management. Presently, pursuant to the Agency's new Ground Water Strategy, considerable emphasis is being placed on developing comprehensive state ground water protection programs that build on the current programs.

The total 106 Ground Water grant allocation for Region IV states in FY 1987 was \$1,080,000. In FY 1992, an estimated \$2,070,000 was awarded to the States (Figure 27). Figures 28 through 34 show a breakdown of 106 grant dollars versus the program element by State.

Projections

Over the next several years, one of Region IV's goal as it relates to ground water will be to implement the EPA Ground Water Strategy for the 1990s. We will seek to improve integration of all EPA programs related to ground water protection; improve coordination with other federal agencies; establish the elements and criteria for oversight of adequate Comprehensive State Ground Water Protection Programs (CSGWPPs); and identify opportunities for increased and more consistent deference to State ground water protection objectives, priorities, and approaches. We will include how a State is making progress in implementing the CSGWPPs as a part in the mid-year evaluation.

Since the CSGWPP will be a major focus in the coming years, it is appropriate to address the process a State will take to move toward implementing the CSGWPP. This process involves completing the State Profile which is a "snapshot" of the existing State program, tailoring the National guidance to meet State needs, assessing the current program against the National guidance and identifying program gaps, developing a multi-year program plan to fill these gaps, developing annual workplans that respond to the multi-year program plan and establishing a State coordination mechanism. By going through this process, a State would be making significant progress toward obtaining an "adequate" program.

Presently, we are working with the States on developing and implementing a Wellhead Protection Program (WHPP). This effort is expected to continue in the coming years and will be a significant part of ground water protection.

