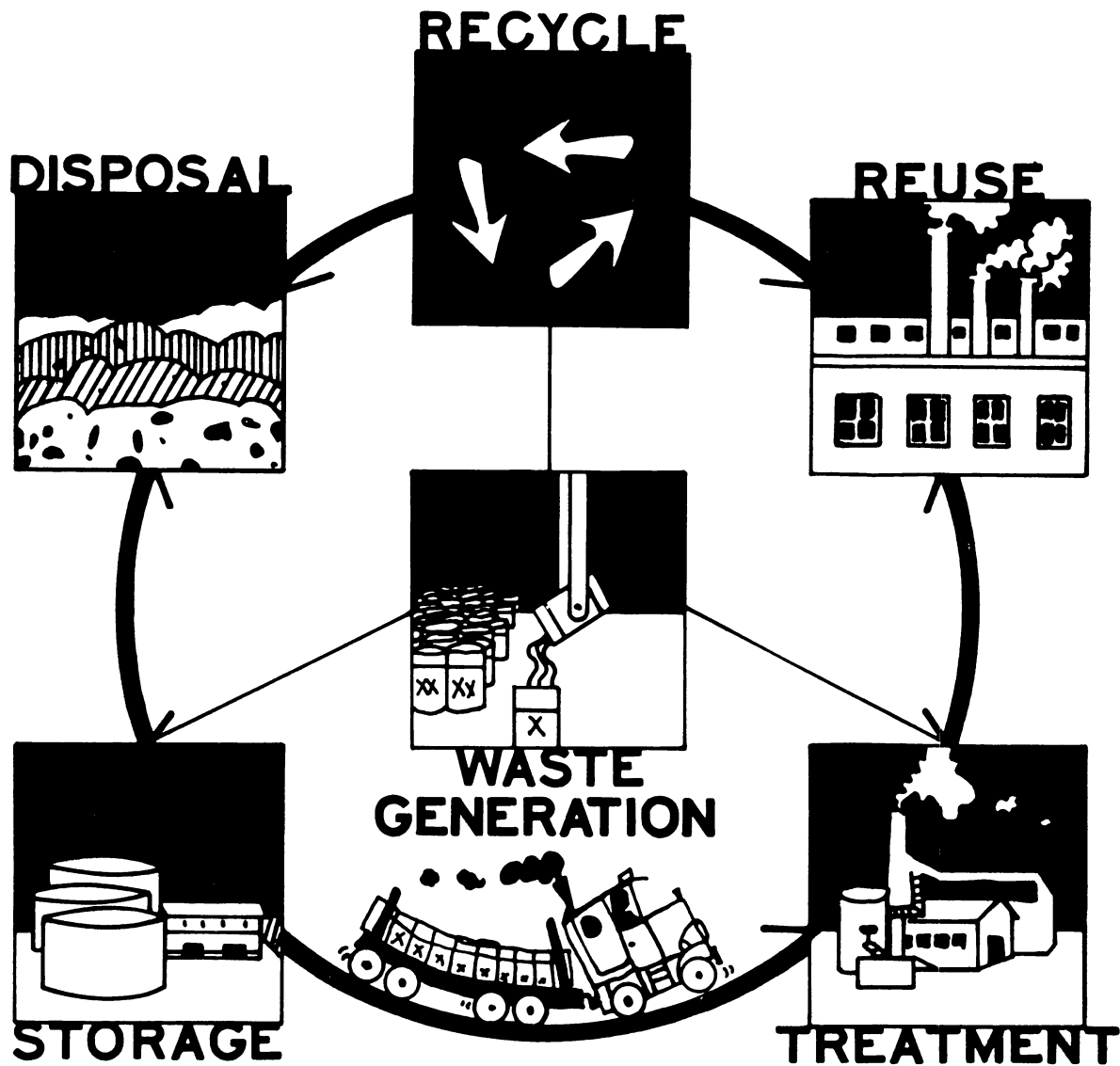


SOLID WASTE MANAGEMENT PLAN FOR TEXAS 1980-1986

Volume II-Industrial Solid Waste



SOLID WASTE MANAGEMENT PLAN FOR TEXAS 1980-1986

VOLUME II - INDUSTRIAL SOLID WASTE

TEXAS DEPARTMENT OF WATER RESOURCES

JANUARY 1981

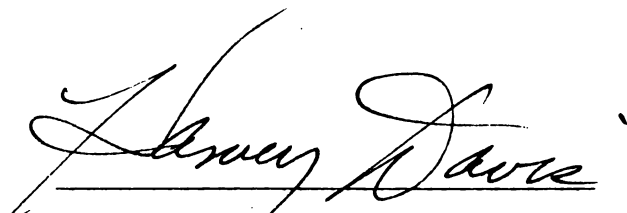
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PLAN APPROVAL

Volume II of the Solid Waste Management Plan for Texas, 1980-1986, has been approved and adopted for implementation, to ensure a unified and comprehensive statewide approach to the management of industrial solid waste. Proper management will assure protection of the public health, property, and the environment, while conserving valuable material and energy resources.

The Texas Department of Water Resources has the primary responsibility within the state, for the implementation of actions recommended in this planning document. The Texas Department of Water Resources will initiate actions as required to produce operational compliance and coordination of activities by all involved agencies and parties. Involved agencies and parties are encouraged to assist in coordinated implementation.

The objectives stated herein are attainable and shall be pursued by the Texas Department of Water Resources. Objectives are, by their nature, tied to present technology and conditions; therefore this Plan will be consistently reevaluated and amended as necessary to reflect needed changes.


Executive Director,
Texas Department of Water Resources


Chairman,
Texas Water Development Board

FOREWORD

This Solid Waste Management Plan for Texas, 1980-1986, complies with the Texas Solid Waste Disposal Act (Art. 4477-7, V.A.T.S.) and the County Solid Waste Control Act (Art. 4477-8, V.A.T.S.), as well as the federal Resource Conservation and Recovery Act (42 U.S.C. 9601 et. seq.), and the U.S. Environmental Protection Agency "Guidelines for Development and Implementation of State Solid Waste Management Plans," (40 CFR Part 256).

Volume II of this plan encompasses the overall solid waste management responsibilities of the Texas Department of Water Resources as delineated in the State Solid Waste Disposal Act. This includes those activities associated with the collection, handling, storage, processing and disposal of industrial solid waste. Volume II is also concerned with the interrelationship of all state, regional, and local authorities involved in the management of industrial solid waste. It applies to hazardous and non-hazardous industrial solid waste as well as the responsibilities of the Texas Department of Water Resources in reviewing the water quality aspects of all solid waste management activities.

The Texas Department of Health is the state agency responsible for the management of municipal solid waste in Texas, including mixed municipal-industrial waste.

Volume I of this Plan concerns the management of municipal solid waste in Texas. The Texas Department of Water Resources and the Texas Department of Health have effectively coordinated the development of both volumes of the Solid Waste Management Plan for Texas, 1980-1986.

Time constraints for the development of this volume have limited the extent of data analysis performed. Further work is planned to analyze existing Department data and to utilize that information in future revisions of this plan.

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CHAPTER I
INTRODUCTION

I. INTRODUCTION

Ten years ago Texas implemented its solid waste management program. With the enactment of the Texas Solid Waste Disposal Act (Article 4477-7, V.A.T.S.), the Texas Water Quality Board was assigned jurisdiction for industrial solid waste with the duty "to safeguard the health, welfare and physical property of the people through controlling the collection, handling, storage and disposal of solid wastes".

In 1973, the Water Quality Board published a plan for industrial solid waste management. It was based on a survey of existing management practices which was conducted to provide information as a basis for developing new regulations under the Texas Solid Waste Disposal Act. Since that time, rules and procedures have been formulated, and the regulatory program has matured. In the seven years that have followed, over two million people have been added to the State's population, agricultural and industrial activities have increased rapidly, and Texans have become aware of environmental problems and energy shortages. Now it is time to take another look at the status of solid waste management in Texas, account for these factors, and develop a new plan for industrial solid waste.

The impetus and funds for this plan are provided by the federal Resource Conservation and Recovery Act of 1976 (RCRA). Federal regulations (40 CFR, Part 256), promulgated pursuant to Subtitle D of RCRA call for the development and implementation of State solid waste plans. Requirements for the approval of the State Solid Waste Plan include:

- (1) Identification of agency responsibilities in development and implementation of the State plan;
- (2) Prohibition of new open dumps, and the requirement that all solid waste be utilized for recovery, or disposed of in an environmentally sound manner;
- (3) Closure or upgrading of existing open dumps;
- (4) Establishment of comprehensive State regulatory powers necessary to implement the State plan;
- (5) Elimination of State and local prohibitions to long-term contracts for the supply of solid waste to resource recovery facilities; and
- (6) Provisions for resource recovery, resource conservation, and environmentally sound disposal practices.

On January 5, 1979 the Governor of Texas designated the entire State of Texas as a single region for industrial solid waste management. Concurrently, the Texas Department of Water Resources was designated as the agency responsible for developing the industrial solid waste management plan.

A. PURPOSE AND SCOPE

As Texas' industrial base has grown, the problems associated with solid waste management have increased as well. These problems are related to the protection of the public health and protection of the State's land and water resources. It has become evident that with the increasing affluence of our industrial society, the generation, transportation, and disposition of solid waste are increasing concerns. The management of industrial wastes requires the coordinated and concerted efforts of numerous State, local and regional agencies, private institutions and individuals.

Problems related to solid waste management cannot be isolated from air and water pollution, vector control and other environmental problems. Reducing the amount of air and water pollutants has increased the amounts of solid waste which must be managed. Incineration may reduce the volume of waste, but it may contribute to air pollution; landfills may contribute to surface or ground water pollution and problems of vector control. Consequently, environmental protection from hazards posed by solid waste treatment and disposal will require a coordinated approach.

The purpose of this plan is to describe and evaluate the current industrial solid waste program and to present plans for modifications where required. This includes administrative, regulatory and legislative remedies. This plan serves as a policy guide for the next five years and emphasizes the encouragement of sound disposal and management practices and the recovery and re-use of wastes. Additionally, the aforementioned federal requirements for an approved state plan are addressed.

The plan considers the management of hazardous and non-hazardous industrial waste including manufacturing, agricultural, and mining wastes, and air and water pollution control residuals. Various management aspects are examined, including transportation, storage, processing, treatment and disposal.

B. GOALS AND OBJECTIVES

The major goals of the plan are to:

1. Address all industrial solid wastes that pose potential adverse effects to public health or the environment.
2. Encourage the recovery and re-use of material and energy from the industrial solid waste stream while conserving remaining natural resources.
3. Increase public awareness of solid waste issues and provide opportunities for public participation.
4. Provide a coordinated approach to solve industrial solid waste problems.
5. Foster understanding of the regulatory management system to improve the efficiency of those who must comply with solid waste laws and regulations.

Specific Objectives include:

1. Strengthen the regulatory program in order to prevent the illegal disposal of industrial solid waste and to foster sound waste management practices;
2. Identify problems caused by past improper disposal practices and begin to correct them;
3. Fulfill requirements enabling the State to secure authorization to operate a state hazardous waste program in lieu of the federal program;
4. Identify those solid waste disposal facilities which are open dumps, and therefore must be upgraded or closed;
5. Prohibit the establishment of new open dumps;
6. Develop TDWR policies and rules which will promote resource recovery and waste reduction;
7. Provide information to industry, the public and government agencies in an effort to promote understanding of the state industrial solid waste program;
8. Improve coordination between state agencies and programs with solid waste management responsibilities;
9. Facilitate participation of local governments in the siting of facilities;
10. Encourage regional solutions to solid waste problems through cooperation with regional and local units of government, chambers of commerce, trade organizations, industry, and other State agencies;
11. Foster the mix of public and private efforts necessary to provide adequate capacity to manage industrial solid wastes;
12. Encourage participation by the public in all stages of plan development and implementation;
13. Identify all State and Federal environmental standards applicable to solid waste facilities;
14. Identify areas where technical assistance to local and regional agencies, and industry would better enable them to carry out their responsibilities under the law; and
15. Encourage private industry involvement in establishing resource recovery facilities.

CHAPTER II
DEVELOPMENT OF THE INDUSTRIAL
SOLID WASTE REGULATORY PROGRAM

II. THE DEVELOPMENT OF THE TEXAS INDUSTRIAL SOLID WASTE REGULATORY PROGRAM

Prior to the enactment of the Texas Solid Waste Disposal Act (Article 4477-7, V.A.T.S.) in 1969 there were no effective State regulations governing the disposal of solid wastes. In many cases, waste was dumped indiscriminately without records or environmental safeguards. With the passage of the Act, the 61st Legislature assigned jurisdiction of industrial solid waste management to the Texas Water Quality Board, now the Texas Department of Water Resources, (TDWR). The Texas Department of Health (TDH) was given responsibility for managing municipal solid waste and any industrial solid waste mixed with and routinely collected with municipal solid waste.

The Texas Solid Waste Disposal Act broadly defines the powers of the TDWR and the TDH. These include:

- the authority to develop state solid waste plans;
- the authority to adopt and promulgate rules and regulations consistent with the general intent of the Act (which is to safeguard the public health, welfare and physical property through controlling the collection, handling, storage and disposal of solid wastes);
- the authority to inspect and approve sites for storage, processing or disposal of solid wastes;
- the power to issue or require permits for processing, storage, or disposal of solid wastes, other than for the on-site processing, storage, or disposal of non-hazardous solid wastes.
- the authority to provide educational, advisory and technical services; assist other governmental entities and institutions in acquiring federal grants for the development of solid waste facilities, management programs and research; and accept and expend funds from the federal government for purposes relating to solid waste management; and
- the authority to administer and expend funds provided by the legislature for the purpose of making grants to local governments for solid waste planning, installation of facilities, and administration of solid waste programs.

Regulatory implementation of the Texas Solid Waste Disposal Act commenced in 1970 with the adoption of a regulation establishing design criteria and permit requirements for commercial (off-site) disposal operations. This initial rule also established the basic policy that the waste generator is responsible for assuring that waste produced by him is properly and safely disposed of regardless of the disposal process employed. Also by rule, the Texas Water Quality Board established requirements for a certificate of registration whereby each non-commercial (on-site) facility's compliance status would be established and regularly reviewed.

Subsequent regulatory development came in 1975. After lengthy public hearings, the Texas Water Quality Board revised its Industrial Solid Waste Management Rules to establish uniform performance standards for all disposal operations. The 1975 rules prohibited discharge to ground

water or surface water, creation of any nuisance or public health problems, and disposal at unauthorized locations. To assure compliance with the unauthorized dumping prohibition, rules were established for shipping control requirements for Class I industrial waste. Texas established one of the first state manifest systems in the nation for tracking waste from cradle to grave.

The continued development of the TDWR regulatory program in the 1970's has been a major factor in the improvement of facility design during the last decade. The 1975 regulatory amendments were significant in that they called for the development of technical guidelines outlining recommended technical standards for various methods of industrial waste storage and disposal. These guidelines have been updated since 1975 to reflect new technologies. The guidelines are used by TDWR Staff to evaluate facility design of both commercial and on-site facilities.

The current solid waste management program consists of four elements: (1) waste disposition control, (2) facility control, (3) solid waste planning and grants administration and (4) enforcement and compliance monitoring.

Waste disposition control involves the registration of waste generators, classification of wastes, and shipping control and reporting requirements for hazardous and Class I industrial wastes.

The facility control program includes the permitting and authorization of industrial solid waste management facilities. Permits are now required for all hazardous waste management facilities. Plans and specifications are evaluated for technical considerations by the solid waste section staff, and permits include provisions for design, construction, operation, closure and post-closure care. Non-hazardous solid waste facilities are inspected and evaluated according to the TDWR Rules (156.22.02.001-018) pertaining to non-hazardous waste management.

Solid waste planning efforts began in 1978 with the designation of the TDWR as the agency responsible for solid waste planning activities under the federal Resource Conservation and Recovery Act. The planning program currently consists of data collection, grants administration, policy coordination, and public participation activities which will aid in the development of the State solid Waste Management Plan.

The Enforcement and Field Operations Division conducts monitoring activities to assure compliance with waste disposition and facility control rules. Activities include facility inspections, aerial surveillance, complaint investigations, laboratory analyses, and use of computer programs to help monitor for violations. This division coordinates enforcement actions in cases of non-compliance.

Summary

In the past ten years the development of an industrial solid waste program has been gradual as new staff members have been added and regulations and policies developed and implemented. Many program elements are still being developed and will be addressed over the next few years. These include:

Permitting of all hazardous waste facilities

The TDWR Solid Waste Section is increasing its efforts to permit the estimated 600 on-site hazardous waste storage, treatment, and disposal facilities in the state. In 1980, Department Rules were amended to reflect the permit requirement for on-site hazardous waste facilities which had been contingent on the identification and listing of hazardous waste by the Administrator of the U.S. E.P.A. Seventeen (17) Class I off-site (commercial) facilities are currently under permit. All hazardous waste facilities are expected to be operating under permit by 1986.

Any hazardous waste management facility which was in existence on or before May 19, 1980 may continue its operations if the owner or operator has filed a permit application with the Department by August 17, 1980. Storage, processing, and disposal activities must be conducted in compliance with Department interim status requirements pending final action on the permit application.

Prevention of illegal disposal of industrial wastes

Inspection, surveillance and enforcement activities to insure compliance with State regulations is a top priority. The TDWR will work with other State and local law enforcement agencies to insure compliance and prevent illegal disposal activities.

Siting of new facilities

The provision of an adequate number of facilities to meet future needs is a difficult problem facing government and industry in hazardous waste management. Although it appears that Texas currently has adequate facilities, public opposition to new and existing facilities could lead to facility shortages in the future. This could lead to increased illegal disposal activities. The challenge facing Texas and other states is to clearly evaluate the needs for new sites, and to develop cooperative procedures for selecting, evaluating, and approving new sites which involve both government and industry. The State must work with industry, citizens and local governments to overcome the negative impact of such incidents as Love Canal and convince the public that hazardous wastes can be handled and disposed of properly without causing dangerous public health problems.

Closure or upgrading of open dumps

An evaluation of approximately two-hundred fifty (250) non-hazardous industrial solid waste disposal facilities was begun in 1979 to identify facilities which did not meet the minimum criteria established by federal and state requirements. The Open Dump Inventory is a list of non-compliant facilities which will be published in the Federal Register. The inventory is expected to be completed in 1984 and the information will be used to assess the environmental adequacy of existing facilities.

Development of technological alternatives to landfill disposal

The most common method for disposal of industrial wastes in Texas is the landfill. Facility sponsors are finding it increasingly difficult and costly to site this type of facility because of public opposition. The increase in public opposition may be related to disastrous results of improper management of hazardous waste that have occurred. In view of the public resistance to establishing new disposal sites and the limitations of land disposal as a long-term solution, the need for developing waste treatment facilities and other alternative disposal techniques is recognized by the Department. The increasing costs of land disposal will provide incentive for the private sector to develop these alternatives, and the State should assist and encourage this activity.

CHAPTER III
EXISTING CONDITIONS AND CURRENT STATUS OF THE PROGRAM

III. EXISTING CONDITIONS AND CURRENT STATUS OF THE PROGRAM

A. INDUSTRIAL WASTE GENERATION

The term industrial solid waste includes those solid wastes resulting from or incidental to any process of industry, manufacturing, mining or agricultural operations. This definition includes waste materials associated with mining, concentrating, and refining of metallic ores and their ultimate fabrication; the refining of oil and natural gas; the manufacturing of chemical, stone, glass, paper, wood, machinery and metal products; and wastes associated with the demolition of old buildings, highways and bridges. Industrial solid wastes also include those incidental to the food processing industries such as canning, freezing and dehydrating of fruits and vegetables; slaughtering and processing of meat animals; and the processing and packaging of dairy products. Agricultural solid wastes are those resulting from animal and crop production including animal manures, dead animals, pesticide and crop residues.

The TDWR classifies waste materials according to their degree of hazard. Class I waste is any industrial solid waste or mixture of industrial solid waste which because of its concentration, or physical or chemical characteristics is toxic, corrosive, flammable, a strong irritant, a generator of sudden pressure by decomposition, heat or other means, and may pose a substantial present or potential danger to human health or the environment when improperly processed, stored, transported, disposed of or otherwise managed, including hazardous industrial waste.

Class II wastes are those which present a relatively low level of hazard with respect to acute toxicity characteristics, and are generally degradable. Environmental problems related to Class II waste usually become significant when the wastes are accumulated in large quantities. These may include paper, wood, grease, plant trash, fabric waste, and other similar materials.

Class III wastes are inert and essentially insoluble materials including but not limited to materials such as rock, brick, glass, dirt and certain plastics and rubber, etc., that are not readily decomposable.

1. Quantities of Waste

In Texas, at least 15 million metric tons of Class I and Class II industrial solid waste are generated each year by more than 1800 registered industrial facilities. 1258 of these facilities generate Class I industrial waste. Table 1 shows the total volume (in metric tons) of Class I and Class II waste generated in Texas from 1977 to 1979. Quantities of Class III wastes are not reported to the TDWR.

TABLE I

	1977	1978	1979
Class I	11,544,464	13,608,886	11,885,053
Class II	6,728,453	3,931,309	3,863,763

Total volumes of Class I and II waste generated in Texas during 1979 by off-site and on-site designation:

	Class I	Class II
Off-site	1,322,051	2,812,422
On-site	10,563,002	1,051,341

These waste generation figures represent minimal values for each category because reporting requirements were new and not well understood by industrial waste generators. 1977 was the first full reporting year for on-site disposal facilities and many generators did not understand the requirements. Other factors contributing to data inaccuracies are waste classification changes, and problems in converting from volumetric units (gallons, and drums) to mass units (pounds, tons etc.). However, the data clearly indicates that Texas industry generates significant quantities of solid and hazardous waste.

Future Quantities of Industrial Waste

It is difficult to make projections for industrial waste generation in the future because current generation data is incomplete. Nonetheless, TDWR projections indicate that industrial and population growth will continue at least until the year 2000. Industrial growth has been projected for almost all industrial sectors in Texas and total earnings are expected to increase by more than 200% between 1980 and 2000, (Table II). The State's population is predicted to increase 50% over the next 20 years (Table III). Assuming that industrial waste generation may be roughly correlated with population and industrial growth, it is evident that Texas will have ever increasing amounts of industrial solid waste which must be disposed of, treated or recycled in the future.

