Water Quality Management Program
Continuing Planning Process

Texas Natural Resource Conservation Commission
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ABSTRACT

This document is an update of the FY 1986 Continuing Planning Process document and 1995 amendments. This update provides the most current management and technical procedures developed and implemented by the Texas Natural Resource Conservation Commission to control, manage, and abate water pollution in the State. The water pollution control programs are derived from the Commission's interpretation of the CWA and incorporate the best management practices available to the State. The Environmental Protection Agency's approval of this update indicates Federal government concurrence with the State procedures and agreement with the State's approach to implementing specific requirements of the CWA.

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Introduction

The Continuing Planning Process (CPP) is a document which describes in detail the State's water quality management program. It provides the most current policies and procedures describing how the Texas Natural Resource Conservation Commission (hereafter referred to as "the Commission" or "TNRCC") implements effective programs to prevent, control, and abate water pollution. The CPP's purpose is to demonstrate that the program requirements and methods employed by the Commission will protect and maintain water quality for the benefit of the entire State.

Authority

The Clean Water Act (CWA), as amended, requires the State to prepare and publish a CPP which contains the procedures by which the Commission will operate. These operating procedures are developed by the various divisions responsible for implementing the Commission's water quality management program. These procedures are coordinated with Region VI of the Environmental Protection Agency (EPA) to ensure state activities are consistent with the CWA and Federal regulations. The CPP must be approved by the Texas Natural Resource Conservation Commission and the EPA Regional Administrator. The Commission must have an approved CPP before the Regional Administrator will approve the State's permit program under Title IV of the CWA.

Planning Activities

The planning and management activities under Titles I, II, and III of the Act are included in the CPP regulations as follows:

- Section 303(c) - Setting and revising standards for all water bodies.
- Section 303(d) - Describes or outlines procedures for calculating total maximum daily loads and waste load allocations for each water body that cannot meet water quality standards.
- Section 303(e) - Outlines the process by which planning and management is implemented [i.e., Sections 106, 205(g), 205(j), 303, and 305(b)].
- Section 305(b) - Development of water monitoring activities and submission of 305(b) report which documents the status of water quality programs.
- Sections 106 and 205(j) - Development of water quality plans that list standards and prescribe regulatory and construction activities to meet standards.

Other activities, including those which are not required under current federal regulation but play a significant role in the overall water quality management program, are included in the CPP.

WATERSHED MANAGEMENT APPROACH

Watershed Management Approach
Office of Water Resource Management

Introduction

The planning and management of water resources in Texas relies on a host of local, state, and federal programs and participants to manage, protect, and maintain public health and the environment. However, it is recognized that planning and management activities for the state's water resources are fragmented due to multiple jurisdictional boundaries, statutory limitations, and the distinct classification of surface and ground waters into separate resources. Furthermore, driven by program-centered objectives and funding, water resource programs and participants lack the flexibility and coordination necessary to address water quantity and water quality issues simultaneously. While significant progress has been made in Texas to protect water resources, public health and water resources continue to be impaired by a variety of complex sources. To address these issues, a comprehensive approach to better coordinate water resource management activities geographically by river basin or watershed is being implemented through the Clean Rivers Program (CRP), which serves as the foundation for watershed management at TNRCC.

The CRP, established in 1991, requires that regional assessments of water quality be performed within each river basin and that assessment reports be written every two years. The CRP has fostered important partnerships and funding mechanisms between the TNRCC, river authorities, other natural resource agencies, and basin steering committees. In addition, the CRP has made significant strides to improve the consistency and quality of collecting and assessing surface water quality data for each river basin.

Guided by the successes and recommendations of the CRP, the stakeholders participating in the program recognize the need to broaden and strengthen watershed management in Texas. A statewide watershed management approach is being improved to:

- Coordinate the development of cost-effective regulatory and non-regulatory management strategies.
- Coordinate existing public participation forums to strengthen support from citizens and local and regional governments in the decision-making process.
- Establish a more consistent and effective process for prioritizing local water resource issues and targeting program goals and resources.
- Allow flexible solutions tailored to the specific characteristics of each basin.
- Leverage resources and expertise from multiple partners to address specific issues in priority watersheds.
- Refocus programs from the current program-centered approach to a watershed approach, using public and environmental health objectives as measures of success.
- Leverage expertise and target data collection efforts to assess nonpoint source pollution impacts and the interaction of water quality and quantity.

How is the OWRM working to improve the watershed management approach?

The Office of Water Resource Management (OWRM) has adopted a long-term vision which will serve to coordinate with as many environmental management programs within and outside of the TNRCC as possible. The OWRM has relied on various internal work groups to further refine a framework for implementing a statewide watershed management approach. Recognizing that a successful watershed management approach requires coordination, support, and input from as many partners as possible, the OWRM facilitates a variety of efforts with other agencies, organizations, and citizens who have a stake in water resource management. CRP has begun by focusing on water resource programs associated with surface water quality.

Efforts are under way to determine the steps and commitments needed to improve the scope of current watershed management efforts. This will include determining opportunities to enhance coordination between programs that focus on water quality, water quantity, groundwater, drinking water, agriculture, on-site wastewater, flood plain management, and dam safety. Watershed management will provide the mechanism necessary to prioritize a range of problems that affect a given geographic area and the coordination needed to develop cost-effective solutions.

The statewide coordination of water resource programs involve several essential duties. Some of these duties include: continuing to build partnerships and commitment for CRP, maintaining schedules for carrying out specific activities within each basin, and ensuring flexible solutions which address each basin's priority issues. A major component of watershed management which will guide these essential duties is the basin management cycle.

The basin management cycle provides the temporal and spatial organization necessary to coordinate the activities of water resource programs. The specific activities of the cycle are scoping (for water resource concerns/issues in a specific basin/watershed), data collection, assessment, prioritization of issues and strategies, and implementation. The basin management cycle provides three features which create an orderly system for focusing and coordinating activities on a continuous basis:

1. a specified length of time for executing each of the major activities;
2. a statewide sequence for addressing the river basins of Texas; and
3. through the combination of these two, a schedule of activities is established for each river basin for all participating programs, agencies, public interest groups, and other partners.

This schedule provides a long-term reference and coordination framework for watershed management partners to follow. Sequencing programs through this schedule requires a transition period in which flexibility and coordination among all participants will be essential.

Internally, the OWRM will focus on cross-program coordination to implement various components of watershed management.

- In support of watershed management the OWRM has combined various programs to improve coordination and customer service. For example:

    1. The Irrigation Water Rights Program and the Water Conservation Program have been combined with the Municipal and Industrial Water Rights team.
    2. The Wellhead Protection Program has been moved under the Drinking Water Program.
    3. The volunteer monitoring program Texas Watch is operating within the same section as the Surface Water Quality Monitoring Team.

- The Nonpoint Source Team has begun to allocate CWA Section 319 funds in response to the Clean Rivers Program assessment recommendations and based on the timing and location of activities prescribed under the basin management cycle.
- The Surface Water Quality Monitoring (SWQM) Team and the Clean Rivers Program (CRP) Team are working together to improve coordination and reduce duplication. This process involves developing strategic monitoring plans for each river basin that will result in the collection of targeted data to improve the TNRCC water quality permitting process.
- A primary focus of coordination efforts between the SWQM and CRP teams will examine opportunities to reduce reporting requirements that are currently mandated by federal and state laws (e.g., CWA 305(b) Report and the Clean Rivers Program Assessment Reports). Efforts will also determine additional opportunities to reduce reporting requirements for other programs in the OWRM.

In conclusion, as an ongoing task, the OWRM continues to work with stakeholders to identify both internally and externally, opportunities for improved coordination of resources through a watershed management approach.

WATER QUALITY MANAGEMENT

SERIES 1
PUBLIC PARTICIPATION

Assessment

Recognizing that environmental programs need strong grass-roots support to be effective, the Texas Natural Resource Conservation Commission (TNRCC) provides for, encourages, and assists the participation of the public at all levels of water quality decision making under Sections 106, 201, 205(j), 303(c) and (d), 314, 319, and 320 of the Clean Water Act.

There are a number of identifiable segments of the public who may be affected by or may have a particular interest in the TNRCC programs or decisions. The TNRCC will give special attention to the identification of these interested parties, while still providing opportunities for the public at large to participate. The policy concerning public participation is two-fold: 1) The TNRCC will provide for direct consultation to assure that actions are responsive to public concerns; 2) The TNRCC will provide information to stimulate support and participation.

Activities and Requirements

The public participation processes utilized by the TNRCC are specific to the type of water quality management or regulatory activity that is undertaken. The process for involving the general public, dischargers, designated management agencies, area planning agencies, and federal, state, and local governments is described in detail in other Series of this Continuing Planning Process (CPP). For instance, Series 6 describes public participation when water quality management plans are prepared or updated. The TNRCC procedural rules describe public participation procedures used when Texas Pollutant Discharge Elimination System (TPDES) permit applications are processed and considered.

SERIES 2
WATER QUALITY MANAGEMENT ANNUAL WORK PROGRAM

Purpose

The Texas Natural Resource Conservation Commission is responsible for administering the constitution and laws of the State of Texas to promote judicious use and maximum conservation and protection of the quality of the State's waters. To assist the State in these efforts, Section 106 of the Federal Clean Water Act, as amended, authorizes grant funds to carry out water quality planning and management activities. These activities include assessments of water quality, revisions of surface water quality standards, development of alternative approaches to control pollution, implementation and enforcement of control measures and development and implementation of ground water programs. The processes for these activities are described under their individual series headings located elsewhere in this document.

Annual Work Program Process

To receive Section 106 Federal grant assistance, the Commission submits an annual work program for approval to the U.S. Environmental Protection Agency (EPA) "for the prevention, reduction and elimination of pollution in accordance with the purposes and provisions of the Act." The work program is developed in consultation with EPA Region 6 staff. The Commission receives funding for approved program elements which are consistent with the goals of the Clean Water Act from EPA. Matching funds required for the Section 106 Federal assistance is based on the maintenance of a State "level-of-effort", non-Federal expenditure amount negotiated previously with EPA by the Commission.

Work Program Evaluation

The approved program elements of the annual work program contain task outputs and performance measures. EPA conducts mid-year and end-of-year evaluations of the status of the outputs of the work program. Written reports are submitted periodically by TNRCC describing the progress to-date on completing the grant task objectives.

SERIES 3
STATE OF TEXAS WATER QUALITY INVENTORY

Description

The Federal Water Pollution Control Act (PL 92-500), commonly known as the Clean Water Act, as last reauthorized by the Water Quality Act of 1987 (PL 100-4), establishes a process for states to develop information on the quality of the Nation's water resources and to report this information to the U.S. Environmental Protection Agency (EPA), the U.S. Congress, and the citizens of this country. The requirements for this process are found in Sections 106(e), 204(a), 303(d), 305(b) and 314(a) of the Clean Water Act. Each state must develop a program to monitor the quality of its surface and ground waters and prepare a report every two years describing the status of its water quality. The EPA issues guidelines for states to use during each reporting cycle. States use these guidelines to prepare reports for EPA. EPA compiles and analyzes the data from the state reports, summarizes them, and transmits the summaries in a National Water Quality Inventory Report to Congress. This report provides analysis of the status of water quality nationwide.

Sources of data include the TNRCC Surface Water Quality Monitoring Program fixed-station network, the USGS Texas Water Quality Monitoring Network, and data contributed through the Clean Rivers Program from cities, river authorities and other local entities. All of the data used for the report are available in several formats to outside users. Field measurements, water sampling, laboratory analysis, and data management are conducted under rigorous quality assurance project plans to insure consistency between contributing programs.

The 305(b) process is an essential and integral part of the State of Texas Water Quality Management Program. The State of Texas Water Quality Inventories (305(b) Reports) detail the findings of water quality assessments in the State as well as descriptions of the specific programs that control, manage and prevent the degradation of water quality and clean up of waterbodies already affected. The 305(b) Report, thus, provides a means for state and federal governments to evaluate the effectiveness of efforts to implement Texas Water Code and the Clean Water Act. The Texas Natural Resource Conservation Commission utilizes the 305(b) Report to consolidate assessments in one document, describe the status and trends of surface and ground waters, identify impaired waters or those of concern, focus agency resources on priority areas, and identify data gaps. The 305(b) Report is also used by the TNRCC to satisfy information needs of public, local governments, state agencies, the Texas legislature, EPA, and the U.S. Congress.

SERIES 4
RESERVOIR RANKING

Introduction

Section 314 of the Federal Clean Water Act requires states to classify lakes and/or reservoirs according to trophic state. The trophic state of a reservoir essentially refers to its nutritional status. Various classification schemes or indices have been developed that group reservoirs into discrete quality (trophic) categories along a continuum from oligotrophic (poorly nourished) to hypereutrophic (over nourished). For many reservoirs, the degree of eutrophication (trophic status) is related to increased nutrient concentrations. An increase in nutrient loading and resulting concentrations may trigger a responding increase in the amount of algae (estimated by chlorophyll a) in the reservoir. Due to increased algal biomass, water transparency, as measured by a Secchi disk or submarine photometer, would be expected to decrease.

Classification Procedure

Texas reservoirs are evaluated by the TNRCC using Carlson's Trophic State Index (TSI). This evaluation and resulting list of reservoirs is discussed in the State of Texas Water Quality Inventory (305(b) Report). Carlson's Index was developed to compare determinations of Secchi disk (SD) transparency, chlorophyll a (Chl) concentration, and total phosphorus (TP) concentration made from in-reservoir sampling (Carlson 1977). These three variables are highly correlated and are considered as estimators of algal biomass. By using regression analysis, Carlson related Secchi disk depth to total phosphorus (TP) concentration and to chlorophyll a concentration. The TSI can be determined from any of the three computational equations:

$$\text{TSI (Secchi Disk)} = 10\left(6 - \frac{\ln SD}{\ln 2}\right)$$

$$\text{TSI (Chlorophyll a)} = 10\left(6 - \frac{2.04 - 0.68 \ln Chl}{\ln 2}\right)$$

$$\text{TSI (Total Phosphorus)} = 10\left(6 - \frac{TP}{}\right)^{\ln \frac{48}{\ln 2}}$$

Texas reservoirs are primarily ranked by the TNRCC according to Carlson's TSI for chlorophyll a as an average calculated from the most current 10 years of Surface Water Quality Monitoring data. In order to maximize comparability among reservoirs, data from the station nearest the dam in the main pool of each reservoir were utilized. For many reservoirs, these are the only sites monitored by the TNRCC.

Chlorophyll a was given priority as the primary trophic state indicator by the TNRCC, because it is the most direct means for estimating algal biomass in most reservoirs. Rankings are also provided for total phosphorus and Secchi disk transparency. This presentation permits comparison of individual TSI indicators for each reservoir, provides indications of the clearest reservoirs, and identifies reservoirs with low and high total phosphorus concentrations.

SERIES 5
ESTUARY STUDIES

Historic Purpose of Estuary Studies

The Texas Water Development Board initiated the Texas Bays and Estuaries Program in 1967 for the purpose of collecting physical, chemical and biological data each year in a coordinated manner necessary for State water planning and management. In 1975 the Texas Legislature directed the Board to prepare reporting documents on each major bay and estuary by December 31, 1979. With the passage of House Bill 2 in 1985 and Senate Bill 683 in 1987 the Board focused on completing a new round of cooperative studies. The 2.6 million acres of open water bays, tidal flats and marshes provide seafood harvests and recreational activities with direct and total annual economic impacts to the State valued at $2.6 billion in 1986 dollars.

Texas Water Code Statutes

Section 16.058

Texas Water Development Board (TWDB) and the Texas Parks and Wildlife Department (TPWD) must jointly conduct freshwater inflow studies to determine bay conditions (sediments, nutrients and salinity gradients) necessary to support a sound ecological environment.

Section 11.1491

The TNRCC and TPWD have joint responsibility to determine specific freshwater inflow levels necessary for maintenance of bays and estuaries; and TNRCC, TPWD, and TWDB may establish an Estuary Management Council for each principal bay and estuary system to develop alternative management methods for meeting the ecological needs.

Program Products

The 1994 final report to the State Legislature provided general information on the following program objectives compiled from completed research studies on Texas bays and estuaries. A technical memorandum with specific recommendations will be issued for each estuary over the next four years.

Program Objectives

Objective 1 - compile freshwater inflow, bay hydrography, and biological data into computer compatible format files.

Objective 2 - develop circulation and salinity models for Texas bays, including finite element mathematical models of estuarine hydrodynamics and conservative mass

transport, as well as statistical salinity-inflow regression equations.

Objective 3 - evaluate effects of salinity and salinity change on estuarine plants and animals. This would include marine bacteria, phytoplankton, benthic algae, vascular macrophytes, zooplankton, benthic infauna, fish and shellfish larvae, juveniles, subadults, and reproductive adults. Also, analyses of fishery independent data are a part of this evaluation.

Objective 4 - assess water quality trends over the last two decades, including correlation of antecedent inflow conditions with the concentrations of selected chemical and water quality parameters.

Objective 5 - determine inflow effects on river deltas and bay sedimentation, including sediment loadings, whether effects are continuous or episodic, and how this relates to estuarine maintenance.

Objective 6 - evaluate effects of freshwater inflows on estuarine primary (plant) production. This would include effects other than direct salinity effects, such as light limitation (turbidity), nutrient loading and biogeochemical cycling in the estuaries.

Objective 7 - develop statistical harvest-inflow regression equations for commercial catch of estuarine-dependent fisheries.

Objective 8 - develop methodology to define objective functions and constraints for use with optimization procedures, such as mathematical or dynamic programming models, and perform example analyses.

Objective 9 - develop state management objectives and constraints for use with the new model optimization procedures.

Objective 10 - perform model optimization analyses and develop estimates of freshwater inflow needs over a range of conditions (short-term or instantaneous requirements versus long-term ecosystem needs).

Objective 11 - review and validate inflow relationships using existing, as well as any new data.

Objective 12 - continue minimal data collection program and update or revise inflow estimates as necessary from 1990-1995. This would include changes made necessary by large-scale modifications such as direct diversion of the Colorado River into West Matagorda Bay, the opening or closing of Gulf inlet passes like Cedar Bayou or Yarborough Pass, and major navigation and development projects in estuarine areas like Galveston Bay and Corpus Christi Bay.

Objective 13 - establish Estuary Management Councils for each principal bay and estuary system and provide technical assistance as requested in their efforts to develop alternative water management methods to meet the estimated needs for maintaining a sound coastal environment.

Continuous Data Collection

Monitoring of coastal waters by state agencies includes the following activities:

1. The TNRCC collects a wide variety of water quality, sediment, bacteriological and/or biological data at approximately 435 fixed sites in bays, estuaries, and tidal streams and rivers. Sampling is conducted quarterly at most locations as part of the Commission's Statewide Monitoring Network.

   The TNRCC receives data through the Clean Rivers Program (CRP) partnerships involving river authorities, local governments, industry and citizens. The CRP partners are in the process of coordinating and developing basinwide monitoring plans that address areas identified in the 1994 assessment as having water quality concerns. The monitoring plans are comprised of three-tiered approach, fixed station, systematic watershed monitoring and targeted monitoring, to support the TNRCC permitting process. Through the efforts of the CRP, all entities collecting water quality data will coordinate to ensure better use of public funds. TNRCC also utilizes data collected by the United States Geological Services (USGS) from many sites around Texas.
2. The Texas Water Development Board operates a statewide streamflow gage network in cooperation with the U. S. Geological Survey to provide data on freshwater flows, a coastwide tide gage network in cooperation with Corpus Christi State University and NOAA/National Ocean Service to provide tidal flow data, and collects water quality field data in cooperation with the Texas Parks and Wildlife Department using continuous recording in-situ monitors at 12 sites on the central and upper Texas coast.
3. The Texas Parks and Wildlife Department samples fish and shellfish populations at a large number of randomly selected sites in each bay system.

Assessing Water Right Impacts on Bays and Estuaries

Sections 11.147, 11.150, and 11.153 of the Texas Water Code require the Commission to assess the effect that the issuance of a new or amended water use permit will have on beneficial inflow needs for bays and estuaries. "Beneficial inflows" means "a salinity, nutrient, and sediment loading regime adequate to maintain an ecologically sound environment in the receiving bay and estuary system that is necessary for the maintenance of productivity of economically important and ecologically characteristic sport or commercial fish and shellfish species and estuarine life upon which such fish and shellfish are dependent." Texas. Water Code §11.147(a).

Any proposed action involving a permit, certificate, or certified filing to store, take, or divert water which has the potential to adversely impact freshwater inflow needs to bays and estuaries shall be evaluated for such impacts according to the procedures outlined in the TNRCC publication A Regulatory Guidance Document for Applications to Divert, Store or Use State Water (TNRCC 1995). Corresponding limitations and conditions may be provided in the permit, if granted, to prevent or mitigate such impacts.

For water right amendments, the assessment of potential adverse effects and corresponding permit limitations apply only to the scope of the proposed change. Changes which may create the potential for new or additional environmental impacts than those which exist under the legally authorized operation of the existing water right include, but are not limited to:

1. increase in the total appropriative amount where such increase may diminish streamflows to the extent that adverse impacts to water quality, instream uses, aquatic and wildlife habitat, or freshwater inflows to bays and estuaries may result;
2. a significant change in the point of diversion (e.g., moving the diversion point a considerable distance upstream where streamflows are significantly less; moving the diversion point to a tributary; or moving the diversion point into habitat of federally listed threatened or endangered species);
3. a significant change in the rate of diversion which would reduce streamflows below the minimum necessary to sustain water quality and aquatic and wildlife habitat;
4. a significant change in the place of use (e.g., to prevent the introduction of poor water quality or exotic and nuisance species through the interbasin transfer of water); and
5. change in the purpose of use which involves an increase in the consumption of water as authorized under the existing water right or change in specifically permitted return flow requirements or patterns of use, including monthly demand distributions not allowed in the existing Permit (TNRCC 1995).

Aspects of the water right which are not affected by the proposed change are not reviewed for potential adverse effects.

For permits issued within an area that is within 200 river miles of the coast, to commence from the mouth of the river thence inland, the Commission shall include in the permit, to the extent practicable when considering all public interests, those conditions considered necessary to maintain beneficial inflows to any affected bay and estuary system. Texas. Water Code §11.147(b). In determining bay and estuary needs, the Commission shall consider, among other factors:

1. the need for periodic freshwater inflows to supply nutrients and modify salinity to preserve the sound environment of the bay and estuary, using any available information, including studies and plans specified in Texas Water Code §11.1491 and other studies considered by the commission to be reliable; together with existing circumstances, natural or otherwise, that may prevent the conditions imposed from producing benefits;
2. the ecology and productivity of the affected bay and estuary system;
3. the expected effects on the public welfare of not including in the permit some or all of the conditions considered necessary to maintain the beneficial inflows to the affected bay or estuary system;
4. the quantity of water requested and the proposed use of water by the applicant, as well as the needs of those who would be served by the applicant;
5. the expected effects on the public welfare of the failure to issue all or part of the permit being considered; and
6. the declarations as to preferences for competing uses of water as found in Texas Water Code §11.024 and 11.033 as well as the policy statement in Texas Water Code §1.003.

Summary of State Agency Programs

Texas Water Development Board

- stream gaging network
- tide gaging network
- engineering models
- ecosystem studies
- economic analyses
- continuous salinity monitoring at selected bay sites
- determination of freshwater inflow effects on estuarine sediments, nutrients, salinity-gradients and fisheries harvests
- development of methods for determining freshwater inflow needs of estuaries
- participation in estuary management advisory councils

Texas Parks and Wildlife Department

- fishery monitoring data
- sport and commercial fishery data
- ecosystem studies

- economic analyses
- assessment of water permit effects on fish and wildlife
- participation in estuary management advisory councils

Texas Natural Resource Conservation Commission

- statewide monitoring network (TNRCC, Clean Rivers Program, and USGS)
- estuary water quality sampling
- assessment of water permit effects on bays, estuaries, and instream flows
- participation in estuary management advisory councils

References Cited

Texas Natural Resource Conservation Commission. 1995. A Regulatory Guidance Document for Applications to Divert, Store or Use State Water. Publication RG-141.

GALVESTON BAY PROGRAM

Introduction

The Texas Natural Resource Conservation Commission's Galveston Bay Program is a continuation of the National Estuary Program (NEP) established for Galveston Bay in 1989. The NEP was established by the Water Quality Act of 1987, authorizing the Administrator of the U.S. Environmental Protection Agency (EPA) to convene Management Conferences to develop Comprehensive Conservation and Management Plans (CCMPs) for estuaries of national significance that are threatened by pollution, development or overuse. Section 320 of the Act outlines the estuary designation process and the purposes of a management conference. The justification for convening a Galveston Bay Management Conference was specifically recognized by Congress prior to passage of the Act, and was further established by the Governor's Supplemental Nomination of May, 1988.

The purpose of the Galveston Bay NEP was to draft and adopt a CCMP to improve water quality and enhance living resources in Galveston Bay. The CCMP integrates the management activities of the various state and federal resource agencies, and takes into account the competing uses of the bay with direct involvement of interested user groups. Under EPA guidance, creation of the CCMP is a joint activity by Conference members who represent government, the private sector and citizens. Galveston Bay's CCMP is now complete, has received concurrence by the Governor of Texas, and was approved by the Administrator of EPA.

Steps Toward a Comprehensive Plan for Galveston Bay

Establishing the Management Conference

A cooperative agreement between Texas and the EPA was signed in October, 1988, enabling initial developmental work to begin on creation of a CCMP for Galveston Bay. A Management Conference was appointed, composed of approximately one-hundred members jointly appointed to five committees by the Governor of Texas and the EPA Region 6 Administrator. A Policy Committee provided high-level leadership, while a Management Committee was the focus of the comprehensive planning work, receiving the advice of the three advisory committees. The Local Governments Advisory Committee advised both the Policy and Management Committees concerning issues of importance to local governments. The Scientific/Technical Advisory Committee provided scientific expertise for development of projects concerned with both historical and new technical data. The Citizen's Advisory Steering Committee provided the means for necessary citizen education and involvement with the program.

Establishing a Priority Problems List

In November, 1989, the Management Conference and interested citizens achieved consensus on identification of the Bay's problems. Public meetings were held in

conjunction with workshops of the Scientific/Technical Advisory Committee to garner professional expertise. This list was further revised as the bay characterization process proceeded (below) and the list served as an overall guide for the Program and as a rationale for allocation of project resources. (Appendix A, page 335, *The Galveston Bay Plan*)

Management Assessments

As one initial step toward drafting a CCMP, existing regulatory and research programs were identified and described. This process led to a published Management Assessment Report "*Framework for Action: Galveston Bay Management Evaluation*,"[1] that, along with the scientific studies described below, provided the foundation for management planning. The GBNEP took a pilot study approach to this element by first conducting management assessments for two subsystems of Galveston Bay, Christmas Bay (GBNEP-7, GBNEP-9, GBNEP-14) and Armand Bayou (GBNEP-8, GBNEP-10, GBNEP-13)

Bay Characterization

Scientific/Technical Assessments

Prior to initiating scientific studies involving both existing and new data sets on the bay, a strategy was written and adopted for assembling historical data, managing data collected by the program and disseminating information to program participants and the public. This strategy was the program's Data and Information Management Systems (DIMS).

Then, based on scientific analyses of historical data and new data collection, trends and status for key aspects of the bay were described. Causes of these trends, as related to the Priority Problems List, were identified. Results of this element were published in a series of technical monographs, and cumulatively, were summarized in a book published by the Program: "*The State of the Bay: A Characterization of the Galveston Bay Ecosystem.*" (GBNEP-44) Findings of the scientific program were used along with the management assessments as factual bases for determining management alternatives for the CCMP.

