

**ZAPATA COUNTY, TEXAS
WATER AND WASTEWATER
REGIONAL PLANNING STUDY**

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REGIONAL PLANNING STUDY

ZAPATA COUNTY WATER AND WASTEWATER

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EXECUTIVE SUMMARY

Zapata County is made up of 1,058 square miles of ranch lands, small communities and town sites. The County is located in South Texas about 50 miles southeast of Laredo on the Rio Grande River. Approximately 60 miles of the County is bordered by the Rio Grande River. Major towns in the County are the Cities of Zapata and San Ygnacio, which are located on the river adjacent to U.S. Highway 83, one of the County's major highways.

More than 80 percent of the County's 1990 population of 9,279 residents lived in and around the Town sites of Zapata and Ygnacio. The County's population is made up of year-round and winter residents. About 81 percent of the County's population is Hispanic.

In 1989, the Texas Water Development Board identified three Colonias in the County with an estimated 1989 population of 2284 persons and a total land area of 99 acres. These Colonias comprise about 25 percent of the total County residents and are located in the Townsite of Zapata. All of the Colonias are connected the Zapata County Waterworks water supply system and most are connected to the wastewater collection and treatment facilities. As shown in this regional report, there is a need to provide service to those residents who are not connected to a community wastewater system and to improve the existing water distribution and fire control facilities in many areas.

The purpose of this Water and Wastewater Regional study is to provide the Zapata County Commissioner's Court with a coordinated, cost effective means for developing potable water supplies and for improving and expanding wastewater collection and treatment facilities for the citizens of Zapata County to the year 2030. The lack of adequate wastewater collection facilities and the existence of septic tanks in the densely populated areas is a possible source of pollution and health hazards. Water quality test made by the TNRCC indicate that, at the present time, the waters of Falcon Reservoir are good with

little or no fecal coliform counts, However, the tests do show high suspended solids and total solids counts are high..

Population growth in Zapata County has been erratic since 1930 and, over a couple of decades between 1930 and 1990, the population actually declined in the County. Between 1930 and 1950, population in the County increased to an estimated 4405, at annual rates between 1.24 and 3.7 percent. However, beginning in 1950 the population decreased until 1970, at which time the County began growing at an annual rate of more than 5.2 percent. The growth trend since 1970 reflects a cycle of a decade of accelerated growth followed by a decade of slow to moderate growth. For example, the rate of growth from 1970 to 1980 is estimated to be 5.23 percent and the growth rate between 1980 and 1990 is estimated to be 4.0 percent.

The Texas Water Development Board's engineers and scientists have analyzed the growth trends in South Texas and Zapata County and have made projections through the year 2050 using several factors which will affect the rates of growth. The projection used in this report is the Board's High Series. See Tables 2-1 and 2-2 in Chapter 2 for the historical and projected populations. The Texas Water Development Board's population projection report, dated June 1994, is also included in Appendix A of this study.

There are six Municipal Utility District's, Water Control and Improvement District's and Water Supply Corporations permitted by the State to provide water services to residents of Zapata County. Only three of these Districts are permitted to provide wastewater

collection and treatment services and to discharge into the Rio Grande River. These Districts are as follows:

DISTRICT	WATER RIGHTS OWNED (AC-FT)	WATER SERVICE	WASTEWATER SERVICE
Falcon RWSC (Starr & Zapata Counties)	79.00	X	
San Ygnacio MUD (Zapata Co. WCID)	233.75	X	X
Siesta Shores WCID*	62.50	X	X
Zapata Co. Water Works	1084.20	X	X
Zapata Co. WCID-Hwy 16E	75.00	X	
Cox Camp (Private)	11.00	X	
TOTAL	1545.45		

- * Siesta Shores Water Control & Improvement District (WCID) was created in 1993 by the residents of the Siesta Shores Community. Existing assets such as a water treatment plant and water lines were purchased from Siesta Shores, Inc., a private water supplier. In 1994, Farmers Home Administration approved a colonia grant/loan in the amount of \$1,100,000 for water treatment, supply and distribution improvements. The construction of the proposed facilities is scheduled to begin in 1995.

Although six water suppliers own 1545.45 acre-feet of water rights for municipal purposes, only Zapata County Water Works, San Ygnacio MUD, Siesta Shores Inc. (Siesta Shores WCID), and Falcon RWSC report diversions from the river. Total diversions in 1993, including charge, no charge and contract diversions, were reported to be 2,370.445 acre-feet, or 825 acre feet greater than the owned water rights.

Since the availability of ground water in Zapata County is very limited, the Rio Grande River will continue to be the source of raw water for Zapata County. The increased demand for water will require Zapata County water suppliers to purchase many acre-feet

of water rights to meet the projected demands and additional transmission and distribution mains.

Wastewater service is provided by Zapata County Waterworks in the Townsite of Zapata and by San Ygnacio MUD in the Townsite of San Ygnacio. Approximately 3,597 County residents discharge an average of 0.192 MGD wastewater to the existing treatment facilities. By the year 2030, it is estimated that 17,300 residents will discharge an average of 1.42 mgd of wastewater into these facilities.

Several developments which are located on the shores of Falcon Reservoir and near the Townsite of Zapata are not connected to any regional or community wastewater treatment facilities and wastewater from these developments is treated by onsite septic systems. These developments, or subdivisions, are Falcon Lake Estates, Black Bass Subdivision, Lakefront Lodge, Linda Vista, Falcon Mesa and Siesta Shores. Soils in these areas are generally conducive to septic tank treatment systems but the population densities are high and the sizes of lots are too small to allow septic tanks in most areas.

Siesta Shores WCID is in the near-construction phase of providing wastewater collection and treatment for the Siesta Shores development. It is estimated that approximately 5,000 people reside in these subdivisions and discharge 150,000,000 gallons of wastewater annually to the septic systems. See Map 6 for the location and size of these subdivisions.

Zapata County is in the process of extending wastewater service to the Medina Colonia in the Townsite of Zapata. There are three Colonias with 1144 lots which are identified by the Texas Water Development Board in the 1989 Survey of Colonias. These Colonias are Medina Colonia, Cuellar and Falcon Mesa Colonia. Existing population of the Colonias is estimated to be 2284.

A major portion of Zapata County Waterworks' wastewater collection lines in the Townsite Zapata are more than 50 years old and appear to need replacement. These lines

were constructed in the 1930's, 1940's and 1950's with Vitrified Clay Pipe which appear to allow inflow and infiltration. Many of these interceptor lines are inadequately sized to discharge the projected flows.

Financial assistance in the form of loans and/or grants for making improvements and upgrades to the water and wastewater systems may be obtained from USDA/Rural Development, the Texas Water Development Board through the State Revolving Fund (sewer), the Economically Distressed Areas Program for Colonias and the Texas Community Development Program.

The County has adopted a Water Conservation and Emergency Management Plan and a Model Subdivision Ordinance. Copies of these are located in Appendix B of this report.

The capital expenses for making the necessary improvements are shown in Chapter 7 of this study. The proposed improvements meet the current minimum standards as established by the State of Texas for the projected growth.

Based on the current depressed economic condition of Zapata County, grants from the State and/or Federal Government will be essential to accomplish the proposed improvements.

The regionalization of the wastewater treatment systems near the Townsite of Zapata does afford significant environmental and economic benefits over the existing system. For the individual user, the initial cost for the regional approach to wastewater collection and treatment is estimated to be substantially less than the costs of permitting, construction and maintenance of the individual treatment and disposal facilities. The existing facilities will provide adequate treatment of the wastewater before discharging into Falcon Reservoir under the existing permit parameters. However, additional treatment of wastewater may be required when limitations on allowable pollutants to be discharged into the Rio Grande River are lowered by the State and the NEPA.

Finally, this regional plan is to be regarded as the beginning of an ongoing planning process, rather than the conclusion. It should be reviewed and modified as needs dictate. It is the road map to insure that proper water and wastewater services are provided to Zapata County residents in the future.

CHAPTER 1 - PROJECT IDENTIFICATION

1.1 Introduction

Zapata County is located in South Texas in the Rio Grande Valley and is bounded by Webb County on the north, Jim Hogg County on the east, Starr County on the south and the Rio Grande River on the west (State of Tamaulipas, Republic of Mexico). See Figure 1-1, which follows, for the location of Zapata County.

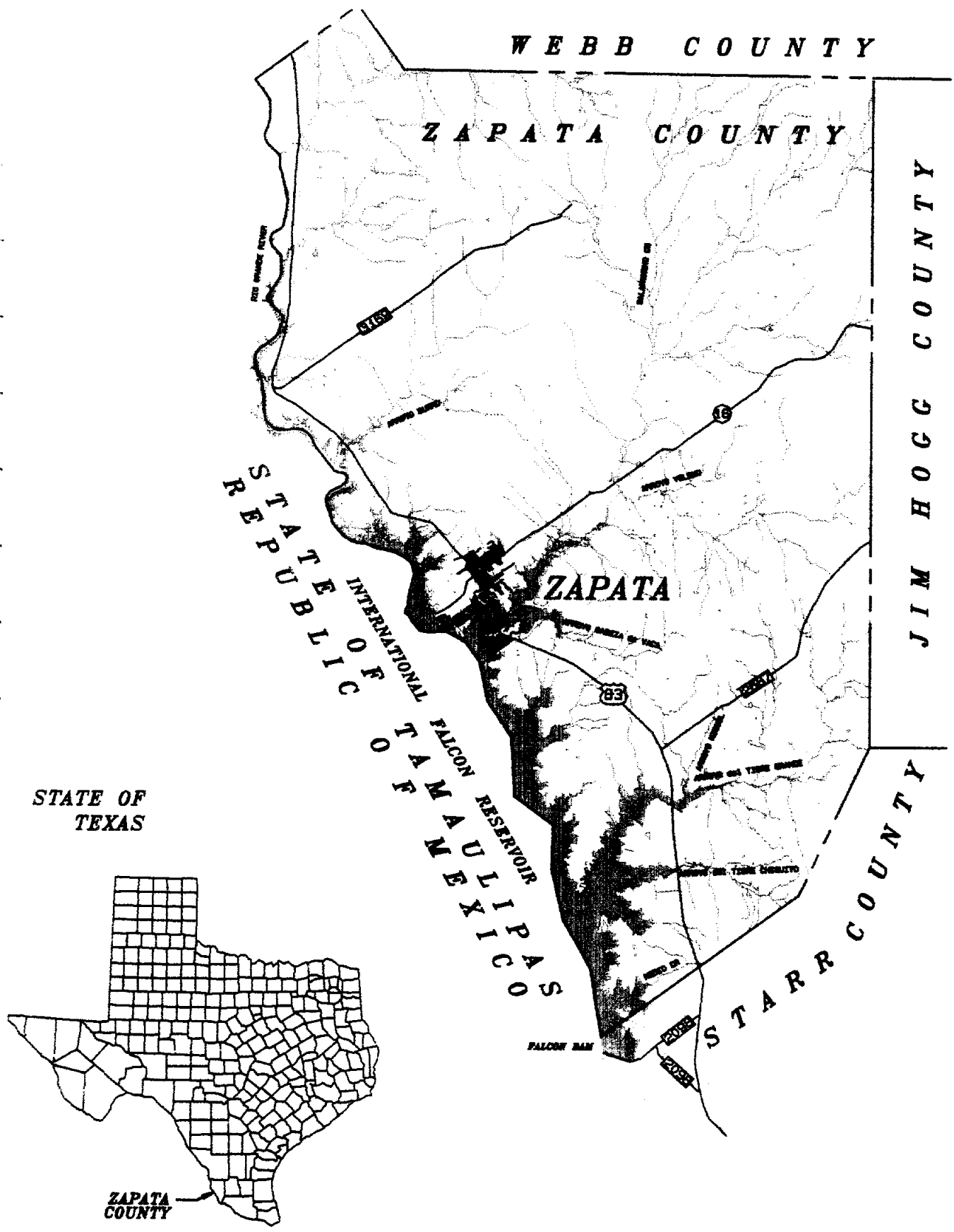
Zapata County is governed by four County Commissioners and a County Judge. The following is a listing of the 1994 County Officials.

ZAPATA COUNTY OFFICIALS

County Judge:	Norma Villarreal-Ramirez
Commissioner Precinct 1:	Jose Luis Flores
Commissioner Precinct 2:	Angel Garza
Commissioner Precinct 3:	Adolfo Gonzalez
Commissioner Precinct 4:	Amaro Bustamonte
Grants Coordinator	Mario Gonzalez-Davis
Sheriff:	Romeo Ramirez
Address for all Officials:	P.O. Box 99, Zapata, TX 78076
Judge's Office:	Phone: 210/765-9920

Zapata County submitted an application to the Texas Water Development Board for financial assistance to conduct a regional water and wastewater planning study. On February 17, 1994, the TWDB approved the application. The TWDB is providing \$30,000 to fund this study. Zapata County is providing \$5,000 of matching funds, and \$5,000 of in-kind services. On March 14, 1994, The Nelson Corporation was awarded the contract to perform the Zapata County Regional Water and Wastewater Study and to publish the subsequent report.

Data and information contained in the following sections which describe the existing conditions of the Planning Area (Zapata County) were obtained from the Texas Water Development Board, Texas Natural Resources Conservation Commission, the South Texas Development Council, the Texas Almanac, Zapata



WEBB COUNTY

ZAPATA COUNTY

JIM HOGG COUNTY

STATE OF TEXAS

STATE OF MEXICO

ZAPATA

INTERNATIONAL FALCON RESERVOIR

STATE OF TEXAS

ZAPATA COUNTY

STARR COUNTY

LOCATION MAP
ZAPATA COUNTY

County Water Works, San Ygnacio M.U.D., Falcon Rural WSC, Siesta Shores WCID, Zapata County-Hwy 16E WCID and Zapata County.

1.2 Purpose

The purpose of the Regional Water and Wastewater Study is to provide the County with a coordinated, cost effective plan for providing and improving water and wastewater services to the citizens of the County.

1.3 Scope, Purpose and Goals

This study evaluates the present water and wastewater service in the County and projects population growth as well as water and wastewater demands to the year 2025, a 30-year planning period. Proposed alternatives to provide water and wastewater service are evaluated, including the estimated implementation and O&M costs. The study also includes a model water conservation and drought contingency plan.

1.4 Planning Area

1.4.1 Description

Zapata County was created in 1858 from Starr and Webb Counties. It was named for Colonel Antonio Zapata, a pioneer Mexican rancher, land holder and freedom fighter. The County was first surveyed by the Spanish in 1767 and is divided into grants, or porciones. The original lines of the Spanish land grants and surveys have been retained by the County and the State.

Zapata County has a total of 677,180 acres, or 1058 square miles, with a land area of 996.8 square miles. The Townsite of Zapata, an unincorporated Townsite, is the County seat with an urban land area of about 6.7 square miles. The Townsite is located 47 miles south of

Laredo, 180 miles south of San Antonio and 148 miles southwest of Corpus Christi.

The principal highways in the County are U.S. Highway 83, which runs north to south paralleling the Rio Grande River, State Hwy. 16 which runs northeasterly from the Townsite of Zapata, F.M. 2687 and F.M. 3169 cross the County in a northeasterly direction. The County is not served by rail. There is one public airfield, 5 miles east of the Townsite and the nearest commercial airfield is in Laredo, 47 miles to the north.

1.4.2 Citation of Legal Authority

Zapata County is a political subdivision of the State of Texas created by the Act approved January 22, 1858, 7th Legislature, Regular Session, Chapter 55, Section 7, 1858 Texas General Laws 58, 60, Reprinted in 4 HPN Gimmel, Laws of Texas 930,932 (1898).

1.4.3 Population

Zapata County has experienced a high rate of growth since 1970. Table 1-1, which follows, shows the County's population for the period of 1930 through 1990.

**TABLE 1-1
HISTORIC POPULATION
ZAPATA COUNTY, TEXAS**

YEAR	POPULATION	% CHANGE
1930	2,867	-
1940	3,916	36.7
1950	4,405	12.5
1960	4,393	-0.3
1970	4,352	-0.9
1980	6,628	52.3
1990	9,279	40.0

Based on projections made by the Texas Water Development Board, it is expected that the year 2000 population will be over 13,000, resulting in another 10 year increase of approximately 40%. See Table 2-4, Population Projections for Zapata County, in Chapter 2 of this report. The population of Zapata County is over 80% Hispanic. The median age of the population is 27.8 years which is 6.6 years below the national median.

Most of the population is concentrated in the western portion of the County along the Rio Grande River Valley; Approximately 95% lives within three miles of the U.S. Highway 83 or the Rio Grande River and about 81 percent of the total population lives in and around the Townsite of Zapata.

1.4.4 Colonias

As identified by the TWDB 1989 survey, Zapata County has three Colonias which have a combined population of approximately 2300. These three Colonias, Falcon Mesa, Medina and Cuellar, are located near

the Townsite of Zapata in the Zapata County Waterworks service area. See Map 1, which follows, for the location of the Colonias. The following is listing of the three Colonias as reported by the Texas Water Development Board:

Colonia	Estimated Population	Number of Lots	Number of Dwellings
Medina	2025	1048	625
Falcon Mesa	251	66	66
Cuellar	42	30	11
TOTAL	2284	1144	601

1.5 **Social and Economic**

Zapata County is one of the poorest counties in the State of Texas with 41 % of the population of 9,279 living in poverty. The following statistics were taken from the 1994-95 Texas Almanac and information obtained from the South Texas Development Council. Of the 1990 Zapata County population:

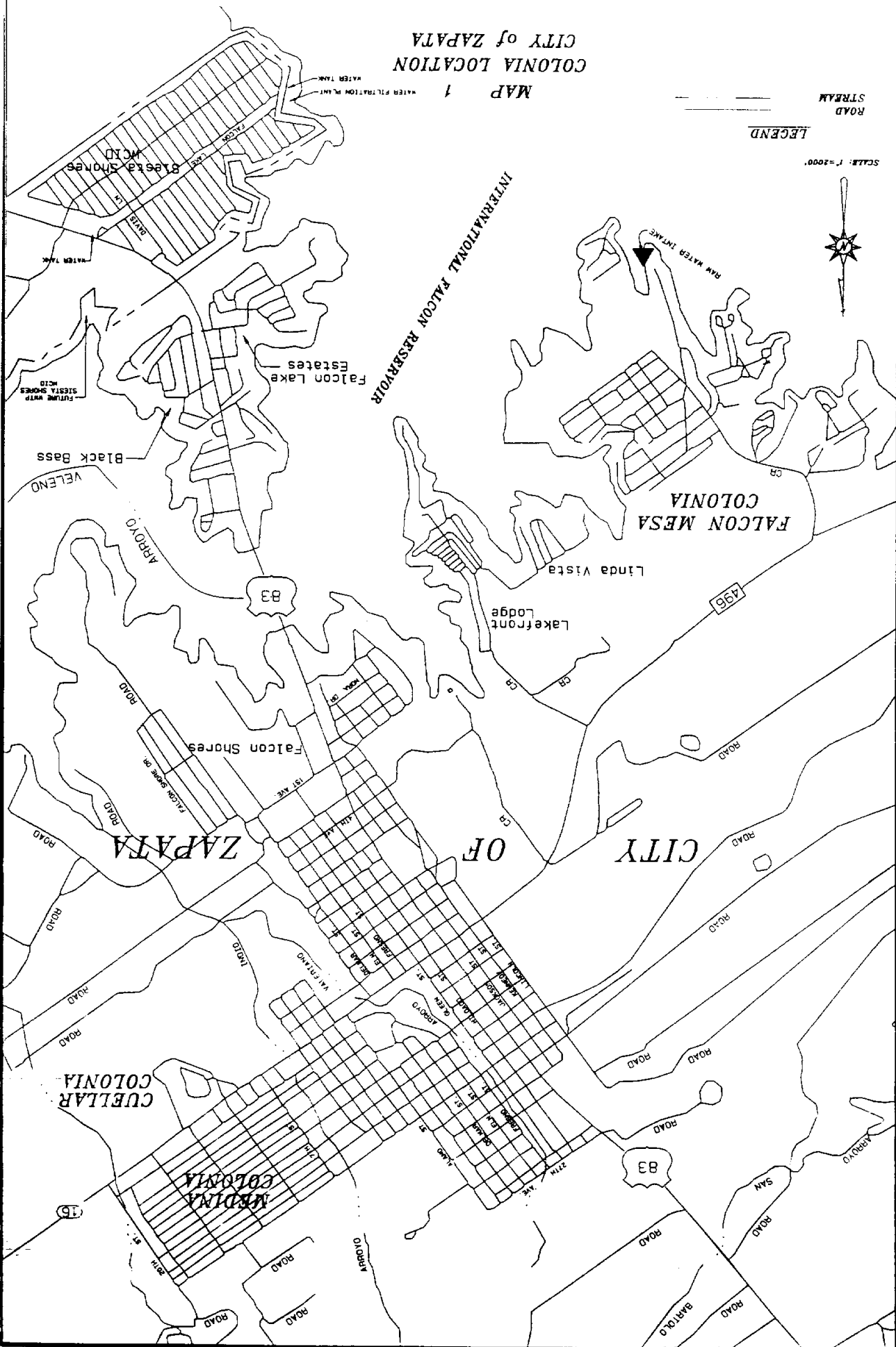
- 16% are foreign born;
- 91% speak a language other than English;
- 50% of the population, age 25 and older, have not finished high school;
- The median per capita annual income is \$6,541;
- 36% of the families live below the poverty level;
- In 1992, the median household annual income is \$14,926, making Zapata County one of the poorest counties in the state;
- There are 4225 housing units of which 2862 are occupied;
- Owner - occupied housing units have a median value of \$35,500;
- 97.4% are served by public water;
- 37.3% are served by public sewer;
- 96.5% of the homes have complete plumbing.

