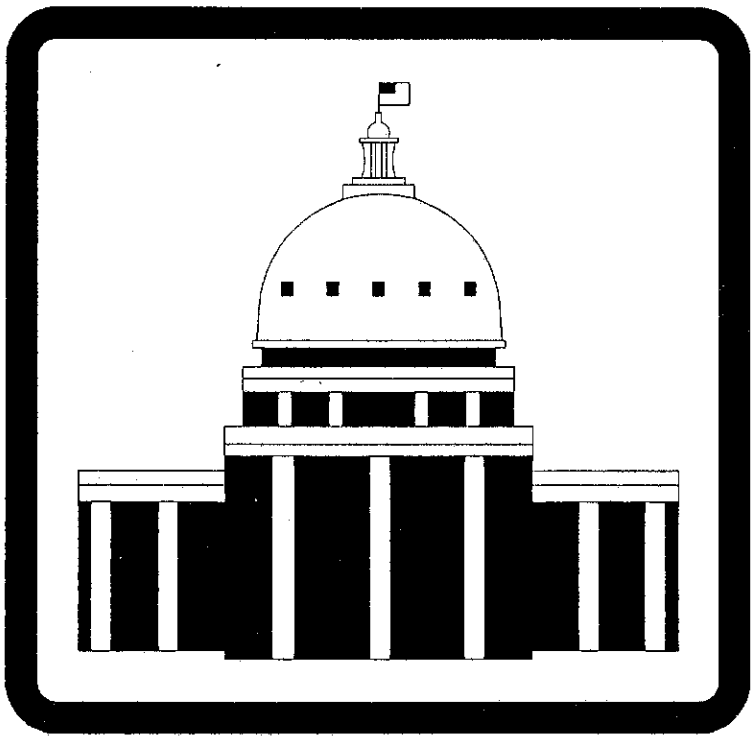
TEXAS GROUND WATER PROTECTION PROFILES



Texas Water Commission
June, 1991

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EXECUTIVE SUMMARY

Ground water is an important resource in Texas because of its availability and the extent of its use. During 1988, the major and minor aquifers furnished about 50 percent of the total state water requirements. The average annual ground water pumpage from the major and minor aquifers was projected to range from approximately 6.7 million acre-feet in 1990 to 5.7 million acre-feet through the year 2030.

Both state and federal programs are in place which provide ground water protection. These programs are, however, oriented towards contaminant sources rather than the ground water resource itself and are reactive in nature versus preventative. The Ground Water Protection Committee, composed of representatives of state agencies whose programs affect ground water, was created in 1985 to address the issue of ground water protection.

With the passage of House Bill 1458 by the 71st Texas Legislature in 1989, the Ground Water Protection Committee was renamed the Texas Groundwater Protection Committee and given statutory recognition under Chapter 26 of the Texas Water Code. The Texas Water Commission was designated as the lead agency and the Commission's Executive Director is designated as the Committee Chairman. The Executive Administrator of the Water Development Board is designated as the Committee Vice-Chairman. The duties of the Texas Groundwater Protection Committee, on a continuing basis are: to coordinate the ground water protection activities of the member agencies; to develop and update a comprehensive state ground water protection strategy; study and recommend to the state legislature ground water protection programs for areas not protected by current regulations; file with the Governor and legislature a report of the Committee's activities and recommendations for ground water legislation; and

publish an annual joint ground water monitoring and contamination report based on the activities of Committee member agencies.

In addition to the creation of the Texas Groundwater Protection Committee, House Bill 1458 also set forth and codified in Chapter 26, the state's Ground Water Protection Policy. The goal of the state's Ground Water Protection Policy is to maintain the existing quality of ground water and prevent degradation. If ground water quality is degraded, it should be restored if feasible. As mandated by the Texas Legislature, the Texas Groundwater Protection Committee has developed a comprehensive ground water protection strategy. The goals of the Committee, through implementation of the ground water protection strategy, are the protection of ground water in the state; the development and improvement of protection programs for areas not currently regulated; the coordination of state, federal and local ground water protection efforts; and public education concerning ground water protection. The state strategy is intended to be a flexible guide for state agencies and others in developing and implementing ground water protection efforts. Many of the elements of a comprehensive ground water protection plan are already in place. State and federal programs already exist which regulate point sources for contamination. The Committee, through the implementation of the state strategy is committed to the state's goal of nondegradation. State agencies operate several programs to achieve this objective. A section of this report profiles the individual agencies which conduct ground water protection activities and programs. The profile includes a discussion of federal legislation, regulation and program delegation; state legislation and regulations; and state program activities. The individual programs are described in terms of contamination protection, monitoring, and enforcement. The ground water protection programs are summarized in two tables outlining agency jurisdiction, enabling legislation and regulatory authority.

Texas Water Commission

The Texas Water Commission administers many environmental regulatory programs which include ground water protection. Four federal laws administered in some degree by the Commission include: (1) Safe Drinking Water Act, (2) Resource Conservation and Recovery Act, (3) Comprehensive Environmental Response, Compensation and Liability Act (Superfund), and (4) Clean Water Act. State legislation, which includes ground water protection, administered by the Commission includes: Texas Water Code, Texas Solid Waste Disposal Act, and Texas Water Well Drillers Act. The Commission in response to state and federal mandates has promulgated rules which establish waste disposal regulatory programs. The programs generally include permitting or other requirements, enforcement procedures, ground water quality monitoring, and corrective action requirements.

It is the Commission's ground water policy to help ensure maintenance of the state's ground water quality through planning and education and cooperation with other state agencies and the public and private sectors. As the lead agency for water resources, the Commission has the responsibility to coordinate the state's Groundwater Protection Committee efforts to implement a comprehensive ground water protection strategy.

Texas Water Development Board

The Texas Water Development Board is responsible for financial assistance programs, long-range water planning, and surface and ground water data collection and studies. The Board does not regulate or control ground water quantity or quality. Its purpose and policy is to collect and analyze ground water data and provide and assist users of this information. The Board's activities include investigations of the occurrence, quantity, quality, and availability of

ground water resources, operation of ground water levels and quality monitoring networks, estimation of future supplies, determination of current water use and projections of future water demands, and development of plans to meet future water demands.

Texas Water Well Drillers Board

The Texas Water Well Drillers Board was created and charged by the Texas Legislature to help ensure the quality of the state's ground water through the licensing of water well drillers. The Texas Water Well Drillers Act is the statutory authority for the Board and its rules and regulations. The responsibilities of the Water Well Drillers Board include establishing licensing procedures and qualifications for water well drillers and setting requirements for licensed drillers. Staff and assistance are provided to the Board by the Texas Water Commission.

Railroad Commission of Texas

The Oil and Gas Division of the Railroad Commission protects ground water from pollution from activities associated with the exploration, development and production of oil, gas and geothermal resources through several provisions of the Texas Natural Resources Code and the Texas Water Code. The U.S. Environmental Protection Agency delegated authority to the Railroad Commission to administer an underground injection control program through the Safe Drinking Water Act, regulating injection wells associated with oil and gas operations. Statewide Rules of the Oil and Gas Division pertaining to drilling, casing, cementing, and plugging wells, and Rules governing the use of surface impoundments are enforced to ensure protection of ground water resources.

Protection of ground water from surface mining activities is administered by the Railroad Commission under the Texas Surface Mining and Reclamation Act. The U.S. Department of the Interior's Office of Surface Mining administers the federal Surface Mining Control and Reclamation Act, which is the basis for the Texas rules and regulations.

Texas Department of Health

The Texas Department of Health is involved in ground water protection through activities and functions administered in three separate sections of the Department. These are the Division of Water Hygiene, Bureau of Solid Waste Management and Bureau of Radiation Control. Federal and state legislation establish authority and specify functions to be carried out in these three areas. The Federal legislation is the Safe Drinking Water Act, the Resource Conservation and Recovery Act, the Atomic Energy Act, and the Uranium Mill Tailings Radiation Control Act. On the state level, the empowering legislation is the Texas Sanitation and Health Protection Law, the Texas Solid Waste Disposal Act, and the Texas Radiation Control Act.

The regulatory programs in the Department impact ground water protection through the previously mentioned legislation in a number of different ways. The Department has established "Rules and Regulations for Public Water Systems" and "Drinking Water Standards." These rules specify construction and wellhead protection standards to protect wells and aquifers from contamination, and establish drinking water quality standards. The disposal of municipal solid waste is administered in a program which permits disposal sites via the Municipal Solid Waste Management Regulations. This permit application must address site selection and a design plan which minimizes possible contamination of ground water. Issues considered in the landfill design are in situ soil evaluation, liner construction, and monitor well testing. Sources of radiation are controlled by a

program which requires licensing of radioactive materials; devices that produce radiation or use radioactive materials; and operations that process, store, or dispose of radioactive materials. Ground water is directly impacted by in situ and surface mining of uranium. For such operations, the Department enforces radiological standards for in situ aquifer restoration, and requires monitoring of by-product material (mill tailings) disposal. The Department also regulates the use of radioactive materials in well logging and subsurface tracer studies.

Since September 1, 1989, the Texas Department of Health (TDH) has been permitting and inspecting new on-site sewerage disposal systems (OSDS) in counties without approved waste control orders.

New or repaired OSDS must be installed in accordance with TDHs "Construction Standards for on-site Sewerage Facilities", which were revised on January 1, 1990. The TDHs authority also requires that all installers and inspectors of OSDS be trained, tested and licensed.

Texas Department of Agriculture

The Texas Department of Agriculture's role in the protection of ground water is to ensure compliance with federal and state laws and regulations relating to pesticide distribution and use through its pesticide enforcement program. Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Department has primary enforcement responsibility for pesticide use violations. In addition, under the Texas Agriculture Code the Department is responsible for regulating distribution and use of pesticides in the state.

Texas State Soil and Water Conservation Board

The Texas State Soil and Water Conservation Board was created by the Texas Legislature in 1939. The Soil and Water Conservation Board is charged with the overall responsibility for administering and coordinating the state's soil and water conservation programs with the state's soil and water conservation districts.

The agency's primary responsibility with regard to ground water protection involves planning, implementing, and managing programs and practices for abating agricultural and silvicultural nonpoint source pollution. The Board has been an active member of the Committee, and had a major role in the development of the draft plan for agricultural chemicals in ground water. At present, the Soil and Water Conservation Board is developing a monitoring program to assess the extent of agricultural and silvicultural nonpoint source pollution to surface or ground water and is in the process of establishing and implementing a state wide management program to address these potential sources of water pollution.

Texas Groundwater Conservation Districts Association
(Underground Water Conservation Districts)

The Texas Groundwater Conservation Districts Association is the umbrella organization for special purpose districts, known as underground water conservation districts, created by the Legislature or by the Texas Water Commission with the purpose and responsibility to preserve and protect ground water. There are presently 32 water conservation district located around the state. These districts are local or regional in their jurisdiction and have, for the most part, elected boards of directors. Among their legislatively granted authorities is the power to monitor ground water quality. A number of districts

also have the authority to bring civil court proceedings for injunctive relief against an entity causing ground water contamination.

Ground water protection programs that are typical of most districts include water quality monitoring, water quantity studies involving use and depletion, well registration and permitting, well construction standards and water conservation efforts. A number of districts have also been active in the state's Wellhead Protection program.

INTRODUCTION

Background

Ground water is an important resource in Texas because of its wide availability and the extent of its use. In recent years competition for ground water supplies and the greater potential for contamination has made Texas aware of the vulnerability of its aquifers. Both state and federal programs are in place which provide ground water protection. These programs, however, have been oriented towards contaminant sources rather than the ground water resource itself.

In March of 1985, the Texas Department of Water Resources, predecessor to the Texas Water Commission and to the Texas Water Development Board, received a grant from the U.S. Environment Protection Agency (EPA). One of the purposes of this grant was to improve coordination of ground water protection activities undertaken by state agencies. In response to this federal mandate, the Ground Water Protection Committee was created to address the issue of ground water resource protection. The Committee consisted of fifteen members representing five state agencies whose programs affected ground water. The agencies represented included the Texas Water Commission, the Texas Water Development Board, the Railroad Commission of Texas, the Texas Department of Health, and the Texas Department of Agriculture. The Committee's goals were to delineate the current status of state agency administered ground water protection programs, establish better coordination of these activities, and develop a comprehensive strategy for addressing ground water protection in the state.

Purpose and Scope

This document was prepared in response to the Fiscal Year (FY) 1991 ground water protection work plan as funded under Section 106 of the Clean Water Act. The document describes the state's comprehensive ground water protection

strategy as it applies to the elements of EPA's Comprehensive Ground Water Protection Plan (CGWPP), and profiles the state agencies which are responsible for ground water protection in Texas.

Ground Water Resources

Ground water is an important resource in Texas, and provides a major source of usable water. Approximately 81 percent of the state's surface area is underlaid by a major and/or minor aquifer, Figures 1 and 2. A major aquifer is defined as one producing large quantities of water in a comparatively large area of the state, whereas minor aquifers yield large quantities of water in small areas or relatively small quantities of water in large areas of the state. Minor aquifers are especially important in Texas as they constitute the only significant source of water supply in some regions.

During 1988, the major and minor aquifers furnished about 50 percent of the total state water requirements, or about 7 million acre-feet of the total annual need of 14 million acre-feet. The average annual ground water pumpage from the major and minor aquifers was projected to range from approximately 6.7 million acre-feet in 1990 to 5.7 million acre-feet through the year 2030.

The quality of ground water in the state is generally good; however, some localized areas have been impacted by nonpoint sources (NPS) of contamination or by noncompliant waste disposal activities. This has caused some localized area of pollution immediately around the source but no resulting aquifer-wide quality problems. The susceptibility of an area to ground water contamination depends in part on the hydrogeologic setting. If ground water does become contaminated, it is extremely difficult to clean up. Therefore, the state's non-degradation philosophy and regulatory approach is to prevent contamination from occurring.

Current data suggest that pollution generally is confined to the most heavily populated and industrialized areas of Texas. Some isolated local cases of ground water contamination have also been found in many other parts of the state. Unfortunately, in many cases ground water contamination is not discovered until after a drinking water source has been affected.

At present, it is not thought that the usefulness of ground water has been appreciably reduced statewide. Based on limited data, it is estimated that probably less than one percent of the state's ground water resources has been affected by anthropogenic sources of contamination. Generally, the state has adopted regulations which will effectively reduce future pollution, although past practices continue to cause concern. It is difficult to prioritize areas or practices of concern, however, based on best professional judgement, improperly completed and abandoned water wells, septic tanks, industrial wastewater impoundments, underground storage tanks, municipal sanitary landfills, and agricultural chemical application are considered to be of major concern. Programs addressing these areas of concern have been developed and are being implement.

State Ground Water Protection Policy

The passage of House Bill 1458, by the 71st Texas Legislature formally established the state's Groundwater Protection Policy, codified in Chapter 26 of the Texas Water Code. Chapter 26 states that **"consistent with the protection of the public health and welfare, the propagation and protection of terrestrial and aquatic life, the protection of the environment, the operation of existing industries, and the maintenance and enhancement of long-term economic health of the state, it is the goal of the groundwater policy in this state that the existing quality of ground water not be degraded. This goal of nondegradation does not mean zero-contaminant discharge".** The Ground Water Protection Policy of the state also

states that "**discharges of pollutants, disposal of wastes, or other activities subject to regulation by state agencies be conducted in a manner that will maintain present uses and not impair potential uses of groundwater or pose a public health hazard**". The Policy also recognizes the important role of the use of best professional judgement of state agencies in attaining the goal and policy of the state, (Appendix A).

Texas Groundwater Protection Committee

In addition to the pronouncement of the state's formal ground water protection policy, the stature of the Ground Water Protection Committee was formally elevated by the passage of House Bill 1458 which created the Texas Groundwater Protection Committee and gave the Committee statutory standing under Chapter 26 of the Texas Water Code (Appendix B). The Texas Groundwater Protection Committee's membership is composed of the chief executives of the Texas Water Commission, the Texas Water Development Board, the Railroad Commission of Texas, the Texas Department of Health, and the State Soil and Water Conservation Board, the deputy commissioner of the Department of Agriculture, and a representative selected by the Texas Groundwater Conservation Districts Association. The Texas Water Commission (Commission) is designated as the lead agency and the Commission's Executive Director is designated as the Committee's Chairman with the Executive Administrator of the Water Development Board designated as the Committee's Vice-Chairman.

The duties of the Committee, on a continuing basis are to: improve coordination of state agency administered ground water protection programs; update a comprehensive ground water protection strategy for Texas which will more fully integrate the activities of the different state agencies and provide guidance in areas of ground water protection not already regulated; and study and recommend to the Legislature, ground water protection programs for each area in which

ground water is not currently protected. The Committee has developed and published a compilation of state agency ground water protection activities and a Ground Water Protection Strategy as well as an annual joint ground water monitoring and contamination report based on the activities of the Committee member agencies. This includes the activities of the Texas Water Well Drillers Board.

State Ground Water Protection Strategy

The passage of House Bill 1458 which created the Texas Groundwater Protection Committee also required the Committee to "**develop and update a comprehensive ground water protection strategy for the state that provides guidelines for the prevention of contamination and for the conservation of ground water and that provides for the coordination of the ground water protection activities of the agencies represented on the committee.**"

The Texas Ground Water Protection Strategy (GWPC, 1988) was originally developed by the Ground Water Protection Committee which was the predecessor committee to the Texas Groundwater Protection Committee. The strategy was preceded by the compilation of existing ground water programs published by the predecessor committee and titled Texas Ground Water Protection Activities - 1986 (GWPC, 1986). The original strategy was developed by six subcommittees consisting of committee members, agency staff, and interested parties. Upon completion of a review and comment period the Texas Groundwater Protection Committee decided to adopt the original Texas Ground Water Protection Strategy with the addition of an update of the status of current strategy implementation. Texas has developed and implemented many comprehensive programs that are effective in protecting the state's ground water resources. These programs are fragmented among several agencies. Coordination of these programs is of utmost

importance if the state's ground water protection strategy is to achieve success. The goals of the Strategy as implementation by the Committee are: **the protection of ground water in the state; the development and improvement of protection programs for areas not currently regulated; the coordination of the state agency, local and federal efforts toward ground water protection; and education of the public about the importance of ground water and ground water protection.**

The Texas Groundwater Protection Committee intends for the strategy to be a flexible guide for state agencies and others in developing and implementing ground water protection efforts. While different state and federal programs are in place which afford protection efforts, the Committee believes that there may be opportunities for improvement in some of these areas. Through the strategy, the Texas Groundwater Protection Committee is working to outline goals, needs, and recommendations in the areas of: Interagency Coordination; Hazardous and Non-Hazardous Materials Management; Public Water Supply; Rural Water Supply; Agricultural Chemicals Management; Research; and Legislation.

COMPREHENSIVE STATE GROUND WATER PROTECTION PROGRAM

As previously stated, this document was prepared in response to the FY 1991 ground water protection work plan funded under Section 106 of the Clean Water Act. The purpose of this document or "**profile process**" is to allow the state the opportunity to "**identify and describe which elements of a Comprehensive Ground Water Protection Plan (CGWPP) it has underway and which are missing**". Guidance material provided by EPA to assist in developing this profile

indicate that the elements of a CGWPP are categorized into four major areas. These are:

- **SETTING GOALS AND DOCUMENTING PROGRESS;**

- **CHARACTERIZING THE RESOURCE AND PRIORITIZING ACTION;**

- **DEVELOPING AND IMPLEMENTING CONTROL PROGRAMS; AND**

- **DEFINING ROLES WITHIN THE STATE AND THE RELATIONSHIP TO FEDERAL PROGRAMS.**

Each one of these categories will be discussed separately with the applicable state goals, activities, programs, strategies, etc., summarized accordingly.

SETTING GOALS AND DOCUMENTING PROGRESS

Ground Water Protection Goal

The ground water protection goal in Texas is to prevent degradation of the existing quality of the state's ground water. The Ground Water Protection Policy of the state was created by the passage of House Bill 1458 by the 71st Texas Legislature and codified in Chapter 26 of the Texas Water Code. The specific language of this policy can be found in Appendix A.

Implementation of the state's ground water protection policy is carried out under the direction of the Texas Groundwater Protection Committee. Through the guidance of the Committee, the state's protection policy is coordinated among member agencies.

The state's policy of nondegradation is perhaps the single most important mechanism for preventing contamination of ground water. Protection of the overall resource can best be achieved by preventing contamination. Non-degradation does not mean zero contaminant discharge; however, it does mean that discharges of pollutants, disposal of wastes, or other activities subject to regulation by state agencies will be conducted in a manner that will maintain present uses, not impair potential uses or pose public health hazard, and that the quality of ground water will be restored if feasible.

Protection, under this concept, is based primarily on water quality criteria related to use. In the past, an informal ground water classification was used to guide best professional judgement of regulatory agencies in authorizing contaminant-producing activities and in remediation of contaminated ground water. A formal Ground Water Classification System has now been developed by the Texas Groundwater Protection Committee. The Committee has recommended that member agencies adopt this classification system and use it in the implementation of the state's ground water protection policy. The formal Ground Water Classification System is contained in Appendix C.

Evaluation Mechanism

The state's ground water protection policy is implemented via the Texas Ground Water Protection Strategy. The main elements or goals of the state strategy are the protection of ground water in the state; the development and improvement of protection programs for areas not currently regulated; the coordination of the state agencies with local and federal efforts toward ground water protection; and public education concerning the importance of ground water and ground water protection.

The implementation of the state strategy is coordination among state agencies by the Texas Groundwater Protection Committee. The Committee was charged by the Texas Legislature with the duty of developing and updating a comprehensive ground water protection strategy that not only provided guidelines for the prevention of contamination and for ground water conservation but also for coordinating the ground water protection activities of member agencies.

The Texas Ground Water Protection Strategy is reviewed and updated by the Committee as needed to keep the strategy up-to-date with ever changing state and federal mandates. On a biannual basis corresponding with the convening of the Texas legislature, the Committee submits a report to the Governor and the legislature which describes the activities of the Committee. Contained in the report to the legislature are specific recommendations concerning program improvements and funding.