TABLE II
 TEXAS DEPARTMENT OF WATER RESOURCES
 EARNINGS PROJECTIONS FOR INDUSTRIAL SECTORS
 MAY 29, 1979
 (\$1,000'S OF 1967 CONSTANT DOLLARS)

<u>Sector</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
1. Agr., For., and Fish	1,539,373	1,474,051	1,467,263	1,571,283
2. Mining	921,479	1,838,649	2,181,799	2,557,234
3. Construction	1,911,166	3,222,777	4,979,425	7,453,296
MANUFACTURING	5,809,053	9,673,001	14,418,338	20,960,839
4. Food & Kindred Prod.	550,043	716,706	867,083	1,067,433
5. Textiles	292,001	556,326	813,778	1,173,447
6. Printing & Publishing	280,642	473,758	700,729	1,054,372
7. Chemical & Allied	674,169	1,034,397	1,391,262	1,877,293
8. Furn., Lumb., & Wood	205,129	323,765	433,510	566,059
9. Machinery Ex. Elect.	569,928	1,383,908	2,155,294	3,127,669
10. Electrical Machinery	438,560	878,376	1,544,727	2,360,169
11. Transportation Equip.	903,749	929,947	1,050,956	1,170,875
12. Primary Metals	291,341	536,387	860,639	1,259,048
13. Fabricated Metals	473,576	1,018,200	1,889,751	3,215,386
14. Other Manufacturing	1,129,915	1,821,231	2,710,609	4,089,088
15. Railroads and R-R Exp.	275,579	351,258	384,572	444,587
16. Trucking & Warehsng.	463,984	878,180	1,154,552	1,891,923
17. Other Transportation	541,581	838,242	1,117,738	1,514,426
18. Communications	411,663	875,962	1,565,625	2,731,223
19. Utilities	414,914	672,499	978,096	1,429,997
20. Wholesale & Retail	5,234,777	8,896,619	12,672,627	18,260,896
21. Fin., Ins., Real Estate	1,472,245	2,744,684	4,301,778	6,780,083
22. Other Personal Services	523,784	549,351	639,368	783,317
23. Business & Repair	773,429	1,626,620	2,827,780	4,652,422
24. Amusement & Recreation	126,375	198,022	280,482	397,881
25. Private Households	319,166	298,692	285,690	287,315
26. Professional Service	2,417,785	5,175,940	9,464,590	16,874,894
27. Civilian Government	<u>3,956,764</u>	<u>6,837,530</u>	<u>11,289,958</u>	<u>17,742,645</u>
TOTAL	27,113,117	46,152,077	70,010,491	106,334,261

TABLE III
 TEXAS DEPARTMENT OF WATER RESOURCES
 PROJECTIONS FOR POPULATION GROWTH

	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
State population	13,549,200	14,744,500	16,043,200	17,401,200	18,896,900

SOURCE: Population Projections for Texas, State, County, State Planning Region and 208 Water Quality Designated Areas, TDWR, January 1980.

2. Types of Waste:

Industrial solid waste includes those solid wastes resulting from or incidental to any process of industry, manufacturing, mining or agricultural operations. This section addresses these different types of waste, how they are managed, by which agencies and pursuant to which laws and regulations.

a. Agricultural Wastes

Agricultural wastes encompass waste materials from several major Texas industries: livestock, lumber, and farming.

Farming Wastes

In past years, the most common methods of disposal have been soil incorporation and field burning. Soil incorporation of waste is beneficial for the soil in a number of ways, and provides an environmentally sound method of disposal. Field burning has been convenient for farmers, allowing for the prompt planting of second crops. However, the Texas Air Control Board has decided that the practice of field burning contributes to air pollution problems and has prohibited the practice. Consequently, alternative forms of waste management have been investigated. These include waste-to-energy processes and the re-use of crop residues in the production of animal feeds and other products.

Livestock Wastes

Intensive livestock feeding operations generate enormous quantities of waste and are regulated under the Federal Clean Water Act and the Texas Water Code, Rule 156.24. The provisions of the Act address the storage and disposal of animal wastes. The Texas Department of Water Resources issues water code permits to such facilities and requires that manure is retained on-site. In some parts of the State manure is in great demand as a fertilizer and is also used in the production of methane fuel.

Silvicultural Wastes

Silvicultural wastes include logging residues and mill waste. Ordinarily, logging residues and slash are left on the ground to decay. Renewed interest in the utilization of wood residues has brought about the development of whole tree harvest and slash treatment for the collection of logging residues.

Pesticide Wastes

Pesticide wastes result from the aerial application of pesticides during agricultural spraying operations. These residues remain on planes and in containers after use. The Texas Department of Agriculture licenses applicators under the Texas Pesticide Control Act and works with farmers to assure proper disposal of small quantities of these wastes. Evaporative ponds have been designed for the purpose of treating pesticide residues resulting from tank cleaning.

The TDWR and the TDA have concurrent jurisdiction for the disposal of pesticide wastes, and will need to work together to develop compatible regulations for the general disposal of these wastes.

b. Mining Wastes

Mining wastes result from the extraction of material deposits on or below the ground. In Texas most mining wastes result from the extraction of lignite, uranium, oil, and natural gas.

Coal and lignite mining operations are generally regulated by the Texas Railroad Commission under the Texas Surface Coal Mining Control and Reclamation Act (Article 5920 V.A.T.S.). The Railroad Commission has developed regulations for in-situ and surface coal mining operations under this Act. According to a Memorandum of Understanding between the TDWR and Texas Railroad Commission, the Texas Department of Water Resources will coordinate regulation by reviewing surface mining permits for water quality considerations.

Wastes resulting from the exploration and development of oil, natural gas and geothermal energy resources are the responsibility of the Texas Railroad Commission and are regulated pursuant to the Texas Water Quality Act, Section 26.131. The TDWR controls those wastes resulting from the refining of oil and natural gas according to the provisions of the Texas Solid Waste Disposal Act and the Texas Water Quality Act.

In-situ uranium mining operations are permitted by the TDWR under the Texas Water Quality Act and the Texas Disposal Well Act. Uranium surface mining operations are regulated pursuant to the Texas Natural Resources Code (131).

With the interest in new sources of energy and the rapid development of geothermal, lignite and uranium resources, the agencies with jurisdiction over these operations should coordinate their regulatory efforts in order to prevent environmental problems which may result during the further development of these industries.

c. Manufacturing Wastes

Wastes resulting from Texas's manufacturing activities include an enormous variety of materials which range from paper used in product packaging to complex chemicals, both solids and liquids.

Table II indicates the manufacturing sectors which will experience the most rapid growth in the future. The chemical, materials and energy producing industries will generate the largest quantities of waste, including a substantial amount of hazardous waste. Table IV indicates several products manufactured and the wastes that are generated as a result.

The wastes resulting from these products are varied in form and recoverability. Waste oils, solvents and some metals may be economically recovered, whereas many chemical compounds are not easily recovered. The recovery of industrial wastes is discussed further in Chapter III, Part E.

TDWR records indicate that the largest concentration of industrial waste generators is found in the metropolitan centers of Houston, Dallas and Fort Worth. Jefferson County (Beaumont-Port Arthur) is next in number of generators and there are fewer, yet still substantial numbers in Nueces County (Corpus Christi), and Bexar County (San Antonio). Manufacturing employment and waste generation generally follow these locational patterns with significant numbers in neighboring counties.

d. Miscellaneous Wastes of Special Interest

A number of waste types and sources are of special interest because of their quantity or degree of hazard. These include wastewater treatment sludge, air pollution control residuals, construction/demolition wastes, dredge materials and hazardous industrial wastes.

(1) Wastewater Treatment Sludge

Wastewater treatment sludge denotes those solids that are taken out of wastewater as it goes through a wastewater treatment system. The sludge accumulates as the wastewater is processed prior to discharge.

With the advent of stricter water quality controls, more and more sludge will be removed to clean up the State's water bodies. The problem of sludge disposal is becoming more serious.

TABLE IV
 PRODUCTS MANUFACTURED AND RESULTING WASTES

Plastics	Organic chlorine compounds
Pesticides	Organic chlorine compounds organic phosphate compounds
Medicines	Organic solvents and residues heavy metals
Paints	Heavy metals, pigments, solvents, organic residues
Oil, gasoline and other petroleum products	Oil, phenols, and other organic compounds, heavy metals ammonia, salts, acids, caustics
Metals	Heavy metals, fluorides, cyanides, acid and alkaline cleaners, solvents, pigments, abrasives, plating salts, oils, phenols
Leather	Heavy metals, organic solvents
Textiles	Heavy metals, dyes, organic chlorine compounds, solvents.

Source - U.S. Environmental Protection Agency

Sludge may be disposed of at a landfill or a lagoon; incinerated; spread on land or composted. The suitability of the disposal option will vary considerably from place to place. Lagoons have limited utility unless ample space and favorable conditions for evapotranspiration are present. Incinerators may face problems of air quality emissions standards. Land spreading and composting suffer from uncertainty about government regulations restricting the use of sludge on lands that may produce food-chain crops. Composting options are also complex because reliable, long-term markets for the compost must be found.

Sludge management almost always involves a landfill, either as a place for disposal or as a reserve facility for resource recovery. Disposal at landfills and land spreading are the most common disposal methods for sludge. Landfill owners and operators may not be willing to accept sludge because it requires special accommodations (to deal with the high water content, meet the needs of sludge trucks, etc.). Texas Department of Health regulations require that only sludges containing 10-100 percent solids may be accepted at municipal landfill facilities.

If sludge is not contaminated, it is valuable as a soil amendment. Contamination may be caused by pathogens, persistent organic compounds (pesticides and solvents) or trace inorganics (including heavy metals and trace elements). Current trends in contaminated sludge control emphasize caution to prevent contaminants from entering the food chain. Landfill disposal is the most common alternative in such cases.

In Texas wastewater treatment sludge from industrial facilities is regulated by the TDWR under two statutes. If the sludge is disposed of on-site it is regulated through water quality permits (NPDES). Hazardous industrial sludge waste that is shipped off-site for disposal is regulated under the Texas Solid Waste Disposal Act by the Solid Waste Section.

Municipal treatment sludge is regulated through water quality permits if it remains on-site. If shipped off-site, the Texas Department of Health solid waste regulations also govern municipal sludge disposal.

Regulations for sludge disposal and recovery are being developed by the U.S. Environmental Protection Agency simultaneously for both the Resource Conservation and Recovery Act and the Clean Water Act. The proposed regulations are scheduled for promulgation in December of 1980. Uncertainty about emerging federal sludge policy has forestalled growth in sludge management at the State and local levels of government.

Sludge is a solid waste and a water quality problem of growing seriousness. Properly managed, it offers good potential for recovery and re-use. So many factors influence decisions regarding the ultimate disposition of sludge that case-by-case decision making will probably continue to characterize sludge management in Texas at least until the federal guidelines are promulgated.

(2) Air Pollution Control Residuals

As Texas' air quality regulations are implemented large amounts of air pollution control residuals are created. Perhaps the largest single source is fly ash, bottom ash, and scrubber sludge from the combustion of coal and lignite. These materials form a concrete-like waste composed of (ash) silica, aluminum, lime, sulfur, and trace elements or (sludge) calcium, sulfur, carbon, and water. This relatively new component of the waste stream receives little attention, yet the magnitude of air pollution control residuals can be great, especially in a local setting. Fly ash and scrubber sludge may pose a serious threat to surface and ground water resources.

The coal fired power plants operating in Texas offer a glimpse at the solid waste implications of clean air. According to the Southwestern Public Service Company, each of the Company's coal fired units produced an estimated 15 tons/hour of ash. In 1979, the company sold or utilized all the ash produced for use in cement, concrete, highway construction, and soil stabilization. Sludge from sulfur removal processes may be used in plastics, as surface bonding material, for mortar and brick panels, in asphalt, and in sulfuric acid production. The Texas Department of Water Resources encourages the continued recovery of these wastes in a manner which observes sound waste management practices.

This practice indicates a promising utilization of ash and scrubber sludge for resource recovery purposes.

(3) Construction/Demolition Wastes

In developing urban areas, construction/demolition wastes are produced at a substantial rate. Typically, these wastes consist of large quantities of inert materials like broken concrete and asphalt, pipes, reinforcing metals, wood, roofing materials, dirt and so on. The majority of this waste is landfilled, with a portion dumped indiscriminately. Facilities designated as type IV by the Texas Department of Health accept only brush and construction or demolition wastes. Other facilities may also receive this type of waste material. Only a small portion is reused, although the potential exists for extensive recycling. There are precedents for success in this area. However, the pattern of disposal may continue even though landfill space is becoming scarcer and more costly.

(4) Dredge Materials

Texas harbors and waterways demand constant attention, which produces a significant amount of dredged material. When this waste material is disposed on land it can be considered to be industrial solid waste, however, dredging and filling activities are regulated under Section 404 of the Clean Water Act by the U.S. Army Corps of Engineers and the Environmental Protection Agency. The TDWR reviews 404 permit applications for water quality considerations, but has not regulated the disposal of dredge material in the past. Concern for water quality may result in more land disposal of dredged material. There are numerous schemes for beneficial uses of dredged materials but none are past the research and development stage in Texas.

(5) Hazardous Industrial Wastes

The Environmental Protection Agency has defined a hazardous waste as a solid waste that may cause or contribute to serious illness or death, or that poses a substantial threat to human health or the environment when improperly managed. Working from this definition, EPA has compiled and published a list of hazardous wastes and certain characteristics which may be used to determine whether a waste is hazardous.

The Texas Department of Water Resources has classified certain wastes as Class I due to their toxicity, corrosivity, flammability or explosive characteristics. Class I wastes are those wastes which may pose a substantial present or potential danger when improperly processed, stored, transported or disposed of. Class I industrial waste includes all hazardous industrial wastes and some which are non-hazardous. Since 1975, an increasing portion of the industrial solid waste management program has been devoted to the regulation of Class I industrial waste. This trend will continue as Texas assumes authorization of the Federal hazardous waste program under the Resource Conservation and Recovery Act (RCRA).

Over 10,000,000 metric tons of Class I industrial wastes are generated by Texas industry each year. Much of this waste is disposed of or processed on-site at industrial facilities. If it is transported off-site to be disposed or processed elsewhere, it must be manifested (accompanied by a shipping control ticket), so that safe and proper management can be monitored. This "cradle to grave" approach has existed in Texas since 1975.

With the implementation of RCRA, hazardous waste will continue to receive increasing attention in Texas and other states. Because Texas has operated an effective solid waste program for several years, the state is seeking authorization from EPA to operate a State hazardous waste program in lieu of the Federal program. In order to receive authorization the State program operated by the TDWR and the Texas Department of Health must be equivalent to the national program. Among other things, the State must have legislation and regulations that are no less stringent than the Federal standards, and the State must show that it has the resources to administer and enforce the program.

The State assumed phase one, interim authorization in December, 1980. Interim authorization may last for a period of two years, after the effective date of the Phase II regulations, during which time the program should be further developed to meet all authorization requirements.

e. State and Federal Laws and Agencies

Numerous state and federal statutes govern the management of solid wastes in Texas. The aforementioned wastes are governed by five state laws and five state agencies (Table V). Due to the number of laws and agencies involved in solid waste management, coordination between agencies is given careful consideration in Part F of this plan. Table VI indicates how different management methods are regulated in Texas.

TABLE V

SOLID WASTE MANAGEMENT STATUTES AND AGENCIES IN TEXAS
FOR DIFFERENT TYPES OF WASTE

Type of Waste	Federal Law and Agency		State Law	Regulatory Agency(s)
Industrial Solid Waste	RCRA SDWA	EPA EPA	TSWDA TDWA	TDWR, TDH TDWR
Agricultural Waste Livestock waste Farming waste Pesticide residues	CWA RCRA FIFRA RCRA	EPA EPA EPA EPA	TWQA TSWDA TSPCA TSWDA	TDWR TDWR TDA TDWR, TDH
Mining Waste Surface mining In-situ mining	RCRA SMCRA SDWA	EPA DOI EPA	TSWDA TSCMCRA TDWA TWQA	TDWR TRC, TDWR TDWR
Air Pollution Residuals	RCRA CAA	EPA EPA	TSWDA TCAA TWQA	TDWR TACB TDWR
Municipal Solid Waste	RCRA	EPA	TSWDA	TDH
Wastewater	CWA Sec.402	EPA	TWQA	TDWR TDH
Dredge material	CWA Sec.404	COE EPA		TDWR 401 Certification Only
Chemical substances and mixtures	TSCA RCRA	EPA EPA	TWQA TSWDA	TDWR TDWR, TDH

TABLE V - LEGEND

Federal Laws	Federal Agencies	State Laws	State Agencies
CWA - Clean Water Act	EPA - U.S. Environmental Protection Agency	TSWDA - Texas Solid Waste Disposal Act	TDWR - Texas Department of Water Resources
SMCRA - Surface Mining Control and Reclamation Act	DOI - U.S. Department of the Interior	TWQA - Texas Water Quality Act	TDH - Texas Department of Health
SDWA - Safe Drinking Water Act	COE - U.S. Army Corps of Engineers	TSCMCRA - Texas Surface Coal Mining Control and Reclamation Act	TRC - Texas Railroad Commission
FIFRA - Federal Insecticide Fungicide & Rodenticide Act		TDWA - Texas Disposal Well Act	TDA - Texas Department of Agriculture
CAA - Clean Air Act		TCAA - Texas Clean Air Act	TACB - Texas Air Control Board
TSCA - Toxic Substances Control Act		TSPCA - Texas Structural Pesticide Control Act	
RCRA - Resource Conservation and Recovery Act			

TABLE VI

FEDERAL AND STATE STATUTES AND REGULATORY AGENCIES
FOR DIFFERENT MANAGEMENT METHODS

Management
Methods

Federal Laws

State Laws

Regulatory
Agency

Treatment, Storage and Disposal Facilities	RCRA	TSWD Act	TDWR TDH
Underground Injection	SDWA	TDWA TWQA	TDWR TRC
Ocean Disposal	MPRSA CWA-403		
Incinerators	RCRA CAA	TSWDA TCAA	TDWR TDH TACB
Resource Recovery	RCRA	TSWDA	TDWR TDH

Resource Conservation
and Recovery Act

Texas Solid Waste
Disposal Act

Texas Department
of Water Resources

Safe Drinking Water
Act

Texas Disposal
Well Act

Texas Department
of Health

Marine Protection,
Research and
Sanctuaries Act

Texas Water
Quality Act

Texas Railroad
Commission

Clean Water Act

Texas Clean Air
Act

Texas Air Control
Board

Clean Air Act

B. THE REGULATORY CONTROL PROGRAM

The regulatory program of the Texas Department of Water Resources includes the control of waste disposition and the control of facilities which store, process, and dispose of industrial solid waste.

The control system begins with the notification requirement for industrial waste generators and their registration with the department. Waste materials which are classified as Class I or hazardous must be manifested (accompanied by a shipping control ticket), assuring delivery to an authorized facility. This "cradle-to-grave" monitoring system has existed in Texas since 1975, and includes reporting and manifest requirements for generators, transporters, and receivers of Class I and hazardous industrial solid waste.

This section describes the elements of the regulatory program and summarizes the requirements for those who manage hazardous industrial waste.

Generator Registration

Industries are required to notify the TDWR if they generate industrial solid wastes. The Department will register them if they generate Class I wastes, if they generate Class II wastes, employ more than 100 people and dispose of waste off-site; or if they have on-site storage, processing, or disposal facilities.

Registration is accomplished by completing a solid waste management inventory form which tells the Department the location of the generating facility, the owner or operator, a general description of products manufactured, and information concerning waste composition and waste management methods. At this time the industrial solid wastes are classified and waste code numbers are assigned. A notice of registration will be sent to the generator along with his solid waste registration number.

The generator has a continuing responsibility to provide TDWR with written notice of any changes in waste management. Waste management is reviewed by the TDWR staff for each facility for compliance with the Rules of the TDWR and the provisions of the Texas Solid Waste Disposal Act.

The information collected from generators provides a data base for solid waste management planning, especially in assessing facility needs and predicting amount of wastes generated.

Waste Classification

Each generator of industrial solid waste provides a description of his wastes to the Department so that each waste may be evaluated and classified according to its degree of hazard and so that the waste may be disposed of or treated in an appropriate facility. The waste classification system is based on the possible adverse impact a waste may have to people or the environment. There are four classifications of industrial solid waste: Class I (Hazardous), Class I (Non-Hazardous), Class II, and Class III.

TDWR technical guideline number one specifies the criteria for classifying a waste as class I: the waste is a hazardous waste (as defined by E.P.A. 40 CFR, Part 260.10), the waste has an oral (LD₅₀) toxicity for rats of less than 500 mg/kg, a dermal (LD₅₀) toxicity for rabbits of less than 200 mg/kg, or an inhalation (LC₅₀) toxicity of less than 100 mg/l.

The criteria for classifying a waste as class three: A liquid fraction of waste or leachate does not contain any component in excess of the National interim drinking water standards set by the U.S. EPA for that component. The waste is inert and essentially insoluble.

The criteria for classifying a waste as class two: the waste is not a class one or class three waste.

A hazardous industrial waste is any industrial solid waste or combination thereof identified or listed by the Administrator of the U.S. Environmental Protection Agency pursuant to Section 3001 of the Resource Conservation and Recovery Act of 1976. (All hazardous wastes are Class I industrial wastes).

1. Waste Disposition Control

Assuring the safe transport of hazardous waste is a major part of the TDWR program for managing hazardous waste. This is accomplished through the use of manifest and reporting requirements.

a. Shipping Control

Regulations are in effect which require generators, transporters and facility operators of Class I and hazardous waste to complete a shipping control ticket (manifest) for off-site shipments to assure that these wastes are delivered to authorized facilities. Minor changes to existing regulations have been adopted to ensure that the State shipping control system requirements are substantially equivalent with the elements of the federal manifest system. TDWR Rules require the shipping ticket to contain the following information:

- A shipping ticket document number;
- The name, mailing address, telephone number and EPA identification number of the generator, each carrier, and the authorized facility designated to receive the waste;
- A description of the waste in accordance with regulations of the U.S. Department of Transportation;
- The total quantity of waste by weight or volume, and the number of containers; and
- Handwritten signatures of the generator, carrier(s) and receiving facility operator, and dates of delivery.