CITY of ZAPATA
COLONIA LOCATION
MAP 1

LEGEND

SCALE: 1"=2000'

ROAD
STREAM



C:\JOB\ 9315000\ FIGURES\ COLONIA

1.6 Employment

Zapata County experiences a high rate of unemployment, 13.3 percent reported for 1992. As reported in the 1994-95 Texas Almanac, average real wages have dropped by \$42 per week between 1982 and 1992.

The majority of the jobs in the County are associated with tourism, the petroleum industry or the government. Forty six percent (46%) of the people employed in non-agricultural jobs work for the government (School District, Townsite, County, etc.). Only 3.5% of the population is employed in manufacturing. Many people are employed as migrant farm workers.

1.7 Land Use

Ninety eight percent (98%) of the land use in the County is used for range land, primarily the areas east of U.S. Highway 83. Urban areas and irrigated lands are concentrated near the Rio Grande River and U.S. Highway 83. On the average, only 7,000 to 10,000 acres of cropland are irrigated each year.

1.8 Government

There are two unincorporated cities in Zapata County and three municipal utility districts: Townsite of San Ygnacio, the Townsite of Zapata, San Ygnacio MUD, Siesta Shores WCID, Zapata County WCID - Hwy. 16E. For the remainder of the population, the County is the only local government. The Regional Council of Governments for Zapata County is the South Texas Development Council located in Laredo.

1.9 Climate

Zapata County has a warm, temperate, sub-tropical steppe climate. While the area is less than 160 miles from the Gulf of Mexico, it has few marine characteristics. Wind speeds average less than 15 miles per hour. The average rainfall is 19.8 inches. On the average, September is the wettest month of the year with an

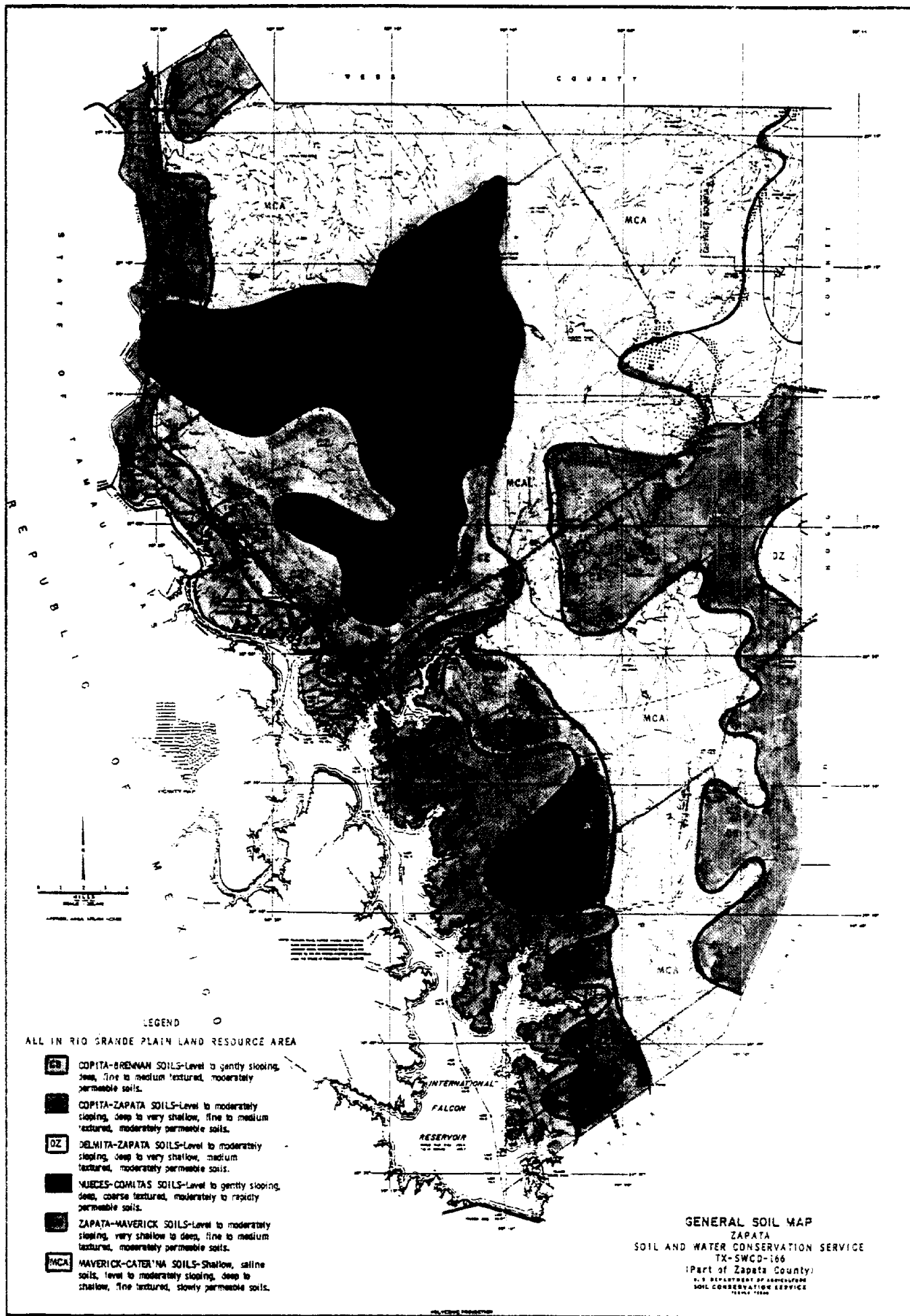


FIGURE 1-2

average of 4.3 inches per year, and March is the driest month with 0.6 inches per year. The average growing season is 304 days. On the average, the first freeze in the fall is on December 15 and the last freeze in the Spring is on February 14. The percentage of possible sunshine averages 60% to 65% annually.

1.10 Topography and Geography

Zapata County is located adjacent to the Rio Grande River in the Lower Rio Grande Valley in South Texas. The County encompasses 1,058 square miles in the Lower Rio Grande River Basin. Physical features of the County consist of brushy, rolling hills broken by tributaries of the Rio Grande River and the Falcon Reservoir. About one-half of the County is located in the Arroyo Valeno Watershed which discharges into the Rio Grande River (Falcon Reservoir) at the Townsite of Zapata. The remainder of the County is located in eight smaller watershed basins or tributaries to the Rio Grande. Elevations of Zapata County vary from 327 feet at the normal conservation pool level of Falcon Reservoir to about 562 feet mean sea level.

The U.S. Soil Conservation Service has not built any flood control structures in Zapata County and does not have any plans to construct any flood control structures in the future. See Figures 1-2 and 1-3, which follow, for the Zapata County Soils and Geologic formations, respectively.

1.11 Soils

The U.S. Soil Conservation Service has not published a soil survey for Zapata County but has identified 6 soil associations in Zapata County. The soil associations and their descriptions are as follows:

1.11.1 Copita - Brennan

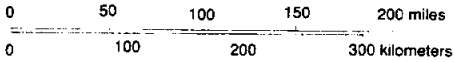
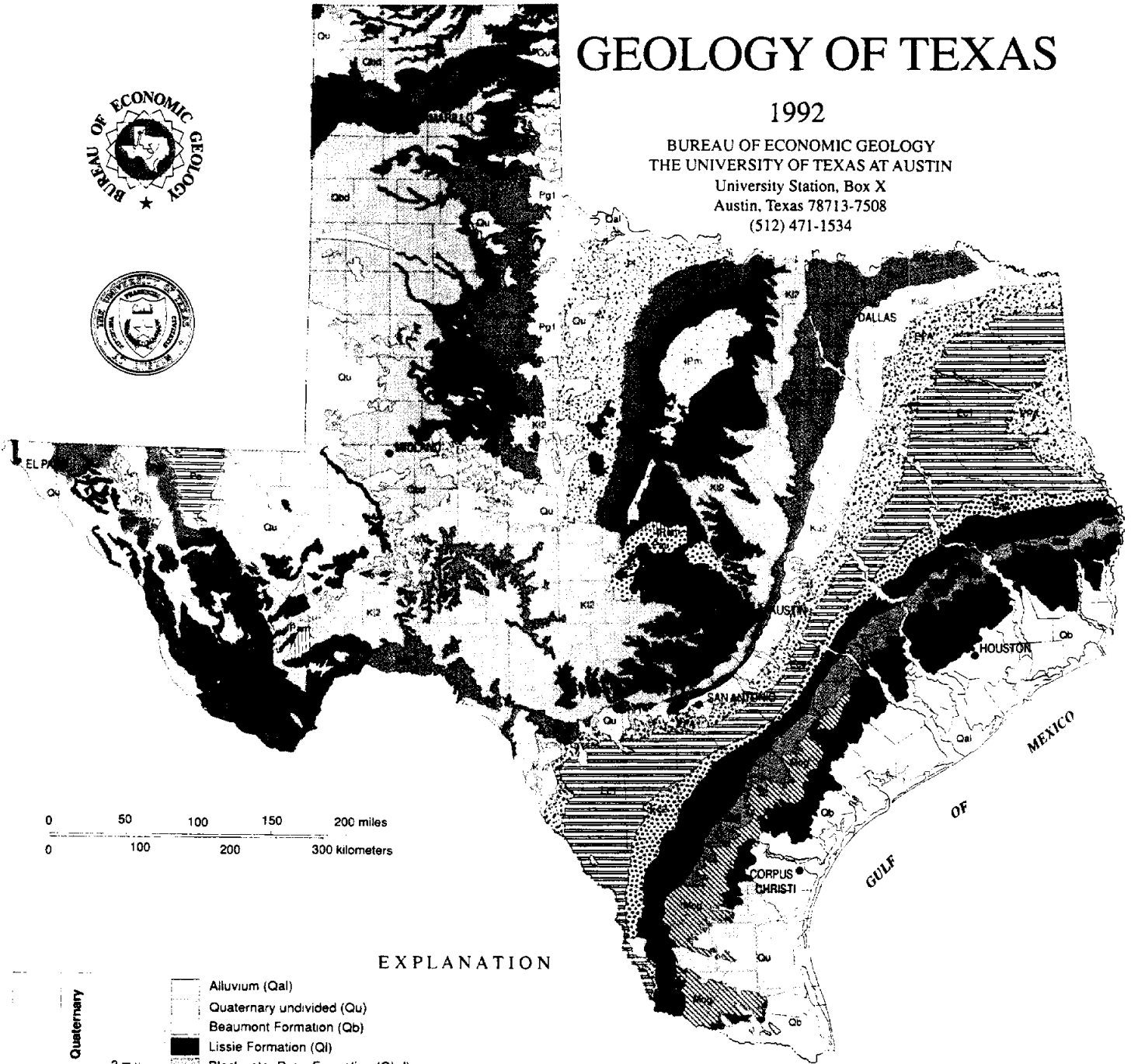
This association covers 14% of the County. It is made up of about 60% Copita and 30% Brennan soils. This association is mainly located in the

GEOLOGY OF TEXAS

1992

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EXPLANATION

Time Period	Age (m.y.)	Geological Unit	Symbol	
CENOZOIC	Quaternary	Alluvium (Qal)	White background	
		Quaternary undivided (Qu)	Light gray background	
		Beaumont Formation (Qb)	Dark gray background	
		Lissie Formation (Ql)	Black background	
	Pliocene	2 m.y.	Blackwater Draw Formation (Qbd)	Black background
		5 m.y.	Willis Formation (Pow)	Black background
		Ogallala Formation (PoMo)	Black background	
	Miocene	24 m.y.	Goliad Formation (Mog)	Diagonal lines (top-left to bottom-right)
		Fleming and Oakville Formations (Mot)	Diagonal lines (bottom-left to top-right)	
	Oligocene	38 m.y.	Catahoula Formation (Oc)	Black background
Oligocene and Eocene undivided (OE) (volcanic rocks and conglomerates in Trans-Pecos Texas)		Black background		
Eocene	Jackson Group (Whitsett, Manning, Wellborn, Caddell, Yazoo, and Moodys Branch Fms.) (Ej)	Black background		
	Claiborne Group (Yegua Formation) (Ec2)	Black background		
Paleocene	58 m.y.	Claiborne Group (Cook Mountain, Sparta, Weches, Queen City, and Reklaw) (Ec1)	Black background	
	66 m.y.	Wilcox and Midway Groups (EPA)	Black background	
Cretaceous	Navarro and Taylor Groups (Ku2)	Black background		
	Austin, Eagle Ford, Woodbine, and U. Washita Groups (Ku1)	Black background		
	Fredericksburg and L. Washita Groups (Kl2)	Black background		
	Trinity Group (Kl1)	Black background		
Jurassic Triassic	144 m.y.	Cretaceous undivided (Ku)	Black background	
	245 m.y.	Jurassic Triassic undivided (JT)	Black background	
PALEOZOIC	245 m.y.	Ochoan Series (Po)	Diagonal lines (top-left to bottom-right)	
		Guadalupe Series (Whitehorse and Quartermaster Formations) (Pg2)	Black background	
		Guadalupe Series (Blaine and San Angelo Formations) (Pg1)	Black background	
		Leonardian Series (Pl)	Black background	
	286 m.y.	Wolfcampian Series (Pw)	Black background	
		Permian undivided (Pu)	Black background	
	320 m.y.	Virgilian Series (IPv)	Black background	
		Missourian Series (IPm)	Black background	
	505 m.y.	Desmoinesian Series (IPd)	Black background	
		Atokan and Morrowan Series (IPam)	Black background	
570 m.y.	Mississippian, Devonian, and Ordovician undivided (MDO)	Black background		
	Cambrian (-C)	Black background		
1200 m.y.	Paleozoic undivided (Pau)	Black background		
	2000 m.y.	Precambrian undivided (p-C)	Black background	
Pre-cambrian	2000 m.y.	Precambrian undivided (p-C)	Black background	

FIGURE 1-3

eastern portions of the County. Copita soils have moderate permeability and bedrock at depths of 25 to 40 inches, Brennan soils have slight permeability.

1.11.2 Copita - Zapata

This association makes up 16% of the County. This association is located in the western central portion of the County. These soils are moderately permeable, but are not good for septic tanks. Zapata soils contain caliche at depths of 8 to 12 inches and Copita soils have bedrock at depths of 25 to 40 inches.

1.11.3 Delmita - Zapata

This association is found in 6% of the County. It is located in the eastern portion of the County. Delmita soils have indurated caliche at 20 to 40 inches and Zapata soils contain caliche at depths of 8 to 12 inches, which makes it a poor soil for septic tank use.

1.11.4 Nueces - Comitas

This association makes up 16% of the County. Nueces soils are not good for septic system use due to moderately slow permeability. This soil association is found in the central northwestern portion of the County. Comitas soils consist of loamy sands with very slight limitations for septic system use.

1.11.5 Zapata - Maverick

This association is found in 11% of the County. Zapata soils generally occur on ridges or on higher parts of the landscape. These are gently sloping, light brownish - gray soils that are very shallow over strongly cemented caliche. Maverick soils are moderately deep, undulating soils on uplands. Internal drainage is slow and permeability is slow. This soil

association is located along the Rio-Grande from the north county line to the south, and is not suitable for septic systems.

1.11.6 Maverick - Catarina

This soil is found in 37% of the County. It consists of 55% - 70% Maverick and 20% - 40% Catarina soils. Catarina soils exhibit very slow permeability and are susceptible to flooding. Maverick soils have slow permeability and are not suitable for septic systems.

1.12 Water Suppliers

Community water service is provided by a public waterworks (Zapata County), three municipal utility districts (MUD or WCID), one private water supplier and two water supply corporations (WSC). The suppliers are as follows:

- Falcon Rural Water Supply Corporation
- Ramireno Water Supply Corporation
- San Ygnacio Municipal Utility District
- Siesta Shores Water Control & Improvement District
- Zapata County Waterworks
- Zapata County Water Control & Improvement District - Hwy. 16E
- Cox Camp (Private System)

Zapata County Waterworks and San Ygnacio WCID provide service to the unincorporated cities of Zapata and San Ygnacio, respectively. San Ygnacio MUD sells water to Ramireno WSC and Zapata County Waterworks sells water to Zapata County WCID - Hwy. 16E. Siesta Shores Waterworks is in the process of selling the water system to Siesta Shores Water Control and Improvements District. Falcon Rural WSC services both Zapata and Starr Counties. The Falcon Rural WSC supply and demand figures have been apportioned in this report to reflect service to Zapata County customers only.

1.13 Certificate of Convenience & Necessity

The water supply corporations in Zapata County have Certificates of Convenience and Necessity (CCN). The certified service areas are shown on Map 1, which is located in the Map Packet of this report. The boundaries are shown for San Ygnacio MUD, Zapata County W.C.I.D. - Hwy 16E, and Siesta Shores WCID. Service areas for the other water suppliers are also shown. The Certificate of Convenience and Necessity numbers for the water supply corporations in Zapata County are:

WSC	CCN NUMBER
Falcon Rural WSC	10246
Ramireno WSC	12378

1.14 Wastewater Collection and Treatment

Currently there are two wastewater systems in the County which provide service to the Cities of Zapata and San Ygnacio; Zapata County Waterworks and San Ygnacio MUD, respectively. Unlike water service, the two cities only provide wastewater service inside the general areas of the Cities. Siesta Shores WCID plans to provide wastewater service to the Siesta Shores service area in the near future.

1.15 Water Supply

Zapata County is served by six public water suppliers and one private supplier. Map 1 shows the service areas of each. All of the water systems in Zapata County rely on water from the Rio Grande River, either directly from the river or from Falcon Reservoir. The connections/populations shown in the following sections are based on 1994-95 data and projections for the various water suppliers. As reported by the water suppliers, the following are brief descriptions of each supplier:

1.15.1 San Ygnacio Municipal Utility District

San Ygnacio Municipal Utility District provides water service to 255 residential connections and 34 commercial customers in the unincorporated town of San Ygnacio. The MUD also provides water for the Ramireno Water Supply Corporation's 49 residential customers. The water treatment plant was designed to treat 600 gpm (0.86 mgd) and is currently operating at about 25 % of capacity. The main problem with the treatment plant is trying to deal with high turbidity raw water. When the river is low, the turbidity of the raw water will rise to over 360 NTU. This limits the production of the plant to about 200 gpm. There are 125,000 gallons of ground storage and 420,000 gallons of standpipe storage. Pressure is maintained with 2 - 500 gpm pressure pumps. The District needs to upgrade the laboratory and to build a new chlorinator room and a larger chemical pump is needed to control turbidity. San Ygnacio MUD has 233.750 acre-feet and the annual use is about 160 acre-feet.

1.15.2 Ramireno Water Supply Corporation

Ramireno Water Supply Corporation provides water service to 49 residential customers along U.S. Hwy. 83 south of San Ygnacio. The service area extends approximately 5.5 miles south from the Townsite of San Ygnacio. Ramireno WSC purchases approximately 5.2 million gallons of water annually from San Ygnacio Municipal Utility District. There is no ground storage and 39,700 gallons of standpipe storage. Pressure is maintained with 2 - 35 gpm pressure pumps. The distribution system consists of approximately 48,000 feet of 4", 2", and 1 1/2" PVC pipe. Due to the small diameter water lines, pressure is very low at the southern end of the system. Any extension south along Hwy. 83 will require replacing approximately two miles of 2" line with a larger pipe

and adding a pump station. Ramireno WSC does not own any water rights.