A number of methods are used by the Committee to measure progress towards the goals set forth in the state strategy. A primary source is individual agency program implementation and report generation. A number of programs such as the Wellhead Protection program and the Nonpoint Source Management program have specific annual goals built into their workplans. EPA year end reviews are used by the Committee to monitor progress. The Committee also prepares a Joint Groundwater Monitoring and Contamination Report on an annual basis which describes the status of ground water monitoring programs, describes ground water contamination cases, and describes the enforcement status of documented contamination cases.

As previously stated, the Committee's biannual report to the legislature contains recommendations for program funding. The extent to which specific programs are implemented and the timetable for this implementation are dependent upon the availability of funding.

Public Participation

The meetings of the Texas Groundwater Protection Committee are open to all interested parties. The time and place of the Committee's meetings are published in the Texas Register so that interested parties can attend and comment on areas of interest.

Most public education efforts addressed by the Strategy have been implemented on an individual agency or program basis. The development of a coordinated and comprehensive public education program remains an important goal of the Committee. Recent efforts in the Nonpoint Source Management program and the Wellhead Protection program have been major steps toward improved public education. These efforts have included an annual ground water protection seminar sponsored by the Water Commission for local officials and the interested public and coordinated work among participating agencies in the development of ground water protection information and dissemination of information at local ground water protection seminars. Public education efforts have been expanded from the traditional ground water agencies to include the Agricultural Extension Service, the State Soil and Water Conservation Board, and Area Councils of Government.

CHARACTERIZING THE RESOURCE AND PRIORITIZING ACTION

Resource Assessment

In order for the state's goal of ground water protection to be achieved, those agencies responsible for ground water protection must first be aware of the extent of the resource, and how the resource can be affected by sources of contamination.

Many organizations have contributed to the current amount of knowledge available on the ground water resources of Texas. These include all levels of government, businesses, and individuals. The largest portion of this information is included in county-level ground water reports prepared by the U.S. Geological Survey and state water agencies, the Texas Water Development Board and the Texas Water Commission and their predecessors. The recently completed Geologic Atlas of Texas by the Bureau of Economic Geology has greatly aided ground water studies by locating outcrops of the formations that comprise aquifers. Data such as this are used by state agencies and local entities in ground water protection, planning, and management activities.

Nine (9) major and twenty (20) minor aquifers have been delineated in Texas. The recharge zone, and the underground extent of usable water within these aquifers have been mapped by the Texas Water Development Board, (Figures 1 and 2). This information is useful in ground water protection as management techniques may vary from one aquifer to another. On a more local level, a number of the state's underground water conservation districts publish maps which are the result of the district's water level and water quality monitoring programs. These data are used in monitoring conservation efforts and in establishing ambient water quality.

The Texas Groundwater Protection Committee has adopted a formal Ground Water Classification System. This system, based on total dissolved solids content, (Figure 3), is intended to be implemented by member agencies as an integral part of their ground water quality programs. The ground water classification system applies to all ground waters in the state. Through classification, ground water can be categorized and protection or restoration measures can then be specified by member agencies according to the quality and present or potential use of the resource. In addition to its response setting function, the classification system can also serve as a common basis among the various state programs to foster

consistency. It can also be used as a mapping tool to delineate specific areas in need of detailed ground water quality management.

As part of its statewide ground water assessment and protection program, the Texas Water Commission has adopted the DRASTIC system for use in assessing aquifer vulnerability to ground water pollution. The DRASTIC system is a methodology which involves delineation of hydrogeologic settings and analysis of data to develop an index number which represents the sensitivity of that setting to ground water pollution potential. The Texas Water Commission has completed initial vulnerability mapping of the state using the DRASTIC methodology. Through interagency coordination, it is hoped that DRASTIC will be used as a tool to assist agencies in setting priorities with regard to ground water protection and monitoring as well as for planning and land management.

The State of Texas, through the cooperative efforts of the Water Commission and Texas Department of Health (TDH) implements and EPA approved Wellhead Protection Program, (WHP). Wellhead protection is a key element of ground water pollution abatement because it provides an opportunity for local government to become involved immediately and to directly administer regulatory functions that may be appropriate. The basic concept of the WHP program is the minimization of land use restrictions while utilizing best management practices to maximize ground water protection and prevent contamination. To accomplish this, the TWC and TDH provide technical guidance and assistance to local government in the areas of contingency planning, system design, WHP area delineation and contaminant inventory. In addition, the TWC and TDH sponsor and conduct public education relating to WHP. Local governments provide an inventory of all potential sources of contaminants within their WHP areas, then implement a protection program. The involvement of local government as an equal partner in the control of potential sources of contamination is an integral part of a successful WHP program.

The Edwards aquifer in the San Antonio area was designated by the EPA in 1975, as the first sole source aquifer in America. A sole source aquifer is an aquifer that serves as the principal source of drinking water for an area and which, if contaminated, would create a significant hazard to public health. The portion of the Edwards aquifer in the Austin-Barton Springs area has also been designated a sole source aquifer (1988). The sole source aquifer program is a federal program that has not been delegated to individual states. The state of Texas has had in place since 1970, rules which strive to preserve the quality of water in the Edwards aquifer. The Edwards Aquifer Rules, now administered by the TWC, complement the federal program by independently addressing and reviewing many surface development activities with ground water contamination potential. The purpose of the review is to permit development while mitigating the potential for point and nonpoint ground water contamination over the Edwards aquifer recharge zone.

In addition to the "Edwards Rules", the TWC has chosen the Edwards aquifer to serve as the pilot project for the TWCs Regional Aquifer Protection Program. This program will apply the principles of the Wellhead Protection Program on a regional aquifer protection basis. The potential exists to expand this program to other aquifers around the state.

The assessment of ground water quality in Texas is carried out through a variety of activities. Many regulatory agencies require ground water monitoring to assure compliance with guidelines and regulations and to protect ground water from discharges of contaminants. Agencies including the TWC, the Railroad Commission of Texas (RCT), the Texas Department of Agriculture (TDA), and the TDH monitor ground water at site-specific, regulated waste-handling or disposal facilities or in connection with other activities that may affect ground water. The Texas Water Development Board, (TWDB), conducts statewide ambient monitoring using 8,000 water-level and 6,000 water quality observation wells. A function of

the TDH is also the routine sampling of the state's public water supply wells. In addition, the Texas Bureau of Economic Geology collects ground water data on a project basis. The U.S. Geological Survey also has monitoring programs on a project basis in certain areas of the state. Some underground water conservation districts have monitoring programs and share their data with the TWDB.

State agency publications such as Ground Water Quality of Texas - An Overview of Natural and Man-Affected Conditions, (TWC, 1989); Water for Texas - Today and Tomorrow, (TWDB, 1990); Chemical Analysis of Public Water Systems, (TDH, 1990); and the Joint Groundwater Monitoring and Contamination Report, (TGWPC, 1990), are examples of how the state utilizes ground water data generated from a number of sources.

The Texas Water Commission is the principal state agency responsible for implementing programs to prevent, control, and abate surface water pollution. In addition to the TWC, state agencies with regulatory authority also have the authority to prohibit activities under their jurisdiction from discharging contaminants into the state's waters. Routine surface water quality monitoring is primarily carried out by the TWC, the TWDB through contracts with the USGS, state river authorities and the Texas Parks and Wildlife Department. The U.S. Geological Survey, in cooperation with the TWDB and other local units of government have conducted studies in sections of the state to determine the impacts of mineralized ground water on the state's surface water.

The Texas Water Commission and the Texas Water Development Board rely on the USGS for considerable ground water information. The USGS provides basic data reports as well as regional aquifer studies. Funding for many of these studies have been provided by either the TWC or the TWDB.

The development and implementation of ground water resource assessments has been underway in Texas for some time. Further development and implementation of these assessments is dependent on the availability of resources.

Contaminant Source Identification

Texas state agencies, which have EPA-delegated authority to conduct federal programs, rely on the EPA to provide a list of contaminants and to establish maximum contaminant levels (MCLs) or health advisory numbers when no MCLs exist. The state also relies on EPA to update this list of contaminants as needed to keep programs current.

The Drinking Water Standards which apply to public water systems are set by the TDH and cover primary and secondary standards. The primary standards are health related standards. They cover such parameters as inorganics, organics, radiochemical constituents, and bacteriological constituents. The standards were adopted pursuant to the National Interim Primary Drinking Water Regulations established by the EPA under the authority of the 1974 Safe Drinking Water Act (SDWA). For the most part, these standards originated from the 1962 U.S. Public Health Service Standards.

The Texas Water Commission, in coordination with the Texas Groundwater Protection Committee has completed and published an assessment of the impacts of nonpoint sources (NPS) of pollution on ground water and a management program for abating those impacts. Implementation of the management program is underway with efforts focused in two main areas, ground water public supply systems and agricultural chemicals usage. The potential impact of NPS pollution on public water supplies is being address through the Wellhead Protection program, (WHP), in which sources of contamination are identified and controlled within a predetermined area around public supply wells. NPS pollution in rural,

predominantly agricultural areas, will be addressed in a statewide agricultural chemicals strategy currently under development. A draft Generic state Management Plan for Agricultural Chemicals in Ground Water, prepared by the Texas Groundwater Protection Committee, is currently undergoing review.

Potential sources of ground water contamination which might pollute a public water supply well include septic tank effluent, leaking underground storage tanks, commercial and industrial pollutants, accidental spills, etc. The emphasis is placed on the identification of facilities in the vicinity of a public supply well that may store or generate these types of contaminants. Local governments which participate in WHP program are encouraged to reinventory contaminant sources every two-to-five years.

The state Management Plan for Agricultural Chemicals in Ground Water, when implemented, will address aquifer vulnerability, agricultural chemical contamination potential, and specific pesticide plans. Efforts are currently underway, under the supervision of the Groundwater Protection Committee, to identify those agricultural chemicals which represent the greatest contamination potential to ground water. In addition to this agricultural contaminant source list, ground water quality, pesticide, and agricultural use data are being compiled as well as the development of a ground water pesticide data base. A barrier to the development of an agricultural contaminant source list, especially for pesticides, is the lack of available data concerning their use history.

Setting Priorities

As noted in previous sections of this report, the Texas Groundwater Protection Committee has developed a formal Ground Water Classification System, (Appendix C), and has recommended that member agencies adopt this classification for use in determining protection or restoration measures. The

classification system is intended to be implemented by member agencies as an integral part of their ground water quality programs incorporating priorities established in state and federal statutes.

The state's classification system applies to all ground waters in the state. It is recognized that there are ground waters in this state that do not fall within the mapped major or minor aquifers but which either are, or are capable of, being put to beneficial use. It is the goal of the ground water classification system to protect these waters for present and future use and require cleanup of such waters on a case-by-case basis, using best professional judgement. When considering the appropriate level of protection or cleanup, the responsible agencies will consider yield, the availability of alternative sources of water, possible hydrogeologic interconnections between aquifers and with surface waters, any naturally occurring concentrations of background constituents, and traditional and potential beneficial uses of the water.

The ground water classification system recognizes two response levels for purposes of assigning the protection or restoration measures that are commensurate with the potential to impact human health and the environment. These response levels are as follows:

- Level I response for the fresh, slightly saline and moderately saline classes should be based on the current or potential use as a human drinking water supply.

- Level II response for the very saline to brine class should be based on indirect exposure (i.e., by means other than drinking) or no human consumption.

Under the state's nondegradation policy, no contaminant sources would be exempt or excluded from the Ground Water Classification System's priority setting process.

Data Management, Monitoring and Research

Ground water monitoring is essential in determining the current status of the state's ground water resources and in effectively managing these resources for beneficial use. Several state regulatory agencies require ground water monitoring to assure compliance with guidelines and regulations and to protect ground water from discharges of contaminants. There are eight (8) programs in five (5) agencies monitoring over 6,896 facilities in Texas for changes in ground water quality. Each agency or specific regulatory program that requires monitoring has its own monitoring program requirements and procedures. Criteria used to assess the need for ground water monitoring and the specific parameters that will be monitored varies among the regulating entities. Some agencies do not have specific regulatory functions which would be served by ground water monitoring programs, but may have responsibilities requiring the monitoring of ambient or existing ground water conditions for purposes of planning and research. Agencies or entities such as the Texas Water Development Board, (TWDB), and underground water districts conduct project-specific and long term ground water monitoring to determine ambient ground water conditions and to track water quality changes over time.

Monitoring includes measuring changes in water levels, which are indicative of changes in ground water storage, and measuring water quality through the analysis of samples collected periodically from wells. Water quality data may be parameter specific or the sampling may be directed at identifying general changes in quality. Monitoring at regulated facilities is often parameter specific, while data collected for ambient monitoring normally focuses on the common inorganic

ions. Until recently, ambient water quality sampling did not target the presence of certain contaminants such as organics, heavy metals, and pesticides. Sampling for these parameters has now been incorporated into a number of ambient monitoring programs.

As a result of the development and implementation of the state's Nonpoint Source Assessment and Management Plan, several state agencies have either expanded their monitoring programs or implemented new monitoring targeted at identifying nonpoint source pollution. The TWDB has increased the scope of its monitoring to include sampling for synthetic organic and radioactive constituents and, in some areas, pesticides. The TDH has also expanded its public water supply well monitoring program. The TWC and TDA have conducted agricultural chemical specific sampling in several areas of the state. The Texas Groundwater Protection Committee also publishes an annual report titled Joint Groundwater Monitoring and Contamination Report which describes the current status of ground water monitoring programs of participating agencies.

EPA requires a Quality Assurance (QA) program for each of the pollution control regulatory activities which have been delegated to the state. QA programs are established to assure the accuracy of data collected, analyzed and recorded. Such programs involve collection procedures, transportation of samples to laboratory for analysis, laboratory procedures, reporting, and data storage. It is the state's responsibility on an agency-by-agency basis to involve any regulated entities that conduct self reporting in QA. The Texas Water Commission has developed an overall agency QA program and additional programs for its EPA-delegated activities. The Texas Water Commission also conducts inspections of laboratories which are utilized under Commission contract.

Ground water monitoring data generated by state agencies are maintained by the Texas Natural Resources Information System (TNRIS). TNRIS functions under

the guidance and direction of the TNRIS Task Force which includes Groundwater Protection Committee member agency representatives. Staff and computer support are provided by the TWDB. TNRIS provides available natural resource information to state, federal, regional, local and private entities, (Figures 4 and 5).

An integral component of the state agricultural chemicals plan is the development of a pesticide specific database. This database will allow a more efficient compilation of agricultural chemicals data generated by protection committee member agencies.

The principal barriers to continued development of data management, monitoring and research in the area of ground water protection is lack of resources. Increasing the number of monitoring wells and the types of analysis performed is very expensive. Computer software which is used to maintain this data becomes obsolete at an ever increasing pace.

DEVELOPING AND IMPLEMENTING PREVENTION AND CONTROL PROGRAMS

Source Elimination

Once ground water has become contaminated, it is very difficult and expensive to clean up. The best way to maintain ground water quality is to prevent contamination in the first place. The state's policy of nondegradation is perhaps the single most important mechanism for preventing contamination of ground water. Nondegradation has not meant, and should not mean, zero contaminant discharge; however, it does mean that the state will protect its ground water resources. The goal of state regulatory agencies is the prevention of contamination, either through the elimination of the potential source, or through the regulation of activities that have the potential to contaminate ground water.

Adequate controls on point and nonpoint sources of contamination are an integral part of the State's ground water strategy. There are currently programs at the state and federal level which regulate point sources of contamination such as industrial and municipal landfills, wastewater impoundments and discharges, mining sites, and injection wells. Through the permitting process, regulatory programs can require specific pollution prevention design criteria. Pollution prevention criteria vary from program to program and are based on site specific data and the use of best professional judgment. The goal is that the design and operation of a regulated facility must be such that the degradation of ground water will not occur.

Nonpoint source (NPS) contaminants, however, are not generally regulated by these point source permit programs. Nonpoint sources include both urban and agricultural runoff, and other sources which act like nonpoint sources. Those sources, because of their great number, and dispersed or widespread occurrence, have been difficult to manage under existing state/federal regulatory programs. The Texas Groundwater Protection Committee, through the effects of the NPS Task Force has completed and published and assessment of the impacts of NPS pollution and has developed a NPS management plan designed to control and abate these sources through the use of best management practices(BMPs). "Best management practices" are voluntary actions or programs taken on by uses of the groundwater resource and those who control possible sources of contamination, which provide for the protection of individual wells, the conservation of water supplies, the proper disposal of waste materials, and the proper handling of materials which may become wastes. "Best management practices" are most effectively promoted through public education and technical assistance to local entities. Implementation of the NPS management plan is underway with efforts focusing primarily in two main areas, ground water public supply systems and agricultural chemicals use.

Another method of eliminating sources of ground water pollution is through the use of waste collection and recycling programs. The TWC has established a solid waste recycling program known as the Resource Exchange Network for Eliminating Waste (RENEW). The RENEW program was developed to promote the reuse and reclamation of solid waste materials. The goal of the RENEW program is to match up waste generators with recyclers. The TWC currently publishes a free bi-monthly document, RENEW Listings, which lists companies with available waste. In addition, the TWC is in the process of developing a Recycling and Product Directory to assist generators in locating business which recycle waste material, including hazardous waste.

In response to a legislative mandate passed by the 71st Texas Legislature in 1989, the Texas Water Commission, Texas Department of Agriculture, and the Texas Agricultural Extension Service jointly conducted a pilot project for the safe collection and proper disposal of waste pesticides. This pilot project entitled "Texas Pesticide Amnesty Day Program" was conducted during 1990 over a 65,000 square mile area of west Texas. The intent of the project was to encourage private agricultural producers who were storing small quantities of pesticide waste to bring those wastes to designated collection centers for proper disposal. Pesticide wastes which were collected were safely transported and disposed of at permitted hazardous waste disposal facilities located in Texas. As a result of the success of the pilot project, participating agencies have asked the Texas Legislature to provide funding for a statewide "Amnesty Day" collection program for waste pesticides.

Location Criteria (Siting and Transport)

state regulatory agencies in Texas do not currently have statutory authority to restrict land use. This power has instead been given to municipalities in the form of broad ordinance writing capabilities. The Wellhead Protection program relies

on these ordinance powers to impose some limited land use restrictions to deal with nonpoint sources of pollution. Examples of restrictions are the prohibition of septic systems and/or domestic water wells within the jurisdiction of a municipality where water and wastewater connections are readily available. An exception to the rule concerning state agency land use restrictions is the provision in the "Edwards Rules" which prohibits certain waste disposal activities on the recharge zone of the Edwards aquifer. This provision is specific to the Edwards, which has been designated by the federal government as a Sole Source Aquifer.

The state's programmatic siting criteria varies from agency to agency and from program to program. Site specific information and best professional judgement are used to determine the most appropriate siting criteria. Special attention is given to those facilities which are located on the recharge zone of one of the state's major or minor aquifers. The TWC has adopted the DRASTIC System for use in assessing aquifer vulnerability to ground water pollution. Regardless of the agency or program, the state's nondegradation policy concerning ground water protection requires that regulated activities will be conducted in a manner that will maintain present uses, not impair potential uses or pose a public hazard, and that the quality of ground water will be restored if feasible. Under Chapter 26.177 of the Texas Water Code, cities with a populating greater than 5,000 people are required to have in place a pollution control and abatement program, (Appendix D). This pollution control and abatement plan must be submitted to the Texas Water Commission for review and approval. Within the scope of this plan, cities are required to develop and maintain an inventory of all significant waste discharges into or adjacent to water within the city. This can include the city's Extra Territorial Jurisdiction (ETJ). Cities are also charged with the development and execution of reasonable and realistic plans for controlling and abating pollution or potential pollution that results from NPS discharges.

Permitting, Compliance Monitoring, and Enforcement Systems

Many different state and federal programs are in place which afford protection to ground water. Implementation of federal programs are generally accomplished by state agencies. Relevant federal statutes include the Safe Drinking Water Act, the Clean Water Act, Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund"), the Resource Conservation and Recovery Act (hazardous waste program), the Surface Mining Control and Reclamation Act, and the Insecticide, Fungicide, and Rodenticide Act. Relevant state statutes include the Texas Water Code, the Texas Solid Waste Disposal Act, the Texas Natural Resources Code, the Texas Sanitation and Health Protection Law, the Texas Radiation Control Act, the Texas Agriculture Code, the Texas Water Well Drillers Act, the Texas Surface Mining and Reclamation Act, and the Texas Coal Mining and Reclamation Act. A more specific breakdown of relevant federal and state statues and ground water protection programs can be found in the section of this report which profiles the ground water protection activities of individual state agencies and in Tables 1 and 2.

In addition to state and federal regulatory programs, the state also encourages non-regulatory ground water protection programs. As previously noted, many nonpoint sources (NPS) of ground water contamination fall outside of existing state and federal programs. Through the NPS management plan, state agencies have developed best management practices which are designed to control and abate NPS contaminants. The implementation of BMPs by local entities is on a voluntary basis, as is participation in the state's Wellhead Protection programs. BMPs are most effective when used in conjunction with public education and technical guidance programs. An integral part of the state's NPS and WHP programs is the annual ground water protection seminar sponsored by the TWC to assist local entities in developing ground water protection programs. BMPs are

also being developed to address agricultural chemical sources of contamination via the generic state management plan.

The state's nondegradation policy of ground water protection does not mean zero-contaminant discharges. It does mean that any discharges which are authorized by permit must be conducted in a manner which will not impair the present or potential use of ground water or pose a threat to human health or the environment. Should a discharge occur which adversely affects ground water quality, then the quality of the water must be restored if feasible. The extent of compliance monitoring and any enforcement actions taken in regard to permitted discharges is determined on a program and site specific basis. It is the goal of the Groundwater Protection Committee that the member agencies use the ground water classification system in determining protection or restoration measures.

Quality Standards

A very important issue at both the federal and state level is the use of ground water classification and numerical water quality standards. The Texas Groundwater Protection Committee has developed and adopted a formal ground water classification system based on water quality and present or potential use of the resource. The Committee has recommended that member agencies use this formal classification system in implementing their ground water protection programs.