Regulations also encompass water and rail (bulk shipment) and international shipment procedures.

Generators, carriers and facility operators are required to keep completed shipping tickets for three (3) years after the date of shipment. Generators and facility owners and operators are also required to prepare and submit to the TDWR monthly reports of the quantity and description of wastes shipped and received, respectively.

The Enforcement and Field Operations Division utilizes computer programs to assist in monitoring compliance with hazardous waste manifest and reporting requirements. The Division audits company records if reporting violations are detected and identifies hazardous waste shipments that may have not been delivered to the designated facility. The system rules also require the generator to report possible undelivered shipments.

To keep track of out-of-state shipments the department will enter into cooperative arrangements to accept manifest forms used by other states which operate an EPA authorized manifest system. The TDWR and TDH will coordinate with the Texas Railroad Commission and the Texas Department of Public Safety regarding transport activities which are subject to concurrent jurisdiction of the agencies.

b. Accidental Spills and Emergency Response

The State of Texas currently administers the "Oil and Hazardous Substances Spill Contingency Plan" to respond to accidents involving the discharge or spill of hazardous wastes. The purpose of this plan is to provide procedures for a coordinated response to spills or accidental discharges of oil or other hazardous materials into the waters or adjacent to the waters of the State by State agencies concerned with protection of the environment and the public health and welfare. It is also the purpose of this plan to outline methods by which such spills and discharges will be reported to State agencies having regulatory responsibility of the activities and/or facilities involved in spills or accidental discharges.

Most spills of hazardous waste occur on the site of a facility rather than during transport. Effective November 19, 1980, TDWR will require every hazardous waste facility to: (1) develop a contingency plan for effective action to minimize unanticipated damage from spills in the treatment, storage or disposal of hazardous waste; (2) meet requirements for preparedness and prevention measures to minimize the need for ever using the contingency plan, and (3) meet requirements for emergency response measures to be taken after situations in which a contingency plan is implemented.

c. Reporting Requirements

The Texas Department of Water Resources and the Texas Department of Health have reporting requirements for the handling of industrial and hazardous waste. These include monthly summaries, annual reports, exception reports, and unmanifested waste reports.

Generators which are shipping Class I and hazardous waste off-site are required to prepare and submit to the TDWR monthly reports of the quantity and description of wastes shipped and received. Generators who treat, store or dispose of Class I, Class II or hazardous waste on-site are not required to submit monthly reports but must submit annual reports, including quantities of waste disposed of, and closure and post-closure cost estimates. Generators of Class II waste shipped off-site must also report annually. Additionally, off-site commercial facility owners/operators must submit an annual report which includes closure and post-closure cost estimates.

2. Facility Control

Regulatory control of industrial solid waste management facilities includes the permitting or authorization of facilities, the assurance that sound management methods are utilized, and the requirements for closure and post-closure care. The issue of facility siting and the need for hazardous waste management facilities are also examined in this section.

a. Existing Facilities and Future Needs

Texas has approximately 900 industrial solid waste management facilities, 875 are registered on-site facilities and 23 are permitted commercial (off-site) facilities. Table VII summarizes the type and classification of existing facilities. The most widespread type of disposal facility is the landfill, while surface impoundments are also utilized to a great extent for treatment and disposal.

In 1980 there were 23 authorized commercial waste management facilities in Texas. These facilities receive approximately 10% of the industrial waste (reported) generated in Texas. A majority of these facilities are located in the Texas coastal region near the petrochemical complexes of Houston, Port Arthur, and Corpus Christi (See map and Table VIII). While these areas have adequate management capacity, other industrial areas (notably in North, Central, and West Texas) are not well served by commercial facilities. Industries in these areas must either dispose of their Class I wastes on-site or transport them to other parts of the state.

With stricter controls on industrial and hazardous waste, it is anticipated that the problem of disposal site availability may worsen. The new RCRA regulations will dramatically increase the demand for proper disposal sites and may result in the

TABLE 7

TDWR Registered On-site Industrial Solid Waste Facilities

Facility Type	Class I	Class II	Class III	Total
Surface Impoundments	252	71	25	348
Landfills	213	112	51	376
Landfarms	51	22	4	77
Storage				
Tanks	277	24		251
Drums	205	10	2	217
Bulk	39	13	8	60
Incinerators	46	33		79
Other (including injection well)	29	1	3	33
Total	1062	286	93	1441
Companies w/facilities	633	118	17	768

Authorized Commercial Industrial Solid Waste Sites
July 1980

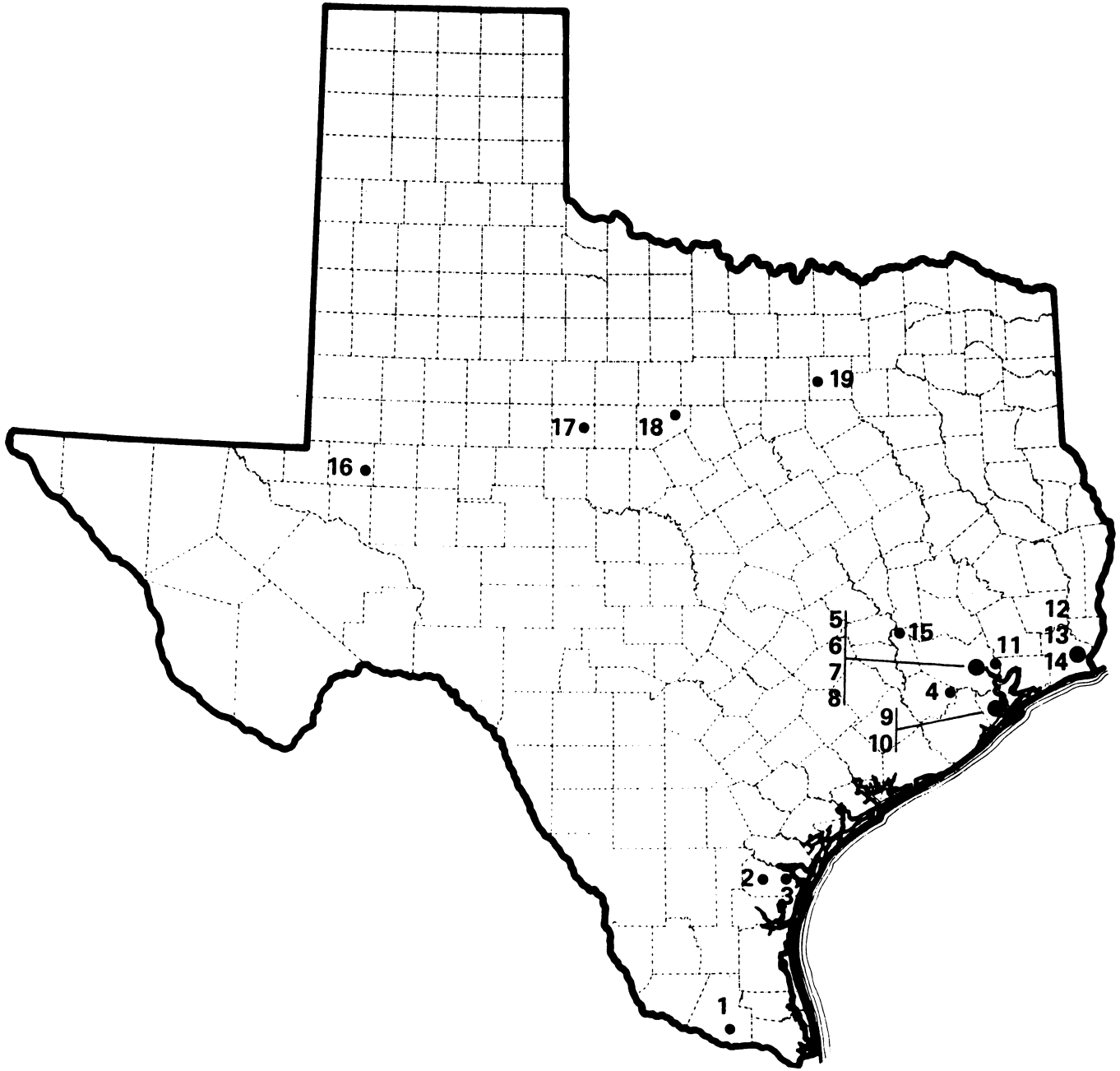


TABLE VIII

AUTHORIZED COMMERCIAL INDUSTRIAL WASTE
MANAGEMENT FACILITIES*

COMPANY NAME	CLASSIFICATION	SITE LOCATION COUNTY, CITY	MANAGEMENT METHOD	MATERIAL
1. R.E.Chastain	Class II	Hidalgo McAllen	Landfill	Vegetables
2. Texas Ecologists, Inc	Class I	Nueces Robstown	Landfill	Oils, Chemicals
3. Waste Management, Inc.	Class I	Nueces Corpus Christi	Reclamation Evaporation Disposal Well	Oil, Emulsion Wastewater
4. Force Oil & Vacuum Truck Company	Class I	Brazoria Arcola	Reclamation Evaporation	Oil, Emulsion
5. Eltex Chemical and Supply Co.	Class I	Harris Houston	Reclamation Temporary Storage	Solvents
6. James C. McDonald	Class II	Harris Houston	Landfill	Concrete, slag, glass, iron, wood, paper
7. Gulf Metals Industries	Class III	Harris Houston	Landfill	Miscellaneous
8. Rollins Environmental Services	Class I	Harris Deer Park	Incineration Landfill Treatment	Petro-chemical wastes
9. Gulf Coast Waste Disposal Authority	Class I	Galveston Texas City	Landfill Landfarm	Miscellaneous
10. Malone Service Company	Class I	Galveston Texas City	Reclamation Disposal Well	Oil and chemical wastes

TABLE VIII
(continued)

COMPANY NAME	CLASSIFICATION	SITE LOCATION COUNTY, CITY	MANAGEMENT METHOD	MATERIAL
11. Liberty Waste Disposal	Class II	Harris Baytown	Landfill	Waste oils, oily sludges
12. Browning-Ferris/Renner	Class I	Jefferson Port Arthur	Reclamation Landfill	Oil and Miscellaneous
13. Chemical Waste Management	Class I, II	Jefferson Port Arthur	Landfill	Miscellaneous trash & chemicals
14. Chemical Waste Management	Inactive	Jefferson Port Arthur	Landfarm	Wastewater treatment sludges
15. Sheridan Disposal Service	Class I	Waller Hempstead	Incineration	Oil sludges
16. Browning-Ferris Chaparral Disposal Site	Class I	Odessa Odessa	Disposal Well	Organic/inorganic compounds
17. Materials Recovery Enterprises	Class I	Taylor Abilene	Storage, treatment, recovery, disposal	Metal finishing wastes
18. Sonics, Intl.	Class I	Eastland Ranger	Disposal Well	Chemical/solvent oils
19. Chemical Waste Management	Class I	Dallas Dallas	Storage/transfer	All Class I material

* This list is informational in nature and does not indicate the compliance status or operational status of these facilities.

closing of a number of marginal sites in Texas. This problem may be compounded since facility sponsors are finding it increasingly difficult to site and operate hazardous waste management facilities. The principle reason for this is public opposition. The increase in public opposition can be traced to national publicity which has focused primarily on the disastrous results of improper management of hazardous wastes.

The U.S. Environmental Protection Agency has estimated that nationwide there will be an increased demand for 50 to 125 new off-site facilities. About 60 percent of these facilities are expected to be treatment facilities with the remainder divided between landfills and incinerators. Capacity needs will differ by region of the country, with the greatest capacity shortages expected in the northeast, southeast, and midwest. Texas appears to have an adequate number of facilities at present, however, how long this will be the case, is uncertain. Without knowledge of facility capacities, remaining life, and the effect of new regulations on existing facilities it is difficult to determine facility needs in the near future. The TDWR has data on waste generation and disposal and is involved in several activities which will provide additional data to assess facility needs. The Department is beginning the process of permitting on-site hazardous waste management facilities. This process will provide information to the agency and the waste industry enabling them to assess the needs for off-site facilities.

In addition, the Department is involved in two surveys which will improve the quality of existing facilities. The Open Dump Inventory is an evaluation of active non-hazardous land disposal facilities which will determine whether these facilities are classified as sanitary landfills or "open dumps". If classified as an "open dump", the facility must be upgraded or closed within 5 years of classification. The Imminent Hazard Survey is an examination of active and inactive hazardous waste disposal facilities which may pose a threat to the public health or the environment. These surveys will enable the Department to improve the quality of existing facilities and to help determine the need for adequate facilities which meet the standards called for in the TDWR Rules and RCRA regulations.

The TDWR should analyze its data and identify regions which may require new capacity development. This information would encourage initiatives by the private sector in order to meet the identified facility needs.

b. Facility Siting

The issue of facility siting is a difficult and complex one, and Texas like other states is grappling with this problem. The TDWR believes that the State's efforts in governing establishment of sites should be based on two key principles:

A complete technical analysis of each proposed site is essential prior to its authorization.

The TDWR should require a siting analysis. This analysis should take into account both environmental effects (e.g. from the hydrology, geology, and ecology of the site) as well as factors based on proximity and relation of the facility to residences and institutions). The TDWR has developed technical guidelines to be used in site selection and evaluation. TDWR Solid Waste Technical Guideline No. 2, could be updated and revised with many alterations. In addition, the TDWR should await promulgation of federal siting criteria for solid waste management facilities and consider incorporating site location standards into enforceable Department Rules.

The permitting and site selection process should be accompanied by full public participation.

This involvement should include public information activities on the part of the applicant to thoroughly explain to concerned citizens and other interested parties the objectives and technical aspects of a proposed facility. The public needs to become a knowledgeable partner in site selection decisions.

In a significant case, Starr County v. Starr Industrial Services, Inc., 584 SW 2d 352, the Texas Supreme Court ruled that "nowhere in the Texas Solid Waste Disposal Act is local opposition mentioned for consideration as a standard to govern the [State's] decision [regarding the issuance of a permit]. Such opposition, standing alone, should have no part in the [State's] decision making process". While local opposition cannot be ignored, it is imperative that the State base its decision on technical considerations of the proposed site.

The TDWR believes that these principles will provide the cornerstones for a comprehensive and technically sound program for facility siting.

c. Environmentally Sound Waste Management Methods

Industry and government have made considerable progress in developing new, economically feasible and environmentally acceptable methods of waste treatment and disposal. Texas industry, in particular, has experimented with new solid waste technologies, however some industrial wastes are still disposed of in an environmentally unsound manner. Although new technologies exist for proper management, some have not been widely used because of their higher costs and because there has been no legal requirement for their use. As new federal and State standards are developed for the design and construction of management facilities, the threat posed by poor practices will diminish. The TDWR plans to adopt EPA's Phase II hazardous waste facility design standards and incorporate these and standards for non-hazardous waste facilities into Department Rules.

Proper management means more than just careful disposal. It means consideration of a range of options that depend upon such factors as characteristics, volume and location of the waste. In order of priority, the desired options for managing industrial solid waste are:

- minimize the amounts generated by efficient operation and modification of the industrial process involved;
- transfer the waste to another industry that can use it;
- reprocess the waste to recover energy or reclaim materials;
- separate hazardous from nonhazardous waste at the source;
- total destruction (e.g. incineration) of the hazardous characteristics;
- treat the waste to reduce hazardous properties, reduce volume, or improve handling characteristics; and
- dispose of the waste in an authorized facility (one that is located, designed, operated, and monitored-even after closure-in a manner that protects life and the environment).

The TDWR has developed technical guidelines which outline recommended technical standards for various methods of industrial waste storage and disposal. This section summarizes existing management methods and technical guidelines for each method.

(1) Landfills

Despite recent innovations, the practice of landfilling is still the most widely practiced method of industrial solid waste disposal today. The TDWR views landfilling as a permanent action, and as such, it should preclude on a permanent basis, adverse environmental effects. A landfill may provide containment and protection from wastes on a permanent basis if properly designed, constructed, and operated. However, failures may occur due to non-compliance with permit design and operational requirements or unintentional damage to barriers which are relied upon for waste containment.

Hazardous waste (or Class I) landfills, ideally are located and constructed to securely contain waste materials indefinitely so that they pose no threat to population or the environment. Unfortunately, the security of a waste that is disposed of in a landfill cannot be indefinitely maintained. An uncontrolled release of pollutants from a landfill via migration is a possibility. One method for reducing this threat to the environment is to restrict certain hazardous wastes from

landfills unless the waste has been satisfactorily treated or stabilized prior to burial. Certain waste characteristics may indicate that a waste is not suitable for land disposal without treatment. These characteristics may include the waste's toxicity, mobility, non-degradability, flammability or reactivity.

Another method for reducing the threat to the environment is to segregate incompatible wastes within the landfill. For example, acids may solubilize and thus mobilize some heavy metals, therefore these two wastes should be segregated. The TDWR technical guideline number nine identifies other incompatible wastes.

In the past, landfills have offered a relatively inexpensive method of disposal, however new operational and design standards to safeguard the environment will increase costs significantly. The TDWR is aware that the burial of wastes is necessary for the disposal of some industrial solid waste, however, it should continue only if the operation is in accordance with Department rules.

(2) Land Treatment

Land treatment (also known as landfarming or land spreading) is a relatively new waste management practice in which waste materials (usually sludges and slurries) are applied to the land surface or incorporated into the soil. This practice utilizes the physical, chemical and biological capabilities of the soil-plant system to serve as the ultimate receiver of wastes and inactive contaminants. Operators of land treatment facilities generally apply the waste in thin layers and use common farm practices such as tilling, contouring, and erosion control techniques. They may also add nitrogen and phosphorus fertilizers to enhance the microbial degradation of organic waste constituents.

The rate that the soil-plant system can assimilate waste materials varies considerably and therefore, land treatment requires careful planning and management to avoid adverse impacts on the environment. Land treatment is used extensively by the petroleum industry to treat oily wastes, and may be feasible for other types of wastes. Land treatment is generally not recommended for: (1) flammable wastes, (2) radioactive wastes, (3) wastes which are highly toxic and persistent in the soil (certain pesticides, PCBs); and (4) highly volatile wastes which would result in degradation of air quality. Hazardous waste regulations should require that land treatment facilities demonstrate that biological, physical, or chemical reactions in the soil will make the waste less hazardous or non-hazardous.

The TDWR views land treatment as a permanent action, and as such, it should preclude on a permanent basis, adverse environmental effects.

(3) Incineration

Incineration is a relatively well-developed and well-understood technology. It involves the thermal conversion of the combustible components of wastes to carbon dioxide, water and non-combustible residues. Properly executed, it can accomplish safe destruction of primarily organic hazardous compounds, permanently reducing large volumes of waste materials to non-toxic gaseous emissions and small amounts of ash and other residues. Incineration can often provide an optimum, permanent solution to hazardous waste management with minimum long-term ecological burden.

Incineration processes include stationary hearth incinerators, multiple hearth furnaces, rotary kilns, fluidized bed reactors, open pit incinerators and conical burners. The type of incinerator chosen to dispose of a particular waste material is primarily dependent on the characteristics of the wastes. Physical characteristics to be considered include the physical state of the material, solids content, combustibles content, and ease of handling. Chemical characteristics to be considered include heat value, content, reactivity with other materials, temperature required for adequate burning, and products of combustion.

Capital, operation, and maintenance costs for incinerators are high compared with other forms of disposal and the potential for air pollution may be a problem. Owners of hazardous waste incinerators require permits from the TDWR and the Texas Air Control Board which regulates these facilities under the Texas Clean Air Act.

In practice, the primary benefits of incineration are (1) reducing the volume of wastes requiring ultimate disposal, (2) destruction of hazardous properties, and (3) the generation of steam energy from the combustion of wastes.

(4) Surface Impoundments

Surface impoundments, also known as pits, ponds and lagoons, are often used to treat, store, or dispose of many different types of waste. Impoundments serve many basic purposes, including: (1) settling and removal of suspended solids; (2) storage or impoundment of settled solids, (3) aeration; (4) equalization; (5) neutralization; (6) biological treatment; and (7) treatment through evaporation.

The relative simplicity and low operating costs of an impoundment have made it the preferred technology for industrial wastewater handling, treatment, and disposal in most instances where it can be utilized. Impoundments are designed to hold an accumulation of liquid wastes and wastes containing free liquids. Some are lined with clay or synthetic materials to reduce or eliminate leakage to ground water. Leakage to ground water poses the most serious threat to human health and the environment, but the air emissions threat to human health from volatile wastes and overtopping of the impoundment as a result of precipitation or overfilling can also create serious problems. Discharges to surface water from impoundments are subject to control under the Clean Water Act (NPDES program). When ultimately used for disposal of accumulated waste, surface impoundments are considered by TDWR as landfills.

The potential for pollution depends on: (1) the composition and reactivity of the waste material; (2) the physical state or form of the wastes; (3) the geological and hydrological conditions at the site; and (4) construction, operation and maintenance of the facility. Further technical information is available in the TDWR technical guideline number 4 and in 40 CFR, Part 265, Subpart K.

d. Closure and Post-Closure Care

Past improper disposal methods have created concern that hazardous waste may come back to haunt those who have not properly closed their facilities. Stiff new requirements for closure and post-closure care will minimize such threats to the environment.

(1) Closure

TDWR rules require owners or operators of hazardous waste disposal facilities to close their facilities in a manner that: (1) minimizes the need for further maintenance; and (2) controls the post-closure escape of hazardous waste, leachate or contaminated rainfall. Additionally, owners or operators must have a written closure plan which identifies the steps necessary to close the facility at any point during its intended life. The closure plan is to be submitted to the Executive Director of the TDWR at least 180 days prior to the expected date of closure. The plan must be amended any time changes in the operating plans or facility design affect the closure plan.

(2) Post-Closure Care

Post-closure care may consist of: (1) ground-water monitoring and reporting requirements, and (2) maintenance of monitoring and waste containment systems. Owners or operators must provide a post-closure plan which will cover the 30 years after the date of completing closure. Additionally, they must submit to the County Clerk prior to commencing land disposal operations a survey plat indicating the locations and dimensions of disposal areas. This serves as a notation on the deed to the facility property that will in perpetuity notify any potential purchaser that the land has been used to dispose of hazardous waste. The post-closure use of property must never be allowed to disturb the integrity of the final cover, liner or any other components of any waste containment system.