106 Ground Water Grants

Region IV, Totals by Year

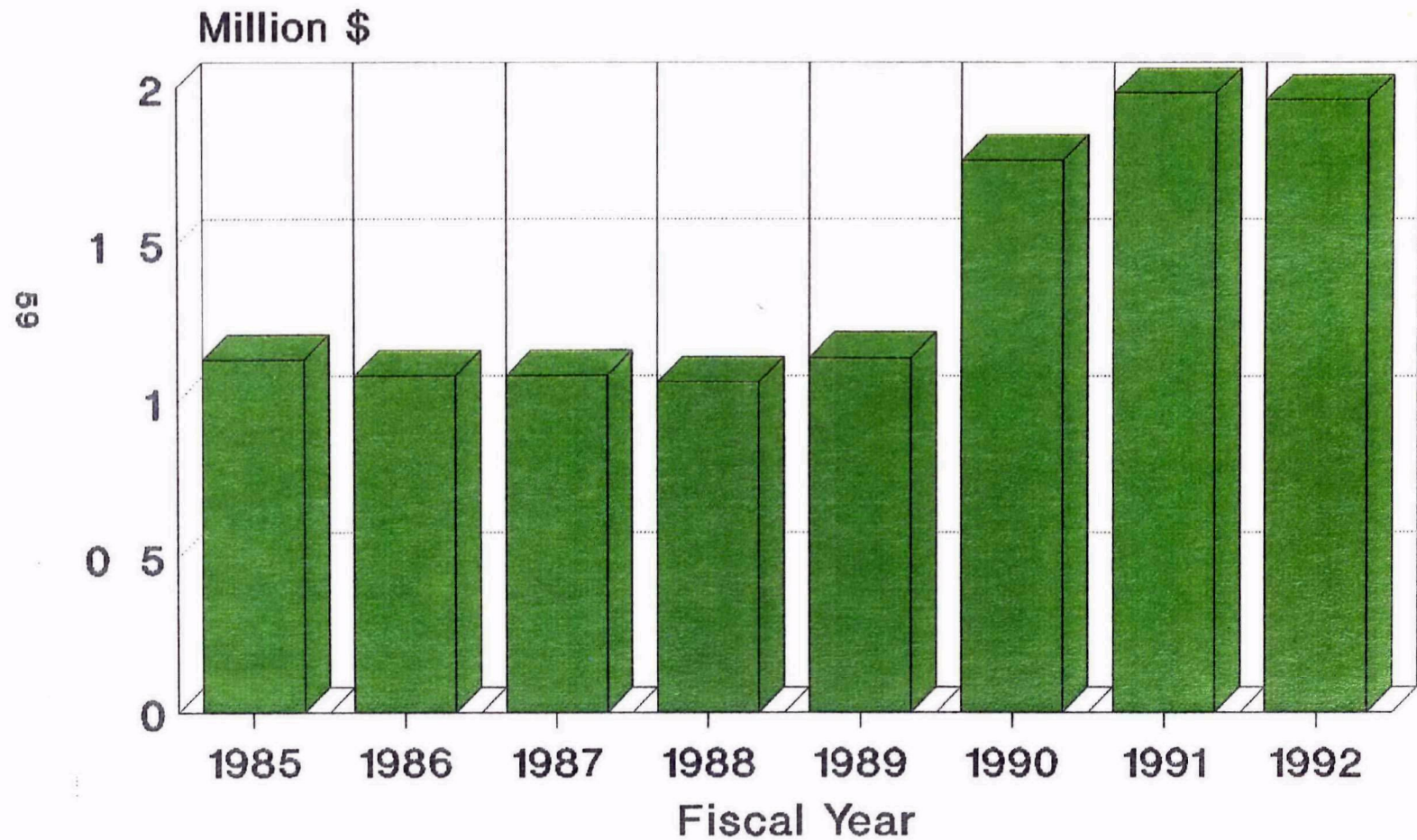


Figure 28

106 Ground Water Grant

Selected Expenditures, 1985-1990

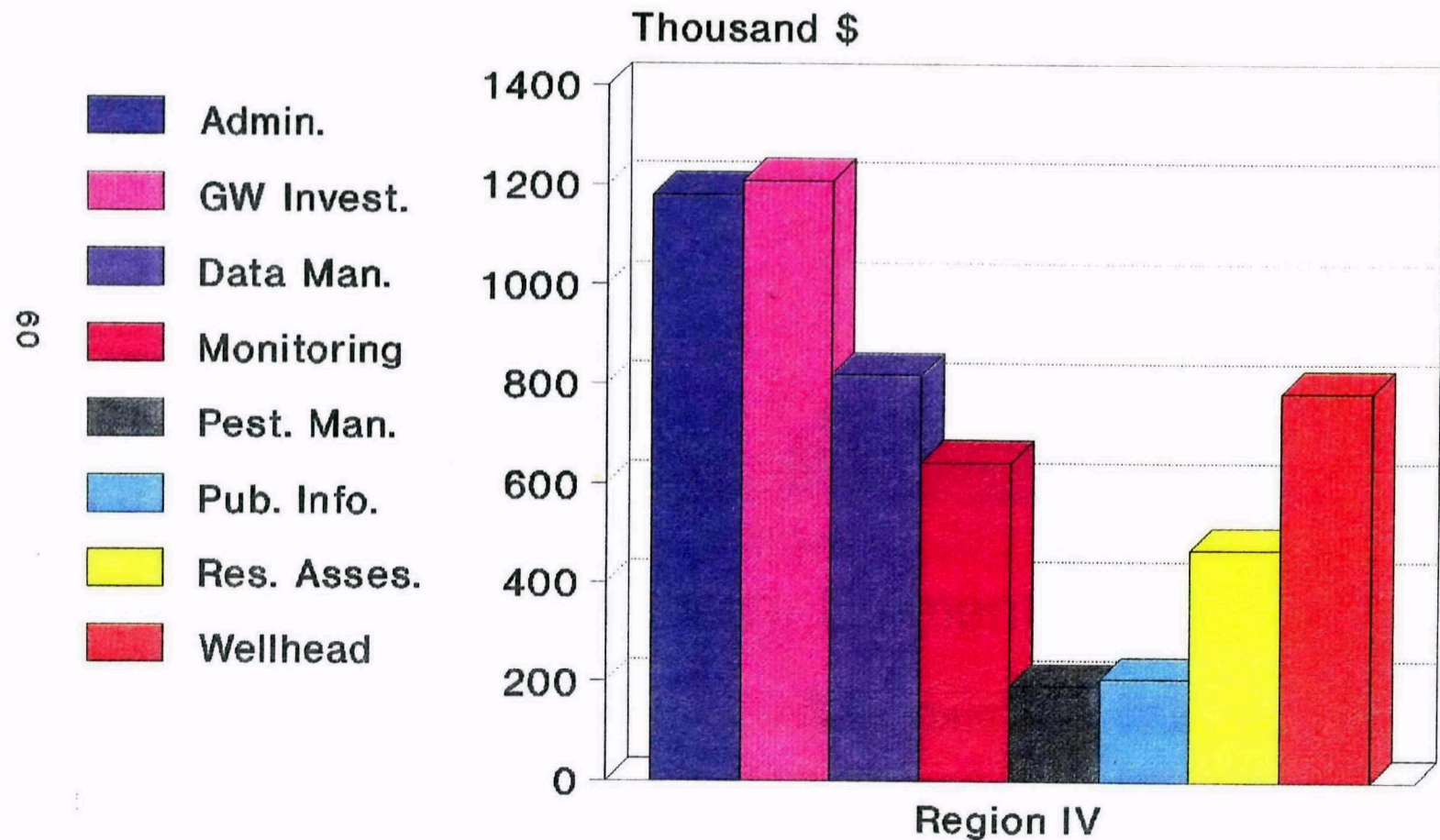


Figure 29

AL 106 Ground Water Grant

Selected Program Elements 1985-1990

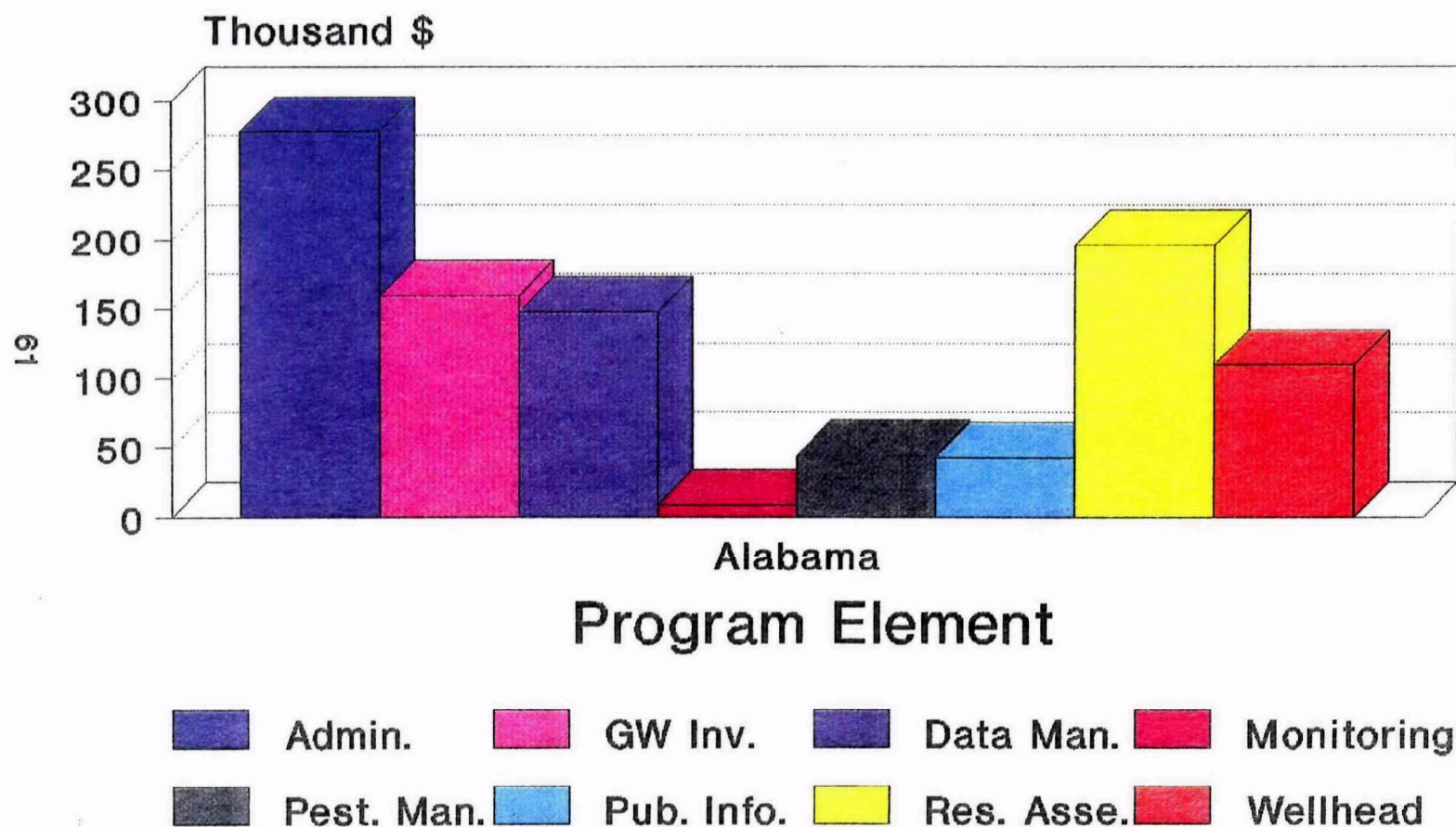


Figure 30

FL 106 Ground Water Grant

Selected Program Elements 1985-1990

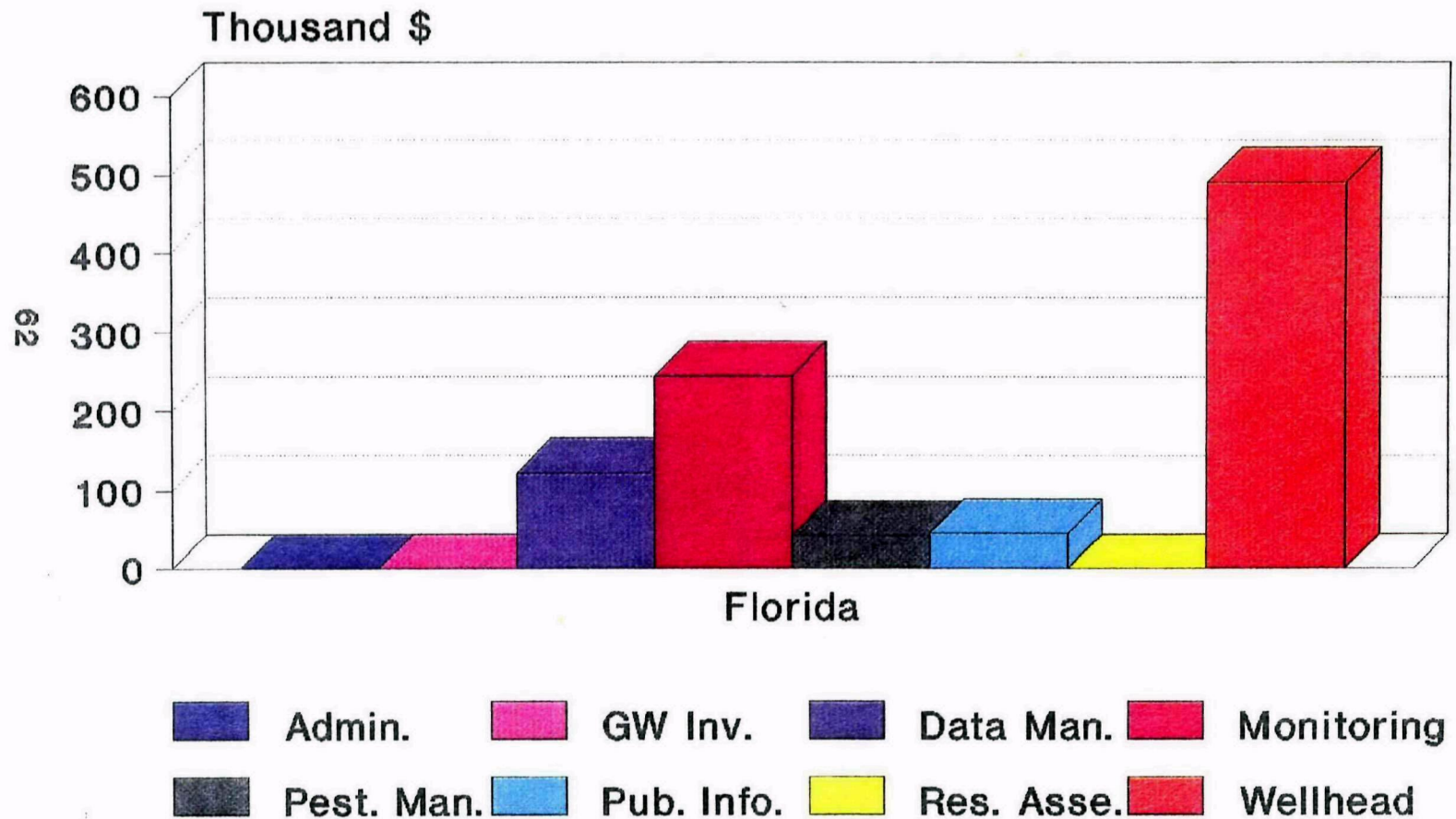


Figure 31

GA 106 Ground Water Grant

Selected Program Elements 1985-1990

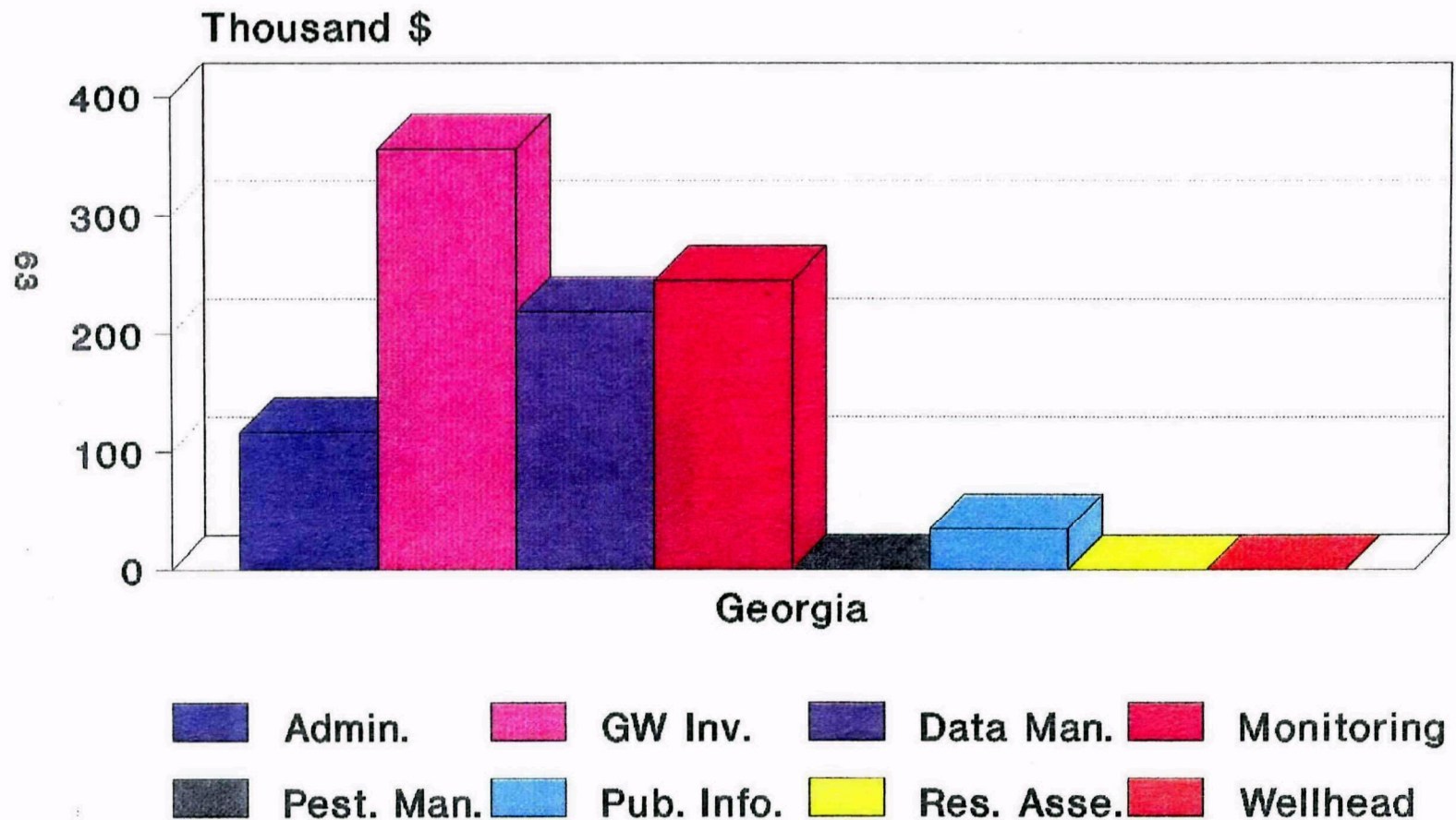


Figure 32

MS 106 Ground Water Grant

Selected Program Elements 1985-1990

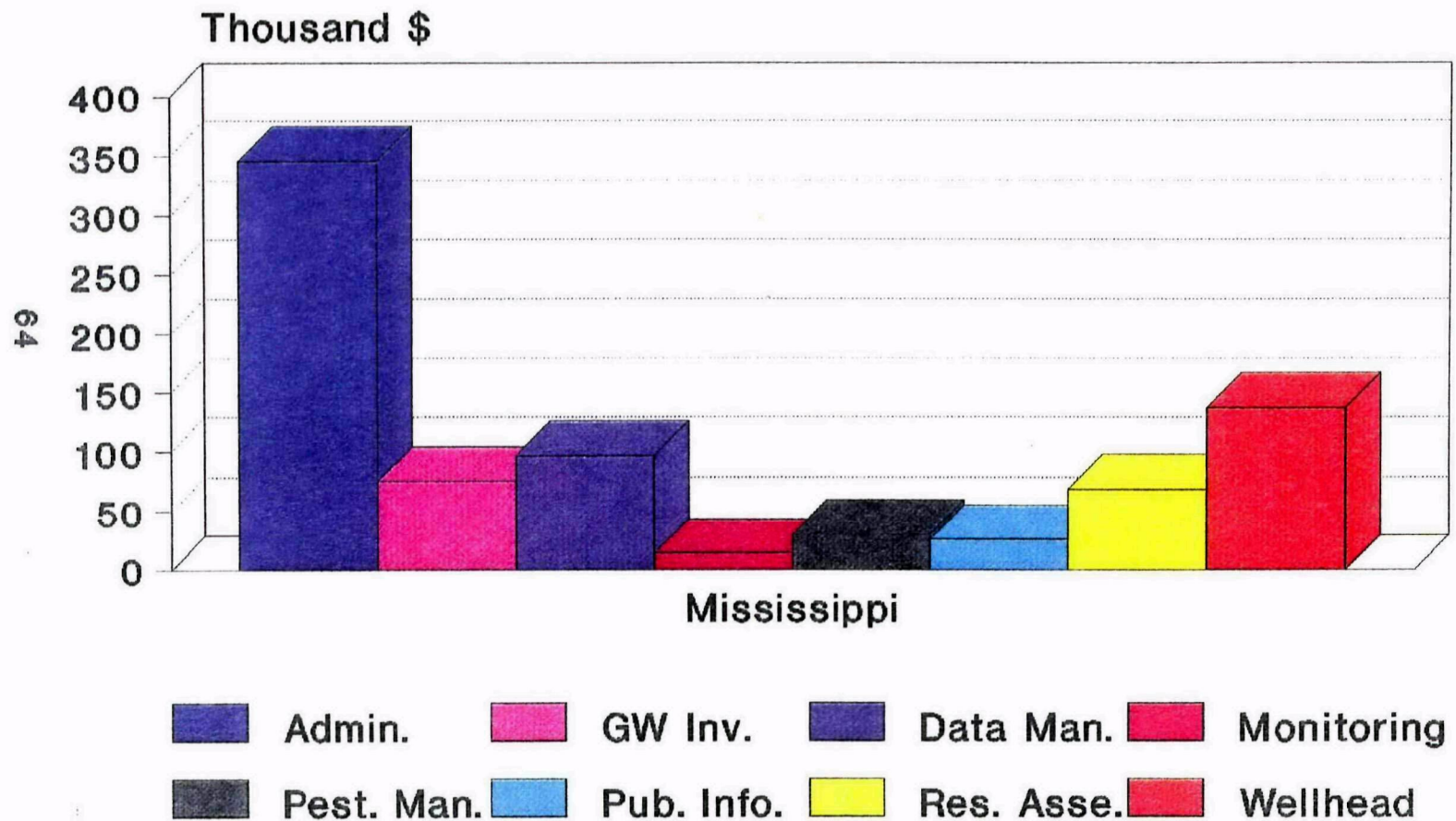


Figure 33

NC 106 Ground Water Grant

Selected Program Elements 1985-1990

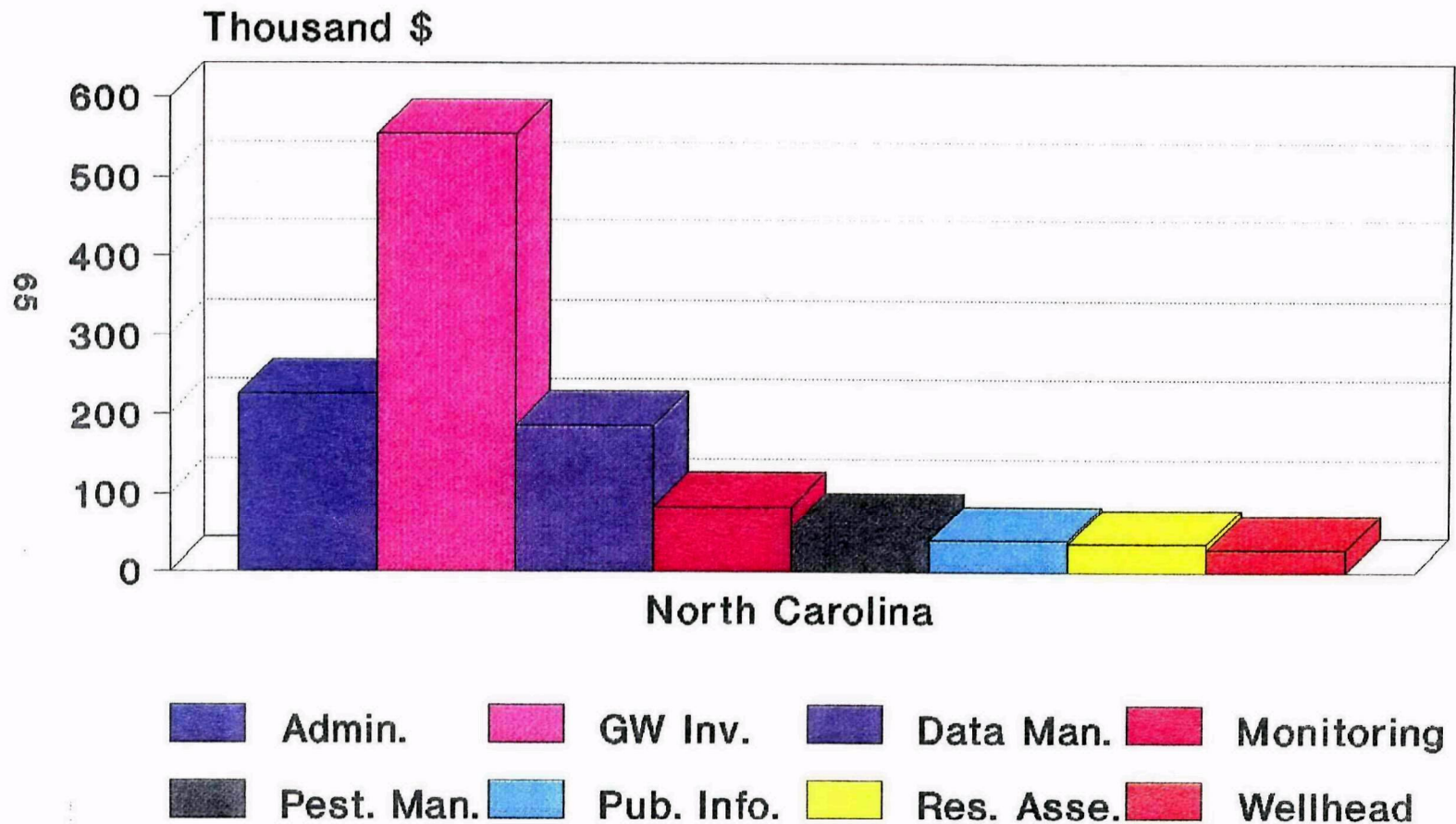


Figure 34

SC 106 Ground Water Grant

Selected Program Elements 1985-1990