The ground water classification system applies to all ground waters in the state. Through the use of the classification system, ground water in the state can be categorized and protected or restoration measures specified by member agencies according to the quality and present or potential use of the ground water, (Appendix C).

The state of Texas does not currently employ set statewide numerical water quality standards for the purpose of ground water protection. The Texas Department of Health has established primary and secondary Drinking Water Standards for public water supply systems. These standards are health related and have no ground water protection function. They cover such parameters as inorganics, organics, radiochemical constituents and bacteriological constituents. These standards were adopted in conjunction with the Safe Drinking Water Act. As a practical matter, numerical standards are currently used in some regulatory programs to aid best professional judgement in determining if contamination has occurred and to what level of water quality ground water can be feasibly treated. Standards are also used for program evaluation and as an enforcement trigger. In the TWC RCRA program, the detection standard is also the enforcement standard. Typically the background concentration of a contaminant in a particular aquifer is less than the detection level based on the majority of analyses for that constituent.

The goal of the state's ground water protection policy is to prevent degradation of the existing quality or ground water resources. The adoption of fixed statewide water quality standards could prove detrimental to achieving this goal as standards could be used to allow a certain amount of contamination and degradation to occur. The use of best professional judgement aided by programmatic numerical standards to prescribe levels of treatment, trigger enforcement action or remediation in conjunction with the state's ground water classification system provides the state with a flexible means of protecting ground water on a site specific basis.

REMEDIATION EFFORTS

Remediation Program and Standards

The state's ground water protection policy requires state agencies to conduct regulated activities in a manner that will maintain present uses and not impair potential uses of ground water or pose a public health hazard. The ground water protection policy also requires that the quality of ground water be restored if feasible. The extent to which contaminated ground water must be remediated is handled on a program-by-program basis in conjunction with applicable MCLs, health advisory figures, risk assessments, and the state's ground water classification system. Specific agency and program enforcement information can be found in the section of this report which profiles individual agencies.

DEFINING ROLES WITHIN THE STATE AND THE RELATIONSHIP TO FEDERAL PROGRAMS

State Roles

The state of Texas has been delegated authority by the EPA to implement all or parts of the Resource Conservation and Recovery Act, the Safe Drinking Water Act, the Comprehensive Environmental Response, Compensation, and Liability Act ("Superfund"), the Surface Mining Control and Reclamation Act, the Federal Insecticide, Fungicide, and Rodenticide Act, the Atomic Energy Act, and the Uranium Mill Tailings Radiation Control Act. The state coordinates closely with EPA concerning those programs or portions of programs which have not been delegated to the state.

The coordination of state regulatory agencies which have ground water protection responsibilities is accomplished by the Texas Groundwater Protection Committee.

The Committee which was given statutory standing by the Texas Legislature not only coordinates agency activities, but is also responsible for the continued development and implementation of a comprehensive state ground water protection strategy. The goal of this strategy is to ensure that the state's ground water protection policy is implemented. Coordination on ground water issues extends beyond state agencies to the federal government, the states bordering Texas, and to the Republic of Mexico. This coordination is necessary because aquifers do not respect political boundaries as do the programs and laws that attempt to protect them. It is the responsibility of the Groundwater Protection Committee to work with EPA to achieve a flexible state-oriented approach to groundwater protection.

Local Roles

In general, local entities currently play a passive role in ground water protection. In a few instances state agencies have delegated limited regulatory authority or a monitoring activity to local authorities. The best example is the cooperative efforts of the Texas Department of Health with local entities in the regulation of private sewage facilities. In this program, TDH has delegated the authority to permit and inspect private sewage facilities to certain county governments and river authorities. Programs such as the Wellhead Protection program and the Nonpoint Source program do and will rely heavily upon local entities for implementation.

Counties and cities are charged with protecting the public they represent. This can take the form of County Commissioners Courts or County Health Departments. Cities through their broad ordinance powers may adopt land use regulations to protect a sensitive aquifer recharge zone or to implement best management practices vital to the protection of a WHP area.

Special purpose districts which may be concerned with ground water include water supply districts, municipal utility districts, water control and improvement districts, soil and water conservation districts, and underground water conservation districts or "ground water districts." Parts of the state are included within the boundaries of 32 local and regional underground water conservation districts which play a role in ground water management, (Figure 6). Some districts have existed for decades, with boundaries encompassing substantial portions of the land overlying major aquifers. Others cover only a single county. Water districts can be a positive vehicle for local initiatives in ground water management. They can educate the public with regard to the need for, and opportunities for achieving water conservation and protection of water quality; provide technical assistance; monitor ground water for contamination; work to prevent depletion and contamination of the aquifers; and serve as a liaison between state government and local citizens with particular concerns. Water districts are represented on the Groundwater Protection Committee via the Texas Groundwater Conservation Districts Association.

state regulatory agencies provide information and limited technical assistance on request to local officials. Some special services are available. TDH works with municipalities and other entities in studying and alleviating radiological contamination problems. The TDH laboratory provides technical assistance and various types of water sample testing for a fee. The TWDB provides ground water availability information and works with ground water districts in well monitoring. The TWC sponsors an annual ground water protection seminar for local officials and the interested public for the purpose of disseminating ground water protection information.

Relationship With Other Federal Agencies

In general, state agencies responsible for ground water protection coordinate with various federal agencies as the need arises, or as programs are developed which require the development of formal Memoranda of Understanding, (MOU). State and federal coordination is necessary to clarify agencies jurisdiction and responsibilities in jointly administered programs and to avoid duplicative regulatory efforts as well to share technical expertise. Some examples of state and federal coordination/cooperation are as follows:

The Texas Groundwater Protection Committee is developing a generic state agricultural chemicals management plan in conjunction with the United States Department of Agriculture. The USDA is functioning as a formal advisor to the Committee.

The U.S.G.S. is conducting a study of the Trinity River Basin. The TWC is coordinating with the U.S.G.S. concerning the ground water resources of the river basin.

The Texas Department of Health-Bureau of Radiation Control in conjunction with the Nuclear Regulatory Commission reviews proposed remediation plans at Department of Energy funded Title I uranium mill tailings sites. In addition, the Bureau of Radiation Control also carries out environmental monitoring at other Department of Energy owned sites.

RESOURCES

The state uses a number of mechanisms to fund programs which deal with ground water protection. Many state agency programs are funded by General Revenue, (G.R.), which is appropriated by the state legislature. In addition to G.R. a

number of state agencies charge a fee for the issuance of permits, licenses, certifications, etc. Some of the revenue generated from these fees goes into the specific program which generated the fee, in other instances, the revenue goes back to G.R. Money generated by the Texas Railroad Commission for instance, through the issuance of permits to drill exploration wells, goes into a fund used to plug abandoned oil and/or gas wells when no responsible party can be found. Revenue generated from the licensing of water well drillers is used to provide staff for the Water Well Drillers Board Assistance Unit. A fee charged by the state to bulk distributors of gasoline is placed in the Petroleum Storage Tank Remediation Fund. This fund is used to pay the cleanup of contamination associated with petroleum storage tanks. The fund pays all allowable and reasonable costs over the deductible and up to one million dollars per occurrence.

state ground water protection programs are staffed by scientists from a number of technical disciplines. They include hydrogeologists, geologists, chemists, biologists, agronomists, and engineers. These scientists average from between 5 to 10 years of experience. In addition to scientists, a significant number of support personnel are associated with the state's ground water protection programs. In order for the state to fully implement all aspects of a comprehensive ground water protection program adequate funding must be made available. At present most state and federal ground water protection programs are reactive in nature. They deal with ground water contamination after it has already occurred. Preventative programs, those that deal with protecting the resource from pollution, such as the Nonpoint Source program and the Wellhead Protection program, require more funding than is currently available. Additional funding can also be used to facilitate more program consistency, improve data management and provide for the transfer of technology between agencies and from the state to local entities.

STATE AGENCY PROFILES
TEXAS WATER COMMISSION

Introduction

On September 1, 1985 the Texas Water Commission assumed primary responsibility for protecting Texas' water resources as mandated in Senate Bill 249 enacted by the 69th Legislature. This legislation abolished the Texas Department of Water Resources and transferred most of its functions to the Commission. The Commission's power and authority for ground water protection are based on a number of existing state and federally legislated statutes which include protection of ground water. The Environmental Protection Agency (EPA) has authority to provide substantial protection to ground water. Four federal laws administered in some degree by the Commission include: 1) Safe Drinking Water Act, 2) Resource Conservation and Recovery Act, 3) Comprehensive Environmental Response, Compensation and Liability Act (Superfund), and 4) Clean Water Act. State ground water protection legislation administered by the Commission includes: 1) Texas Water Code, 2) Texas Solid Waste Disposal Act and 3) Texas Water Well Drillers Act.

Additional authority delegated to the Commission is founded by an administrative act issued from the Office of the Governor. On January 20, 1986 the Governor formally designated the Commission as Texas' lead agency with respect to administration of grant funds associated with the Section 106 program of the Federal Clean Water Act. Funding for this program assists the Commission in developing the comprehensive ground water protection program for the state.

Federal Legislation

The Safe Drinking Water Act (SDWA) provides for the establishment by a state or the EPA of an Underground Injection Control (UIC) program to regulate subsurface injection of fluid which might endanger underground sources of drinking water. Regulations set minimum program requirements for states or the EPA to follow in regulating subsurface injection, including engineering, performance and monitoring guidelines for different classes of disposal wells. EPA has delegated authority to the Commission to administer its UIC program in lieu of the federal program for industrial and municipal activities. A UIC program for these activities has been implemented by the Commission.

In addition, the SDWA provides that the EPA may designate sole or principal source aquifers, which have been determined to be sensitive to contamination and which if contaminated would pose a public health risk, as Sole Source Aquifers. For a designated Sole Source Aquifer, no federal funds may be committed to a project if EPA determines that the project may contaminate the designated aquifer. Amendments in 1986 to the SDWA provide funds for sole source aquifer demonstration projects to state and local governments for ground water protection programs.

The Commission has received authorization from EPA under the Resource Conservation and Recovery Act (RCRA), as amended, to administer its hazardous waste program in lieu of the federal program. The RCRA program regulates the generation, transportation, treatment, storage and disposal of hazardous waste. Facilities regulated under the RCRA program must obtain a permit that requires compliance with specified performance standards relating to the protection of ground water.

The RCRA Program also includes the federal legislation for the Underground Storage Tank Program in Subtitle I. This subtitle became effective in 1985 in order to provide for the prevention, detection, and cleanup of leaks from underground storage tanks.

The Comprehensive Environmental Response, Compensation, and Liability Act (Superfund) authorizes the Commission and EPA to initiate an appropriate response to releases or threatened releases of hazardous substances. Such a response may include either an emergency response (removal) action or a more permanent remedial action, or both. Particular emphasis is placed on threats to ground water when they occur. The program partially finances remedial activities for the cleanup of sites on the National Priorities List, holds polluters liable for the costs of cleanups, and establishes a federal notification requirement for hazardous substances releases and a comprehensive program to assist the Commission's efforts to monitor the location of hazardous sites.

The Clean Water Act (CWA) under Section 106 provides funds to the Commission to develop statewide ground water protection strategies and management programs. The Commission acts as the lead agency in an interagency ground water protection coordination committee charged with the responsibility of developing and implementing the overall state ground water protection policy and strategy.

State Legislation

Chapter 26 of the Texas Water Code establishes a permitting program for point source discharges into or adjacent to water in the state, including ground water. The Commission is mandated to make and enforce rules for protecting and preserving ground water. Chapter 26 also authorizes state participation in the Federal Superfund Program.

Chapter 26 requires that all spills or discharges of oil or hazardous substances be reported to the Commission when such incidents affect or threaten to affect water in the state, including ground water. It establishes the Commission as the lead state agency in spill response and provides the authority to require removal of ground water threats. Chapter 26 created the Texas Spill Response Fund which may be utilized to provide a state authorized cleanup of a substantial ground water threat when no action is taken by the responsible person.

Chapter 26 also includes the laws concerning the Underground and Aboveground Storage Tank program. Subchapter I requires the Texas Water Commission to regulate the prevention, detection, and cleanup of releases that may threaten state waters.

Chapter 27 of the Texas Water Code (Injection Well Act) establishes a state Underground Injection Control (UIC) program that requires the Texas Water Commission to regulate injection wells used for the subsurface disposal of wastes or other fluids resulting from industrial and municipal sources, and for the solution mining of minerals except sodium chloride.

Chapter 28 of the Texas Water Code places a duty upon the owner of a water well that encounters salt water or water containing minerals or other substances injurious to vegetation or agriculture to plug or case the well in a manner that prevents contamination. Under authority of Chapter 28, the Commission has promulgated standards and procedures for the completion or plugging of such wells. In addition, Chapter 28 establishes a permitting program for the construction, operation, and decommissioning of drilled and mined shafts.

Chapter 52 of the Texas Water Code establishes procedures for the creation and administration of underground water conservation districts. Subchapter B allows the Commission, on its own motion or on receiving a petition, to designate and

delineate underground water management areas (districts). Subchapter C establishes a procedure for the identification, designation, and delineation of areas which are experiencing or may experience critical ground water problems such as water shortages, land subsidence, or contamination. This subchapter also provides for the formation of underground water conservation districts in proposed critical areas through Commission order subject to a confirmation election in the proposed district.

The Texas Solid Waste Disposal Act (TSWDA), V.T.C.S. Article 4477-7, establishes a permitting program for the transportation, storage, processing, and disposal of solid and hazardous wastes. The Texas Water Commission administers the program for industrial solid wastes and all hazardous wastes. The TSWDA also establishes a state superfund for remedial action at sites which are not eligible for federal funds.

The Texas Water Well Drillers Act, V.T.C.S. Article 7621e, created the Texas Water Well Drillers Board and requires the licensing of water well drillers. The Act also requires the Texas Water Commission to provide assistance to the Board and to promulgate procedures and standards for plugging water wells.

State Rules

Administrative rules are promulgated or adopted by state agencies in response to state legislative mandates. These rules provide more specific regulations for agencies to carry out their functions under the broader framework of enabling legislation. Texas Water Commission rules are codified in Title 31 Texas Administrative Code abbreviated as 31 TAC Chapter ____ with an identifying chapter number. Commission rules include 31 TAC Chapters 261 to 339 with chapters either program specific or specific to an administrative function such as applications processing or enforcement. Program-specific rules define regulated

activities and require permits or specify standards for regulation by rule. Program-specific rules also specify technical requirements which may include inventory, monitoring, reporting, and recordkeeping requirements. The chart titled State Program Authority lists authorizing state legislation and corresponding Commission rules (31 TAC Chapter) for each TWC-administered program involving ground water protection. Reorganization of the state water agencies resulted in the renumbering of some 31 TAC Chapter numbers for TWC rules.

Ground Water Policy

Ground water is one of the most important and essential resources of the state. It is the policy of the Commission to help ensure maintenance of the state's ground water quality through planning and education and cooperation with other state agencies and the public and private sectors. The Commission, as the lead agency for water resources, has the responsibility to coordinate the state's efforts to develop and implement the state ground water protection strategy through the efforts of the Texas Groundwater Protection Committee.

Ground Water Strategy

The Commission's strategy for the protection of the state's ground water resources is threefold: (1) continued administration of existing protection programs; (2) a commitment to coordinate and integrate these programs and those of other state agencies into a comprehensive and effective protection plan; and (3) a continued effort to work with citizens and local government to develop and achieve ground water protection goals.

More specifically, the Commission's present strategy is:

- Continue to administer and maintain existing and new ground water protection programs which are mandated by state legislation or delegated under federal authority;

- Cooperate with appropriate entities in monitoring ground water quality and availability within the state;

- Promote the identification and delineation of areas of the state facing critical ground water problems and encourage and assist the formation of underground water conservation districts by local and regional entities;

- Conduct in-depth investigations of alleged ground water contamination or conditions which threaten to cause deterioration of ground water quality;

- Make recommendations to industry and the Railroad Commission of Texas for protection of usable-quality ground water during exploration, production, plugging, and waste disposal operations related to oil, gas, or other minerals and surface mining activities;

- Cooperate with the Texas Department of Health in joint regulation of private sewage facilities and in situ uranium mining activities;

- Provide administrative and investigative support to the Texas Water Well Drillers Board, which has responsibility for developing and enforcing standards for the state's water well drillers, including licensing;

- Continue to enforce and to improve minimum well construction standards;

- Coordinate program activities with other state ground water related agencies through memoranda of agreement and the Texas Groundwater Protection Committee or similar committees whose responsibilities are to prevent contamination of the state's ground water resources.

- Encourage exploration of the feasibility of interstate and international cooperation in ground water management for water conservation and protection of aquifer recharge zones;

- Adopt special regulatory programs to protect sensitive aquifer recharge zones;

- Promote "Best Management Practices" through public education in order to encourage local government participation in ground water protection strategies; and

- Investigate funding mechanisms to finance state and local protection activities.

Ground Water Agreements

The Commission has entered into the following agreements with three separate state agencies to clarify jurisdiction and prevent duplication of effort:

- Memorandum of Understanding between the Commission and the Texas Department of Health to coordinate regulation of in situ uranium mining.

- Memorandum of Understanding among the Railroad Commission, the Department of Health, and the Commission concerning regulation of waste materials resulting from activities associated with the exploration, development, production, and refining of oil and gas.

- Memorandum of Understanding between the Department of Public Safety and the Commission to coordinate enforcement and investigations of industrial solid waste transportation.

Ground Water Protection Programs

1. Ground Water Standards

Hazardous and Solid Waste

The Texas Water Commission establishes ground water protection standards for hazardous waste land disposal facilities permitted under the RCRA program. When contamination is detected, the Commission specifies additional monitoring and investigation, designates numerical concentration limits for individual contaminants and specifies remedial action to be taken if the limits are exceeded. The principal purpose of the standards is to indicate the level of ground water contamination that triggers the need for corrective action measures. The standards also define the constituents that must be addressed in the Commission's compliance monitoring program. The standards can be based on site specific background concentrations, other established drinking water standards, or alternate concentrations that are protective of human health and the environment.

UIC - Solution Mining

An aquifer containing a source of usable quality ground water may be exempted from the federal Underground Source of Drinking Water (USDW) restrictions under the SDWA to allow the injection of fluids for the purpose of mineral extraction. Rules require that baseline or pre-mining water quality be determined prior to injection and that, upon completion of mining, the aquifer be restored to baseline conditions. During mining the production zone is surrounded by monitor wells that ensure containment of injected fluids.

Petroleum Storage Tanks

Commission rules require underground storage tank (UST) and aboveground storage tank (AST) owners and operators to take emergency actions to abate releases and cleanup and remediate any resulting environmental contamination. The Commission has established cleanup standards which focus on ground water, surface water and soil contamination. These standards are used as guidance and the degree to which they are applied is dependent on site specific conditions and the threat the site represents to human health and the environment.

2. Ground Water Contamination Protection

UIC

Waste Disposal Wells - The Commission's UIC program regulates the following: (1) municipal and industrial waste disposal wells; (2) wells which inject for solution mining of minerals such as uranium, potash, sodium sulfate, and sulfur;

(3) wells used to inject hazardous wastes into or above formations which contain underground sources of drinking water; and (4) other injection wells not included above or under the jurisdiction of the Texas Railroad Commission. Rules and permits require ground water protection, provide construction criteria for the setting and cementing of casings, require periodic testing for injection wells, provide technical criteria for plugging and abandonment, and require financial assurance for closure. Monitoring, recordkeeping, and reporting are required for permittees.

Solution Mining - Rules and permits require ground water protection and provide construction, operation, monitoring and reporting standards for solution mining activities. Standards for restoration of mined aquifers to pre-mining ground water quality and plugging and abandonment requirements are also specified. Aquifer exemptions allow the injection of fluids for mineral extraction.

Hazardous and Solid Waste

All RCRA facilities which store, treat, or dispose of hazardous waste on the ground must have a ground water monitoring system which is able to determine the quality of ground water at the perimeter of the waste management area. The ground water is checked for selected hazardous and nonhazardous constituents which, if detected in statistically significant quantities, would give early warning of the arrival of contamination. Once contamination is detected, the facility must notify the Commission and analyze samples from each of the local monitoring wells for over 200 possible waste

constituents. If contamination is verified, the facility must conduct a ground water assessment and submit an application for a compliance plan. The compliance plan will require a more extensive sampling and analysis program and a corrective action program to restore ground water quality to specified standards. Non-RCRA waste units located at a permitted hazardous waste site are also investigated for releases to ground water. Only if a release is confirmed, however, will additional monitoring and remediation be required.

Superfund

The Superfund program does not specifically address protection of ground water, except through notification of spills which may threaten ground water. The program is intended to achieve remedial cleanup, either returning contaminated ground water to acceptable quality levels, or minimizing further degradation of ground water quality through removal or control of the source of contamination.

Petroleum Storage Tanks

The Commission's PST program regulates the following: (1) underground storage tanks (USTs) which store petroleum substances and CERCLA-listed nonwaste hazardous materials; and (2) aboveground storage tanks (ASTs) which store certain motor-fuel type petroleum products. Commission rules require UST systems to be equipped with leak detection, corrosion protection, and spill/overfill prevention systems. If a release is detected, the PST facility is required to notify the Commission and abate the release of the product. The responsible party is required to initiate an assessment of the extent and degree of

subsurface contamination. If contamination is confirmed, a remedial action plan which presents the method of ground water restoration must be submitted to the Commission for review and approval.

Drilled or Mined Shafts

The Commission rules regulate the permitting, construction, operation and decommissioning of drilled or mined shafts not under the jurisdiction of the Texas Railroad Commission. Construction, use or operation of a new shaft is prohibited unless authorized by permit of the Commission. Any shaft penetrating a major or minor aquifer is subject to these rules and permits must include terms and conditions for ground water protection, including requirements regarding shaft construction, operation, decommissioning and corrective action to prevent ground water pollution.

Wastewater Discharge Permit Program

Applications for wastewater discharge permits are evaluated for the potential impact of surface impoundments and discharges on ground water. Recommendations are made in the permitting process which may include permit denial, stricter effluent limitations or lining of impoundments. Special provisions, which may require annual or quarterly sampling and reporting of ground water quality, are added to the discharge permit when the potential for ground water contamination exists.