(3) Financial Requirements

TDWR rules require owners or operators of hazardous waste management facilities to provide a written estimate of: (1) the cost of properly closing a permitted facility (on November 19 of each year, this cost must be adjusted to account for inflation; and (2) the annual cost of post-closure monitoring and maintenance of the facility. Additionally, owners or operators of permitted facilities must obtain a surety bond or other financial assurance to close the disposal facility in accordance with the closure plan.

(4) Perpetual Care Fund

In response to the need for minimizing the potential hazards of land disposal facilities, the Texas Senate during the 65th Legislature, adopted resolution 471 pertaining to "an assessment of the need to create a perpetual care fund to insure that (industrial waste disposal) sites can be properly maintained in an equitable fashion without placing an undue burden on the tax payers of the State of Texas".

The Senate Resolution directed that the Texas Coastal and Marine Council, in cooperation with the TDWR and the Gulf Coast Waste Disposal Authority undertake this assessment and present a report to the 66th Legislature.

The report made the following conclusions:

"The current statutory authority and the TDWR regulatory program for industrial solid waste management appear adequate with respect to environmental protection from waste management activities undertaken since the passage of the Texas Solid Waste Disposal Act. However, State resources for correcting problems predating that Act, and correcting potential problems from present and future waste disposal activities are not available. The lack of such resources has severely limited the TDWR's ability to correct past problems and can be expected to hamper future efforts.

Experience and practicality suggest that ultimate responsibility for monitoring, control and future corrective actions rest with the State. The cost of both post-closure monitoring and correction of future environmental problems can be borne by waste generators and/or disposal site operators".

Based on the above conclusions, the report recommended that a fund be established for industrial solid waste disposal facilities by collecting fees from generators of industrial solid waste and operators of industrial solid waste disposal facilities. The stated purpose of the fund was to provide for post-closure monitoring of disposal facilities and correction of identified problems at such closed or abandoned facilities.

e. Permitting and Appellate Review Procedures for Industrial Solid Waste Management Facilities

Pursuant to the Texas Solid Waste Disposal Act (Article 4477-7, V.A.C.S.), as amended, and Rule 156.22 of the Texas Department of Water Resources, a permit is required for the off-site storage, processing and disposal of industrial solid waste, and for the on-site disposal of hazardous industrial waste. Hazardous industrial waste is defined in Department rules as "any industrial solid waste or combination of industrial solid wastes identified or listed as a hazardous waste by the Administrator of the United States Environmental Protection Agency pursuant to the Federal Solid Waste Disposal Act" (RCRA).

(1) Off-Site Facilities

The Department has implemented a permitting program for off-site storage, processing and disposal of industrial solid waste since the passage of the Texas Solid Waste Disposal Act in 1969. Department rules require the permit applicant for an off-site industrial solid waste management facility to meet the following requirements:

- Submit to the TDWR six (6) copies of the permit application on forms provided by or approved by the Executive Director and accompanied by a like number of copies of all required exhibits;
- Include plans and specifications detailing the construction, operation, staffing pattern and closure of the proposed facility;
- All engineering plans and specifications submitted with an application are to be prepared and sealed by a Registered Professional Engineer, with current registration provided by the Texas Engineering Practice Act; and
- Include any other information deemed necessary by the Executive Director to determine whether the proposed facility will comply with the requirements of Department Rules and the Texas Solid Waste Disposal Act.

The Department has developed technical guidelines which are available to the applicants to assist them in the development of facility design plans which will be consistent with the objectives of the Texas Solid Waste Disposal Act. These guidelines outline methods designed to aid in the prevention of conditions prohibited in Department rules. The Department intends to establish by rule technical standards, presently embodied in these guidelines, as necessary to meet interim and final status standards promulgated by the Environmental Protection Agency.

The Department routinely coordinates permit application activities. Pursuant to the Texas Solid Waste Disposal Act, copies of any applications are forwarded to the Texas Department of Health, the Texas Air Control Board, affected local governmental agencies, and the appropriate TDWR District Office. In this manner, full assurance that the proposed activities will meet the objectives of the Texas Solid Waste Disposal Act, public health and air quality statutes, and local ordinances, is achieved. Copies of hazardous waste applications will be sent to the U.S. E.P.A. for review.

The application and accompanying documents are reviewed and evaluated for adequacy by the Solid Waste Section of the Permits Division of the Department. If the application complies with all Department requirements, a fact sheet and a draft permit are prepared and submitted to the Texas Water Commission. In addition to specific requirements addressed by the Department's technical guidelines, the draft permit also includes closure and post-closure financial requirements.

A hearing before the Texas Water Commission or before a hearings examiner appointed by the Commission is required for all applications for off-site hazardous waste management facilities. Proper notice of a hearing is given to all affected parties. Hearings are conducted in accordance with the rules of the Commission, Section 4(e) of the Texas Solid Waste Disposal Act, and the requirements of the Administrative Procedure Act (Article 6252-13a). Decisions are rendered by the Commission upon conclusion of the hearings and a review of the factual and legal issues presented.

Under Section 16 of the Administration Procedure Act and the rules of the Texas Water Commission, a motion for rehearing, filed within 15 days after the date of rendition of a final decision or order, is a prerequisite to an appeal. A decision or order of the Commission becomes final and appealable on the date of rendition of the order overruling the motion for rehearing or on the date the motion is overruled by operation of law. Under the Texas Solid Waste Disposal Act, Article 4447-7, Section 9, V.A.C.S., a person affected by any ruling, order, or decisions of the Department of Water Resources may appeal by filing a petition in a District Court of Travis County within

30 days after the date of the ruling, order, or decision complained of. In an appeal from an action by the Department, the issue is whether the action is invalid, arbitrary or not reasonably supported by substantial evidence.

(2) On-site Facilities

The promulgation of the Environmental Protection Agency's hazardous waste regulations on May 19, 1980, activated State statutory requirements for on-site hazardous waste storage, processing, and disposal facility permits. Any person who has commenced on-site storage, processing or disposal of hazardous waste on or before May 19, 1980, and who has filed a hazardous waste permit application on or before August 17, 1980, in accordance with applicable rules and regulations, may continue to operate the facility until such time as the TDWR approves or denies the application.

The Texas Water Development Board adopted emergency rules in June, 1980 to implement the statutory requirements for on-site hazardous waste management facility permits. In addition, rules have been adopted by the Board which will include all interim standards necessary for facilities to continue operation. These standards include general requirements concerning waste analysis, security, inspection, personnel and specific requirements for various types of management facilities.

Applications for existing on-site facilities must contain the following information:

- Name of the facility owner/operator;
- Description of the site;
- Description of the facility and all facility components;
- Identification of wastes generated, stored, processed or disposed, together with quantities and sources; and
- Methods and types of operations used in the storage, processing, or disposal of wastes.

In addition, a complete application must be submitted at a future date to be specified by the Department which must include:

- Engineering plans and specifications and other documentation necessary to demonstrate that all components of the facility design, construction and operation conform to Department standards; and
- Information describing actions necessary to bring existing facilities into compliance with Department standards and a schedule for completion of such action. The Executive Director may also require financial assurances applicable to the cost of closing the facility.

Applicants for on-site hazardous waste management facilities will be subject to generally the same type of permitting procedures as have been implemented by the Department for off-site facilities. Under Chapter 4(f)(2) of the Act, a public hearing is required upon the motion of the Department or the request of a person affected. This opportunity for a public hearing is equivalent to the federal regulatory procedure.

The permitting of new and existing on-site facilities will not actually begin until 6 months after EPA promulgates Phase II regulations. These regulations include standards for facility design and construction and will become effective 6 months after promulgation probably in May of 1981.

f. Classification of Non-hazardous Solid Waste Disposal Facilities

The Texas Department of Water Resources is currently involved in an inventory and evaluation of non-hazardous industrial waste disposal facilities. Federal regulations call for all states to conduct this Open Dump Inventory according to eight criteria developed by the U.S. EPA, (40 CFR, Part 257). Those facilities which do not meet the standards will be listed as open dumps by the TDWR and must be either upgraded or closed. The TDWR will submit its list of open dumps to EPA by October 1st of each year and this list will be published in the Federal Register.

The eight major criteria used to evaluate disposal facilities include floodplain, endangered species, surface water, ground water, food chain crops, air, disease, and safety considerations.

1. Floodplains - Solid waste disposal activities may not restrict the base flood (a 1 percent chance flood), reduce the water storage capacity, or wash out solid waste so as to pose a hazard to human life, wildlife or land and water resources.
2. Endangered species - Disposal activities may not cause or contribute to the "taking" of endangered or threatened species.
3. Surface water - All point discharges of pollutants must be in compliance with Section 402 of the federal Clean Water Act, and the facility must be located and operated in such a manner as to comply with approved Section 208 water quality plans.
4. Ground water - This criterion protects underground drinking water sources beyond the solid waste boundary. Contamination resulting from leachate formation and dispersion, can cause concentrations of certain pollutants in ground water to exceed specific contaminant levels. The pollutants and maximum concentrations levels are those specified in the national interim drinking water regulations.

5. Food chain crops - This criterion applies only to solid waste activities involving the application of solid waste as a fertilizer or soil conditioner to lands producing food chain crops. It establishes levels and application rates for wastes containing cadmium or PCBs.
6. Air - Open burning and violations of the State Implementation Plan (Clean Air Act) are banned.
7. Disease - This criterion provides protection from disease vectors associated with solid waste activities. Daily cover and "other techniques as appropriate" are required for the control of on-site population of disease vectors, such as rodents, flies, and mosquitoes.
8. Safety - The safety criteria include explosive gases, fires, bird hazards to aircraft, and site access provisions.

The State has approximately 250 industrial waste disposal sites to evaluate according to the aforementioned criteria. The TDWR plans to phase the Open Dump Inventory over a period of 5 years. During fiscal year 1980, fifteen facilities were evaluated for compliance with the "Criteria for Classification of Solid Waste Disposal Facilities and Practices". In 1981 the Department will inspect an additional 48 facilities and complete classification of 20 of those facilities.

The Department has considered three parameters in setting priorities for the inventory: the degree of hazard posed, the type of facility, and the size of the company and facility. The procedure for conducting the Open Dump Inventory was developed by the Department's Solid Waste Section and the Industrial Compliance Unit. The Department first determines which facilities are subject to evaluation. Facility design data is requested and an inspection made to determine whether a facility complies with the appropriate state and federal criteria. The Industrial Compliance Unit notifies the facility operator that the facility is compliant or non-compliant by letter. For facilities which are determined to be non-compliant, the letter will detail the inadequacies. If the facility is found inadequate and therefore classified as an open dump, the operator will have 15 days in which to contact the Department for a classification change determination. Failure to show satisfactory evidence for such a change will result in a request by the Department to the operator to submit either an upgrade or closure plan.

Upgrade or closure plans will be incorporated into agency enforcement procedures. The TDWR district offices will monitor the implementation of the plans. The Department will notify the facility owner when compliance is achieved. Those facilities still found to be non-compliant will be subject to further enforcement action to achieve compliance.

3. Compliance Monitoring and Enforcement Program

The compliance monitoring program of the TDWR is accomplished through inspections and surveillance of the activities of generators, transporters and receivers of industrial solid waste. A major objective is to obtain and maintain compliance with permits, orders and directives issued by the Texas Water Commission and the Executive Director in accordance with the TDWR Industrial Solid Waste Management Rules. This objective is accomplished by conducting inspections of solid waste management facilities; investigating unauthorized discharges and unauthorized facilities, and responding to citizen complaints.

Coordinating inspections and investigation activities relative to requirements imposed by the Open Dump Inventory, Imminent Hazard Survey and citizen complaints, is facilitated by centralizing the responsibility within the Enforcement and Field Operations Division. This centralized effort enhances operational efficiency and enables facilities evaluated under inappropriate guidelines to be expeditiously reassigned and evaluated according to more applicable criteria.

A designated non-hazardous waste disposal facility subject to evaluation under the Open Dump Inventory guidelines and found to contain hazardous waste materials is re-evaluated according to Imminent Hazard Survey criteria and vice-versa.

a. Inspections

Pursuant to Section 7 of the Texas Solid Waste Disposal Act, authorized agents of the TDWR and local governments have the right of entry to property for the purpose of inspecting and investigating conditions relating to solid waste management and control. Compliance inspections are conducted on all major facilities by district representatives on at least an annual basis. The accuracy of self-reporting data and solid waste inventory data will be verified at the time of inspection for all permit holders and "interim status" facilities, (facilities in existence prior to May 19 which have applied for, but not yet received a permit). The adequacy of sampling and monitoring procedures used by facility owners and operators will be reinspected as each situation requires. The inspection of non-major facilities will be conducted on a less frequent basis, such as once every two years. The agency will compile a list of all hazardous waste management facilities subject to permit requirements.

In order to maintain a viable compliance monitoring program, a Compliance Monitoring Management System is being developed by the Enforcement and Field Operations Division. This system will include the use of computerized programs for data storage, analysis and retrieval in conjunction with the established inspection activities. Additionally, a quality assurance program plan will be prepared and implemented to assure the generation of reliable data by all monitoring and measurement activities, including data collection and laboratory analyses.

b. Enforcement, Penalties and Public Participation

In cases of non-compliance, the Department has enforcement procedures which include enforcement letters, compliance conferences, citations and the initiation of formal enforcement proceedings pursuant to Section 8 of the Texas Solid Waste Disposal Act. Prosecution of a civil suit under this statute may be referred to the State Attorney General in order to seek injunctive relief and/or civil penalties.

Texas law differs radically from federal laws with regard to penalties for hazardous waste violations. The state law provides for a maximum civil penalty of 1000 dollars for each day of violation and makes no provision for criminal penalties.

The federal Act provides for a maximum civil penalty of 25,000 dollars for each day of violation and a maximum criminal penalty of 25,000 dollars for each day of violation and one year imprisonment. The TDWR in conjunction with the Texas Department of Health, has drafted proposed legislation to amend the Texas Solid Waste Disposal Act to provide statutory equivalence with federal requirements. The proposed legislation provides for equivalent criminal and civil penalties, and authority for mandatory and prohibitory emergency orders.

All citizen complaints filed with the TDWR are investigated timely and thoroughly. Citizen complaints will be responded to by attempting to establish telephone contact with the complainant within 48 hours of the receipt of the complaint, and concurrently beginning whatever records review is necessary. Upon completion of the investigation (s), the complainant is informed of the findings, and the ultimate resolution of the problem.

The State Attorney General will not oppose intervention by any citizen where it is authorized by statute, rule, or regulation into any civil suit involving the State of Texas relating to a hazardous waste violation of the Solid Waste Disposal Act. In addition the Attorney General will publish and provide at least 30 days for public comment on any proposed settlement of a State enforcement action.

c. Imminent Hazard Survey

Pursuant to Section 7003 of RCRA, the U.S. EPA has developed procedures to mitigate problems associated with solid waste disposal which pose an imminent hazard to public health or the environment. As a result of increasing discovery and reporting of serious health hazards and environmental damage resulting from current and past improper chemical waste disposal practices, the State and EPA have placed a high priority in locating and securing all waste disposal facilities which pose imminent hazards.

As part of the TDWR's FY 80 work program funded under RCRA, the TDWR has budgeted over \$500,000 to identify, evaluate, and begin to secure all industrial solid waste disposal facilities in the State which may endanger the public health, property, or the environment.

The first step in the survey was to develop a list of potential problem sites. The list was divided between the EPA Region 6 office and the Texas Department of Water Resources. Site log forms are used to track the status of all identified problem sites and facilities are prioritized according to potential hazard by review of department records and known information. Prioritization is based upon waste classifications, site sensitivity (proximity to housing and waterways), and site security (available information concerning the technical security of sites to contain waste).

This preliminary assessment determines whether a site inspection is necessary. District Office personnel conduct site inspections in order of the priority established and complete site survey forms. The Industrial Compliance Group of TDWR's Enforcement and Field Operations then make determinations of the long-term stability of subject sites by evaluating the collected data and initiating any necessary additional investigations or follow-up activities.

For those facilities determined to present imminent hazards, corrective action is initiated in those cases where there is a responsible party who can be required to correct the problem. In cases where the state of Texas is able to take expeditious and appropriate action to mitigate the hazards associated with a site, the U.S. Environmental Protection Agency will defer its lead in enforcement actions.

4. Summary of Requirements

Effective November 19, 1980 new rules for industrial solid waste management include requirements for generators and transporters, and owners and operators of industrial solid waste management facilities.

a. Generators

All waste generators who store, process or dispose of waste on-site are required to:

- keep records of industrial solid waste storage processing, and disposal activities;
- retain such records for a minimum of three years; and
- submit an annual or monthly summary of activities.

A generator of hazardous industrial waste must:

- determine if his waste is hazardous by consulting the lists of hazardous waste contained in 40 CFR part 261 or, if the waste is not listed, by testing it, using procedures specified in the part 261 regulations, to establish if it is ignitable, corrosive, reactive or toxic;
- obtain an EPA identification number from the TDWR;
- obtain a facility storage permit if waste is accumulated on the generator's property more than 90 days;
- use appropriate containers and label them properly for shipment;
- issue a manifest to control transport of all Class I industrial waste;
- follow manifest procedures to assure that the waste arrives at the designated facility; and
- submit a monthly summary of activities.

b. Transporters

Transporters of hazardous and Class I industrial solid waste are required to:

- obtain an EPA identification number from the TDWR;
- comply with manifest system requirements;
- deliver the entire quantity of the waste to the facility designated on the manifest;
- retain a copy of the manifest for 3 years;
- comply with the U.S. Department of Transportation regulations and the Texas Oil and Hazardous Substances Spill Contingency Plan pertaining to reporting of spills or discharges; and
- clean up any waste spilled or accidentally discharged during transport.

c. Facility Owners and Operators

Existing Department rules for owners and operators of industrial hazardous waste storage, processing and disposal facilities include:

- preparedness for and prevention of any occurrence which may endanger human health or the environment;

- contingency plans and emergency procedures;
- use of a shipping control ticket (manifest);
- record keeping and reporting procedures;
- ground water monitoring;
- closure and post-closure plans; and
- technical standards for containers, tanks, surface impoundments, waste piles, land treatment, landfills incinerators, thermal treatment and chemical physical and biological treatment.

Phase II hazardous waste regulations will be promulgated by the U.S. EPA in December, 1980. These regulations will encompass facility design and construction standards and permit requirements.

C. RESOURCE CONSERVATION AND RECOVERY

The reduction of waste and the recovery of industrial waste materials are major objectives of RCRA and the State Industrial Solid Waste Plan. Stringent regulations on industrial solid waste will serve as an economic incentive to reduce and recover waste rather than dispose of it. Any highly regulated waste stream will be expensive to justify, thus generators can save money by reducing the waste stream volume. As a result of inflation, scarcity of raw materials and more stringent regulations, recycling industries will develop during the 1980s for many materials which have been discarded in the past. Some organic chemicals (e.g. oils and solvents) and metals (aluminum and silver) are economically recoverable; however, feasibility of recovery will depend on purity of the waste, raw material prices, transportation costs, and other socio-economic factors. Table IX indicates common industrial wastes which are amenable to recovery.

Four elements constitute the core of an industrial waste conservation and recovery program:

(1) an adequate legislative base, (2) Department policies and actions which promote waste reduction, energy conservation and resource recovery, (3) a complete and current data base on industrial conservation and recovery activity within the state, (4) an active market assessment and development program.

1. Development of a Legislative Base

The development of a legislative base is an essential part of the State program. This process has two parts:

- (1) removal of existing State laws which prevent or impede resource conservation and recovery; and
- (2) enactment of new laws which promote and simplify resource conservation and recovery. These two objectives can be met through an analysis of existing laws, an effort to remove or amend barriers identified in the analysis, and finally, the development and introduction of any new legislation necessary to correct whatever gaps have been identified.

Legislative mandates (Texas Senate Bills 1076 and 1077) provide for funding of resource recovery systems by authorities or special districts. Passed during the 66th Legislative session, the bills are a first step in resource recovery financing for needy areas. Senate Bill 1077 allows Home Rule City Charter Provisions (e.g. Houston) to be overridden by waste recovery authorities for use of waste in energy or material recovery systems. This essentially complies with RCRA Section 4003(b) and 40 CFR Part 256.30(b), requirements of prohibiting long term contracts in waste stream supply. However, it was vetoed by the Governor because he felt that local taxpayers should have the opportunity to decide issues which may effect local government spending and especially those spending contracts which would increase taxation rates.

TABLE IX

COMMON INDUSTRIAL WASTES AMENABLE TO SALVAGE FOR RESOURCE RECOVERY

TYPE OF WASTE		Direct Recovery	Raw Materials Secondary Use	Energy Recovery	Use in Pollution Control	Little or Low Potential Recovery
INORGANIC	Acid Solution (No Contaminants)	x	x		x	
	Acid Solutions with Metals					
	Heavy Metals (except Cr)	x	x			
	Chromium	x				
	Noble Metals	x				
	Pickling Liquor	x	x		x	
	Acid Solutions with Organics					
	Emulsified Organics		x	x		
	Dissolved Organics	x	x			
	Acid Sludges					
	Inert Solids					x
	Solids with Metals	x				
	Organic Solids					x
	Acid Gases				x	
	Alkali Solutions with Metals	x	x		x	
Alkali Solutions with Organics	x	x	x			
Cyanide Solutions					x	
Cleaning Solutions					x	
Alkaline Sludges						
Inert Solids					x	
Solids with Metals	x					
Organic Solids					x	
Salt Solutions					x	
Metals						
Heavy Metals	x					
Alkali Metals					x	
Volatile Metals	x	x				
Non-Metals						
Phos. Sulf. Compounds	x					
Asbestos					x	
ORGANIC	Concentrated Liquids					
	Clean, halogenated	x	x	x		
	Clean, non-halogenated	x	x	x		
	Clean, solvent mixtures	x	x	x		
	Dirty, halogenated	x	x	x		
	Dirty, non-halogenated	x	x	x		
	Dirty, solvent mixtures	x	x	x		
	Dilute Aqueous Solutions					
	Readily oxidized, halogenated					x
	Readily oxidized, non-halogenated					x
	Difficult to oxidize, halogenated					x
	Difficult to oxidize, non-halogenated					x
	Organic Solids					
	Salts & Other Solids	x	x			
	Tars and Residues			x		
Sludges	x		x			
Special Wastes						
Strong oxidizing agents					x	
Explosives					x	
Biological Wastes					x	

Source: New York State Department of Environmental Conservation

The TDWR and the Texas Department of Health, as the State agencies responsible for resource recovery should take steps necessary to identify barriers to recovery and eliminate them where feasible. These steps include: reviewing statutes, drafting executive orders and legislation; and working toward enactment of such orders and legislation.