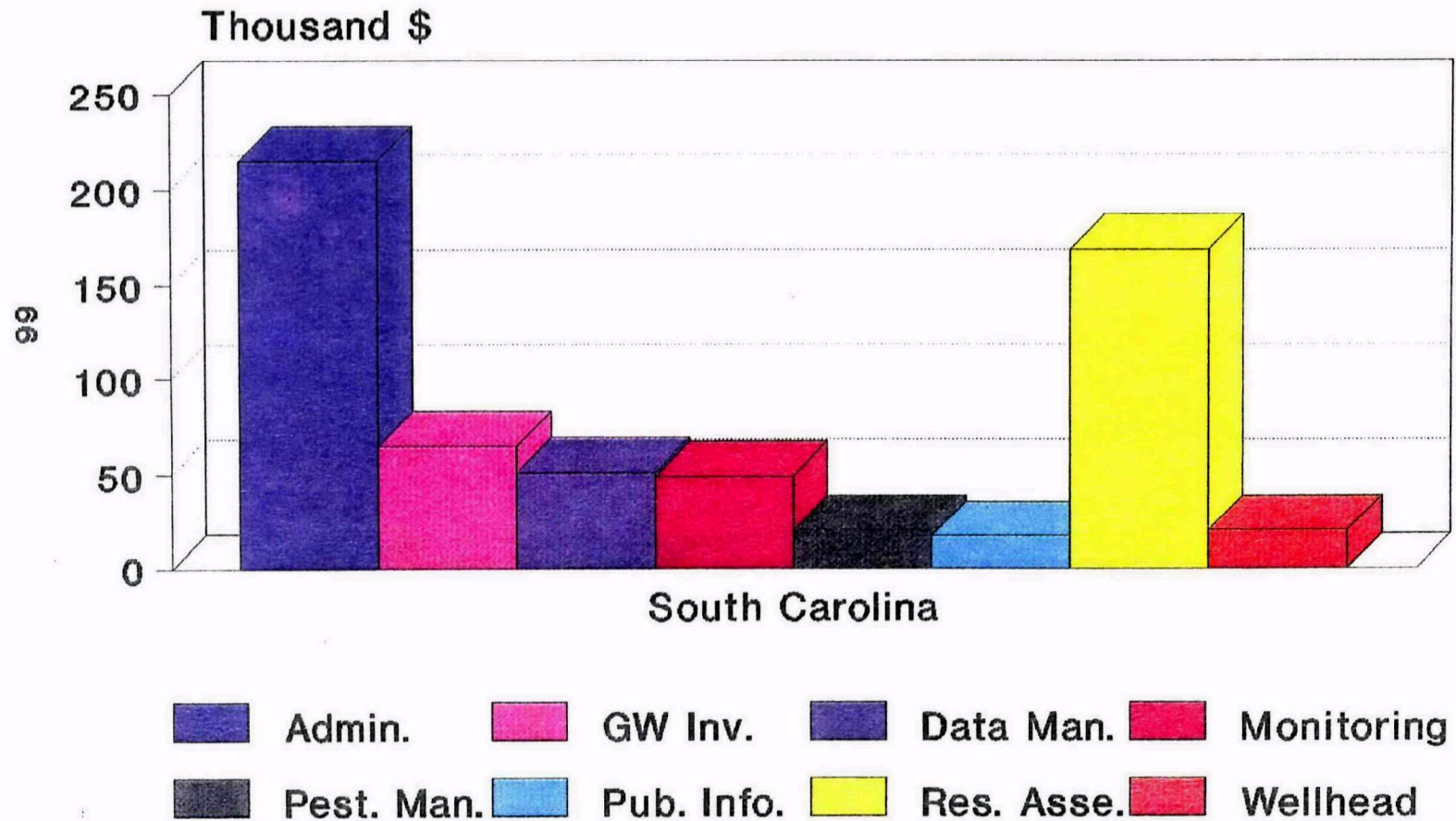


Figure 35

TN 106 Ground Water Grant

Selected Program Elements 1985-1990

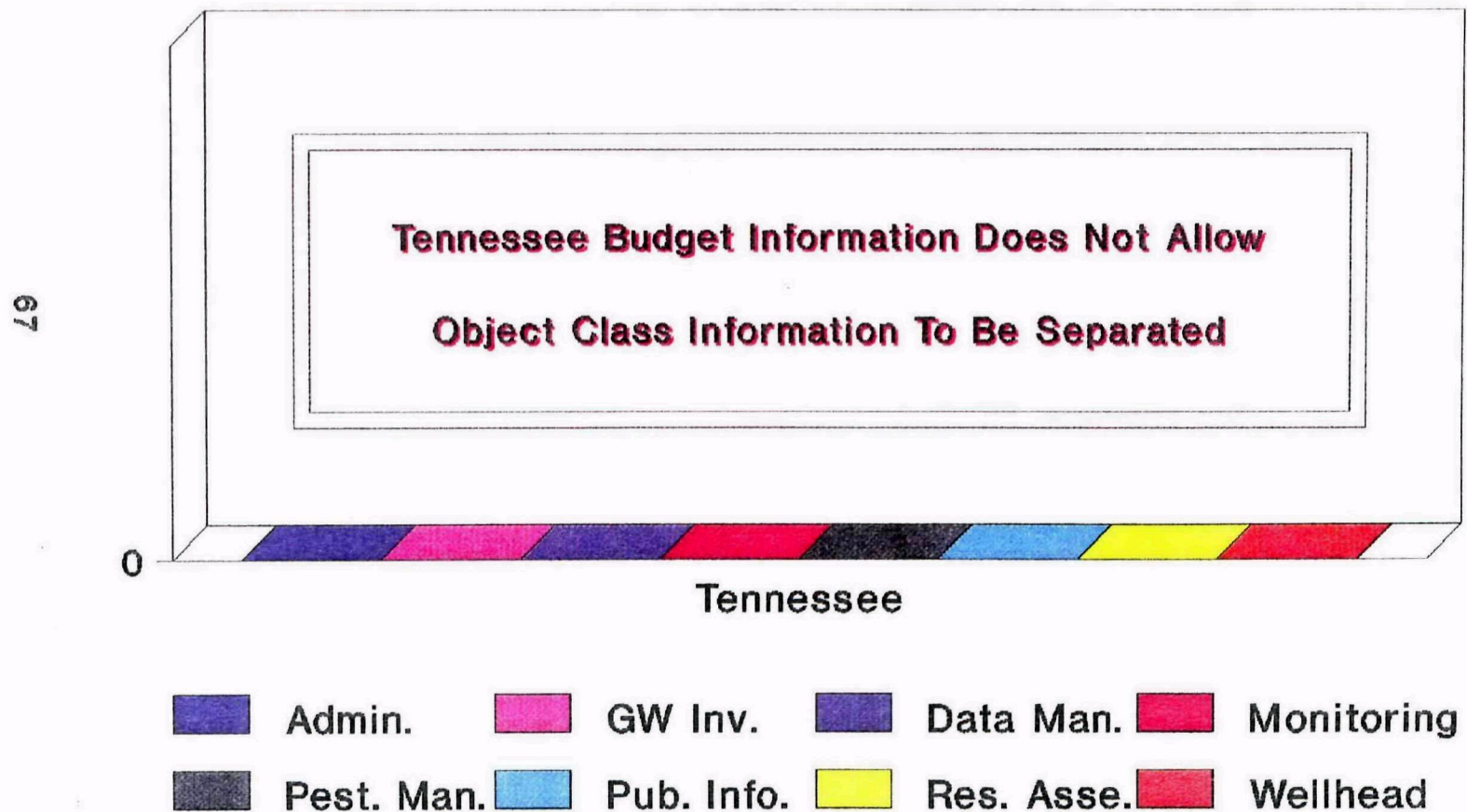


Figure 36

Anticipated Resource Needs

Because of the increasing responsibilities in the areas of the Ground Water Strategy, Wellhead Protection and the CSGWPP, the Ground Water Management Unit will need more personnel to review documents/reports and to respond to inquiries from other agencies and the general public on these programs. Also, an increase in staff is needed to perform the overall management and implementation of the new programs as well as maintaining our present responsibilities.

In a recent roundtable discussion with the States on the CSGWPP, the States questioned about the possibility of increasing their funding to implement the CSGWPP, WHP, and other new programs. This matter is a major concern for them since locally, they