Edwards Aquifer Protection

For delineated areas of the Edwards Aquifer Recharge Zone, direct wastewater discharges are restricted, a pollution abatement plan is required for all regulated developments, and special requirements are imposed on sewage collection lines and storage of hazardous substances and static hydrocarbons.

Water Well Protection

Rules require that drillers of water wells and certain types of injection wells, such as recharge wells and earth coupled heat exchange wells, be licensed and report the drilling, construction, and completion of wells they drill. The rules also specify minimum construction and plugging standards and require proper casing and sealing to prevent ground water contamination.

Assistance to Texas Railroad Commission

The Texas Water Commission assists the Railroad Commission in the following areas: (1) reviewing permit applications to the Railroad Commission and making recommendations for the protection of ground water for surface mining and for underground injection of oil and gas wastes; (2) providing information to the Railroad Commission, to the oil and gas industry, and to mineral exploration companies on the occurrence of usable-quality ground water for the purpose of protecting ground water resources during exploration for and production of oil, gas, and other minerals, and for the plugging of such holes; and (3) reviewing permit applications to the Railroad Commission and evaluate problems from the proposed use of fresh water for enhanced oil recovery.

3. Ground Water Data Collection

The Commission maintains computerized files containing monitoring data received from wastewater permittees, UIC program permittees, RCRA permittees and interim status facilities. The Central Records Center of the Commission's Administrative Services Division maintains files containing ground water data from the UIC program, the federal and state Superfund program, the RCRA program, ground water contamination investigations, and water well completion data as well as other Agency records. The Commission also collects and monitors over 270,000 logs furnished by water well drillers in compliance with the Texas Water Well Drillers Act; and an estimated 250,000 geophysical logs obtained from the petroleum industry. The Commission periodically publishes reports of its activities including ground water information and maintains an extensive water resources library in cooperation with the Texas Water Development Board.

4. Ground Water Enforcement

General

Enforcement action is a process by which regulated entities are directed to conduct action to remediate ground water contamination problems. All point-source incidents of ground water contamination are regarded as unauthorized discharges to the waters of the state, a violation of the Texas Water Code, Section 26.121. Voluntary notifications, complaints of discharges to ground water or non-compliance with permits, rules, or orders are first investigated by TWC inspectors who

then refer the entity for enforcement action. The TWC can address the referral by means of: administrative directives; compliance schedules; permit provisions; or TWC enforcement orders. Administrative penalties may be assessed, commensurate with the severity of contamination or degree of non-compliance. Integral to all enforcement action options are technical directives aimed at achieving three basic objectives:

- Prevention of the recurrence of contamination;
- Removal or containment of the source of contamination; and
- Remediation of ground water quality to specified standards, as appropriate to the situation.

UIC

Rules regulating underground injection activities provide for inspections by Commission staff and investigations of citizen complaints. The rules also require monitoring and reporting of UIC activities by the permittee. Violation of rules or permit may result in administrative directives, Commission orders or permit amendments, and civil, criminal and administrative penalties.

Hazardous and Solid Waste

Complaints from the public, voluntary notification, or reports from the Commission's district offices of discharges to ground water or noncompliance with permits or rules are investigated by Commission staff and then referred for enforcement action.

In addition, should ground water monitoring at a facility (required by rule and/or permits) indicate the presence of contaminants, then the facility is referred for enforcement action. Enforcement action may involve administrative directives, Commission orders and permit amendments, or civil, criminal, and administrative penalties. Hazardous waste sites subject to permitting can receive a compliance plan for long term monitoring and remediation programs. Initiation of investigations and interim remedial measures can occur with issuance of an enforcement order until superseded by a compliance plan. Solid waste sites not subject to permitting are addressed with an enforcement order. Other options include referral to the Superfund program or to the EPA for violation of federal requirements. The primary goal of the enforcement action is the removal or containment of the source of contamination and remediation of ground water quality.

Superfund

Contaminated sites referred from the Commission's district offices, EPA, local governmental entities, and individuals are evaluated and ranked according to degree of actual or potential hazard presented to the public health or the environment. High priority sites are referred to EPA for National Priority Listing (NPL). When the sites are listed, Commission Superfund staff petition EPA for federal funds for planning, site investigation, feasibility studies, design work, and remediation of the site. Sites not eligible for listing on the NPL are referred to the state Superfund Program for similar action with state funds. Entities determined to be potentially

responsible parties are subject to either federal or state enforcement action for recovery of costs in civil proceedings.

Petroleum Storage Tanks

Owners and operators of aboveground and underground storage tanks are required to report any suspected or confirmed releases. Rules further require owners and operators to abate the release and take corrective actions necessary to address the impact or threatened impact to ground water or surface water. An entity may be referred for enforcement if an investigation, review, or inspection by Commission personnel does not sufficiently demonstrate that the corrective action or any other activity related to the tank system are performed in accordance with the applicable requirements. Enforcement action may involve administrative directives, Commission orders and/or civil, criminal, and administrative penalties. In the event that the party responsible for the release is unknown, or is unwilling or unable to address the impact or threat of impact to ground water, the Commission has the authority to undertake corrective action with funds from the state Petroleum Storage Tank Remediation Fund (PSTR) or the federal Leaking Underground Storage Tank (LUST) Trust Fund.

Wastewater Discharge Permits

Violations of the Wastewater Discharge permit may be referred from the Commission's district offices, resulting from inspection or citizen complaint, or from Commission staff involved in the review of a permittee's self-reporting data pursuant to

requirements of Texas Water Code Chapter 5.117, and 31 Chapter TAC 305.126. Violations of the Texas Water Code, 31 TAC, orders or permits are subject to Commission orders to resolve technical issues and civil, criminal and administrative penalties.

Edwards Aquifer Protection

Rules provide for inspection of regulated developments and hazardous materials storage facilities by Commission staff. Referrals from the Commission's district offices and the public are investigated. Violations of the rules are subject to administrative actions, Commission orders, civil, criminal and administrative penalties. Rules regarding private sewage facilities are enforced by local health departments.

Emergency Spill Response

Releases of oil or hazardous substances that affect or threaten to affect ground water must be immediately reported to the Commission. The Emergency Response Unit and District Field Office staff investigate such incidents and provide direction for appropriate corrective actions. This area of authority regarding spills or discharges includes corrective actions to address leaking underground storage tanks, pipelines, etc. In the event that a party responsible for a release is unknown, or is unwilling or unable to remove a significant threat to ground water, the Commission has the authority to activate the Texas Spill Response Fund to be utilized to eliminate the ground water threat and to subsequently pursue recovery of state costs. Other areas of authority include the pursuit of

administrative directives and civil, criminal, and administrative penalties.

Water Well Protection

The Commission in cooperation with the Water Well Drillers Board responds to citizen complaint concerning water well problems. Any ground water contamination would be referred to the Commission for appropriate technical and enforcement evaluation. Failure of a water well driller to comply with Commission rules could result in disciplinary action including license revocation or civil and administrative penalties.

Drilled or Mined Shafts

Standard provisions include power of entry, power to examine records and civil, criminal and administrative penalties.

Ground Water Management Coordination

The Commission is designated by the Governor as the lead agency for ground water protection and receives federal funds to assist in the development and coordination of a statewide ground water protection program. The Commission administers the grant funds, provides staff support to the Texas Groundwater Protection Committee, and coordinates the efforts of a Ground Water Data Committee. Both Committees are made up of representatives from state agencies involved in ground water protection and data collection.

Public Participation

The Texas Water Commission conducts regularly scheduled meetings, which are open to the public, to consider permit applications, rulemaking, and other

business. Rulemaking activities of the Commission are also subject to public notice and comment. Public notice is given for all proposed wastewater, underground injection, and solid waste permits. The public has the opportunity to comment or to request a public hearing to discuss the draft permit or any of its provisions. All Superfund actions are subject to public hearing and comments prior to the final selection of a remedial alternative. Public input is solicited through the Superfund process.

The Texas Groundwater Protection Committee holds meetings that are open to the public. Public and environmental interest groups are notified of these meetings. Each year the Commission holds a public meeting on its ground water protection work program prior to submitting an application to the EPA for federal assistance. Substantive comments are incorporated in the work program.

The Commission conducted joint public meetings with the Texas Water Development Board to obtain public comment and input in order to begin the process of designating "critical" ground water areas in Texas. Further public meetings and evidentiary hearings may be conducted for specific areas should a critical ground water designation be proposed.

LEGAL AUTHORITY FOR PROGRAM IMPLEMENTATION
TEXAS WATER COMMISSION – FEDERAL PROGRAM AUTHORITY

Federal Legislation	Federal Regulations	Ground Water Programs
Safe Drinking Water Act (SDWA)	Underground Injection Control 40 CFR Parts 124, 144, 145, 146 and 147	Program regulates subsurface injection of waste and other fluids which can contaminate underground sources of drinking water.
	Sole Source Aquifer Designation 40 CFR Part 149	Program authorizing EPA to review federally funded projects for ground water impacts on aquifers designated as Sole Source Aquifers under the SDWA. In addition program provides funds for Sole Source demonstration projects at the state and local level for aquifer protection.
Resource Conservation and Recovery Act (RCRA)	Solid and Hazardous Waste 40 CFR Parts 260-271	Program regulates hazardous material generated from industrial waste which can contaminate ground water.
	Underground Storage Tanks 40 CFR Part 280	Program currently provides for the registration of underground storage tanks, installation and upgrading standards which require leak detection, corrosion protection, spill and overfill control, and corrective action measures when a release is detected.

TEXAS WATER COMMISSION -- FEDERAL PROGRAM AUTHORITY (CONT.)

Federal Legislation	Federal Regulations	Ground Water Programs
Comprehensive Environmental Response, Compensation and Liability Act (Superfund)	Superfund 40 CFR Parts 300-302	Under the National Contingency Plan the program authorizes the EPA and the state to respond to releases of hazardous materials which include remedial activities at sites on the National Priorities (NPL) and emergency response activities at listed or unlisted sites.
Clean Water Act Water Quality Act (Section 106)	Ground Water Protection Strategy 40 CFR Part 130	Program provides planning funds to assist states in developing a comprehensive ground water protection program.
Clean Water Act Water Quality Act (Sections 205 and 319)	Nonpoint Source Pollution Assessment and Management Plans	Provides funds for assessing nonpoint sources of pollution and implementing programs to prevent NPS contamination.

TEXAS WATER COMMISSION – STATE PROGRAM AUTHORITY

State Legislation	State Regulations	Ground Water Programs
Texas Water Code Chapter 26	Wastewater Discharge Permits 31 TAC Chapter 309 31 TAC Chapter 317	Establishes a permitting program for point source discharges into or adjacent to water in the state, including an evaluation of ground water impact and protection of ground water
Chapter 26	Superfund	Authorizes state participation in Federal Superfund program, including remedial cleanup of contaminated ground water.
Chapter 26	Emergency Spill Response	Designates the Commission as lead state agency for spill response (i.e., to direct cleanup) and established an immediate notification requirement for releases of hazardous substances to state waters, including ground waters. Provides the Commission with funding authority to address emergency threats to ground water.
Chapter 26	Edwards Aquifer Protection 31 TAC Chapter 313	Establishes a program to protect ground water in portions of the Edwards Aquifer through regulation of activities over the aquifer's recharge zone.

TEXAS WATER COMMISSION – STATE PROGRAM AUTHORITY (CONT.)

State Legislation	State Regulations	Ground Water Programs
Chapter 26	Private Sewage Facility Orders 31 TAC Chapter 285	In cooperation with Texas Department of Health, authorizes the Texas Water Commission to delegate its authority and to provide assistance in establishing local programs for regulation of private sewage facilities for the abatement of public nuisance and protection of ground water.
Texas Water Code Chapter 26	Railroad Commission Assistance Ground Water Protection ———	In cooperation with the Railroad Commission of Texas, authorizes the Texas Water Commission to provide recommendations concerning the depth to which ground water should be protected.
Chapter 26	Underground and Aboveground Storage Tanks 31 TAC Chapter 334	Establishes minimum standards and procedures to reasonably protect and maintain the quality of waters in the state from environmental contamination that could result from releases of harmful substances stored in tanks.
Chapter 26	Texas Groundwater Protection Committee	The Texas Groundwater Protection Committee of which the Texas Water Commission is the designated lead agency, is directed to coordinate state agency actions for the protection of groundwater quality, publish a joint groundwater monitoring and contamination report by April 1 of each year.

TEXAS WATER COMMISSION -- STATE PROGRAM AUTHORITY (CONT.)

State Legislation	State Regulations	Ground Water Programs
Chapter 26	Ground Water Protection and Enhancement Plans	With the advice of the Texas Groundwater Protection committee, the Water Commission is directed to develop plans for the protection and enhancement of water quality pursuant to federal statute, regulation, or policy, including management plans for the prevention of water pollution by agricultural chemicals and agents.
Texas Water Code Chapter 26	Livestock and Poultry Production Operations 31 TAC 321.39	Prohibits the discharge of waters which have been contaminated by pesticides to the waters in the state and requires immediate Commission notification if a discharge occurs.
Chapter 27	Underground Injection Control 31 TAC Chapter 331	Establishes a state Underground Injection Control Program (UIC) to regulate the subsurface injection of industrial and municipal wastes and other fluids exclusive of fluids associated with the production of energy resources.

TEXAS WATER COMMISSION -- STATE PROGRAM AUTHORITY (CONT.)

State Legislation	State Regulations	Ground Water Programs
Chapter 27	Railroad Commission Assistance Ground Water Protection	Requires Texas Water Commission to review permit applications to the Railroad Commission for subsurface disposal of oil and gas waste and provide information and recommendations for ground water protection. Also, the Commission provides comments regarding the use of fresh water for enhanced recovery of oil.
Chapter 28	Water Well Protection 31 TAC Chapter 287	Licenses driller of water well and certain injection wells. Establishes minimum standards for construction, completion, and plugging of water wells except public supply wells. Directs the Commission to protect the quality of ground water. Sets standards for plugging abandoned wells.

TEXAS WATER COMMISSION -- STATE PROGRAM AUTHORITY (CONT.)

State Legislation	State Regulations	Ground Water Programs
Texas Water Code Chapter 28	Drilled or Mined Shafts 31 TAC Chapter 329	Establishes a permitting program for drilled or mined shafts, including protection of ground water.
Chapter 52	Underground Water Conservation Districts	Provides for the delineation of critical ground water areas for purposes of ground water protection and requires the Texas Water Commission to assist local and regional entities in the formation of ground water protection and conservation districts.
Texas Agriculture Code §76.007	Interagency Corporation	Gives the Texas Water Commission the principal authority to regulate and control water pollution. Gives the Agricultural Commission the authority to obtain technical advice from pertinent state agencies (such as Texas Water Commission) in reviewing applications for special local need or emergency pesticide registration. Establishes communication between the Water Commission and Agricultural Commission for notification when there is probable cause to believe that serious contamination of water has occurred as a result of use, misuse, manufacture, storage or disposal of pesticides.

TEXAS WATER COMMISSION -- STATE PROGRAM AUTHORITY (CONT.)

State Legislation	State Regulations	Ground Water Programs
Texas Agriculture Code §76.003	State-Limited-Use Pesticides	States that the Agricultural Commission shall not place a pesticide on the state-limited-use list solely on the basis of damage or risk of damage to water quality without obtaining approval from the Texas Water Commission based on the impact of the pesticide's use on water quality. The Water Commission in conjunction with its responsibilities under Chapter 26 of the Water Code, can direct the Department of Agriculture to add any pesticide to the state-limited-list.
Texas Agriculture Code §76.009	Agricultural Resources Protection Authority	Establishes the Agricultural Resources Protection authority of which the Chief of the Ground Water Conservation Section of the Texas Water Commission is a member

TEXAS WATER COMMISSION -- STATE PROGRAM AUTHORITY (CONT.)

State Legislation	State Regulations	Ground Water Programs
Texas Solid Waste Disposal Act Chapter 361 Health and Safety Code	Solid and Hazardous Waste (RCRA) 31 TAC Chapter 335	Establishes a permitting program for disposal of industrial (hazardous and solid) waste and municipal hazardous waste requiring ground water monitoring and remediation for land disposal sites and also contains general prohibitions which are the basis for requiring remediation of contaminated ground water at nonpermitted sites.
Texas Solid Waste Disposal Act Chapter 361 Health and Safety Code	State Superfund 31 TAC Chapter 335, Subchapter K	Establishes a hazardous waste facility assessment and remediation program, including the identification and remediation of contaminated ground water.
Texas Surface Mining and Reclamation Act (Article 5920-11, V.T.C.S.)	Surface Mining Ground Water Protection ———	Gives Railroad Commission authority to obtain technical advice from pertinent state agencies (such as Texas Water Commission) to coordinate permitting activities for surface mining applications.

TEXAS WATER DEVELOPMENT BOARD

Introduction

On September 1, 1985 the Texas Department of Water Resources was reorganized under Senate Bill 249 enacted by the 69th Legislature of Texas. The legislation assigned to the Texas Water Development Board responsibilities for financial assistance, long-range water planning, and surface- and ground water data collection and studies. The financial programs include the state loan programs and the administration of the construction grants program authorized under the Federal Clean Water Act. The Board's legislative authority to operate and maintain a ground water data collection and studies program is cited in Chapter 16, Texas Water Code. It also provides technical assistance to the Texas Water Commission on hydrologic and geologic matters concerning ground water in Texas. Currently, the Board is not a direct recipient of any federal funds supporting its ground water program.

The Board also administers research activities funded by the Water Research and Planning Fund. As of February 1991, the Board has funded fourteen studies that address ground water quality protection with a total expenditure of $2,418,778.

State Legislation

Senate Bill No. 249 relates to the organization, administration, powers, duties, jurisdiction, and continuation of the Texas Water Commission and the Texas Water Development Board. Portions of the Act pertaining to the Board's responsibilities for ground water include:

- Section 16.012 - The Board's Executive Administrator shall make studies, investigations, and surveys of the occurrence, quantity, quality, and availability of the surface and ground water of the state.

- Section 16.013 - The Board's Executive Administrator shall advise and assist the Board and the Texas Water Commission with regard to engineering, hydrologic, and geologic matters concerning the water resources of the state.

- Section 16.015 - The Board's Executive Administrator may make studies and investigations of the physical characteristics of water-bearing formations and of the sources, occurrence, quantity, and quality of the underground water supply of the state and may study and investigate feasible methods or conserve, preserve, improve, and supplement water supply.

Chapter 52 of the Texas Water Code establishes procedures for the creation and administration of underground water conservation districts. Subchapter B allows local entities to petition the Texas Water Commission, with assistance from the Board, to designate and delineate underground water management areas (districts). Subchapter C establishes a procedure for the identification, designation, and delineation of areas which are experiencing or may experience critical ground water problems such as water shortages, land subsidence, or contamination. This subchapter also provides for the formation of underground water conservation districts in proposed critical areas through the cooperation of the Board and the Texas Water Commission subject to a confirmation election in the proposed district.

Ground Water Policy

The Texas Water Development Board does not regulate or control ground water quantity or quality. Its purpose and policy is to collect and analyze ground water data and provide and assist users of this information. It is a depository of ground water information and recognized for its research and development expertise.

Ground Water Strategy

The Water Development Board's overall strategy is to provide advice and assistance on matters pertaining to engineering, hydrologic, and geologic studies concerning the water resources of the state. The Board makes studies and investigates the underground water supply of the state and makes recommendations for improvement where necessary. The Water Development Board will coordinate its program activities with other state ground water related agencies through the Texas Groundwater Protection Committee.

Ground Water Protection Programs

Ground water Assessment: The Board conducts an active ground water resource assessment program. Boundaries and various characteristics for all of the state's nine (9) major and twenty (20) minor aquifers, including water availability, recharge, structural contours for selected aquifers, and other geological information, have been identified. An estimate of the recoverable storage has also been calculated for all major and minor aquifers having substantial pumpage. In addition, the major user of ground water in each aquifer has also been identified.

User Categories:
- Municipal
- Manufacturing
- Stream-electric generating
- Irrigation
- Mining
- Livestock

The Board collects basic data on these and other categories based on occurrence, quantity, and quality of the state's ground water.

Texas Water Development Board maintains a statewide ground water quality sampling program and a water level measurement program.

Public Participation

The Texas Water Development Board conducts regularly scheduled meetings which are open to the public. Rulemaking activities of the Board are subject to public notice and comment.

The Board has conducted joint public meetings with the Texas Water Commission to obtain public comment and input in order to begin the process of designating "critical" ground water areas in Texas in accordance with House Bill 2, 69th Legislature. Further public meetings and evidentiary hearings will be conducted for specific areas should a critical ground water designation be proposed.

TEXAS WATER DEVELOPMENT BOARD – STATE PROGRAM AUTHORITY

State Legislation	State Regulations	Ground Water Programs
Texas Water Code Chapter 16 Senate Bill 2 as amended	———	The TWDB maintains statewide programs to monitor ground water quality and water levels, and to conduct ground water studies. These programs are entirely state funded.
Chapter 52 House Bill 2 as amended	Underground Water Conservation Districts	Provides for the delineation of critical ground water areas for the purpose of solving or managing areas with ground water problems.

TEXAS WATER WELL DRILLERS BOARD

Introduction

The Texas Water Well Drillers Board was created and charged by the Texas Legislature to help ensure the quality of the state's ground water through the licensing of water well drillers. The Texas Water Well Drillers Act is the statutory authority for the Board and its rules and regulations. The Board's activities do not arise from any specific federal program, legislation or delegation. The responsibilities of the Board include establishing licensing procedures and qualifications for water well drillers and duties for licensed drillers. Staff and assistance are provided to the Board by the Texas Water Commission.

State Legislation

The Water Well Drillers Act (WWDA), Article 7621e Texas Civil Statutes, is intended to aid in the prevention of pollution of the state's ground water by providing minimum qualifications for water well drillers. The Act creates the Water Well Drillers Board and establishes a licensing program and requirements for water well drillers. The Board has rule-making ability and administers the licensing program. The Act also requires the Texas Water Commission to provide assistance to the Board.