2. Department Policies and Actions

TDWR policies should promote resource recovery as a preferred alternative. A legislative or executive policy would put the Department on record as encouraging the procurement of recycled materials. Procurement by the Texas Purchasing and General Services Commission and other agencies is a key element of the resource recovery strategy. The lead role for these State agencies is to lessen their dependence on raw material products.

Regulations for industrial solid waste should encourage recovery of materials in the private sector. Incentives for recovery and waste reduction should be included in the regulatory scheme. However, the goal of increasing the recovery of industrial solid waste must be weighed against the hazards involved in processing or reclaiming hazardous waste materials. Haphazard recovery practices may result in damage to the public health and the environment. Therefore, the TDWR requires permits for facilities which reclaim or reprocess hazardous waste.

3. Information system

The TDWR is currently involved in the development of a recycling information system and a state-wide directory of recycling activities. The information gathered from an industrial survey will be provided to Texas industry and the public in an effort to increase awareness of recovery opportunities. The objective of the project is to inform industrial solid waste generators of alternatives to disposal of their wastes.

4. Market Assessment and Development

The success of resource recovery is almost wholly dependent upon economics. If reliable markets exist for the products that can be derived from resource recovery systems, then those systems will be successful.

a. Assessment of Existing and Potential Markets

The state should support Statewide or regional market studies as part of its resource recovery program and should maintain these market surveys for both secondary materials and energy. Secondary materials covered should include: waste oil, paper, glass, and metals.

As a result of one western state's market study efforts, six refuse-to-energy projects are currently being planned. In that case, the State made the cities and counties aware of the existing energy demand in their jurisdictions, as well as the potential supply available from their own wastes.

b. Stimulation of Existing Markets

The amount of paper and construction materials used in government operation is considerable. If secondary materials are to be proven as usable, State agencies must take the lead in demonstrating that usefulness.

c. Creation of new markets

Although the Federal government and private industry will take the lead in researching, developing and issuing specification standards on new secondary materials, the state can play a role.

The Purchasing and General Services Commission could provide valuable demonstrations of the practical utility of new secondary materials. Recycled items that could be available for State use include: paper for copying machines, other paper products (boxes, etc.), recycled asphalt for road construction, and other products that are manufactured using reclaimed materials. State officials should make a commitment, either through legislation or executive order, to use at least limited quantities of these materials and evaluate their performance.

5. Waste Exchange

Another form of recycling is the waste exchange whereby a waste from one manufacturing process can represent a raw material for another. Capitalizing on this concept the Houston Chamber of Commerce has established the Chemical Recycle Information Program as an aid to Gulf Coast industry in the marketing of industrial wastes. This program is a clearinghouse where companies can offer potentially saleable waste products to potential users and thereby encourage the conservation of resources through reuse.

To participate in the program, waste chemical generators or their potential users may register (in confidence) the products being offered or sought. Prospective users identify themselves to offerers or seekers by requesting additional information in writing from the Houston Chamber of Commerce. The program staff forwards any requests to the offeror or seeker. It is the responsibility of the offeror or seeker to contact the respondent and to negotiate a transfer if he wishes to do so. The Houston Chamber of Commerce does not participate in negotiations.

The inventory of waste chemicals is published each month. Information on availability of a currently or newly listed waste chemical should be transmitted to the Houston Chamber of Commerce by the 25th of each month. Neither the Chamber nor any member thereof makes any warranty as to the accuracy of description, the fitness for a particular purpose, or the merchantability of any waste chemical offered through the program. For more information, contact:

Chemical Recycle Information Program
Houston Chamber of Commerce
1100 Milam Building, 25th Floor
Houston, Texas 77002
(713) 651-1313

The waste exchange concept offers relief to both the industrial waste manager and resource and energy conservation officials. The Houston program offers potential economic incentives for users. In addition the program represents several values for the Community:

- (1) It represents a selling point to attract new business to the area, providing a mechanism whereby manufacturing costs can be further lowered and difficult waste disposal problems can be eliminated completely.
- (2) It places industries with compatible supplies and demands in contact with each other, thereby maximizing the potential for additional reciprocal exchange agreements.
- (3) It reduces the administrative burdens on a small business that must face waste disposal problems equal to those of large firms.
- (4) It increases the opportunities for a reprocessor to enter the scene and transform the waste of one firm into a raw material for another.

The degree of success achieved to date indicates that the Houston Chemical Recycle Information program is a viable operation and provides a valuable service to the community. The TDWR encourages the establishment of similar programs in other parts of the state, where appropriate. These programs should be operated by industry or trade associations.

6. Waste Reduction

Waste reduction is the prevention of waste at its source either by redesigning products or by otherwise changing societal patterns of consumption or industrial patterns of waste generation. Several major problems associated with solid waste management such as the shortage of sites, the loss of natural resources, and environmental degradation can be reduced in scope through the concept of waste reduction.

Waste reduction differs significantly from resource recovery in that it focuses on preventing or reducing the generation of waste rather than on attempting to deal with waste after it becomes a problem. For this reason many people envision waste reduction as the ultimate answer to the solid waste problem.

There are three entities who may develop or alter policies to encourage waste reduction: product suppliers or manufacturers, consumers, and government.

Government regulations may sometimes act as an impetus for waste reduction.

The TDWR's primary responsibility is to protect the public health and property by controlling the storage, processing, and disposal of industrial solid waste. However, regulation may indirectly lead to waste reduction if it increases disposal and treatment costs. It may become more economical to modify manufacturing processes and reduce the amount of waste generated than to dispose of large amounts of industrial waste, especially if the waste has hazardous properties.

D. COORDINATION WITH OTHER AGENCIES AND PROGRAMS

Although the Texas Department of Water Resources is given primary responsibility for the regulation of industrial solid waste, the Texas Solid Waste Disposal Act requires the TDWR to coordinate with the Department of Health and the Air Control Board (Article 4477-7, Section 3b). Pursuant to this mandate, the TDWR may revoke or amend any permit it issues for reasons pertaining to air or water pollution or violation of the Act or of any other laws which apply to the disposal of solid waste. Coordination with other agencies is essential in solid waste management and the success of the RCRA program will depend on it.

1. Texas Air Control Board

The TDWR and the Texas Air Control Board (TACB) have proposed to enter into an interagency agreement which will provide a coordinated approach to the regulation of waste water treatment and industrial solid waste facilities. Pursuant to this proposed agreement, the TACB would review all permit applications and submit written comments and recommendations to the TDWR Permits Division.

The interagency agreement also would provide a coordinated State response to monitor odor conditions, investigate complaints, and take appropriate action to insure that all reasonable measures are taken to abate any condition of air pollution.

2. Texas Department of Health

The Texas Department of Health is designated as the state solid waste agency responsible for municipal solid waste. When municipal and industrial solid waste become mixed, the TDH is the agency responsible and has jurisdiction over the activity. To avoid jurisdictional problems, the TDH and the TDWR have closely coordinated permitting and review procedures.

Prior to federal involvement in solid waste, the TDH and the TDWR developed a coordinated approach to the problem of Class I industrial waste which enters municipal disposal facilities. Pursuant to the Texas Solid Waste Disposal Act, Class I wastes under the jurisdiction of the TDWR may be accepted in municipal facilities if authorized by the TDH (with the concurrence of the TDWR). To date, twenty-one municipal facilities have received permission to receive Class I industrial waste. According to TDWR self-reporting data, municipal facilities received for disposal 1.4% of all Class I industrial wastes generated in 1977.

If a generator wishes to dispose of a particular Class I industrial waste in a municipal landfill, he should first contact the TDWR Solid Waste Section to verify the accurate classification of the waste. If the waste is properly classified as Class I he should then contact the municipal operator to determine whether the operator is authorized or willing to seek authorization to receive the Class I waste material. If the facility is approved by the TDH to accept such wastes, the waste may be deposited there. If the facility is not approved to accept a Class I industrial waste, the TDH will need to coordinate with the TDWR. The operator should collect the necessary information from the generator, (waste type and amount) and develop a waste management plan for submittal to TDH to allow an evaluation of the environmental adequacy of the proposed disposal operation. Because municipal facilities are not specifically designed to accept Class I industrial waste, the TDH may specify technical requirements, in addition to the normal municipal solid waste practices, before concurring on an application from a municipal operator to receive the industrial waste.

Texas Department of Health regulations allow Type 1 facilities to accept minor amounts of Class I industrial solid waste without special approval (5% or less by weight or volume) if such waste is comingled in the same containers with the municipal solid waste at the point where the waste is generated. (Sec. F-2.5c).

This exemption applies only when the Class I industrial solid waste will not significantly increase the danger of fire or endanger personnel during any phase of collection, storage, transportation or disposal.

The TDH and TDWR have coordinated program review and development to ensure state equivalence with the federal hazardous waste program. The two agencies are jointly applying to E.P.A. to operate a state hazardous program in lieu of the federal program. Specific administrative procedures which require some degree of inter-agency coordination include operation of a uniform manifest system, permit mechanism, compliance and enforcement activities, and public participation programs. Additionally, the two agencies are coordinating in the preparation of this State Solid Waste Management Plan.

3. Texas Department of Agriculture

The Texas Pesticide Control Act (Article 135b-5a, V.A.T.S.) empowers the Texas Department of Agriculture (TDA) to regulate the application and handling of pesticides. This agency works with pesticide users in order to develop and enforce adequate guidelines for the disposal of waste pesticides and pesticide containers.

The TDWR is given responsibility for pesticide disposal under the Texas Solid Waste Disposal Act and subtitle C of RCRA. With the increasing public concern over the use and disposal of pesticides, it is necessary that the TDA and the TDWR coordinate their efforts to develop compatible regulations to assure the safe disposal of pesticide waste materials.

4. Texas Railroad Commission

The Texas Railroad Commission has jurisdiction over wastes resulting from the surface mining of lignite and uranium resources. Those wastes associated with the exploration and development of oil, natural gas, and geothermal energy resources are not defined as solid wastes in the Texas Solid Waste Disposal Act. This exemption has led to some confusion regarding when these wastes become solid wastes. An interagency agreement concerning this definition would be beneficial to both agencies and industries concerned.

5. Regional and Local Agencies

The Texas Solid Waste Disposal Act provides solid waste management powers to county governments including development of plans and coordination with local governments, regional planning agencies and other governmental agencies. Counties have the authority to appropriate and expend money for the collection, handling, storage and disposal of solid waste, and for administering a solid waste program. To date, those counties involved in solid waste permitting have regulated domestic refuse and municipal solid waste disposal. No Texas counties are issuing industrial solid waste disposal permits, or conducting planning activities in this area exclusively. However, the TDWR sends copies of permit applications to the county in which the proposed facility is to be located. Harris County Pollution Control District has been active in reviewing and commenting on permit applications for industrial solid waste management facilities.

Regional planning commissions, councils of government and municipalities have completed or are engaged in some form of solid waste planning studies. The North Central Texas Council of Governments (NCTCOG) is in the first phase of a regional industrial waste management study which will quantify and characterize the industrial waste stream and estimate industrial growth and regional quantities of waste through the year 2000. In phase two of the study, the NCTCOG will address problems of industrial solid waste management, including the need for management facilities. The Houston-Galveston Area Council of Governments is involved in a survey of uncontrolled municipal solid waste disposal sites.

Another activity is a study by the Edwards Aquifer Research and Data Center which is examining the effects of solid waste disposal sites on the water quality of the aquifer recharge zone. The center is conducting aerial surveillance activities and ground inspections in six central Texas counties.

6. Coordination With Other Programs

Coordination with other environmental programs is essential for success of the Resource Conservation and Recovery Act program. The State/E.P.A. Agreement (S.E.A.) is an attempt by state agencies to coordinate their efforts to solve environmental problems. The Agreement is a cooperative effort of the Texas Department of Health, the Texas Department of Water Resources, the Texas Department of Agriculture, and the Railroad Commission of Texas. The SEA integrates environmental programs conducted under the federal Safe Drinking Water Act, the federal Clean Water Act, and the Resource Conservation and Recovery Act.

Since resources for these programs are limited in all levels of government, closer coordination could increase State effectiveness by reducing procedural and substantive duplications. Additionally, an integrated approach should minimize the jurisdictional migration of pollutants. For example, increased amounts of wastes produced by pollution control activities prompted by the federal Clean Air and Clean Water Acts have greatly increased the pollution of land needed to absorb these wastes. This loop has been closed by RCRA and, as a result, those solid wastes which have been regulated by State law or other federal laws, will need to be coordinated with the new RCRA regulations.

In the State/E.P.A. Agreement nine priority issues have been identified by the state agencies and EPA Region 6. Five of these issues relate to the State Solid Waste Plan:

- improvements in the oil and hazardous spill coordination system,
- the improved control of hazardous pollutants,
- the improved disposal of toxic containers,
- State authorization to operate the federal hazardous waste program, and
- an updated and improved solid waste management plan.

The SEA summarizes agency responsibilities and activities according to the federal acts under which they are required. It does not, however, specify how permit requirements for the different programs will be coordinated to protect air, water and land resources. In the past, interagency agreements have been utilized to coordinate agency efforts and to clarify jurisdictional issues.

The TDWR will also need to internally coordinate its permitting programs in order to eliminate duplication and assure compatibility of different program's permit provisions. The Permits Division will consider a plan to coordinate permit programs which pertain to solid waste management. This includes the Underground Injection Control (UIC) program, the National Pollutant Discharge Elimination System (NPDES) program, and the RCRA program.

The Data and Engineering Services Division within the TDWR should be contacted for the 100-year floodplain delineation and a determination of whether Section 16.238 of the Water Code will apply. This section requires approval of plans before a levee may be constructed within the floodplain.

E. PUBLIC AWARENESS AND OPPORTUNITIES FOR PARTICIPATION

The Texas Department of Water Resources encourages public involvement in the development of the solid waste management program. A well-informed public can be instrumental in solving some solid waste problems. When the public and solid waste decision makers share common perceptions of problems, it may be easier and less expensive to solve the problems. However, solid waste topics are not especially popular, unless a group or community feels threatened by a proposed facility or other action.

The TDWR will attempt to correct this situation by informing people about solid waste management issues well ahead of the time that problems or conflicts may occur. Mechanisms which have been utilized to provide the general public and the regulated community an opportunity for participation include the following:

- public meetings on the State Plan for industrial solid waste,
- preparation of a responsiveness summary of public comments on issues related to the State Plan,
- public hearings on proposed rule changes,
- TDWR staff participation in regional forums and workshops with the aim of fostering understanding of the solid waste management program,
- responses to citizen's complaints, and
- opportunities for public hearings on all permit applications.

Future activities should be aimed at increasing public awareness of solid waste issues. Media coverage has concentrated on the disastrous results of improper methods of solid waste management. The Department should inform the public of successful solid waste management alternatives, and encourage waste reduction through newspaper articles, press releases and brochures. Additionally, presentations at public forums and appearances on radio and television could help to address the negative images of industrial solid waste management which have been produced.

Public awareness of recycling alternatives will be enhanced by the development of a recycler's directory which will be produced in the near future.

Decision makers at the local level need to be reached by solid waste public awareness programs. In some states, local law enforcement officers and citizens have been instrumental in providing information leading to the arrest of "midnight dumpers" and other violators.

New avenues of consulting with the public should be explored. Some agencies have formed advisory groups, composed of representatives from industry, government and the general public, to advise them regarding solid waste issues. This approach could be instrumental in developing workable solutions to difficult problems, such as siting and enforcement. Such a group could provide a forum for addressing issues, promote constructive dialogue among the various interests, and enhance public understanding of the Department's actions.

F. MANPOWER AND BUDGET

The Resource Conservation and Recovery Act has provided federal funds for the continuing development and improvement of the industrial solid waste program elements, including the hazardous waste management program, the open dump inventory and the solid waste management plan. This section describes the projected manpower and budget requirements for each of these program elements.

1. Hazardous waste management program

The development and implementation of an industrial hazardous waste management program will occur in two phases. Phase I will approximately coincide with State Fiscal Year 1981 and Phase II will approximately coincide with State Fiscal Years 1982 and 1983. Although the State will seek final authorization long before the expiration of the two years allowed for Phase II interim authorization, the resources required for Phase II and final authorization are substantially the same and therefore, no differentiation will be made for final authorization in this description.

a. Phase I

Table X lists the objectives to be achieved under Phase I, the corresponding man-years to be expended and the occupation of the employees who will be engaged in carrying out these objectives. Tables X and XII exhibit the human and financial resources necessary to accomplish the objectives of Phase I of the industrial hazardous waste program. The projected man-years of effort are based on the TDWR's previous experience in conducting a state industrial solid waste program. Elements of the program such as the manifest system, compliance monitoring, and enforcement have been conducted for a number of years and will require few changes to be consistent with the federal hazardous waste program. The resource requirements identified in Tables X and XII are identical to the Department's existing resources, assuming matching federal funds are provided, and are adequate to implement Phase I of the industrial hazardous waste program.

b. Phase II

Tables XI and XIII identify TDWR estimates of the resources required to implement Phase II of the industrial hazardous waste program. These estimates are based on the TDWR's previous experience in conducting a state industrial solid waste program. Estimates of resources required for the operation of the manifest system are straightforward since the system the TDWR has used for 5 years will be substantially unchanged. Resource requirements in other areas, particularly permitting, cannot be accurately determined until the state has reviewed and assessed Phase II federal regulations to be promulgated in December, 1980. However, the projections shown are based on past experience in the state permitting process.

The TDWR has estimated that 30-60 man-days of effort are required for the review of and action on most permit applications. The Department anticipates that 400 to 600 existing industrial hazardous waste management facilities will require permits and has projected permitting activities for these facilities over the next 5 years. Estimates of resource requirements for Phase II are consistent with the Department's budget request for State Fiscal Years 1982 and 1983.

Table XIV is an itemization of the TDWR's operating budget for the RCRA program for State Fiscal Year 1981 and the proposed budget for State Fiscal Years 1982 and 1983. The proposed budget for State Fiscal Years 1982 and 1983 has been approved by the Texas Water Development Board and submitted to the Governor's Budget and Planning Office and to the Legislative Budget Board for review.

The 1982-83 budget will be established by the Texas Legislature in the spring of 1981 and will become effective on September 1, 1981. Consequently both state and federal funds "budgeted" for State Fiscal Years 1982 and 1983 are speculative at this time as they are both subject to future congressional and legislative actions.

2. Solid Waste Management Plan and the Open Dump Inventory

Table XV indicates the TDWR program objectives for 1981 under Subtitle D of RCRA. Objectives related to the development and implementation of the Solid Waste Management Plan are funded on a 75/25% (federal/state) matching basis. The development of the Plan occurred primarily during State Fiscal Year 1980. Implementation of the Plan will begin during State Fiscal Year 1981. The Open Dump Inventory is completely funded by federal grant monies.

TABLE X

**TEXAS DEPARTMENT OF WATER RESOURCES
STAFFING REQUIREMENTS FOR PHASE I
OF HAZARDOUS WASTE MANAGEMENT PROGRAM**

<u>Objective</u>	<u>Man Years (Annual Basis)</u>
1. Provide adequate resources and training	1.0
2. Develop equivalent legislation	0.5
3. Develop equivalent regulations	0.8
4. Obtain interim authorization	1.0
5. Obtain final authorization	1.0
6. Develop and operate a permitting program	6.6
7. Operate a notification program	1.3
8. Develop and conduct a public participation program	2.6
9. Operate a manifest system	4.5
10. Operate an emergency response system	1.3
11. Implement an enforcement program	5.2
12. Implement a problem site program	4.2
13. Perform compliance monitoring inspections	8.8
14. Develop a laboratory program	<u>2.6</u>
	Total 41.4

<u>Personnel</u>	<u>Man Years</u>
Engineers	
Hydrologists	
Environmental Quality Specialists	
Economists	
Geologists	
Chemists	
Legal Clerks	
Court Reporters	
Technicians	
Secretaries	
	Total 41.4

TABLE XI

TEXAS DEPARTMENT OF WATER RESOURCES
 STAFFING REQUIREMENTS FOR PHASE II
 OF HAZARDOUS WASTE MANAGEMENT PROGRAM

<u>Objective</u>	<u>Man Years (Annual Basis)</u>
1. Develop equivalent regulations	0.5
2. Conduct a permitting program	20.0
3. Operate a notification program	1.0
4. Conduct public participation activities	2.0
5. Operate a manifest system	6.0
6. Operate an emergency response system	1.7
7. Conduct an enforcement program	10.1
8. Conduct a problem site program	8.3
9. Perform compliance monitoring inspections	17.0
10. Develop and operate a laboratory program	3.4
Total	<u>70.0</u>

<u>Personnel</u>	<u>Man Years</u>
Engineers	
Hydrologists	
Environmental Quality Specialists	
Economists	
Geologists	
Chemists	
Legal Clerks	
Court Reporters	
Technicians	
Secretaries	
Total	<u>70.0</u>

TABLE XII

TEXAS DEPARTMENT OF WATER RESOURCES
ESTIMATED PROGRAM EXPENDITURES FOR PHASE I
OF HAZARDOUS WASTE MANAGEMENT PROGRAM

<u>Objective</u>	<u>State Funds</u>	<u>Federal Funds</u>	<u>Total</u>
1. Provide adequate resources and training	\$ 9,225	\$ 27,675	\$ 36,900
2. Develop equivalent legislation	4,612	13,837	18,449
3. Develop equivalent regulations	7,380	22,140	29,520
4. Obtain interim authorization	9,225	27,675	36,900
5. Obtain final authorization	9,225	27,675	39,000
6. Develop and operate a permitting program	73,409	220,223	293,632
7. Operate a notification program	11,992	35,977	47,969
8. Develop and conduct a public participation program	23,985	71,954	95,939
9. Operate a manifest system	41,512	124,536	166,048
10. Operate an emergency response system	11,992	35,977	47,969
11. Implement an enforcement program	47,969	143,908	191,877
12. Implement a problem site program	38,745	116,234	154,979
13. Perform compliance monitoring inspections	93,703	281,108	374,811
14. Develop a laboratory program	23,984	71,954	95,938
TOTALS	\$406,958	\$1,220,873	\$1,627,831

TABLE XIII

TEXAS DEPARTMENT OF WATER RESOURCES
ESTIMATED ANNUAL PROGRAM EXPENDITURES FOR PHASE II
OF HAZARDOUS WASTE MANAGEMENT PROGRAM (RCRA Subtitle C)

<u>Objective</u>	<u>State Funds</u>	<u>Federal Funds</u>	<u>Total</u>
1. Develop equivalent regulations	\$ 5,923	\$ 21,637	\$ 27,560
2. Conduct a permitting program	171,778	627,478	799,256
3. Operate a notification program	5,923	21,635	27,558
4. Conduct public participation activities	17,770	64,912	82,682
5. Operate a manifest system	53,311	194,735	248,046
6. Operate an emergency response system	11,847	43,274	55,121
7. Conduct an enforcement program	82,927	302,922	385,849
8. Conduct a problem site program	71,081	259,646	330,727
9. Perform compliance monitoring inspections	142,161	519,292	661,453
10. Develop and operate a laboratory program	29,618	108,187	137,805
Totals	<u>\$592,339</u>	<u>\$2,163,718</u>	<u>\$2,756,057</u>

TABLE XIV

TEXAS DEPARTMENT OF WATER RESOURCES
PROJECTED FUNDING REQUIREMENTS

	State Fiscal Year		
	<u>1981</u>	<u>1982*</u>	<u>1983*</u>
State Funds	\$ 406,958	\$ 592,339	\$ 592,339
Federal Funds	1,220,873	2,204,092**	2,123,343**
Total	\$1,627,831	\$2,796,431	\$2,715,682

Budget Categories

<u>Object Class Categories</u>	<u>1981</u>	<u>1982/1983 (Annual Average)</u>
(a) Personnel	\$ 911,585	\$1,543,392
(b) Fringe benefits - 22% of (a)	200,548	339,546
(c) Travel	59,906	101,423
(d) Total Direct Charges	1,172,039	1,984,361
(e) Indirect Charges - 50% of (a)	455,792	771,696
(f) Totals	\$1,627,831	\$2,756,057

* FY82 and FY83 amounts have been included in the Texas Department of Water Resources Budget Request submitted in July, 1980 but have not yet been appropriated. Amounts appropriated during Legislative Session beginning January, 1981 could vary.