1.15.3 Zapata County Waterworks

It is estimated that Zapata County Waterworks provide water service to 2,365 residential connections and 228 commercial or business connections in the unincorporated Townsite of Zapata. The estimated 1994 population of the Townsite is 7849 persons as shown derived from Table 204 is Chapter 2. This number for the population in the Townsite includes Siesta Shores. However, the water connections are separated because of the existence of the Siesta Shores WCID and the ZCWW does not provide water service to the WCID. As a wholesale account, the Waterworks also provides water to the Zapata County Water Control and Improvement District - Hwy. 16E. The Waterworks' water treatment plant was designed to treat 4.9 mgd. and is currently operating at about 28% of capacity. There are 1,700,000 gallons of ground storage, 375,000 gallons of elevated storage and 2,400 gallons per minute of pressure pump capacity.

In order to improve the supply and pressure of the water system in the Falcon Estates Subdivision area, Zapata County Waterworks is in the process of extending a 12-inch water line south along US Highway 83 across Arroyo Valeno to Falcon Estates Subdivision (near Siesta Shores) and is constructing a 300,000 gallon standpipe in the subdivision.

The County Waterworks has 1,084.200 acre-feet of water rights and another 75.00 acre-feet from Zapata County Water Control and Improvement District- Hwy. 16E. Zapata County Waterworks leases approximately 500 acre-feet annually at a cost of \$15.00 per acre-foot per

year to make up the deficit between the owned water rights, free pumping and the demand.

1.15.4 Zapata County Water Control and Improvement District - Hwy. 16E

Zapata County Water Control and Improvement District - Hwy. 16E. provides water service to 111 customers along and generally near Hwy 16E in Zapata County from the Townsite of Zapata to the Jim Hogg County line. Zapata County W.C.I.D. - Hwy. 16E purchases approximately 12.3 million gallons annually from Zapata County Waterworks. There is no ground storage, 63,800 gallons of standpipe storage and 250 gallons per minute of pressure pump capacity. A new chlorinator is planned to ensure the quality of water at the end of the line. Water pressure is low at the Jim Hogg County line but at the present there are no plans to do anything about the pressure or to extend the water line. Zapata County WCID claims ownership to 75,000 acre-feet of water that is used by Zapata County Waterworks. The water district uses about 55 acre-feet annually.

1.15.5 Falcon Rural Water Supply Corporation

Falcon Rural Water Supply Corporation provides water service to 384 customers in Zapata County. The WSC's treatment plant, which is located on the Rio Grande River in community of Salineno in Starr County, has a capacity of 0.8 mgd, but currently production is limited to about 0.5 mgd due to turbidity of the raw water. The Corporation provides water to customers in Starr and Zapata Counties and plans to expand the treatment plant to 1.5 mgd in the next two years. The WSC owns 170,000 gallons of ground storage, two standpipes with a total capacity of 165,000 gallons, two high service pumps with a total pumping capacity of 1600 gpm, approximately 80 miles of 3/4" to 8" distribution lines and 79.00 acre-feet of water rights. Each year the Corporation must

lease approximately 300 acre-feet at an approximate cost of \$18.00 per acre-foot.

1.15.6 Siesta Shores WCID

Siesta Shores WCID provides water service to 435 registered customers in the Siesta Shores subdivision area, which has about 2700, fifty-foot by one hundred-foot platted lots, near the Townsite of Zapata. Siesta Shores is a subdivision of Zapata County and is considered a part of the Townsite of Zapata. Consequently, the population of Siesta Shores is also included in the population of the Townsite. The water treatment plant has a capacity of 100 gpm (.144 MGD). Currently the plant is operating at 100% of capacity. They have 90,400 gallons of ground storage, a 2000 gallon pressure tank and service pump capacity of 750 gpm. Unlike many of the other areas near Falcon Reservoir, Siesta Shores does not experience the seasonal population fluctuations.

Siesta Shores plans to construct a new water treatment plant, a 370,000 gallon standpipe and a distribution system which will be capable of providing service to more than 1200 connections, or an estimated population of 3900 persons. In 1994, Siesta Shores WCID purchased the water supply utilities from a privately operated utility named Siesta Shores Waterworks. The WCID was formed in 1993 and has received recent approval of funds for water facilities construction for Siesta Shores Subdivision. The assets of Siesta Shores Waterworks include a small water treatment plant, an undersized distribution system and 62.50 acre-feet of water rights. In addition to 62.50 acre-feet of water rights, the Waterworks leased approximately 20 acre-feet annually at a cost of \$20 per acre-foot per year.

1.15.7 Cox Camp (Private System)

Cox Camp is a privately owned water supply system that supplies water to about 50 customers. The Camp is primarily a vacation/fishing camp located on the banks of the Rio Grande River about 12 miles downstream from the Townsite of Zapata. Water is diverted from the river through the ownership of 11 acre-feet of water rights to a small water treatment plant and distributed to the local customers. The treatment plant consists of a 10-foot diameter settling tank, two sand filters, 315 gallon pressure tank, 6000 gallon ground storage and 2-.75 Hp service pumps.

1.16 Water and Sewer Rates

The current, average, domestic water and sewer rates for each of the public water and wastewater supplier are shown in Table 1-2, which follows.

Table 1-2
Average Monthly Water and Wastewater Charges
Zapata County Public Water Suppliers
1993 Data

Utility	Rates		
	Water	Wastewater	Total
Falcon Rural WSC	\$27.00	N/A	\$27.00
Ramireno WSC	18.50	N/A	18.50
San Ygnacio MUD	18.50	\$9.60	28.10
Siesta Shores WCID	28.15	(Service 1997)	28.15
Zapata County Waterworks	15.50	5.00	20.50
Zapata County WCID - Hwy 16E	33.00	N/A	33.00

1.17 Water Rights

Zapata County is situated within Reach VI as identified in 31 TAC Chapter 303, Operations on the Rio Grande, as that portion of the Middle Rio Grande Basin between Falcon Dam and San Ygnacio. All of the water provided by the public water suppliers in Zapata County is surface water pumped from the Rio Grande River. Adjudication of Rio Grande River water is complete and is governed by two interstate and two international treaties. The International Boundary and Water Commission enforces the International Treaties and the State of Texas enforces the interstate agreements in Texas. The Texas Natural Resource Conservation Commission oversees the sale and distribution of water rights for diversion of surface waters for irrigation, municipal and industrial uses through the Rio Grande River Watermaster.

Zapata County receives its surface water from the International Falcon Reservoir on the Rio Grande River. This reservoir was completed in 1953 and was the first of two reservoirs built as a result of the 1945 treaty between Mexico and the United States. The second reservoir is International Amistad located north of Del Rio, Texas.

The conservation storage of Falcon reservoir is 2,267.6 thousand acre feet at elevation 301.1 feet, msl; the United States' share is 1,328.8 thousand acre feet.

Texas' share of water rights is under the jurisdiction of the Texas Water Commission and is maintained by the Rio Grande Watermaster in Weslaco. The allocation of water complies with the decision of the Thirteenth Court of Civil Appeals in the case of State of Texas, et al. vs. Hidalgo Water Control and Improvement District No. 18 et al., as approved by the Texas Supreme Court in 1969.

Originally, an acre of irrigation right was equal to 2.5 acre feet of water. The Water Commission has converted acres of irrigation rights to acre feet of irrigation rights so that all water rights are in the same units. Irrigation rights may be converted to municipal use at the rates shown in the following table.

WATER RIGHTS		
IRRIGATION		MUNICIPAL
1 acre Class A	converts to	1.25 ac. ft.
1 acre Class B	converts to	1 ac. ft.
1 ac. ft. Class A	converts to	0.5 ac. ft.
1 ac. ft Class B	converts to	0.4 ac. ft.

The priority of the water right is enforced when there is not enough water to satisfy all users and conservation measures have to be enforced. The lowest priority users are restricted or prohibited from using their water right until there is sufficient water. Therefore, irrigation use, having a lower priority, would be restricted prior to municipal use.

The water suppliers in Zapata County own the following water rights:

OWNER OF RECORD	WATER RIGHT (Ac. Ft.)
Falcon Rural WSC*	36.00
San Ygnacio MUD	233.75
Siesta Shores	62.50
Zapata County Waterworks	1,084.20
Zapata County WCID-Hwy 16E	75.00
Cox Camp (Private)	11.00
TOTAL	1,502.45

* Falcon Rural Water Supply Corp. provides water service to Zapata and Starr Counties and owns a total of 79 ac-ft of water rights.

There are 10,138.680 acre-feet of irrigation rights in Zapata County, 1177.000 acre-feet of Class A and 8961.680 acre-feet of Class B.

Falcon Rural WSC has applied to USDA/Rural Development for funding to acquire 150 acre-feet of additional water rights.

According to the Rio Grande River Watermaster, the costs for water rights is negotiable between the buyer and the seller. However, the Watermaster reports that water rights are being sold for the approximately the following prices:

Class A Irrigation	\$280 - \$400 per acre-ft
Class B Irrigation	\$260 - \$280 per acre-ft
Municipal	\$1200 - \$1500 per acre-ft

There are three ways to obtain additional water rights:

1. Buy Water Rights: As stated above, the going rate is \$260 to \$400 for an acre foot of irrigation water rights and \$1200 - \$1500 for an acre foot of municipal water rights.

2. Lease Water Rights: Water rights lease for about \$10 to \$40 per acre foot and is good for the year in which it is bought. In 1993 the suppliers in Zapata County leased the following amounts of water rights:

<u>Supplier</u>	<u>Acre Feet</u>
Zapata Co. Waterworks	500
Siesta Shores WCID	20
* Falcon Rural WSC	300
Total	820

The suppliers paid \$15 to \$20 acre foot.

- * Used for Zapata and Starr Counties; Approximately 135 acre-ft. was for Zapata County

This amount of leased water rights is equal to 36% of the raw water pumped in 1993.

3. "No Charge" Pumping: Free pumping may occur when the Falcon and Amistad reservoirs are above their conservation pools and when the Rio Grande River is above its flood stage below Falcon Reservoir. This privilege is only permitted to water users who own water rights and is not charged against the owner's water rights.

Even with "no charge", the water suppliers in Zapata County had to lease water rights in 1993, indicating the suppliers need to purchase additional water rights.

CHAPTER 2 - POPULATION PROJECTIONS

2.1 Population Studies and Projections

Six established population projections for the period 1990 to 2030 were considered for this study. Two versions were prepared by the Texas Water Development Board (TWDB) and four by the South Texas Development Council (STDC). In mid June, 1994, the Texas Water Development Board released preliminary population projections developed by the South Texas Development Council for Zapata County. These demographic studies and projections considered factors such as migration of people and rainfall which affect movements from and to the County. Comparisons were made of the TWDB's High Population Projection, the South Texas Development Council's "most likely series" with the 1.0 migration rate, which assumes 100 percent of the migration rate between 1980 and 1990, and the polynomial projection of the historical population between 1930 and 1990. The TWDB's High projection follows very closely and slightly below the polynomial projection. Consequently, the TWDB High Population projection is used in this study to evaluate and estimate the needs of the County for the planning period. Table 2-1, which follows, is a tabulation of the historical population for the County, the STDC "most likely" projection, and the TWDB High population projection for the years 2000 to 2030. Figure 2-1 consists of plots of the historical population, the STDC and TWDB projections as well as the polynomial projection of the historical which compares the three projections and illustrates how close the TWDB High projection follows the polynomial projection. Table 2-2 is a tabulation and summary of the six studies. Historical population data for the Townsite of San Ygnacio are not available and projections are limited to the estimated percentages for rural County growth.

According to Zapata County personnel, the traffic along Hwy. 83 has approximately doubled since the U.S. and Mexico adopted the North America Free Trade Agreement (NAFTA) in the early 1990s. However, traffic counts were not

made and historical data on traffic were not analyzed and are not included as a separate or combined component to projecting population in this study or the effects that traffic may have on the migration factors. Although NAFTA may increase the rate of migration into Zapata County, the TWDB and the South Texas Development Council included the effects of trade and migration in their population analyses.

The population projections are shown in Tables 2-2 and 2-3, which follow, with the annual rates of projected population increases. A copy of the 1994 Population and Water Demand Projections, published by the Texas Water Development Board, is included in Appendix A.

TABLE 2-1

Historical and Projected Population
 Zapata County and Townsite of Zapata, Texas
 1930 - 1990

Zapata County					Zapata Townsite	
Year	Population from Census Counts	% Change	So. Texas Development Council's "Most Likely"	Texas Water Development Board High	Population	Annual Change %
1930	2867	-			-	
1940	3916	36.6			-	
1950	4405	12.5			-	
1960	4393	(0.3)			-	
1965					2066	-
1970	4352	(0.9)			2102	0.35
1975					2828	6.11
1980	6628	52.3			3806	6.12
1985					4639	4.04
1990	9279	40.0			7119	9.19
2000			13328	11281		
2010			18900	13428		
2020			26399	15866		
2030			35353	18203		

FIGURE 2-1

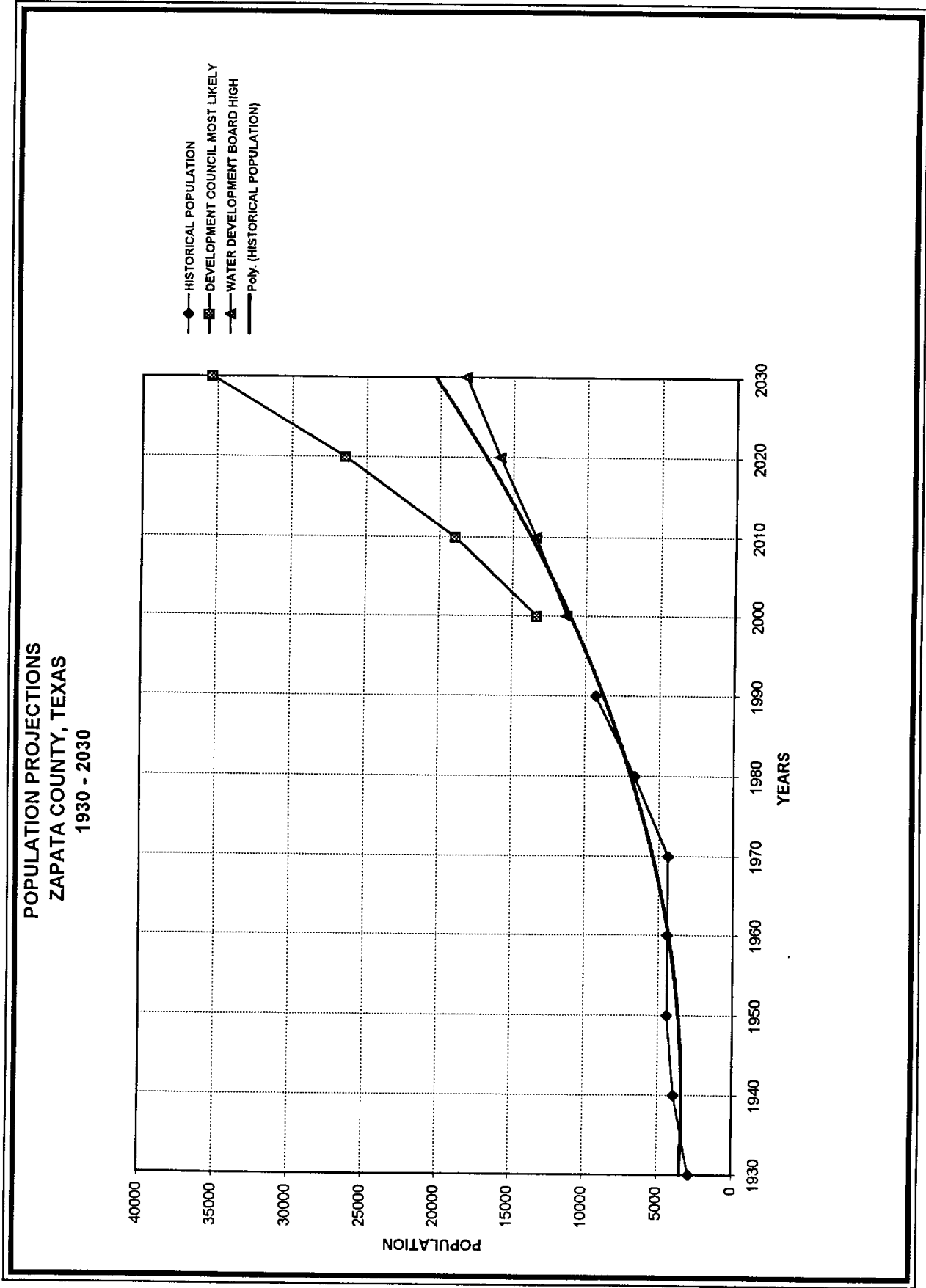


TABLE 2-2

Six Population Projections for Zapata County
by
Texas Water Development Board
and
South Texas Development Council
1995 - 2030

Reference: 1994 Consensus-Based Water Planning by TWDB

Projection	1990 Census	Years						Average Annual Growth
		1995	2000	2010	2020	2025	2030	
1. Texas Water Development Board - Low	9279	10023	10827	11941	12847	13372	13918	1.0%
2. Texas Water Development Board - High	9279	10231	11281	13428	15866	16994	18203	1.7%
3. South Texas Development Council - 0.0 Migration	9279	9811	10373	11596	12731	13108	13496	0.9%
4. South Texas Development Council - 0.5 Migration	9279	10377	11606	14632	18070	19748	21581	2.1%
5. South Texas Development Council - 1.0 Migration	9279	11121	13328	18900	26399	30550	35353	3.4%
6. Most Likely Series: STDC - 1.0 Migration	9279	11121	13328	18900	26399	30550	35353	3.4%

TABLE 2-3

Population Projections
Texas Water Development Board's High Projection
(Selected Series)
1990 - 2030

Year	TWDB High Projection	Rate of Change %	Annual Change %
1990	9279		
1995	10231	10.26	1.97
2000	11281	10.26	1.97
2010	13428	19.03	1.76
2020	15866	18.16	1.68
2025	16994	7.11	1.38
2030	18203	7.11	1.38

The Townsite of Zapata as well as the Hwy 16E WCID area are the service areas for the Zapata County Waterworks, a department of Zapata County. With the exception of Zapata County Waterworks, each of the water supplier's population and connections are projected at the Zapata County's rate of increase. Table 2-4 shows the population projections for the Townsite and Table 2-5 shows the projected connections for the various water and wastewater utilities.

Table 2-4

Population Projections
for
Townsite of Zapata and Remainder of Zapata County

A Year	B Townsite of Zapata Population	C Annual Percent Change*	D Remainder of County Population	E Annual Percent Change	F Total B+D	G Zapata Townsite % of Total County Population
1990	7119	-	2160	-	9279	76.7
1995	8042	2.47	2189	0.27	10231	78.6
2000	9070	2.44	2211	0.20	11281	80.4
2010	10957	1.91	2471	1.12	13428	81.6
2020	13058	1.77	2808	1.29	15866	82.3
2025	13918	1.77	3076	1.84	16994	81.9
2030	14926	1.41	3277	1.27	18203	82.0

* Average annual percent change is calculated by: $((P2/P1)^{1/n} - 1) \times 100$, where n = no. of years.

Table 2-5

Projected Water Connections
 Zapata County Water Supply Utilities
 Based on Projected County Growth Rates

Year	Public Water Supplier						Townsite of Zapata		Total
	Average Annual Growth for Zapata County in Percent	Falcon Rural WSC Connections	Ramireno WSC Connections	San Ygnacio MUD Connections	Siesta Shores WCID Connections	Zapata County WCID-Hwy 16E Connections	Average Annual Growth in Percent	Zapata County Waterworks Connections	
1994	-	384	49	289	435	111	-	2584	3852
1995	0.27	385	49	290	436	111	2.47	2648	3919
2000	0.20	389	50	293	441	112	2.44	2986	4271
2010	1.12	435	55	327	492	126	1.91	3608	5043
2020	1.29	494	63	372	559	143	1.77	4299	5930
2025	1.84	541	69	407	613	156	1.28	4582	6368
2030	1.27	576	74	434	653	167	1.41	4914	6818

Projected water connections are calculated by: $P2 = P1(1+X)^{**n}$, where X = rate of growth and n = the number of years in a period.