Public Participation

A hallmark of the NEP, public education and involvement in program activities occurred for all program elements and projects. The public, through the Citizens' Advisory Steering Committee helped shape all aspects of the program and the development of the CCMP.

[1]Texas Natural Resource Conservation Commission. 1988. The Galveston Bay National Estuary Program. Galveston, Texas, Technical Report GBNEP-27

CCMP Development

The Galveston Bay Plan

Beginning in Fiscal Year 1993, the GBNEP began development of the actual CCMP. The CCMP, which evolved through more than 10 complete drafts, included more than 80 distinct action plans, an implementation strategy (including a financial plan, a monitoring plan to measure effectiveness), and a federal Consistency Report to assure that federal agency activities are consistent with the CCMP. *The Galveston Bay Plan* was sent to the Governor and to the EPA Administrator in December, 1994. By Spring, 1995, all required approvals were received–the first CCMP to be approved by EPA with no suggested revision.

What does *The Galveston Bay Plan* accomplish? Bay-wide, increasing pressure from pollution, development and over-use of resources by the expanding coastal population has created some significant problems indicated in the following box.

SOME PROBLEMS FACING GALVESTON BAY...*	**...HAVE LIMITED THE BAY'S HUMAN USES AND ECONOMIC VALUE:**
Contaminated runoff degrades some of the bay's tributaries and near-shore areas.	Some species of marine life and birds have declined.
Raw or partially treated sewage and industrial waste enter Galveston Bay due to design and operational problems, especially during rainfalls.	Seafood from some areas in Galveston Bay may pose a public health risk to subsistence or recreational consumers as a result of the potential presence of toxic chemicals.
Certain toxic substances have contaminated water and sediment, impacting marine life.	About half of the bay is closed to the taking of shellfish because of high bacterial levels that may indicate risk to shellfish consumers.
Vital Galveston Bay habitats like wetlands have declined, threatening the bay's productivity.	Some tributaries and near-shore areas of Galveston Bay are not safe for activities such as swimming and wade-fishing, due to risk of bacterial infection.
Future demands for freshwater and alterations to circulation may reduce overall ecosystem health.	Water and sediments are degraded in and around marinas from boat sewage and introduction of dockside wastes from non-point sources.

*See The Galveston Bay Plan and The Economic Value of The environmental Quality of Galveston Bay, Dale Whittington, Ph.D., GBNEP-38

To address these issues, some general program objectives identified in *The Galveston Bay Plan* ,Chapter VII, page 303, include:

- Acquire federal funds and local commitments to help implement *The Galveston Bay Plan*
- Facilitate public-private partnerships and volunteer public participation in implementing some of the Plan's key initiatives.
- Provide for coordination and communication among state and federal resource agencies for the many cross-jurisdictional initiatives

- Monitor implementation of specific actions undertaken both by program staff and the Plan's Partners; redirect *The Galveston Bay Plan* where improvements lag
- Review federal, state, and local projects in an open process for consistency with the Plan
- Conduct public outreach and education to increase public awareness of Galveston Bay, and advocate protection of the estuary

Based on responsibilities agreed upon in The Plan, the TNRCC will have many specific responsibilities in fiscal years 1996-97 and beyond. Many of The Plan's actions were slated to be implemented by the staff of the Galveston Bay Program. Generally, staff activities were directly linked to the problems identified by the program's previous scientific studies. Some examples of staff activities identified in The Plan were:

- – Perform pilot projects to develop best management practices for local governments in the Galveston Bay watershed...correct malfunctioning shoreline septic tanks...adopt regional construction standards to reduce polluted runoff...implement toxics and nutrient control practices at construction sites...establish a research coordination board...identify research needs from an ecosystem perspective to supply needed information to bay managers...continue State of the Bay process of reporting to the public on progress....implement and maintain the Galveston Bay Regional Monitoring Program. (*The Galveston Bay Plan,* page 141)
- – Reduce water consumption...identify simplified procedures for carrying out damage assessments for small oil spills...facilitate effective restoration of Galveston Bay's natural resources damaged by spills...improve access to publicly-owned shorelines.
- – Improve trash management near the shoreline... publicize environmental harm caused by illegal dumping...establish residential standards for reducing use of pesticides and fertilizers...continue and expand the State of the Bay Symposia...develop and implement a long-range adult education and outreach program...develop specific curricula for use in the Galveston Bay watershed school districts...continue to develop effective volunteer opportunities for citizens (for example replacing lost wetlands by volunteer marsh plantings)...maintain a citizen pollution reporting system...provide assistance for user groups affected by implementation of *The Galveston Bay Plan.* (Public Participation & Education, *The Galveston Bay Plan,* page 231; Galveston Bay Council, page 311)

The Program Today: Implementing The Galveston Bay Plan

Funding by the Texas Legislature

The Texas Legislature agreed with the regional Galveston Bay community concerning the high importance of this bay system to Texas. During the 1995 legislative session–a session in which few new environmental initiatives were addressed–significant funding was approved for the Galveston Bay Program to proceed with *Plan* implementation. Both the

Senate and House subcommittees working on appropriations allocated $750,000 for implementation of *The Galveston Bay Plan.* This is half the amount of state funding called for by the Management Conference in *The Plan* itself, but would still allow for implementation of key *Plan* initiatives. The Senate version called for general revenue, while the House version allocated the same dollar amount from the Coastal Protection Fund. The Conference Committee adopted the House version and the final appropriations bill allocated $750,000 from the Coastal Protection Fund. (Rider 20, Texas General Appropriations Act for 1996-1997)

In making its appropriation, the Legislature called for joint management of the Galveston Bay Program by the Texas Natural Resource Conservation Commission and General Land Office, the agency which administers the Coastal Protection Fund. According to the language in the appropriation, this will be guided by a memorandum of understanding (MOU) between the two agencies, laying out how the program will proceed. Because both these agencies were key organizations in creating *The Galveston Bay Plan* in the first place, a high level of agreement already exists on the steps needed for implementation. The Management Committee has requested review of this agreement prior to approval by the two agencies. (MOU for FY96, FY97 - 30 TAC 305.521; Section 5.104(b), Texas Water Code)

The Texas Legislature also called for local governments to contribute to implementation. Local Governments are critical to success of *The Plan*, and were very influential in reshaping the implementation strategy during the final stages of *Plan* development. Many initiatives in *The Plan* are already local government initiatives. Participation by Local Governments on the Galveston Bay Council, and their expenditures toward actions identified in *The Plan* as part of their ongoing activities, are anticipated as a significant element of support.

Sound reasons existed for the Legislative support for this initiative:

- *The Plan does not place environmental management at odds with the economy.* Instead, it is based on the concept that the economy depends upon good management of sustainable natural resources–and that is good business.
- *The Plan has the broadest support possible for a regional program.* All the players, industry, fishing, agencies, environmental groups, and the public, were at the table for five years. *The Plan* was not opposed by any organization.
- *A little gets a lot.* A little investment of the State's public resources opens the door for substantial non-state investments in bay management. The state funded base program will trigger public/private partnerships, federal funding and involvement, and volunteer activities to multiply the State's resources many times over.

<u>The State Program for Implementation</u>

With the completion of *The Galveston Bay Plan* and support from the Texas Legislature, the program underwent a transition from the planning phase (Clean Water Act Section 320

funds under the NEP) to implementation (primarily a state effort augmented by federal funds from various sources not including Section 320).

The Program Office, currently located near the bay in Webster Texas, will continue to oversee activities related to *The Galveston Bay Plan*. Numerous agency and stakeholder partners will continue to work together, as they already have in taking action on a demonstration scale (demonstration implementation projects are described in a report to be published Fall, 1995). A new advisor organization, the Galveston Bay Council, has been appointed to replace the six-committee Management Conference. The perspective adopted for undertaking implementation continues to be the community-based, consensus-oriented approach successfully utilized by the program for six years. The work will directly address actions proposed in *The Galveston Bay Plan* to solve problems at the watershed level.

CORPUS CHRISTI BAY NATIONAL ESTUARY PROGRAM

Introduction

In its 1987 reauthorization of the Water Quality Act, the U.S. Congress established the National Estuary Program (NEP) to promote long-term planning and management of nationally significant estuaries threatened by pollution, development, or overuse. The Administrator of the U.S. Environmental Protection Agency (EPA) was given authority to convene Management Conferences and to award Federal financial assistance grants to approved state programs, for the purpose of developing Comprehensive Conservation and Management Plans (CCMP) for each selected estuary. The Act defines criteria by which Management Conferees are charged with balancing the conflicting uses in target estuaries, while restoring or maintaining their natural character.

The Corpus Christi Bay National Estuary Program, formally established in October 1992, is one of the first NEPs to use a streamlined approach in the development of its CCMP. A streamlined approach is made possible by the significant amount of problem characterization already completed for the CCBNEP study area, and by commitments from key state and local agencies to participate in and support the Management Conference. The goal of the CCBNEP is to complete a Preliminary CCMP within twelve to eighteen months (beginning 09/01/94), and a Final CCMP in approximately four years, or by September 1998. A Management Conference Agreement detailing this and other specific outputs of the four-year program was approved between the EPA and the State of Texas in May 1994.

Management Conference Membership

The Management Conference is the decision making framework for carrying out the National Estuary Program process. The members of the Conference identify major problems in their estuary, decide where to focus corrective actions, and agree to specific political, financial, and institutional commitments. Management Conferences include representatives of citizen and user groups and of scientific and technical institutions, and they include all relevant government agencies and resource managers at the federal, state, and local levels. Representatives of these groups serve on committees that comprise the formal Management Conference and oversee the development of the CCMP.

The CCBNEP Management Conference is currently composed of five committees. The Policy Committee members, jointly appointed by the Governor of Texas and the Regional Administrator EPA Region 6, set the program goals and objectives and establish priorities and direction for the CCBNEP. The Management Committee members are also jointly appointed by the Governor of Texas and the Regional Administrator EPA Region 6 with the advice of staff, work groups, and the other committees. It is responsible for defining priority problems, approving scientific characterization reports, developing management strategies, and designing the CCMP. The Local Governments Advisory Committee (LGAC) provides advice and guidance to the Management and Policy Committees on issues relevant to local governments. The Scientific-Technical Advisory Committee (STAC) provides advice and

guidance to the Management and Policy Committees on matters of technical characterization, research, data management, modeling, and sampling and monitoring effects. The Citizen's Advisory Committee (CAC) provides advice and guidance to the Management and Policy Committees on issues of importance to the study area's user groups, and solicits public interest and public participation in the CCBNEP.

Management Conference Agreement

The Four-Year Management Conference Agreement sets forth a work plan to be accomplished during the study period (October 1993 - September 1998). The activities and schedules presented in the Conference Agreement are the general guidelines for CCBNEP activities, while annual work plans define detailed projects and their associated budgets. The commitments outlined below are designed to fulfill the requirements of the overall framework as set forth in Section 320 of the Clean Water Act of 1987.

These commitments listed below describe the major milestones and activities of the CCBNEP Management Conference. In order to successfully achieve these commitments it will be necessary for the CCBNEP to undertake additional projects, studies, and other activities. Detailed descriptions of these efforts will be provided in subsequent annual work plans developed by the Management Conference.

1. To **establish and support a Program Office** with a dedicated staff to support the Management Conference and its participants, and implement the projects and programs included in this agreement and subsequent annual work plans.
2. To **match the federal funds** provided to the Corpus Christi Bay National Estuary Program by the EPA under Section 320 of the Clean Water Act of 1987. The State and/or other participants will provide 25% of the aggregate costs of the project from non-federal funds.
3. To **educate and involve the public** in the development of the CCMP. Successful completion and implementation of the CCMP will be largely reliant upon the knowledge, participation, and support of the local public.
1. To **rank and report the Priority Problems** facing the bay system as identified by the Management Conference participants and the public. The final priority list will serve as the basis for establishing the environmental and ecological goals of the CCMP.
2. To **conduct a technical characterization of the priority problems** through the funding of specific studies designed to elucidate the nature, extent, and causes of the priority problems. The results will be summarized in non-technical language in a final Characterization Report and designed for an audience of natural resource managers and the public. The final Characterization Report will be completed and available in September 1997.
3. To **develop a Data and Information Management Strategy** (DIMS) for the efficient management of data and information gathered for and by the CCBNEP.
4. To perform an **inventory and analysis of Base Programs**. The CCBNEP will inventory and analyze the scope and effectiveness of existing federal,

state, and local laws, regulations, and programs that deal with managing water quality and natural resources within the CCBNEP study area. The initial Base Programs Analysis will be completed by September 1, 1995.

5. To **produce a preliminary, draft, and final Comprehensive Conservation and Management Plan** for the protection and enhancement of the water quality and living resources within the bays and estuaries and the CCBNEP study area.
7. A Preliminary CCMP will be developed by April 30, 1996 and will include information on the development of priority problems, available characterization results, environmental and ecological quality goals and objectives, the base programs analysis, CCMP format, and other pertinent information.
8. A draft CCMP will be developed by September 30, 1997. The draft CCMP will be subjected to a formal review by the public. Public comment will be solicited, compiled, and reported to the Management Conference so that they may consider revisions to the final CCMP in response.
8. A Final CCMP will be approved by the Management Conference and submitted to the Administrator of EPA and the Governor of Texas no later than September 30, 1998.
9. To **target actions for early implementation** to begin the process of estuarine restoration as early as possible.

SERIES 6
WATER QUALITY MANAGEMENT PLANNING

Continuing water quality management planning in the State of Texas is conducted by the TNRCC, in cooperation with other appropriate state, regional, and local planning agencies, in accordance with Sections 205(j), 208, 303(e) and 604(b) of the federal Clean Water Act (CWA). The TNRCC is designated under Section 26.012 of the Texas Water Code as the state agency responsible for conducting water quality planning. As such, the TNRCC is responsible for the coordination of water quality management planning in Texas. Responsibility for the development and implementation of control programs for any identified water quality problems attributed to nonpoint source agricultural or silvicultural activities is assigned to the Texas State Soil and Water Conservation Board (TSSWCB). Long-range planning, development and financing of water resources is the responsibility of the Texas Water Development Board (TWDB), pursuant to Chapters 15, 16, and 17 of the Texas Water Code.

Planning Delegation and Coordination

The continuing water quality management planning program utilizes the combined capabilities of the TNRCC, the TSSWCB, the TWDB, and local/area-wide planning agencies. The review process includes the circulation of water quality management plan (WQMP) documents to other state agencies whose activities may affect or be affected by the TNRCC's program, thus ensuring coordination with overall state policies and programs. Program reports and WQMP proposed updates, prior to being submitted to the TNRCC for state review, are available for review within the affected areas of the state by other local governments which are interested in the documents. Each document which is to be certified as part of the State of Texas WQMP goes through the approval process described below in the section entitled WQMP Updates.

Water Quality Management Plan Elements

The U.S. Environmental Protection Agency (EPA) requirements for WQMP elements are cited at Title 40, Code of Federal Regulations (CFR) §130.6(c). The plan elements shall be included in the WQMP when needed to address water quality problems in a state. The regulation specifies the following nine plan elements.

Management Agencies
Total Maximum Daily Loads (TMDLs) (Series 20)
Municipal & Industrial Waste Treatment
Dredge & Fill Program
Ground Water (Series 32)
TPDES Effluent Limitations
Nonpoint Source Management and Control (Series 15)
Implementation Measures
Basin Plans

As identified above, discussion of some plan elements is found in other series of this Continuing Planning Process document. Implementation Measures for the WQMP are addressed as they relate to each element below and are also addressed by the TWDB, in

accordance with its authority under state statute. The remaining elements are discussed in this series.

Management Agencies

To be designated as a management agency for wastewater collection or treatment, an entity must demonstrate the legal, institutional, managerial, and financial capability necessary to carry out its responsibilities in accordance with §208 of the federal Clean Water Act. Before an entity can apply for a state revolving fund loan, it must be recommended for designation as the management agency in the approved WQMP. Designation as the management agency does not require the designated entity to provide wastewater services, but enables it to apply for grants and loans to provide the services. The TNRCC includes the documentation from qualified entities which have the requested designation as management agencies in WQMP updates.

TPDES Effluent Limitations

Pollutant effluent limitations are specified in all Texas Pollutant Discharge Elimination System (TPDES) permits that allow a discharge of pollutants into water in the state. Effluent limitations are expressed as a loading of a pollutant and may also be expressed as a concentration of a pollutant. When technology-based effluent limitations alone cannot adequately protect surface water quality, the TNRCC applies water-quality-based effluent limitations in a permit. Series 23 of this document describes in detail how water-quality-based effluent limitations are derived. This section of this Series describes the scope of WQMPs in setting effluent limitations. The next section describes setting effluent limitations in the context of a pending TMDL.

Water-Quality-Limited Considerations

Federal regulations (40 CFR §130.2(j)) define a water-quality-limited segment as any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by §§301(b) and 306 of the federal Clean Water Act.

As an important water quality management tool, the TNRCC considers a segment to be water-quality limited based on the federal definition. The TNRCC further identifies how a water-quality-limited designation is used in water quality management planning and TPDES permit issuance. An industrial or municipal discharger is considered to discharge into a water-quality-limited segment and will be incorporated into a WQMP when:

1) a pollutant being discharged from the facility is reasonably likely to contribute to an impairment or threat of impairment of a water body, as described in either the current EPA-approved CWA §303(d) list or a recently submitted TNRCC update,
2) the discharge has been identified and controlled in a waste load evaluation (WLE), or
3) a total maximum daily load (TMDL) has been developed.

The physical, chemical, or biological water quality conditions or pollutants which result in impairment, threats of impairment, or listing of a water on the CWA §303(d) list are described in other parts of this CPP.

Additional WQMP Activities Associated with Municipal Discharges

In addition to this primary method of identifying dischargers into a water-quality-limited segment, state rules at 30 TAC §309.1(a) and 30 TAC §309.3 define when a discharger of treated domestic sewage (also referred to as a municipal discharger) is considered to discharge into either an effluent-limited or a water-quality-limited segment. Section 309.3(a)(2) specifies that effluent limitations for a new or increased municipal discharge shall be based upon a consideration of water quality requirements, including receiving water assimilative capacity and uses of the water body. Section 309.3(b) defines a water-quality-limited segment for purposes of permitting municipal discharges. This definition is described in Series 11 of this CPP.

In addition to any other pollutant identified above in the section entitled “Water-Quality-Limited Considerations”, other specific pollutant loadings from a municipal discharger are a part of the WQMP when the discharge is into a water-quality-limited segment. Specific effluent limitations are derived for all municipal discharges based upon modeling or similar analyses. These effluent limitations provide protection of aquatic life uses of the receiving water as a standard practice for implementation of specific dissolved oxygen criteria identified in the Texas Surface Water Quality Standards (TSWQS). For municipal discharges, each TPDES permit that is developed specifies the maximum effluent loading limitations necessary for the attainment of the dissolved oxygen criterion associated with the aquatic life use. Maximum effluent loading limitations for each municipal permittee discharging into a water-quality-limited segment are specified in the WQMP. These effluent limitations include biochemical oxygen demand, carbonaceous biochemical oxygen demand, and ammonia-nitrogen loading values as well as the effluent concentration for dissolved oxygen. TPDES permits must be consistent with the latest approved WQMP.

Existing WLE or TMDL

An approved WLE or TMDL becomes a part of the WQMP once it has been certified by the TNRCC and approved by the EPA. For both municipal and industrial discharges identified in an approved original or updated WLE or TMDL, each TPDES permit that is developed specifies the maximum effluent loading limitations identified in the approved allocation. The effluent loading limitation(s) ensure the attainment of the pollutant criteria or attainment of the water body’s uses. Only the pollutant(s) identified in the allocation as causing the water quality problem is included in the WQMP.

Previous WQMP Updates

Previous updates to the WQMP may have included effluent limitations for pollutants or discharge quantities that do not relate to a water quality problem, an impairment of a water body, or a limitation which was not water-quality driven. The WQMP updates no longer address effluent limitations of this nature. Permit effluent concentration limitations for pollutants, pollutant loading limitations for pollutants that are not derived as water-quality based, or flow quantity are not reviewed for consistency with the WQMP. Permits are considered consistent with a WQMP when the TNRCC has no information to suggest that

a pollutant being discharged from a particular facility is affecting the water quality of an impaired or threatened water body.

Schedules of Compliance for Existing Dischargers

Schedules of compliance for achieving water-quality-based effluent limitations are allowed in TPDES permits when an existing discharger must achieve more stringent effluent limitations to ensure consistency with a WQMP. A TPDES permit with a schedule of compliance normally includes the existing effluent limitation carried forward from the previous permit as an interim effluent limitation, and a final effluent limitation consistent with the WQMP. WQMPs do not specify interim permit effluent limitations. However, requirements for ensuring a timetable to implement the requirements of a WQMP are established in 30 TAC §307.2(f). This rule describes the length of time for establishing interim limitations, when final limitations must go into effect, and development of site specific standards. Section 307.2(d)(4) and the Implementation Procedures (a separate part of the CPP referenced in Series 23, entitled *Implementation of the TNRCC Standards via Permitting*) describe how variances are approved when permits are issued before completion of the process to consider site-specific standards revisions. Also, §305.127(3)(D) requires that schedules of compliance be included as TPDES permit conditions.

TPDES Effluent Limitations When TMDL is Pending Completion

In some instances, municipal and industrial facilities discharge a pollutant of water quality concern into a water body identified as either threatened or impaired by that pollutant on the TNRCC's most current CWA §303(d) list. A TMDL will normally incorporate a loading allocation for existing dischargers and will specify loading allocations for future growth (for instance, new sources or new dischargers). When the TMDL is not yet completed, the TNRCC must still consider permit actions for applicants based on whether the discharger is seeking renewal of its permit or whether the proposal is for a discharge from a new source, new discharger, or increased loading of the pollutant of concern. The TNRCC will issue TPDES permits consistent with 40 CFR §122.4(i).

Processing Renewal Permit Applications

When a facility is contributing a pollutant of concern to a water body described on the most current CWA §303(d) list and that facility is seeking a renewal of its permit and loading, the existing permitted loading of the pollutant of concern is allowed in the renewed permit until the completion of a TMDL. In this instance, a change in pollutant loading is not established for these dischargers in the WQMP until the TMDL is completed. However, the TNRCC may reduce the permitted loading of a pollutant of concern at the time of renewal of the permit, based upon the TNRCC's determination that the full permitted pollutant loading is no longer needed.

The renewed permit may require effluent or receiving water monitoring for the pollutant of concern when this data could contribute to development of the TMDL. Where a narrative water quality standard is not met, effluent monitoring for the relevant indicator pollutants present in the effluent or receiving water may be required. For example, a municipal

discharger may be required in its renewed permit to monitor its loading of nitrogen and phosphorus when the water body is listed as being impaired or threatened due to nutrients.

Processing Permit Applications for a New Source or New Discharger

The TNRCC will issue TPDES permits consistent with 40 CFR §122.4(i). When a facility would be contributing a pollutant of concern to a water body described on the most current CWA §303(d) list and that facility is either a new source or new discharger, the WQMP sets a limitation for the loading of that pollutant through a permit action. New source and new discharger are both defined in 30 TAC §305.2. New source determinations by the TNRCC are described in 30 TAC §305.534. If the CWA §303(d) list indicates that the narrative criteria of the standards are not met, an existing discharger proposing a discharge from a new source may need to demonstrate and quantify its existing loading of an indicator pollutant, and the WQMP may set the limitation at the existing loading of the indicator pollutant.

Where a new source or new discharger would likely contribute to the pollutant loading into a water body on the CWA 303(d) list, the TNRCC may recommend a loading not to be exceeded until a TMDL addressing all point and nonpoint sources in a watershed can be completed. The pollutant loading set in the WQMP may be based on best professional judgement of what is practical and reasonable prior to completion of a TMDL when an intensive review of allocation requirements is completed. Examples of acceptable loading increases which may be approved in such a plan include, but are not limited to:

1) an effluent limitation which meets the water quality standard for the pollutant of concern prior to any dilution in the water body (end-of-pipe),
2) a loading increase for a pollutant which can be demonstrated not to exceed the water quality standard in the area of the water body affected by the discharge,
3) where a water body is not meeting a water quality standard, a loading increase that will not further raise the in-stream pollutant concentration in the water column or will not result in greater bioaccumulation when such a condition is the focus of the TMDL, or
4) some reduction in the permitted loading of the pollutant that would later be revised based upon a TMDL.

Municipal & Industrial Waste Treatment

The TNRCC has established detailed review and coordination procedures for wastewater permit issuances and federally funded wastewater facility construction projects in order to ensure general conformance with the WQMP, as mandated by the federal Clean Water Act. All applications for new and amended permits are also reviewed for conformance with applicable WQMP recommendations. The WQMP specifies effluent limitations for TPDES municipal permits based upon TNRCC rules in 30 TAC §309.4. All facility plans and engineering reports in the TWDB State Revolving Fund and other construction programs are reviewed by the TNRCC staff for general conformance with the approved WQMP. In those instances where there is a conflict between a WQMP recommendation and a proposed TWDB construction project, the applicant, the TNRCC and the appropriate local

planning agency in a designated area will work jointly toward a resolution. Justification for the proposed changes to the plan will be reviewed. If acceptable, the TNRCC will advise all parties (including EPA) that the new information will be incorporated into the next revision of the WQMP. If no WQMP revision is recommended and approved, or if the recommendation differs from the proposed engineering report, then the construction project must be revised. Through this process, conformance between the WQMP and wastewater facility construction projects is achieved.

Dredge and Fill Program

In Texas, the TNRCC has not assumed the permitting program associated with discharges of dredged or fill materials (§404 of the federal Clean Water Act). The TNRCC does maintain a state certification program to review U.S. Army Corps of Engineers (Corps) permits which allow the discharge of dredged or fill material into water in the state. The TNRCC requirements for technical review of Corps permits and the procedures relating to state certification are described in 30 TAC Chapter 279. The National Oceanic and Atmospheric Administration (NOAA) has approved the State of Texas Coastal Management Program (CMP). The CMP covers the Texas coastal region. Certifications of Corps permits must be consistent with the goals and policies of the CMP. The TNRCC rules governing its CMP are found in 30 TAC Chapter 281, Subchapter B.

By agreement between the Corps and the TNRCC, the Corps provides a joint public notice of Corps permit actions that also serves to inform the public of the pending state certification by TNRCC. The public notice invites comment to the TNRCC on the issue of state certification. The Texas Parks and Wildlife Department (TPWD) reviews Corps permit applications and provides comments to both the Corps and TNRCC on permit applications. The TNRCC regularly consults with the TPWD on the effects of Corps permits on state fish and wildlife resources. Series 22 of the CPP provides additional information on Corps dredge and fill permits.

Basin Plans: State and Area-wide Planning Areas

The State of Texas contains 15 major river basins and 8 coastal basins. The water quality management planning program utilizes the generalized boundaries of those basins and the specific boundaries of the seven areas designated by the Governor as area-wide waste treatment management planning areas to delineate state planning areas. The boundaries of the state and area-wide planning areas are shown in Figure 1. Each of the designated planning areas falls within one or more of the 15 major river basins. The relationship between the designated areas and the river basins (state planning areas) is shown in Table 1.

Consistent with statutory direction from the 1991 Texas Legislature, the TNRCC made a strategic change in its water quality management program. The Texas Water Code, §§26.0135, 26.0136, and 26.0285, all specify watershed-oriented management of TNRCC and local government water-quality-related activities. Section 26.0285 specifies that the TNRCC shall issue TPDES permits with consideration of the watershed into which the discharge will occur. The watershed-based permitting cycle is established in the TNRCC

rules at 30 TAC §305.71. The TNRCC has also oriented its water quality inventory reporting (CWA §305(b)) and listing of impaired or threatened water bodies (CWA §303(d)) into a basin cycle, completing the assessment on one-fifth of the state every year, rather than assessing water bodies statewide every two years. As well, completion of TMDLs is scheduled so that implementation of allocations into TPDES permits may occur in a well-managed fashion.