** Amounts include \$270,000 of 100% reimbursed federal money.

TABLE XV

ESTIMATED 1981 PROGRAM EXPENDITURES FOR THE
OPEN DUMP INVENTORY AND THE INDUSTRIAL SOLID WASTE
MANAGEMENT PLAN (RCRA - SUBTITLE D)

<u>Objective</u>	<u>State Funds</u>	<u>Federal Funds</u>	<u>Total</u>
1. Develop effective solid waste management plan	2497	7492	9989
2. Conduct an effective Open Dump Inventory Program	0	75,600	75,600
3. Develop and Implement Regulatory powers	577	1732	2309
4. Analyze solid waste data	13,749	41,246	54,995
5. Develop resource recovery strategy	222	666	888
6. Establish recycling information system and directory	5400	16,200	21,600
7. Develop alternative state funding	1005	3014	4019

BUDGET CATEGORIES AND MANPOWER NEEDS

	<u>State Funds</u>	<u>Federal Funds</u>	<u>Total</u>	<u>Man-Years</u>
1. Development of Solid Waste Management Plan	2497	7492	9989	.2
2. Implementation of Solid Waste Management Plan	20,953	62,858	83,811	2.1
3. Open Dump Inventory	0	75,600	75,600	1.9
Total	23,450	145,950	169,400	4.2

CHAPTER IV
PLAN AND PROGRAM IMPLEMENTATION

IV. PLAN AND PROGRAM IMPLEMENTATION

In Chapter One of this report, goals, objectives and basic policies were established. The goals and objectives outlined reflect the conditions and needs existing in the State, as well as the priorities for fulfillment of those needs. These conditions and needs have been reviewed in various parts of this Plan, and provide the basis for defining appropriate goals, objectives and necessary actions for the implementation of program elements.

A. RESPONSIBILITIES OF STATE, LOCAL AND REGIONAL AUTHORITIES AND INDUSTRY

The establishment of goals and objectives which are inconsistent with the policy or function of State government will generate efforts which cannot come to fruition. The basic policy required is the determination of the appropriate State role and scope of functions.

After careful analysis of the situation in Texas, it is the TDWR's conclusion that the State role in industrial solid waste management should be that of a regulatory control agency and technical information center. This role includes the control of waste management activities through permits, technical standards of design and performance, shipping control requirements, and other regulations. Additionally, the agency gathers solid waste data, disseminates technical information and provides technical assistance to government and industry pertaining to industrial solid waste planning and management.

Environmental protection for solid waste management activities has been and will continue to be a state responsibility. The TDWR has established and will maintain the basic policy that the waste generator is responsible for assuring that waste produced by him is properly and safely disposed of regardless of the disposal process employed.

The TDWR will encourage regional approaches to solid waste problems, and will work with regional entities such as the councils of government, 208 (water quality) planning groups, chambers of commerce, and industry trade associations. Local solid waste plans can be coordinated at the regional level and reviewed for consistency with the goals and objectives of this plan.

To avoid the proliferation of new special purpose agencies or additional layers of bureaucracy, this plan recommends the utilization of existing State, regional or local authorities to the maximum extent possible.

The TDWR shall foster a mix of public and private efforts to provide adequate capacity to manage industrial solid waste. The State can complement the efforts of industry in the design, siting, acquisition, and operation of waste management facilities. While it should not be in the business of providing actual facilities, the TDWR has a responsibility to develop and demonstrate solid waste planning, engineering, and management techniques and to set up the instruments for effective implementation. Assuming that the TDWR has adequate resources, it can act as a regulatory control agency and provide technical assistance to other agencies and industry.

B. PROBLEMS, GOALS, OBJECTIVES AND NECESSARY TASKS

Throughout this report a number of problems have been described. This section summarizes the problems facing the state in the management of industrial solid waste. A complete set of goals, objectives and tasks has been developed and is presented on the following pages. The major problems which must be addressed include:

1. Control of hazardous industrial waste;
2. Improper disposal of non-hazardous industrial waste;
3. Loss of material and energy resources due to an insufficient number of alternatives to conventional waste disposal practices;
4. Lack of public understanding of solid waste issues;
5. Lack of a unified approach in solving solid waste problems;
6. The complexity of the solid waste regulatory program;
7. Inadequate planning for Industrial solid waste management at all levels of government.

Other problems could be listed, but these are the major areas which should be addressed. Each of these problems is summarized below and is followed by one or more goals, objectives and recommended tasks for accomplishing the objectives. The period of time during which a particular task is expected to be accomplished is the milestone and is listed after the task to which it applies.

I. Control of Hazardous Industrial Waste

The federal Resource Conservation and Recovery Act of 1976 mandated a federal program for hazardous waste management and gave states the option of operating their own programs if equivalent with the federal program. The federal approach is a cradle-to-grave monitoring of hazardous waste which will manage such waste from its point of generation to its ultimate disposition.

Texas, which has operated solid waste programs for many years, is now applying to E.P.A. to operate the hazardous waste management program in lieu of the federal program. The Texas Department of Water Resources and the Texas Department of Health have coordinated in a joint effort to gain the desired authorization. If authorization is secured, the program will require adjustments in the existing industrial solid waste management program operated by the TDWR.

Goal:

Improve the system for management of hazardous industrial solid waste in order to provide maximum protection of the public health and the environment.

Objective No. 1

Improve the system for controlling hazardous industrial waste from its point of generation to the time that it is either properly disposed of, rendered non-hazardous, or recovered for re-use.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Coordinate with the Texas Department of Health to operate a uniform manifest system for tracking hazardous waste in Texas.	1980-1986
2. Establish and enforce standards (rules) for generators, transporters, processors and disposers of hazardous industrial waste.	1980-1986
3. Improve computer programs to assist in monitoring for compliance with hazardous waste manifest and reporting requirements.	1980-1981
4. Improve the oil and hazardous substance spill response coordination system to handle accidental discharge of hazardous wastes.	1980-1981
5. Examine cooperative arrangements to accept manifest forms used by other states which operate an EPA authorized manifest system.	1981-

Objective No. 2

Insure that environmentally sound waste management practices are employed at hazardous waste treatment, storage and disposal facilities.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Develop and enforce criteria for the design, construction and operation of hazardous waste management facilities.	1981
2. Operate and maintain a program for the surveillance of solid waste management activities, including the operation, closure and long term monitoring of facilities.	1980-1986
3. Determine which hazardous wastes are not suitable for direct land disposal, and examine alternative processing and disposal methods for such wastes.	1981-1986
4. Encourage the development, construction, and operation of safe disposal and treatment facilities.	1980-1986

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|--|-----------|
| 5. Develop and enforce criteria for operating land disposal facilities for hazardous industrial waste. | 1980-1986 |
|--|-----------|

Objective No. 3

Begin to correct problems and hazards caused by past improper management methods.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Locate and inventory inactive and abandoned disposal sites through the imminent hazard survey using ground inspections and other surveillance techniques.	1980-1986
2. Determine what actions can be taken to clean up or contain wastes at sites which pose a hazard to the public health or environment.	1980-1986
3. Support State and federal legislation which would finance the clean up and containment of wastes at abandoned sites.	1981-

Objective No. 4

Secure interim authorization (phase one) from E.P.A. to operate a state hazardous waste management program.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Amend Department Rules to meet standards established by E.P.A.	1980-1981
2. Draft legislative recommendations which will increase penalties for violations of the Texas Solid Waste Disposal Act.	1980
3. Coordinate with the Texas Department of Health in developing an application for phase one, interim authorization.	1980
4. Secure resources and staff to adequately operate phase one of the hazardous industrial waste management program.	1980
5. Process Part A permit applications and set priorities for permitting of facilities. Designate major and non-major facilities for inspection purposes; improve procedures for permitting new and existing facilities.	1980

Objective No. 5

Secure Phase II, interim authorization from E.P.A. to operate the state hazardous waste program.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Revise TDWR Rules as necessary to become eligible to operate the State hazardous waste program.	1981-
2. Coordinate with the Texas Department of Health in developing an application to E.P.A. for phase two, interim authorization.	1981-
3. Develop Part B permit application and send to all hazardous waste management facilities.	1981-
4. Secure adequate resources to operate Phase II of the hazardous industrial waste management program.	1981-

Objective No. 6

Secure authorization from EPA to operate the permanent program for the management of hazardous waste.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Begin permitting of on-site hazardous waste facilities	1981
2. Amend Rules and adjust program as necessary.	1981
3. Coordinate with Texas Department of Health in the development of a final application for authorization of the program.	1981
4. Consider plan to coordinate permit requirements for the UIC, RCRA, and NPDES programs.	1981

Objective No. 7

Reduce the amount of hazardous waste being disposed of.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Encourage the safe recovery and re-use of hazardous waste materials.	1980-1986
2. Foster processes that will render hazardous industrial wastes inert or non-hazardous.	1980-1986

- | | | |
|----|---|-----------|
| 3. | Encourage conservation and waste reduction on the part of industry and government entities. | 1980-1986 |
| 4. | Support the "waste exchange" concept whereby one company's waste may be transferred to another company to be used as a feedstock. | 1980-1986 |

II. Improper Disposal of Non-hazardous Industrial Waste

The term "open dump" has been used to describe a solid waste disposal facility which poses a reasonable probability of adverse effects on public health or the environment. Those facilities which violate the criteria for classification of solid waste disposal facilities and practices (40 CFR, Part 257) are open dumps and must be upgraded or closed within five years after the classification is made. Open dumps are to be reported to the U.S. E.P.A. and the Bureau of the Census annually.

Goal:

Assure that all land disposal operations in Texas are maintained in a manner that will prevent adverse effects to the public health and environment.

Objective No. 1

Identify, evaluate and prohibit the operation of those facilities which constitute a threat to the public health or environment.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Develop and adopt Rules prescribing minimum standards for non-hazardous solid waste disposal facilities.	1980-1981
2. Prevent the establishment of new open dumps.	1980-1986
3. Evaluate and classify all applicable solid waste disposal facilities.	1980-1986
4. Upgrade or close those facilities which are classified as open dumps.	1980-1986

III. Loss of Material and Energy Resources Due to an Insufficient Number of Alternatives to Conventional Disposal Practices

Although industry and government have taken initial steps to reduce the amount of waste generated and to recover waste materials, there are numerous actions which would increase recovery options.

Goal:

Conserve land, raw materials and energy by increasing industrial solid waste recovery, re-use and waste reduction efforts.

Objective No. 1

Increase the reclamation of material and energy resources available in the industrial solid waste stream.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Develop and establish TDWR policies which will encourage the procurement of recycled material products when possible.	1981-1986
2. Review Department Rules to assure that they do not unnecessarily impede recovery options.	1981-
3. Develop a recycling information system and directory in an effort to provide information to industry, government and the public to increase awareness of recycling opportunities.	1980-1981
4. Identify and support the removal of state laws which impede resource recovery.	1981-1982
5. Develop legislative recommendations which will encourage resource recovery.	1982-1986
6. Support the "waste exchange" concept by publicizing the Houston Chemical Recycle Information Program and supporting the establishment of similar endeavors.	1980-1986

Objective No. 2

Reduce the amount of land utilized for land disposal purposes.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Encourage alternative methods of industrial solid waste disposal, treatment and processing.	1980-1986
2. Encourage policies and activities that will reduce the amount of solid waste generated.	1980-1986
3. Examine ways to assure full consideration of alternatives to land disposal, especially for those wastes which are not suitable for land disposal.	1981-1986

IV. Lack of Public Understanding of Solid Waste Issues

Public opposition to solid waste facilities has increased dramatically in recent years. This is primarily due to fear and concern resulting from the publicity regarding improper disposal practices and the disastrous results which accompany these practices. The public is more concerned because of this publicity but the problem of siting adequate facilities is compounded because of public fear of all facilities. It is essential that the public understand the difference between a dump like the Love Canal and a facility which is properly designed, constructed, and operated. Otherwise it will be difficult to provide an adequate number of facilities for the waste that is generated. This could lead to illegal dumping or stockpiling of hazardous wastes. Reliable and factual information regarding solid waste issues is needed to fully inform the public.

Goal:

Increase public awareness of solid waste issues and provide opportunities for public participation.

Objective No. 1

Promote public understanding of the State industrial solid waste program.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Prepare public information materials which explain the solid waste program.	1981-1986
2. Encourage and work with local officials and citizen and environmental groups to publicize the program and promote understanding of the issues.	1980-1986

Objective No. 2

Increase public involvement in the solid waste program and its development.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Develop an improved public participation program to encourage more involvement.	1980-1981
2. Explore the establishment of an advisory group as a mechanism to increase communication between the TDWR and the general public, and to help resolve difficult issues.	1981

V. Lack of a Unified Approach in Solving Solid Waste Problems

As described in Chapter III of this volume, numerous state agencies have responsibility for solid waste management in Texas. Due to

the number of programs and agencies involved, state efforts in solving solid waste problems can be fragmented and duplicative. The two agencies with authority under the Texas Solid Waste Disposal Act are the Texas Department of Water Resources and the Texas Department of Health. The two agencies have coordinated many program elements, particularly those pertaining to hazardous waste control.

The State/EPA Agreement is an attempt to coordinate environmental programs at the state level. State agencies with environmentally oriented programs are required to coordinate their work programs, agree on priorities, and combine them into one document which is approved by the EPA, and the affected agencies. In theory, the principles behind this Agreement are sound, however in practice, each agency operates independently. Interagency agreements have been more effective in coordinating programs and actions. More coordination and cooperation between agencies is necessary if the difficult problems in solid waste management are to be addressed.

Goal:

Provide a coordinated approach to solve industrial solid waste problems.

Objective No. 1

Improve coordination between state agencies and programs with solid waste management responsibilities.

Recommended Actions

Milestones

- | | |
|---|-----------|
| 1. Develop inter-agency agreements to assure that regulations and enforcement actions are adequate, and not unnecessarily duplicative. | 1981-1984 |
| 2. The TDWR should consider a plan to coordinate permit programs (under its authority) which relate to hazardous industrial waste. This includes the UIC, RCRA, and NPDES programs. | 1981 |

VI. Complexity of the Solid Waste Regulatory Program

The RCRA program for solid waste management is one of the most complex regulatory programs ever implemented. Four years after the passage of RCRA, federal regulations are still being promulgated. Another phase of regulations is expected as well as numerous regulatory interpretive memoranda and technical amendments to the regulations.

Texas, like other states, has operated solid waste programs which must be coordinated and amended to meet federal requirements. The period of interim authorization will be a difficult time for state government and industry as federal regulations are interpreted for specific types of waste and management methods. The TDWR will attempt to keep the regulated community (industry) informed as Department Rules are amended and will foster understanding of the Rules so that compliance is obtained in an efficient manner.

Goal:

Foster understanding of the regulatory management system on the part of those who must comply with the Rules.

Objective

The regulatory program should be clearly outlined and explained to industry.

<u>Recommended Actions</u>	<u>Milestones</u>
1. Sponsor public meetings in an effort to explain the regulatory program.	1981-
2. Provide technical assistance to those who may have difficulty complying with the new Rules.	1981-1986
3. Participate in meetings with industrial associations to foster understanding of the Rules among the regulated community.	1980-1986

VII. Inadequate Planning for Industrial solid Waste Activities

Local and regional governments have been involved in municipal solid waste management and planning activities for many years. However, planning for industrial solid waste management has been primarily the responsibility of state government and industry for the past 10 years. This absence of local involvement may contribute to local opposition to industrial solid waste disposal facilities. Therefore, local and metropolitan governments should be involved in the process of siting facilities at the earliest possible stages. The state must rely on the support of local government in the siting and permitting process.

Local opposition is not the only problem caused by inadequate planning. There may not be adequate consideration of many factors in the siting of facilities. Facility sponsors must consider site topography, hydrology, geology, access to transportation, proximity to industrial generators, and compatibility with local land uses and zoning. Facility sponsors must consider all of these factors if they plan to invest large amounts of money in an effort to secure approval of disposal sites.

Technical assistance is available from the TDWR in the form of technical guidelines to assist in facility planning. Numerous consulting firms provide services in solid waste management as well.

The TDWR has collected data from industrial waste generators and disposal facilities. This information should be analyzed in order to gain a better understanding of solid waste problems within the state.

Goal:

Secure adequate planning for industrial solid waste management at all levels of government.

Objective No. 1

Develop and maintain a current state plan for industrial solid waste management, and encourage the development of regional plans.

Recommended Actions

Milestones

- | | |
|---|---------------|
| 1. Develop a new five year state plan. | 1980-1981 |
| 2. Analyze existing TDWR records to establish a data base which can be used for future planning efforts. Update the data base at least every three years. | 1981-1982 |
| 3. Improve computer programs which are capable of data retrieval and analysis. | 1980-1982 |
| 4. Review, revise and readopt the state plan for industrial solid waste management. | 1983 and 1986 |
| 5. Encourage the development of regional plans which could be developed from TDWR data. The Department could contract, on a priority basis, with regional planning agencies for the development of regional plans which are compatible with the goals and objectives of the State Solid Waste Plan. | 1982-1986 |
| 6. Provide technical assistance to industry to provide environmentally sound storage, processing, and disposal facilities. | 1980-1986 |

C. SCHEDULE OF EVENTS (1980-1986)

Milestones

December, 1980	Secure interim authorization (Phase one) from U.S. E.P.A. to operate a state hazardous waste program.
January 31, 1981	Approve and adopt the State Plan for Solid Waste Management.
March 1981	Establish quality assurance plan for compliance monitoring and measurement activities.
March 31, 1981	Complete recycling information system and directory.
May 1981	Secure interim authorization (Phase two) to operate the state hazardous waste program.
August 1981	Develop annual work program and application for federal assistance.
October 1981	Secure final authorization to operate the state hazardous waste program.
October 1983	Review and reassess State Plan.
1980 - 1986	Provide necessary rules and legislation to achieve the goals of the Plan.
1981 - 1986	Process permits for new and existing hazardous waste management facilities.
1980 - 1984	Conduct Open Dump Inventory; evaluate facilities; upgrade or close existing open dumps.
1980 - 1986	Identify problem hazardous waste sites and begin to correct the problems posed by past poor practices.
1980 - 1986	Provide public information and opportunities for public participation.
1980 - 1986	Provide technical assistance to industry and government agencies.
1981 - 1986	Analyze existing registration, open dump inventory evaluations, and imminent hazard survey data to assess solid waste management problems.
1981 - 1982	Examine alternative funding sources to support the solid waste management program.

D. REVIEW AND MODIFICATION OF PLAN

Long range planning is essential to the economic well-being of a corporation or a government body. Yet, the fixing of long-term effort based on today's knowledge may be short sighted. The pace of technology is so rapid today that the premature commitment to a particular solution may produce an obsolete system before it is completely implemented.

This conflict can be resolved by reviewing and modifying the Plan's goals, objectives and actions at the end of each year. Goals and objectives are seldom altered except to change emphasis or to include a new element. They reflect basic policies which, when properly established, seldom change. The necessary actions should be reviewed for progress or completion in light of any changes in conditions, needs or priorities. A complete set of tasks and milestones is developed in the preparation of the TDWR annual work program and application for federal assistance at the end of each fiscal year.

The entire Plan will be reviewed at least every three years. After a reassessment is made, the Plan must be readopted by the Texas Water Development Board and approved by the U.S.E.P.A.