As shown in Table 2-1 and documented by census counts, most of the population in Zapata County has been located in and around the Townsite of Zapata. For example, the 1978-79 Texas Almanac reports that in 1975, 3,500 of the County's population of 4,828, or 72 percent, resided in the Townsite. As can be seen from the projected growth rates in Table 2-4 of the County and the Townsite of Zapata, more than 80 percent of the County's total population will reside in the Townsite by the year 2000.

CHAPTER 3 - PROJECTED WATER DEMANDS

3.1 Historical Demands

The following Table 3-1 is a tabulation of historical water uses in Zapata County which are taken from the Texas Water Development Board's water use records. The period of record for these records is 1974 through 1991 and the water uses are divided into municipal, manufacturing, power, irrigation, mining, and livestock.

In 1993, the water supply utilities reported an annual raw water diversion from the Rio Grande River of 732,412,500 gallons for 3,852 connections, or 521 gallons per day per connection. The estimated 1993 population of the County, when projected at an average annual increase of 1.7 percent and using the 1990 population of 9279, is 9760 persons. Dividing the 1993 diversions from the river as shown above by the projected 1993 population, the average daily demand from the river is estimated to be 206 gpcd.

TEXAS WATER DEVELOPMENT BOARD
PLANNING DIVISION

COUNTY SUMMARY HISTORICAL WATER USE
(Units: Acre-feet)

TABLE 3-1

County	Population	Municipal	Manufact.	Power	Irrigation	Mining	Livestock	Total
ZAPATA								
1950	4405							
1960	4393							
1970	4352							
1974		154	0	0	0	14	830	1048
		647	0	0	4588	0	98	5333
	5149	801	0	0	4588	14	978	6381
1977		190	0	0	0	100	102	392
		858	0	0	5000	0	914	6772
	5842	1048	0	0	5000	100	1016	7164
1980		169	0	0	0	0	73	242
		1113	0	0	4840	0	657	6610
	6628	1282	0	0	4840	0	730	6852
1984		0	0	0	0	0	94	94
		1744	0	0	3300	0	853	5897
	8151	1744	0	0	3300	0	947	5991
1985		58	0	0	0	0	83	141
		1784	0	0	4400	0	748	6932
	8476	1842	0	0	4400	0	831	7073
1986		25	0	0	0	0	81	106
		1904	0	0	4000	0	732	6636
	8400	1929	0	0	4000	0	813	6742
1987		26	0	0	0	0	78	104
		1740	0	0	2458	0	702	4900
	8600	1766	0	0	2458	0	780	5004
1988		29	0	0	0	0	82	111
		2245	0	0	2767	0	744	5756
	8800	2274	0	0	2767	0	826	5867
1989		0	0	0	0	0	81	81
		1994	0	0	1955	0	733	4682
	8972	1994	0	0	1955	0	814	4763
1990		0	0	0	0	0	80	80
		1852	0	0	2229	0	723	4804
	9279	1852	0	0	2229	0	803	4884
1991		0	0	0	0	0	82	82
		1748	0	0	1596	28	737	4109
	9598	1748	0	0	1596	28	819	4191

- (1) Data is by county in which the water is used.
- (2) Municipal use excludes reported industrial sales.
- (3) Electric power cooling water is consumptive use.
- (4) Irrigation surface water use for 1974, 1977 is on-farm use.
Surface water diversion loss estimates are included after 1977.
- (5) 1989 mining data is substituted for 1990.
- (6) 1991 surface water consumption for power is not available.

Publication

3.2 Projected Water Demands

3.2.1 Population and Water Demand Studies

In the publication Projections of Population and Municipal Water Use, which is included in Appendix A of this report, the Texas Water Development Board and the South Texas Development Council made projections for municipal water demands in Zapata County to the year 2050. Factors affecting water use demands which were also considered in these projections are annual rainfall, conservation measures, plumbing codes, and migration. Different levels of possible demands are presented in the publication based on rates of estimated migration of people to and from the County. Each level considers equally the annual rainfall, both average and below average, conservation measures, and plumbing codes. The different levels of projection are (1) Migration Rate 0.00, (2) Migration Rate 0.5, (3) and Migration Rate 1.0. Migration Rate 1.0 assumes that 100 percent of the net migration for the period 1980 to 1990 will continue to occur for the County. It is expected that all of Zapata County households will be on a community water system within the next ten years.

The following Table 3-2 is a tabulation of the projected water supply demands based on the previously calculated and projected number of connections for the utilities using the 521 gallons per connection [per day] demand. Table 2-5 in Chapter 2 shows the projected connections for each of the water suppliers. The total projected connections for the County water suppliers shown in Table 2-5 are presented in column 2 of the following Table 3-2. Water Demands are calculated at the derived rate of 521 gallons per day per connection in other tables which follow Table 3-2.

Table 3-2
 Projected County Water Connections and Demands
 1994 - 2030

1 Year	2 Total Projected Connections	3 Projected Demands (MGD)	4 Acre-Feet Per Year Required
1994	3852	2.00	2248
1995	3919	2.04	2287
2000	4271	2.23	2493
2010	5043	2.63	2943
2020	5930	3.09	3461
2025	6368	3.32	3716
2030	6818	3.55	3979

With the enforcement of conservation measures and a concerted effort by the water suppliers to reduce system water losses, the projected demands shown in Column 3 above appear to be reasonable. These projections compare favorably with the estimated number of connections and the expected unit density of the projected population. The County will adopt a Water Conservation and Emergency Demand Management Plan as a part of this Regional Planning project which will include requirements to enforce the plumbing regulations shown in Chapter 372, *Water Saving Performance Standards*, of the TNRCC Permanent Rules.

3.2.1.5 Water Conservation Scenarios

This section, Water Conservation Scenarios, is copied from the Texas Water Development Board's publication, *1994 Consensus-Based Water Planning: Forecasts of Municipal Water Demands, Executive Overview*, to illustrate how much the municipal water demands may be reduced through the enforcement of a water conservation plan.

In Texas, the use of conservation plans and strategies by cities and water utilities is expected to occur for several reasons. Most importantly,

conservation is increasingly recognized as the most cost effective approach for meeting future water demands. Additionally, many conservation strategies are simply good management. Thus, these strategies are being used more and more by utilities. This brief summaries how the TWDB, TNRCC, and TPWD estimated the potential range of water conservation savings expected over the next 50 years and presents new water demand forecasts, taking into account the estimated water conservation savings.

The 1990 Texas Water Plan municipal demand projections assumed that municipal per capita water use would decline by a statewide average of 15 percentage. This assumption was based upon certain water conservation strategies already being pursued by some major utilities as well as expectations about increasing reliance upon conservation strategies by the municipal sector. However, revisions of the 1990 water demand forecasts are necessary for three basic reasons: First, the state's population growth forecasts have been revised. Secondly, the three agencies have acquired better data on water use characteristics and on the potential water savings attributable to a range of conservation strategies. Thirdly, potential water conservation savings vary from city to city, and this variation needed to be determined in order to develop more valid water demand forecasts. For the 1994 forecasts, individual and unique water conservation savings were estimated for each municipality with population of 1000 or more, as well as for the State as a whole.

Municipal water demand represents all those uses pumped into a system for residential, commercial, public and institutional uses. Municipal demands are forecasted by multiplying daily per capita water use times population and then annualizing this number. To reflect estimated water conservation savings, per capita water use is reduced. For water supply planning purposes, a "below average" rainfall year, or "dry year" is used as the base per capita use.

Use of a "dry year" reflects additional urban irrigation demands resulting from below average rainfalls.

The statewide potential savings range from 32.7 gpcd to 44 gpcd, or 18 % to 25 % (using the base dry year of 1984, or 179 gpcd). Three scenarios were examined to estimate the amount of water conservation savings expected to occur over the next 50 years. For each scenario, water conservation savings were estimated for four categories of water use. Table 1 lists each use and the savings, in either gallons per capita per day or as a percentage reduction, associated with that use. Table 2 describes the 3 conservation scenarios.

TABLE 1

<u>General Categories of Municipal Water Use:</u>	<u>Potential Conservation Savings:</u>	
	<u>Most likely</u>	<u>Advanced</u>
(a) Indoor water use (plumbing uses)	20.5 gpcd	21.7 gpcd
(b) Seasonal water use	7.0% seasonal use	20% avg annual use
(c) Dry year urban irrigation use	10.5% dry year use	20% dry year use
(d) Other municipal uses	5.0% average use	7.5% of avg use

TABLE 2

Conservation Scenarios:

- Scenario 1: Base Savings: Only savings associated with the 1991 plumbing fixtures bill was estimated. This ranges from 20.5 to 21.7 gpcd.
- Scenario 2: Most likely savings: What is expected to occur: Savings attributable to the 1991 plumbing fixtures bill plus some additional savings based upon the estimated cost effectiveness of additional conservation measures.
- Scenario 3: Advanced water conservation: The maximum technical potential for water conservation savings without restricting uses to minimum drinking water and sanitation needs. That is, commercial, public, and some urban uses are still occurring even with implementation of advanced conservation measures.

TABLE 3: State-wide estimation of water conservation savings for 1994 forecasts

<u>Categories of Municipal Water Use:</u>	<u>Potential conservation Savings:</u>	
	<u>Most likely</u>	<u>Advanced</u>
(a) Indoor water use (plumbing uses)	20.5 gpcd	21.7 gpcd
(b) Seasonal water use	2.7 gpcd	7.7 gpcd
(c) Dry year urban irrigation use	1.0 gpcd	1.8 gpcd
(d) Other municipal uses	<u>8.5 gpcd</u>	<u>12.8 gpcd</u>
TOTAL SAVINGS	32.7 gpcd (18%)	44.0 gpcd (25%)
	Using 179 gpcd as base demand.	

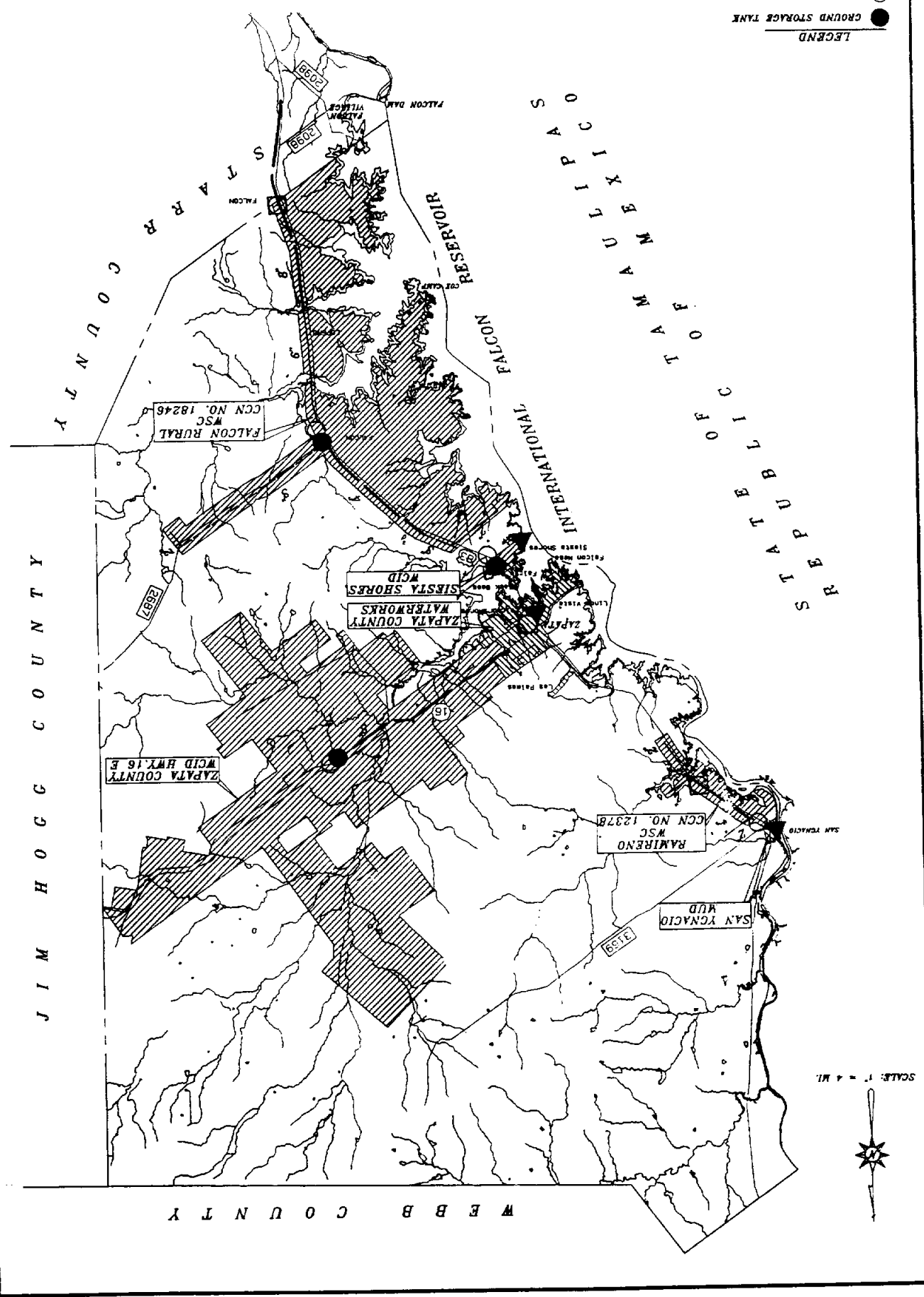
See Map 2, which follows, for the existing water suppliers and related facilities.

3.2.2 Water Supply and Demand

As shown in Table 3-1 for the year 1991, most of the surface water in Zapata County is used for irrigation, mining and livestock. According to Table 3-1 as published by the TWDB, 43 percent of a total 4109 acre feet, or 1748 acre feet of surface water was used for municipal purposes in 1991 and 57 percent, or 2361 acre feet were used for irrigation, mining and livestock purposes. A total of 82 acre feet of ground water was listed that year with its use being livestock. According to Table 3-1, only surface water has been used for irrigation in the County with irrigation uses dropping from 5000 acre feet in 1977 to 1596 acre feet in 1991, a 68 percent reduction in irrigation. Municipal uses of combined ground

MAP 2
EXISTING WATER SYSTEMS
ZAPATA COUNTY

- LEGEND
- GROUND STORAGE TANK
 - PUMP STATION
 - ▲ WATER TREATMENT PLANT
 - ELATED STORAGE TANK



SCALE: 1" = 4 MI.

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and surface water has increased from 1048 acre feet in 1977 to 1748 acre feet in 1991, with a high of 2274 acre feet of use occurring in 1988. No ground water is shown as being used for municipal purposes since 1988. Since 1977, increases and reductions in water use are as follows:

Municipal: Increased at the annual rate of 3.72 percent.

Irrigation: Decreased at the annual rate of 8.5 percent.

Livestock: Decreased at the annual rate of 1.55 percent.

Mining: Reports 100 acre-feet in 1977 and 28 acre-feet in 1991, only.

If irrigation uses of water continues to decline at the average annual rate of 8.5%, it is estimated that the irrigation demands will be near 100 acre-feet per year in about 30 years from the year 1991. Additionally, at the rate of increase of municipal demands of 3.72 percent per year as derived from Table 3-1, the municipal demands could double in 20 years from the year 1991. The percentage of irrigated land has decreased as shown in Table 3-3, which follows. Since most of the population growth in the County has been and is projected to be near the Rio Grande River along U.S. Highway 83, it is expected that this trend will continue.

Currently, there is no manufacturing in Zapata County and no projections are made for industrial use. The major commercial users are the school districts and local businesses in and around the town sites of Zapata and San Ygnacio.

3.3 Review of the Need for Water Distribution and Treatment

3.3.1 Rural Areas of the County

Census data shown in Section 1.5 indicates that 97.4 percent of the County's population was served by a community water supplier in 1990. Using the estimated 1994 populations of the Townsite of Zapata and the Townsite of San Ygnacio of 7849 and 826, respectively, as non-rural populations, the rural population would be calculate to be about 1,357 people, or about 13.53 percent of the estimated total 1994 population of 10,032 persons. One hundred percent of the non-rural population is served by a community water supply, which when calculated for 97.4

**Projected Water Demands
Rural Zapata County
Ramireno WSC, Falcon Rural WSC, and Zapata County WCID-16E**

Year	Total* Water Connections	Projected Demands (MGD)	Projected Annual Demands (ac-ft)**
1994	544	0.28	317
1995	545	0.28	317
2000	551	0.29	322
2010	616	0.32	359
2020	700	0.36	409
2025	766	0.40	447
2030	817	0.43	477

* Reference Table 2-5

** Annual demand based on the calculated demand of 521 gallons per connection.

percentile, means that 1,097 persons of the 1,357 rural population is connected to a community water supply. This would imply that about 260 persons in rural Zapata County, or approximately 80 housing units, are not connected to a community water supply. These rural residents would be located in the service areas of Ramireno WSC, Falcon Rural WSC and Zapata County WCID-Hwy 16E water suppliers.

3.3.2 Townsite of San Ygancio and San Ygnacio MUD

San Ygnacio MUD provides water to all of the Townsite as well as to the customers of Ramireno Water Supply Corporation. Ramireno's annual demands are shown in the table above with the rural area demands. The MUD provides complete management and operations of the WSC. The District currently has a 0.86 MGD water treatment plant which is adequate to about the year 2025, based on the projected increase of connections in the existing service areas. There are residents along Highway 3196 in the Ramireno WSC service area that do not have access to a community water system which the District could possibly serve.

**Projected Water Demands
San Ygnacio MUD**

Year	Total Water Connections	Projected Demands (MGD)*	Projected Annual Demands (ac-ft)**
1994	289	0.15	169
1995	290	0.15	169
2000	293	0.15	171
2010	327	0.17	191
2020	372	0.19	217
2025	407	0.21	238
2030	434	0.23	253

3.3.3 Townsite of Zapata and Zapata County Waterworks

The Zapata County Waterworks utility provides water to the Townsite and areas around the Townsite. These areas include Falcon Lake Estates, Black Bass Subdivision, Falcon Shores, the Townsite of Zapata, Zapata County WCID - Hwy 16E, Lakefront Lodge Subdivision, Falcon Mesa Colonia, Medina Colonia and Cuellar Colonia.

The Waterworks utility operates and maintains a 4.9 MGD treatment plant and provides water to about 2365 households (1993). Water distribution mains to many of the subdivisions are small and should be replaced with larger, more adequate lines. For instance, a 4-inch water line is serving 209 connections in the Falcon Mesa Colonia and surrounding area. During the peak tourist/fishing season, approximately 5000 people are served by this 4-inch line. In order to serve the existing population as well as the expected growth in other areas such as Cuellar Colonia and Medina Colonia, the water distribution mains will require evaluation and replacements. The following Tables 3-3 and 3-4 outline the areas populations and projected water demands.

The following is a tabulation of the water pumped, treated and metered by the Waterworks in 1993 with the calculated water losses. This data is taken from the Waterworks' records and reports.

1. Raw water pumped from Falcon Res: 594.205 MG
2. Treated water pumped into the Sys: 554.280 MG (6.72% plant losses)
3. Metered water to customers: 392.980 MG (29.10% system losses)

Based on the pumpage of 594,205,000 gallons of water from the river to an estimated population of 7,663 (2365 connections) people in 1993, the estimated per capita demand is 212 gpcd. This demand is used in the following calculations and tables for estimating the future demands for the systems in the Townsite of Zapata.