Table 1.
Statewide and Designated Area-wide Planning Areas and Agencies

State Planning Area	Designated Planning Area	Designated Area Planning Agency
Canadian Basin		
Red River Basin	Texarkana	Ark-Tex Council of Governments
Sulphur Basin		
Cypress Basin		
Sabine Basin	Southeast Texas	South East Texas Regional Planning Commission
Neches Basin		
Trinity Basin	Dallas/Fort Worth	North Central Texas Council of Governments
San Jacinto Basin	Greater Houston	Houston-Galveston Area Council
Brazos Basin	Killeen-Temple	Central Texas Council of Governments
Colorado Basin		
Lavaca Basin		
Guadalupe Basin		
San Antonio Basin		
Nueces Basin	Corpus Christi	Coastal Bend Council of Governments
Rio Grande Basin	Lower Rio Grande Valley	Lower Rio Grande Valley Development Council

Water Quality Management Plan Updates

The WQMP utilizes pertinent, available data and is reviewed and revised as needed to account for changing circumstances, conditions, and program requirements. The WQMP is maintained electronically in a database and in bound volumes located at the TNRCC. If revisions are required, the WQMP is updated to reflect the proposed changes through the process described as follows.

1. The draft WQMP is compiled from pending update requests, from pending permit applications, and other applicable information on an as-needed basis, but at least annually.

2. A draft WQMP update is routed to the EPA, Region 6, requesting a determination if the update is approvable. The EPA shall review the update within 30 days of receipt and either determine the update is approvable or indicate in writing the reason the update is not approvable. Normally, the TNRCC waits for the EPA's determination of approvability, especially when the plan update is of significant interest. But, the TNRCC may move forward with the update process without the EPA input. Once the EPA has commented on the plan update, changes to the plan to address the EPA comments will be made. When the plan is changed, the TNRCC may provide an additional opportunity for public participation, depending on the nature of the change.
3. The plan update is published in the *Texas Register*. The TNRCC also provides mailed notice to persons known to be interested in the WQMP and the TNRCC will post WQMP update information on its Internet site. Interested parties are allowed at least a 30-day period of time during which an opportunity is extended to provide the TNRCC with written comments on the proposed WQMP update.
4. The public notice may also specify a date for a public meeting (non-adjudicative public hearing) during which interested persons can submit written comments or provide oral testimony on whether the plan update should be approved or modified. A determination on whether a public meeting is convened is consistent with the requirements of 40 CFR Part 25.
5. If no significant comments are provided by the deadline established in the public notice, the WQMP update is approved and certified by either the Commission or the executive director. If significant comments are received, the executive director's staff will consider the comments and revises the WQMP update, as deemed appropriate. The WQMP update is then submitted to the Commission or the executive director, and action is taken to certify or deny the update. To all persons who commented on the WQMP update prior to the close of the public comment period, the executive director will mail a copy of the response to comments and any WQMP update certified by the executive director.
6. An interested person has the opportunity to seek Commission review of a WQMP update certified by the executive director. A written request from an interested person for Commission review must be filed with the Commission's Office of Chief Clerk after receipt of the executive director's response to comments and receipt of the certified WQMP update (if the executive director certified the WQMP).
7. After consideration of the written comments filed with the Office of the Chief Clerk, the Commission will review the matter and may take any appropriate action on the WQMP update at a regularly scheduled Commission meeting.

8. A Certified WQMP update is forwarded to the EPA, Region 6 for approval. The EPA shall review the update within 30 days of receipt and either approve, partially approve, or conditionally approve of the update or indicate in writing the reason for not approving the update.

An integral part of this review process is the development of work programs under Section 205(j) and 604(b) by the TNRCC in cooperation with local planning agencies. The work program defines the work effort necessary to result in appropriate revisions to the WQMP

and identifies which agency should be responsible for accomplishment of each task. The responsible planning agency develops appropriate recommendations (such as updated population projections) for revision to the WQMP for its area. The review process for the revisions is described in Series 6 above, in the section entitled Planning Delegation and Coordination. Following satisfactory completion of the review/approval process, the revised documents are certified to EPA as adopted revisions to the State of Texas WQMP.

The TNRCC has linked its WQMP update process to its TPDES permitting process to achieve as much efficiency as possible and to prevent delays that could negatively affect local or private planning and improvements in water quality. As described above, the TNRCC issues permits with expiration dates that set up a permitting-by-basin cycle. Approximately two years prior to the expiration date specified for a water body's segment number, TNRCC notifies municipal permittees and affected industrial permittees of the need to consider local water quality planning needs, especially relating to anticipated new or increased loadings to water bodies. These notices may also serve to notify permittees of pending permit expiration dates. As WQMP update requests are received, TNRCC considers whether the update is technically sound and consistent with the applicable TSWQS.

Although permittees should plan ahead and notify the TNRCC of plan updates far ahead of the permitting process, the TNRCC also accommodates updates requested with TPDES permit applications. When the update requests occur along with submittal of a permit application to TNRCC, permit applicants may expect delays in permit issuance pending the TNRCC and the EPA approval of a WQMP update. Whether the update occurs prior to or during the TPDES permitting process, the TNRCC process for updating the WQMP is the same. A technical determination is made, usually through modeling the effect of the proposed loading, and a memorandum is prepared to document the initial recommendation. Figure 2 describes the WQMP update process.

Figure 1.

Designated Planning Areas

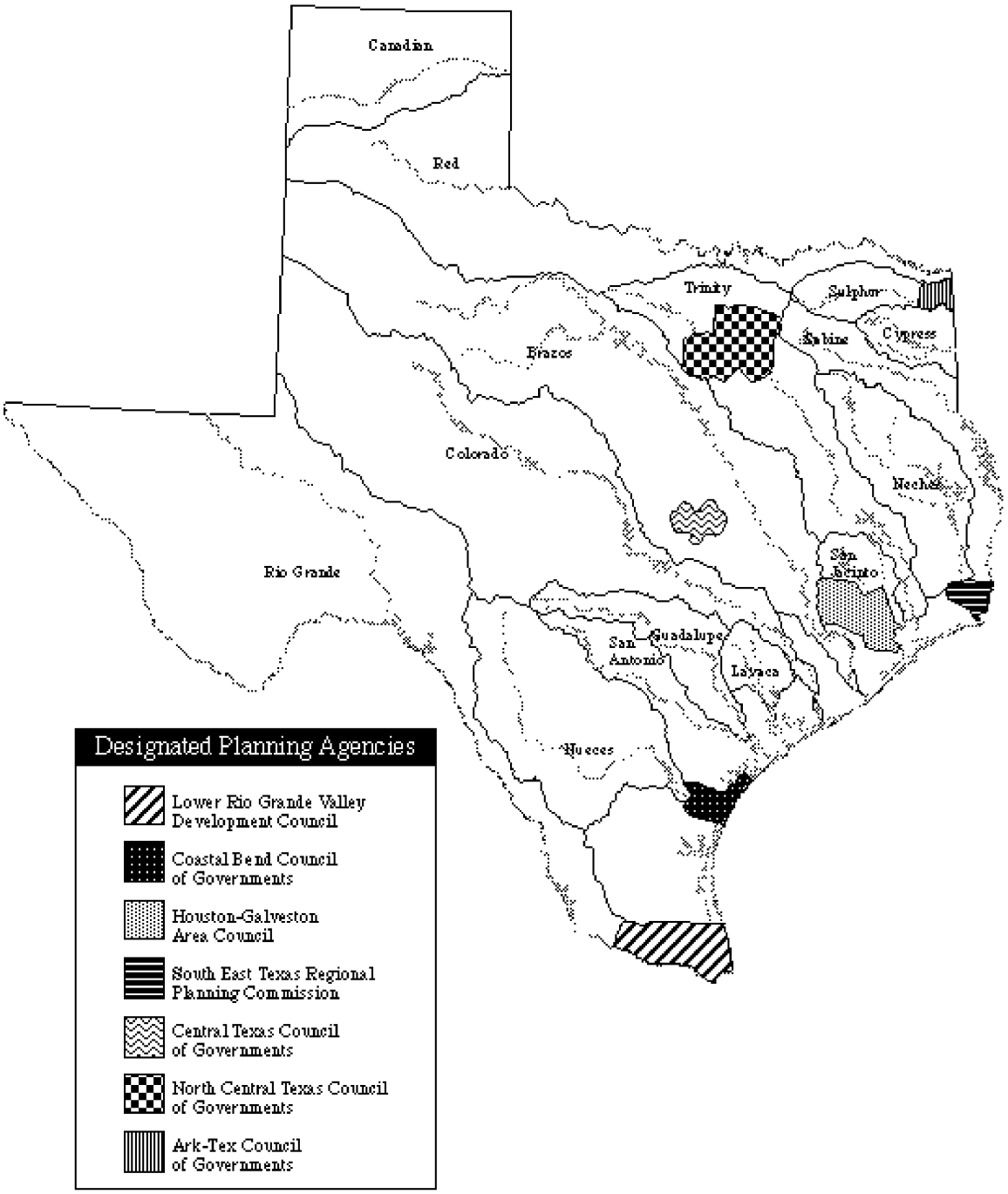
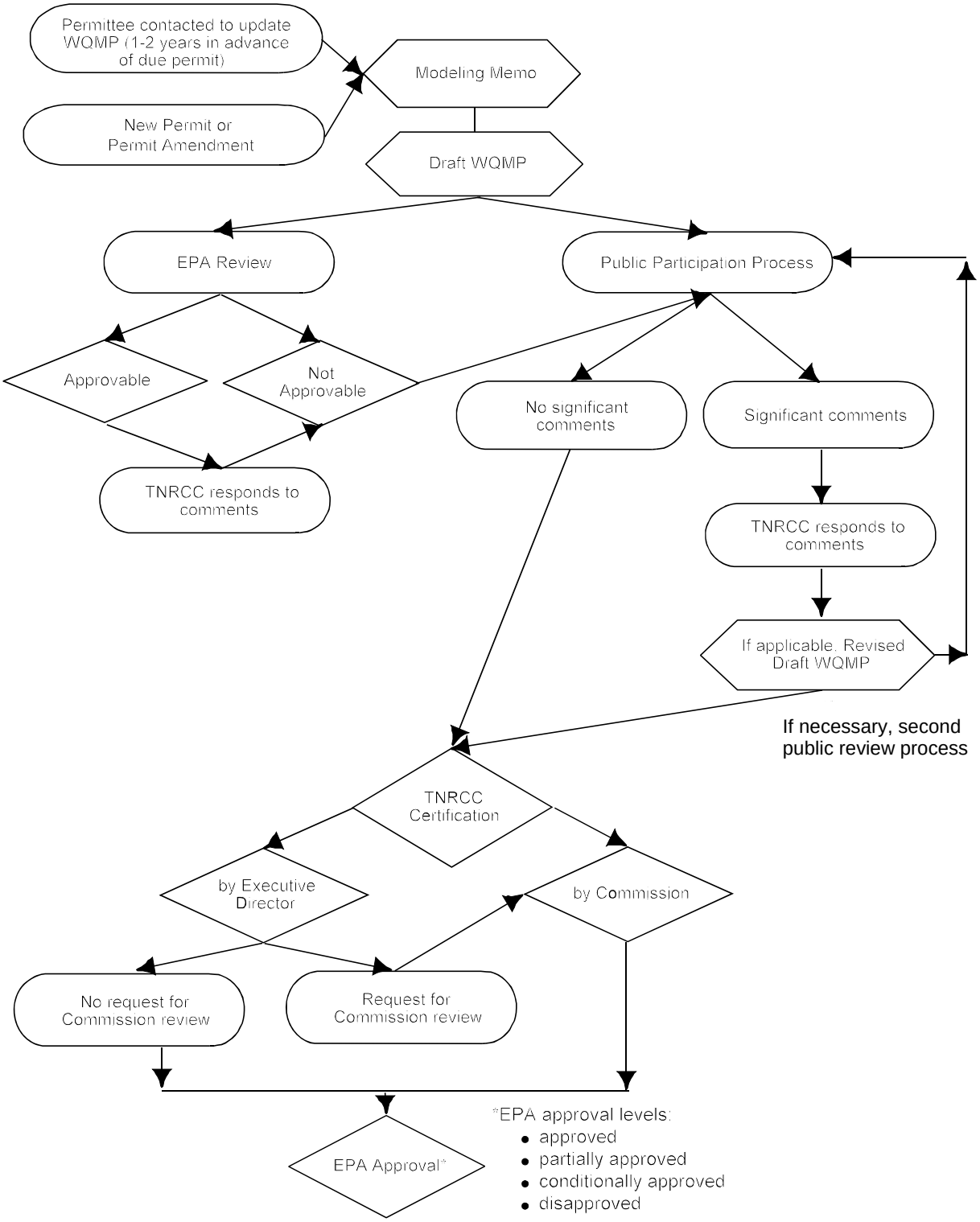


Figure 2. Water Quality Management Plan Update Process



SERIES 7
MUNICIPAL FACILITY FINANCING

Objectives

The objectives established for the Texas Water Development Board's efforts in managing municipal facilities are as follows:

a. To ensure that financed projects are completed in accordance with regulations and schedules,
b. To utilize Federal Capitalization Grants and state matching funds to establish State Revolving Funds and financing for appropriate projects,
c. To ensure that funds are provided only for projects which meet the amended 1987 requirements of the Federal Clean Water Act and are cost-effective;
d. To ensure operation and maintenance techniques employed at all publicly-owned treatment works provide for the maximum practicable level of treatment for existing facilities.

To ensure that these objectives are achieved, the Board's long-established program in municipal facilities management has been retained. Continued emphasis is given to the critical areas of operations and maintenance manual review and certification of municipal ordinances designed to control discharges into publicly-owned treatment works and allocate costs of sewer use equitably. Financially assisted projects will be monitored and inspected to ensure completion of the projects as planned and designed.

Categories Eligible for Funds

Federal capitalization and special grant funds continue to be used to build a low interest State Revolving Loan Program (SRF), complete ongoing construction grant projects, and provide specific assistance in the Economically Distressed Areas Program (EDAP). The SRF Program is capable of funding project categories meeting the definition of treatment works in the Act (Section 212) and management plans and programs developed under Sections 319 and 320 of the Act. The Board also administers the Colonia Wastewater Treatment Assistance Program and the Colonia Plumbing Loan Program, which both receive funding through grants from EPA.

Ranking Criteria

A rating process for the SRF Program is embodied in the TWDB Rules (Section 363.208). The rating process is designed to achieve optimum water quality management, consistent with public health and water quality goals, and to give consideration to the varying populations of the state’s political subdivisions.

Priority Ranking List

The rating process is capable of producing a priority ranking list consistent with Federal priority requirements which set out the following general priority for municipal construction:

a. Projects required to meet existing water quality standards and/or otherwise comply with the enforceable provisions of the law; and,
b. Projects not required to meet water quality standards but which must comply with enforceable provisions of the law.

The priority ranking could be used, if necessary, to distribute funds to the higher priority projects appearing on the Fiscal Year Intended Use Plan (IUP). However, at this time, adequate funds are available for financing of all SRF projects on the IUP allowing funds to be distributed on a first come/first serve basis.

SERIES 8
FACILITY PLANNING

Planning Process

Facility planning is a broad process encompassing the development of an application for proposed water related facilities. The application consists of general, legal, fiscal, engineering, and environmental data sufficient to determine the feasible and appropriate alternative to meet the identified needs and comply with the enforceable requirements of the Clean Water Act. TWDB in coordination with TNRCC assists political subdivisions of the State of Texas in completing the planning process.

Water Conservation and/or Reuse Analysis

State law requires a water conservation plan be submitted with any application for financial assistance of $500,000 or more to be provided by the TWDB. This planning requirement allows consideration of conservation and reuse as either an alternative, or complement, to investments in water supply development and wastewater infrastructure.

Relationship to Other Planning Requirements

Coordination between TWDB and TNRCC will verify consistency of the proposed facilities planning with area plans, if any, developed under the Clean Water Act Sections 205(j), 208, 303(e), 319, or 320 which apply to the project(s) to receive financial assistance.

SERIES 9
NEEDS SURVEY

Background

Sections 205(a) and 516(b) of the Clean Water Act Amendments (PL 97-117) require that the U.S. Environmental Protection Agency (EPA), in cooperation with the States, provide Congress with an estimate of needed publicly-owned wastewater facilities by February 10 of each odd numbered year. Surveys were completed in each of the following years: 1973, 1974, 1976, 1978, 1980, 1982, 1984, 1986, 1988, 1990, and 1992. A 1996 update is now beginning.

Needs are categorized and, along with a variety of related technical information, are reported on a facility-by-facility basis. The product is both a comprehensive estimate of dollar requirements to meet the legislative goals and a detailed inventory of publicly-owned wastewater treatment and conveyance systems.

A 1995 SRF Drinking Water Needs Survey is also being conducted by EPA for use with the Safe Drinking Water Act SRF program, which is currently under consideration by Congress.

Importance

On a national scale the Needs Surveys have two fundamental roles:

(1) State-by-state facility needs totals are used to allocate federally appropriated funds.

(2) The Needs Survey inventory is useful to the State and to EPA as an informational tool, and a middle and long range planning tool.

TWDB Activity

Funding for water, wastewater, and stormwater improvements in a rapidly growing, water-scarce state such as Texas is critical. Hence TWDB has taken a keen interest in the Needs Survey, not only for the federal funds at stake, but for the information acquired in the process that will assist in planning Texas' water future.

Since 1976 EPA has employed a contractor to obtain and verify facility data, and provide automatic data processing. Since 1980, EPA has restricted Needs Survey facility updates to facilities involved in the Construction Grants Program and facilities with new federal permits unless states specifically request a more extensive review and provide documentation.

Since 1979, TWDB has engaged in a vigorous program to upgrade and augment Texas' Needs Survey inventory. Hundreds of facilities have been added to the inventory and all information is routinely checked for accuracy and timeliness. A contractor appointed by

EPA performs all tasks related to automated data processing. TWDB has the capability to access the data through EPA's national computer files.

Work is being initiated on the EPA's 1996 Clean Water Needs Survey which will for the first time include separate estimates for sanitary sewer overflows and storm water pollution control in addition to the traditional publicly-owned wastewater treatment and conveyance facilities.

Also nearing completion is the data collection for the 1995 SRF Drinking Water Needs Survey, a survey being conducted nationally by EPA and managed cooperatively within Texas by both TWDB and TNRCC. This survey is being performed in conjunction with the Safe Drinking Water Act SRF program, which is currently under consideration by Congress.

SERIES 10
STATE PROJECT FUNDING SYSTEM

This section addresses Texas Water Development Board (TWDB) rules adopted under authority of Section 6.101 as amended, of the Texas Water Code. These rules include:

CHAPTER 363 - FINANCIAL ASSISTANCE PROGRAMS

Introductory Provisions
Texas Administrative Code Section 363.1

These rules are adopted under the authority of Texas Water Code, Section 6.101, which requires the board to adopt rules necessary to carry out the powers and duties of the board provided by the Texas Water Code.

Subchapter A. General Provisions

§363.1. Scope of Subchapter.

This subchapter shall govern the board's programs of financial assistance under the following programs established by the Texas Water Code:

(1) in Chapter 15:

(A) Water Loan Assistance Fund under Subchapter C;
(B) State Water Pollution Control Revolving Fund under Subchapter J;
(C) Storage Acquisition Program authorized under Subchapter E;
(D) Bond Insurance Program under Subchapter B;

(2) in Chapter 16, state participation in the purchase or acquisition of facilities under Subchapters E and F;

(3) in Chapter 17, the programs of assistance under the Texas Water Development Fund, including financing of water supply projects under Subchapter D, water quality enhancement projects including municipal solid waste facilities under Subchapter F, flood control projects under Subchapter G, and economically distressed areas projects under Subchapter K;

(4) in Chapter 17, Revenue Bond Program under Subchapter I.

Introductory Provisions
Texas Administrative Code Section 363.201

These rules are adopted under the authority of Texas Water Code, Section 6.101, which requires the board to adopt rules necessary to carry out the powers and duties of the board provided by the Texas Water Code, and adopt rules for the SRF.

Subchapter B. State Water Pollution Control Revolving Fund

§363.201. Scope of Subchapter.

Subchapter B shall pertain to applications for financial assistance from the State Water Pollution Control Revolving Fund established by the Texas Water Code, Chapter 15, Subchapter J, and which are not required to comply with 33 USC 1251 et. seq., §602(b)(6) (commonly referred to as Title II requirements). Unless in conflict with the provisions of this Subchapter, the provisions of Subchapter A of this title (relating to General Provisions) also apply to applications for assistance from the SRF.

Introductory Provisions
Texas Administrative Code Section 363.301

These rules are adopted under the authority of Texas Water Code, Section 6.101, which requires the board to adopt rules necessary to carry out the powers and duties of the board provided by the Texas Water Code.

Subchapter C. Municipal Solid Wastes

§363.301. Scope of Subchapter.

The sections of Subchapter C, shall pertain to applications for financing municipal solid waste facility projects authorized by the Texas Water Code Chapter 17, Subchapter F. Unless in conflict the provisions of this Subchapter, the provisions of Subchapter A of this title (relating to General Provisions) shall also apply to municipal solid waste facility projects.

Flood Control
Texas Administrative Code Section 363.401

These rules are adopted under the authority of Texas Water Code, Section 6.101, which requires the board to adopt rules necessary to carry out the powers and duties of the board provided by the Texas Water Code.

Subchapter D. Flood Control

§363.401. Scope of Subchapter.

The sections of Subchapter D shall pertain to applications for financing flood control projects authorized by the Texas Water Code §§17.771-17.776. Unless in conflict with the provisions in this subchapter, the provisions of Subchapter A of this title (relating to General Provisions) shall also apply to flood control projects.

Economically Distressed Areas
Texas Administrative Code Section 363.501

These rules are adopted under the authority of Texas Water Code, Section 6.101, which requires the board to adopt rules necessary to carry out the powers and duties of the board provided by the Texas Water Code and carry out the economically distressed areas program.

Subchapter E. Economically Distressed Areas Program

§363.501. Scope of Subchapter.

The sections in this subchapter shall govern the board's Economically Distressed Areas Program as established by the Texas Water Code, Chapter 16, Subchapter J and Chapter 17, Subchapter K. Unless in conflict with the provisions in this subchapter, the provisions of Subchapter A of this title (relating to General Provisions) shall also apply to economically distressed areas projects.

Storage Acquisition and State Participation
Texas Administrative Code Section 363.601

These rules are adopted under the authority of Texas Water Code, Section 6.101, which requires the board to adopt rules necessary to carry out the powers and duties of the board provided by the Texas Water Code.

Subchapter F. Storage and Acquisition and State Participation

§363.601. Scope of Subchapter.

The sections of Subchapter F shall pertain to applications for financing storage acquisition and state participation projects authorized by the Texas Water Code, Chapter 15, Subchapter E, and Chapter 16, Subchapters E and F. Unless in conflict with the provisions of this subchapter, the provisions of Subchapter A of this title (relating to General Provisions) shall apply to storage acquisition and state participation projects.

CHAPTER 375 - STATE WATER POLLUTION CONTROL REVOLVING FUND

Introductory Provisions
Texas Administrative Code Section 375.1

These rules are adopted under the authority of Texas Water Code, Section 6.101, as amended.

§375.1. Scope of Rules. These sections, adopted pursuant to the Texas Water Code, §6.101, shall govern the State Water Pollution Control Revolving Fund as authorized by the Texas Water Code, §§15.601 - 15.608.

SERIES 11
SEGMENT CLASSIFICATION

Federal regulations (40 CFR §130.2(j)) define a water-quality-limited segment as any segment where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by §§301(b) and 306 of the federal Clean Water Act. Segment classifications are published in the State of Texas Water Quality Inventory (305(b) Report).

Primary Determination of Water-Quality-Limited Segments

As an important water quality management tool, the TNRCC considers a segment to be water-quality-limited based on the federal definition. The TNRCC further identifies how a water-quality-limited designation is used in water quality management planning and TPDES permit issuance. An industrial or municipal discharger is considered to discharge into a water-quality-limited segment and will be incorporated into a WQMP when:

1) a pollutant being discharged from the facility is reasonably likely to contribute to an impairment or threat of impairment of a water body, as described in either the current EPA-approved CWA §303(d) list or a recently submitted TNRCC update,
2) the discharge has been identified and controlled in a waste load evaluation (WLE), or
3) a total maximum daily load (TMDL) has been developed.

The physical, chemical, or biological water quality conditions or pollutants which result in impairment, threats of impairment, or listing of a water on the CWA §303(d) list are described in other Series of this CPP.

Secondary Determination of Water-Quality-Limited Segments for Municipal Discharges

In addition to the above-described primary method of identifying dischargers considered to discharge into a water-quality-limited segment, state rules at 30 TAC §309.1(a) and 30 TAC §309.3 define when a municipal discharger is considered to discharge into either an effluent-limited or a water-quality-limited segment. In the rules, a water-quality-limited segment is defined for purposes of municipal discharges.

"A surface water segment classified by the commission as water quality limited where conventional treatment of waste discharged to the segment is not stringent enough for the segment to meet applicable water quality standards; monitoring data have shown significant violations of water quality standards; advanced waste treatment for point sources is required to protect existing exceptional water quality; or the segment is a domestic water supply reservoir used to supply drinking water."

Significant violations of water quality standards are determined through assessment of surface water quality monitoring data. The procedures for assessment of the data are described in the publication entitled *State of Texas 1998 Clean Water Act Section 303(d) List and Schedule for Development of Total Maximum Daily Loads* (6/26/98). Section IV of the publication describes in detail how monitoring data is assessed and compliance with standards is determined. The 1998 document has been approved by the EPA, and subsequent EPA-approved updates to these procedures will be utilized.

Under this TNRCC definition of water-quality-limited segment, specific effluent limitations are described that are incorporated into a WQMP when a municipal discharger is subject to the WQMP. These specific effluent limitations include pollutants that could affect in stream dissolved oxygen. These effluent limitations include biochemical oxygen demand, carbonaceous biochemical oxygen demand, ammonia-nitrogen loading values as well as the effluent concentration for dissolved oxygen.

SERIES 12
SEGMENT RANKING

Introduction

Section 303(d) of the Clean Water Act requires each state to rank designated segments by water quality and priority for corrective action. Utilizing data from Stream Monitoring Network (SMN) stations, the Texas Natural Resource Conservation Commission ranks all segments by existing water quality, then uses other factors to determine segment priority for action. Segment ranking is part of the Texas Water Quality Inventory.

Ranking Procedure

Each designated segment is classified by type as either Stream, Reservoir, or Estuary. Appropriate water quality parameters related to trophic status are analyzed for each segment type. Analyses of SMN data for each relevant parameter determines the statistical distribution for a segment type, and for each segment of that type. Each segment is assigned a score based on where the segment parameter means fall within the parameter distributions determined for the segment type. Each segment also receives a score based on known or potential toxicity problems. Segment scores are normalized to a common base value to avoid ranking bias due to the number of parameters used for segment types, and to provide equal weight to trophic status and toxicity criteria. The combined scores for trophic status and toxicity allow segments of all types to be ranked together by existing water quality.