State Rules

The Texas Water Well Drillers Board has adopted rules, Title 31 Texas Administration Code (TAC) Chapter 231, to implement the requirements of the Water Well Drillers Act. These rules outline the procedures of the Board in conducting meetings, rule making, licensing and administrative hearings. The

qualifications for licensing water well drillers and the duties of licensed water well drillers are specified. These duties include identification of vehicles and equipment, making and submission of well logs, and proper plugging and completion of water wells. The rules also provide for driller trainee registration and Standards of Conduct for water well drillers.

The Texas Water Commission in order to fulfill its statutory mandate under the WWDA adopted rules, 31 TAC Chapter 287. These rules outline clerical, legal, and investigative services provided by the Executive Director of the Commission to the Board. Specifically these rules outline procedures for licensing water well drillers, for actions by water well drillers encountering undesirable water, and for complaints or violations of the WWDA. These rules also provide for other matters concerning water wells mandated by Chapters 26 and 28 of the Water Code (see section on Texas Water Commission).

Ground Water Policy

The policy of the Board is to help ensure ground water quality in the state through the maintenance of minimum standards for water well drillers' qualifications and conduct. The Board is committed to enforcement of its licensing program and rules promulgated by the Texas Water Commission under the authority of the WWDA.

Ground Water Strategy

The Board's strategy is to continue to administer and improve the water well drillers licensing program. The Board will coordinate its program activities with other state ground water related agencies through the Texas Groundwater Protection Committee or similar committees whose mission is to prevent contamination of the state's ground water resources.

Ground Water Protection Programs

1. Ground water Contamination Protection

   The Board, through its licensing program, requires technical competency and ethical standards of all water well drillers. Drillers are required to meet standards for plugging and completion of water wells established by the Texas Water Commission.

2. Ground water Data Collection

   The Board through its licensing program and the Texas Water Commission maintains a listing of licensed water well drillers. The submission of Water Well Drillers Reports for newly drilled or deepened wells is required. These reports are maintained by the Commission and include such information as water well location, completion, depth, rock units, and undesirable water, if encountered (see section on Texas Water Commission).

3. Ground water Enforcement

   The Board with the assistance of the Commission responds to citizen complaint concerning water well problems. Ground water contamination problems are referred to the Commission for appropriate technical and enforcement evaluation. Failure of a water well driller to comply with the rules could result in disciplinary action including license revocation and civil and administrative penalties.

TEXAS WATER WELL DRILLERS BOARD -- STATE PROGRAM AUTHORITY

State Legislation	State Regulations	Ground Water Programs
Texas Water Well Drillers Act (V.T.C.S.A. Article 7621e Title 128 - Water)	(Water Well Drillers Board) 31 TAC Chapter 321	Establishes a licensing program for drillers of water wells (see also 31 TAC Chapter 287) administrative procedures for the Water Wells Drillers Board.
	(Board Assistance from the Commission) 31 TAC Chapter 287	Outlines clerical, legal, and investigative services provided by the Commission to the Board.

RAILROAD COMMISSION OF TEXAS

Introduction

Pursuant to various provisions of the Texas Natural Resources Code and the Texas Water Code, the Oil and Gas Division of the Railroad Commission administers programs to prevent the pollution of ground water by activities associated with the exploration, development, and production of oil, gas, or geothermal resources. Pursuant to the federal Safe Drinking Water Act (SDWA), the U. S. Environmental Protection Agency (EPA) has delegated authority to the Railroad Commission to administer an underground injection control program dealing with the underground injection of produced oil and gas wastes, injection wells associated with enhanced oil recovery, and underground hydrocarbon storage.

The Surface Mining and Reclamation Division (SMRD) of the Railroad Commission is authorized to enforce state laws and regulations consistent with the Texas Surface Mining and Reclamation Act of 1975 and the Texas Surface Coal Mining and Reclamation Act of 1979. These rules are based on the federal Surface Mining and Reclamation Control Act regulations, which are administered by the Office of Surface Mining of the U.S. Department of the Interior.

The Texas Water Commission provides information to the oil and gas industry and to the Railroad Commission on the occurrence of usable-quality ground water that may be affected by operations and activities regulated by the Railroad Commission.

The following material summarizes the Railroad Commission's current ground water protection responsibilities under federal and state law and briefly describes the Railroad Commission's existing ground water protection programs.

Federal Legislation

The federal Safe Drinking Water Act (SDWA) established an underground injection control program for the protection of underground sources of drinking water. Pursuant to the SDWA, EPA has delegated authority to the Railroad Commission, Oil and Gas Division, to administer the underground injection control program for injection wells subject to the Railroad Commission's jurisdiction. The wells that fall under the Railroad Commission's jurisdiction include oil and gas waste disposal wells, fluid injection wells used for the enhanced recovery of oil and gas, underground hydrocarbon storage wells, and brine mining injection wells.

In 1977 Congress passed the Surface Mining Control and Reclamation Act to regulate surface coal mining. The Office of Surface Mining (OSM) of the Department of Interior administers the Act. OSM approved the Texas surface coal mining program in 1980.

Federal Regulations

The underground injection control (UIC) regulations adopted by EPA contain minimum requirements for state-administered underground injection control programs, including engineering, performance, and monitoring requirements for different classes of injection wells.

The surface mining and reclamation regulations adopted by OSM contain procedures and criteria for approval of state surface coal mining programs.

State Legislation

Chapter 27 of the Texas Water Code establishes a permitting program for injection wells. It authorizes the Railroad Commission to regulate wells used for the disposal of oil and gas waste, injection wells used for the in situ recovery of tar sands, and brine mining injection wells.

Chapter 91 of the Texas Natural Resources Code requires the Railroad Commission to adopt rules to prevent the pollution of surface and subsurface water that might result from activities associated with the exploration, development, and production of oil and gas. These activities include: (1) the drilling, operation, and plugging of oil and gas wells and fluid injection wells used for the enhanced recovery of oil and gas; (2) the operation of gasoline plants, natural gas or natural gas liquids processing plants, pressure maintenance plants, or repressurizing plants; (3) the construction and operation of underground natural gas storage facilities and underground hydrocarbon storage facilities; (4) the storage, handling, reclamation, gathering, transportation and distribution of oil prior to refining or of gas prior to use in manufacturing or as a fuel; and (5) the storage, handling, reclamation, transportation, and disposal of oil and gas waste.

Chapter 89 of the Texas Natural Resources Code places a duty on operators and working interest owners of oil and gas wells, fluid injection wells used for the enhanced recovery of oil and gas, and exploratory wells to properly plug those wells in accordance with Railroad Commission rules.

Chapter 141 of the Texas Natural Resources Code requires the Railroad Commission to adopt rules to protect the environment against damage that might result from the exploration, development, and production of geothermal resources.

Chapter 29 of the Texas Water Code establishes a permitting program for haulers of oil and gas waste produced in connection with the drilling or operation of oil or gas wells.

Chapter 131 of the Natural Resources Code, titled the Texas Surface Mining and Reclamation Act, created the Surface Mining and Reclamation Division of the Railroad Commission in 1975. This Act gave the Railroad Commission the responsibility to regulate surface mining of coal and uranium in Texas. Regulation of coal mining was separated from uranium mining under Texas Revised Civil Statutes Annotated, Article 5920-11, in 1979 titled Texas Surface Coal Mining and Reclamation Act. In 1983 the Railroad Commission's responsibilities were expanded to include iron ore and iron ore gravel mining under revisions to the same article.

State Rules

Oil and Gas Division statewide Rules 9, 46, and 74 are the Railroad Commission's underground injection control rules. Permits are required for oil and gas waste disposal wells (Rule 9), fluid injection wells used for the enhanced recovery of oil and gas (Rule 46), and underground hydrocarbon storage wells (Rule 74).

Oil and Gas Division statewide Rule 8 governs the disposal of oil and gas waste by methods other than injection, such as disposal in pits, by land farming, or by discharge into surface waters. Permits are required for disposal methods not specifically authorized in Rule 8. In addition, permits are required for pits used to store or dispose of oil and gas waste or to store oil field fluids, except for pits specifically authorized by Rule 8. Statewide Rule 8 also requires permits for oil and gas waste haulers.

Oil and Gas Division statewide Rules 13 and 14 set out drilling, casing, cementing, completion, and plugging requirements for wells subject to the Railroad Commission's jurisdiction.

Oil and Gas Division statewide Rule 70 requires permits for pipelines used to transport oil, gas, or geothermal resources.

The regulations developed by the Surface Mining and Reclamation Division contain the provisions that were required by the Office of Surface Mining prior to their approval of the state surface coal mining program. SMRD has also developed regulations for the surface mining of uranium, iron ore, and iron ore gravel. The surface mining regulations include requirements for plugging exploratory holes, monitoring ground water in mine areas, and determining the probable hydrologic consequences of proposed mining activities.

Interagency Agreement

The Railroad Commission has executed a Memorandum of Understanding with the Texas Water Commission and the Texas Department of Health concerning the division of jurisdiction over waste materials resulting from activities associated with the exploration for and the development, production, and refining of oil or gas. The MOU is reviewed periodically and is updated as necessary to address evolving concerns.

Ground Water Policy

In accordance with Subchapter J, Chapter 26, Texas Water Code, the Railroad Commission's policy is to regulate activities under its jurisdiction in a manner that will maintain present uses of ground water, will not impair future uses, nor pose a public health hazard.

Ground Water Strategy

The Railroad Commission will continue to administer the ground water protection programs that are mandated by state law and delegated under federal authority. The Railroad Commission will enhance existing programs and initiate new programs as needs are identified. The Railroad Commission will coordinate its ground water programs with the ground water programs of other state agencies through the Texas Groundwater Protection Committee or similar committees whose mission is to prevent the contamination of the state's usable-quality ground water.

Ground Water Protection Programs

1. **Ground Water monitoring** - The Surface Mining and Reclamation Division requires ground water monitoring before, during, and following surface mining of coal or uranium to detect any changes that may take place due to mining. Also, ground water is monitored in reclaimed areas of coal mines to measure water quality, quantity, and the recovery of water levels. Final reclamation bond release requires the evaluation of the monitoring data to ensure that impacts on ground water have been properly mitigated.

   The Oil and Gas Division requires ground water monitoring of brine mining injecting well facilities as an additional assurance that activities are not contaminating ground water. Also, on a case by case, monitoring wells may be required by permits issued under statewide Rule 8 for various oil and gas waste disposal activities.

2. **Contamination Protection** - Through its Underground Injection Control (UIC) program, the Railroad Commission regulates oil and gas waste disposal wells, fluid injection wells used for the enhanced recovery of oil and gas, underground hydrocarbon storage wells, and brine mining injection wells. Rules adopted by the Railroad Commission regulate the drilling, casing, cementing, completion, and plugging of wells subject to the Railroad Commission's jurisdiction. Also, the Railroad Commission regulates the disposal of oil and gas wastes and the use of pits for the storage of oil-field fluids or the storage or disposal of oil and gas wastes. The Railroad Commission also regulates oil and gas waste haulers and oil, gas, and geothermal pipelines.

   Through its surface mining program, the Commission requires all coal and uranium exploration and test holes and wells to be adequately plugged to protect both ground water and surface water.

3. **Public Participation** - The Commission holds public meetings and seminars that concern general ground water issues, holds public hearings on citizen complaints involving water quality matters and rule violations, and conducts educational seminars in various Texas cities to discuss the Oil and Gas Division's UIC rules and other water protection rules.

RAILROAD COMMISSION OF TEXAS -- FEDERAL PROGRAM AUTHORITY

Federal Legislation	Federal Regulations	Ground Water Programs
Underground Injection		
Part C of the Safe Drinking Water Act (PL 93-523), as amended	40 CFR Part 145 (State Underground Injection Control Program Requirements)	Program relates to the protection of underground sources of drinking water from contamination by improperly designed and operated injection wells.
Surface Mining		
Surface Mining Control and Reclamation Act of 1977, Pub. Law 95=87	30 CFR Parts 700-950 (Surface Mining and Reclamation Regulations)	Document base-line ground water conditions prior to mining; require water monitoring in mine areas before, during, and after mining to detect any changes in quality, quantity, and hydrologic balance of the aquifer encountered; regulate the plugging of all coal exploration holes.

RAILROAD COMMISSION OF TEXAS – STATE PROGRAM AUTHORITY

State Legislation	State Regulations	Ground Water Programs
Oil, Gas, & Geothermal Resources		
Texas Water Code, Chapter 27 Texas Natural Resources Code Chapter 91	Statewide Rules 9, 46, 74 (16 TAC §§ 3.9, 3.46, 3.74)	Program relates to oil waste disposal wells; fluid injection wells used for enhanced recovery of oil and gas; underground hydrocarbon storage wells; brine mining injection wells.
Texas Water Code Chapter 29	Statewide Rule 8 (16 TAC §3.8) haulers	Program relates to oil and gas waste.
Texas Natural Resources Code Chapter 89	Statewide Rule 14 (16 TAC §3.14)	Program relates to well plugging
Texas Natural Resources Code Chapter 91	Statewide Rule 8 (16 TAC §3.8)	Program relates to the use of pits and the disposal of oil and gas waste.
Texas Natural Resources Code Chapters 91 & 141	Statewide Rule 70 (16 TAC §3.70)	Program relates to pipelines used to transport crude oil, natural gas, and geothermal resources.
Texas Natural Resources Code Chapter 141	Statewide Rules 8, 13, 14 (16 TAC §§3.8, 3.13, 3.14)	Program relates to the development of geothermal energy and associated resources.

RAILROAD COMMISSION OF TEXAS -- STATE PROGRAM AUTHORITY (CONT.)

State Legislation	State Regulations	Ground Water Programs
Mining		
Texas Natural Resources Code Chapter 131	Uranium Mining Regulations 16 TAC §§11.71-206	Program relates to the surface mining of uranium and uranium ore, and the plugging of uranium exploration holes.
Texas Surface Mining and Reclamation Act		
Texas Revised Civil Statutes Annotated, Ar. 5920-11	Coal Mining Regulations 16 TAC §11.221	Program relates to the surface mining of coal and iron ore, and the plugging of coal and iron ore exploration holes.

TEXAS DEPARTMENT OF HEALTH

Introduction

The Texas Department of Health's ground water protection program is impacted by a number of state and federal laws and regulations. Federal programs delegated to the Department which affect ground water protection include: 1) the Safe Drinking Water Act, 2) the Resource Conservation and Recovery Act, and 3) the Uranium Mill Tailings Radiation Control Act of 1978. State legislation includes: 1) the Texas Solid Waste Disposal Act, 2) the Texas Health and Safety Code, and 3) the Texas Radiation Control Act. Federal and state legislation deal with ground water protection programs which stem from program activities in areas of uranium mining and radioactive materials, municipal solid waste, and public water systems.

Federal Legislation

The Safe Drinking Water Act (SDWA) provides the Department with broad authority to establish both primary and secondary water quality standards for drinking water supplies. These standards apply to ground water and surface water sources alike. A primary standard for a substance must contain an appropriate maximum contaminant level (MCL). When an MCL is exceeded, the Department must either prohibit the use of the affected water supply, or require that the water be treated. Secondary standards affecting aesthetics, such as taste, odor, and related minerals and metals, are also enforced by the Department.

The Resource Conservation and Recovery Act (RCRA) provides the Department authority to regulate nonhazardous municipal solid waste. The authority extends to the prevention and minimization of contaminant seepage to ground water. In

response to RCRA regulations, the Department has developed a plan to implement these regulations and has assumed full responsibility for enforcement.

The Atomic Energy Act of 1954 as amended and the Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA-78) provide states the opportunity to implement programs to regulate radioactive materials including the processing, storage, and disposal of radioactive wastes and the mining of uranium ores. In Texas these programs are implemented by the Department (Bureau of Radiation Control), designated as the Texas Radiation Control Agency by the Texas Radiation Control Act (TRCA).

Federal Regulations

The Texas Department of Health, Division of Water Hygiene, has primary enforcement responsibility for the public drinking water system aspects of the Safe Drinking Water Act (P.L. 93-523). Under the Act and this authority, the Division enforces the National Primary Drinking Water Regulations (40 CFR, Part 141 and Part 142), the National Primary Drinking Water Regulations (40 CFR, Part 142), and the National Secondary Drinking Water Regulations (40 CFR, Part 143).

The Resource Conservation and Recovery Act (RCRA) through the Environmental Protection Agency (EPA) developed the following:

- Solid waste management guidelines;

- Minimum criteria to be used by the states to define those solid waste management practices which constitute the open dumping of solid waste or hazardous waste and which are to be prohibited;

- Criteria for identifying hazardous waste;

- Standards for generators, transporters and treatment, storage and disposal facility owners and operators;

- Guidelines to assist the states in developing and implementing state solid waste management plans; and,

- Guidelines for identifying regional planning agencies and areas.

Under 40 CFR 192 uranium mill tailings impoundments must include liners and appropriate detection monitoring programs and are subject to certain EPA RCRA regulations including concentration limits, corrective action programs, design and operating requirements, and ground water protection standards. Other regulations deal with effluent discharge limits, dose limitations, design and performance standards, and licensing requirements and procedures.

State Legislation

The Texas Solid Waste Disposal Act establishes a permitting program for the storage, processing, and disposal of solid and hazardous wastes. The Texas Department of Health administers the municipal solid waste program. Issuance of permits is conditioned on site selection and operational design plans that minimize the possible contamination of ground water. The Texas Radiation Control Act establishes a regulatory program for sources of radiation to be administered by the Texas Department of Health as the Texas Radiation Control Agency. The program requires the licensing of radioactive materials; devices that produce radiation or use radioactive materials; and operations that process, store or dispose of radioactive materials. The Minimum Standards of Sanitation and Health Protection Measures, (MSSHPM), (Chapter 341-Health and Safety Code),

establishes the authority for rules and regulations covering the construction of ground and surface public drinking water systems. The Act also provides for approval of engineering design plans and specifications which must comply with the rules and regulations.

Chapter 366 of the MSSHPM provides for regulation of construction, repair and certification of installers of on-site sewage treatment facilities.

State Rules

The Division of Water Hygiene, Texas Department of Health, has established "Rules and Regulations for Public Water Systems" and "Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Systems." The rules and regulations specify construction and wellhead protection standards to protect the well and the aquifer from possible contamination. The drinking water standards establish quality standards.

Pursuant to implementing the Solid Waste Disposal Act, the Bureau of Solid Waste Management, Texas Department of Health, has written the "Municipal Solid Waste Management Regulations" (MSWMR). These regulations have undergone several revisions necessitated by the adoption of new regulatory provisions under RCRA on the federal level.

The general ground water protection requirements mandated by the TRCA, as amended, are put into operational language in the Texas Rules for Control of Radiation (TRCR) as adopted by the Texas Board of Health.

Ground Water Policy

The Department of Health's solid waste program maintains a policy and philosophy of ground water protection through containment of the contaminants as well as the monitoring of ground water for possible contamination. The Department has implemented a detailed reporting program which requires extensive evaluation, testing and reporting of each landfill area, trench or sector prior to authorizing waste disposal. This program also requires quality control testing and reporting of all liner construction prior to authorization of usage by the Department. The Department's policies relating to other ground water protection programs such as public water systems, on-site sewage systems, and radiation activities are specified in each program.

Ground Water Strategy

The Department's strategy is to continue to administer and maintain ground water protection programs which are mandated by state legislation and delegated under Federal authority. The Department will coordinate its program activities with other state ground water related agencies through the Texas Groundwater Protection Committee or similar committees whose mission is to prevent contamination of the state's ground water resources.

Ground Water Agreement

A Memorandum of Understanding exists between the Railroad Commission and the Department relative to regulations of waste materials resulting from activities associated with the exploration for and the development, production, and refining of oil or gas.

Also the Department has entered into a Memorandum of Understanding with the Texas Water Commission to coordinate the regulation of in situ uranium mining.

Ground Water Protection Programs

1. **Ground Water Quality Standards** - The Division of Water Hygiene establishes standards for public drinking water and maintains records on the chemical and bacteriological analyses of public water supplies.

   The Bureau of Radiation Control sets radiological standards for in situ mining aquifer restoration and enforces radiological standards for effluent releases to surface and ground water.

2. **Construction Standards** - The Division of Water Hygiene establishes construction and wellhead protection standards to protect the aquifer and the public water system from any insanitary conditions or contamination.

   New or repaired on-site sewerage disposal systems must be installed in accordance with the TDHs "Construction Standards for On-site Sewerage Facilities" which were revised on January 1, 1990.

3. **Ground Water Monitoring** - The Bureau of Solid Waste Management requires ground water monitoring at Type I landfills (serving 5,000 persons or more) and requires ground water monitoring at any of the landfill sites it regulates where environmental sensitivity may require it.

   The Division of Water Hygiene has expanded its program of organic and inorganic sampling of public water supply wells with a wide

range of volatile organics and pesticides in addition to routine chemical analysis parameters. The provisions of the Safe Drinking Water Act, Phase II, have established Maximum Contaminant Level Goals (MCLG) and Maximum Contaminant Levels (MCL) for an additional 33 contaminants raising the number of MCL's from 34 to 60 regulated compounds. Monitoring is also occurring for 200 to 250 additional unregulated compounds.

As of January 1, 1991, the Department in conjunction with the Texas Water Commission began a program to accurately map all public water supply wells and surface water intakes. This project will provide latitude and longitude coordinates for each facility in order to support efforts in the Wellhead Protection, Vulnerability Assessment and Contamination Response programs.

The Bureau of Radiation Control conducts radiological monitoring at uranium mining sites and requires pre-operational, operational, and post-closure monitoring at by-product material (mill tailings) and radioactive waste disposal sites.

4. **Ground Water Enforcement** - The Division of Water Hygiene maintains records on approximately 7,500 public water systems, conducts annual on-site sanitary surveys, establishes sanitary control easements, certifies water operators, initiates legal action, and reviews plans for new systems and improvements to existing systems.

The Bureau of Solid Waste Management enforcement program prohibits municipal solid waste disposal facilities from contaminating any underground water sources beyond the disposal site. Regular inspections are conducted, citations are issued, and the judicial

process is exercised where necessary. Remediation may also be required.