**Projected Water Demands
Townsite of Zapata**

Year	Total Water Connections	Projected Demands (MGD)	Projected Annual Demands (ac-ft)
1994	2584	1.35	1508
1995	2648	1.38	1545
2000	2986	1.56	1743
2010	3608	1.88	2106
2020	4299	2.24	2509
2025	4582	2.39	2674
2030	4914	2.56	2868

Table 3-3
 Projected Population of Area Subdivisions
 Townsite of Zapata and Zapata County Waterworks
 Zapata County, Texas
 1994 - 2030

Year	Falcon Lake Estates	Black Bass Subdiv.	Falcon Shores	Lakefront Lodge Subdiv.	Falcon Mesa Colonia	Medina Colonia	Cuellar Colonia	Townsite of Zapata	Total
1994	183	634	303	463	232	1829	39	2740	6422
1995	191	660	315	483	241	1906	40	2855	6691
2000	215	745	356	544	271	2150	45	3220	7546
2010	260	900	430	657	328	2596	55	3890	9116
2020	309	1072	512	783	392	3095	65	4636	10864
2025	330	1143	546	835	418	3298	70	4940	11580
2030	354	1225	585	896	448	3537	75	5299	12419

Table 3-4
 Projected Water Demands**
 Area Subdivisions
 Townsite of Zapata and Zapata County Waterworks
 2000 - 2030

Year	Falcon Lake Estates (MGD)	Black Bass Subdiv. (MGD)	Falcon Shores Subdiv. (MGD)	Lakefront Lodge Subdiv. (MGD)	Falcon Mesa Colonia (MGD)	Medina Colonia (MGD)	Cuellar Colonia (MGD)	Townsite of Zapata (MGD)	Total* (MGD)
1995	.04	.14	.07	.10	.05	.40	.01	.61	1.41
2000	.05	.16	.08	.12	.06	.46	.01	.68	1.60
2010	.06	.19	.09	.14	.07	.55	.01	.82	1.93
2020	.07	.23	.11	.17	.08	.66	.01	.98	2.30
2025	.07	.24	.12	.18	.09	.70	.01	1.05	2.45
2030	.07	.26	.12	.19	.09	.75	.02	1.12	2.63

* Totals may differ from the summation of the columns and calculations at the rate of 521 gallons per connection per day due to rounding.
 ** Projected demands = Population X 212 gpcd/1,000,000.

3.3.4 Siesta Shores Water Control & Improvement District

Siesta Shores is a 2700 lot development near the Townsite of Zapata and the Waterworks but does not purchase water from the Waterworks. Siesta Shores provides water to an existing 435 connections with a 100 GPM water treatment plant.

Projected Water Demands
Siesta Shores WCID

Year	Total Water Connections	Projected Population	Projected Water Demands (MGD)	Projected Annual Demands (ac-ft)
1994	435	1297	0.23	254
1995	436	1351	0.23	254
2000	441	1524	0.23	257
2010	492	1841	0.26	287
2020	559	2194	0.29	326
2025	613	2338	0.32	358
2030	653	2507	0.34	381

Conclusions

Zapata County needs to develop plans to upgrade the Zapata County Waterworks water transmission and distribution facilities to provide adequate water supply and fire control service to all of the subdivisions in and around the Townsite of Zapata which are now being served by the Waterworks, excluding the 2700 lot Siesta Shores subdivision which is located within the Siesta Shores WCID boundaries. The following is listing of the recommended improvements to the Zapata County Waterworks' distribution system for compliance with the TNRCC Permanent Rules for public water supply systems.

- (1) Approximately 39,000 linear feet of 6-inch, 8-inch and 12-inch water supply mains to Falcon Mesa, Medina and Cuellar Colonias.

3.4 Water Rights

The following Table 3-5 is a summary of the projected water rights requirements for the various water suppliers in Zapata County for the years 1995 through 2030. These requirements are based on annualizing the current gpcd demands. The water suppliers own a total of 1,502 acre-feet of water rights, 889 acre-feet fewer than the amount required in 1995. These water suppliers will require an additional 1,972 acre-feet of water rights to provide for the year 2020 demand of 3,474 acre-feet of water.

Table 3-5
 Projected Water Rights Requirements
 Zapata County Water Suppliers
 Acre-Feet
 1995-2030

Year	Ramireno WSC Falcon Rural WSC Zapata Co. WCID-Hwy 16E	San Ygnacio MUD	Siesta Shores WCID	Townsite of Zapata (Zapata Co. WW)	Total
1995	314	168	254	1655	2391
2000	325	168	257	1742	2492
2010	358	190	287	2105	3070
2020	426	213	326	2509	3474
2025	448	235	358	2674	3715
2030	480	256	378	2864	3978

3.5 Water Storage Requirements

Total water storage requirements for the water suppliers are calculated on the basis of 200 gallons per connection in accordance with Chapter 290 of the TNRCC Permanent Rules. Although these rules also states that 100 gallons per connection may be used for calculating elevated storage requirements, the 200 gallons per connection rate is used here since most of the storage maintained by the suppliers is in standpipes. Table 3-6, which follows, lists the existing (1994) storage and the projected storage requirements for each utility.

Table 3-6
 Projected Minimum Water Storage Requirements
 Zapata County Water Suppliers
 1994-2030
 (Gallons)

Year	Ramireno WSC	Falcon Rural WSC	San Ygnacio MUD	Siesta Shores WCID	Zapata County WCID-Hwy 16E	Townsite of Zapata	Total
1,994**	39,700	335,000*	545,000	90,400	63,800	2,375,000	3,448,900
1,995	9,800	77,000	58,000	87,200	22,200	529,600	783,800
2,000	10,000	77,800	58,600	88,200	22,400	597,200	854,200
2,010	11,000	87,000	65,400	98,400	25,200	721,600	1,008,600
2,020	12,600	98,800	74,400	111,800	28,600	859,800	1,186,000
2,025	13,800	108,200	81,400	122,600	31,200	916,400	1,273,600
2,030	14,800	115,200	86,800	130,600	33,400	982,800	1,363,600

Reference Table 2-5 for the number of connections for each utility.

* Total storage which supplies Starr and Zapata Counties.

** Reported existing storage capacities.

CHAPTER 4 - WASTEWATER COLLECTION AND TREATMENT DEMANDS

4.1 Existing Wastewater Treatment Systems

Currently, wastewater service is provided by Zapata County Waterworks and San Ygnacio Municipal Utility District within the unincorporated Town sites of Zapata and San Ygnacio, respectively. The following is a tabulation of the two treatment facilities' permit parameters, treatment capacities and current reported flows

Permit Number	Plant Owner	Current Flows (MGD)		Permit Capacity (MGD)		Permit Parameters	
		Average	Peak	Average	Peak	BOD ₅	TSS
13383.01	San Ygnacio MUD	0.051		0.194			
10462.01	Zapata County Waterworks	0.141*	0.463*	0.800	1.132	10	15

Zapata County Waterworks reports (August, 1994) 961 domestic wastewater connections and 139 commercial connections for a total of 1100 connections. Based on the 1993 water connections of 2365 in and around the Townsite of Zapata, the 1100 wastewater connections indicates that only 47 percent of the existing houses in the Townsite are connected to a regional wastewater treatment facility. This percentage is exclusive of the 435 existing housing units in Siesta Shores which are near the Townsite. Besides Siesta Shores, unsewered areas in the Zapata County Waterworks' area include Falcon Lake Estates, Black Bass Subdivision, Linda Vista Subdivision, Lakefront Lodge Subdivision, Medina Colonia, Cuellar Colonia and Falcon Mesa Colonia. These unsewered subdivisions are relatively high density with small lots (50' X 100') where homeowners who do not have access to a wastewater collection system use septic tanks and conventional drain fields for wastewater treatment.

Zapata County water and wastewater records indicate a greater than normal or greater than expected difference between the reported metered potable water use and the wastewater flows through the wastewater treatment plant. This difference indicates that considerable

losses of wastewater could be attributable to the old, vitrified clay sewer pipes with leaking joints cracks to quartering, or breaking, of the pipe. Since the calculations in the following table indicates excessive losses of wastewater flows from the wastewater collection lines, a wastewater design flow of 100 gallons per day per person will be used in this analysis for determining the size of treatment and collection facilities which will required for future populations. The following table is a tabulation and comparison of the Waterworks' residential water sales and wastewater discharges for 1993 with GPCD calculations.

Month 1993	Water Demands			Wastewater Flows				
	Sales (MG)	Conn.	gpcd	Metered Flows (mgd)	Irrigation Diversion (mgd)	Total (mgd)	Conn.*	gpcd**
JAN	15.915	2365	217	.143	.000	.143	1046	42
FEB	14.968	2357	226	.124	.064	.188	1037	56
MAR	16.290	2368	222	.152	.059	.211	1039	63
APR	23.350	2366	329	.095	.084	.179	1037	53
MAY	21.106	2334	292	.135	.095	.230	1039	68
JUN	22.095	2332	316	.180	.159	.339	1034	101
JUL	27.077	2332	375	.106	.100	.206	1036	61
AUG	31.608	2352	433	.103	.108	.211	1043	62
SEP	34.367	2374	483	.150	.044	.194	1053	57
OCT	22.182	2383	300	.193	.048	.241	1074	69
NOV	20.694	2419	285	.131	.106	.237	1082	68
DEC	20.488	2427	272	.169	.022	.191	1091	54
TOTAL	392.980	28,409	3750	1.681	.889	2.57	12,611	754
AVG	32.748	2367	313	.140	.074	.214	1051	63

*Includes commercial connections which average about 140 connections per month.

**Calculated at the rate of 3.24 persons per connection including the commercial connections.

The County's wastewater treatment plant is a dual Oxidation Ditch plant which was constructed in 1983. It has a treatment capacity of 0.8 MGD which is estimated to be adequate for a population of about 8000 people. The plant is not adequate to provide

treatment for the unsewered subdivisions shown in the above paragraphs. The sewer trunk lines consist of 10-inch, 8-inch and 15-inch pipes. Many of these lines are greater than 40 years old, constructed of vitrified clay materials, have problems with inflow and exfiltration and are of inadequate size to transport the area's wastewater to the treatment plant. Many of these lines are also inadequately sized to carry flows from subdivisions such as the Medina Colonia when wastewater service will be provided to the entire subdivision.

San Ygnacio MUD reports 250 domestic wastewater connections and 10 commercial connections for a total of 260 connections. These wastewater connections represent 90 percent of the District's existing water connections, indicating the District provides wastewater collection and treatment to all of the Townsite of San Ygnacio.

All other communities with subdivisions or subdivision lots use septic tanks and drain fields for wastewater treatment. See Maps 4 and 5, which follow, for existing wastewater in Zapata County waterworks and San Ygnacio M.U.D.

4.2 Review of the Need for Wastewater Collection and Treatment

4.2.1 Rural Areas of the County - Falcon Community and Lopeno Community

Generally, regional wastewater collection and treatment do not appear to be needed in the rural areas of the County. Located adjacent to U.S. Highway 83 with 7,500 square foot lots, these two communities would require some form of POTW if the projected growth was expected to substantially fill the subdivisions. However, in 1994 only approximately 55 of the 199 lots, or 28 percent, were occupied and only 50 percent of the 199 lots is projected to be occupied in the year 2030. These communities are located more than a mile from the Falcon International Reservoir, are not located near a stream which drains into the reservoir and should not contribute to pollution of the reservoir through the use of septic tanks. As shown in the Zapata County Plat Records for the subdivision

"New Falcon", the community of Falcon has 199 lots which are 50 feet wide and 150 feet long. Septic tanks and drain fields are used in Falcon and no problems with operations or health have been reported from their use. At 7,500 square feet per lot, three lots would be required to install a septic tank for one housing unit under the County's minimum one-half acre criterion. This means that 66 lots would be maximum build-out for the subdivision using septic tanks. Based on the projected growth rate calculated in Table 4-1, the community would reach this density (population of 215) in the year 2015, or about 20 years. The County should begin planning for a community treatment system to treat the wastewater through the year 2035. Based on the projected needs of this community and its rural location, a 30,000 gallon per day Step Aeration plus irrigation is a good and appropriate process. It is expected that, since the population as shown in Table 4-1 is low in this community, septic tanks will continue to be used for wastewater treatment in this community throughout the planning period under the management of the County's DMA officer.

The subdivision/community of Lopeno consists of 223 lots which are 60 feet wide by 125 long, of 7,500 square feet in area. Using the density of 3.24 persons per household, it is estimated from the 1994 Voting Tabulation District Census that only about 107 of these lots are occupied, or 48 percent. It is projected that only 205 lots will be occupied in the year 2030 with an expected population of about 665. Like Falcon, Lopeno residents use septic tanks for wastewater treatment with no problems being reported from their use. Using the same formula that is used for the Falcon Community for determining the maximum density that should be permitted with the use of septic tanks, the maximum number of permitted occupied lots with the use of septic tanks would be about 75 lots. This number is already exceeded by more than 30 lots, whereas the County should begin the planning, design and construction of a community wastewater treatment facility. Based on the rural location of the community, a low cost Step Aeration plus irrigation process is recommended. As shown in Table 4-1, a 40,000 gallon per day facility

is projected to be sufficient for this community through the 2020, or a 20-year planning period.

Projected populations and wastewater needs are tabulated in the following Table 4-1. See Map 3, which follows, for the location of these two communities.

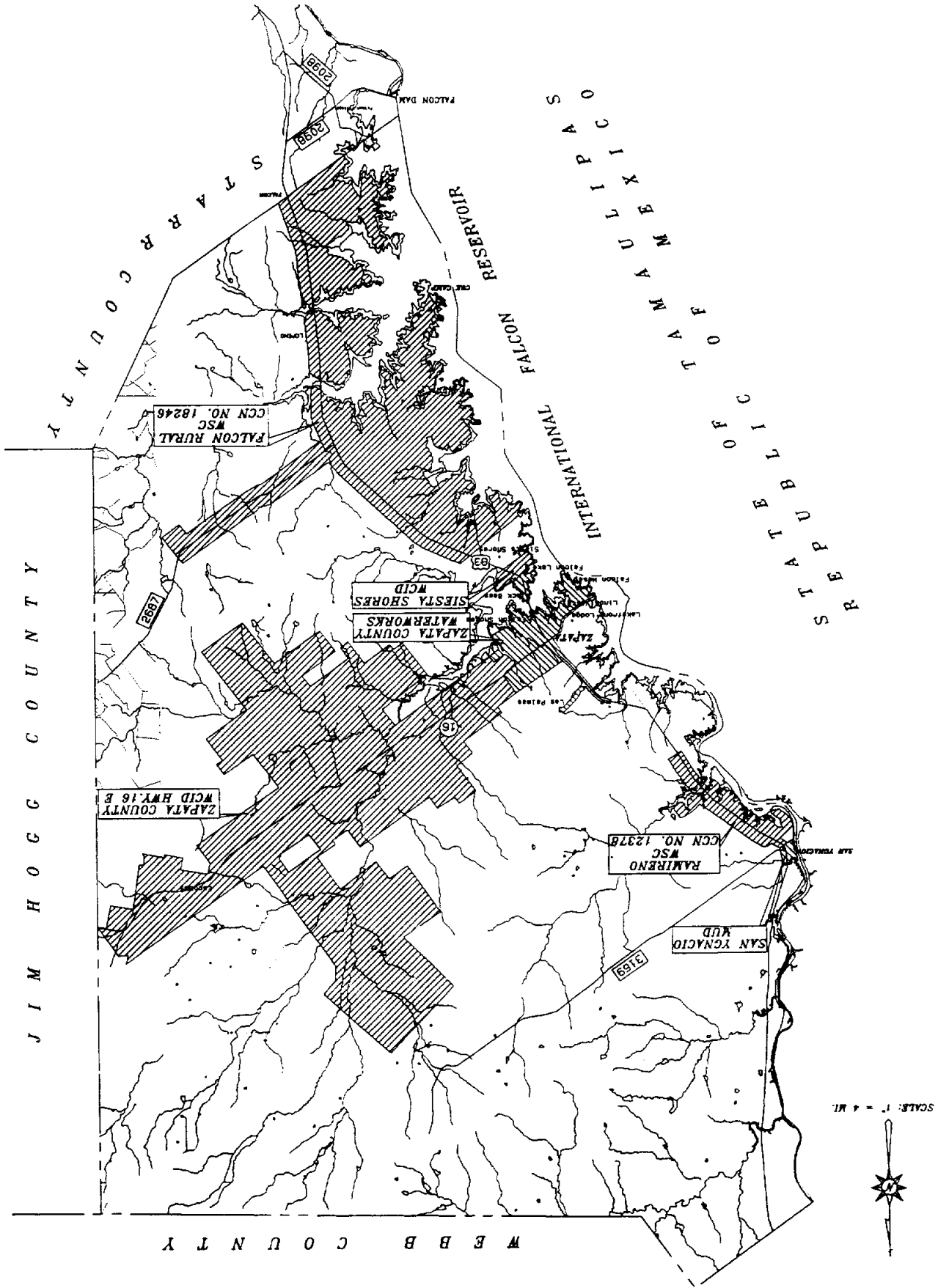
Table 4-1

Projected Population and Wastewater Flows
Falcon and Lopeno Communities
Zapata County, Texas
1994 - 2030
1994 Voting Tabulation District Census

Year	Falcon Community		Lopeno Community	
	Population	Flows* (MGD)	Population	Flows* (MGD)
1994	179	0.01	346	0.03
1995	181	0.01	349	0.03
2000	208	0.02	402	0.03
2010	240	0.02	464	0.04
2020	278	0.02	537	0.04
2025	319	0.03	616	0.05
2030	366	0.03	665	0.05

* Wastewater flows are calculated at the average rate of 82 gpcd. This is derived from the measured wastewater flows in the Townsite of Zapata of 63 gpcd and adding 30 percent to estimated exfiltration in the Townsite's old wastewater collection system.

MAP 3
GCN AND SERVICE AREA MAP



STARR COUNTY

JIM HOGG COUNTY

WEBB COUNTY

STATE OF TEXAS
INTERNATIONAL FALCON RESERVOIR

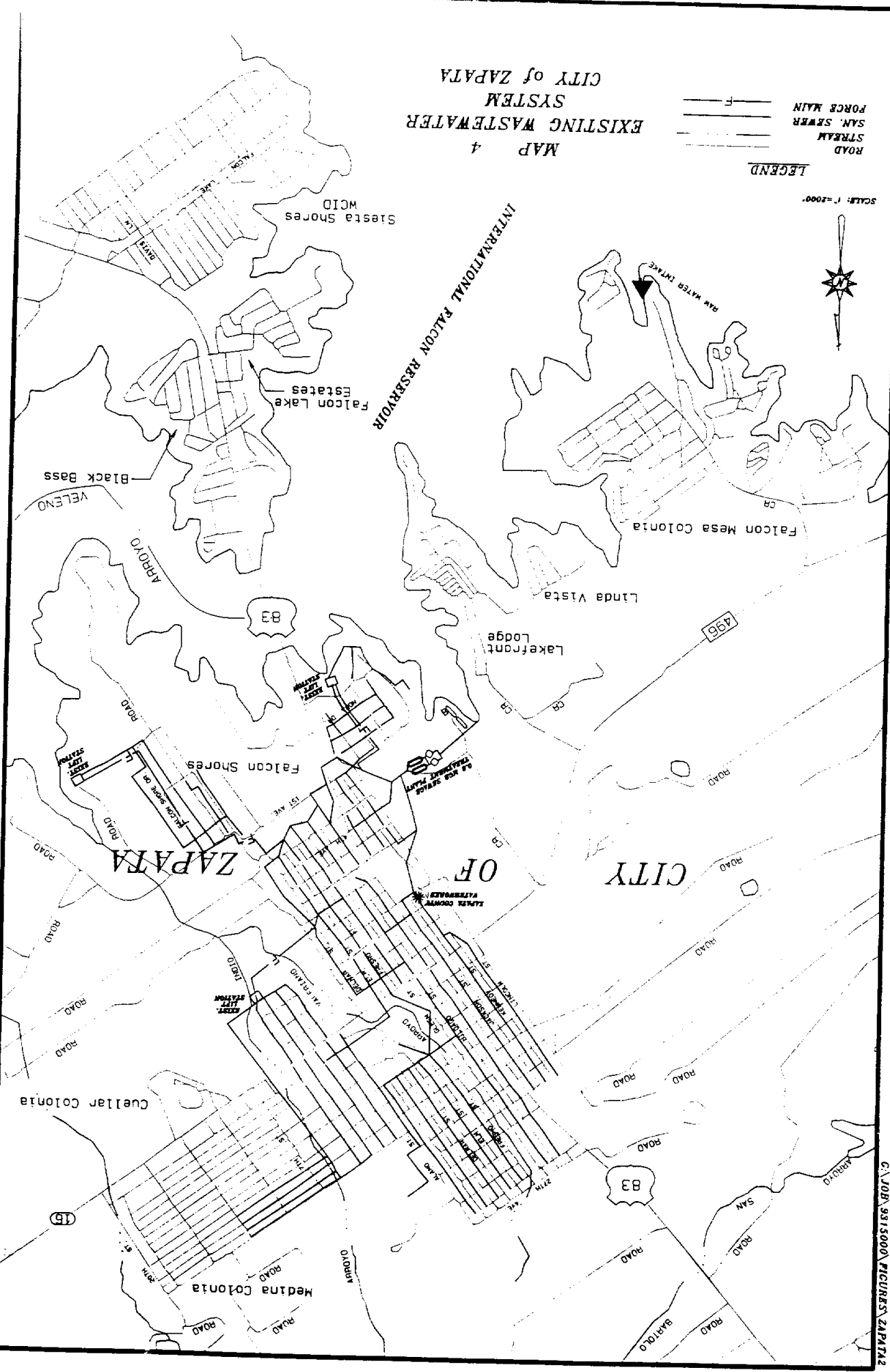
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CITY OF ZAPATA
EXISTING WASTEWATER
SYSTEM
MAP # 4