Ranking for action priority is a continuation of the water quality ranking. Weighting factors are determined for each segment based on standards attainment, potential for future impacts, and resource value. Standards attainment weighting is based on how well the segment has maintained the current designated uses. Potential impact weighting is based on permitted point source discharges, and known or potential nonpoint sources of pollution. Resource value weighting is based on a combination of natural use (wildlife) value, human use (water supply, recreation) value, and fish kill records. The weighting factors are structured in a modular fashion that will allow improvements to individual factors without requiring that the whole process be redesigned. The weighting factors are applied to the individual segment scores for existing water quality to determine the action priority scores.

The ranking procedure described above has been used since 1992. However, a new, but similar, procedure is currently being developed in conjunction with the Clean Rivers Program (CRP). The new procedure will be based on data screening and analyses performed by regional authorities for each river basin for the CRP. Basin results will be combined by the TNRCC to compile the statewide ranking. The new method will provide much more local input and coordination than the current method, and will enhance coordination between the CRP and other watershed-based programs.

SERIES 13
TEXAS WATCH PROGRAM

Program Overview
Founding Goals and Philosophy

Texas Watch offers guidance to citizens with water quality concerns and to train committed individuals to collect useful water quality data. The State's volunteer environmental monitoring program was founded in response to public concerns over fish kills in the Pecos River, and it continues to respond to citizens who are interested in contributing to environmental protection.

Texas Watch addresses two significant needs: (1) It collects accurate, usable information about the environment which is needed to support resource management priorities; and (2) it effectively communicates with the public about environmental issues. To address these needs, Texas Watch operates under the guidance of three principle goals: (1) to produce environmental information agencies, the regulated community and the public need to make environmentally-sound decisions; (2) to improve communication about the environment and environmental issues, and; (3) to resolve conflicts over environmental impacts through positive cooperation.

Communications, Cooperation and Coordination

One of the most important functions of Texas Watch is its role in bridging information gaps between citizens, environmental regulators, and the private sector. The program has been instrumental in establishing supportive networks which transcend geographic and political boundaries.

Working directly with the public, Texas Watch serves a crucial role for the State's environmental agency by maintaining an avenue for free and open exchange about environmental issues. In an effort to provide volunteers with the greatest possible range of opportunities, rewards, access and influence, Texas Watch continuously works to strengthen information networks within TNRCC. The program works with other TNRCC programs including but not limited to Field Operations, Surface Water Quality Monitoring, Environmental Research and Assessment, Watershed Texas, Information Resources, Geographic Information Systems, Public Outreach, Clean Industries, Clean Cities, and the Clean Rivers and Nonpoint Source Programs to increase consistency and efficiency in planning and performance.

The Texas Watch newsletter, distributed bimonthly, keeps the public informed of environmental management issues while highlighting citizen and partner contributions to environmental protection. Program staff also contribute to other publications, including the national "Volunteer Monitor" newsletter and EPA's "The Water Monitor".

Texas Watch has hosted four annual statewide conferences and three regional wide workshops to emphasize the importance of taking a watershed approach to environmental management and where program participants are invited to interact and share information about their monitoring activities. Texas Watch recognizes its role as a model for other volunteer environmental monitoring projects around the nation. Program representatives periodically accept invitations to discuss citizen monitoring at interregional and national gatherings.

The Texas Watch Advisory Council facilitates communication between Texas Watch staff and volunteers by providing ongoing feedback and advice about sensitive and complex issues. The Council helps Texas Watch understand and address the needs of volunteers and partners.

Recruitment and Training

Texas Watch participants represent a diverse group of Texans. As of August, 1995, the number of Texas Watch volunteer groups has grown to 300. About forty-five percent of these groups are schools (135 groups), twenty-nine percent are individuals (87 groups), twenty percent are citizens' organizations (61 groups), and six percent are recognized Texas Watch partners (17 groups).

Texas Watch supports volunteers who have environmental concerns or reasons for monitoring a specific site which support and enhance the Agency's mission. Texas Watch continues to target recruitment of Texas Watch volunteers in areas where water quality data needs have been identified. Professionals who model streams for permitting and stream standard requirements have requested that Texas Watch sites be established on segments where there is little or no professional monitoring.

Texas Watch offers several levels of training and participation to volunteer monitors, from Texas Watchers to Quality Assurance Officers. Texas Watchers are students who monitor under the guidance of a Certified Water Quality Monitor or anyone monitoring water quality with equipment other than the Texas Watch monitoring kit. Approximately 1100 volunteers have received certification as Certified Water Quality Monitors and have completed a rigorous three-phase training program. They must participate in ongoing quality control sessions to keep their certification current. The number of Certified Water Quality Monitors continues to grow. As of August, 1995, there are approximately 97 Certified Texas Watch Trainers and 20 Certified Quality Assurance Officers in the Texas Watch program.

Quality Assurance and Data Management

The importance of collecting accurate information about the environment influences all aspects of Texas Watch. Federal policy requires that data collected through EPA grants be collected following very precise standards which are specified in an approved Quality Assurance Project Plan (QAPP). By adhering to these guidelines, Texas Watch is able to assure all users of volunteer data that the data meet specified quality standards, and that it can be used for comparison to water quality standards, water quality trend analysis, and

identification of water quality conditions and problems requiring further action. Analysis of the data enable volunteers and partners to identify potential water quality problems.

Texas Watch continuously strives to improve the procedures which ensure the quality of information throughout the data management process. Currently, volunteer data are only accepted and entered into the Texas Watch Data Retrieval and Information Processing System (DRIPS) if they meet quality control criteria set statewide by Texas Watch and adhered to by Texas Watch and by all partners designated as data repositories. Texas Watch works with partners to ensure these data criterion are met. Once volunteer data are input into DRIPS, they can be loaded into the TNRCC's TRACS (Texas Regulatory and Compliance System) data base, and are "tagged" to differentiate them from data collected by professional monitors. The data are accessible to the public, educational and research institutions, and governmental agencies.

Nonpoint Source Pollution Monitoring Projects

Texas Watch is currently implementing four projects focused on preventing and monitoring nonpoint source (NPS) pollution in Texas. These projects are part of the State's strategy to address nonpoint source pollution through education while at the same time gathering important information about nonpoint source pollution problems in urban and rural areas around Texas. In the nonpoint source monitoring projects, volunteers monitor for different pollutants depending on which project they are part of. More importantly, though, the nonpoint source monitoring program can be viewed as a testing ground for Texas Watch activities. Through these projects, volunteers participate in a wide variety of activities, some of which might work statewide, and some of which are only locally effective.

The success of these projects are measured in two ways: First, by whether they accomplish what they set out to do in the grant project workplan. Did we see improvement in water quality? Did we recruit enough volunteers? Are we meeting the data collection requirements prescribed in our grants? Second, and probably most important, are the new techniques and protocols developed appropriate in other, non-project areas? Are partners willing to support these new activities in other areas? Are volunteers excited about the activities? When a new activity is successful, Texas Watch can consider disseminating it statewide, depending on funding and partner support.

Texas Watch is currently developing protocol for volunteer benthic macroinvertebrate monitoring within two of the projects. The sampling of benthic macroinvertebrates is taking on greater importance in both professional and volunteer water monitoring, particularly in the study of nonpoint source pollution.

TNRCC Regional and Partner Support

Texas Watch is supported by representatives in the 15 TNRCC regions across the State. These professionals provide a vital link to local members of the community who want to contribute to the State's environmental protection efforts. They also serve as the first line of response, along with river authorities and other local environmental management teams, when volunteers detect potential problems at their monitoring sites.

Over the years, Texas Watch has encouraged volunteers to rely less on state resources and more on the resources of local organizations to support their monitoring activities. In 1992, Texas Watch developed the partners program to provide volunteers with the technical and financial support they need to collect high quality, useable data and to more effectively address environmental issues. The number of Texas Watch partners has grown to 69 in 1995 and represents a diverse group of organizations: River Authority (13), City (11), Industry (12), Nonprofit (10), Regional Council (8), Water Authority (3), School District (2), University (2), Utility (2), Other (6). Texas Watch has modified the partners program to accommodate the changing needs of partners and volunteers by introducing partnership agreements, different partnership levels which allow partners to select the level of commitment appropriate for them, and partnership networks to ensure uniformity in how volunteers are supported and to encourage long-term commitments from partners.

Looking Ahead

Internally, program infrastructure refinements are essential in meeting the growing needs of volunteers and partners. Texas Watch will endeavor to cultivate and sustain a greater diversity of partners and networks. Moreover, with input from partners, Texas Watch will develop techniques to effectively support the invaluable participation and contribution of all volunteers.

Presently, Texas Watch has unprecedented support at all levels as the benefits of volunteer monitoring become an integral part of environmental protection. As TNRCC progresses with its initiative to better coordinate and integrate water resource management activities geographically by river basin, volunteer monitoring will be linked to strategic watershed monitoring. Texas Watch participants will play an essential role in supplementing comprehensive, prioritized monitoring plans for individual watersheds. Volunteers will provide valuable data for areas professionals cannot access, including sites never before monitored. Volunteers will also collect data in priority areas with greater frequency than the scientific community can achieve. With this effort, Texas Watch foresees an unparalleled partnership between volunteer monitors and the scientific and technical community.

SERIES 14
INTENSIVE SURVEY

Directive

The intensive survey is accomplished in accordance with the Texas Water Code, Section 26.127. The intensive survey report is used in developing and maintaining the State Water Quality Strategy, and for the purposes described below.

Description

Intensive surveys are synoptic studies where specific water quality measurements (primarily dissolved oxygen) are made under a specific hydrologic condition during a brief period of time. Intensive surveys are used by the Surface Water Quality Monitoring (SWQM) Program to evaluate wasteloads, verify stream standards, address existing or potential special water quality problems, and document water quality after controls are implemented. They are usually conducted over several days duration on a stream, reservoir, or estuary segment. Intensive surveys are generally conducted during steady state, low flow conditions when the influence of point source discharges on water quality are most apparent. Segments which are selected for intensive survey monitoring generally include those with recurrent water quality standards violations, where new or amendments of major wastewater permits are scheduled, where substantial improvements in wastewater treatment have been implemented, impacted by toxic substances, affected by nonpoint sources, and where a wasteload evaluation or a total maximum daily load have not been developed or an existing one needs revision. The TNRCC primarily uses the segment ranking in the State of Texas Water Quality Inventory (305(b) Report) to prioritize those waterbodies needing intensive surveys.

Field physicochemical, water chemistry, hydraulic, toxic substances, and biological data may be collected depending on the scope of the project. Field measurements are collected at selected instream stations, on significant tributaries, and at major wastewater treatment plants over one diel period to measure temporal fluctuations in water quality. Water samples are collected and typically composited to characterize average water quality conditions. Hydraulic measurements are made to determine the amount of water flowing in the waterbody and the amounts contributed from tributaries and wastewater discharges. Stream velocity is determined by dye studies, and representative stream widths are measured and averaged. Biological data (benthic macroinvertebrates and/or fish) are occasionally collected to complement the physicochemical data and aid in determining water quality impacts on aquatic life in the waterbody. Although not done routinely, samples for ambient water and sediment toxicity evaluations and toxic substances analyses in water, sediment, and fish tissue may also be collected. Water quality data collected during intensive surveys are stored in the SWQM Database. Results of the surveys are published by the TNRCC in the Agency Study/Intensive Survey Report Series.

SERIES 15
NONPOINT SOURCE POLLUTION ABATEMENT

Section 319 of the 1987 Federal Water Quality Act Amendments prompted the State to address nonpoint source water pollution. Prior to the 1987 amendments, except for the voluntary efforts of landowners to conserve soil and water, Texas had few state government programs to deal with the problems caused by this rainfall runoff pollution. In the ensuing years, the State has undertaken a variety of program initiatives including financial assistance, water quality assessments, demonstration projects and public awareness campaigns to address nonpoint sources of water pollution.

In order to strengthen the nonpoint source abatement effort, the Commission in early 1989 appointed a 27-member Nonpoint Source Advisory Committee to devise a long-term strategy for the program. A more comprehensive review of state water quality policies was undertaken by a citizens advisory committee, the Texas Clean Water Council, in 1992. These forums have provided recommendations regarding educational efforts, best management practice development, monitoring and database commitments, and state funding alternatives.

The TNRCC receives over $2 million in federal funds each year through the Section 319 grant program to address nonpoint source prevention and control issues in the State. These federal funds are matched by state and local funds on a 60% federal, 40% non-federal matching basis. Solving problems caused by urban storm water runoff, mitigating sedimentation problems from construction sites, monitoring effectiveness of best management practices mandated by local ordinances and developing alternative onsite wastewater systems are examples of nonpoint source pollution prevention efforts which are geared toward water quality improvement. Currently, over 20 state, regional and local governmental entities receive funding support from the TNRCC Section 319 grant program.

The TNRCC is working with the Texas State Soil and Water Conservation Board (TSSWCB) and other agriculture assistance agencies to implement a pilot watershed management project in the Lake Fork Reservoir watershed. Biological, water chemistry and sediment quality data will be collected by TNRCC to define reference conditions and to identify impacted areas. This information will be used to target management efforts in priority areas and establish pollution reduction objectives. The TSSWCB then has the responsibility of implementing appropriate management measures to improve the condition of impacted areas. TNRCC will continue to monitor instream conditions to verify the effectiveness of the management practices.

The TNRCC Nonpoint Source, Texas Watch and Clean Texas 2000 programs are implementing a pilot project to reduce nonpoint source pollution in urban areas through technical assistance, education and community involvement. The TNRCC is coordinating with city staffs to promote improved water quality protection in existing municipal practices and programs. The TNRCC is providing support to community interest groups for their implementation of community projects such as storm drain stenciling, neighborhood inventories, tree planting and revegetation and interpretive sites.

The TNRCC is implementing a best management practice (BMP) demonstration project in the Arroyo Colorado River watershed. The TNRCC is demonstrating the effectiveness of a BMP for urban-related NPS pollution. The urban BMP consists of utilizing integrated landscape management (ILM) techniques to modify existing landscape management practices and thus achieve reduced pollutant loadings. ILM techniques utilize soil and tissue testing results to support landscape management decisions pertaining to watering, fertilizing and pest management.

The TNRCC is preparing and will disseminate information pertaining to successful NPS pollution prevention and control programs, strategies and technologies. This information will be prepared in cooperation with local program sponsors where appropriate. Materials will be distributed through mailing lists, electronic bulletin boards and agency distribution outlets.

Incorporated in the Commission's nonpoint source pollution program is the Federal Clean Lakes program, which is oriented toward solving nonpoint source problems affecting lakes proximal to urban areas. Four municipalities with water supply lakes are presently participating in this program, and approximately $4.5 million in federal and local money is estimated to be spent for mitigating these problems.

The TNRCC currently has a Nonpoint Source Assessment Report and Management Program approved by EPA. The TNRCC is updating the statewide report on the nonpoint source pollution-affected waterbodies in the state and its management program for nonagricultural and nonsilvicultural sources of pollution. The objective of the Assessment Report is to identify waterbodies that are impaired or threatened by NPS pollution. Thirteen additional nonpoint source pilot assessment projects are being implemented in urban, agricultural and open areas through the Clean Rivers Program. The TNRCC is coordinating with the National Resource Conservation Service (NRCS) to compile land use information available at the county or HUA level. One of the goals of the Clean Rivers Program is to inventory and evaluate existing land use information for each river basin to facilitate the identification of nonpoint source concerns. Usage will be categorized as percentages of irrigated and non-irrigated cropland, pasture, forest and range land, in addition to percentages of industrial and municipal land use. This will allow correlations between pollutant concentrations reported from the TNRCC data collection and land use. This data will be used to support the assessment of nonpoint source pollution as specified in the 319 Assessment Report and the 305(b) Water Quality Inventory Report. The objective of the Management Program is to specify the programs and practices that the state proposes to implement to address the problems identified in the assessment report. The management program contains milestone commitments for a four year planning period.

The TNRCC Nonpoint Source Program is responsible for implementing provisions of Section 29.179 of the Texas Water Code that provides for the designation of Water Quality Protection Zones. The statute requires the Commission to review water quality plans and annual reports prepared for these areas.

SERIES 16
SPECIAL STUDIES

Directive

The intensive survey accomplished in accordance with the Texas Water Code, Section 26.127. The special study survey report is used in developing and maintaining the State Water Quality Strategy, and for the purposes described below.

Description

Special studies provide the Surface Water Quality Monitoring (SWQM) Program an improved understanding of the sources, distribution, and fate of particular constituents in selected reaches of waterbodies. In some instances, special studies are conducted over the entire length of one or more segments. Special studies are primarily conducted by SWQM Program personnel in the TNRCC's 15 regional offices and Central Office SWQM Team. Special study monitoring is used for a variety of purposes, including:

1. Assess accumulations of toxic substances in water, sediment and organism tissue and toxicity in sediment and surface waters;
2. Assess impacts of point and nonpoint source discharges;
3. Develop water quality controls;
4. Assess improvement in water quality after enforcement action or implementation of water quality controls;
5. Develop new or revision of existing sampling and assessment procedures;
6. Describe impacts of habitat modifications on water quality;
7. Describe water quality in intermittent streams, isolated pools of intermittent streams, and in unclassified, effluent-dominated streams;
8. Augment significant complaint or fish kill investigations;
9. Define water quality and biological characteristics of streams, reservoirs, estuaries and bays and wetlands; and
10. Develop water quality assessment procedures and biological criteria.

Special study monitoring changes substantially from year to year. During the last several years much of the emphasis of the special studies program has been placed on toxic substances, biological, and point and nonpoint source assessments. Water quality data collected during special studies are stored in the SWQM Database. Many of the special studies are published by the TNRCC in the Agency Study/Special Report Series.

SERIES 17
TEXAS ECOREGION PROJECT

Texas is a large state with many different natural regional landforms that are easily recognizable. Streams that cross these natural areas tend to be just as distinct. As water flows over and through the land to the stream channel it acquires and integrates characteristics from the land, especially soils and vegetation. Studies conducted by the TNRCC have recognized natural regional variability in water quality. Use attainability analysis studies conducted on seven northeast Texas streams resulted in site-specific adjustments of dissolved oxygen criteria to reflect naturally occurring levels. Studies of instantaneous dissolved oxygen minima from least disturbed Texas streams have suggested that there is a relationship between dissolved oxygen and geographical areas. However, until recently there has not been a rational method to partition these natural regional variations in water quality.

The establishment of regions can best be accomplished by examining homogeneous patterns of several terrestrial variables because they are presumed to have major influences on aquatic ecosystems. Omernik (1985) developed a map that clearly identifies natural aquatic ecological regions of the conterminous United States. [Omerik, J.M. 1985. Aquatic Ecoregions of the Coterminus United States. Annals of the Association of american Geographers. 77:118-225.] Omernik's approach is based on the presumption that streams derive their character primarily from the watershed's characteristics and that these watershed characteristics exhibit identifiable and measurable spatial patterns that can be seen from mapped information. These areas with homogenous watershed characteristics are defined as ecoregions.

Maps like the one developed by Omernik are hypotheses that must be tested and improved. While the use of an ecoregion approach for determining physical, chemical, and biological goals for the State is based on sound ecological theory, the concept and map must be tested and validated before long range analysis and planning are undertaken. Recent studies in Oregon, Ohio, Kansas, Arkansas, and Minnesota have shown that an ecoregion approach to stream classification, based on Omernik's map, is useful for describing the regional variability of water chemistry, instream habitat, and fish community structure.

The Texas Ecoregion Project which is being conducted by the TNRCC and Texas Parks and Wildlife Department and EPA Region 6 utilizes Omernik and Gallant's (1987) map of the South Central States as a framework to evaluate regional variability of physical, chemical and biological characteristics of Texas streams. [Omerik, J.M. and A.L. Gallant. 1987. Ecoregions of the South Central States. EPA 1600/d-87/315. U.S. Environmental Protection Agency, Corvallis, Oregon.] The primary goals of the study are to evaluate the potential for determining aquatic life uses for various stream types on a regional basis, develop regional water quality and biological criteria, verify Texas ecoregions, and refine use assessment procedures [Twidwell, S.R. and J.R.Davis. 1989 An assessment of six least disturbed unclassified Texas streams. LP 89-04. Texas Water Commission.]

Omernik and Gallant's map identifies 12 ecoregions in Texas based on characteristics of land use, land surface form, potential natural vegetation, and soils. Least disturbed streams of varying size were selected in 11 of the defined ecoregions. Ecoregion 23 - Arizona/New Mexico Mountains was not sampled because only a small portion extends into far west Texas. Also, little pollution threat exists because of the sparse population and the fact that all or most of the Ecoregion 23 in Texas is contained within the Guadalupe Mountains National Park. Preference was given to those streams located within the most typical areas of each ecoregion. Streams found upon field reconnaissance to have intermittent flow but yet maintained perennial pools were also sampled. In all, 72 Texas streams were sampled as part of the ecoregion study.

Intensive surveys were conducted on these streams when critical summertime low-flow conditions and elevated water temperatures have existed. Parametric coverage common to these surveys include 24-hour field measurements, water chemistry, bacteriological analysis, stream flow and habitat analysis. Benthic macroinvertebrate and fish communities were also sampled.

The ecoregion data provides the basis for the development of biocriteria, on a regional basis, for Texas. The data will also assist in the development of regional criteria for conventional water quality parameters.

SERIES 18
TEXAS SURFACE WATER QUALITY STANDARDS

Contents

Introduction

The Texas Surface Water Quality Standards (Title 30, Chapter 307 of the Texas Administrative Code (TAC)) establish explicit water quality goals throughout the state.

Regional hydrologic and geologic diversity is given consideration by dividing major river basins, bays and estuaries into defined segments (referred to as classified or designated segments). The standards rule contains (1) general standards and criteria which apply to all surface water in the state, and (2) segment-specific standards which identify appropriate uses (aquatic life, contact or noncontact recreation, drinking water, etc.) and list upper and lower limits for common indicators (criteria) of water quality - such as dissolved oxygen, temperature, pH, dissolved minerals, and fecal coliform bacteria.

Water quality standards are publicly revised at least every three years in order to incorporate new information on potential pollutants and additional data about water quality conditions in specific waterbodies, and to address new state and federal regulatory requirements.

The Texas Surface Water Quality Standards include several key sections which are essential to their overall effectiveness. The General Criteria (307.4) contain a variety of narrative statewide provisions which define the general goals to be attained by all waters in the State. These provisions are particularly important in dealing with those pollutants which are not addressed by specific numerical criteria. The General Criteria also specify procedures which are used to develop site-specific standards for small unclassified waterbodies.

The Antidegradation Policy (307.5) establishes extra protection for high quality waterbodies. In accordance with EPA requirements, this policy stipulates that no degradation will be allowed in high quality waters, unless the resulting degradation is demonstrated to be economically and socially justified. The antidegradation policy also provides for establishing Outstanding National Resource Waters, in which no degradation is allowed under any circumstances.

Standards for Toxic Materials (307.6) include numerical criteria (as maximum instream concentrations) for 39 toxic pollutants in order to protect aquatic life. Human consumption of fish and drinking water is protected by numerical criteria for 65 toxic pollutants. This section also requires larger wastewater dischargers to conduct biomonitoring, which involves exposing selected aquatic organisms to samples of the discharge effluent. Any significant toxicity observed during biomonitoring must then be evaluated and eliminated.

Appropriate numerical criteria needed to support various water quality related uses are defined in Section 307.7. Conditions under which portions of the standards do not apply - such as in mixing zones near discharge points, or at unusually low streamflows - are noted in Section 307.8. Sampling and analytical procedures to assess standards attainment are described in Section 307.9. Site-specific standards for designated waterbodies are individually listed in Section 307.10 (Appendices A,B,C,D and E).

Procedures for implementing the Texas Surface Water Quality Standards are described in "Implementation of the Texas Natural Resource Conservation Commission Standards Via Permitting."

Outline Summary of the Texas Standards

<u>General Features of the Water Quality Standards</u>
Establish Instream Goals for Water Quality Statewide
Promulgated as Title 30 of TX. Admin. Code, Chapter 307 -
Texas Surface Water Quality Standards

There is a Companion Document describing the Implementation Procedures:

> "Implementation of the Texas Natural Resource Conservation Commission Standards Via Permitting"
> Implementation procedures are revised periodically, and a public hearing is conducted on proposed revisions

The Standards Are Periodically Revised at Least Every 3 Years:

- To address new state and federal initiatives
- To incorporate new data and information
- To address public concerns
- EPA Approval Is Required

Extensive TNRCC review of standards revisions is coordinated through rulemaking procedures of the TNRCC Office of Policy and Regulatory Development.