are experiencing a reduction in financial support. Also, the States encourage EPA to continue offering the WHP demonstration grants. These grants have been very beneficial to the local communities in delineating their wellhead protection areas.

IV. EPA'S GROUND WATER PROTECTION STRATEGY FOR THE FUTURE

IV. EPA'S GROUND WATER PROTECTION STRATEGY FOR THE FUTURE

A. NEED AND GOAL

During the early 1980's, EPA recognized that the authority to protect our ground water was fragmented among many different statutes and was largely undefined. As a result, in 1984 the Agency adopted a Ground Water Protection Strategy to articulate both the problem and EPA's role in a national ground water protection program.

While this strategy was effective in creating momentum for States to develop and implement ground water programs, the passage of time and growing body of experience indicated that gaps remained in protection efforts across the country. It became clear that there was a need to assess our progress and adjust our approach to take into account recent changes in statutory authorities and our increased knowledge of the issue by promoting comprehensive protection on the State and local level.

B. POLICY

In 1989, EPA Administrator, William Reilly created the Ground Water Task Force to review the present Ground Water Strategy and develop recommendations for providing a better approach to protect ground water. One of the major reasons for the creation of this task force was that ground water activities occur within many EPA Programs and in a number of different state and local agencies. These ground water activities are often perceived as being uncoordinated which can lead to gaps in ground water protection, duplication in activities, or programs working at cross purposes.