LEGEND
 ROAD
 STREAM
 SAN. SEWER
 FORCE MAIN

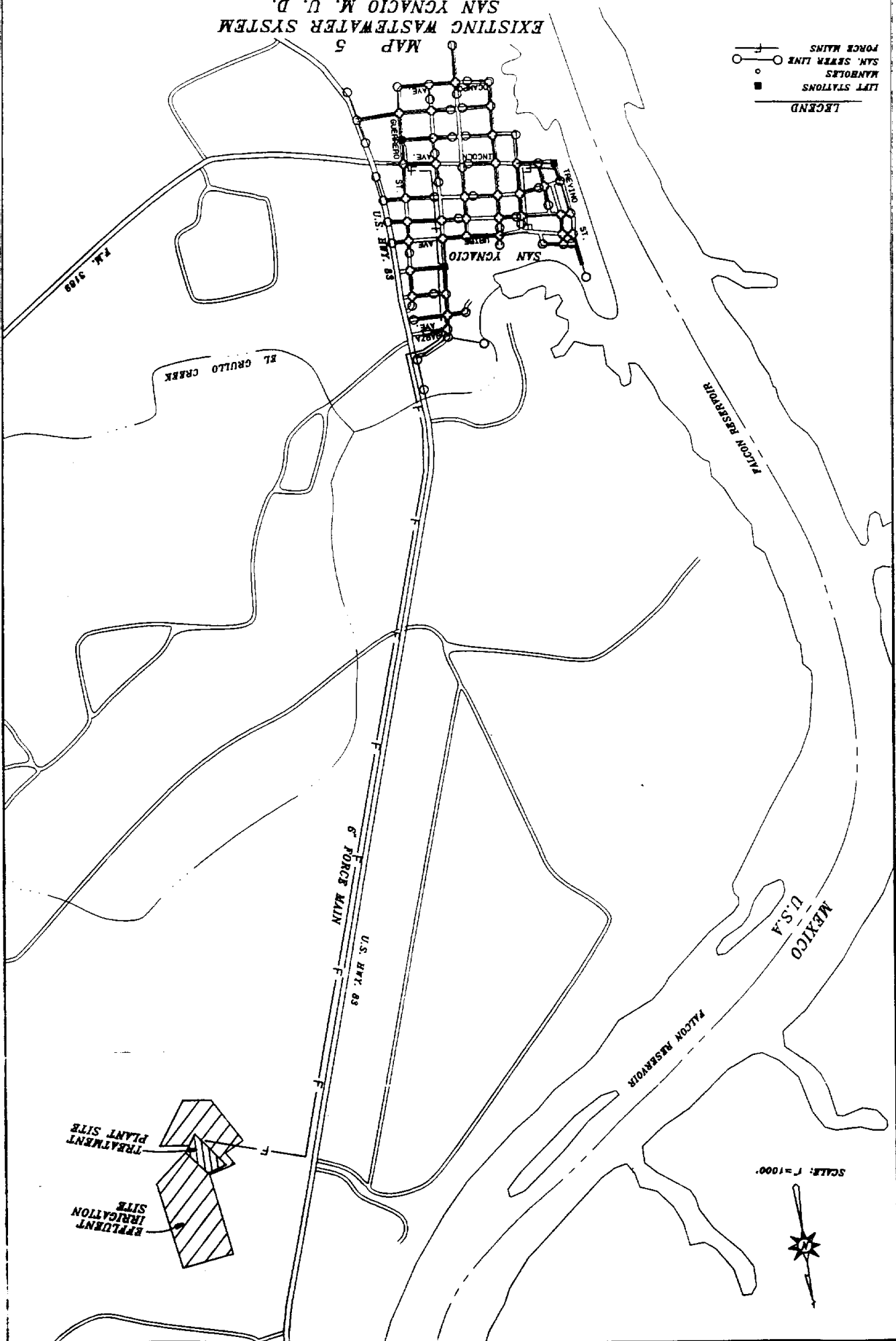
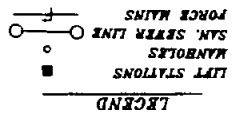
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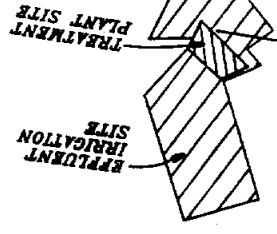
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EXISTING WASTEWATER SYSTEM
SAN YGNACIO M. U. D.
ZAPATA COUNTY

MAP 5



SCALE: 1" = 1000'



4.2.2 Townsite of San Ygnacio and San Ygnacio MUD

San Ygnacio MUD currently provides wastewater collection and treatment to all of the Townsite of San Ygnacio. The MUD's treatment and collection facilities were constructed in 1992 and consist of a Facultative Lagoon treatment plant, 8-inch collection lines and lift stations and 6-inch force mains. The plant has a treatment capacity of 0.19 MGD and is operating at 25 percent of the design capacity. Based on the projected growth (water connections) and 100 percent of sewer connections in the Townsite as shown in Table 2-5 at 434 water connections, it is estimated that the District will require 0.14 MGD treatment capacity and will not require additional treatment facilities through the year 2030.

Population in the Townsite of San Ygnacio is expected to grow at the rate of rural Zapata County and is estimated to be about 20 percent of the total growth of the County. Table 4-2 is a summary of the expected wastewater connections to the San Ygnacio collection and treatment facilities.

Table 4-2

Projected Connections and Wastewater Flows
 San Ygnacio MUD and the Townsite of San Ygnacio
 Zapata County, Texas
 1994 - 2030

Year	San Ygnacio MUD	
	Projected Connections	Estimated** Flows (MGD)
1994	289	0.051*
1995	290	0.051
2000	293	0.051
2010	327	0.057
2020	372	0.065
2025	407	0.071
2030	434	0.076

*The MUD reports average flows of .043 to .051 MGD to the new facilities.

** The wastewater flows are estimated from the average discharges of .051 MGD (54 gpcd), and 3.24 persons per connection.

4.2.3 Townsite of Zapata and Zapata County Waterworks

Zapata County Waterworks provides wastewater collection and treatment to less than 43 percent of the occupied lots in the subdivisions located near the Townsite of Zapata and the Zapata County wastewater treatment plant. Subdivisions which are not connected to the Waterworks' collection and treatment facilities include Falcon Lake Estates, Siesta Shores (see Siesta Shores WCID also), Black Bass Subdivision, Falcon Shores, Falcon Mesa Colonia, Linda Vista Subdivision, Lakefront Lodge Subdivision, Medina Colonia and Cuellar Colonia. These subdivisions have an estimated 1,630 additional connections. Lots within these subdivisions are platted at 50 feet wide and 100 feet long, too small to meet the County's Subdivision Ordinance criteria for the construction and use of septic

tanks. Population densities in these subdivisions vary from 11 to 24 persons per acre. Most of these areas are located on the shores of Falcon Reservoir and all currently use septic tanks and drain fields for wastewater treatment. Although no health hazards have been reported from the use septic tanks near the shore of Falcon Reservoir, it is expected that the septic tanks may introduce pollution into the reservoir when the densities within the subdivisions are high and water use is high.

Water quality reports for Segment 2303 of the Rio Grande River, which includes Falcon Reservoir, obtained from the Texas Natural Resource Conservation Commission show the average level of total dissolved solids exceeds the standard criteria in this segment, but fecal coliform counts did not exceed the standards criteria. The TNRCC's testing results show the standards were exceeded for the following:

pH	6.1 %
Chlorides	46 %
Sulfates	21 %
Total Dis. Solids	82 %
Orthophos.	3.70 %
Total Phosphorus	3.57 %

Since the County has wastewater treatment facilities located in the center of these subdivisions and the Townsite of Zapata, collection systems should be constructed to collect the wastewater from these subdivisions and eliminate the possible pollution and health problems created by septic tanks on small lots in highly developed areas. Tables 4-3 and 4-4, which follow, are listings of the individual subdivisions with the estimated existing and projected populations and wastewater treatment needs.

4.2.3.1 Colonias

The Texas Water Development Board identified three Colonias in Zapata County: Medina Colonia, Cuellar Colonia and Falcon Mesa Colonia. These Colonias are located in and near the Townsite of Zapata. Medina Colonia, located in the north part of the Townsite of Zapata, is the largest Colonia. Falcon Mesa Colonia is located south of the community of Zapata near the shore of Falcon Reservoir. Cuellar Colonia is located adjacent to Medina. The population densities range from 10.5 to 23.7 persons per acre and the total estimated current population of the identified colonias is 2,284. All three areas receive public water from Zapata County Waterworks. Falcon Mesa is served from a single 4-inch water main. Medina Colonia is served by an 8-inch main which loops the colonia.

All of the colonias found in Zapata County currently rely on individual on-site septic systems for wastewater disposal. All three Colonias are located near the service area of the Zapata County Wastewater Treatment Plant. The Texas Department of Housing and Community Affairs has funded grants totaling \$788,922 to extend sewer service and to improve water service to the Medina and Cuellar colonias. Additionally, the County received \$2,830,000 to construct wastewater collection facilities in the Medina Colonia in 1995. There are several lodges and RV parks located near the Falcon Mesa Colonia which are using septic tanks for wastewater treatment. No problems associated with the septic tank treatment facilities in these colonias have been reported or noted by the County's DMA officer. The following is a tabulation of the Colonias as reported by the Texas Water Development Board from their survey of colonias for Zapata County.

Colonia	Estimated Population	Number of Lots	Number of Dwellings
Medina	2025	1048	625
Falcon Mesa	251	66	66
Cuellar	42	30	11
TOTAL	2284	1144	601

Table 4-3*
 Projected Population of Area Subdivisions
 Townsite of Zapata and Zapata County Waterworks
 Zapata County, Texas
 1994 - 2030

Year	Falcon Lake Estates	Siesta Shores	Black Bass Subdiv.	Falcon Shores	Lakefront Lodge Subdiv.	Falcon Mesa Colonia	Medina Colonia	Cuellar Colonia	Townsite of Zapata	Total
1994	183	1297	634	303	463	232	1829	39	2740	7719
1995	191	1351	660	315	483	241	1906	40	2855	8042
2000	215	1524	745	356	544	271	2150	45	3220	9070
2010	260	1841	900	430	657	328	2596	55	3890	10957
2020	309	2194	1072	512	783	392	3095	65	4636	13058
2025	330	2338	1143	546	835	418	3298	70	4940	13918
2030	354	2507	1225	585	896	448	3537	75	5299	14926

* Table is reprinted from Chapter 3.

Table 4-4
Projected Wastewater Flows
Area Subdivisions
Townsite of Zapata and Zapata County Waterworks
Zapata County, Texas
1994 - 2030

Year	Falcon Lake Estates (MGD)	Siesta Shores (MGD)	Black Bass Subdiv. (MGD)	Falcon Shores Subdiv. (MGD)	Lakefront Lodge Subdiv. (MGD)	Falcon Mesa Colonia (MGD)	Medina Colonia (MGD)	Cuellar Colonia (MGD)	Townsite of Zapata (MGD)	Total (MGD)
1995	.02	.11	.05	.03	.04	.02	.16	.003	.23	0.66
2000	.02	.11	.05	.03	.04	.02	.18	.004	.26	0.71
2010	.02	.12	.06	.04	.05	.03	.21	.005	.32	0.86
2020	.02	.15	.09	.04	.06	.03	.25	.005	.38	1.03
2025	.03	.19	.09	.04	.07	.03	.27	.006	.41	1.14
2030	.03	.21	.10	.05	.07	.04	.29	.006	.43	1.23

* Projected wastewater flows = Population X 82 gpcd as calculated for Falcon and Lopeno Communities in the previous sections.

The County is working annually to fund and construct water supply and distribution lines as well as wastewater collection lines to these subdivisions and colonias. As noted previously, The County has applied community block grants to the construction of wastewater collection lines and lift stations to the Medina Colonia and other subdivisions and has received \$2,830,000 from USDA/Rural Development to construct wastewater lines and lift stations in the Median Colonia. However, it is recommended that the County develop a plan for reducing I&I in the wastewater collection systems in the Townsite of Zapata by slip lining existing lines, replacing lines and by constructing water tight manholes.

With the exception of Siesta Shores, which is now a WCID, the projected treatment requirement when calculated on an average daily wastewater flow from the Townsite of Zapata and the surrounding subdivisions is about 0.88 MGD in the year 2020. However, with the exception of Colonias of Medina, Cuellar, and Falcon Mesa, the County does not have immediate plans to provide wastewater collection and treatment service to the other subdivisions due environmental and permitting channel crossing of Arroyo Valeno on Falcon Reservoir to reach the subdivisions. The existing plant capacity is 0.8 MGD as shown in Section 4.1 and planning for expansion of these facilities should begin when the flows through the plant reach 75 percent of the plant's capacity, or .56 MGD. It is estimated that this planning would be required in the year 2010 when Falcon Mesa and Medina have been connected to the treatment facilities.

The following is a listing of the projected needs for collection and treatment of the Waterworks:

- (1) Begin planning treatment plant expansion in 2010;
- (2) Design and construct wastewater collection lines, pump stations and force mains in the subdivision around the Townsite of Zapata. It is estimated that 22,000 linear feet of wastewater mains, 15 lift stations and 28,000 feet of 6-, 8- and 10-inch force mains will be required to provide complete service to the area;

- (3) Evaluate the existing wastewater collection main lines, design and construct replacements as necessary for adequate size and to reduce the Inflows and Infiltration problems. It is estimated that 70,000 linear feet of the existing lines may need replacement or repairs.

The following is a listing of improvements which are needed and recommended for the Community of Lopeno. It is recommended that the County plan, design, construct and provide maintenance and operation of treatment facilities in the Lopeno community.

- (1) Design and construct a 0.04 MGD package treatment plant or a Step Aeration plus irrigation treatment facility for the Lopeno Community;
- (2) Design and construct approximately 10,000 linear feet of 6-, 8- and 10-inch collection mains or small diameter force mains with pumping facilities for the treatment facilities shown in Item 1:

The wastewater treatment plant operators employed by the Zapata County Waterworks could provide operation and maintenance for these facilities in the Lopeno Community. These needed improvements are quantified with projected implementation costs in Chapter 6 of this report. See Map 10 for the area and location of the recommended improvements.

4.2.4 Siesta Shores WCID

Although the WCID is a part of the community of the Townsite of Zapata, the WCID, formed in 1993, does not own a permit from the TNRCC to discharge wastewater into the Falcon International Reservoir south of the Townsite of Zapata, but has made application for \$7,000,000 to USDA/Rural Development to construct a Facultative Lagoon and Stabilization Ponds treatment facility adjacent to Highway 83. The facilities would discharge into Arroyo Valeno and then into Falcon International Reservoir. The project would be funded as a Colonia through Rural Development.

CHAPTER 5 - RECOMMENDED WATER SYSTEM IMPROVEMENTS

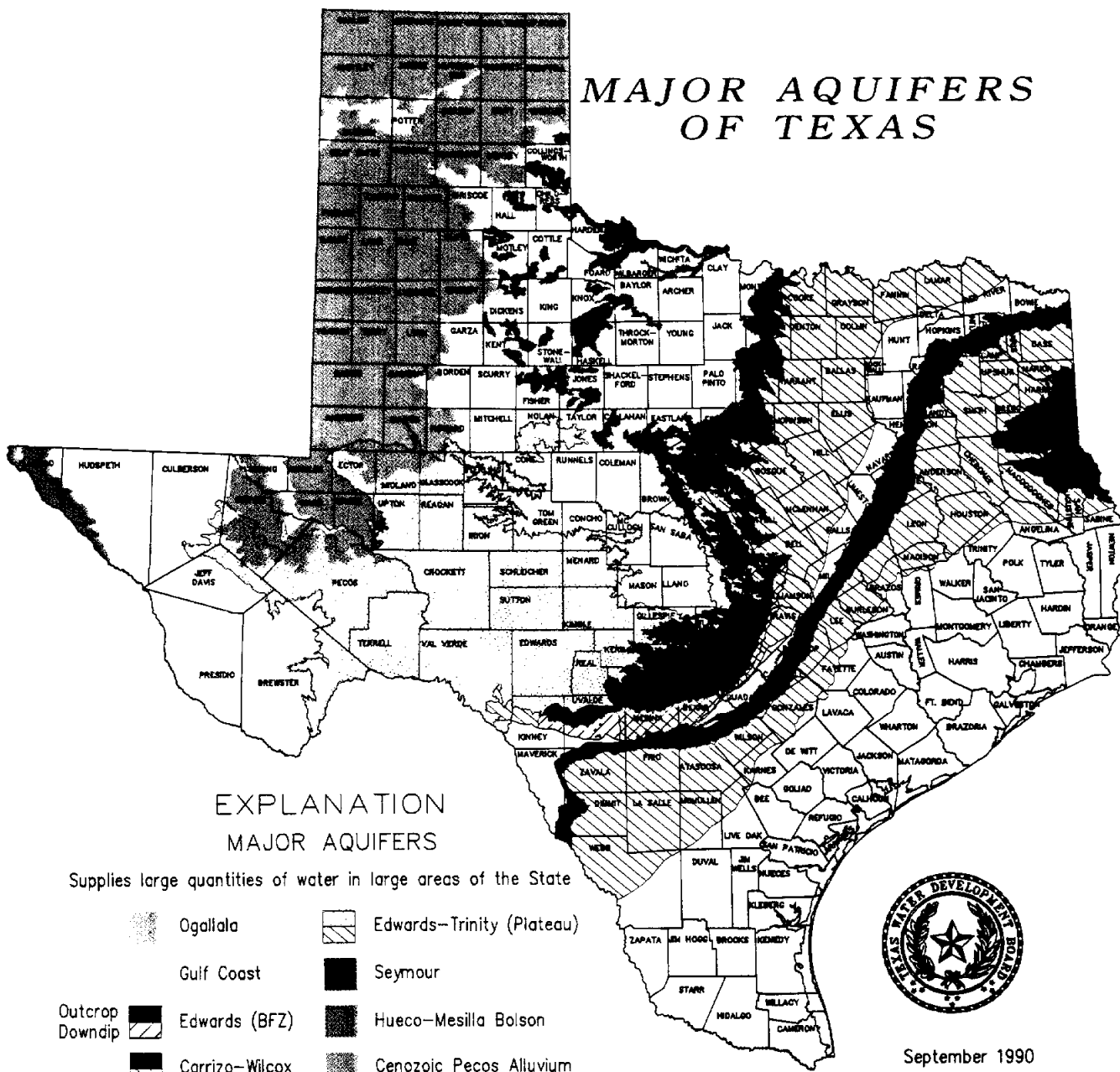
5.1 Water Rights and Ground Water Availability

The water suppliers in Zapata County rely exclusively on surface water from the Rio Grande River to supply their customers and water rights currently owned by the suppliers do not meet the present needs of the County. As shown in Chapter 3, it is estimated that the water suppliers in Zapata County will require 3.55 MGD of water in the year 2030. Currently, the water suppliers own 1,502 acre-feet of water rights and lease an additional 705 acre-feet a year to meet the existing demand of 2.00 MGD (2,240 acre-feet). Water rights ownership is only 67 percent of the existing demand. Table 5-1, which follows, summarizes the water rights needed by individual water suppliers.

Ground water in Zapata is of limited quantity and is not sufficient to provide the County an alternative to the Rio Grande River. The Gulf Coast Aquifer crosses the eastern edge of Zapata County as is shown in Figures 5-1 and 5-2, which follow. Figure 5-2 also shows the minor aquifers in Texas; there are no minor aquifers shown in Zapata County. Maps 6 and 7, which follow, show the locations of reported water wells in Zapata County. See Appendix G for copies of the Texas Water Development Board's Zapata County Ground Water Quality Records.