APPENDICES

APPENDIX A

THE STATE OF TEXAS SOLID WASTE DISPOSAL ACT

Article 4477-7 of the Revised Civil Statutes

1 An Act relating to the regulation of solid wastes; providing penalties.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

3 SECTION 1. Section 1, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969 (Article 4477-7, Vernon's Texas Civil Statutes), is amended to read as follows:

5 Section 1. This Act may be cited as the Solid Waste Disposal Act. It is the policy of the state and the purpose of this Act to safeguard the health, welfare, and physical property of the people and to protect the environment, through controlling the management of solid wastes, including the accounting for hazardous wastes generated.

7 SECTION 2. Section 2, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969, as amended (Article 4477-7, Vernon's Texas Civil Statutes), is amended to read as follows:

9 Section 2. As used in this Act, unless the context requires a different definition:

11 (1) "Board" means the Texas Water Development Board.

(2) "Board of health" means the Texas Board of Health.

13 (3) "Class I industrial solid waste" means any industrial solid waste designated as Class I by the Executive Director of the Texas Department of Water Resources as any industrial solid waste or mixture of industrial solid wastes which because of its concentration or physical or chemical characteristics is toxic, corrosive, flammable, a strong sensitizer or irritant, a generator of sudden pressure by decomposition, heat, or other means and may pose a substantial present or potential danger to human health or the environment when improperly processed, stored, transported, or otherwise managed, including hazardous industrial waste.

15 (4) "Commission" means the Texas Water Commission.

17 (5) "Commissioner" means the Commissioner of Health.

19 (6) "Composting" means the controlled biological decomposition of organic solid waste under aerobic conditions.

21 (7) "Department" means the Texas Department of Health.

23 (8) "Department of water resources" means the Texas Department of Water Resources.

25 (9) "Disposal" means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any solid waste or hazardous waste (whether containerized or uncontainerized) into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including groundwaters.

27 (10) "Executive director" means the Executive Director of the Texas Department of Water Resources.

29 (11) "Garbage" means solid waste consisting of putrescible animal and vegetable waste materials resulting from the handling, preparation, cooking, and consumption of food, including waste materials from markets, storage facilities, handling, and sale of produce and other food products.

31 (12) "Hazardous waste" means any solid waste identified or listed as a hazardous waste by the administrator of the United States Environmental Protection Agency (EPA) pursuant to the federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, 42 U.S.C. 6901 et seq., as amended.

33 (13) "Industrial solid waste" means solid waste resulting from or incidental to any process of industry or manufacturing, or mining or agricultural operations.

35 (14) "Local government" means a county; an incorporated city or town; or a political subdivision exercising the authority granted under Section 6 of this Act.

37 (15) "Management" means the systematic control of any or all of the following activities of generation, source separation, collection, handling, storage, transportation, processing, treatment, recovery, or disposal of solid waste.

39 (16) "Municipal solid waste" means solid waste resulting from or incidental to municipal, community, commercial, institutional, and recreational activities, including garbage, rubbish, ashes, street cleanings, dead animals, abandoned automobiles, and all other solid waste other than industrial solid waste.

41 (17) "Person" means individual, corporation, organization, government or governmental subdivision or agency, business trust, partnership, association, or any other legal entity.

43 (18) "Person affected" means any person who is a resident of a county or any county adjacent or contiguous to the county in which a solid waste facility is to be located including any person who is doing business or owns land in the county or adjacent or contiguous county and any local government. Such person affected shall also demonstrate that he has suffered or will suffer actual injury or economic damage.

45 (19) "Processing" means the extraction of materials, transfer, volume reduction, conversion to energy, or other separation and preparation of solid waste for reuse or disposal, including the treatment or neutralization of hazardous waste, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such waste, or so as to recover energy or material from the waste, or so as to render such waste nonhazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume. Unless the state agency determines that regulation of such activity under this Act is necessary to protect human health or the environment, the definition of "processing" does not include activities relating to those materials exempted by the Administrator of the Environmental Protection Agency pursuant to the federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, 42 U.S.C. 6901 et seq., as amended.

1 (20) "Radioactive waste" means that waste which requires specific licensing under Chapter 72, Acts of the 57th Legislature, Regular Session, 1961, as amended (Article 4590f, Vernon's Texas Civil Statutes), and the rules adopted by the Texas Board of Health under that law.

3 (21) "Rubbish" means nonputrescible solid waste (excluding ashes), consisting of both combustible and noncombustible waste materials; combustible rubbish includes paper, rags, cartons, wood, excelsior, furniture, rubber, plastics, yard trimmings, leaves, and similar materials; noncombustible rubbish includes glass, crockery, tin cans, aluminum cans, metal furniture, and like materials which will not burn at ordinary incinerator temperatures (1600° F to 1800° F).

7 (22) "Sanitary landfill" means a controlled area of land upon which solid waste is disposed of in accordance with standards, rules, or orders established by the board of health or the board.

9 (23) "Sludge" means any solid, semisolid, or liquid waste generated from a municipal, commercial, or industrial wastewater treatment plant, water supply treatment plant, or air pollution control facility exclusive of the treated effluent from a wastewater treatment plant.

11 (24) "Solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, municipal, commercial, mining, and agricultural operations, and from community and institutional activities, but does not include: (i) solid or dissolved material in domestic sewage; or solid or dissolved material in irrigation return flows, or industrial discharges subject to regulation by permit issued pursuant to Chapter 26, Water Code; (ii) soil, dirt, rock, sand and other natural or man-made inert solid materials used to fill land if the object of the fill is to make the land suitable for the construction of surface improvements; or (iii) waste materials which result from activities associated with the exploration, development, or production of oil or gas and are subject to control by the Texas Railroad Commission.

19 (25) "Solid waste facility" means all contiguous land, and structures, other appurtenances, and improvements on the land, used for processing, storing, or disposing of solid waste. A facility may be publicly or privately owned and consist of several processing, storage, or disposal operational units; e.g., one or more landfills, surface impoundments, or combinations of them.

21 (26) "Solid waste technician" means an individual who is trained in the practical aspects of the design, operation, and maintenance of a solid waste facility in accordance with standards, rules, or orders established by the board or board of health.

23 (27) "Storage" means the holding of solid waste for a temporary period, at the end of which the solid waste is processed, disposed of, or stored elsewhere.

25 SECTION 3. Section 3, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969, as amended (Article 4477-7, Vernon's Texas Civil Statutes), is amended to read as follows:

27 Section 3. (a) The department is hereby designated the state solid waste agency with respect to the management of municipal solid waste, and shall be the coordinating agency for all municipal solid waste activities. The department shall be guided by the board of health in its activities relating to municipal solid waste. The department shall seek the accomplishment of the purposes of this Act through the control of all aspects of municipal solid waste management by all practical and economically feasible methods consistent with the powers and duties given the department under this Act and other existing legislation. The department has the powers and duties specifically prescribed in this Act and all other powers necessary or convenient to carry out its responsibilities. The department shall consult with the department of water resources with respect to the water pollution control and water quality aspects, and with the Texas Air Control Board with respect to the air pollution control and ambient air quality aspects, of the matters placed under the jurisdiction of the department by this Act.

35 (b) The department of water resources is hereby designated the state solid waste agency with respect to the management of industrial solid waste, and shall be the coordinating agency for all industrial solid waste activities. The department of water resources shall seek the accomplishment of the purposes of this Act through the control of all aspects of industrial solid waste management by all practical and economically feasible methods consistent with the powers and duties given it under this Act and other existing legislation. The department of water resources has the powers and duties specifically prescribed in this Act and all other powers necessary or convenient to carry out its responsibilities. The department of water resources shall consult with the department with respect to the public health aspects, and with the Texas Air Control Board with respect to the air pollution control and ambient air quality aspects, of the matters placed under the jurisdiction of the department of water resources by this Act.

43 (c) Where both municipal solid waste and industrial solid waste, except Class I industrial solid waste which is not routinely collected with municipal solid waste, are involved in any activity of management of solid waste, the department is the state agency responsible and has jurisdiction over the activity; and, with respect to that activity, the department may exercise all of the powers, duties and functions vested in the department by this Act. Class I industrial solid waste under the jurisdiction of the department of water resources may be accepted in a municipal solid waste facility if authorized in writing by the department with the written concurrence of the department of water resources. Solid waste, including hazardous waste, under the jurisdiction of the department may be accepted in an industrial solid waste facility, if authorized in writing by the department of water resources with the written concurrence of the department.

49 (d) The department is designated under Chapter 72, Acts of the 57th Legislature, Regular Session, 1961, as amended (Article 4590f, Vernon's Texas Civil Statutes), as the state agency with respect to regulating radioactive waste activities that are not preemptively regulated by the federal government. The department has all powers under the Solid Waste Disposal Act, as amended (Article 4477-7, Vernon's Texas Civil Statutes), necessary or convenient to carry out responsibilities concerning the regulation of the management of solid waste components of any radioactive wastes under its jurisdiction.

55 SECTION 4. Section 4, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969, as amended (Article 4477-7, Vernon's Texas Civil Statutes), is amended to read as follows:

57 Section 4. (a) As used in this section, the term "state agency" refers to either the department or the department of water resources and "state agencies" means both the department and the department of water resources.

59 (b) The department is authorized to develop a state municipal solid waste plan, and the department of water resources is authorized to develop a state industrial solid waste plan. The state agencies shall coordinate the solid waste plans developed. Before a state agency adopts its solid waste plan or makes any significant amendments to the plan, the Texas Air Control Board shall have the opportunity to comment and make recommendations on the proposed plan or amendments, and shall be given such reasonable time to do so as the state agency may specify.

63 (c) Each state agency may adopt and promulgate rules consistent with the general intent and purposes of this Act, and establish minimum standards of operation for all aspects of the management and control of the solid waste over which it has jurisdiction under this Act. Each state agency shall require persons who generate, transport, process, store, or dispose of Class I industrial solid waste or hazardous waste to provide recordkeeping and use a manifest or other appropriate system to assure that such wastes are transported to a processing, storage, or disposal facility permitted or otherwise authorized for that purpose.

1 (d) Each state agency is authorized to inspect and approve solid waste facilities used or proposed to be used for the storage, processing, or disposal of the solid waste over which it has jurisdiction.

3 (e) Except as provided in Subsection (f) of this section with respect to certain industrial solid wastes, each state agency has the power to require and issue permits authorizing and governing the operation and maintenance of solid waste facilities used for the storage, processing, or disposal of solid waste. This power may be exercised by a state agency only with respect to the solid waste over which it has jurisdiction under this Act. If this power is exercised by a state agency, that state agency shall prescribe the form of and reasonable requirements for the permit application and the procedures to be followed in processing the application, to the extent not otherwise provided for in this subsection. The following additional provisions apply if a state agency exercises the power authorized in this subsection:

9 (1) The state agency to whom the permit application is submitted shall mail a copy of the application or a summary of its contents to the Texas Air Control Board, to the other state agency, to the mayor and health authorities of any city or town within whose territorial limits or extraterritorial jurisdiction the solid waste facility is located, and to the county judge and health authorities of the county in which the facility is located. The governmental entities to whom the information is mailed shall have a reasonable time, as prescribed by the state agency to whom the application was originally submitted, to present comments and recommendations on the permit application before that state agency acts on the application.

15 (2) A separate permit shall be issued for each solid waste facility. The permit shall include the names and addresses of the person or persons who own the land where the solid waste facility is located and the person who is or will be the operator or person in charge of the facility; a legal description of the land on which the facility is located; and the terms and conditions on which the permit is issued, including the duration of the permit. The state agency in its discretion shall have the power to process a permit application for purpose of determining land use compatibility alone, and at another time, if the site location is acceptable, consider technical matters related to the application. Where this power is exercised, a public hearing may be held for each determination in accordance with Paragraph (4) of this Subsection (e).

21 (3) The state agency may amend, extend, or renew any permit it issues in accordance with reasonable procedures prescribed by the state agency. The procedures prescribed in Paragraph (1) of this Subsection (e) for permit applications apply also to applications to amend, extend, or renew a permit.

25 (4) Before a permit is issued, amended, extended, or renewed, the state agency to which the application is submitted shall provide an opportunity for a hearing to the applicant and persons affected; the state agency may also hold such a hearing upon its own motion. The state agency by rule shall establish procedures for public notice and any public hearing authorized under this paragraph. A hearing on a permit involving a solid waste facility for hazardous industrial solid waste must include one session held in the county in which the solid waste facility is located. Hearings under this paragraph shall be conducted in accordance with the hearing rules adopted by the state agency and the applicable provisions of the Administrative Procedure and Texas Register Act, as amended (Article 6252-13a, Vernon's Texas Civil Statutes).

31 (5) Before a permit is issued, amended, extended, or renewed, the state agency to which the application is submitted may require the permittee to execute a bond or give other financial assurance conditioned on the permittee's satisfactorily operating and closing the solid waste facility. The state agency to which the application is submitted shall require an assurance of financial responsibility as may be necessary or desirable consistent with the degree and duration of risks associated with the processing, storage, or disposal of specified solid waste. Financial requirements established by the state agency shall at a minimum be consistent with the federal requirements established under the federal Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, 42 U.S.C., 6901 et seq., as amended.

37 (6) If a permit is issued, amended, renewed, or extended by a state agency in accordance with this Subsection (e), the owner or operator of the solid waste facility does not need to obtain a license for the same facility from a county, or from a political subdivision exercising the authority granted in Section 6 of this Act.

39 (7) A permit issued under this Act is issued only to the person in whose name the application is made and is issued only for the facility described in the permit. A permit may not be transferred without prior written notice to and prior written approval by the state agency which issued it.

43 (8) The state agency has the authority, for good cause, to revoke or amend any permit it issues for reasons pertaining to public health, air or water pollution, land use, or violation of this Act or of any other applicable laws or rules controlling the management of solid waste. The state agency using this authority shall notify the governmental entities named in Paragraph (1) of this Subsection (e) and provide an opportunity for a hearing to the permittee and persons affected. The state agency may hold such a hearing upon its own motion. The state agency by rule shall establish procedures for public notice and any public hearing authorized under this paragraph. Hearings under this paragraph shall be conducted in accordance with the hearing rules adopted by the state agency and the applicable provisions of the Administrative Procedure and Texas Register Act, as amended (Article 6252-13a, Vernon's Texas Civil Statutes).

49 (9) Manufacturing and processing establishments, commonly known as rendering plants, which process for any purpose waste materials originating from animals, poultry, and fish (all hereinafter referred to as "animals") and materials of vegetable origin, including without limitation animal parts and scraps, offal, paunch manure, and waste cooking grease of animal and vegetable origin are subject to regulation under the industrial solid waste provisions of this Act and may also be regulated under Chapter 26, Water Code. When a rendering establishment is owned by a person who operates the rendering establishment as an integral part of an establishment engaged in manufacturing or processing for animal or human consumption food derived wholly or in part from dead, slaughtered, or processed animals, poultry, or fish, the combined business may operate under authority of a single permit issued pursuant to Chapter 26, Water Code. The provisions of this subsection do not apply to those rendering plants in operation and production on or before August 27, 1973.

57 (10) Each state agency may issue an emergency order, either mandatory or prohibitory in nature, regarding any activity of solid waste management within its jurisdiction, whether such activity is covered by a permit or not, if the state agency determines that the activity is creating or will cause extensive or severe property damage or economic loss to others or is posing an immediate and serious threat to human life or health and that other procedures available to the state agency to remedy or prevent the occurrence of the situation will result in unreasonable delay. The order may be issued without notice and hearing, or with such notice and hearing as the state agency deems practicable under the circumstances.

63 (i) If an emergency order is issued under this authority without a hearing, the issuing agency shall fix a time and place for a hearing to be held in accordance with the departmental rules by the state agency, so as to affirm, modify, or set aside the emergency order.

65 (ii) The requirements of Paragraph (4) of this subsection relating to public notice do not apply to such a hearing, but such general notice of the hearing shall be given in accordance with the departmental rules of the state agency.

67 (f) (1) This subsection applies to the collection, handling, storage, processing, and disposal of industrial solid waste which is disposed of within the property boundaries of a tract of land owned or otherwise effectively controlled by the owners or operators of the particular industrial plant, manufacturing plant, mining operation, or agricultural operation from which the waste results or is produced, and which tract of land is within 50 miles from the plant or operation which is the source of the industrial solid waste. This subsection does not apply if the waste is collected, handled,

1 stored, processed, or disposed of with solid waste from any other source or sources or if the waste, which is collected, handled, stored, processed, or
2 disposed of is hazardous waste. The department of water resources may not require a permit under this Act for the disposal of any solid waste to
3 which this subsection applies, but this does not change or limit any authority the department of water resources may have with respect to the
4 requirement of permits, the control of water quality, or otherwise, under Chapter 26, Water Code. However, the department of water resources may
5 adopt rules as provided under Subsection (c) of this section to govern and control the collection, handling, storage, processing, and disposal of the
6 industrial solid waste to which this subsection applies so as to protect the property of others, public property and rights-of-way, groundwater, and
7 other rights requiring protection. The department of water resources may require a person who disposes or plans to dispose of industrial solid waste
8 under the authority of this subsection to submit to the department of water resources such information as may be reasonably required to enable the
9 department of water resources to determine whether in its judgment the waste disposal activity is one to which this subsection applies.

11 (2) No person shall process, store, or dispose of hazardous industrial solid wastes under this subsection without having first obtained a
12 hazardous waste permit issued by the commission; provided, however, that any person who has on or before November 19, 1980, commenced on-site
13 processing, storing, or disposing of hazardous waste under this subsection and who has filed a hazardous waste permit application in accordance with
14 the rules of the board may continue to process, store, or dispose of hazardous waste until such time as the commission approves or denies the
15 application. Upon its own motion or the request of a person affected, the commission may hold a public hearing on an application for a hazardous
16 waste permit. The board by rule shall establish procedures for public notice and any public hearing authorized by this subsection. The commission
17 may include requirements in the permit for any remedial actions by the applicant that are determined by the commission to be necessary to protect
the public health and safety and the environment.

19 (g) Each state agency is authorized to develop a program for the training of solid waste technicians to improve the competency of those
20 technicians. Each state agency is authorized to issue letters of competency. The owner or operator of a solid waste facility is encouraged to employ as
21 site manager a solid waste technician holding a letter of competency from the appropriate state agency. If a state agency develops a program for
training solid waste technicians under this subsection, the state agency may:

23 (1) prescribe standards of training required for the program;

24 (2) determine the duration of the letter of competency;

25 (3) award one or more categories of letters of competency with each category reflecting a different degree of training or skill;

26 (4) require a reasonable, nonrefundable fee, in an amount determined from time to time by the state agency, to be paid by
27 participants, deposited in the general revenue fund, and used for administering the program;

28 (5) extend or renew letters of competency issued by the state agency; and

29 (6) withdraw a letter of competency for good cause, which may include a violation of this Act or rules of the agency relating to the
technician's duties and responsibilities.

31 (h) The state agencies may, either individually or jointly:

32 (1) provide educational, advisory, and technical services to other agencies of the state, regional planning agencies, local governments,
33 special districts, institutions, and individuals with respect to solid waste management;

34 (2) assist other agencies of the state, regional planning agencies, local governments, special districts, and institutions in acquiring
35 federal grants for the development of solid waste facilities and management programs, and for research to improve the state of the art; and

36 (3) accept funds from the federal government for purposes relating to solid waste management, and to expend money received from
37 the federal government for those purposes in the manner prescribed by law and in accordance with such agreements as may be necessary and
appropriate between the federal government and each state agency.

38 If a state agency engages in any of the programs and activities named in this subsection on an individual basis, it may do so only as
39 the participation by that state agency is related to the management and control of the solid waste over which it has jurisdiction. When the state
40 agencies do not participate jointly, they shall coordinate on any efforts undertaken by either one individually so that similar programs and activities of
41 the state agencies will be compatible.

42 (i) The state agencies are authorized to administer and expend state funds provided to them by legislative appropriations, or otherwise, for
43 the purpose of making grants to local governments for solid waste planning, the installation of solid waste facilities, and the administration of solid
44 waste programs. The grants made under the terms of this Act shall be distributed in a manner determined by the state agency to whom the
45 appropriation is made. Any financial assistance granted by the state through either of the state agencies to any local government under the terms of
this Act must, at a minimum, be equally matched by local government funds.

47 SECTION 5. Section 5, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969, as amended (Article 4477-7, Vernon's Texas Civil
Statutes), is amended to read as follows:

48 Section 5. (a) Every county has the solid waste management powers which are enumerated in this Section 5. However, the exercise of the
49 licensing authority and other powers granted to counties by this Act does not preclude the department or the department of water resources from
50 exercising any of the powers vested in the department or the department of water resources under other provisions of this Act, including specifically
51 the provisions authorizing the department and the department of water resources to issue permits for the operation and maintenance of facilities for
52 the processing, storage, or disposal of solid waste. The powers specified in Subsections (d) and (e) of this section and Section 18 of the County Solid
53 Waste Control Act (Article 4477-8, Vernon's Texas Civil Statutes) may not be exercised by a county with respect to the industrial solid waste disposal
54 practices and areas to which Subsection (f) of Section 4 of this Act applies. The department or the department of water resources, by specific action
55 or directive, may supersede any authority or power granted to or exercised by a county under this Act, but only with respect to those matters which
56 are, under this Act, within the jurisdiction of the state agency acting.

57 (b) A county is authorized to appropriate and expend money from its general revenues for the management of solid waste and for
58 administering a solid waste program; and to charge reasonable fees for the services.

59 (c) A county may develop county solid waste plans and coordinate those plans with the plans of local governments, regional planning
60 agencies, other governmental entities, the department, and the department of water resources.

61 (d) Except as provided in Subsection (a) of this section, a county is empowered to require and issue licenses authorizing and governing the
62 operation and maintenance of facilities used for the processing, storage, or disposal of solid waste, excluding hazardous waste, in areas not within the
63 territorial limits or extraterritorial jurisdiction of incorporated cities and towns. If a county elects to exercise licensing authority, it must adopt,

1 promulgate, and enforce rules for the management of solid waste. The rules shall be compatible with and not less stringent than those of the
2 department or the department of water resources, as appropriate, and must be approved by, the department or the department of water resources as
3 appropriate. The following additional provisions apply if a county exercises the power authorized in this Subsection (d):

4 (1) The county shall mail a copy of the license application with pertinent supporting data to the department, the department of
5 water resources, and the Texas Air Control Board. The governmental entities to whom the information is mailed shall have no less than 60 days to
6 submit comments and recommendations on the license application before the county acts on the application unless waived by the commenting
7 agency.