Basic Types of Standards

General Criteria and Statewide Standards:

- Narrative criteria which prohibit the following:
  - Taste and odor in drinking water
  - Changes in color and transparency
  - Oil and grease contamination
  - Floating debris and suspended solids
  - Toxicity
  - Additional impacts from pollutants

- Numerical criteria specifying instream concentration limits:
  - Substances potentially toxic to human health
  - Substances potentially toxic to aquatic life

Site-Specific Standards:

- Uses:
  - Aquatic life suitability categories -
    Exceptional, high, intermediate, limited
  - Contact or noncontact recreation
  - Drinking water supply
  - Agricultural, industrial uses

- Criteria:
  - Dissolved oxygen
  - Temperature, pH
  - Various dissolved minerals (salts)
  - Fecal coliform bacteria
  - Appropriate general criteria (such as toxic criteria)

Waterbodies with individually listed site-specific standards are called "classified" or "designated" segments

Standards and Water Quality Management

Monitor Instream Conditions:

- To determine baseline water quality
- To determine appropriate standards
- To obtain sufficient data for predicting pollutant impacts

Set Water Quality Standards

Limit Pollutant Input to Meet the Standards and Other Goals

- Steps:
  - Determine allowable pollutant loads
  - Develop permit limits and other pollutant reductions

- Scope:
  - Individual discharge permits
  - Wasteload evaluations for major waterbodies
  - River basins, as part of Clean Rivers Program

Enforce Permit Limits

Re-monitor:

- To determine if standards are being maintained
- To determine if standards are appropriate

Setting Site-specific Standards: Procedures

A Site-specific Standard Is Reviewed When:

- Additional data or information becomes available
- A wasteload evaluation suggests standard may be unattainable
- Public concern and interest indicates review is needed
- A statewide criterion is shown to be locally inappropriate

Administrative Steps to Change Site-specific Standards:

- A use-attainability analysis is conducted
- Results submitted to EPA for preliminary review
- EPA determines if proposed change is "approvable"
- Proposed changes are reviewed through TNRCC Office of Policy and Regulatory Development (OPRD)
- Rulemaking is initiated in accordance with TNRCC OPRD
- Public notice and hearing conducted
- Commissioners consider proposed revision(s) in open agenda
- If adopted, amended standards submitted to EPA for approval

Setting Site-specific Standards: Use-attainability Analysis

Definition:

A use-attainability analysis is a scientific procedure to evaluate and define appropriate uses and criteria for a waterbody

Requirements are described in 40 CFR Part 131; and the analysis is consistent with the intent of Sections 26.023 and 26.177 of the Texas Water Code

Applicability:

The ability of a water body to support a desired use is an integral consideration in the state and federal water quality standards review and revision process

A use-attainability analysis is used to evaluate a water body which is not capable of attaining all the uses included in Section 101(a)(2) of the Clean Water Act or where the level of protection necessary to achieve those uses is not being met or cannot be met

If a use-attainability analysis indicates that new or different uses or criteria are appropriate for a waterbody, the changes are incorporated in the Texas Water Quality Standards (30 TAC Chapter 307)

Purposes:

- To evaluate and define existing and potential uses and criteria of waterbodies
- To determine if existing criteria and uses are appropriate
- To determine if the uses and criteria are being maintained
- To determine causes of use or criteria impairment
- To recommend a course of action to attain uses and criteria

Justifications in 40 CFR 131.10(g) for Lowering a Site-specific Standard:

- Naturally occurring pollutant concentrations prevent the attainment of the use
- Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions are compensated for by the discharge of sufficient volumes of effluent without violating state water conservation requirements to enable uses to be met
- Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place
- Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use
- Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, etc., unrelated to water quality, preclude attainment of aquatic life protection uses
- Controls more stringent than the technology-based requirements established by Sections 301(b) and 306 of the federal Clean Water Act would result in substantial and widespread economic and social impact

Sampling and Analysis May Be Conducted on:

- Instream flow characteristics
- Habitat diversity and suitability

- Water quality
- Biological characteristics

Aquatic Life Category Is Assessed by Numerical "Ratings"

Emphasis is on Relatively Unimpacted Areas of the Waterbody

Site-specific Standards for Small, Unclassified Waterbodies

Many Smaller Streams in Texas Do Not Have Site-specific Standards:

- 18,000 miles of streams in Texas are designated
- Approximately 60,000 miles of streams are not designated

TNRCC Procedures to Address Unclassified Waterbodies:

- Set presumed minimum aquatic life uses for perennial waters
- Investigate site-specific uses where permit actions occur
  - Conduct site assessments by Regional offices as needed
  - Determine appropriate site-specific standards
- If site-specific uses are less stringent than presumption:
  - Conduct use-attainability analysis
  - Submit use-attainability to EPA for approval
  - Revise water quality standards rule(Appendix D)
- Issue permit with final effluent limits that meet site-specific standards
- Continue to adjust presumed uses and criteria for perennial streams on a regional basis, in accordance with:
  - Ecoregion studies of small streams
  - Data from receiving water assessments at permit sites

Numerical Toxic Criteria To Protect Aquatic Life

General Characteristics:

- Applied "across-the-board" to all waters
- Chronic criteria to protect over longer exposures
- Acute criteria applicable to short exposures (< 24 hrs)
- Separate freshwater and marine criteria

Site-specific Factors:

- For metals, criteria are for dissolved portions
- Criteria for metals vary with hardness, which affects toxicity
- Chronic criteria apply where there are aquatic life uses
- Acute criteria apply to all waters
- Effects of local water chemistry can be considered ("water-effects ratio")

Numerical Toxic Criteria To Protect Human Health

General Characteristics:

- Criteria expressed as maximum instream concentration
- Applied as three separate sets of criteria:
  - One set to protect for fish consumption in freshwater
  - One set to protect for fish consumption in saltwater
  - One set to protect drinking water supplies

- Criteria are meant to protect for multiple risks:
  - Lifetime exposure protection from cancer
  - Protection from short or long term toxicity effects

Assumptions for Human Health Criteria:

- Risk level is set at 1:100,000
- Fish consumed / person = 10 g/day freshwater, 15 g/day marine
- Water consumed / person = 2.0 liters per day
- Bioconcentration factors in fish tissue estimated using octanol/water partitioning coefficients (Kow) etc.
- Toxicity is generally extrapolated from animal experiments:
  - Assumes rat response is similar to humans
  - Requires conversions from rat to human body sizes
  - Low-dose risks estimated from high-dose measurements

Toxicity Biomonitoring

General Characteristics:

- Biomonitoring = toxicity testing = whole effluent testing
- Measures combined, overall toxicity to aquatic biota
- Required for larger discharges:
  - Domestic discharges > or = to 1 million gallons per day
  - Major industrial discharges
  - Minor industrial discharges with a potential for toxicity

Procedure:

- Testing is performed on effluent samples, which are diluted to simulate conditions after discharge mixes instream
- Two species of aquatic organisms are placed in water samples:
  - Cladoceran crustacean + fathead minnow in freshwater
  - Mysid shrimp + inland silverside minnow for saltwater
- Chronic toxicity testing for effects on survival, and/or reproduction over a seven day period required for discharges that could affect waters with aquatic life uses

- Acute toxicity testing for lethality over a 48 hour period required for discharges to waters with no aquatic life use (intermittent streams)
- Also, as of 1991 tests on undiluted effluent are required to check for lethality (>50% of organisms) in 24 hours
- Toxicity tests are repeated periodically for the term of the permit

Requirements to Control Toxicity:

- If a discharge repeatedly fails effluent toxicity tests, then a toxicity reduction evaluation is required to:
  - Identify substances and sources causing toxicity
  - Initiate controls to eliminate toxicity
- Following a toxicity reduction evaluation; an effluent limit for toxicity, a chemical specific effluent limit, or a required best management practice may be added to the discharge permit

Antidegradation Policy

Both an Antidegradation Policy and the Antidegradation Implementation Procedures are Included in the Texas Surface Water Quality Standards
Basic Provisions:

- Existing water quality uses cannot be impaired in any waters in the State

There can be no degradation of high quality waters unless that degradation is demonstrated to be "economically and socially justified"

- For waters which are determined to be "Outstanding National Resource Waters" (ONRWs), no degradation of water quality is allowed under any circumstances; Texas has no designated ONRWs

Implementation:

- All permit actions are reviewed to protect existing uses
- Permits for new or increased discharges to waterbodies with high or exceptional quality aquatic life uses are reviewed for potential degradation, even if numerical criteria will be met
- If significant degradation is anticipated, this is put in public notices concerning the permit
- Permit applicant is given opportunity to demonstrate that degradation of high quality waters is socially and economically justified

Developing Permits To Meet Water Quality Standards

Discharge Permits Must Be Renewed Every Five Years

Existing Discharge Permits are Gradually Being Put on the Same Renewal Schedule Within Each River Basin, to Facilitate Watershed Planning

A Waterbody That Receives a Discharge Is Reviewed to:

- Ensure that applicable standards are considered
- Determine instream dilution in dry-weather conditions
- Set allowable mixing zone size

Permit Applicant Samples Effluent to See What Pollutants Are There
For Toxic Substances:

- Effluent limits are required if projected instream concentrations due to the discharge are within 85% of numerical standards
- Daily average and daily max effluent limits are calculated with statistical consideration of effluent variability, so that probability of standards being exceeded is low

For Toxicity Biomonitoring:

- Appropriate dilution for critical condition is determined
- Protocol, frequency, and testing requirements specified in permit

For Oxygen Demanding Organic Materials:

- Computer simulation models predict impact of discharge on instream dissolved oxygen concentration
- Effluent limits for biochemical oxygen demand (BOD) are set so that instream dissolved oxygen criteria are maintained at critical low-flow conditions

Additional Effluent Limits:

- Effluent limits for parameters such as dissolved minerals and temperature, are also set to meet instream standards
- Effluent limits are also based on typical treatment levels achievable by best available technology (such as for total suspended solids, etc.)

SERIES 19
METHOD FOR WASTE LOAD EVALUATIONS

Introduction

This summary describes the information developed in evaluating the effects of point source discharges of pollutants into Texas waters. The study of these effects, as described in Waste Load Evaluations, will serve as aids in issuance of waste discharge permits, and become components of state water quality management plans and total maximum daily load allocations (TMDLs). Complete TMDLs will allocate point source loading (waste load allocations or evaluations), nonpoint source loading (load allocations), and a margin of safety.

The Commission recognizes the need for additional water quality data to determine whether water quality criteria are being attained. The Commission is committed to seeking additional funding from the legislature for such data collection, particularly for toxic pollutants. It is further committed to encouraging the collection of such ambient data by other state and federal agencies, local entities and the regulated community. The TNRCC's Clean Rivers Program has been established to coordinate statewide monitoring that will provide additional water quality data through partnerships with river authorities, industry, local governments, and citizen monitoring programs. The TNRCC cooperative Basin Cycle Plan defines phases to identify problems in water quality, collect data, perform assessment evaluations, develop water quality basin management plans, and implement water quality improvement measures.

At this point, little research has been done in regard to nutrient impacts on streams and rivers in Texas; however, nutrient impacts on lakes have been the focus of numerous studies. A methodology for modeling water quality pollutants in reservoirs is given in *Methods for Applying WASP to Texas Reservoirs for Waste Load Allocation and Eutrophication Potential Analyses*, LP 88-08, TWC 1988.

Many Waste Load Evaluations assess the effects of waste loading on instream dissolved oxygen concentrations. The modeling techniques and report format described below are used to analyze dissolved oxygen issues in water bodies for which adequate data are available to support model calibration. The implementation of dissolved oxygen criteria for streams from which little or no data are available primarily involves the application of a Streeter-Phelps model. The methodology for Streeter-Phelps applications is given in *Simplified Streeter-Phelps Stream Model Implementation Methodology*, Texas Water Commission 1987 (Unpublished). Model analyses are performed for critical conditions described in Section 307.7(b)(3)(A) of the Texas Surface Water Quality Standards.

Waste Load Evaluation reports that address constituents other than dissolved oxygen use a similar format and process. Analysis methods used for toxic pollutants are specifically described in Series 20, TMDL Development Steps for Toxics, of this document.

Each waste load evaluation report should contain, but not be limited to, the following:

Evaluation Content

A. An INTRODUCTION including:

1) A general paragraph on the purpose of waste load evaluations.
2) A discussion of the parameter or parameters evaluated in the report.
3) A discussion of the dates of past evaluations and the date of the present evaluation.

B. SEGMENT DESCRIPTION including:

1) A general description of the area in the vicinity of the segment under study including the following:
   Geography
   In a concise manner the segment location in the State, basin location, segment description and boundaries, counties encompassed by watershed, length of segment, area of watershed, elevations, major tributaries, proximity to major towns, etc. are discussed. Figures showing location in state and segment map are referenced.
   Climatology
   Air temperature, winds, precipitation, humidity, etc. are discussed.
   Hydrology
   Flows (7-day 2-year; annual average; min; max), slopes, widths, depths, tides, etc. are discussed.
   Land Use Patterns
   Predominant land use patterns are discussed.
2) A discussion of applicable water quality standards including desired water uses and numerical criteria.
3) A discussion of wastewater dischargers and waste loads which includes the number of dischargers sorted by municipal or industrial category. A table showing existing, permitted and projected loads in terms of flow, BOD_5, NH_3-N, etc. is provided. The permit limitations in terms of effluent concentration and pounds per day are given. Figures showing the historical loading trends for wastewater flow, BOD_5, etc. from 1970 to the present are provided.
4) A discussion of past and present water quality conditions from available data. A summary of data from stream monitoring stations for the last four years is provided in a table for the parameters with specified numerical criteria. This table is discussed briefly. Figures showing the historical trend of water quality conditions from 1969 to present are shown and discussed. Intensive surveys may be referenced. However, detailed discussion of the intensive surveys used for model calibration or verification will appear later in the report.
5) Discussion of segment classification (effluent limited or water quality limited) within the State (See Series 11, Segment Classifications).
   Classifications are taken from the State of Texas Water Quality Inventory prepared by the Texas Natural Resource Conservation Commission pursuant

to Section 305(b) of the Federal Water Pollution Control Act, as amended. Segments are classified as water quality limited if applicable water quality criteria cannot be met following incorporation of best practical treatment (BPT) for industries and/or secondary treatment for municipalities. Segments are classified as effluent limited if they are presently meeting or will meet applicable water quality criteria following incorporation of BPT for industries and/or secondary treatment for municipalities.

C. DOCUMENTATION OF THE WATER QUALITY MODEL including:

1) A discussion of the selection and formulation of the model.
Model selection is dependent on the amount of available data and the complexity of the water quality problem. In certain situations, EPA guidance allows the use of simplified water quality models, i.e., Streeter-Phelps. When guidance requires a calibrated/verified model, the State will normally use QUAL-TX, although other models may be selected if more suitable to a specific situation.
QUAL-TX is a modified version of QUAL-II that is maintained by the Research and Environmental Assessment Section of the Texas Natural Resource Conservation Commission. The original QUAL-II model was developed by Water Resources Engineers (now Camp, Dresser & McKee) for EPA. Since that time, many modifications have been made to QUAL-II by many people. QUAL-TX is a user-oriented model incorporating many of those modifications and is intended to provide the basis for evaluating waste load allocations in the State of Texas. The theoretical basis and program documentation for QUAL-TX is not yet available. However, the basic solution technique and theory do not drastically deviate from the original QUAL-II model. Any QUAL-II documentation can provide this information. The QUAL-TX User's Manual is available from the Texas Natural Resource Conservation Commission in Austin, Texas.
2) A discussion of the calibration/verification of the model including discussion of the data and calibration/verification technique.
The intensive survey data used to calibrate the model is described. Summaries of flow, field, and laboratory data collected at stream stations are shown in tables. Summaries of flow, field, laboratory, and self-reporting data collected from wastewater discharges are shown in tables.
Discussion of the data input for model calibration includes flows, BOD, NH3-N, etc. used in the model (i.e., survey data, self-reporting, calculated, estimated, etc.). Discussion of the calibration procedure includes how the biological coefficients were chosen and the differences between the observed and predicted water quality profiles. Some of the major rate coefficients (base e) for the calibration run are summarized. The discussion of the data input used for verification modeling follows discussion of the calibration effort. In addition, the verification discussion includes why biological coefficients were changed if they were changed.

D. WATER QUALITY PROJECTIONS including:

1) A discussion of the predictive use of the model including the critical conditions to be utilized.

Tables are included which show the coefficients used in the alternative computer runs. Discussion will include why biological coefficients were changed if changes were required. When running advanced treatment alternatives, modeling rates from the literature may be considered. The TNRCC believes that site-specific data may often fall out of the range of expected values but are still preferable whenever future stream conditions are expected to be near or representative of past conditions. When modeling dissolved oxygen, biochemical oxygen demand is input as BOD_5 in the alternative runs using a BOD_u/BOD_5 ratio of 2.3. The critical flow evaluated is the 7-day 2-year low-flow determined from a frequency analysis of USGS discharge records and other relevant and necessary data sources. This flow is distributed throughout the watershed on a flow-per-unit-area basis. Tables are included showing the distributions of the flow.

Water quality parameters for the baseflows are assumed to be at background levels and are described or shown in a table. The critical stream temperature for summer conditions is based on the average water temperature for June, July and August plus one standard deviation and is obtained from USGS temperature records or from Texas Natural Resource Conservation Commission stream monitoring data. If the 7-day 2-year low-flow does not occur in the summer season, an appropriate critical temperature will be calculated for the season in which the low-flow occurs.

2) A discussion of waste load projections to be simulated by the model.
Included in the alternatives is the no-load alternative representing the no-discharge projection in which no wastewater discharges are occurring. Although, realistically, it is not a viable alternative, it represents a baseline from which to compare the other alternatives. Other typical alternatives may include runs with existing flows, ultimate permitted flows, projected flows, and intermediate projected flows. Existing flows are based on the latest calendar year self-reporting data. Ultimate permitted flows are based on the final flow values in existing permits plus the flows from pending permit applications. Projected flows for an approximate 20-year planning period are obtained from approved basin planning reports or proposed revisions to those reports. Projected flows for intermediate years are usually based on straight-line interpolation between existing and projected flows. Effluent set recommendations are usually based on design flow alternatives, which use the larger of either ultimate permitted or projected flows for the target year for each discharger.

Alternative effluent limitations to be examined for the various municipal flow projections are as follows:

Level	30-Day Average BOD_5	NH_3-N	DO
Secondary	30	8	4
Secondary	20	12-15	2-6
Advanced	10	12-15	4-6
Advanced	10	3	4-6
Advanced	10	2	4-6
Advanced	7	2	5-6
Advanced	5	2	5-6

Ambient ammonia-nitrogen concentrations for the alternatives not requiring nitrification will be documented. Effluent levels of dissolved oxygen for all alternatives will be documented. Alternative effluent limitations for industrial discharges will include best practicable control technology currently available (BCT) and in some cases a percentage reduction which will be between BCT and BAT. Ambient ammonia- nitrogen concentrations and effluent dissolved oxygen concentrations for the industrial dischargers will be documented. Any variance in BOD_5 and ammonia-nitrogen from the effluent sets indicated in the above table will be fully documented.

3) A discussion of the predicted water quality conditions for projected waste loads.

   In stream segments where there is a cumulative impact from discharges, all discharges will be evaluated at the advanced treatment levels shown in the previous section. In cases where localized problems exist, only the dischargers causing the localized problems will be evaluated at advanced treatment levels. Plots of predicted water quality profiles resulting from the waste load projections at critical stream conditions are presented. These results are summarized and a table is shown describing alternatives, minimum parameter concentration, number of kilometers and miles the parameter concentration falls below the criteria.

E. NONPOINT SOURCE ASSESSMENT including:

1) A discussion of present nonpoint source problems.
   Available designated and undesignated area water quality management program assessments of nonpoint sources will be discussed and referenced.
2) A discussion of future nonpoint source problems.
   If future stormwater and in-stream sampling indicates nonpoint source related water quality problems, control strategies for nonpoint sources may be required.

F. ANALYSIS OF ALTERNATIVES including:

1) A discussion of the feasibility of changing the standards.
2) A discussion of the selected treatment levels necessary to meet water quality standards.

3) A discussion of the sensitivity of the model to various model parameters.
The results of a sensitivity analysis indicate which parameters are most affected by uncertainties and to what extent these uncertainties may affect the predictions. In the sensitivity analysis, all but one parameter are held constant, and the remaining parameter value is varied by a certain percentage. The selection of the percent variation is purely arbitrary and provides a relative measure of comparison.
Sensitivity analyses at a minimum are performed on the following parameters: Temperature, stream baseflow, BOD decay rate, ammonia decay rate, sediment oxygen demand rate, and reaeration rate. Figures are presented which indicate the relative sensitivity of the dissolved oxygen concentrations using the chosen treatment alternative as the basis for comparison.

4) A discussion of permit variances including seasonal discharge and statistical adjustments.
Critical temperatures and stream flows will be evaluated from USGS data. Seasonal alternatives will be evaluated as deemed necessary.

G. CONCLUSIONS AND RECOMMENDATIONS including:

1) A summary of the analysis.
2) A summary of the recommended treatment levels and other recommendations. These recommendations and Table 1, following EPA approval, become revisions to the State of Texas Water Quality Management Plan and provide the basis for permit limitations for both state and federal permitting actions.

TYPICAL SCHEDULE FOR WASTE LOAD EVALUATION REVIEW AND CERTIFICATION

ACTIVITY	AVERAGE TIME
Initial draft of new/revised WLE sent to the TNRCC Office of Policy and Regulatory Development (OPRD) for review.	30 days
TNRCC Modeling staff reviews OPRD comments and makes appropriate revisions	15 days
Initial draft of new/revised WLE circulated to other TNRCC divisions/sections/units for review (may also be sent to local planning agency if related to a special study in the agency's contract)	30 days
TNRCC Modeling Team review initial draft comments and makesappropriate revisions	15 days

ACTIVITY	AVERAGE TIME
At this point a determination is made whether to immediately schedulethe public hearing on the individual WLE, and the review distributionassociated therewith, or to defer those actions until several reports can bescheduled for joint hearing. Special consideration will be given toproceeding with any WLE's for which prompt certification is desired toavoid construction grant project and/or permitting delays	60 days
When ready to proceed following the above determination, the finalized draft is distributed to EPA and relevant state agencies for review; a public hearing is set and affected permittees and the public are advised of the availability of the report in the public hearing notice and an appropriate fact sheet; a public hearing is held following the 45-day minimum notification period	
TNRCC Modeling Team reviews comments from EPA and the state agencies involved in the review process, and the comments received at the public hearing, and makes appropriate revisions to the WLE	30 days
Final WLE report is submitted to the TNRCC for approval and certification to the EPA	45 days
TNRCC certifies the WLE report to EPA 15 days EPA review of certified WLE report	30 days
TNRCC includes the approved WLE into the State's Water Quality Management Plan	

SERIES 20
TMDL DEVELOPMENT STEPS FOR TOXICS

Introduction

The implementation of the toxic pollutant management program began with the collection of monitoring data from representative water bodies in the state. The type of data collected at many of the monitoring stations includes concentrations of toxic constituents in water, fish tissue, and sediment. Some information is gathered through cooperation with other state, federal and local government agencies. The Basin Cycle Plan sets guidelines for a comprehensive schedule to collect data to support model development, and identify priorities for permit site assessments and standards development. Upon collection and analysis of these data, TNRCC identifies stream segments that are not attaining water quality standards. Each of these segments are then ranked for priority for more extensive evaluation and development of control measures. In the Basin Cycle assessment phase, TMDLs are developed to address point sources of toxic materials either in the form of Waste Load Evaluations or specific water quality based effluent limitations in discharge permits. The TMDL allocation process will encourage and allow development of alternative methods for improving water quality in a particular basin, especially when model-based allocations are perceived as unattainable.

To date, the TNRCC has utilized the water quality based effluent limitations for toxic pollutant control. Two areas, the Houston Ship Channel and Corpus Christi Inner Harbor, have been identified as candidates for TMDLs using a Waste Load Evaluation approach. Toxic pollutant controls in these two areas will be implemented through water quality based effluent limitations in discharge permits until final results of additional monitoring indicate the need for a Waste Load Evaluation and such an evaluation is completed.

Segments may be classified as water quality limited for toxic pollutants in two ways: (1) ambient monitoring shows a parameter violating water quality standards or (2) treatment beyond Best Practical Control Technology Currently Available (BPT) for industrial discharges is required to meet water quality standards. A basin Total Maximum Daily Load (TMDL) may be developed for a segment if the segment is on the 304(l) list and has also been identified as water quality limited for a particular toxic pollutant. Each basin TMDL is to include a maximum allowable daily load for a specific toxic pollutant for the water quality segment(s) included. The basin TMDL will consist of two parts: (1) WLA - a wasteload allocation for point source loads and (2) LA - a load allocation for nonpoint source loads. The allowable basin TMDL will be the sum of the WLA and LA. In segments or waterbodies where basin TMDLs have not been developed, site-specific TMDLs will be developed in the form of water quality based effluent limitations in discharge permits. Steps for developing water quality based effluent limits for permits are described in the Implementation Procedures.

Critical Design Conditions for Streams and Rivers

Critical conditions for assessing the impacts of point sources will occur during low stream flows when nonpoint loads are nonexistent or minimal. However, critical conditions for assessing the impacts of nonpoint source loads on the receiving water occur during wet weather conditions. Therefore, TMDL's may need to incorporate both wet weather and dry weather critical design conditions.

For dry weather, the 7-day, 2-year low flow (7Q2) will be used for the headwaters and tributaries for attaining chronic aquatic life criteria. The 1-day, 2-year low flow (1Q2) will be used for modeling the acute aquatic life criteria.

If a wet weather analysis is necessary, the analysis will be conducted according to the Technical Support Document for Water Quality Based Toxics Control, EPA/505/2-90-001, U. S. Environmental Protection Agency 1990 (TSD) and evolving TMDL guidance.

Maximum Pollutant Load for WQS Violation

An estimate of the maximum pollutant load to the segment that would not cause a violation of the water quality standard (WQS) must be made under the critical design conditions. This maximum load will be calculated as follows:

a) dry weather load = 7Q2 * water quality chronic criteria
= 1Q2 * water quality acute criteria
b) wet weather load = TSD guidance and evolving methodology

The smaller of the wet and dry weather loads will be considered the maximum pollutant load that would not cause a water quality standard violation of the acute and/or chronic criteria.

Actual Pollutant Load

The actual pollutant load to the segment must also be estimated during critical design conditions. These loads will then be compared to the maximum pollutant load to ascertain if a reduction in total pollutant load is necessary. The actual total load for dry weather design conditions is equivalent to the sum of the point source load and the dry weather nonpoint source load. Likewise, the actual total load for wet weather design conditions is equal to the sum of the point load and the wet weather nonpoint load.

Point Source Loads

Several methods may be used for calculating the point source load:
1) average monthly permitted flow * average monthly permitted concentration, or
2) average monthly permitted flow * observed effluent concentration, or
3) average monthly permitted flow * estimated effluent concentration from similar facilities, or
4) predicted average monthly permitted flow * estimated effluent concentration.

Nonpoint Source Loads

1) Dry Weather Load = sum of 7Q2 or 1Q2 * observed or estimated concentrations for each headwater and tributary;
2) Wet Weather Load = estimated from TSD guidance

Wasteload Allocation (WLA) and Load Allocation (LA)

Should the actual load exceed the maximum load that would not cause a WQS violation, the total allowable load will need to be determined and allocated between point and nonpoint sources. This allocation is done via a WLA and a LA. The loads from the WLA and LA are incorporated into an appropriate water quality model for predicting the resulting toxic concentration in the water quality segment and for insuring that the WQS is not violated. The combined WLA and LA become the TMDL.

Wasteload Allocation (WLA)

For point source discharges, a mixing zone analysis may be necessary if the pollutant does not become completely mixed throughout the cross-section. The estimated toxic concentration at the edge of the zone of initial dilution (ZID) and at the edge of the mixing zone must meet acute and chronic aquatic life criteria, respectively. Consequently, the estimated toxic concentrations at the edge of these zones will be used in estimating the allowable load from that discharger. Mixing zones from multiple discharges are not permitted to overlap. Should the mixing zones be predicted to overlap, modifications to the outfall structure and/or effluent limits will be required.

A reduction in point source load may be required to reduce the overlap of mixing zones. Several options will be considered:

1) reduce effluent concentrations and/or flow for each discharger by a percentage based on the percent total effluent load if the effluent concentrations are nearly equal,
2) reduce effluent concentration and/or flow of the discharger with the substantially higher concentration than the other dischargers,
3) reduce effluent concentrations of all discharges to that achieved via Best Available Technology Economically Achievable (BAT),
4) a combination of the above methods, or
5) other alternatives will be considered on a case by case basis as deemed appropriate.

Depending on the characteristics of the outfall and the receiving water, the following mixing zone models may be used: RIVMIX, JETMIX, UMERGE, UOUTPLM, UDKHDEN, ULINE, UPLUME, CORMIX1, CORMIX2. These models have various limitations and have been developed for specific types of outfalls and water bodies. Consequently, other methods as deemed appropriate may be necessary for estimating the concentrations at the edges of the ZID and the mixing zone.

Load Allocation (LA)

The LA will be considered equivalent to the nonpoint source load, calculated as described under Actual Pollutant Load, for the appropriate critical design condition. To meet the TMDL, the LA will not be reduced unless:

1) the WQS is being violated with no point source loads to the water body, or 2)all dischargers are currently meeting BAT, or
3) a significant portion of the LA is attributable to an easily definable and treatable nonpoint source, or
4) even if all dischargers were to meet BAT, the WQS would still be violated.

Modeling of the Water Quality Segment

The critical design condition (dry or wet) will be modeled as determined in the preceding sections about Maximum Pollutant Load and Actual Pollutant Load.

The predicted loads from the WLA and LA will be used as input to a water quality model for predicting the segment-wide pollutant concentration. For each discharger, the concentration at the edge of the mixing zone and the permitted flow will be used as model input. The physical, chemical, and biological processes that govern the fate of the pollutant will be considered as necessary to achieve an acceptable simulation of segment pollutant concentrations. Depending on the complexity of the system, the following models may be used: CSTR (completely stirred tank reactor), PFR (plug flow reactor), QUALTX, QUAL2E, and WASP. Other models may be used as deemed necessary depending on site-specific problems. The probability of multiple point sources simultaneously discharging at their maximum allowable loadings may be considered in the development of the WLA, if appropriate for a specific segment pollutant.

TMDL

The allowable TMDL is the sum of the WLA and LA.