The Bureau of Radiation Control enforces radiological standards for effluent discharges and prescribes radiological cleanup standards for in situ aquifer restoration. In addition, the Bureau is implementing new ground water protection standards at uranium recovery facilities.

Ground water protection standards applicable to facilities that manage uranium or thorium byproduct materials were promulgated by the U.S. Environmental Protection Agency (EPA) in October 1983 (Subparts D and E of 40 CFR Part 192). The 40 CFR Part 192 requirements, which became effective in December 1983 for U.S. Nuclear Regulatory Commission (NRC) and Agreement state licensees and license applicants, imposed by reference many ground water protection provisions of the Resource Conservation and Recovery Act (RCRA) program under the Solid Waste Disposal Act. The NRC amended 10 CFR Part 40, Appendix A to conform to the standards promulgated by the EPA in November 1987. As an Agreement state, Texas adopted similar rules in Texas Regulations for Control of Radiation (TRCR) Part 43, "Licensing of Uranium Recovery Facilities." These Rules became effective on April 1, 1990.

5. **Permit Programs** - The Bureau of Solid Waste Management regulates nonhazardous municipal solid waste facilities to ensure compliance with the Texas Solid Waste Disposal Act. Nonhazardous municipal solid waste is nonhazardous solid waste resulting from or incidental to municipal, community, commercial, institutional, and recreational activities and includes garbage, rubbish, ashes, street cleanings, sludges generated by municipal or commercial wastewater

and water supply treatment plants, septic tank pumpings, and grease and grit trap wastes.

Under its licensing program the Bureau of Radiation Control authorizes uranium recovery facilities, by-product material and radioactive waste disposal sites, operators of well logging services using radioactive sources and use of radioactive tracers in ground water studies.

TEXAS DEPARTMENT OF HEALTH -- FEDERAL PROGRAM AUTHORITY

Federal Legislation	Federal Regulations	Ground Water Programs
Safe Drinking Water Act (SDWA)	40 CFR Parts 141, 142, and 143	Program provides a system of national standards and treatment technologies for public drinking water.
Resource Conservation and Recovery Act (RCRA)	40 CFR (Various Parts)	Program regulates nonhazardous waste facilities, such as municipal landfills and open dumps.
Atomic Energy ACT of 1954 as amended and Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA-78)	10 CFR, Parts 40, 51, and 61 40 CFR, Parts 190, 192, and 440	Agreement with the Federal Government to regulate sources of radiation.

TEXAS DEPARTMENT OF HEALTH – STATE PROGRAM AUTHORITY

State Legislation	State Regulations	Ground Water Programs
Texas Solid Waste Disposal Act Chapter 361 Health and Safety Code	Municipal Solid Waste Management Regulations	Ground Water protection through appropriate in situ soil evaluation, construction, and testing. Monitor well testing and evaluation.
Minimum Standards of Sanitation and Health Protection Measures Chapter 341 Health and Safety Code	"Rules and Regulations for Public Water Systems," "Drinking Water Standards, Governing Drinking Water Quality and Reporting Requirements for Public Water Systems"	Specifies construction, wellhead protection, and quality standards for public water systems.
	"Construction Standards for On-Site Sewerage Facilities"	Specifies construction requirements for onsite wastewater disposal.
Radioactive Materials and Other Sources of Radiation Chapter 401 Health and Safety Code	Texas Rules for Control of Radiation, Parts 11, 12, 13, 21, 22, 36, 41, 43, 44, and 45	Regulates sources of remediation including production of radioactive source material (uranium) by both in situ and surface mining techniques; disposal of by-product material (mill tailings); processing, storage, and use of radioactive materials in well logging and subsurface tracer studies.
Minimum Standards of Sanitation and Health Protection Chapter 366 Health and Safety Code	Texas Department of Health Administrative Requirements for On-Site Sewage Facilities	Regulates construction, repair, and certification of installers of on-site sewerage facilities.

TEXAS DEPARTMENT OF AGRICULTURE

Introduction

The Texas Department of Agriculture's role in the protection of ground water is to ensure compliance with federal and state laws and regulations relating to pesticide distribution and use through its pesticide enforcement program. Under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), the Department has primary enforcement responsibility for pesticide use violations. In addition, under the Texas Agriculture Code the Department is responsible for regulating distribution and use of pesticides in the state.

Federal Legislation

FIFRA requires that all pesticide products be registered by the Environmental Protection Agency (EPA) before they may be sold. Prior to registration of any pesticide, the EPA is required to make a determination that the intended use of the pesticide will not cause unreasonable adverse effects to humans or the environment when the pesticide is used according to the label directions, taking into account the economic, social, and environmental costs and benefits of using the pesticide. While FIFRA contains no specific provisions to respond to instances of pesticide contamination of ground water, EPA has authority to restrict the use of a pesticide when necessary to protect ground water. It is a violation of FIFRA to use a pesticide in a manner inconsistent with an EPA restriction. The Texas Department of Agriculture is responsible for enforcement of EPA restrictions.

Federal Regulation

Regulations promulgated by EPA under authority of FIFRA define pesticides required to be registered, registration procedures, data required in support of registration, labeling requirements, and procedures for storage and disposal of pesticides and pesticide containers. Prospective registrants of pesticides must submit a range of test data so EPA can assess the fate of a pesticide when used as proposed. As part of its process for registering new pesticides and re-registering pesticides already on the market, EPA requires registrants to submit data assessing the potential for ground water contamination. Pesticides that are demonstrated to have the potential to leach into ground water and that pose hazards because of their toxicity and use patterns may be the subject of regulatory actions ranging from label direction changes and use restrictions to suspension and cancellation of product registrations.

State Legislation

Chapter 76 of the Texas Agriculture Code (Texas Pesticide Law) authorizes the Department to register pesticides distributed in the state and to regulate pesticide use, storage, and disposal. In addition to the registration and labeling required under FIFRA, the Department may require any additional information necessary to determine the eligibility of a product for registration, and by rule may restrict or prohibit use of a pesticide. The Department is responsible for investigating pesticide complaints and for enforcement of other provisions of the Texas Pesticide Law within the state. The Law also requires that pesticides be stored in a manner that will reasonably insure that domestic and public water supplies, human food, drugs, pet foods, animal feeds, commercial fertilizers, seeds or clothing will not be contaminated. The law also directs that pesticide containers are to be disposed of as directed on the label or by any other methods approved by the Department. Any use of pesticides inconsistent with label directions is a

violation of the law and may subject the user to penalties under both federal and state law. The Texas Herbicide Law regulates the sale of, and in some counties, the use of hormone-type herbicides. The Department requires permits in regulated counties for applying hormone-type herbicides to 10 or more acres.

State Regulations

Regulations promulgated under authority of the Texas Pesticide Law define pesticides required to be registered for distribution and use within the state, requirements for pesticide registration, use restrictions, rules for storage and disposal of pesticides and pesticide containers, and rules for investigation of pesticide complaints. The Department may also adopt rules regulating chemigation, mixing, loading, and transportation of pesticides.

Ground Water Policy

It is the Department's policy to prevent pollution of ground water which might result from pesticide use, distribution, storage, and disposal of pesticides. The agency is committed to take preventive action on pesticides found to be a hazard to ground-water quality.

Ground Water Strategy

The Department's strategy is to continue its ground-water protection and monitoring programs as authorized by state legislation and delegated under federal authority of EPA. The Department is involved in coordinating efforts to develop the state management plan for agricultural chemicals in ground water and is developing criteria to be used in determining the appropriate regulatory action or alternative measure that should be implemented to prevent pesticide contamination of ground water.

Ground Water Protection Programs

1. **Ground Water Assessment**. The Department is currently assessing the source and extent of pesticide contamination of ground water found in several areas in Texas through its ground-water monitoring program. Regulatory and management measures to prevent ground water contamination are also being examined.

2. **Ground Water Monitoring**. The Department conducts an active ground water monitoring program. The program is designed to evaluate the potential effects of agricultural chemicals on water quality and to ensure compliance with federal and state laws and regulations relating to the use of pesticides and protection of ground water resources. To accomplish these objectives, monitoring is conducted in a manner that will support appropriate regulatory actions necessary to correct or prevent ground water contamination problems.

   The Department has primarily focused its monitoring activities in rural areas where ground water supplies water for private drinking water wells that are not protected under existing regulations for public water supplies. Sampling is conducted in areas where agricultural and pesticide use practices, hydrogeological characteristics, and other parameters indicate a high potential for ground water contamination from pesticide use. As part of the monitoring effort, the Department collects and evaluates information that may indicate the types of agricultural and pesticide use practices, hydrogeological characteristics, well construction, or other parameters associated with pesticide contamination of ground water. Pesticide analysis for

ground water samples is conducted by the Department's Pesticide Residue Laboratories. Analytical procedures routinely utilized in these laboratories for water samples are capable of detecting more than 200 pesticides including organo-chloride, organo-phosphorus, organo-nitrogen, carbamate, and chlorophenoxy compounds. The Department has a comprehensive quality assurance program plan that has been approved by EPA. The sampling and analytical procedures are adequate to support any regulatory actions that may be necessary to correct or prevent ground water contamination problems.

3. **Pesticide Registration**. The majority of the Department's ground water protection activities are conducted in connection with the Department's pesticide registration and pesticide enforcement program activities. The Department is responsible for evaluating data on the potential effects of ground water contamination on human health, non-target organisms, crops, animals, wildlife, endangered species and other environmental media to support regulatory actions related to ground water protection.

The Department registers all pesticides used in Texas. Denial or cancellation of registration and classification as a state-limited-use pesticide are the primary regulatory options that can be exercised to prevent ground water contamination from nonpoint sources. Testing, certification and licensing of applicators, in association with classification of a pesticide as a state-limited-use pesticide, can be used to effectively address ground water contamination resulting from point and nonpoint sources. The stop-sale order, injunction, administrative, civil and criminal penalties are the primary options to

prevent ground water contamination resulting from point sources. Suspension, modification and revocation of a license can also be used to help prevent ground water contamination resulting primarily from point sources.

4. **Pesticide Enforcement**. It is a violation to use a pesticide in a manner inconsistent with the directions on its label or inconsistent with TDA rules. The Department will initiate an action in response to detection of any level of a pesticide found in ground water. Under provisions of the Texas Pesticide Law and Regulations relating to pesticide enforcement, the Department conducts equipment inspections, examines records, collects samples, and investigates complaints and cases of pesticide misuse and contamination, in both agricultural and urban areas, and takes enforcement action as needed.

5. **Pest Management**. The Department encourages and provides technical assistance in the use of best management practices, waste minimization and waste management strategies, and integrated pest management, sustainable agriculture, and organic farming systems in its efforts to prevent ground water contamination.

6. **Testing, Certification, and Licensing of Pesticide Applicators**. The Department sets licensing and recordkeeping requirements for pesticide dealers, and tests, certifies, and licenses commercial and noncommercial pesticide applicators. Each person who applies a restricted-use or state-limited-use pesticide must be licensed as a commercial, non-commercial or private applicator and authorized by the license to use the pesticide in the license use categories covering the proposed pesticide use. As part of the certification and licensing

process, the person must demonstrate practical knowledge in various areas by passing a written examination in each of the license use categories they will be licensed in. Testing includes information on laws and regulations, labels and labeling, types of pesticides and mode of action, application systems, calibration of application equipment, safety precautions, mixing and loading procedures, protective equipment, pest and pest damage, and environmental considerations.

The training on environmental considerations focuses on contamination of soil, water and air, effects on humans, wildlife, fish and domestic animals, development of pest resistance, release of secondary pests, reductions of beneficial populations, and reduction of pollinators. The potential for pesticides to contaminate ground water is addressed in various parts of the training materials that deal with application rates, timing of application, method of application, cultivation practices, storage and disposal, irrigation and chemigation.

The Department licenses applicators in agricultural pest control, forest pest control, ornamental and turf pest control, seed treatment, right-of-way pest control, aquatic pest control, demonstration and research, regulatory pest control, aerial application and chemigation. The Department is also responsible for developing and implementing the state of Texas Plan for Certification of Pesticide Applicators. All application equipment used by commercial applicators must be registered with the Department and is subject to inspection at any reasonable time. All licensed applicators must maintain a record of all uses of restricted and state-limited-use pesticides for a period of two years.

7. **Public Awareness/Participation**. The Department assists in activities designed to increase public awareness, participation, and provide outreach to pesticide users in the area of ground water protection. Speaking engagements, informational brochures, newsletters, formal education courses and training, as well as labeling of pesticides for proper use and disposal are some of the Department's responsibilities.

TEXAS DEPARTMENT OF AGRICULTURE -- FEDERAL PROGRAM AUTHORITY

Federal Legislation	Federal Regulations	Ground Water Programs
Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)	40 CFR Part 152 40 CFR Part 156 40 CFR Part 157 40 CFR Part 162 40 CFR Part 165 40 CFR Part 166 40 CFR Part 169 40 CFR Part 170 40 CFR Part 171 40 CFR Part 172 40 CFR Part 173	Provides the Department with authority to enforce provisions of FIFRA relating to pesticide registration, labeling, packaging, storage, and disposal.

TEXAS DEPARTMENT OF AGRICULTURE -- STATE PROGRAM AUTHORITY

State Legislation	State Regulations	Ground Water Programs
Texas Agriculture Code Chapter 76 (Texas Pesticide Law)	Texas Administrative Code Chapter 7 (Texas Pesticide Regulations)	Authorizes the Department to enforce provisions of the Texas Pesticide Law relating to pesticide registration, labeling, applicators, dealers, equipment, complaints, storage, use and classification.

TEXAS STATE SOIL AND WATER CONSERVATION BOARD

Introduction

The Texas State Soil and Water Conservation Board was created by House Bill 20, Acts of the 46th Legislature in 1939. The Soil and Water Conservation Board is charged with the overall responsibility for administering and coordinating the state's soil and water conservation districts. Title 7, Chapter 201 and 203 of the Agriculture Code of Texas contain the provisions of law pertaining to soil and water conservation. The Soil and Water Conservation Board is named as the agency responsible for implementing the constitutional provisions and state laws relating to the conservation and protection of soil resources. The agency's primary responsibility with regard to ground water protection involves planning, implementing, and managing programs and practices for abating agricultural and silvicultural nonpoint source pollution.

Federal Legislation

The Watershed Protection and Flood Prevention Program, administered by the Soil Conservation Service, provides for a project-type approach to soil and water resource conservation. Purposes which are eligible for assistance under the program include land treatment, flood prevention, agricultural water management, municipal and industrial water supply, recreation, fish and wildlife, rural area development, and water quality management.

The Soil and Water Conservation Board is responsible in Texas for approving applications and setting priorities for project planning.

The Clean Water Act under Section 319 provides funding for implementing approved nonpoint source management programs which were developed under

provisions of the same section. The Soil and Water Conservation Board has obtained approval of its Agricultural/Silvicultural Nonpoint Source Management Program from the EPA, and is currently involved in developing, implementing and managing programs to address agricultural and silvicultural nonpoint source concerns for both surface and ground water.

In fulfilling its responsibility to secure the cooperation and assistance of the federal government and federal agencies, the Soil and Water Conservation Board works with numerous federal agencies to secure cooperation and assistance that helps soil and water conservation districts provide assistance to landowners in developing and carrying out sound soil and water conservation programs on their property. These programs include consideration of both surface and ground water quality and quantity. Federal agencies with which interaction occurs include the Soil Conservation Service; Agricultural Stabilization and Conservation Service; Agricultural Research Service; U.S. Forest Service; Cooperative Extension Service; and the Cooperative Research Service.

State Legislation

Title 7, Chapter 201, and 203 of the Texas Agriculture Code contain the provisions of law pertaining to soil and water conservation. In addition to its responsibilities for creation, reorganization and division of soil and water conservation districts, the Soil and Water Conservation Board is charged with the following general powers and duties:

1. To offer appropriate assistance to the directors of conservation districts in carrying out programs and powers;

2. To coordinate the programs of the conservation districts to the extent possible through advice and consultation;

3. To secure the cooperation and assistance of the federal government, federal agencies and state agencies;

4. To disseminate information throughout the state concerning the activities and programs of the conservation districts;

5. To encourage the formation of a conservation district in each area in which the organization of a conservation district is desirable;

6. To prepare information of public interest describing the functions of the Soil and Water Conservation Board and make the information available to the general public and to appropriate state agencies;

7. To plan, implement and manage programs and practices for abating agricultural and silvicultural nonpoint source pollution; and

8. To administer the State Brush Control Program under Chapter 203.

In addition, the Soil and Water Conservation Board administers three state programs which provide financial assistance to soil and water conservation districts. The Conservation Assistance Program provides funds to soil and water conservation districts on a matching basis to assist them with annually recurring operating expenses. A general Technical Assistance Program provides funds to districts to provide for salaries and overhead for full time and part time technicians that assist landowners in applying soil and water conservation practices.

A Technical Assistance Program under Subchapter H, Chapter 201, Agriculture Code provides funds for technical assistance to landowners and operators for soil and water conservation land improvement measures. In areas within the state

where critical soil and water conservation needs are known to exist, including water quality needs, funds are available for implementing soil and water conservation plans developed jointly by the landowner/operator and local soil and water conservation district as endorsed and approved by the Soil and Water Conservation Board.

Ground Water Policy

The Texas State Soil and Water Conservation Board does not regulate or control ground water quality or quantity. The State Board is responsible for planning, implementing and managing programs and practices for abating agricultural and silvicultural nonpoint source pollution which could impact ground water resources.

Ground Water Strategy

The State Board's overall strategy involves programs and practices for abating agricultural/silvicultural nonpoint source pollution. The State Board has played an important role in developing the state's draft agricultural chemicals in ground water plan. In regard to the draft agricultural chemicals plan, the State Board has been involved with delineating crop and pesticide use patterns and in developing best management practices. The State Board will coordinate its program activities with other state ground water related agencies through the Texas Groundwater Protection Committee or similar committees whose mission is to prevent contamination of the state's ground water resources.

Ground Water Protection Programs

At present, the State Board's ground water protection efforts involve programs and practices for abating agricultural/silvicultural nonpoint source pollution. The State Board is currently developing a surface water and ground water monitoring

plan which will be incorporated into the nonpoint source management plan. Monitoring will target areas where nonpoint source assessment activities show problems or potential problems from agricultural and silvicultural activities and to the agricultural chemicals plan. Monitoring has also been proposed to evaluate the implementation of best management practices.

TEXAS STATE SOIL AND WATER CONSERVATION BOARD – FEDERAL PROGRAM AUTHORITY

Federal Legislation	Federal Regulations	Ground Water Programs
Watershed Protection and Flood Prevention Act PL 83-566		Provides financial and technical assistance to local sponsors for planning and implementing watershed protection projects.
Clean Water Act (Section 319)		Provides Funds for implementing nonpoint source management programs.

TEXAS STATE SOIL AND WATER CONSERVATION BOARD -- STATE PROGRAM AUTHORITY

State Legislation	State Regulations	Ground Water Programs
Agriculture Code Title 7, Chapter 201		State Soil and Water Conservation Board coordinates programs and activities of and provides assistance to soil and water conservation districts.
Agriculture Code Title 7, Chapter 201 Section 201.026		State Soil and Water Conservation Board plans, implements and manages programs and practices to abate agricultural/silvicultural nonpoint source pollution.
Agriculture Code Title 7, Chapter 201 Subchapter H	31 TAC 521.1-521.11 Agricultural Water Conservation	State Soil and Water Conservation Board administers a program to provide technical assistance to landowners and operators for soil and water conservation land improvement measures and soil and water conservation plans in areas with critical water conservation needs.
Agriculture Code Title 7, Chapter 201 General Appropriation Bill	31 TAC 519.1-519.11 Technical Assistance Program	State Soil and Water Conservation Board administers a program to provide technical assistance for the development and implementation of soil and water conservation plans and soil and water conservation measures.

TEXAS STATE SOIL AND WATER CONSERVATION BOARD -- STATE PROGRAM AUTHORITY (CONT.)

State Legislation	State Regulations	Ground Water Programs
Agriculture Code Title 7, Chapter 201 General Appropriation	31 TAC 517.1-517.12 Conservation Assistance	State Soil and Water Conservation Board administers a program to provide funds on a matching basis to assist soil and water conservation districts with expenses of administration and implementation of conservation programs.

TEXAS GROUNDWATER CONSERVATION DISTRICTS ASSOCIATION

Introduction

The Texas Groundwater Conservation Districts Association is the umbrella organization for special purpose districts, known as underground water conservation districts, created by the Texas Legislature or by the Texas Water Commission with the purpose and responsibility to preserve and protect ground water. The Association is not a state entity but rather is an organization dedicated to keeping its members involved and informed on developing issues impacting ground water statewide by promoting conservation and aquifer protection activities; educating membership and other interested parties on ground water techniques; and the management of ground water resources in general.

Members of the Association have served on and been actively involved in the Texas Groundwater Protection Committee since the Associations appointment to the Committee by the 71st Legislature. The Association has also been involved with the activities of the Committee's Agricultural Chemicals Subcommittee. Through the Committee, the Association has represented member districts ground water interests and local concerns.

Districts in General

Introduction

To date, 32 underground water conservation districts have been created. Most of these districts were created by Acts of the Texas Legislature, with several created by the Texas Water Commission or its predecessor agencies, and a few by County Commissioners Courts under statutory provisions which have been repealed. A map showing the location of these districts is shown as Figure 6.

Underground water conservation districts are local or regional in their jurisdiction and have, for the most part, elected boards of directors. Among their legislatively granted authorities is the power to monitor ground water quality. A number of districts also have the authority to bring civil court proceedings for injunctive relief against an entity causing ground water contamination.

State Legislation

Article XVI, Section 59 of the Texas Constitution provides the basic authority for the state Legislature to create underground water conservation districts.

Chapter 52 of the Texas Water Code provides the mechanism for the creation of underground water conservation districts by the Texas Water Commission. Confirmation elections are required for districts created under Chapter 52.

Ground Water Policy

Underground water conservation districts are created with the purpose and responsibility for preserving and protecting ground water. These responsibilities are carried out through water quality and quantity monitoring programs and conservation efforts.