The Task Force completed its work during the summer of '91 and issued the Ground Water Task Force Report which is known as "EPA's New Ground Water Strategy". The report reaffirms EPA's policy of:

Focusing on the protection of both human health and the environment,

Emphasizing a resource-based, prevention-oriented approach to ground water protection,

Advocating a differential protection approach to managing ground water quality that considers use, value, and vulnerability.

C. PRINCIPLES

In order to implement the policy, the report recommended implementation principles. Three basic themes embodied in these principles are:

PREVENTION - The cost of remediation suggests that prevention is the most cost-effective approach to ground water quality management.

PRIORITIZATION - The principles stress that all ground water activities should be prioritized based on relative risk.

INTEGRATION - An effective ground water protection program must integrate federal, state, and local activities within each of these levels of government and across them.

Probably the most important principle is integration of activities and programs at the federal, state, and local level. The cornerstone of this integration is the State-developed and implemented Comprehensive Ground Water Protection Program. The goal of the strategy's new federal/state relationship is to coordinate the operations and objectives of the ground water programs to form a coherent whole which comprehensively protects the resource. Each program will maintain its independent identity and continue to carry out its mandate. However, each program will rely on common elements, goals, and principles to assure coordination, cooperation, and comprehensive protection of the nation's ground water.

This new comprehensive approach, that stresses integration and cooperation among programs, attempts to take advantage of our collective experiences to enable more efficient use of all resources and consistent environmental decisions. The development of ground water programs at all levels of government has been truly impressive.

D. CONCLUSION

As EPA moves into the twenty-first century, it is with a keen awareness that the Nation's ground water is of vital importance to our country, to the health of our citizens, the integrity of our ecosystems, and the vigor of the economy. Every effort to protect the quality of these resources must be made. It is not the intent of EPA's New Ground Water Strategy to start over again, but to build upon our previous accomplishments and successes. Many things have been done to protect the ground water in the last 20 to 30 years, but much still remains to be done.