Report Preparation

A report will be prepared for each basin TMDL which will include all assumptions and methods used in the preparation of the TMDL. Each report is reviewed by the Office of Policy and Regulatory Development, and then circulated for technical review to the Texas Natural Resource Conservation Commission staff, other state agencies, EPA, and local planning agencies. The public and affected permittees are advised of the availability of the report. A public hearing is held, and all interested parties are given the opportunity to comment. All comments are considered and the report revised to resolve conflicts to the extent possible while achieving water quality goals. The revised report is then prepared for consideration by the Commissioners. Following approval by the Commissioners, each report will be submitted to USEPA Region VI for approval. The basin TMDL will then become part of the Water Quality Management Plan upon approval by the Texas Natural Resource Conservation Commission.

SERIES 21
POINT SOURCE PERMITTING

The Texas Natural Resource Conservation Commission (TNRCC) is given broad authority by Chapter 26 of the Texas Water Code (Code) to adopt rules and procedures and to issue permits to control discharges of waste into or adjacent to water in the State. Water in the State includes percolating and other forms of groundwater, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, wetlands, marshes, inlets, canals, the Gulf of Mexico, inside the territorial limits of the State, and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, navigable or nonnavigable. It includes the beds and banks of all watercourses and bodies of surface water, that are wholly or partially inside or bordering the State or inside the jurisdiction of the State.

Permits are developed to be consistent with state and federal statutes, regulations and rules and also incorporate state and federal policies. The following items are considered when evaluating a permit application and developing a permit.

- Permit Application
- Existing State and Federal Wastewater Permits
- EPA Development Documents and Supporting Federal Registers
- Treatability Manuals and Information
- Self-Report Data (DMRs)
- State and Federal Inspection Reports
- Waste Load Evaluations and Intensive Surveys
- Water Quality Management Plans
- TNRCC Receiving Water Assessments (RWA)
- Enforcement Orders
- Title 30 Texas Administrative Code
  Chapter 281 - Applications Processing
  Chapter 305 - Consolidated Permits
  Chapter 307 - Texas Surface Water Quality Standards
  Chapter 308 - Criteria and Standards for NPDES
  Chapter 309 - Effluent Standards
  Chapter 310 - Use of Reclaimed Water
  Chapter 311 - Watershed Protection
  Chapter 312 - Sludge Use, Disposal, and Transportation
  Chapter 313 - Edwards Aquifer
  Chapter 314 - Toxic Pollutant Effluent Standards
  Chapter 315 - Pretreatment Regulations for Existing and New Sources of Pollution
  Chapter 317 - Design Criteria for Sewage Systems
  Chapter 319 - General Regulation Incorporated into Permits
  Chapter 321 - Control of Certain Activities by Rule
  Chapter 325 - Certificates of Competency
- 40 Code of Federal Regulations

Part 122 - NPDES Program
Part 123 - State Program Requirements
Part 124 - Procedures for Decision Making
Part 125 - Criteria and Standards for NPDES
Part 129 - Toxic Pollutant Effluent Standards
Part 133 - Secondary Treatment Regulations
Part 136 - Guidelines Establishing Test Procedures for the Analysis of Pollutants
Part 257 - Solid Waste Disposal Regulations
Part 258 - Criteria for Municipal Solid Waste Landfills
Part 400-471 - Effluent Limitation Guidelines
Part 501 - State Sludge Management Program Regulations
Part 503 - Standards for the Use or Disposal of Sewage Sludge

- Water Quality Standards Implementation Procedures
- State of Texas Water Quality Inventory (305B Report)
- EPA Toxics Criteria Documents
- EPA Permit Writer's Guide to Water Quality Based Permitting
- Technical Support Document for Water Quality-based Toxics Control

Technology based permit limits will be at least as stringent as Best Practical Control Technology Currently Available (BPT), Best Available Technology Economically Achievable (BAT), and Best Conventional Pollutant Control Technology (BCT) limits in accordance with Effluent Limitations and Standards as promulgated for categorical industries and found in federal regulations (40 CFR Parts 400 to 471), as referenced in 30 TAC §305.541. Production based limitations will be based on a reasonable measure of actual production levels at a facility. Mass limitations for concentration based guideline limits will be developed using the appropriate wastewater flows as required by regulations.

Municipal permit limits will be consistent with Wasteload Evaluation/Allocations, the Water Quality Management Plan, Watershed Protection Rules (30 TAC Chapter 311), and at least as stringent as requirements found in 30 TAC §§309.1 - .4 (secondary treatment).

Permits will include provisions for the management of domestic sewage sludge to assure compliance with 40 CFR Parts 257, 258, 501, and 503. The TNRCC has broad authority as described in Chapter 361 of the Texas Health and Safety Code to control municipal solid waste. The TNRCC has adopted 30 TAC Chapter 312 which implements all of the requirements of 40 CFR Part 503 regarding sewage sludge, and water treatment sludge use, disposal, and transportation. Further, the TNRCC has adopted 30 TAC Chapters 330 and 332 which govern the disposal of sewage sludge in a Municipal Solid Waste Landfill (MSWLF) and composting of sludge. All industrial wastewater permits require that industrial solid waste, including hazardous waste, be managed and disposed of in accordance with 30 TAC Chapter 335 and any applicable requirements of the Resource Conservation and Recovery Act (RCRA).

Permit requirements and limits will be considered on a case-by-case basis and based on Best Professional Judgement (BPJ) in accordance with 40 CFR 125.3(c) when specific regulations do not apply to a particular facility. In addition to issuing individual permits for

wastewater discharges, the TNRCC also authorizes particular categories of discharges by rule.

Water quality based effluent limitations to control the discharge of toxic pollutants will be developed in accordance with 30 TAC Chapter 307, entitled Texas Surface Water Quality Standards, 40 CFR 122.44(d), and standards implementation procedures. The standards implementation procedures describe in detail the TNRCC approach to screening discharges for compliance with both numerical aquatic life criteria and human health criteria, and for developing specific numerical limits and whole effluent limits/monitoring requirements in permits.

The evaluation of renewal applications for wastewater discharge permits within the same river basin will be done in accordance with 30 TAC §305.71. This section has been established as part of a program for the comprehensive evaluation of the combined effects of permitted discharges on water quality within each watershed. The Commission, to the greatest extent practicable, will evaluate all renewal applications for discharges into or adjacent to waters in the state within a single basin within the same year. Renewal applications for permits will include provisions setting the permits' expiration date in accordance with the schedule in §305.71(b). The executive director may require submission of a renewal application sooner than the dates set out in §305.71(b) and (c) upon the determination that a particular waste disposal activity necessitates a more frequent evaluation. Permit renewals generally will be issued to maintain a five year cycle of the expiration date schedule in §305.71(b), although the commission may issue a permit for less than a five year term if it is determined that a shorter term is necessary. Some permit expiration dates may vary from the schedule in order to prevent permit terms of less than two years. It may, therefore, be necessary to require two renewal cycles for some permits before they are on the basin renewal cycle. Basins which have a large number of water quality permits will be evaluated over a two year period in order to address both public concerns and the Commission's resources required to properly evaluate these basins. The schedule of expiration dates in 305.71(b) has been designed to provide an even flow of permit applications which will expedite the application process.

SERIES 22
TNRCC CERTIFICATION OF FEDERAL PERMITS

Overview

Title 30, Chapter 279 of the Texas Administrative Code governs the issuance of state certifications under Section 401 of the Federal Clean Water Act. Section 401(a)(1) of the Act requires that any applicant for a federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into navigable waters of the United States, shall obtain from the State in which the discharge originates or will originate a certification that the discharge will comply with applicable provisions of the Federal Clean Water Act and all applicable state laws**.** Section 401(a)(1) of the Act further provides that the state shall establish procedures for public notice in the case of all applications for certification and, to the extent it deems appropriate, procedures for public hearings in connection with specific applications. All United States Army Corps of Engineer (COE) 404 permits (Individual, Nationwide, and General) require a 401 certification. State certification under Section 401 is also required for federal National Pollutant Discharge Elimination System (NPDES) permits that are issued under Section 402 of the Clean Water Act.

Federal Permits For Dredge And Fill

The COE has been regulating activities in the nation's waters since 1890. Until the 1960's the primary purpose of the COE's regulatory program was to protect navigation. Since then, as a result of laws and court decisions, the program has been broadened so that it now considers the full public interest for both the protection and utilization of water resources. Many proposed activities located near waters of the U.S., including wetlands, require a COE permit prior to the initiation of the project. The regulatory authorities and responsibilities of the COE are based on the following laws:

Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 1343)

Prohibits the obstruction or alteration of navigable waters of the United States without a permit from the COE.

Section 404 of the Clean Water Act (33 U.S.C. 1344)

Prohibits the discharge of dredged or fill material into waters of the United States without a permit from the COE.

The two primary types of federal 404 permits are as follows:

Individual A standard permit processed through the typical review procedures, which include public notice, opportunity for a public hearing, and receipt of comments. The permit is issued following a case-by-case evaluation of a specific activity.

General Permits that are designed to regulate with little, if any, delay or paperwork certain activities assumed to have minimal impacts. General permits require the same review, public notice and 401 certification of individual permits. Regional permits are issued by the individual COE districts. Nationwide permits are issued by the Department of the Army, COE headquarters and apply throughout the U.S.. Nationwide permits are published in the *Federal Register* and currently include 40 different permit types. After 401 certification and the close of the comment period the general permits can be issued without additional public notice. The COE retains discretionary authority to suspend, modify, or revoke authorizations of general permits.

Application And Public Notice

Water Quality Certification (401 certification) for a 404 permit may be requested by the district engineer or the applicant. All applications for a 404 permit with the COE initiate an application for 401 certification through an agreement with the COE. To the maximum extent possible the COE and TNRCC use a joint public notice. Typically this public notice serves as the application for 401 certification. The public comment period is for 30 days. The Commission considers all comments related to the impacts of the proposed activity submitted in accordance with the rules before issuing certification.

Public Hearings On State Certifications

The Commission may conduct a nonadjudicated public hearing on any application for state certification. The Commission shall conduct a public hearing on an application for state certification if a request for such a hearing is made by a Commissioner or if the Executive Director determines that the request is appropriate. The Commission may conduct a public hearing at the request of any affected person who requests such hearing in writing within 30 days after the publication of notice of application. The written request shall contain the following information:

(1) The name, mailing address, and phone number of the person making the request;
(2) The application number or other recognizable reference to the application;
(3) A brief description of the interest of the requestor, or of persons represented by the requestor; and
(4) A brief description of how the application, if granted, would adversely affect such interest.

TNRCC Options For Certification

After reviewing the proposed permit which may result in a discharge to waters in the state, the Commission shall:

(1) Grant certification for any activity which the Commission finds will not result in any discharge in violation of water quality standards or any other appropriate requirements of state law.

(2) Deny or grant conditional certification for any activity which the Commission finds will result in any discharge in violation of water quality standards or any other appropriate requirements of state law. Conditional certifications contain required modifications (conditions) of the proposed project so that when the activity is modified to address the certification conditions, there will be no violation of water quality standards or any other appropriate requirements of state law.

(3) Waive certification for any activity which the Commission finds will result in no discharge, or, which does not fall within the purview of the Commission's authority, or concerning which the Commission expressly waives its authority to act on a request for certification for other reasons.

SERIES 23
IMPLEMENTATION OF THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION STANDARDS VIA PERMITTING

The TNRCC has developed a comprehensive permitting program to ensure that permitted discharges of treated wastewater will protect instream water quality, as defined by the Texas Surface Water Quality Standards. Water quality based permitting requires the following components:

- Information on instream water quality and hydrology
- Data on the characteristics of existing or proposed discharge effluents
- Specific instream water quality standards and criteria
- Predictions of water quality impacts of pollutant loadings
- Consistent procedures to use this information to establish effluent limits for pollutants of concern

A summary of how water quality standards are implemented is presented elsewhere in the Continuing Planning Process (Series 18: Texas Surface Water Quality Standards).

The TNRCC program for water quality based permitting is presented in detail in a separate document entitled "Implementation of the Texas Natural Resource Conservation Commission Standards Via Permitting" (Implementation Procedures). The purpose of the Implementation Procedures document is to provide the regulated community, general public, and other interested parties with guidance and explanation of the specific permitting procedures used by the TNRCC to protect water quality.

The Implementation Procedures include descriptions of the following:

- Reviewing Water Quality Uses and Criteria at Permit Sites
- Evaluating Water Quality Impacts from Wastewater Discharges
- Permit Review Under the Antidegradation Policy
- General Procedures for Controlling Toxic Pollutants
- Deriving Permit Limits for Aquatic Life Protection
- Deriving Permit Limits for Human Health Protection
- Application Screening and Analytical Methods
- Total Toxicity Testing (Biomonitoring)
- Defining Critical Conditions and Mixing Zones
- Establishing Site-specific Standards and Variances

Revisions to the Implementation Procedures are developed by the TNRCC staff with public participation and EPA review. Revisions are made after triennial revisions of the Texas Surface Water Quality Standards. Additional revisions are conducted as needed to incorporate new information and procedures, and to address changes in federal and state regulations. Revisions to the Implementation Procedures include the following steps:

- Develop proposed revisions in coordination with TNRCC staff, public, EPA, local government, state agencies, and other federal agencies
- Provide 30 days for EPA comment and review on draft proposals
- Provide 30-day advanced notice of public hearing; provide copies of proposed revisions upon request
- Conduct public hearing
- Incorporate oral and written comments as appropriate
- Provide 30 days for EPA review and written comment
- Provide additional public notice and opportunity for additional public comment if substantive changes are made to proposed revisions
- Adopt revisions at TNRCC public agenda meeting
- Provide written response to public comments on the proposed revisions
- Provide 30 days for final EPA review and approval (when the procedures are utilized in development of TPDES permits after program assumption)
- Provide copies of the revised Implementation Procedures

SERIES 24
WATER RIGHTS PERMITTING
ENVIRONMENTAL ASSESSMENTS

Background

Sections 11.147, 11.150, and 11.153 of the Texas Water Code, enacted in 1985, require the Commission to assess the impacts of an application for a new or amended water right on existing instream uses, water quality, and aquatic and riparian wildlife habitat. "Instream uses" is defined to include, in pertinent part to the Clean Water Act, contact and non-contact recreation, fisheries, aesthetics, water quality protection, aquatic and riparian wildlife habitat, and freshwater beneficial inflows to bays and estuaries (30 Texas Administrative Code §297.1).

Program

Any proposed action which has the potential to adversely impact instream uses, water quality, aquatic and wildlife habitat, or the freshwater inflow needs to bays and estuaries shall be evaluated for such impacts, and corresponding limitations and conditions may be provided in the permit, if granted, to prevent or mitigate such impacts. New or amended water rights which present a potential adverse impact to the environment include any new appropriation and all permit amendments that involve the following:

- increase in the appropriative amount;
- change in point of diversion;
- change in rate of diversion;
- change in place of use; and
- change in purpose of use which involves the increased consumption of water or change in pattern of use.

Technical Review of Applications

Specific review criteria and review procedures are outlined in the document entitled "A Regulatory Guidance Document for Applications to Divert, Store, or Use State Water" (TNRCC Publication RG-141). Several assessment techniques are available for evaluating potential water quality effects of individual water rights permits. They range from reviewing historical hydrology and assigning habitat value based on average or median annual flows, to performing in-depth field assessments of flow-dependent instream uses including water quality and aquatic habitats. The following technical
review elements relevant to the Clean Water Act are considered for each application:

I. Instream Uses
II. Water Quality
III. Wildlife Habitats
    a. Wetland Habitat

b. Terrestrial Habitat
c. Riparian Habitat

III. Freshwater Inflows (see Series 5, Estuary Studies, of this document)

In determining whether to require an applicant to mitigate adverse impacts on a habitat, the commission may consider any net benefit to the habitat produced by the project. The commission shall offset any mitigation it requires by any mitigation required by the United States Fish and Wildlife Service (USFWS) pursuant to 33 CFR §§320-330.

Water necessary to protect instream uses for such public purposes may be reserved from appropriation by the Commission. Accordingly, in granting new appropriations since 1985, a reservation of water for public purposes is made by providing a limitation on the ability to divert water when stream flows are at or below a certain level (commonly referred to as "the CFS restriction").

SERIES 25
CONCENTRATED ANIMAL FEEDING OPERATIONS PERMITTING

The Texas Natural Resource Conservation (TNRCC) has just completed a recent change in granting authorizations to operate a concentrated animal feeding operation (CAFO) in Texas. As of July 13, 1995, anyone wanting to construct and operate a new CAFO shall do so in accordance with 30 TAC Chapter 321, Subchapter K. These new rules consolidate the previously separate air quality and water quality requirements into a single multimedia authorization process. All existing CAFOs as of July 13, 1995 are allowed to continue to operate under the previous Subchapter B rules of Chapter 321 in the Administrative Code.

With the adoption of the new Subchapter K rules, the TNRCC has incorporated the EPA, Region VI General Permit for CAFO as the base provision for the new rules. In addition to using the Region VI General Permit provisions, the TNRCC has added provisions specifically relating to protection of ground water quality and air quality, and expanded some General Permit provisions. These General Permit provisions provide for more specific facility design guidelines and criteria that CAFO operators must consider prior to beginning operation.

Similar to the Region VI General Permit, all new CAFO facilities are required to file an application under the new Subchapter K rules if they confine more than 1000 animal units. The new rules give the specific head limits related to 1000 animal units for each of the animal species. New CAFOs located in eight counties in the state (Erath, Comanche, Hamilton, Bosque, Johnson, Hopkins, Wood and Rains) that confine more than 300 animal units shall either file an application for authorization or register their facility and complete the following requirements: 1) complete 8 hours of animal waste management training within 12 months of beginning operation; 2) complete an additional 8 hours of animal waste management training every 24 months thereafter; and 3) conduct an audit of all CAFO related facilities, by a third party, once every five years after beginning operation. If problems with the facility are found during this audit, the new rules allow the owner/operators to pursue, within specific guidelines, the necessary corrective action without the threat of enforcement.

The TNRCC has adopted the Region VI General Permit as the basis for the new Subchapter K rules and combined the water quality and air quality requirements into a single authorization. At the same time the TNRCC has streamlined the permitting process for CAFO authorizations. The new Subchapter K process lays out specific timeframes the TNRCC has to complete the administrative and technical reviews (15 days) on the applications for authorizations. If the application is declared to be administratively and technically complete, notice is given to surrounding landowners. Simultaneously, general notice is given through newspaper publication to allow for a thirty-day public comment period. The applicant is required to make a copy of the completed application available for anyone to review near the proposed operation. Upon completion of the thirty-day public comment period, TNRCC's Executive Director or his staff will review all comments and

decide if any of these comments demonstrate technical merit. Technical merit has been defined for the new rules as "evidence demonstrating that the application on its face does not meet all technical requirements of this subchapter and therefore the granting of an authorization under this subchapter may result in detrimental impacts to ground water underlying the related CAFO, detrimental impacts to surface water quality within one mile of the CAFO, or evidence demonstrating that history of compliance by the applicant has resulted in detrimental impacts to such ground water or surface water quality within these geographic limits." If the Executive Director decides that a public comment has demonstrated technical merit, the applicant shall either: 1) request the Executive Director's determination of technical merit be sent to the Commission for review; 2) request the Executive Director suspend processing of the application for up to thirty days to allow the applicant to correct the application; 3) request the Executive Director to submit the application to the Commission for a contested case proceeding; or 4) withdraw the application. Parties submitting public comment may also request a review by the Commission, should the Executive Director determine that their comments do not demonstrate technical merit.

The new Subchapter K process will reduce the amount of time it takes to process the application since the requirements for authorization are specified in the rule itself. For an uncontested case under the new Subchapter K rules, from the date the application was declared administratively complete the process will take only 60 days to complete. Those cases involving public comment should only take about 90 days, depending on the options the applicant and commentor pursue.

SERIES 26
STATE OIL AND HAZARDOUS SUBSTANCES POLLUTION CONTINGENCY PLAN

Purpose

Prevent and/or mitigate the adverse effects of a spill or discharge into waters of the State primarily through the use of a State Oil and Hazardous Substances Spill Contingency Plan. A plan designed to: (1) coordinate planning and response activities among state agencies having environmental and public health protection responsibilities, (2) outline notification procedures by which spill incidents shall be reported to local, state and federal authorities, and (3) provide spill response guidance and information of value to all levels of response.

Plan Refinements and Revisions

The State of Texas Oil and Hazardous Substances Contingency Plan (SCP), as last published, is an agency publication GP 88-01 dated October 1988. While there has been an attempt for some time to publish a revised document, an almost annual rewrite of a working draft revision is the extent of the accomplishment. There have been some changes in authority, organization and technological advancements following the passage of two new laws, the federal Oil Pollution Act of 1990 and the Texas Oil Spill Prevention and Response Act of 1991, and amendments to the Texas Hazardous Substance Spill Prevention and Control Act. Subsequent to 1991, a rewrite of the statewide plan has been a joint effort of the Texas Natural Resource Conservation Commission, General Land Office and the Railroad Commission.

The most recent revision to the SCP reflects more detailed notification procedures and additional background and technical information for response activities including cleanup, coordination, documentation, waste management, natural resource damage assessment and reporting. Spill Response Maps, which represent Part II of the SCP, are available for both coastal and most inland counties of the State. The Spill Response Maps depict county-specific logistical and environmental information as plotted features, and each map is accompanied by corresponding support information. Plotted features are alpha-numerically and/or color keyed to the support information which includes facility names, contact details, residing species of indicated habitats, environmental sensitivity, and other pertinent items of information. Menu-driven computer software is available to assist in using and updating the maps.

SCP distribution includes state and federal agencies having spill response responsibilities and interests. Other state and federal agencies with significant involvement in the SCP and spill response are:

- General Land Office
- Railroad Commission of Texas
- Texas Department of Public Safety

- Texas Department of Transportation
- Texas Department of Health
- Texas Parks and Wildlife Department
- Texas Department of Agriculture
- Texas Commission on Fire Protection
- Office of the Governor of Texas
- Environmental Protection Agency, Region VI
- United States Coast Guard, 8th District
- U.S. Department of the Interior
- U.S. Department of Commerce

Users of the plan are noted to be state river authorities, county emergency and disaster coordinators, fire departments, area councils of government, and other local authorities involved with spill response. Non-governmental entities such as industry, private contractors, cleanup organizations and the general public are also noted users of the plan.

The TNRCC participates in local, state and federal contingency planning initiatives. In the past few years, some of the developments noted in this activity include the plans made by Local Emergency Planning Committees and Area Committees formed as a result of the Superfund Amendments and Reauthorization Act of 1986 and the Oil Pollution Act of 1990. The TNRCC has also participated in activities of the Region VI Regional Response Team to revise the five-state regional plan and to facilitate preparedness for the U.S. and Mexico border.

The TNRCC responds to all reported spills within its jurisdiction and provides on-scene assessment, assistance and guidance for many significant incidents. Other state agencies having jurisdictional roles for spill response include the Railroad Commission and the General Land Office. In the event the cleanup actions of the person or persons responsible for a spill are not adequate, the TNRCC may authorize use of state funds to remedy the problem.

SERIES 27
SURFACE WATER QUALITY MONITORING PROGRAM

Program Mission and Emphasis

The TNRCC Surface Water Quality Monitoring (SWQM) Program provides for an integrated evaluation of physical, chemical, and biological characteristics of aquatic systems in relation to human health concerns, ecological condition, and designated uses. Thus, SWQM data provide a basis for establishment of effective TNRCC management policies that promote the protection, restoration, and wise use of Texas surface water resources.

The TNRCC SWQM Program, which was initiated in 1967, includes monitoring of streams, reservoirs, estuaries, and the Gulf of Mexico. The SWQM Program encompasses the full range of activities required to obtain, manage, store, assess, present, share, and report water quality information to the Clean Rivers Program participants, other TNRCC teams, agency management, other agencies and institutions, local governments, and the public. Primary statutory authority for the SWQM Program is Section 26.127 of the Texas Water Code.

The mission of the SWQM Program is to characterize the water quality of the ambient surface waters of the State. The basic components of the SWQM Program include a fixed station monitoring network, intensive surveys, and special studies. Water quality data obtained through these components are stored in the SWQM Database. The monitoring results obtained through the SWQM Program may be used by the TNRCC to (1) characterize existing conditions, (2) evaluate spatial and temporal trends, (3) determine water quality standards compliance, (4) identify emerging problems, and (5) evaluate the effectiveness of water quality control programs.

TNRCC's SWQM Program is jointly coordinated by the Surface Water Quality Monitoring Team within the Water Planning and Assessment Division and the Water Program within the Field Operations Division. Fixed station and special study monitoring is primarily conducted by SWQM Program personnel in the TNRCC's 15 regional offices. The SWQM Team is primarily responsible for conducting intensive surveys, special studies and maintenance of the SWQM Database.

Fixed Station Monitoring Network

The TNRCC has subdivided river and coastal basins into segments for water quality management activities. Most of the major streams, reservoirs, and estuaries have been classified as segments by the TNRCC. In most cases, lengthy streams have been further subdivided into segments. Minor streams, reservoirs, and estuaries are treated as unclassified waters by the TNRCC. One of the primary goals of the SWQM Program has been to establish fixed station monitoring within each classified segment.

The number of fixed stations monitored each year and the frequency at which they are sampled by the TNRCC vary from year to year depending on the amount of funding the SWQM Program receives and the manner in which the funds are allocated. During 1995, 435 sites consisting of 1,700 sampling events will be monitored by the TNRCC. TNRCC SWQM Program personnel are working closely with Clean Rivers Program personnel as they develop and implement basin monitoring plans. This coordination will result in reduced duplication of effort among monitoring groups, improve communication, increase spatial coverage, and in many cases increase temporal and parametric coverages.

In 1995, most of the fixed station monitoring sites are located within classified segments, but 67 are located on important unclassified waters. The fixed stations are sampled at varying frequencies, with most sampled quarterly. Parametric coverages typically include field measurements, routine water chemistry and fecal coliform analysis. Additional coverages may include toxic substances in water, sediment, or fish tissue, toxicity testing of water and sediment, and fish and/or macrobenthos community structure analysis. The sampling methodologies employed by the TNRCC for the collection of each set of parameters are described in the SWQM Program Water Quality Monitoring Procedures Manual.

Field Measurements, Routine Water Chemistry, and Bacteriological Analyses

Sampling that is common to all sites includes field measurements, routine water chemistry and fecal coliform densities. The objectives of monitoring these parameters are to detect and describe spatial and temporal changes, determine impacts of point and nonpoint sources, and assess compliance with water quality standards. Dissolved oxygen, water temperature, and pH are field measurements for which water quality criteria are established for each classified waterbody. Secchi disk measurements are used to determine the transparency of the water column at each site. Conductivity and salinity are monitored to estimate the total concentration of dissolved ionic matter, evaluate mixing of fresh and salt water in estuaries, determine density stratification, and document impact and dispersion of pollutants. Many chemical and biological processes in the aquatic environment are affected by field measurements. Monitoring of field measurements also provides complementary information necessary in evaluating chemical and biological data. In order to relate chemical concentrations and flow, instantaneous flow measurements are made at most stream sites concurrently with the collection of water samples. In some cases, stream flow is obtained at the time of sampling from a United States Geological Survey (USGS) gauge if one is located nearby. Water samples are collected, preserved, and sent to the TNRCC or a contract laboratory where analyses are performed. The routine field and water chemistry parameters measured in situ or in the laboratory are listed in Table 1. Due to the difficulty in culturing specific pathogens, the TNRCC monitors fecal coliform bacteria as indicators of human pathogen densities in order to assess the recreational potential of waterbodies. Water samples for fecal coliform analysis are typically filtered and incubated with the aid of portable equipment.