Ground Water Strategy

Water districts are charged with the responsibility of preserving and protecting ground water resources. Through membership in the Texas Groundwater Conservation Districts Association, district managers are kept informed on developing issues impacting ground water statewide and are able to have input into the development and implementation of the state's Ground Water Protection Strategy. Several water districts are involved in the state's wellhead protection

program and in developing the state's generic agriculture chemicals plan. Through the Districts Association's membership in the Texas Groundwater Protection Committee, underground water districts can coordinate their programs with state ground water agencies to prevent contamination of the state's ground water resources.

Ground Water Protection Programs

Ground water programs that are typical of most districts include water quality monitoring, water quantity studies on use and depletion, well registration programs, well permitting and new well construction programs, well plugging programs, water conservation efforts, and public education efforts. Water quality monitoring programs are mostly of a reconnaissance nature designed to track water quality trends and identify contaminants with minimal expenditure of resources. Ground water studies of more detail regarding specific areas and specific contaminants or elements are also conducted by some districts. Several water districts are participating with the Water Commission in cooperative projects related to the management of nonpoint sources of contamination. These projects include the Wellhead Protection program, pesticide sampling in connection with agricultural nonpoint sources, and aquifer vulnerability mapping in connection with the Commission's DRASTIC mapping program.

UNDERGROUND WATER CONSERVATION DISTRICTS – STATE PROGRAM AUTHORITY

Legislatively Granted Authority	Subchapter and Subsection	Ground Water Programs
Texas Water Code Chapter 52 Subchapter A General Provisions	§52.001 Definitions	Defines "Waste" as pollution or harmful alteration of underground water in an underground water reservoir by salt water, other deleterious matter admitted from another stratum or from the surface of the ground.
	§52.005 Applicability to Groundwater Conservation Generally	Grants districts who have the authority to regulate the production or spacing of water wells the provisions of Chapter 51 of the Water Code.
Subchapter B. Creation of Districts and Management Areas Generally	§52.021 Purpose	Gives the local people the authority to petition the Texas Water Commission to create a Underground Water District.
Subchapter E. Powers and Duties	§52.151 Rule-Making Power	Grants the district the authority to write rules for the protection of the ground water.
	§52.153 Enforcement of Rules	Grants the district the authority to enforce the rules of the district.
	§52.154 Rules Reasonable; Appeal of Rules	Requires the district to adopt rules which are reasonable and fair to all water uses and gives the people of the district the right of appeal concerning the rules.

UNDERGROUND WATER CONSERVATION DISTRICTS – STATE PROGRAM AUTHORITY (CONT.)

Legislatively Granted Authority	Subchapter and Subsection	Ground Water Programs
Texas Water Code Chapter 51 Subchapter E. Powers and Duties (cont.)	§52.160 Planning	Gives the district the responsibility to conduct planning activities to address the needs of the district concerning the management and protection.
	§52.169 Regulation of Spacing and Production	Grants the district the authority to regulate spacing and production of wells in order to minimize, as far as practicable, the drawdown of the water table or the reduction of artesian pressure, to control subsidence, or to prevent waste of the underground water.

SELECTED REFERENCES

Ground Water Protection Committee, 1986, Texas ground water protection activities - 1986, 178 p.

_____, 1988, Texas ground water protection strategy, 104 p.

Texas Ground Water Protection Committee - Agricultural Chemicals Subcommittee, 1990, Generic state management plan for agricultural chemicals in ground water, (draft), 300 p.

_____, 1991, Activities of the Texas groundwater protection committee - report to the 72nd Legislature, 37 p.

Texas Water Commission, 1989, Ground water quality of Texas -- an overview of natural and man-effected conditions, Rept. 89-01, 197 p.

_____, et. al, 1989, Nonpoint source water pollution management report for the state of Texas, 376 p.

_____, 1991, Underground water conservation districts, a report to the 72nd Legislature, 37 p.

_____, 1990, Water quality management program continuing planning process, 225 p.

_____, 1990, Texas wellhead protection program, 126 p.

Texas Water Development Board, 1990, Water for Texas - today and tomorrow, 172 p.

TABLE 1

GROUND-WATER PROTECTION PROGRAMS

CONTAMINATION SOURCES	FEDERAL PROGRAMS								STATE PROGRAMS								
	AEA	SHCRA	RCRA	SDWA	Super Fund	CWA	UMTRCA	FIFRA	UIC	TWC	SWDA	TNRC	WWDA	TSHP	TPCA	TAC	SHRA	CHRA
Waste Disposal:																		
o Industrial wastewater impoundments			X		X	X				X	X			X			X	
o Industrial and municipal solid waste landfills			X		X					X	X			X				
o Septic systems										X				X				
o Municipal wastewater systems						X				X				X				
o Land spreading of sludge			X	X	X	X				X	X			X				
o Waste disposal wells			X	X						X	X	X			X			
o Radioactive materials	X														X			
o Pesticide wastes								X								X		
Oil Gas and Geothermal Activities																		
o Brine disposal practices of oil and gas exploration operations										X	X		X					
o Improper management of oil, and gas wells											X		X					
o Abandoned wells										X	X		X					

TABLE 1 (cont.)

GROUND-WATER PROTECTION PROGRAMS

CONTAMINATION SOURCES	FEDERAL PROGRAMS									STATE PROGRAMS								
	AEA	SMCRA	RCRA	SDWA	Super Fund	CWA	UMTRCA	FIFRA	UIC	IWC	SWDA	TNRC	WWDA	TSHP	TRCA	TAC	SMRA	CMRA
Agriculture Practices:																		
o Irrigation return flows						X												
o Fertilizer and pesticide								X								X		
o Animal feed lots						X				X								
Mining Activities																	X	X
o Wastewater impoundments		X															X	X
o Reclamation		X															X	X
o Mining wastes	X	X							X	X					X		X	X
o Exploration boreholes										X							X	X
Water Wells																		
o Improper management of water wells				X						X			X	X				
o Abandoned water wells		X		X					X	X			X				X	X

TABLE 1 (cont.)

GROUND-WATER PROTECTION PROGRAMS

CONTAMINATION SOURCES	FEDERAL PROGRAMS									STATE PROGRAMS								
	AEA	SMCRA	RCRA	SDWA	Super Fund	CWA	UMTRCA	FIFRA	UIC	TWC	SWDA	TNRC	WWDA	TSHP	TRCA	TAC	SMRA	CHRA
Underground Storage Tanks																		
o Leaks from chemical waste storage tanks			X		X					X	X							
o Leaks from tanks at facilities associated with the production of oil and gas			X		X							X						
o Leaks from other petroleum product or regulated substance tanks			X		X					X								
Fuel Transportation and Use																		
o Leaks or spills from pipelines,			X		X	X				X	X	X						

TABLE 1 (cont.)

Legend:

Federal Legislation

- RCRA - Resource Conservation and Recovery Act
- SDWA - Safe Drinking Water Act
- CWA - Clean Water Act
- AEA - Atomic Energy Act
- UMTRCA - Uranium Mill Tailings Radiation Control Act
- SMCRA - Surface Mining Control and Reclamation Act
- FIFRA Federal Insecticide, Fungicide, and Rodenticide Act
- UIC - Underground Injecton Control Program of the SDWA

State Legislation

- TWC - Texas Water Code
- SWDA - Solid Waste Disposal Act
- TNRC - Texas Natural Resources Code
- TSHP - Texas Sanitation and Health Protection Law
- TRCA - Texas Radiation Control Act
- TAC - Texas Agriculture Code
- WWDA - Texas Water Well Drillers Act
- SMRA - Texas Surface Mining and Reclamation Act
- CMRA - Texas Coal Mining and Reclamation Act

TABLE 2
GROUND WATER PROTECTION
STATE AGENCY AUTHORITY

State Agency	Waste Disposal	Underground Storage Tanks	Fuel Transportation & Use	Well Operations (Oil & Gas & & Geothermal)	Agriculture Practices	Water Wells	Mining Activities
Texas Water Commission	RCRA, Superfund, TWC, CWA, UIC, SWDA	Superfund, TWC, RCRA	TWC, CWA, RCRA		CWA, TWC	SDWA, TWC, WWDA	TWC,UIC
Railroad Commission	TNRC, TWC, UIC,	TNRC	TWC, TNRC	TNRC, TWC	CMR, SMRA		SMCRA, SMRA, CMRA
Texas Department of Health	RCRA, SDWA, UMTRCA, SWDA, TSHPL, TRCA,					SDWA, TSHPL	UMTRCA, TRCA
Texas Department of Agriculture	FIFRA, TAC				FIFRA, TAC		
Texas Water Development Board						WWDA	
Texas Water Well Drillers Board							

Legend:

Federal Legislation

- RCRA - Resource Conservation Recovery Act
- SDWA - Safe Drinking Water Act
- Superfund - Comprehensive Environmental Response, Compensation and Liability Act
- CWA - Clean Water Act
- UMTRCA - Uranium Mill Tailings Radiation Control Act
- FIFRA - Federal Insecticide, Fungicide, and Rodenticide Act
- UIC - Underground Injection Control Program of the SDWA
- SMCRA - Surface Mining Control and Reclamation Act
- AEA - Atomic Energy Act

State Legislation

- TWC - Texas Water Code
- SWDA - Solid Waste Disposal Act
- TNRC - Texas Natural Resources Act
- TSHP - Texas Sanitation and Health Protection Law
- TRCA - Texas Radiation Control Act
- TAC - Texas Agriculture Code
- WWDA - Texas Water Well Drillers Act
- CMRA - Texas Coal Mining and Reclamation Act
- SMRA - Texas Surface Mining and Reclamation Act

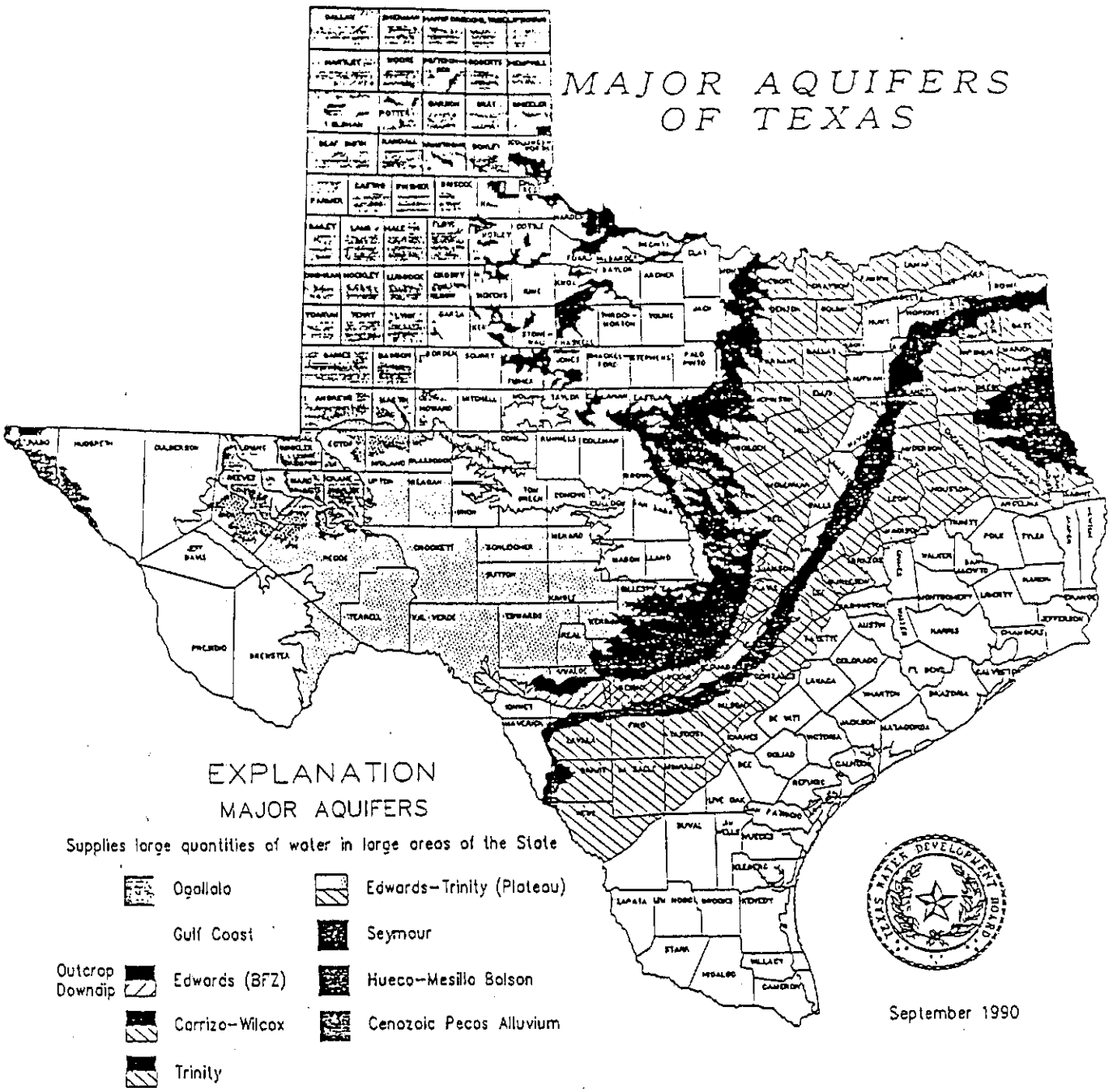

MAJOR AQUIFERS
OF TEXAS
EXPLANATION
MAJOR AQUIFERS
Supplies large quantities of water in large areas of the State
Ogallala
Gulf Coast
Outcrop
Downdip
Edwards (BFZ)
Carrizo-Wilcox
Trinity
Edwards-Trinity (Plateau)
Seymour
Hueco-Mesilla Bolson
Cenozoic Pecos Alluvium
TEXAS WATER DEVELOPMENT BOARD
September 1990

Figure 1

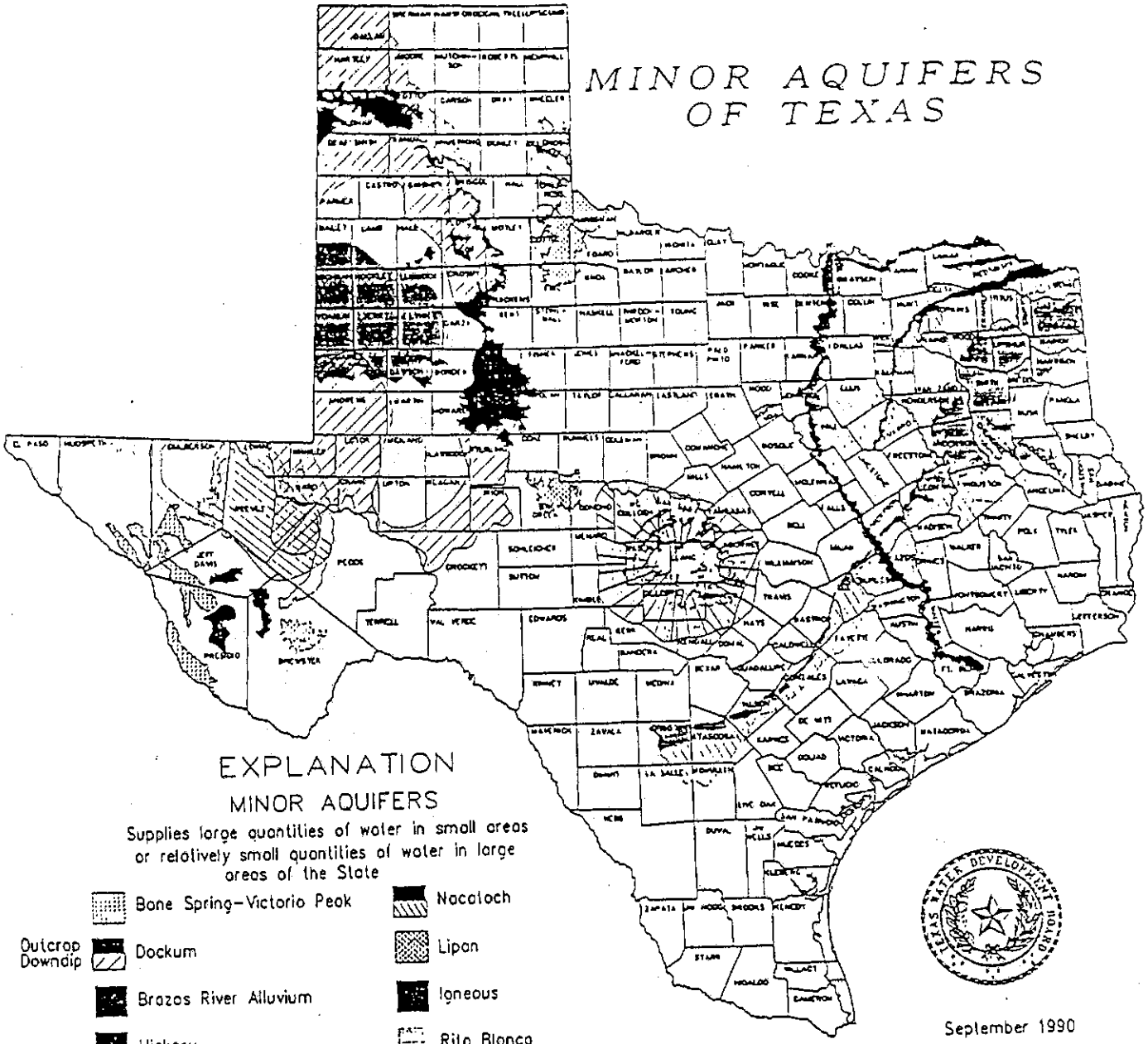

MINOR AQUIFERS
OF TEXAS
EXPLANATION
MINOR AQUIFERS
Supplies large quantities of water in small areas or relatively small quantities of water in large areas of the State
Outcrop
Downdip
Bone Spring-Victorio Peak
Dockum
Brazos River Alluvium
Hickory
West Texas Bolsons
Queen City
Woodbine
Edwards-Trinity (High Plains)
Bloine
Sparto
Nacatoch
Lipan
Igneous
Rita Blanca
Ellenburger-San Saba
Blossom
Marble Falls
Rustler
Capitan Reef Complex
Marathon
Note: Other Aquifers Undifferentiated (Not Shown)
TEXAS WATER DEVELOPMENT BOARD
September 1990

Figure 2

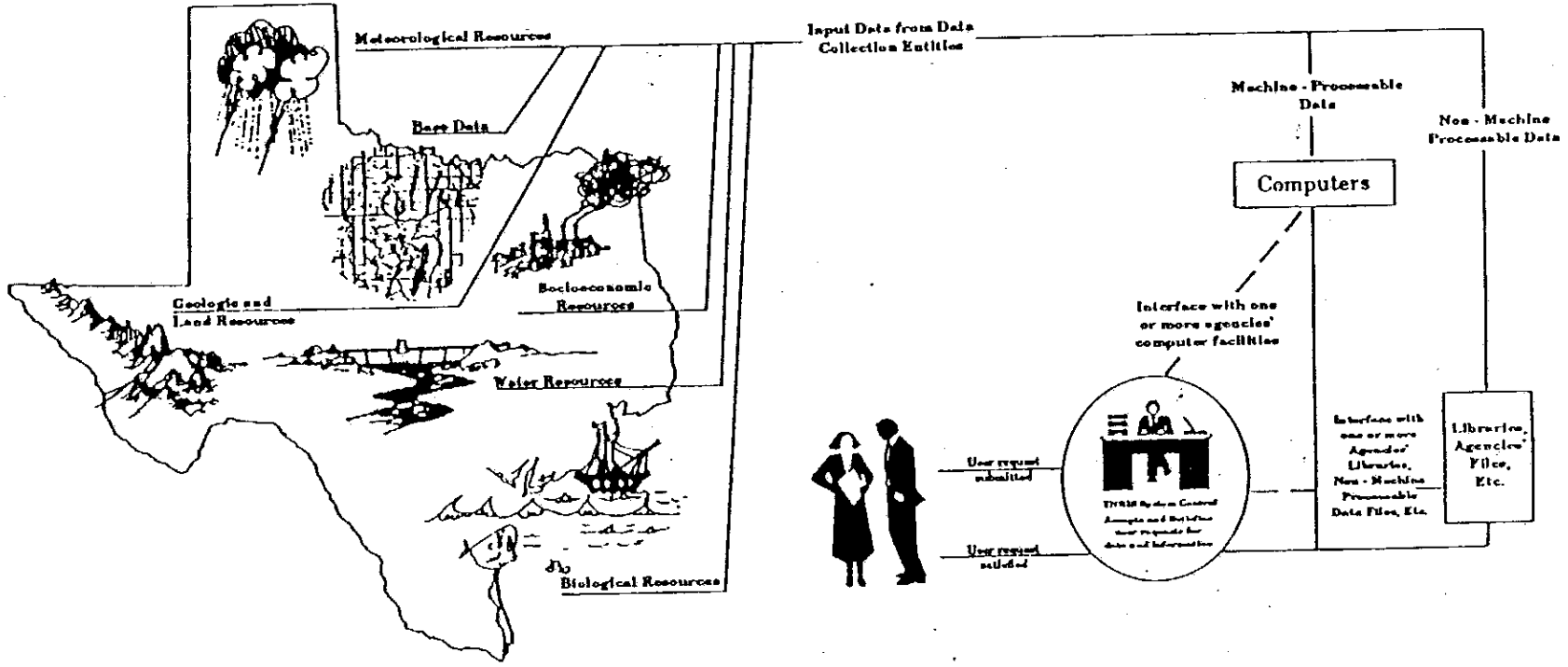
Figure 3 –Texas Ground Water Protection Committee Ground Water Classification System

Class	Quality*	Examples of Use	Agency Response
Fresh	Zero to 1000	Drinking and all other uses	**Level I Response:** Protection or restoration measures based on current or potential use as a human drinking water supply
Slightly Saline	More than 1000 to 3000	Drinking if fresh water is unavailable, livestock watering, irrigation, industrial, mineral extraction, oil and gas production	
Moderately Saline	More than 3000 to 10,000	Potential/future drinking and limited livestock watering and irrigation if fresh or slightly saline water is unavailable; industrial, mineral extraction, oil and gas production	
Very Saline to Brine	More than 10,000	Mineral extraction, oil and gas production	**Level II Response:** Protection or restoration measures based on indirect exposure or no human consumption