Recommendations which follow are based on (1) San Ygnacio MUD continuing operation and maintenance of the Ramireno WSC facilities and (2) Zapata County Waterworks providing treated water to the Falcon Lake Estates/Black Bass areas on the south side of Arroyo Valeno. (In 1994-95, the County constructed a 12-inch water main across Arroyo Valeno to serve these subdivisions.) Since Zapata County Waterworks provides water to the Zapata County WCID-16E, it is assumed that the Waterworks (Zapata County) will purchase and maintain ownership of water rights sufficient to supply the WCID-16E throughout the planning period.

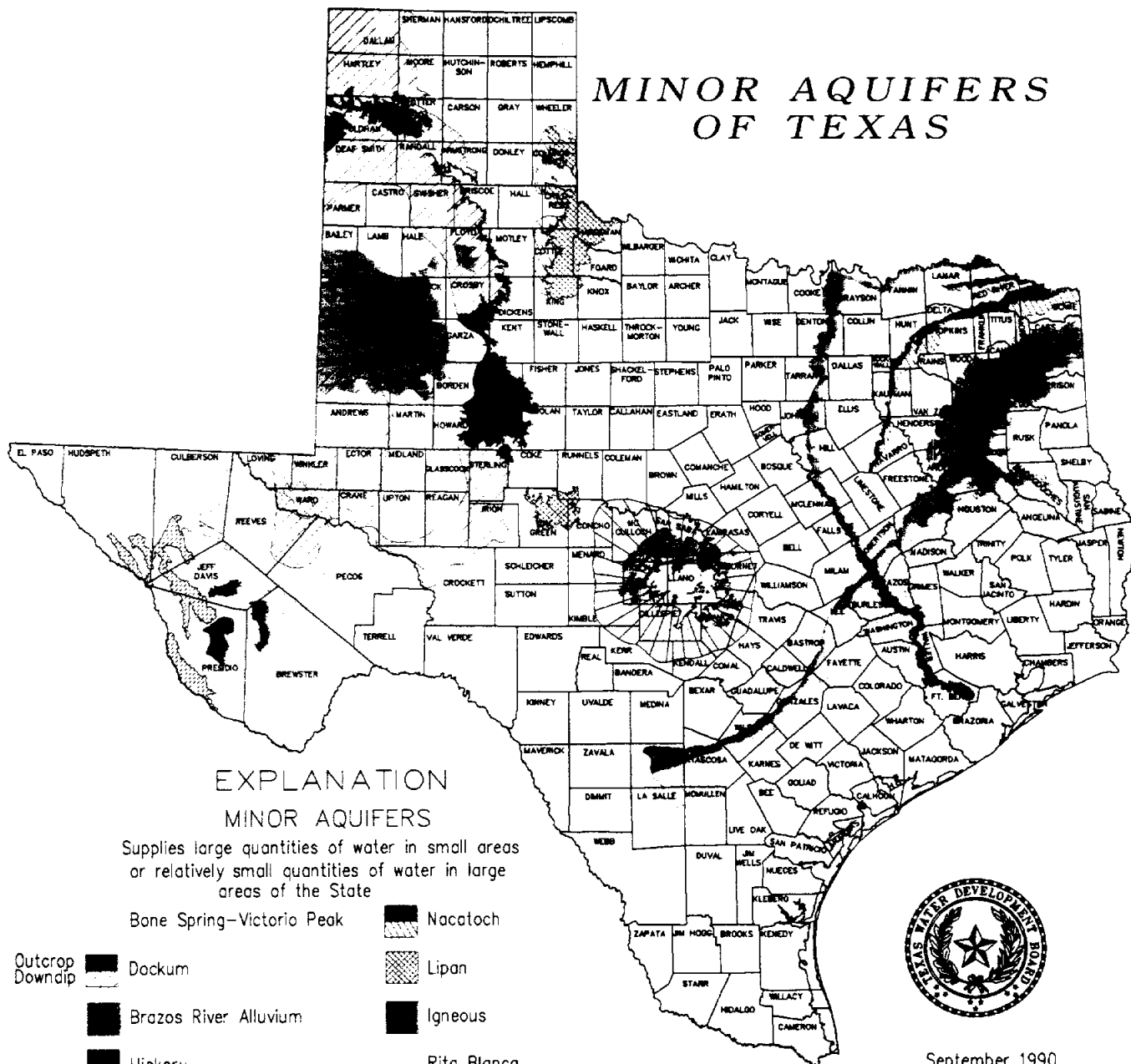
MAJOR AQUIFERS OF TEXAS



September 1990

FIGURE 5-1

MINOR AQUIFERS OF TEXAS



EXPLANATION MINOR AQUIFERS

Supplies large quantities of water in small areas or relatively small quantities of water in large areas of the State

Bone Spring-Victorio Peak

- | | | | | | |
|---------|--|-------------------------------|--|----------------------|--|
| Outcrop | | Dockum | | Nacatoch | |
| Downdip | | Brazos River Alluvium | | Lipan | |
| | | Hickory | | Rita Blanca | |
| | | West Texas Bolsons | | Ellenburger-San Saba | |
| | | Queen City | | Blossom | |
| | | Woodbine | | Marble Falls | |
| | | Edwards-Trinity (High Plains) | | Rustler | |
| | | Blaine | | Capitan Reef Complex | |
| | | Sparta | | Marathon | |

Note: Other Aquifers Undifferentiated (Not Shown)



September 1990

FIGURE 5-2

MAP 6 WATER WELL LOCATION ZAPATA COUNTY

EXPLANATION

Boundaries of the Lower Rio Grande Basin

Boundaries of major subdivisions
RG-72
Major subdivisions, number 15 of
the Lower Basin

Well symbols

(Symbol with dot) Private
 (Symbol with cross) Municipal
 (Symbol with triangle) Industrial
 (Symbol with square) Public
 (Symbol with circle) Street
 (Symbol with diamond) School
 (Symbol with star) Church
 (Symbol with hexagon) Other

Hydrologic symbols

(Symbol with horizontal lines) Alluvial
 (Symbol with vertical lines) Sand, silt, and gravel
 (Symbol with diagonal lines) Sand, silt, and gravel
 (Symbol with wavy lines) Sand, silt, and gravel
 (Symbol with dots) Sand, silt, and gravel
 (Symbol with horizontal lines) Sand, silt, and gravel
 (Symbol with vertical lines) Sand, silt, and gravel
 (Symbol with diagonal lines) Sand, silt, and gravel
 (Symbol with wavy lines) Sand, silt, and gravel
 (Symbol with dots) Sand, silt, and gravel

Geologic symbols

(Symbol with horizontal lines) Alluvium
 (Symbol with vertical lines) Sand, silt, and gravel
 (Symbol with diagonal lines) Sand, silt, and gravel
 (Symbol with wavy lines) Sand, silt, and gravel
 (Symbol with dots) Sand, silt, and gravel
 (Symbol with horizontal lines) Sand, silt, and gravel
 (Symbol with vertical lines) Sand, silt, and gravel
 (Symbol with diagonal lines) Sand, silt, and gravel
 (Symbol with wavy lines) Sand, silt, and gravel
 (Symbol with dots) Sand, silt, and gravel

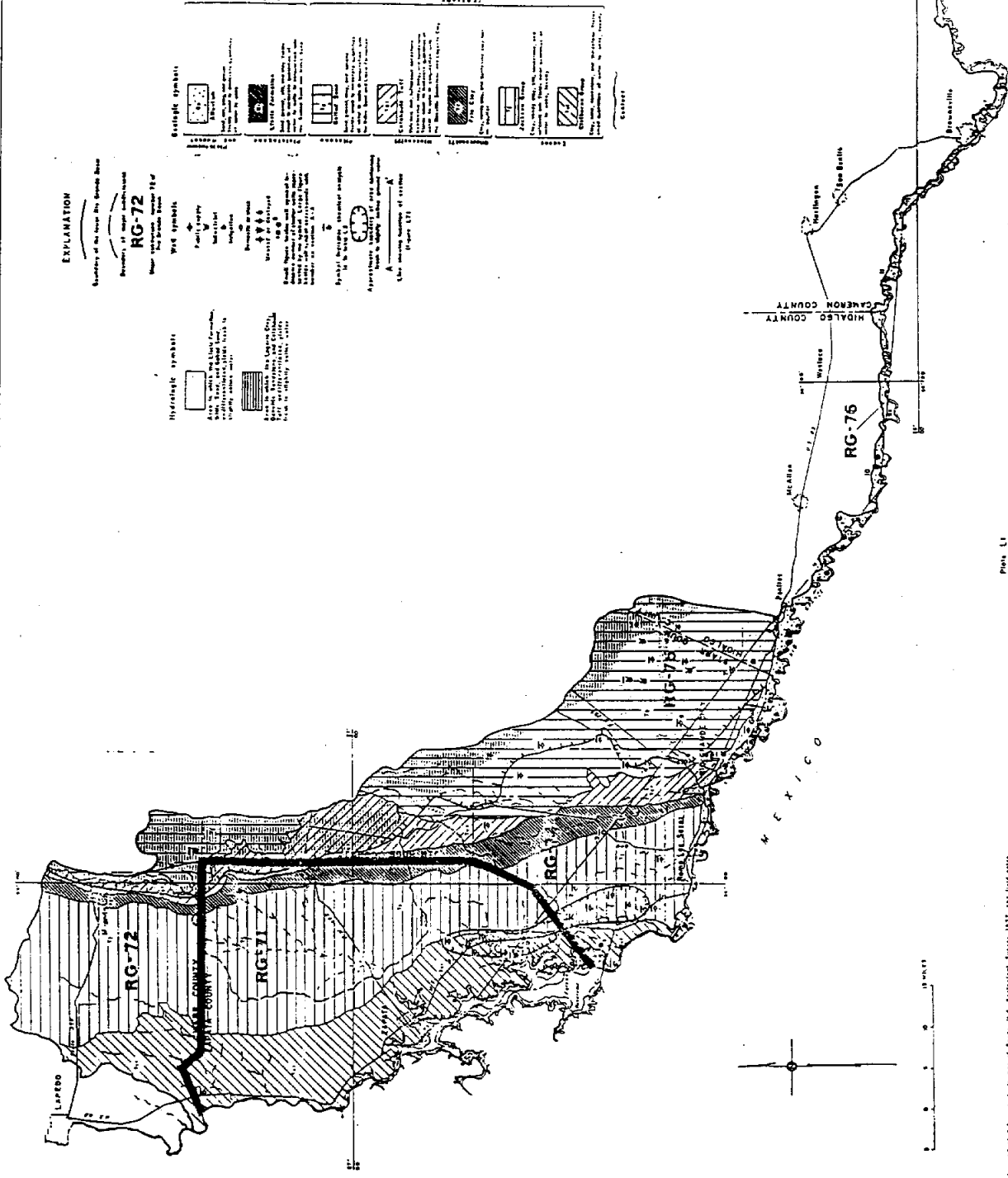


Plate LI
Geologic Map Showing Locations of Selected Wells, Lower Rio Grande Basin

Geologic map adapted from geologic map of Texas, U. S. Geological Survey, 1937, and later years. Well locations from United States series of hydrographic maps.

MAP 7
WATER WELL LOCATION
ZAPATA COUNTY

EXPLANATION

Boundary of the State of Texas
 Boundary of the County of Zapata
 RG-72
 RG-71
 RG-74
 RG-75
 RG-76

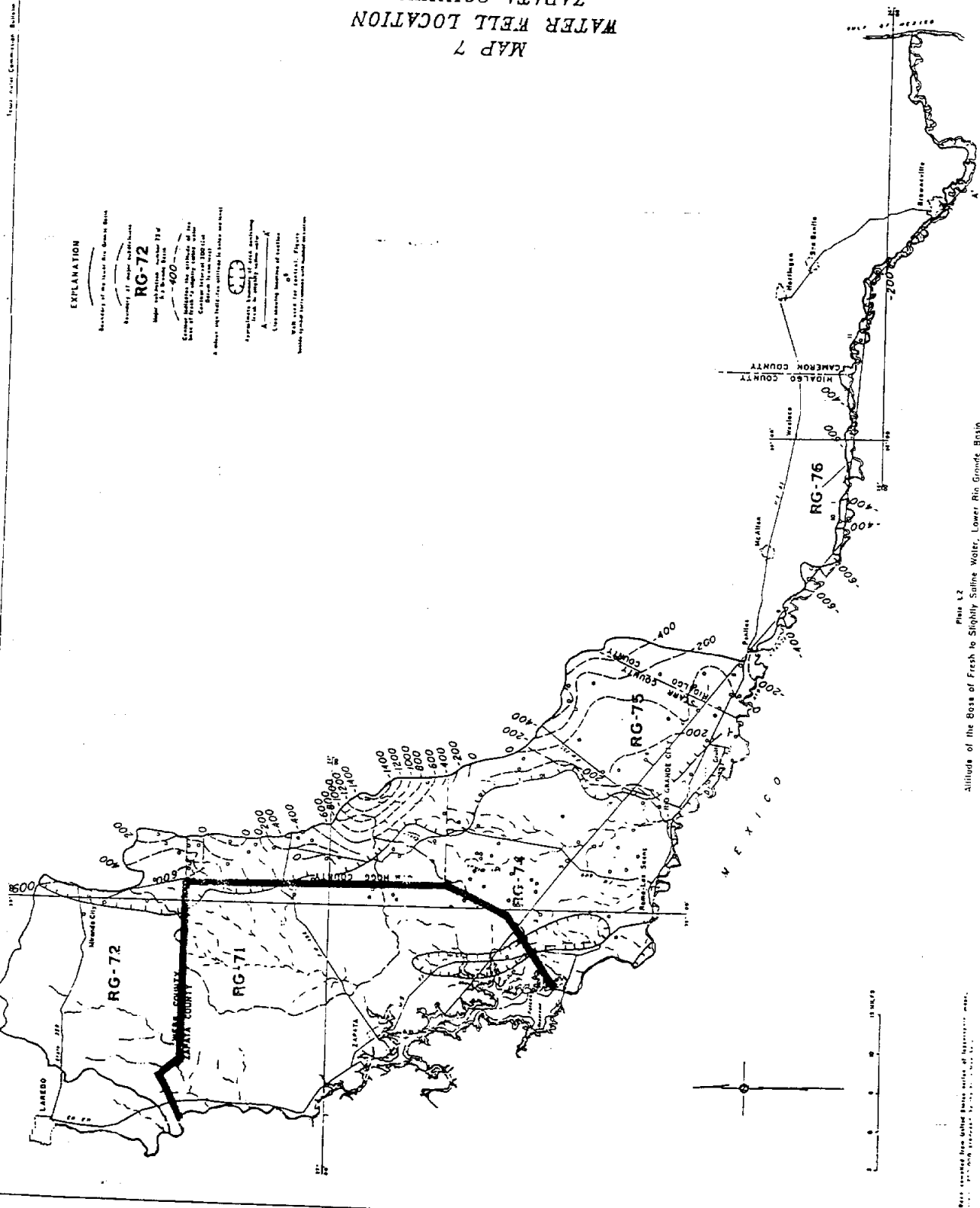


Plate L2
 Altitudes of the Bots of Fresh to Slightly Saline Water, Lower Rio Grande Basin

Base contoured from United States series of topographic maps.
 1:250,000 scale, projected by the State of Texas.

Based on the projected average annual demands of the County's residents and businesses of 3.55 MGD in the year 2030, a total of 3,978 acre-feet of water rights will be required to divert these demands from the river. Table 5-1 lists each supplier's water rights and projected requirements at various intervals throughout the period of 1995 through 2030. Quantities are calculated for municipal water rights in acre-feet, which could be converted when purchased as irrigation rights. These projections are based on the reported diversions from the Rio Grande River by the water suppliers, the calculated gpcd demands for diversions, the projected populations and connections as shown in Chapters 1, 2 and 3 of this study. Estimated costs for purchasing these water rights are based on information obtained from the Rio Grande River Watermaster's office for the "going price" for water rights and are shown in Chapter 7, Financial.

Table 5-1
 Projected Water Rights Requirements
 Zapata County, Texas
 (acre-feet)

Water Supplier	Exist. Ownership (ac-ft)	Existing 1994 Demand (ac-ft)	Projected Water Demands (ac-ft)					
			1995	2000	2010	2020	** 2025	2030
Falcon Rural WSC	36	225	225	227	254	288	316	336
Ramireno WSC	0	29	29	29	32	37	40	43
San Ygnacio MUD	234	169	169	171	191	217	238	253
Siesta Shores WCID	62.5	254	254	257	287	326	358	381
Zapata County Waterworks	1084	1508	1545	1743	2106	2509	2674	2868
Zapata County WCID - HWY 16E	75	65	65	65	74	83	91	97
Cox Camp (Private System)*	11							
TOTAL	1,502.50	2,250.00	2,287.00	2,492.00	2,944.00	3,460.00	3,717.00	3,978.00

* Cox Camp will be included in Falcon Rural WSC totals.

** Texas Water Development Board projects a requirement of approximately 6,922 acre-feet in the year 2025.

5.1.1 Water Reuse

Zapata County Waterworks in the Townsite of Zapata is reusing wastewater effluent from the County's treatment facilities for irrigation of the local golf course. The Waterworks holds a permit from the TNRCC to use up to 4.2 acre-feet per acre per year. San Ygnacio M.U.D. is currently irrigating its wastewater treatment plant site with treated effluent. Zapata County Waterworks and San Ygnacio MUD currently are the only providers of wastewater service in the County for the communities of the Town sites of Zapata and San Ygnacio. Siesta Shores WCID, which is on the south side of the Townsite of Zapata, will eventually construct a wastewater treatment plant for the Siesta Shores subdivision and should review the possibilities of irrigating the subdivision's public areas with the effluent. See Appendix D for copies of wastewater discharge permits for Zapata County Waterworks and San Ygnacio MUD.

With the exception of the Texas Water Law which governs the return of unused waters from surface water diversions, the providers of wastewater treatment services as well as the TNRCC and TWDB must consider certain aspects and consequences of the use of treated wastewater effluent for irrigation. Of course, this use could not include human or animal contact for specific and established periods of time, except with certain treatment and disinfection methods and levels.

Items to consider before the utility uses effluent for irrigation are:

1. Irrigation with effluent would reduce the diversion requirements by providing water in areas where treated, potable water is normally used;
2. Irrigation with effluent would enhance the growth of hay crops, parks and recreational area landscape, and forests;
3. Irrigation with effluent would lower the quantity of BOD, suspended solids, chlorine and other contaminants into the receiving stream, and;

4. Irrigation with wastewater effluent, although an environmentally desired process of treatment, would reduce the amount of water available for downstream users of Rio Grande River stream flows. This could be a significant factor on the Rio Grande since water is scarce in many years and droughts are frequent in this area. As a matter of accounting for diverters of surface waters in Texas, the utility is not allowed credit against his water rights for the amount of water returned to the stream. The Texas Water Law would require amending to allow for this credit.

5.2 Water Treatment Plants

In order to provide a more dependable and cost effective supply of water to the communities around the Townsite of Zapata, it is recommended that Zapata County Waterworks construct the needed facilities and provide water service to subdivisions adjacent to the Townsite. The County has treatment facilities in place that could be upgraded to provide the additional service and preclude the need for constructing additional facilities and the need to fund its operation and maintenance, thereby reducing the cost of services to the customers.

Since San Ygnacio MUD already operates, maintains and supplies Ramireno WSC, it is recommended that the MUD acquire the WSC, adding the WSC to the MUD's service area. San Ygnacio MUD can also provide service to rural areas in north Zapata County. See Map 1 for a layout of Zapata County and the San Ygnacio MUD areas.

Falcon Rural WSC's service area is near Cox Camp and could be extended to provide service to this area. Water rights for diverting stream flows to Cox Camp are in the estate of a deceased man and could be transferred or sold to the RWSC for providing water service.

As shown in Table 3-2 in Chapter 3, the projected demand for municipal water in the County is 3.55 MGD (3,979 ac-ft) in the year 2030. Treatment of this water will be

provided by the four major water supply utilities: Zapata County Waterworks, Falcon Rural WSC, San Ygnacio MUD and Siesta Shores WCID. Table 5-3, which follows, outlines the existing capacities of these utilities and the projected required treatment capacities for the years 2010 and 2030. These capacities are calculated from the requirement of 521 gallons per day per connection as previously calculated, based on average daily demands.