Toxic Substances in Water, Sediment, and Fish Tissue

A long list of organic substances (pesticides, semi-volatiles, and volatiles) and metals are monitored in water, sediment, and fish tissue at selected fixed stations, as listed in Tables 2, 3, and 4. The SWQM Program focuses toxic substances monitoring on those sites deemed to have a likelihood of being impacted and carefully selects sample stations on criteria which include: sites near dischargers that have shown receiving water or effluent toxicity, sites that have shown recurrent ambient water and/or sediment toxicity, sites near large industrial or domestic discharges, areas that receive high nonpoint source loads, areas with exceptional recreational uses, sites near hazardous waste facilities, sites downstream of major metropolitan areas, areas adjacent to Superfund sites, and sites which exhibit biological impairment.

Toxic substances in water, sediment, and fish tissue are monitored to determine their prevalence and magnitude, to detect and describe spatial and temporal changes, and to evaluate compliance with applicable water quality standards. Water quality criteria to protect aquatic life and human health have been established by the TNRCC for many metals and organic substances.

Although criteria do not presently exist for sediments, they represent a major sink for many toxic chemicals. The results of monitoring sediment chemistry may be used to evaluate the condition of the benthic habitat, determine point and nonpoint source impacts, and to monitor rates of recovery following establishment of pollution controls or improved wastewater treatment. In addition to monitoring toxic chemical contaminants in sediments, conventional parameters in sediment are also measured: total phosphorus and Kjeldahl nitrogen are used for evaluation of nutrient status; volatile solids, for organic content; percent solids, for determination of water content; oil and grease, for petrochemical influences; sediment grain size, for availability of contaminants; total organic carbon, for bioavailability of organic contaminants that adsorb to particulates; and acid volatile sulfide, for bioavailability of metal contaminants.

TABLE 1.

Surface Water Quality Monitoring Program
Field Measurements and Routine Water Chemistry Analyses

Field Measurements	**Routine Water Chemistry***	
Water Temperature (°C) pH (s.u.) Dissolved Oxygen (mg/L) Specific Conductance (µmhos/cm) Salinity (ppt) Secchi Disk (m) Fecal Coliform (#/100 mL) Stream Flow (cfs)	Ammonia Nitrogen Chloride Chlorophyll a (µg/L) Pheophytin a (µg/L) Kjeldahl Nitrogen Nitrate Nitrogen Nitrite Nitrogen	Orthophosphorus Total Phosphorus Sulfate Total Alkalinity Total Dissolved Solids Total Organic Carbon Total Suspended Solids Volatile Suspended Solids
	Additional Parameters for Water Supply Reservoirs	
	Hardness Bicarbonate Carbonate Dissolved Calcium Dissolved Fluoride	Dissolved Potassium Dissolved Sodium Dissolved Silica Dissolved Magnesium

* All routine water chemistry parameters reported in mg/L except where noted.

TABLE 2.

Surface Water Quality Monitoring Program
Routine Metals in Water, Sediment, and Tissue

Water (µg/L)*	Sediment (mg/kg)	Tissue (mg/kg)
Aluminum Arsenic Cadmium Chromium Copper Lead Mercury Mercury (total) Nickel Selenium Silver Zinc	Arsenic Barium Cadmium Chromium Copper Lead Manganese Mercury Nickel Selenium Silver Zinc	Arsenic Cadmium Chromium Copper Lead Mercury Selenium
Additional Parameters Analyzed with Each Water, Sediment or Tissue Sample		
Hardness (mg/L) Total Suspended Solids (mg/L)	Volatile Solids Kjeldahl Nitrogen Total Phosphorus Oil and Grease Percent Solids (by weight) Total Organic Carbon Acid Volatile Sulfide Sediment Particle Size Clay < 0.0039 mm Silt 0.0039-0.0625 mm Sand > 0.0625-2mm Gravel > 2 mm	% Lipids

* Dissolved fraction analyzed except where noted

TABLE 3.

Surface Water Quality Monitoring Program
Routine Pesticides and Volatile Organic Substances in Water, Sediment, and Tissue

Pesticide and Volatile Organic Substances in	
PESTICIDES	**VOLATILE ORGANICS**
DDT, total	Chloromethane
DDD, total	Bromomethane
DDE, total	Vinyl Chloride
Aldrin	Chloroethane
Dieldrin	Acrylonitrile
Endrin	Chloroform
Chlordane, total	Methylene Chloride
Heptachlor	1,1-Dichloroethylene
Heptachlor Epoxide	1,1-Dichloroethane
Methoxychlor	1,2-Trans-Dichloroethylene
Lindane (gamma BHC)	1,2-Dichloroethane
Toxaphene	Carbon Tetrachloride
Hexachlorobenzene	Dichlorobromomethane
Alpha BHC	Benzene
Beta BHC	Chlorodibromomethane
Delta BHC	1,1,1-Trichloroethane
Dicofol (Kelthane)	1,2-Dichloropropane
Mirex	trans-1,3-Dichloropropylene
Pentachlorobenzene	cis-1,3 dichloropropylene
Malathion	1,1,2-Trichloroethane
Parathion	2-Chloroethylvinyl Ether
Diazinon	Trichloroethylene
2,4-D	Bromoform
2,4,5-T	Toluene
2,4,5-TP (Silvex)	Ethylbenzene
Diuron (Karamex)	1,1,2,2-Tetrachloroethane
Chlorpyrifos (Dursban)	Tetrachloroethylene
Endosulfan I & II	Chlorobenzene
Endosulfan sulfate	Total Xylenes
Demeton	bis (chloromethyl) ether
Guthion	1,2-Dibromoethane
Carbaryl (Sevin)	
% Lipids (tissue only)	
PCB-1242	
PCB-1254	
PCB-1221	
PCB-1232	
PCB-1248	
PCB-1260	
PCB-1016	

TABLE 4.

Surface Water Quality Program
Routine Semivolatile Organic Substances in Water, Sediment, and Tissue

Semivolatile Organic Substances in Water (µg/kg dry weight) and Tissue and (mg/kg wet weight)	
Phenol	2,4-Dinitrotoluene
2-Chlorophenol	Fluorene
2-Nitrophenol	4-Chlorophenyl Phenyl Ether
2,4-Dichlorophenol	Diethyl Phthalate
3-Methyl-4-Chlorophenol	N-Nitrosodiphenylamine
2,4,5-Trichlorophenol	1,2-Diphenylhydrazine
2,4,6-Trichlorophenol	4-Bromophenyl Phenyl Ether
2,4-Dimethylphenol	Phenanthrene
2,4-Dinitrophenol	Anthracene
4-Nitrophenol	Di-n-Butyl Phthalate
4,6-Dinitro-o-cresol	Fluoranthene
Pentachlorophenol	Pyrene
N-Nitrosodimethylamine	Benzidine
bis-(2-Chloroethyl)ether	Butylbenzyl Phthalate
1,3-Dichlorobenzene	Chrysene
1,4-Dichlorobenzene	Benzo(a)anthracene
1,2-Dichlorobenzene	3,3'-Dichlorobenzidine
bis-(2-Chloroisopropyl)ether	bis-(2-Ethylhexyl)phthalate
Hexachloroethane	Di-n-octyl Phthalate
N-Nitroso-Di-N-Propylamine	Benzo(b)fluoranthene
Nitrobenzene	Benzo(k)fluoranthene
Isophorone	Benzo(a)pyrene
bis-(2-Chloroethoxy)Methane	Indeno(1,2,3-cd)pyrene
1,2,4 Trichlorobenzene	Dibenz(a,h)anthracene
Naphthalene	Benzo(ghi)perylene
Hexachlorobutadiene	Cresols, total
Hexachlorocyclopentadiene	Hexachlorophene
2-Chloronaphthalene	N-nitrosodiethyl amine
Acenaphthylene	N-nitrosodi-n-butyl amine
Dimethyl Phthalate	Pyridine
2,6-Dinitrotoluene	1,2,4,5 Tetrachlorobenzene
Acenaphthene	

TOXNET Monitoring

The TOXNET monitoring program was established in 1990 by EPA Region 6 in cooperation with the TNRCC to encourage the use of ambient toxicity testing for water quality assessment, to assess potential toxicity in waterbodies, and to evaluate the effectiveness of implemented toxicity control measures. Waterbodies that have shown recurrent toxicity are candidates for more intensive special study assessments to confirm the occurrence of toxic conditions or aquatic life use impairment and determine causes and sources of toxicity.

Approximately 30 fixed stations are monitored for water and/or sediment toxicity. Water and sediment samples are collected by TNRCC Regional Office SWQM Program personnel and are shipped to the EPA Region 6 Laboratory in Houston. Analyses of the samples include routine water quality parameters and standardized short-term chronic bioassays. Sediment toxicity tests are performed on elutriates. Organisms used in the tests include Ceriodaphnia dubia (water flea) and Pimephales promelas (fathead minnow) in freshwater and Cyprinodon variegatus (sheepshead minnow) in estuarine waters or saline waters. Results of the water and toxicity tests are sent to the EPA Region 6 where they are stored in a PC database.

Biological Monitoring

The SWQM Program uses biological monitoring (fish and macrobenthos) to provide integrated evaluations of water quality. Biological communities are useful in assessing water quality for a variety of reasons, including their sensitivities to low-level disturbances and their functioning as continuous monitors. Monitoring of resident biota, thus, increases the possibility of detecting episodic spills and dumping of pollutants, wastewater treatment plant malfunctions, toxic nonpoint source pollution, or other impacts that periodic chemical sampling is unlikely to detect. Perturbations of the physical habitat such as sedimentation from stormwater runoff, dredging, channelization, and erosion may be detected through biological monitoring.
The objectives of monitoring fish and macrobenthic communities are to detect and describe spatial and temporal changes in structure and function. These results can be used to assess impacts of point and nonpoint sources, assess community condition or "health," determine appropriate aquatic life uses, monitor rates of recovery following implementation of improved wastewater treatment, and provide early warning of potential impacts.

Macroinvertebrate communities are particularly good indicators of water quality impacts or physical habitat alterations because they are relatively sedentary which enables the detection of localized disturbances. Their relatively long life histories and/or continuous recruitment allow for integration of pollution effects. The SWQM Program uses standard procedures modeled after the Rapid Bioassessment Protocols established by EPA for freshwater macroinvertebrate monitoring. Most samples are collected from riffle and other available habitats with a standard kick net procedure. A subsample is obtained during field sorting of the samples. Organisms are typically field identified to the family level. Samples are preserved and returned to the laboratory for more intensive enumeration and identification. In some cases a quantitative technique employing a Surber net is used. In this case, several samples from a riffle area are composited and the entire sample is preserved

and returned to the laboratory for identification and enumeration. At deep freshwater and estuarine sites quantitative samples are collected with dredges.

Fish communities are also useful as water quality monitors because many are high on the food chain and reflect the responses of the entire trophic structure to environmental stress. Although fish are mobile, they have the potential to integrate impacts from a variety of habitats. Due to their longevity, fish add a temporal perspective to monitoring. The most common method for collection of fishes by the SWQM Program is with electro-fishers; both generator-powered, boat mounted rigs and battery-powered, backpack units are employed. In areas where electrofishing is not practical due to site constraints, elevated conductivity, or equipment availability seines, gill nets, and trawls may be used. Collections are made over a set time period, and the catch is typically identified and enumerated in the field. A portion of the catch is examined for abnormalities.

Toxic chemical contaminants may be assimilated through aquatic food chains and subsequently bioaccumulate in fish tissues. The SWQM Program uses fish tissue monitoring to provide indications of areas experiencing water quality problems and contaminated sediments, and to detect and evaluate levels of contaminants in fish that may be harmful to humans. Information concerning elevated toxic chemical contaminants in fish tissue is communicated by the TNRCC to the Texas Department of Health (TDH). If the TDH concludes, based on additional sampling of edible tissues, that consumption of chemically contaminated fish poses an unacceptable human health risk, they may issue fish consumption advisories or aquatic life closures for specific waterbodies. These advisories may apply to the general population and/or a subpopulation that could be at potentially greater risk (e.g., pregnant women or children). Fish are collected using the gear described in the biological monitoring section. Whole fish are typically submitted for tissue analysis. Three to five fish of the same approximate size from a target freshwater or estuarine species are collected at each site and composited to constitute a sample.

Ecoregion Monitoring

Ecoregion monitoring is designed to describe the characteristic water quality, habitat diversity, and biological communities of least impacted waters in ecoregions of the State. All TNRCC regional office boundaries are overlapped by at least two ecoregions, and one has portions of four. These sites are monitored for at least one year at quarterly frequencies to ascertain seasonal influences. Stream flow, field measurements, water chemistry parameters, fecal coliform densities, and macrobenthic and fish community structure are monitored at most sites. Ecoregion monitoring was initiated in 1990 to encourage SWQM Program personnel to explore realistically attainable conditions that exist in least impacted waterbodies within their regions. Sites are usually rotated annually to different locations within the same ecoregion to allow better determination of the range of expectations within the region, or to a different ecoregion to ascertain differences among regions. Existing sites may be resampled several years later to evaluate trends. Ecoregion monitoring will generate regional reference databases that may be used to establish water quality standards, develop biological criteria, establish background conditions, and assist in the assessment of aquatic life uses in unclassified waters.

SERIES 28
COMPLIANCE MONITORING AND ENFORCEMENT

Purpose

The purpose of the wastewater compliance monitoring and enforcement program is to ensure that all wastewater activities which the Texas Natural Resource Conservation Commission (TNRCC) is required to regulate are conducted in an environmentally sound manner and in accordance with the laws and rules over which the Commission has jurisdiction. Wastewater compliance monitoring and enforcement activities are the responsibility of the Enforcement Division, Litigation Support Division (LS), and Field Operations Division which includes the Regional Offices located throughout the State. Additionally, the Program Support Team of the Agriculture and Watershed Management Division has the responsibility for recording self-reported information from the wastewater point source discharges. This information is used by the Enforcement Division to determine the need for mandatory enforcement actions.

Delegation of this program involves management and monitoring of wastewater point source dischargers. The TNRCC will ensure it carries out all laws, rules, and regulations of the Federal Clean Water Act, as adopted in the Texas Water Code and Title 30 of the Texas Administrative Code, in an environmentally sound manner.

Responsibilities

Regional Offices: Regional Offices of the Field Operations Division are responsible for:

1. Conducting compliance inspections of wastewater treatment facilities
2. Initiating appropriate enforcement action to resolve noncompliances
3. Undertaking follow-up action to assess implementation of corrective measures
4. Providing documentation and technical support for formal enforcement actions
5. Reviewing formal enforcement documents for accuracy

Enforcement Division: The Enforcement Division is responsible for:

1. Processing Enforcement Action Requests proposed by the Regional Offices
2. Identifying facilities for formal enforcement action based on self-reported data reviews under the Mandatory Enforcement Hearing (MEH) program (Texas Water Code Section 5.117)
3. Coordinating formal enforcement actions with the activities of other divisions and other state agencies who request information concerning enforcement cases
4. Assisting in the development and documentation of evidence to support formal enforcement actions
5. Assisting in the development of technical recommendations for corrective actions necessary to achieve compliance

6. Preparing Executive Director's Preliminary Enforcement Reports (EDPRs) pursuant to the requirements of the Texas Water Code Section 26.136
7. Preparing proposed Agreed Orders which include corrective actions and may also include administrative penalties
8. Tracking compliance with the terms of wastewater discharge permits, Commission Orders, and Court Orders
9. Preparing reports for the Executive Director pursuant to the requirements of the MEH program
10. Preparing compliance summaries on active enforcement cases for the Commission's information

Litigation Support Division: The LS Division is responsible for:

1. Providing legal representation to the wastewater enforcement program in any formal enforcement action to enforce compliance. Legal representation includes preparing legal documentation, attending public meetings and hearings, negotiating settlement, and preparing staff for testimony.
2. Providing legal counsel on issues relating to the enforcement of permits, statutes, rules, or regulations. Legal counsel includes legal interpretation of statutes, rules, and regulations; counseling staff regarding enforcement options and the legal consequences of their decisions.
3. Undertaking criminal enforcement actions where appropriate.

Procedures

Comment: The following procedures and discussion in this section that deal with formal wastewater enforcement apply to actions by the Enforcement Division pursuant to Chapter 26 of the Texas Water Code. Procedures for enforcement actions to be taken pursuant to the NPDES program are specified in the Program Description of the National Pollutant Discharge Elimination System (NPDES) delegation application.

Compliance Inspections and Regional Level Enforcement Action: Regional Offices conduct compliance inspections for a selected number of wastewater permittees annually and notify the permittees in writing of the inspection findings. During compliance inspections, operation and maintenance procedures are evaluated, monitoring records are reviewed, and samples of the effluent may be taken for comparison with permit limits. When violations and/or substantial deficiencies are noted, appropriate action is taken by the Regional Office to ensure that noncompliances are resolved. Enforcement options available to the Regional Offices include Notice of Violation (NOV) letters or meetings to solicit a plan and schedule of corrective action which will be monitored at the regional level or referral to the Enforcement Division for formal enforcement action.

Initiation of Formal Enforcement Action: Formal enforcement action may be initiated by Enforcement Action Requests (EARs) submitted by the Regional Offices or by self-reported data reviews conducted by the Central Office under the Mandatory Enforcement Hearing (MEH) program. When a Regional EAR is received, a screening meeting is held between the Enforcement Division, Field Operations Division, and Litigation Support Division to

determine which formal enforcement option should be pursued. For MEH cases, the direction of the enforcement action is determined by consultation between the Enforcement staff and Enforcement management.

Formal Enforcement Options: The following options are available for formal enforcement actions:

1. Commission Order
   A Commission Order may be issued specifying corrective actions to be taken to achieve compliance and/or assessing administrative penalties for violations. Since September 1, 1985, the Commission has been authorized to assess administrative penalties of up to $10,000 a day for violations of Chapter 26 of the Texas Water Code or water quality rules, orders and permits issued by the Commission.

   a. Preparation of the Executive Director's Preliminary Report
      If the decision is made to seek an Order, an enforcement report called the Executive Director's Preliminary Enforcement Report (EDPR) is prepared by the Enforcement Division. Alternatively, the Enforcement Division may choose to develop a proposed Agreed Order without preparing a formal EDPR; this option is used for cases which have lower administrative penalties and are expected to be uncontested. The EDPR or proposed Agreed Order is reviewed by the Enforcement Review Committee for consistency, adequacy of the technical requirements, and appropriateness of the recommended penalty amount. The Enforcement Review Committee consists of representatives from the Enforcement Division, Litigation Support Division, Field Operations Division, and the Attorney General's Office, when applicable. The Executive Director then issues the EDPR or mails the proposed Agreed Order, thereby giving written notice to the respondent with a summary of the alleged violations, recommended technical requirements and any proposed administrative penalty amount.

   b. Enforcement Conference
      At the respondent's request, an enforcement conference may be held after the issuance of the EDPR or mailing of the proposed Agreed Order. The Enforcement Division and the Litigation Support Division will be represented at the conference, and the Regional staff will be given an opportunity to participate either by attending the meeting or by conference call. The TNRCC staff will present the Commission's position concerning the alleged violations, the causes of the alleged violations, and the necessary corrective measures. The respondent will be invited to comment on the alleged violations, the corrective measures, and any proposed penalties.

   c. Commission Decision on an Order
      If agreement is reached between the respondent and TNRCC staff, a proposed Agreed Order will be forwarded to the Commissioners for consideration. If the respondent requests a hearing or the Commission so orders, a full evidentiary hearing will be convened, either by the Commission

or by the State Office of Administrative Hearings (SOAH) after referral by the Commission, prior to the Commission's decision on the enforcement case. The Enforcement Division, Regional Office, and the Litigation Support Division will participate jointly in the hearing. At the conclusion of a SOAH hearing, the Administrative Law Judge (ALJ) will send a recommendation to the Commissioners for consideration. As a result of the hearing the Commission will decide whether or not to issue an order. If an order is issued, the respondent has a right to appeal the Commission's Order in Travis County Court.

2. Referral to the Attorney General's Office for a Civil Suit
   The Commission may refer violations of TNRCC water quality rules, permits, or orders or Chapter 26 of the Texas Water Code to the Office of the Attorney General for prosecution of a civil suit to seek injunctive relief and/or civil penalties. If such action is pursued, an enforcement history will be prepared by the Enforcement Division listing the alleged violations and setting forth technical requirements to bring about compliance. The report will be reviewed by the Enforcement Review Committee and then forwarded to the Attorney General's Office. The TNRCC will provide any assistance the Attorney General's Office may reasonably require in prosecution of the case.

3. Criminal Enforcement Action
   If criminal enforcement action is to be pursued, the Litigation Support Division will process the case in accordance with procedures for criminal cases.

Mandatory Enforcement Hearings Program

Legislation which went into effect September 1, 1985, requires a mandatory enforcement hearing if it is determined that a permittee or licensee has been in substantial noncompliance for four months or that an emergency exists. Substantial noncompliance is determined based on a review of self-reported data. TNRCC must take a formal enforcement action against any permittee which meets the MEH criteria.

EDPRs and/or Agreed Orders for noncompliant permittees identified under the MEH program are prepared and processed in accordance with procedures previously described. If the self-reported violations have been corrected, a No Action Order is prepared which includes language that the violations have been resolved. If corrective measures are needed to achieve compliance, the EDPR or proposed Agreed Order will include technical requirements. Administrative penalties may or may not be proposed depending upon facts in the case. The Commission shall call and hold a hearing, or refer the matter to SOAH to do so, to determine whether the respondent has been in substantial noncompliance. When the EDPR/Agreed Order or ALJ's proposal, if a SOAH hearing is held, is sent to the Commission for decision, that action constitutes the mandatory hearing for the case.

75/90% Rule

The 75/90% rule (30 TAC Section 305.126) was adopted in June, 1986 and has been incorporated into domestic permits. It requires that whenever flow measurements for any domestic sewage treatment facility reach 75% of the permitted average daily flow for three consecutive months, the permittee must initiate engineering and financial planning for expansion and/or upgrading of the wastewater treatment and/or collection facilities. If the planned population to be served or the quantity of waste produced is not expected to exceed the design limitations of the treatment facility, the permittee may apply for a waiver of this requirement. Whenever the average daily flow reaches 90% of the permitted average daily flow for three consecutive months, the permittee is required to obtain necessary authorization from the Commission to commence construction of additional treatment and/or collection facilities.

1. Notices
   A review of self-reported data is used to determine permittees which are subject to the requirements of the 75/90% rule. Notices are sent to these permittees and actions taken by the permittees are tracked to ensure compliance. To avoid conflict with any pending enforcement cases, the appropriate Enforcement Coordinator is notified of permittees which fall under the 75/90% rule. A decision is then made whether the actions required by the 75/90% rule will be included with the ongoing formal enforcement action or whether the actions will be monitored through the 75/90% program.

2. Formal Enforcement Action
   If a permittee identified under the 75/90% rule fails to submit a satisfactory response to both the first and second notice or fails to make adequate progress toward achieving compliance with the rule, a referral will be made to the Enforcement staff. The Enforcement Coordinator assigned to the case will then determine what enforcement action should be pursued. The formal enforcement options available are the same as those previously described.

Soil and Ground Water Reporting

Soil monitoring and groundwater report data are required by TNRCC wastewater discharge permits. Data are reviewed to determine what effect disposal of wastewater is having on soil and groundwater conditions. Should problems be noted, the permittee will then be required to submit plans for soil and groundwater remediation. Tracking continues until appropriate cleanup has been accomplished.

1. Letters and Meetings
   If a respondent is suspected of causing a soil or groundwater related problem, the Regional Office may request by letter that the respondent undertake appropriate evaluation of the situation and identify any necessary corrective action to be taken. Should it be advantageous, a meeting may be held with the respondent for further discussions on the matter. If groundwater contamination is actually documented, the Regional Office must refer the respondent for formal enforcement action. For

documented soil contamination, the Regional Office has the discretion to either monitor implementation of the corrective action at the Regional level or refer the respondent for formal enforcement action.

2. Formal Enforcement Action
   If it is determined that formal enforcement action is warranted, the Regional Office will submit an Enforcement Action Request (EAR) to the Enforcement Division. The enforcement option to be pursued will be determined when the EAR is reviewed by the Enforcement Division, Field Operations Division and Litigation Support Division at the screening meeting. The formal enforcement options available are the same as those previously described.

Relationship of Formal Enforcement Actions and Draft Permits

To ensure that permit applications are processed in such a manner so as to avoid conflict with formal enforcement actions, the Applications Team of the Permitting Section will forward copies of the permit work list to the Enforcement Division for review. The Enforcement Division will provide comments to the Permit Engineer to ensure the draft permit is consistent with the pending enforcement action. Should a problem be found with the draft permit, the Enforcement Division and Permit Engineer will try to reach a mutually agreeable solution prior to the weekly Executive Review Committee (ERC) meetings. If an agreement cannot be reached before the weekly ERC meeting, the problem will be discussed at the meeting and a decision will be made by the committee at that time.

SERIES 29
STATE QUALITY ASSURANCE PROGRAM

Introduction

Ongoing policy of the Texas Natural Resource Conservation Commission requires establishment of a centrally managed Quality Assurance (QA) Program. The implementation of this QA Program is the responsibility of the Quality Assurance Officer(s) and any complimentary staff. Adherence to this QA Program will allow a single approach to data generation for or in agreement with EPA and those programs funded in whole or in part by grants or contracts with EPA.

In data gathering systems, QA is concerned with all of the activities that have an important effect on the quality of the data, as well as the establishment of methods and techniques to measure the quality of the data. Environmentally related measurement activities include all field and laboratory procedures that generate data involving the measurement of chemical, physical, or biological parameters in the environment; determining the presence or absence of pollutants or hazardous substances; and studies of measurements on pollution transport.

This document will provide QA goals and procedures for all environmental measurements funded by or through the TNRCC involving EPA agreements and grants. The Commission also intends to adhere to these QA procedures for state funded programs, where applicable.

Quality Assurance Program Goal

The goal of the QA Program for the Texas Natural Resource Conservation Commission is to ensure that all scientific data generated by or for the Commission will be scientifically valid, legally defensible, and of known and acceptable precision and accuracy. This goal will be achieved by following QA procedures throughout the entire technical study, from planning to data usage.

Therefore, it is the goal of the Texas Natural Resource Conservation Commission that:

a) All scientific data generated by or for the Commission will be of sufficient or greater quality to withstand scientific and legal challenge. This includes requiring equivalent quality data when obtained through contracts, interagency agreements, cooperative agreements, and programs providing for self-reporting of data by regulated entities.
b) The intended use of the data will be determined before the data collection efforts begin to ensure that the necessary level of data quality is available.
c) All data produced by or for the Commission will be of known and acceptable precision, accuracy, representativeness, completeness, and comparability.

d) Where appropriate, all projects of the Commission will receive adequate funding and staff to support an acceptable level of QA.
e) The QA Officer(s) of the TNRCC will have overall responsibility for the implementation of the Commission's QA program.

Quality Assurance Management

In order to properly coordinate the QA activities within and for the Texas Natural Resource Conservation Commission, an adequate system of QA program management will be established under the discretion of a QA officer(s).

The overall responsibilities of the QA officer include:

a) Being the official Commission point of contact for all QA matters pertinent to Commission programs.
b) Coordinating all QA activities within the Commission and between the Commission and extramural entities.
c) Ensuring that all data gathered for or in agreement with the EPA and those projects funded in whole or in part by grants or contracts with the EPA, will be of known and acceptable quality with respect to precision, accuracy, representativeness, completeness, and comparability.
d) Providing technical QA assistance within the Commission as well as for entities responding to legal requirements of the Commission.
e) Reviewing and approving all ongoing and new project plans for QA adequacy and recommending modifications when necessary.
f) Periodic onsite inspections of the QA system and physical facilities of the laboratories to be used for analytical service.