* *Concentration range of Total Dissolved Solids in milligrams per liter*

Figure 4

Texas Natural Resources Information System
Data Categorization, Storage and Retrieval Activities

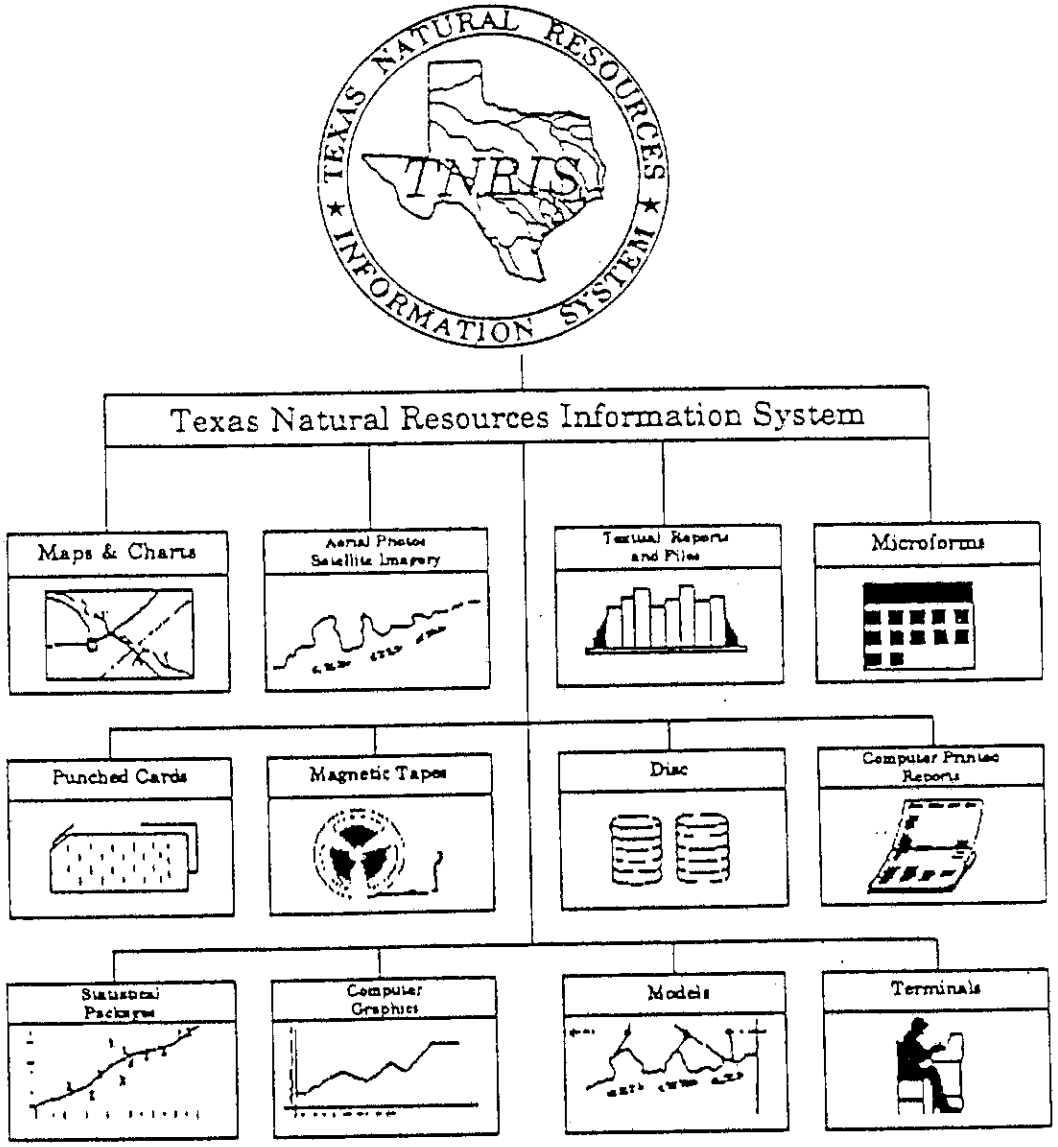


To facilitate the storage and retrieval of data in the Texas Natural Resources Information System (TNRIS), data collected by participating agencies or acquired from other sources is indexed using a system of General Data and Information Categories: Base Data, Meteorological Resources, Biological Resources, Water Resources, Geologic and Land Resources and Socioeconomic Resources. These categories were designed with the assistance of the cooperating TNRIS agencies to best satisfy the data and information needs of all users of the System. Once the data is collected, and verified by participating agencies, it is indexed and made available through TNRIS Systems Central in cooperation with these agencies. As previously indicated, the TNRIS also accesses with a number of federal data systems to incorporate federal data into the TNRIS and to provide TNRIS users with federally held data and information in addition to that held within the State.

Data requests come to TNRIS in many ways: by letter, telephone, walk-in, and via computer terminals. TNRIS Systems Central provides the coordination to satisfy requests. Some requests require contact with participating agencies or access to federal systems. Requests may be for computerized data or for non-machine processable data such as textual reports and files, aerial photography, maps, etc. TNRIS Systems Central determines the user requirements, obtains the data in the desired format, contacts with the participating agencies as needed, and returns the data to the requester. TNRIS Systems Central also stores data and information for participating entities in accordance with standard operating procedures. Data input and output formats are depicted on the following page.

Figure 5

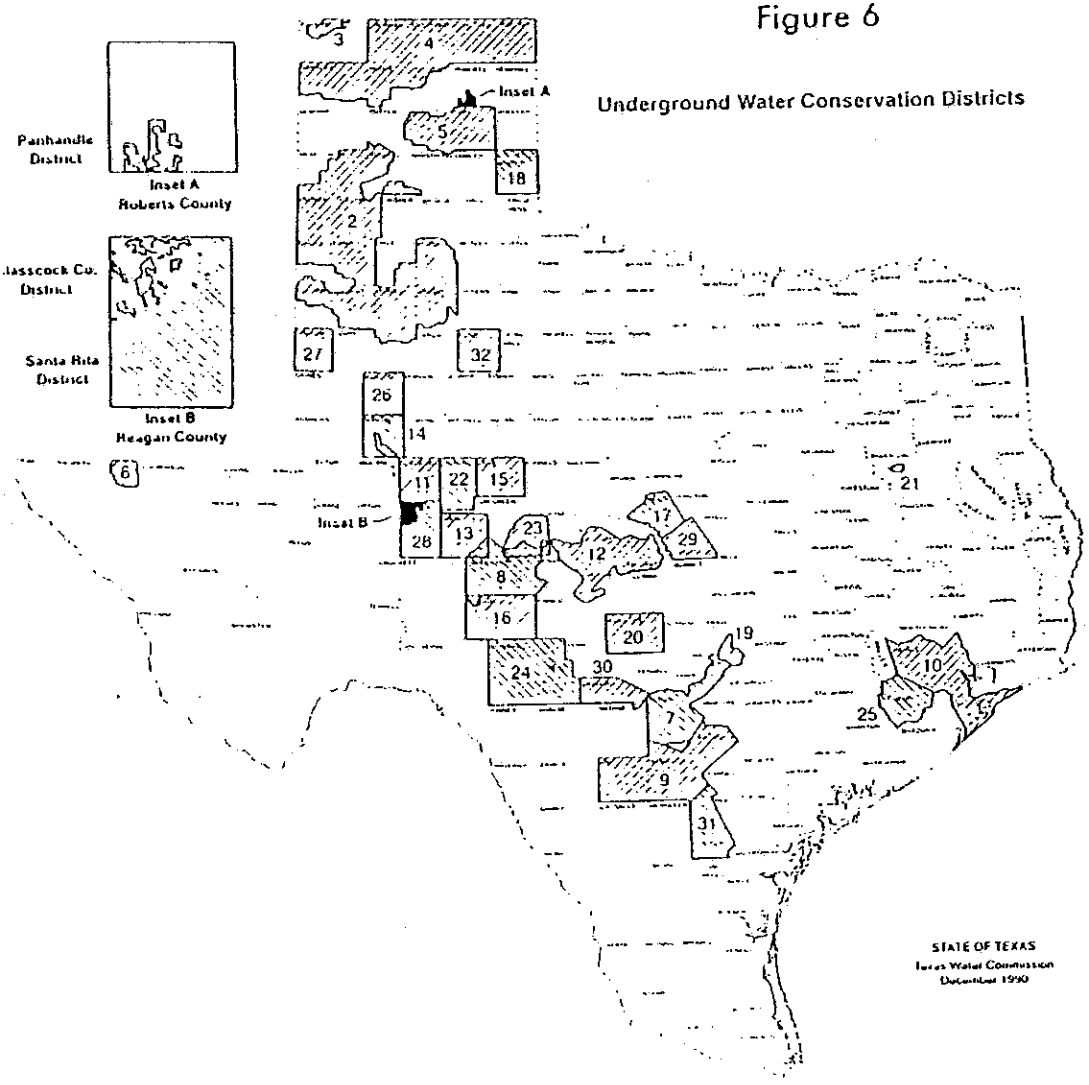
TNRIS Data Input and Output Formats



The Texas Natural Resources Information System has been designed to offer users maximum benefits available from data stored in the TNRIS. In addition to the computerized data and information available through the TNRIS, a variety of graphs, maps, charts, aerial photos, satellite imagery, and textual reports and data are available. The System provides the user the capability of converting computerized data into several forms of useful information. Typical output formats for computerized data include printed reports, punched cards, magnetic tapes, hard disc, floppy diskettes, graphical output, and microforms. Limited data analysis using statistical packages and models is also available. Data input and output can also be accomplished using terminals. The TNRIS File Description Report, available through TNRIS Systems Central, describes the files that are available through the System.

Figure 6

Underground Water Conservation Districts



EXPLANATION

1. Martin County Underground Water Conservation District No. 1 (1951) Dissolved by the Texas Legislature in 1985 and district now includes the entire county as shown in No. 14.
2. High Plains Underground Water Conservation District No. 1 (1951)
3. Dallam County Underground Water Conservation District No. 1 (1953)
4. North Plains Ground Water Conservation District No. 2 (1954)
5. Panhandle Ground Water Conservation District No. 3 (1955) Roberts County consists of individually annexed parcels.
6. Hudspeth County Underground Water Conservation District No. 1 (1957)
7. Edwards Underground Water District (1959)
8. Plateau Underground Water Conservation and Supply District (1965) Northwest portion of district also included in Irion County district as shown in No. 13. The southwest portion of the district also included in Sutton County district as shown in No. 16. The northeast portion of the district is also included in Lipan-Kickapoo district as shown in No. 23.
9. Evergreen Underground Water Conservation District (1965) Frio County added to district in October 1965.
10. Harris-Galveston Coastal Subsidence District (1975)
11. Glasscock County Underground Water Conservation District (1981)
12. Hickory Underground Water Conservation District No. 1 (1982)
13. Irion County Water Conservation District (1985) Southeast portion of district also included in Plateau district as shown in No. 8.
14. Martin County Underground Water Conservation District (1985)
15. Coke County Underground Water Conservation District (1986)
16. Sutton County Underground Water Conservation District (1986) Northwest portion of district also included in Plateau district as shown in No. 8. A small area in the northcentral part of the county was omitted from district.
17. Fox Crossing Water District (1986)
18. Collingsworth County Underground Water Conservation District (1987)
19. Barton Springs-Edwards Aquifer Conservation District (1987)
20. Hill Country Underground Water Conservation District (1987)
21. Anderson County Underground Water Conservation District (1987)
22. Sterling County Underground Water Conservation District (1987)
23. Lipan Kickapoo Water Conservation District (1987) Southwest portion of district also included in Plateau district as shown in No. 8.
24. Real Edwards Conservation and Reclamation District (1959)
25. Fort Bend Subsidence District (1989)
26. Mesa Underground Water Conservation District (1989)
27. Sandy Land Underground Water Conservation District (1989)
28. Santa Rita Underground Water Conservation District (1989)
29. Saratoga Underground Water Conservation District (1989)
30. Springhills Water Management District (1989)
31. Brush Country Underground Water Conservation District (1989)
32. Salt Fork Underground Water Conservation District (1989)

[1] [14] Limits of underground water conservation districts (numbered in the order in which they were established)

(1959) Date of establishment

APPENDIX A

Texas Ground Water Protection Policy

Texas Groundwater Protection Policy

Chapter 26, Water Code
Subchapter J

The legislature finds that:

In order to safeguard present and future groundwater supplies, usable and potentially usable groundwater must be protected and maintained;

Protection of the environment and public health and welfare requires that groundwater be kept reasonably free of contaminants that interfere with present and potential uses of groundwater;

Groundwater contamination may result from many sources, including current and past oil and gas production and related practices, agricultural activities, industrial and manufacturing processes, commercial and business endeavors, domestic activities, and natural sources that may be influenced by or may result from human activities;

The various existing and potential groundwater uses are important to the state economy; and,

Aquifers vary both in their potential for beneficial use and in their susceptibility to contamination.

The legislature determines that,

Consistent with the protection of the public health and welfare, the propagation and protection of terrestrial and aquatic life, the protection of the environment, the operation of existing industries, and the maintenance and enhancement of the long-term economic health of the state, it is the goal of groundwater policy in this state that the existing quality of groundwater not be degraded. This goal of nondegradation does not mean zero-contaminant discharge.

It is the policy of this state that:

Discharges of pollutants, disposal of wastes, or other activities subject to regulation by state agencies be conducted in a manner that will maintain present uses and not impair potential uses of groundwater or pose a public health hazard; and

The quality of groundwater be restored if feasible.

The legislature recognizes the important role of the use of the best professional judgment of the responsible state agencies in attaining the groundwater goal and policy of this state.

APPENDIX B

Creation and Membership of Texas Groundwater Protection Committee

CREATION AND MEMBERSHIP OF THE TEXAS GROUNDWATER PROTECTION COMMITTEE

Chapter 26, Water Code
Subchapter J

Definitions:

"Commission" means the Texas Water Commission.

"Committee" means the Texas Groundwater Protection Committee.

Creation and Membership of Texas Groundwater Protection Committee:

The Texas Groundwater Protection Committee is created as an interagency committee to coordinate state agency actions for the protection of groundwater quality in this state.

The commission is designated as the lead agency for the committee and shall administer the activities of the committee.

The committee is composed of:

(1) the executive director of the commission;
(2) the executive administrator of the Texas Water Development Board;
(3) the executive director of the Railroad Commission of Texas;
(4) the commissioner of health of the Texas Department of Health;
(5) the deputy commissioner of the Department of Agriculture;
(6) the executive director of the State Soil and Water Conservation Board, and
(7) a representative selected by the Texas Groundwater Conservation Districts Association.

Each member of the committee may designate a personal representative from the member's agency to represent the member on the committee, but the designation does not relieve the member of responsibility for the acts and decisions of the representative.

The executive director of the commission shall serve as chairman, and the executive administrator of the Texas Water Development Board shall serve as vice-chairman of the committee.

Powers and Duties of the Committee

The committee shall, on a continuing basis:

(1) coordinate groundwater protection activities of the agencies represented on the committee;
(2) develop and update a comprehensive groundwater protection strategy for the state that provides guidelines for the prevention of contamination and for the conservation of groundwater and that provides for the coordination of the groundwater protection activities of the agencies represented on the committee;
(3) study and recommend to the legislature groundwater protection programs for each area in which groundwater is not currently regulated:
(4) file with the governor, lieutenant governor and speaker of the house of representatives, before the date that each regular legislative session convenes, a report of the committee's activities during the two preceding years and any recommendations for legislation for groundwater protection; and
(5) publish the joint groundwater monitoring and contamination report required by the Water Code.

APPENDIX C

Texas Ground Water Classification System

Texas Ground Water Protection Committee
Ground Water Classification System

Purpose

The Texas Ground Water Protection Committee and its member agencies* recognize that ground-water classification is an important tool to be used in the implementation of the ground-water policy contained in Section 26.401 of the Texas Water Code. Through classification, the ground waters in the state can be categorized and protection or restoration measures can then be specified by member agencies according to the quality and present or potential use of the ground water.

Basis

Four classes are defined based on quality as determined by total dissolved solids content (Figure 1). The names and concentration ranges are based on traditional nomenclature associated with each class. Quality also determines usability, however, it is implicit in this classification that a water-bearing zone must be able to produce sufficient quantities of water to meet its intended use. The examples of use are intended to describe some of the common uses of these classes and are not meant to be exclusive of other uses which might arise due to unusual circumstances or application of new technology such as desalinization.

Application

This ground-water classification system applies to all ground waters in the state. In assigning a classification, the member agencies shall endeavor to use the natural quality of the ground water that is unaffected by discharges of pollutants from human activities.

All usable and potentially usable ground waters are subject to the same protection afforded by the nondegradation policy goal of the Texas Water Code in Section 26.401. This section further states that nondegredation does not mean zero-contaminant discharge. Starting with this nondegradation policy goal,protection or restoration measures can be varied according to the response level set by the classification and guidance of this narrative so

long as the following conditions are met:

a) Current ground-water uses are maintained;
b) Potential ground-water uses are not impaired;
c) A public health hazard is not created; and
d) The quality of ground water is restored if feasible.

In determining protection or restoration measures, the member agencies should consider all beneficial uses to which ground water of a given quality can currently or potentially be put. Generally, the use of ground water requiring the highest degree of protection or restoration is human consumption as drinking water. Protection for this use will also be protective of all other current or potential uses in almost all circumstances. The suitability of a zone for use as a human drinking water supply can be based on the quality and quantity of the water it contains as well as its ability to produce enough water to meet its intended use. These considerations facilitate defining two response levels for purposes of assigning protection or restoration measures that are commensurate with the potential to impact human health and the environment.

- Level I response for the fresh, slightly saline and moderately saline classes should be based on the current or potential use as a human drinking water supply.

- Level II response for the very saline to brine class should be based on indirect exposure (i.e., by means other than drinking) or no human consumption.

Evaluations. In specifying a protection or restoration measure, member agencies must apply best professional judgement on a case by case basis. Evaluations to be made include but are not limited to such factors as yield, the availability of alternate sources of water, any background concentrations of naturally occurring constituents, the effects of constituents on usability, traditional and potential beneficial uses of the water, economic and technical feasibility of treatment and projected needs for and types of impacts on these ground waters. In instances where there is a likelihood of hydrologic interconnection with resultant potential for

contaminant movement from a given ground-water zone to a surface water body or other ground-water zones, protection and restoration measures for that zone should be determined by the quality and current and potential use of the receiving waters.

Additional Functions

This classification system is intended to be implemented by member agencies as an integral part of their ground-water quality programs. In addition to its response setting function, the classification system can also serve as a common basis among the various programs to foster consistency. It can also be used as a mapping tool to delineate specific areas in need of more detailed ground-water quality management. Towards this end, the Committee recognizes the important contributions of all agencies that compile such data and supports the continuing efforts to enhance the statewide database.

*The Texas Ground Water Protection Committee consists of representatives from the following member agencies: Texas Water Commission, The Texas Water Development Board, Railroad Commission of Texas, Texas Department of Health, Texas Department of Agriculture, Texas State Soil and Water Conservation Board, and Texas Ground Water Conservation Districts Association.

Texas Ground Water Protection Committee
Ground Water Classification System

Class	Quality*	Examples of Use	Agency Response
Fresh	Zero to 1000	Drinking and all other uses	**Level I Response:** Protection or restoration measures based on current or potential use as a human drinking water supply
Slightly Saline	More than 1000 to 3000	Drinking if fresh water is unavailable, livestock watering, irrigation, industrial, mineral extraction, oil and gas production	
Moderately Saline	More than 3000 to 10,000	Potential/future drinking and limited livestock watering and irrigation if fresh or slightly saline water is unavailable; industrial, mineral extraction, oil and gas production	
Very Saline to Brine	More than 10,000	Mineral extraction, oil and gas production	**Level II Response:** Protection or restoration measures based on indirect exposure or no human consumption

** Concentration range of Total Dissolved Solids in milligrams per liter*

APPENDIX D

Water Pollution Control Duties of Cities

WATER POLLUTION CONTROL DUTIES OF CITIES
CHAPTER 26, WATER CODE
Subchapter E

Every city in the state, having a population of 5,000 or more inhabitants shall, and any city of this state may, establish a water pollution control and abatement program for the city. the city shall employ or retain an adequate number of personnel on either a part-time or full-time basis as the needs and circumstances of the city may require, who by virtue of their training or experience are qualified to perform the water pollution control and abatement functions required to enable the city to carry out its duties and responsibilities under this section.

The water pollution control and abatement programs of a city shall encompass the entire city and may include areas within its extraterritorial jurisdiction which in the judgement of the city should be included to enable the city to achieve the objectives of the city for the area within its territorial jurisdiction. The city shall include in the program the services and functions which, in the judgement of the city or as may be reasonably required by the commission, will provide effective water pollution control and abatement for the city, including the following services and functions:

(1) The development and maintenance of an inventory of all significant waste discharges into or adjacent to the water within the city and, where the city so elects, within the extraterritorial jurisdiction of the city, without regard to whether or not the discharges are authorized by the commission;
(2) The regular monitoring of all significant waste discharges included in the inventory prepared pursuant to subdivision (1) of this subsection;
(3) The collecting of samples and the conducting of periodic inspections and tests of the waste discharges being monitored to determine whether the discharges are being conducted in compliance with this chapter and any applicable permits, orders, or rules of the commission, and whether they should be covered by a permit from the commission;
(4) In cooperation with the commission, a procedure for obtaining compliance by the waste dischargers being monitored, including where necessary, the use of legal enforcement proceedings.
(5) The development and execution of reasonable and realistic plans for controlling and abating pollution or potential pollution resulting from generalized discharges of waste which are not traceable to a specific source, such as storm sewer discharges and urban runoff from rainwater; and
(6) Any additional services, functions, or other requirements as may be prescribed by commission rule.

The water pollution control and abatement programs required by this section must be submitted to the commission for review and approval. The commission may adopt rules providing the criteria for the establishment of those programs and the review and approval of those programs.