8 (2) A separate license shall be issued for each solid waste facility. The license shall include the names and addresses of the person or
9 persons who own the land where the solid waste facility is located and the person who is or will be the operator or person in charge of the facility; a
10 legal description of the land on which the facility is located; and the terms and conditions on which the license is issued, including the duration of the
11 license. The county is authorized to charge a fee for a license of not to exceed \$100.00, as set by the commissioners court of the county. Receipts
12 from the fees shall be placed in the general revenue fund of the county.

13 (3) The county may amend, extend, or renew any license it issues in accordance with rules prescribed by the county. The procedures
14 prescribed in Paragraph (1) of this Subsection (d) apply also to applications to amend, extend, or renew a license.

15 (4) No license for the use of a facility for the processing, storage, or disposal of solid waste may be issued, amended, renewed, or
16 extended without the prior approval, as appropriate, of the department or the department of water resources. If a license is issued, amended, renewed,
17 or extended by a county in accordance with this Subsection (d), the owner or operator of the facility does not need to obtain a permit from the
18 department or the department of water resources for the same facility.

19 (5) A license issued under this Act is issued only to the person in whose name the application is made and is issued only for the
20 facility described in the permit. A license may not be transferred without prior notice to and prior approval by the county which issued it.

21 (6) The county has the authority, for good cause, after hearing with notice to the licensee and to the governmental entities named in
22 Paragraph (1) of this Subsection (d), to revoke or amend any license it issues for reasons pertaining to public health, air or water pollution, land use, or
23 violation of this Act or of any other applicable laws or rules controlling the processing, storage, or disposal of solid waste. For like reasons, the
24 department and the department of water resources each may, for good cause, after hearing with notice to the licensee, the county which issued the
25 license, and the other governmental entities named in Paragraph (1) of this Subsection (d), revoke or amend any license issued by a county, but only
26 as to those facilities which fall, under the terms of this Act, within the jurisdiction of the state agency acting.

27 (e) Subject to the limitation specified in Subsection (a) of this section, a county may designate land areas not within the territorial limits or
28 extraterritorial jurisdiction of incorporated cities and towns as suitable for use as solid waste facilities. The county shall base these designations on the
29 principles of public health, safety, and welfare, including proper land use, compliance with state statutes, and any other pertinent considerations.

30 (f) A county is authorized to enforce the requirements of this Act and the rules promulgated by the board of health and the board as
31 related to the management of solid waste.

32 (g) A county may enter into cooperative agreements with local governments and other governmental entities for the purpose of the joint
33 operation of solid waste management activities and to charge reasonable fees for the services.

34 SECTION 6. Section 6, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969, as amended (Article 4477-7, Vernon's Texas Civil
35 Statutes), is amended to read as follows:

36 Section 6. This section applies to a political subdivision of the state which has jurisdiction over two or more counties or parts of two or more
37 counties, and which has been granted the power by the Legislature to regulate solid waste handling or disposal practices or activities within its
38 jurisdiction. The governing body of such a political subdivision may, by formal resolution, assume for the political subdivision the exclusive authority
39 to exercise, within the area subject to its jurisdiction, the powers granted in this Act to a county, to the exclusion of the exercise of the same powers
40 by the counties otherwise having jurisdiction over the area. In the exercise of these powers the political subdivision is subject to the same duties,
41 limitations and restrictions applicable to counties under this Act. When a political subdivision assumes this authority, it shall also serve as the
42 coordinator of all solid waste management practices and activities for all cities, counties and other governmental entities within its jurisdiction which have
43 solid waste management regulatory powers or engage in solid waste management practices or activities. Once a political subdivision assumes the authority
44 granted in this section, it is empowered to and shall exercise the authority so long as the resolution of the political subdivision remains in effect.

45 SECTION 6a. Section 6a, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969, as amended (Article 4477-7, Vernon's Texas Civil
46 Statutes), is amended to read as follows:

47 Section 6a. (a) No incorporated city or town may abolish or restrict the use or operation of a solid waste facility within its limits or
48 extraterritorial jurisdiction if the solid waste facility:

49 (1) was in existence at the time the city or town was incorporated or was in existence at the time the city or town annexed the area
50 where it is located; and

51 (2) is operated in substantial compliance with all applicable state and county regulations.

52 (b) An incorporated city or town or a political subdivision operating a solid waste facility shall not be prevented from operating the solid
53 waste facility on the ground that it is located within the limits or extraterritorial jurisdiction of another city or town.

54 SECTION 7. Section 7, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969, as amended (Article 4477-7, Vernon's Texas Civil
55 Statutes), is amended to read as follows:

56 Section 7. (a) The authorized agents or employees of the department, the department of water resources, and local governments have the right
57 to enter at all reasonable times in or upon any property, whether public or private, within the governmental entity's jurisdiction, including in the case
58 of an incorporated city or town, its extraterritorial jurisdiction, for the purpose of inspecting and investigating conditions relating to solid waste
59 management and control. Agents and employees shall not enter private property having management in residence without notifying the management,
60 or the person in charge at the time, of their presence and exhibiting proper credentials. The agents and employees shall observe the rules and
61 regulations of the establishment being inspected concerning safety, internal security, and fire protection.

62 (b) The authorized agents or employees of the department and the department of water resources may have access to, examine, and copy
63 during regular business hours any records pertaining to hazardous waste management and control.

1 (c) Records copied pursuant to Subsection (b) of this section shall be public records, except that, if a showing satisfactory to the
3 commissioner of the department or to the executive director is made by the owner of such records that the records would divulge trade secrets if made
5 public, then the department or the department of water resources shall consider such copied records as confidential. Nothing in this subsection shall
require the department of water resources or the department to consider the composition or characteristics of solid waste being processed, stored,
disposed, or otherwise handled to be held confidential.

7 SECTION 8. Section 8, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969, as amended (Article 4477-7, Vernon's Texas Civil
Statutes), is amended to read as follows:

Section 8. (a) Civil Penalties; Injunction.

9 (1) No person may cause, suffer, allow, or permit the collection, storage, handling, transportation, processing, or disposal of solid
11 waste, or the use or operation of a solid waste facility for the storage, processing, or disposal of solid waste, in violation of this Act or of the rules,
permits, licenses or other orders of the department or the department of water resources, or a county or a political subdivision exercising the authority
granted in Section 6 of this Act within whose jurisdiction the violation occurs.

13 (2) Any person who violates any provision of this Act or of any rule, permit, license, or other order of the department or the
15 department of water resources, or a county or a political subdivision exercising the authority granted in Section 6 of this Act within whose jurisdiction
the violation occurs, which is not a requirement applicable to hazardous waste, is subject to a civil penalty of not less than \$100.00 nor more than
17 \$2,000.00 for each act of violation and for each day of violation, as the court may deem proper, to be recovered in the manner provided in this
Section 8. Any person who violates any requirement applicable to hazardous waste shall be subject to a civil penalty of not less than \$100.00 nor
19 more than \$25,000.00 for each act of violation and for each day of violation, as the court may deem proper, to be recovered in the manner provided
in this Section 8(a).

21 (3) Whenever it appears that a person has violated, or is violating or threatening to violate, any provision of this Act, or of any rule,
23 permit, or other order of the department or the department of water resources, then the department or the department of water resources may cause a
civil suit to be instituted in a district court for injunctive relief to restrain the person from continuing the violation or threat of violation, or for the
25 assessment and recovery of a civil penalty as provided by this subsection, as the court may deem proper, or for both injunctive relief and civil penalty.
Upon application for injunctive relief and a finding that a person is violating or threatening to violate any provision of this Act or any rule, permit, or
27 other order of the department or the department of water resources, the district court shall grant appropriate injunctive relief. At the request of the
commissioner or the executive director, the attorney general shall institute and conduct a suit in the name of the State of Texas for injunctive relief or
to recover the civil penalty, or for both injunctive relief and penalty, as authorized in this subsection.

29 (4) Whenever it appears that a violation or threat of violation of any provision of this Act, or of any rule, permit, license, or other
31 order of the department, the department of water resources, a county, or a political subdivision exercising the authority granted in Section 6 of this
Act, has occurred or is occurring within the jurisdiction of that county or political subdivision, the county or political subdivision, in the same manner
as the department of water resources and the department, may cause a civil suit to be instituted in a district court through its own attorney for the
33 injunctive relief or civil penalties, or both, as authorized in Subsection (3) of this section, against the person who committed, is committing, or is
threatening to commit, the violation.

35 (5) Whenever it appears that a violation or threat of violation of any provision of this Act, or of any rule, permit, license, or other
37 order of the department, the department of water resources, a county, or a political subdivision exercising the authority granted in Section 6 of this
Act, has occurred or is occurring within the area of the extraterritorial jurisdiction of an incorporated city or town, or is causing or will cause injury to
or an adverse effect on the health, welfare or physical property of the city or town or its inhabitants, then the city or town, in the same manner as the
39 department of water resources and the department, may cause a civil suit to be instituted in a district court through its own attorney for the injunctive
relief or civil penalties, or both, as authorized in Subsection (3) of this section, against the person who committed, is committing, or is threatening to
commit, the violation.

41 (6) A suit for injunctive relief or for recovery of a civil penalty, or for both injunctive relief and penalty, may be brought either in the
43 county where the defendant resides or in the county where the violation or threat of violation occurs. In any suit brought to enjoin a violation or
threat of violation of this Act or of any rule, permit, license or other order of the department of water resources, the department, a county, or a
45 political subdivision exercising the authority granted in Section 6 of this Act, the court may grant the governmental entity bringing the suit, without
bond or other undertaking, any prohibitory or mandatory injunction the facts may warrant, including temporary restraining orders after notice and
hearing, temporary injunctions, and permanent injunctions.

47 (7) In a suit brought by a local government under Subsection (4) or (5) of this section, the department of water resources and the
department are necessary and indispensable parties.

49 (8) Any party to a suit may appeal from a final judgement as in other civil cases.

51 (9) All civil penalties recovered in suits instituted under this Act by the State of Texas through the department of water resources or
the department shall be paid to the General Revenue Fund of the State of Texas. All civil penalties recovered in suits first instituted by a local
53 government or governments under this Act shall be equally divided between the State of Texas on the one hand and the local government or
governments on the other, with 50 per cent of the recovery to be paid to the General Revenue Fund of the State of Texas and the other 50 per cent
equally to the local government or governments first instituting the suit.

55 (b) Criminal Penalties. (1) Any person who knowingly:

57 (A) transports, or causes to be transported for storage, processing, or disposal, any hazardous waste to any location which does
not have a permit as required by a state agency exercising jurisdiction under Section 4 of this Act;

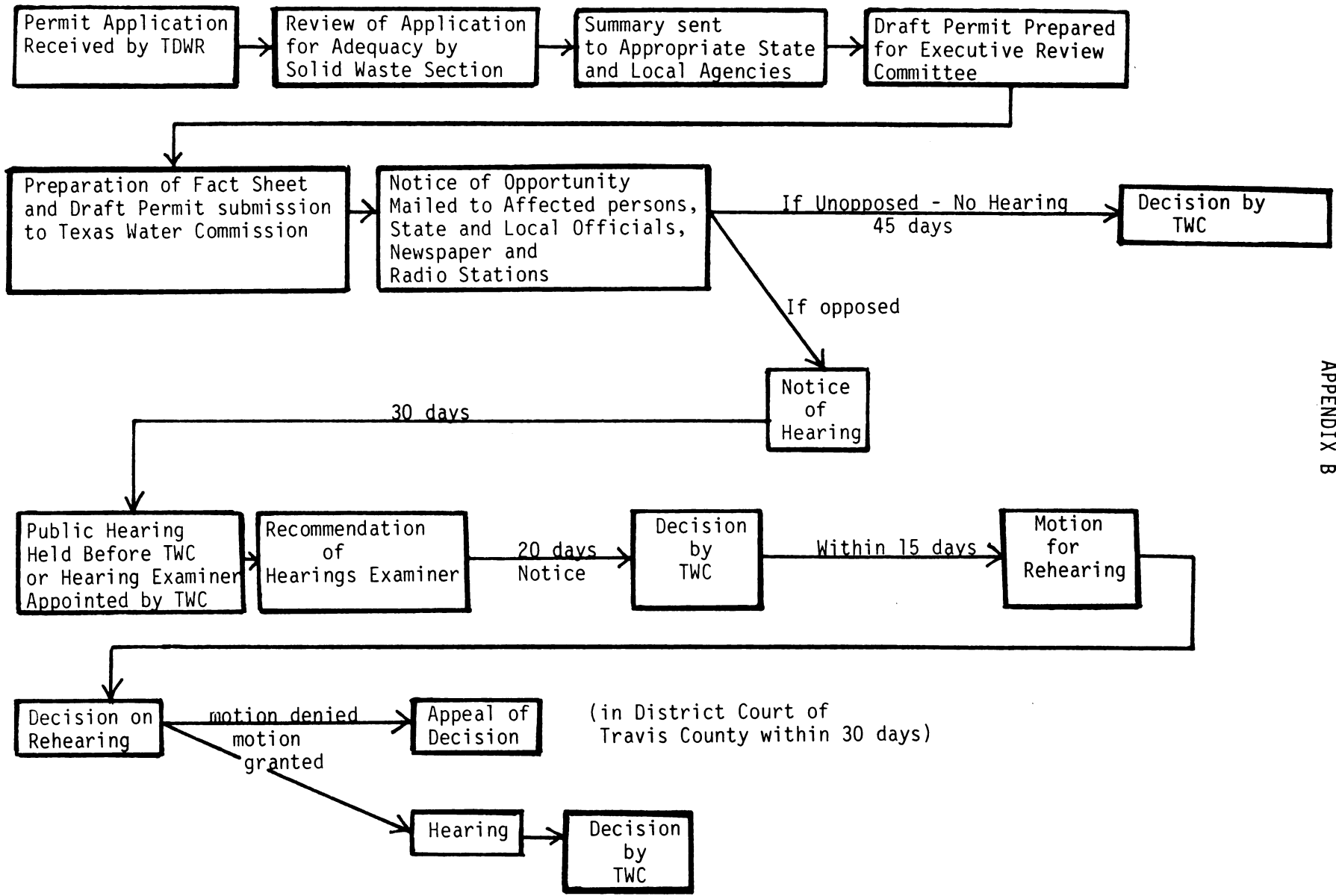
59 (B) stores, processes, or disposes, or causes to be stored, processed, or disposed, any hazardous waste without having obtained
a permit as required by a state agency exercising jurisdiction under Section 4 of this Act or in knowing violation of any material condition or
requirement of a permit;

61 (C) makes, or causes to be made, any false material statement or representation in any application, label, manifest, record,
63 report, permit, or other document filed, maintained, or used for purposes of compliance with any requirement of this Act applicable to hazardous
waste; or

65 (D) generates, transports, stores, processes, or disposes of, or otherwise handles, or causes to be generated, transported, stored,
67 processed, disposed of, or otherwise handled, any hazardous waste (whether such activity took place before or after the date of enactment of this
section) and who knowingly destroys, alters, or conceals, or causes to be destroyed, altered, or concealed, any record required to be maintained under
the rules promulgated by the state agency under this Act, shall be subject, upon conviction, to a fine of not less than \$100.00 nor more than
69 \$25,000.00 for each act of violation and each day of violation, or to imprisonment not to exceed 180 days, or both. If the conviction is for a violation
committed after a first conviction of such person under this Section 8(b), punishment shall be by a fine of not less than \$200.00 nor more than
\$50,000.00 for each day of violation, or by imprisonment not to exceed one year, or both.

1 (c) Knowing Endangerment. (1) Any person who knowingly:
3 (A) transports, processes, stores, or disposes of, or causes to be transported, processed, stored, or disposed of, any hazardous waste in violation of this Act and who knows at the time that he thereby places another person in imminent danger of death or serious bodily injury, and
5 (B) (i) if his conduct in the circumstances manifests an unjustified and inexcusable disregard for human life,
7 (ii) if his conduct in the circumstances manifests an extreme indifference for human life, shall be subject upon conviction to a fine of not more than \$250,000.00 or imprisonment for not more than two years, or both, except that a person that violates Subsection (c)(1)(A) and (c)(1)(B)(ii) of this section shall, upon conviction, be subject to a fine of not more than \$250,000.00 or imprisonment for not more than five years, or both. A person, other than an individual, shall upon conviction of violating this Section 8(c) be subject to a fine of not more than \$1,000,000.00.
11 (2) It is an affirmative defense to a prosecution under this subsection that the conduct charged was consented to by the person endangered and that the danger and conduct charged were reasonably foreseeable hazards of
13 (A) An occupation, a business, or a profession; or
15 (B) medical treatment or medical or scientific experimentation conducted by professionally approved methods, if such endangered person had been made aware of the risks involved prior to giving consent.
17 (d) For purposes of Sections 8(b) and 8(c) of this Act, the term "person" means an individual, corporation, company, association, firm, partnership, joint stock company, foundation, institution, trust, society, union, or any other association of individuals.
19 (e) Venue for prosecution for any alleged violation of Subsections (b)(1) and (c)(1) of this Section 8 is in the county in which the violation is alleged to have occurred or in Travis County, Texas.
21 (f) All fines recovered under Sections 8(b) and 8(c) of this Act shall be equally divided between the State of Texas and the local government or governments first instituting the cause with 50 per cent of the recovery to be paid to the General Revenue Fund of the State of Texas and the other 50 per cent to be paid equally to the local government or governments instituting the cause, or as otherwise provided by this Act.
23 SECTION 9. Section 10, Chapter 405, Acts of the 61st Legislature, Regular Session, 1969, as amended (Article 4477-7, Vernon's Texas Civil Statutes), is amended to read as follows:
25 Section 10. This Act is cumulative of and supplemental to any other laws and parts of laws relating to the same subject and does not repeal those other laws or parts of laws. Nothing in this Act diminishes or limits, or is intended to diminish or limit, the authority of the department, the department of water resources, the Texas Air Control Board, or local governments in performing any of the powers, functions, and duties vested in those governmental entities by other laws.
27 SECTION 10. On or before January 1, 1982, the Texas Department of Water Resources, the Texas Department of Health, and the Railroad Commission of Texas shall execute a memorandum of understanding that specifies in detail these agencies' interpretation of the division of jurisdiction among the agencies over waste materials that result from or are related to activities associated with the exploration for and the development, production, and refining of oil or gas. The agencies shall amend the memorandum of understanding at any time that the agencies find it to be necessary.
31
33 SECTION 11. This Act shall take effect on September 1, 1981.

SOLID WASTE PERMIT PROCESS



APPENDIX C

SUMMARY OF PUBLIC PARTICIPATION PROGRAM

Purpose and Objectives

The public participation program is intended to encourage and facilitate public awareness of and participation in significant decision-making activities in industrial solid waste management.

Objectives

1. To provide the public with policy, program and technical information pertaining to issues that will be the subject of decision-making.
2. To consult with interested and affected segments of the public prior to decision-making.
3. To assure that proposed governmental actions are responsive to public concerns.

Program Design

To accomplish the foregoing objectives, the TDWR has developed a public participation program which has three major components:

1. Information development and dissemination
2. Consultation through public hearings, meetings and workshops
3. Response to public comment

Information Development and Dissemination Citizens Targeted for Involvement

The TDWR Solid Waste Section has identified those members or groups who might be interested, or affected, by the solid waste program and has developed two mailing lists to notify these people of solid waste activities. The first list is for those interested in hazardous waste management. It contains 2500 names including owners and operators of solid waste management facilities, public interest groups, trade, industrial and agricultural associations, and government agencies. The second list is for those people interested in the Solid Waste Management Plan and the Open Dump Inventory. It contains 600 names.

Information Depositories

Solid waste information depositories have been established in the TDWR library, the district offices, and regional councils of government. These depositories will receive any documents or notifications produced and sent out by the Solid Waste Section.

Information Dissemination

Several mechanisms have been used to provide the public with information on solid waste issues, meetings and workshops.

1. The Texas Register is the official notification publication for governmental agencies in Texas. This publication is used to announce public meetings and hearings on plan development and implementation, rule development and permitting of facilities.
2. The TDWR newsletter, Texas Water, often contains articles on solid waste and hazardous waste management that are of interest in Texas.
3. The State A-95 clearinghouse distributes copies of the annual work plan for review under the provisions of OMB Circular A-95. This review is to assure that federally assisted activities are in compliance with state plans, programs, goals, objectives and policies.
4. News media of general distribution are used to publicize information on public hearings, meetings and workshops. Press releases are coordinated by the TDWR Office of Public Information.
5. Technical and policy documents developed by the solid waste management program are distributed to the state information depositories and individuals upon request.
6. The solid waste mailing lists are used to notify various groups of meetings and activities.
7. Requests for solid waste program information are coordinated by the Solid Waste Section, Permits Division. Citizen complaints are coordinated by the Industrial Wastewater and Solid Waste Section, Enforcement and Field Operations Division. Individuals in each Division have been identified to coordinate responses to citizen inquiries.

Public Consultation

Public hearings, meetings or workshops are conducted by the TDWR to encourage participation and recommendations from those interested or affected by development and implementation of the solid waste management plan, development of the annual work program, development of state rules and approval of facility permit applications.

Response to Public Comment

The TDWR has considered and incorporated, where possible, all comments received from the public, both written and verbal, in public hearings on development and implementation of the state plan and during public hearings on rule development. A Responsiveness Summary was prepared for the public meetings held last June and one is being finalized to respond to comments presented at the public hearings in December. Copies of these summaries are available upon request.

Other Activities

The TDWR Solid Waste staff has coordinated with other state agencies in the development of the State Solid Waste Plan and the State/EPA Agreement. The TDWR and the Texas Department of Health coordinated hearings to receive comment on the State Plan. Through the State/EPA Agreement, TDWR Solid Waste staff have coordinated with other agencies to develop an environmental brochure and questionnaire.

TDWR staff have utilized the film libraries of both EPA and the Department of Health in making presentations before various groups on the solid waste program.

The TDWR Solid Waste Planner has served on a toxic/hazardous waste advisory group which provides guidance to an EPA-funded project. The purpose of this project is to develop training workshops and informational materials for members of the public who have been affected by hazardous and toxic materials.

Information on resource recovery is being assembled into a directory of solid waste recyclers. This directory will be available for general distribution in May.