The system of communication and periodic reporting of QA program status and needs will be established and maintained within the Commission.

It is important that the independence and integrity of the QA officer(s) be protected within the system by being responsible directly to the appropriate level of management. Management in turn will also respond to identified program plans, problems, and needs. A current and projected chain of command for QA officer(s) to upper management is established.

QA operation reporting within the TNRCC will be ongoing from the QA officer(s) to upper management while QA operations will be reported annually to EPA Regional QA officer.

QA operation reporting within the TNRCC will be ongoing from the QA Officer to upper management, while QA operations will be reported to the EPA Regional Quality Assurance Office whenever corrective action is determined to be necessary to assure quality operations. The QA Officer(s), with the concurrence of the Field Operations Division Director, will have responsibility for directing those actions. Also, the QA Officer will be responsible for compiling an annual summary report assessing the quality of data obtained by and for the

Commission during the previous fiscal year. This report will be submitted within two months of the conclusion of each fiscal year.

Quality Assurance Officer Qualifications: The QA Officer should possess an acceptable knowledge through past education, training, and/or experience of the technical aspects of the QA program within his/her responsibility. The QA Officer should have as a minimum, six years of experience within his/her discipline. The QA Officer should have laboratory experience and should possess at least a general knowledge of all monitoring and analytical activities in the field and in the laboratory. The QA Officer should have sufficient administrative and professional status to deal effectively with project managers and organizational administrators and have an acceptable knowledge of appropriate laws, regulations and environmental monitoring guidelines.

Technical Personnel: Those staff members who procure environmental samples, generate environmental data, or interpret environmental conditions using environmental data should possess at a minimum a Bachelor of Science degree in one of the physical or environmental sciences, or have accumulated at a minimum five years experience in an environmental monitoring profession, or receive sufficient training to compensate for any deficiencies in educational preparation and professional experience.

Training Programs: Training programs will be administered, as necessary, to all personnel of the Texas Natural Resource Conservation Commission who are deficient in skills required for their jobs. This training should include attendance at job related training courses, seminars, workshops, or professional meetings. This training can include instruction which is Commission produced, contract supplied, or promoted by professional associations or other government entities.

Facilities And Equipment

All prime contracted laboratory support facilities or Commission operated laboratories will be inspected at least annually by the QA office and determined to be capable of producing acceptable quality data. These systems audits will include review of instrumentation and lab facilities to ensure that proper maintenance is performed and that all necessary equipment is in working order.

General field equipment will be inspected by qualified technical personnel, who will determine if there is sufficient quantity which would provide acceptable quality environmental data. If the available field equipment is not sufficient to produce quality data, no substitution of procedures will be accepted if those data are to be used in enforcement or water quality decisions. The ultimate decision of alternate procedure equivalency shall rest with the QA Officer(s).

In order to ensure consistently high quality data, routine inspections and preventive maintenance will be performed on all facilities and equipment. The maintenance will be performed by qualified technical personnel using prescribed procedures. Permanent records of all maintenance of all facilities and equipment will be kept locally, dated, and acknowledged by the responsible authority.

Data Generation

Quality Assurance Project Plans (QAPP) should provide for the review of all activities which could influence data quality and the determination of those operations which must be covered by Standard Operating Procedures (SOP's). Where applicable, depending on the project, the activities to be included in the SOP's or QAPP and reviewed should include:

- general network design
- specific sampling site selection
- sampling and analytical methodology
- probes, collection devices, storage containers, and sample additives and preservatives
- special precautions, such as heat, light, reactivity, combustibility and holding time
- Federal reference, equivalent or alternate test procedures
- instrument selection and use
- calibration and standardization
- preventive and remedial maintenance
- replicate sampling
- blind and spiked samples
- collocated samples
- quality control procedures such as intralaboratory and intrafield activities and interlaboratory and interfield activities
- documentation
- sample custody
- transportation
- data handling procedures
- service contracts
- measurements of precision, accuracy, completeness, representativeness, and comparability
- document control
- quality assurance reports

QAPP's must be prepared in document control format, with provision for revision, as needed, and with a record of the official distribution. All project plans must conform to the guidelines established in the EPA document *Interim Draft EPA Requirements for Quality Assurance Project Plans, May 1994 (EPA QA/R-5)*. The previous guidance *Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans*, (QAMS-005/80 December 29, 1980) may be used for projects that were initiated under that guidance.

SOP's should be developed and used to implement routine quality control requirements for all monitoring programs, repetitive tests and measurements, and for inspection and maintenance of facilities, equipment, and services.

Project planning and design should consider the following factors:

a. The intended use of the data should be specified to determine the necessary level of analytical quality in terms of precision and accuracy. Laboratory QA activities which should produce analytical data of sufficient quality include:

    1. use of EPA-acceptable sample preparation and analytical methods
    2. use of EPA-acceptable laboratory equipment
    3. calibration of laboratory instruments before, during, and after use; reference standards should be used when necessary
    4. periodic inspection, maintenance, and servicing of all laboratory equipment
    5. use of reference standards and quality control samples (e.g., spikes, blanks, duplicates, splits) to determine the precision of procedures, instruments and operators and the accuracy of the results
    6. use of adequate statistical procedures (e.g., quality control charts) to determine the precision and accuracy of the data and to establish acceptance limits
    7. regular participation in external laboratory evaluations including EPA's performance audit programs
    8. use of EPA-acceptable chain of custody procedures in the laboratory
    9. maintenance and storage of complete records, charts, and logs of all pertinent laboratory calibration, analytical and quality control data
    10. where EPA procedures or guidance have not been published, the TNRCC QA officer will determine TNRCC-acceptable guidelines based on best chemistry criteria only.

b. To ensure that study objectives are met, representative sampling should be assured. Field activities which should ensure representative sampling include:

    1. use of EPA-acceptable sample collection and field measurement methods
    2. use of EPA-acceptable field equipment and instruments, if available
    3. calibration of field instruments according to EPA or manufacturer's specifications before, during, and after use in the field; these calibrations should be recorded as a permanent record
    4. periodic inspection, maintenance and servicing of all field office laboratory equipment and instruments
    5. use of EPA-acceptable sample containers to prevent contamination and to ensure an adequate sample size
    6. use of published EPA-acceptable sample preservation methods and adherence to recommended sample holding times
    7. use of EPA-acceptable chain of custody procedures in the field and during shipment
    8. collection of quality control samples (e.g., field blanks and duplicate samples) as needed for the laboratory quality control program
    9. where EPA guidance has not been published, the TNRCC QA Officer(s) will determine TNRCC-acceptable sampling guidelines based on best chemistry criteria only.

Data Processing

Data processing includes collection, validation, storage, transfers, and reduction. Precautions should be taken each time the data are reduced, recorded, calculated, and transcribed to prevent errors and the loss of information.

1. **Collection**: Each QAPP shall address the checks which must be used to avoid errors in the data collection process.
2. **Validation**: Data validation is defined as "the process whereby data are filtered and accepted or rejected based on a set of criteria". Since this aspect of QA may include various forms of manual or computerized checks, criteria for data validation shall be specified in each QAPP.
3. **Storage**: Each QAPP shall indicate how specific types of data will be stored, and the duration of storage. For every state of data processing at which data are stored, procedures shall be established to ensure data integrity and security.
4. **Transfers**: Each QAPP shall describe procedures which shall be used to ensure that data transfer is error free, and that no information is lost in the transfer. Examples of data transfers are copying raw data from a notebook onto a data form for keypunching; converting a written data set to punched cards; copying from computer tape to disk; and telemetering. Data transfer steps contained in each QAPP shall be kept to a minimum.
5. **Reduction**: Each QAPP shall contain procedures for ensuring and verifying the correctness of data reduction processes. Data reduction includes all processes which change either the form of expression or quantity of data items. It is distinct from data transfer in that it entails a change in the size or dimensionality of the data set. All results should be reported in scientifically valid units and with proper numbers of significant figures. All data reduction processes will follow recognized statistical criteria. The QAPP must identify the processes used to obtain the reduced data set.

Data Quality Assessment

The quality of all data should be determined before they are used based on the following five factors:

1. **accuracy** of the data can be demonstrated by comparison to known true values and reported as percent recovery
2. **precision** of the data can be demonstrated by the reproducibility of the measurement process and reported as percent deviation
3. data are **complete** enough to support a planning or enforcement action
4. data are **representative** of the actual conditions at the sampling location
5. the data are **comparable** due to standardized siting, sampling and analysis methods, reporting units, and data format.

This assessment will be performed by the end users of the data with the support and advice of the QA Officer(s).

Corrective Action

Project plans will specify performance limits which, if not met automatically, initiate corrective action. The QA Officer(s) will be informed of any major corrective action and of any changes in procedures or loss of data results. Also, upper level management should always be kept adequately informed of all program problems, needs, and overall status.

Corrective action should begin at the data collection level with the guidance and, if necessary, the initiation of the QA Officer(s). Such corrective action may be initiated by results of performance audits, systems audits, interlaboratory/ interfield comparison studies, or by failure to adhere to standard procedures. The laboratories to be used during this fiscal year for analytical service will each be audited a minimum of once by a member of the QA staff of the TNRCC.

Future contracts between the TNRCC and any entity providing data acquisition service will provide for any corrective actions to be the responsibility of the director of operations actually providing the data to the TNRCC. Prime contractors will be required to ensure necessary corrective action in operations of any subcontractor. Once corrective action is deemed necessary by the QA Officer(s) of the TNRCC, the contracting director of operations has 30 days to respond to identify the source of unacceptable quality service and specify what corrective action will be undertaken to upgrade the quality of service supplied to the TNRCC. An additional 60 days will be allowed to implement any corrective action.

Definitions

Data Quality is the summation of data characteristics which determine whether the data will satisfy a given purpose.

Data Quality Objectives (DQO) is the established quantitative measurements (with associated precision and bias or acceptable uncertainty) that must be obtained from the environmental data operations in order to demonstrate that the desired and expected result has been achieved. Such measurements are defined and established using the DQO Planning Process.

Quality Assurance (QA) is an integrated system of management activities involving planning, implementation, assessment, reporting, and quality improvement to ensure that a process, item, or service is of the type and quality needed and expected by the customer.

Quality Management Plan is a formal document or manual, usually prepared once for an organization, that describes the quality system in terms of the organizational structure, functional responsibilities of management and staff, lines of authority, and required interfaces for those planning, implementing, and assessing all activities conducted.

Quality Assurance Project Plan is a formal document describing in comprehensive detail the necessary QA, QC, and other technical activities that must be implemented to ensure that the results of the work performed will satisfy the stated performance criteria.

Quality Control (QC) is the overall system of technical activities that measures the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated requirements established by the customer; operational techniques and activities that are used to fulfill requirements for quality.

SERIES 30
WASTEWATER OPERATOR CERTIFICATION

Purpose

The purpose of the wastewater operator certification program is to ensure that all wastewater treatment and collection system operators are adequately trained, tested and certified. Wastewater treatment facility operations companies must also obtain a certificate of competency. This program is conducted under authority of Section 26.0301 of the Texas Water Code and pursuant to TAC Chapter 325.

General Requirements

The primary requirements under the wastewater operator certification program include the following:

1. Any wastewater treatment or collection system operator must hold a valid certificate of competency.
2. Every wastewater treatment facility operations company must hold a valid certificate of competency.
3. The holders of permits to discharge domestic wastewater shall employ one or more certified operators.
4. The qualification requirements for each class of certification (four classes of wastewater treatment certificates and two classes of collection system certificates) include a minimum level of training, a period of experience, a minimum level of formal education, a grade of 70% or higher on a written examination, and the payment of the applicable fee.
5. The Commission may suspend or revoke the certificate of competency of an individual operator or of an operations company for good cause.

General Responsibilities

The Wastewater Operator Certification Unit (a part of the Occupational Certification Section in the Compliance Support Division) has the primary responsibility for the following aspects of the wastewater operator certification program.

1. Review applications and issue certificates of competency to operators and operations companies who meet all requirements.
2. Maintain records of certified operators and operations companies.
3. Develop wastewater certification examinations and provide testing statewide to the operators.
4. Review the content of and approve all wastewater operator training courses.
5. Review the qualifications of and approve all wastewater training instructors.

6. Conduct investigations and take appropriate enforcement action against individual operators and/or operations companies. Coordinate enforcement actions with Enforcement, Field Operations, and Litigation Support Divisions.

SERIES 31
EDWARDS AQUIFER PROTECTION PROGRAM

Purpose

Through its implementation of the Edwards Aquifer Program, the Texas Natural Resource Conservation Commission (TNRCC) strives to preserve the high quality of water produced from the karst aquifer. Much of the Edwards Aquifer has been designated a Sole Source Aquifer by the Administrator of the U.S. Environmental Protection Agency. TNRCC rules complement the federal program by independently addressing and reviewing many surface development activities with ground water contamination potential. The TNRCC Field Operations Division, Austin and San Antonio Regional Offices, implement compliance with 30 TAC Chapter 313, concerning the Edwards Aquifer in an 8-county area. This is accomplished by reviewing plans and specifications for: residential, commercial, and industrial development; organized sewage collection systems; and underground and aboveground storage tanks (UST and AST, respectively) for liquid hydrocarbons and hazardous substances. The purpose of the review is to permit development while mitigating potential for point and nonpoint ground water contamination over the Edwards Aquifer Recharge Zone, which includes geologic features that allow rapid, unfiltered recharge of surface waters to the subsurface.

Procedure

Scope: The Regional Offices review water pollution abatement plans, organized sewage collection system plans and specifications, and petroleum storage tank facilities for development projects over the Edwards Aquifer and coordinate relevant Edwards Aquifer activities with appropriate program divisions.

Responsibilities: The Field Operations Division has the primary responsibility for the following aspects of the Commission's Edwards Aquifer Protection Program.

1. Development plans and specifications are reviewed for potential adverse impact on the quality of water in the aquifer.
2. The review of submitted water pollution abatement plans (WPAPs) for proposed residential, commercial, and industrial development; organized sewage collection system (OCS) plans and specifications; and underground and aboveground storage tank systems includes an evaluation of compliance with state-promulgated rules, in addition to assessments of engineering used to mitigate contamination potential resulting from development.
3. Staff from Regional Offices coordinate with staff from the central office in order to conduct and report on predevelopment assessments of area geology and hydrology and to assess preliminary evaluations of proposed construction and its probable impact on the aquifer.

4. Compliance with approved plans is assessed by Region investigators who check site conditions and the progress of proposed installations before, during, and after development construction.
5. Upon determining that the proposed facility complies with requirements over the Recharge Zone or Transition Zone, a letter outlining standard and special conditions of approval is sent to the owner and the owner's agent. For WPAPs, deed recordation of the approval is required.

Review of Plans and Site Geology: In order to evaluate the sensitivity of areas included in or near proposed developments, developers or their authorized agents are required to submit WPAPs, which contain detailed information about site geology, downgradient geology, and pollution abatement engineering during and after completion of construction. Requests for approval of OCSs, namely wastewater lines and lift stations, also must demonstrate compliance with sections of rules that address engineering design criteria that enhance protection of the aquifer during and after related construction. As a follow-up, the entity that installs the organized collection system must periodically test all newly installed or rehabilitated and existing lines to assess line integrity, thus minimizing the potential for exfiltration and infiltration. Underground storage tanks must incorporate double-wall construction and monitoring of the interstitial spaces and backfill in their designs.

Fee System: Fees are required to be submitted prior to review of WPAPs, OCS, or UST/AST plans and specifications. Submittals are sent to the appropriate TNRCC Regional Office for review. A field investigator field checks the proposed site for the presence of recharge features. Fee payments, geologic assessments, and engineering compliance are all checked for administrative and technical completeness and compliance by the Regional Office.

Initiation of Formal Enforcement Action

If potential or detected problems with ground water quality are reported to or discovered by TNRCC, or if development construction commences prior to plan approval by TNRCC, the entity may be referred to the Enforcement Division which has the authority to assess fines of up to $10,000 a day for violations. The procedure for formal enforcement action and the options available are the same as those discussed in Series 26, State Oil and Hazardous Substances Pollution Contingency Plan, which deals with compliance monitoring and enforcement.

SERIES 32
GROUND WATER PROTECTION

Texas Ground Water Protection Policy
Texas Water Code Section 26.401

The legislature finds that:

- In order to safeguard present and future ground water supplies, usable and potentially usable ground water must be protected and maintained;
- Protection of the environment and public health and welfare requires that ground water be kept reasonably free of contaminants that interfere with present and potential uses of ground water;
- Ground water 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 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 ground water policy in this State that the existing quality of ground water 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 ground water or pose a public health hazard; and
- The quality of ground water 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 ground water goal and policy of this state.

Ground Water Resources

Ground water is an important resource in Texas, and provides a major source of usable water. During 1990, the major and minor aquifers furnished about 56 percent of the total state water requirements, or about 8.9 million acre-feet of the total annual need of 15.8 million acre-feet, and provided 44% of all municipal drinking water. These aquifers crop out or underlie approximately 76 percent of the State's surface area of about 267,338 square miles. As ground water stewards, it is essential that responsible state agencies, as well as the public, exert every effort to preserve this valuable resource for future generations.

Suitability of ground water for municipal, industrial, rural, irrigation, and other uses is determined by the amount and type of minerals present in the water. One of the main factors which limit the use of ground water is the total dissolved solids (TDS) concentration. Most aquifers contain water which ranges from fresh, less than 1000 ppm (parts per million) TDS, to brine, greater than 35,000 ppm TDS. TDS concentrations are mapped for all major and select minor aquifers. Generally, TDS concentration increases downgradient from recharge areas. Topography, surface drainage pattern, and faults have visible effects on the mapped regional water quality trends within an aquifer and may be responsible for some identified areas of natural contamination.

The quality of ground water in the state is generally good; however, localized areas have been impacted by sources of contamination which are not located at a specific point, or by noncompliant waste disposal activities. This has caused pockets 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 regulatory philosophy is to prevent contamination from occurring.

Man-induced ground water contamination usually involves substances released on or slightly below land surface and, therefore, shallow aquifers are normally considered more susceptible to pollution than the deeper aquifers. Current data suggest that pollution generally is confined to the most heavily populated and industrialized areas of Texas. However, isolated local cases of ground water contamination have been found in many other parts of the State. The Commission and other experts currently believe that the usefulness of ground water has not been appreciably reduced statewide. Based on limited data, it is estimated that less than one percent of the state's ground water has been contaminated by man.

Contamination found in ground water ranges in degree from slight degradation, in cases of septic tank pollution, to the presence of toxic concentrations of contaminants, such as heavy metals, organics, and inorganics which are present in abandoned hazardous waste facilities. Additionally, minor amounts of pesticides, related to agricultural activities, have been detected in the State's ground water. In most cases, ground water contamination was discovered only after a drinking water source had been affected. There are several known cases where municipal water supply wells have become unusable due to contamination. Numerous instances of private wells being affected have been noted during investigations.

Based on a statewide assessment of potential and actual ground water contaminants, waste disposal practices and existing regulations which provide for contamination detection and mitigation, it was concluded that there are still conditions which exist or practices being used which cause concern. Generally, the State has adopted regulations and policies which will effectively reduce future pollution. However, based on best professional judgement, improperly completed and abandoned water wells, septic tanks, industrial wastewater impoundments, underground storage tanks, impoundments from confined animal feeding operations, municipal sanitary landfills, and agricultural chemical application are considered to be of major concern. Programs addressing these problems have been developed and are continually being refined.

Texas Ground Water Protection Committee

The Texas Ground Water Protection Committee was created by the 71st Texas Legislature in 1989 as a means to bridge the gap between existing state ground water programs and to optimize water quality protection by improving coordination among agencies involved in ground water activities. House Bill 1458, codified as Sections 26.401 through 26.407 of the Texas Water Code, sets out the state's ground water protection policy, and provides legislative recognition for the Texas Ground Water Protection Committee.

Texas Water Code §26.403 and subsequent legislative amendments (Senate Bill 2, 72nd Legislature, 1991, and Senate Bill 469, 73rd Legislature, 1993) identify the following state agencies with ground water protection programs for membership to the Texas Ground Water Protection Committee:

- Texas Natural Resource Conservation Commission
- Texas Water Development Board
- Railroad Commission of Texas
- Texas Department of Health
- Texas Department of Agriculture
- Texas State Soil and Water Conservation Board
- Texas Alliance of Ground Water Districts

- Texas Agricultural Experiment Station
- Bureau of Economic Geology

The Texas Natural Resource Conservation Commission is designated as the lead agency of the Texas Ground Water Protection Committee. The Committee's tasks are: 1) to improve coordination of state agency-administered ground water protection programs; 2) 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 3) 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. Staff from TNRCC supports the Committee by reporting the status of all ground water monitoring and contamination in the State annually.

Ground Water Protection Strategy

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 state agencies. Coordination of these programs is of utmost importance if the State's ground water protection strategy is to achieve success. Another important area of coordination from the standpoint of improving existing efforts is working with and through local and regional entities to increase the level of ground water protection.

The Texas Natural Resource Conservation Commission (TNRCC) conducts various ground water protection programs that focus on both prevention of contamination and remediation of existing problems through education, permitting, and enforcement. As the State's lead agency for water resources, the TNRCC administers both state and federally mandated programs including: the Resource Conservation and Recovery Act; the Comprehensive Environmental Response, Compensation and Liability Act (also referred to as the Superfund program); the Clean Water Act; the Safe Drinking Water Act; and the development of state management plans for ground water under the Federal Insecticide, Fungicide and Rodenticide Act.

The main elements of the Ground Water Protection Strategy are to: strengthen state and local ground water programs; consider ground water issues which are not fully addressed; improve interagency coordination; and carry out the programs efficiently and effectively. The Strategy outlines goals, needs, and recommendations in six important areas: Interagency Coordination, Hazardous and Non-Hazardous Materials Management, Public Water Supply, Rural Water Supply, Research, and Legislation. Within these areas, the following strategy elements are discussed: status of existing programs; gaps or inadequacies in these programs; areas of currently unaddressed ground water issues; recommendations for changes or improvements in existing programs and institution of new programs where needed.

The Strategy was designed to be a flexible guide for state agencies in designing and implementing ground water protection programs. The State, through the Ground Water Protection Committee and working with the United States Environmental Protection Agency (EPA), currently has a mandate to further develop and refine the strategy as the basis of a Comprehensive Ground Water Protection Plan (CSGWPP).

Classification of Ground Water and Aquifers

A very important issue at both the federal and state levels is the use of ground water classification and numerical water quality standards. The TNRCC and other state regulatory 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.

Four classes are defined based on quality as determined by total dissolved solids content. The names and concentration ranges are based on traditional nomenclature associated with each class. Quality also determines usability. 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.

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

The State's policy of nondegradation is perhaps the single most important mechanism for preventing contamination of ground water. All usable and potentially usable ground waters are subject to the same protection afforded the nondegradation policy goal of the Texas Water Code in Section 26.401. This section further states that nondegradation 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 not impaired;
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.

Future water needs must also be considered in the context of a nondegradation policy. In determining protection or restoration measures, the regulatory 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 as drinking water for human consumption requires the highest degree of protection or restoration. 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.

In specifying a protection or restoration measure, regulatory 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.

This classification system is intended to be implemented by regulatory 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 Commission recognizes the important contributions of all agencies that compile such data and supports the continuing efforts to enhance the statewide database.

This approach of affording maximum protection for the wide range of aquifers in common use is preferred. Application of an aquifer or ground water classification without a protection goal considering potential and future uses can result in degradation of less developed or lesser-quality ground water sources. The informal classification presently used is under review for refinement and more formal recognition by the Texas Groundwater Protection Committee. Implementation of the classification would be accomplished, based on the availability of resources, through the use of guided best professional judgement of regulatory agencies in authorizing contaminant-producing activities and in remediation of contaminated ground water.

Nonpoint Source Management

The Commission, with the assistance of the Texas Groundwater Protection Committee, has published an assessment of the impacts of nonpoint sources (NPS) of pollution on ground water and a management program for abating those impacts. Both of these documents are slated for revision during the coming fiscal year (FY96). Future NPS activities will embrace the priorities set forth in these revised documents, and also reflect the evolution of these programs into watershed based ground water protection efforts. Techniques employed in the NPS management plan include data acquisition and management, aquifer vulnerability mapping, interagency and interlocal coordination, and public education.

Wellhead Protection Program

Designation of a restricted use area around a public drinking water well is one way of protecting underground water supplies. This area is referred to as a wellhead protection area and it is defined as the surface and subsurface area surrounding a public water well or well field through which contaminants could likely pass and eventually reach the ground water supply. Potential sources of ground water contamination which might pollute an aquifer in the vicinity of a public water supply well include septic tank effluent, commercial and industrial pollutants, leaking underground storage tanks, urban runoff, hazardous and solid waste disposal, and accidental spills.

The basic concept of the Wellhead Protection Program (WHP) is the minimization of land use restrictions while maximizing ground water protection. To accomplish this, the Commission delineates WHP areas based on aquifer parameters, a five year travel time for potential contaminants, and best professional judgement to prevent ground water contamination. The Water Utilities Division of the Commission reviews contingency plans developed for the provision of alternate water supplies in the event of contamination of the existing source. Local governments provide an inventory of all potential sources of contaminants within their WHP areas, then implement a protection program. Guidance to local governments with respect to the inventory of potential contaminant sources and other required technical assistance will be provided by the Commission.

Local government participation and implementation involves contamination source inventory and management programs directed to the particular sources with greatest potential impact. The management program may be informal, relying on public education and promotion of best management practices. Management of pollution sources may be approached more formally with regulatory programs established through city ordinances. Local government is also encouraged to reinventory contamination sources at two to five year intervals.

Texas State Management Plan for Agricultural Chemicals in Ground Water

The Agricultural Chemicals Subcommittee of the Texas Ground Water Protection Committee has developed a plan that describes the general policies and regulatory approaches the state will use in order to protect ground water resources from risks of contamination by agricultural chemicals and agents. The subcommittee is currently revising the *State Management Plan (SMP) for Agricultural Chemicals in Ground Water* under the Federal Insecticide Fungicide and Rodenticide Act. A series of monitoring programs will be undertaken, each addressing an individual agricultural chemical found within a geographic area. Among the factors considered will be the chemical usage, mobility, and ground water vulnerability. The first program for atrazine was begun in 1994 with its monitoring phase. In the future, Best Management Practices identified in the SMP for atrazine may be implemented if analyses of ground water indicate contamination has occurred. Another important part of the Commission's efforts will be the compilation of ground water quality, pesticide, and agricultural use data and the development of a ground water pesticide data base.

DRASTIC

DRASTIC, a methodology for delineating sensitivity to ground water pollution, was developed in the mid-1980's to serve as a tool in ground water assessment. DRASTIC is a systematic process for assessing the ground water pollution potential of hydrogeologic settings. The DRASTIC system is a methodology which involves delineation of hydrogeologic settings and analysis of data to develop a single index number which represents the sensitivity of that setting to ground water pollution potential. The method is simple, understandable, and has wide applicability as a management and learning tool. The system depends to some degree on subjective but skilled judgement by the user, as does any artificial system.

The Commission has completed broad-brush vulnerability mapping of the State of Texas using the DRASTIC methodology, as well as more detailed regional scale vulnerability maps for 22 counties in the state. The DRASTIC methodology and published Texas DRASTIC maps have other applications in many program areas.

Interagency and Interlocal Cooperation

A significant amount of coordination is needed for implementation of a successful nonpoint source management program. A multi-agency approach is needed to bring together varying agency authorities and expertise. Coordination and cooperation with local and regional entities is also crucial. Efforts continue through the Texas Ground Water Protection Committee to identify authorities and expertise among state agencies and participating entities, and to set up interagency and interlocal agreements.