Table 5-3
 Projected Water Treatment Plant Requirements
 Average Daily Diversion Demands
 Zapata County, Texas
 1995 - 2030

Water Supplier	Existing No. Connections	Existing Treatment Capacity (MGD)	Projected Treatment Plant Requirements (MGD)			
			Year 2010		Year 2030	
			No. Connections	Plant Requirement	No. Connections	Plant Requirements
Falcon Rural WSC	384	0.36**	435	0.23	576	0.20
San Ygnacio MUD	289	0.86	327	0.17	434	0.23
Ramireno WSC	49***	0	55	0.03	74	0.04
Siesta Shores WCID	435	0.144	492	0.26	653	0.34
Zapata Co. WCID HWY 16-E	111****	0	126	0.07	167	0.09
Zapata County Waterworks	2584	4.90	3608	1.88	4914	2.56
TOTAL	3692	6.12	5043	2.54	6818	3.55

*Current capacity required to treat the proposed regional improvements. San Ygnacio MUD includes Ramireno WSC and Falcon Rural WSC includes Cox Camp.

**Falcon Rural WSC's total treatment capacity is 0.80 MGD; 0.36 MGD of the 0.80 MGD is estimated for Zapata County

*** Treatment Capacity for Ramireno would be provided by San Ygnacio MUD.

**** Treatment Capacity for WCID Hwy 16-E would be provided by Zapata Co. Waterworks.

Recommendations for expanding the utilities' water treatment facilities are based on (1) San Ygnacio MUD continuing to operate the Ramireno WSC and continuing to provide water services to this area as well as expanding into the rural areas around the Townsite of Ygnacio, (2) Falcon Rural WSC extending water mains to Cox Camp and acquiring this system, and (3) Zapata County Waterworks extending water supply services to the

Colonias and continuing to provide service to the Hwy 16E WCID. As showing Table 5-3 on the previous page, the treatment capacities of the utilities' treatment plants appear to be sufficient to supply the needs of the projected demands for the planning period.

5.3 Storage

Recommended storage capacities the water supply utilities are based on the standards of 200 gallons per connection as contained in the Texas Natural Resource Conservation Commission permanent Rules, 30 Texas Administrative Code, Chapter 290, Water Hygiene. For the purposes of this study, it is assumed that all storage will be at elevations which will serve all connections on the systems and pressure tank systems are not reviewed for the rural supply systems. Table 5-4 outlines the utilities' existing storage, projected connections and the projected total storage requirements.

Table 5-4
Projected Total Water Storage Requirements
Zapata County, Texas
1995 - 2030

Water Supplier	Existing Storage Capacity (MG)	Existing No. Connections	Projected Storage Requirements			
			Year 2010		Year 2030	
			No. Connections	Storage MG	No. Connections	Storage MG
Falcon Rural WSC	0.335	384	435	0.087	576	0.115
San Ygnacio MUD	0.545	289	327	0.065	434	0.087
Ramireno WSC	0.040	49	55	0.011	74	0.015
Zapata Co. WCID Hwy 16-E	0.064	111	126	0.025	167	0.033
Siesta Shores WCID	0.090	435	492	0.098	653	0.131
Zapata County Waterworks	2.375	2584	3608	0.722	4914	0.983
TOTAL	3.449	3852	5043	1.009	6818	1.364

As can be seen from the above table, all utilities appear to have sufficient minimum storage capacities to provide for the projected number of connections for the planning

period. No recommendations for constructing additional storage are made for the proposed planning period.

5.4 Distribution Systems

Most of the water suppliers are experiencing supply and pressure problems which are typical with rural and municipal water supply systems. These problems are primarily caused by long lines which are not supported by alternate sources or are not looped to prevent complete shut-down of large segments of lines during repairs or line breaks. Small diameter lines such as 2-inch and 3-inch lines also limits the volume and pressure of the water supply. Although Falcon Rural WSC has approximately 30 miles of water lines and a break at the Starr/Zapata County line could cause a temporary break in service to the WSC's 384 customers in Zapata County, the WSC has dependably provided adequate rural water supply to these Zapata County customers for many years.

Zapata County WCID-Hwy 16E purchases water from the Zapata County Waterworks which is supplied by 8-inch water mains and provides service to County residents north of the Townsite along Highway 16 to the County Line. The water utility appears to have sufficiently sized lines (water supply main is 8-inches in diameter) and storage for a dependable water supply, has provided adequate rural water service dependably to this area for many years and has not reported any supply problems.

The following Table 5-5 outlines the recommended water line upgrades as well as the recommended additions to the water supplier's distribution facilities.

Table 5-5

Recommended Distribution Line Additions
 Zapata County Regional Water Suppliers
 Zapata County, Texas
 1995 - 2030

Water Supplier	Additions Recommended for 1995 (Feet)			Additions Required for Year 2010 Flows (Feet)		Total (Feet)
	6-inch	8-inch	12-inch	6-inch	12-inch	
Siesta Shores WCID***	7,000			9,000		16,000
Falcon Rural WSC*	10,000					10,000
Zapata County** Waterworks	49,600			33,000		82,600
Total	66,600			42,000		108,600

* Extensions to Cox Camp area.

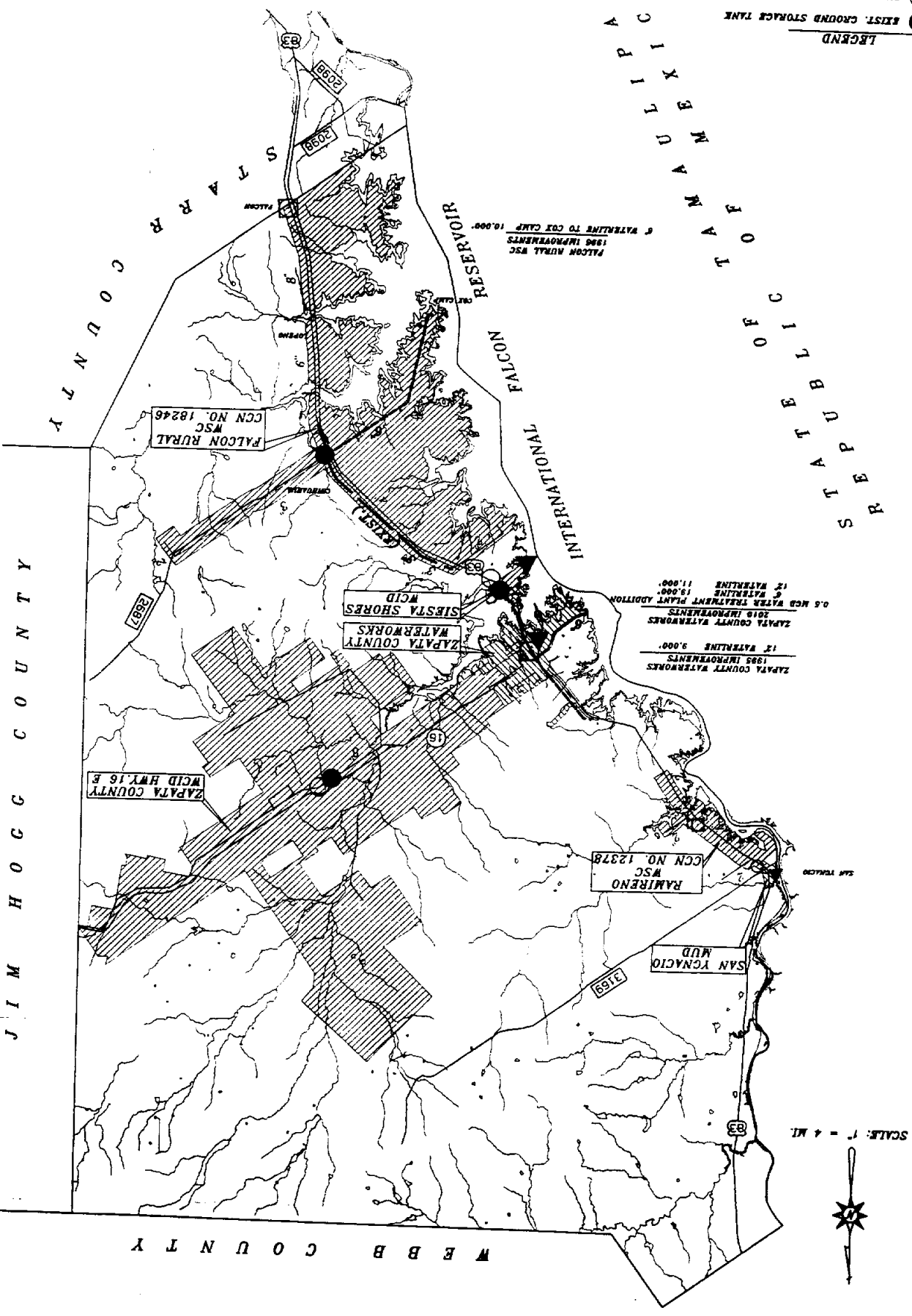
** Extension of lines to primarily serve Colonia.

*** Siesta Shores WCID has received funding from the R.E.C.D. (USDA/Rural Development) to construct water treatment plant clarifiers, water transmission mains, pumping facilities beginning in 1995.

Map 8, which follows, shows the location and sizes of the recommended water distribution/supply lines. Projected implementation costs are outlined in Chapter 7 of this report with prospective pro-formas for the improvements.

PROPOSED WATER IMPROVEMENTS
 ZAPATA COUNTY
 MAP 8

- LEGEND
- EXIST. GOOD STORAGE TANK
 - EXIST. PUMP STATION
 - ▲ EXIST. WATER TREATMENT PLANT
 - PROP. 6'
 - PROP. 8'
 - PROP. 12'
 - EXIST. WATER LINES



REPUBLIC OF TEXAS
 STATE OF TEXAS
 INTERNATIONAL FALCON RESERVOIR

ZAPATA COUNTY WATERWORKS
 1985 IMPROVEMENTS
 17' WATERLINE 9,000'
 ZAPATA COUNTY WATERWORKS
 2019 IMPROVEMENTS
 U.S. MCD WATER TREATMENT PLANT ADDITION
 6' WATERLINE 19,000'
 12' WATERLINE 11,000'

FALCON RURAL MSC
 1986 IMPROVEMENTS
 8' WATERLINE TO COX CAMP
 10,000'

SCALE: 1" = 4 MI.



C:\JOB 0315000\FIGURES\PROPRATE

JIM HOGG COUNTY

STARR COUNTY

WEBB COUNTY

CHAPTER 6 - RECOMMENDED WASTEWATER IMPROVEMENTS

6.1 Wastewater Treatment Plants

6.1.1 Zapata County Waterworks and the Townsite of Zapata

Regionalization of the wastewater treatment facilities in and around the Townsite of Zapata provides advantages to prospective users by (1) reducing the individual's user costs, (2) allowing the public agency to collect more user charge fees, (3) having improvements, repairs and upgrades to the system more readily made because of staff, equipment and funds, (4) providing better control of the operation and maintenance of the collection facilities, lift stations and treatment system, (5) providing better control of the discharge of pollutants into Falcon Reservoir with only one treatment plant, (6) financing and paying off debt service is easier with a larger, regional provider and (7) regionalization of the facilities follows the Texas Water Development Board's specific policy regarding regionalization.

Communities and subdivisions to which the Zapata County Waterworks could extend wastewater collection and treatment service are shown in Table 6-1. These areas currently use septic tanks in high density areas for wastewater treatment. See Maps 9 and 10, which follow, for the location and estimated density of these areas and the collection system improvements required to serve these areas. Connections north along Highway 16 in the Zapata County WCID - Hwy 16E area may be added as extensions are made and the population grows in this area.

ZAPATA CITY

PROPOSED WASTEWATER IMPROVEMENTS

MAP 9

LEGEND

- EXIST. SEWER LINE
- - - EXIST. FORCEMAIN
- - - PROP. GRAVITY MAIN
- PROP. FORCEMAIN
- PROP. LIFT STATION

SCALE: 1" = 2000'



1995 - VCP SAN SEWER REPLACEMENT IMPROVEMENTS

1995 - SAN SEWER IMPROVEMENTS

FALCON MESA * COLONIA IMPROVEMENTS
 27,500'
 7,100'
 4,000'
 28,000'
 LIFT STATIONS & EL. FORCEMAIN

LINDA VISTA & THORNHILLS * INCLUDES LAKEFRONT LODGE LIFT STATIONS & EL. FORCEMAIN 28,000'

FALCON LAKE

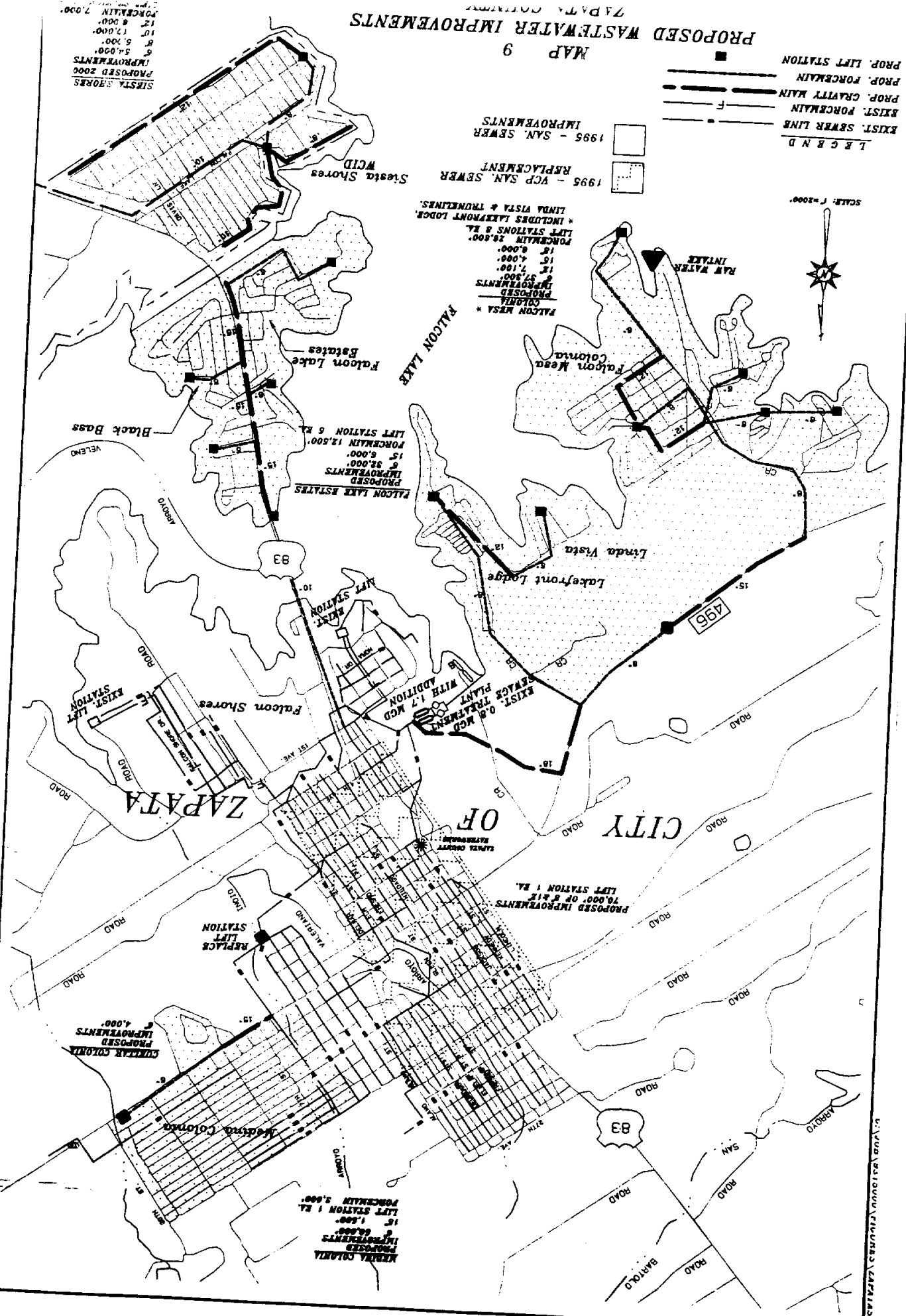
FALCON LAKE ESTATES PROPOSED IMPROVEMENTS
 12,500'
 8,000'
 28,000'
 LIFT STATION & EL. FORCEMAIN

FALCON LAKE ESTATES LIFT STATION & EL. FORCEMAIN 12,500'

Falcon Lake Estates

Stesta Shores WCID

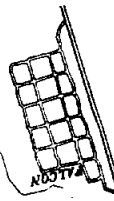
SISTA SHORES PROPOSED 2000 IMPROVEMENTS
 54,000'
 6,000'
 12,000'
 8,000'
 12,000'
 FORCEMAIN 7,000'



CITY OF ZAPATA, TEXAS

PROPOSED WASTEWATER IMPROVEMENTS
MAP 10
ZAPATA COUNTY

PATA
COUNTY



89

PROPOSED 0.05 MGD
WASTEWATER TREATMENT
PLANT

PROP. 7,000'
6" SAN. SEWER

PROP. 10,000' 8" SAN. SEWER

FALCON RESERVOIR

CHIGUITA

TIGER

ARROYO

COYOTES

LOS

ARROYO

ARROYO

SCALE: 1"=4000'



Table 6-1
Projected Wastewater Flows
Area Subdivisions
Townsite of Zapata and Zapata County Waterworks
Zapata County, Texas
1994 - 2030

Year	Falcon Lake Estates (MGD)	Siesta Shores (MGD)	Black Bass Subdiv. (MGD)	Falcon Shores Subdiv. (MGD)	Lakefront Lodge Subdiv. (MGD)	Falcon Mesa Colonia (MGD)	Medina Colonia (MGD)	Cuellar Colonia (MGD)	Townsite of Zapata (MGD)	Total (MGD)
1995	.02	.11	.05	.03	.04	.02	.16	.003	.23	0.66
2000	.02	.11	.05	.03	.04	.02	.18	.004	.26	0.71
2010	.02	.12	.06	.04	.05	.03	.21	.005	.32	0.86
2020	.02	.15	.09	.04	.06	.03	.25	.005	.38	1.03
2025	.03	.19	.09	.04	.07	.03	.27	.006	.41	1.14
2030	.03	.21	.10	.05	.07	.04	.29	.006	.43	1.23

* Projected wastewater flows = Population X 82 gpcd as calculated for Falcon and Lopeno Communities in the previous sections.

Currently, the Zapata County Waterworks' 0.80 MGD wastewater treatment plant is reported to be operating at about 22 percent capacity with the existing 961 domestic and 139 commercial connections. The population equivalent of the plant's treatment capacity is approximately 8,000 persons. As shown in Table 6-1 without providing service to Siesta Shores WCID, the County should begin planning for upgrades to the existing treatment plant in the year 2000, or at the 75 percent level of treatment. In order to accommodate this growth to the year 2030, the County will be required to construct additions or replacements to treat at least an additional 0.20 MGD of wastewater flows. If the County were to negotiate with and provide service to Siesta Shores, planning for additional treatment facilities should begin now.

6.1.2 Wastewater Collection Lines, Lift Stations and Force Mains

With the exception of Falcon Lake Estates and Black Bass Subdivision, all of the communities or subdivisions around the Townsite of Zapata may be connected to the existing wastewater collection system by extending gravity lines, force main lines and constructing lift stations. Falcon Lake Estates and Black Bass Subdivision will require an additional channel or creek crossing along US Highway 83.

Alternatively, the County may negotiate with Siesta Shores for providing wastewater treatment capacity for these two subdivisions when sanitary sewer and the wastewater treatment plant is in place. The County would be responsible for constructing collection and pumping facilities for delivering the wastewater to the Siesta Shores WWTP. See Maps 9 and 10 for the recommended gravity wastewater collection lines and the lift stations and force mains. Table 6-2, which follows, is a tabulation of recommended improvements required to serve the areas listed in Table 6-1.

Table 6-2
 Recommended Wastewater Collection Facilities
 Zapata County Waterworks and the Townsite of Zapata
 Zapata County, Texas
 1995

Gravity Collection Lines (Ft)						Force Main Lines (Ft)			Lift Sta.	Channel Crossing (Ft)
6-inch	8-inch	10-inch	12-inch	15-inch	18-inch	6-inch	8-inch	10-inch		
123,300	62,500	-0-	14,600	11,500	6,000	22,000	15,000	5,000	15	2,500

6.2 San Ygnacio MUD

Based on the projected growth rates and connections to the MUD's 0.194 mgd wastewater treatment facilities, the Townsite will only be required to extend service collection lines as the limited growth occurs in the Townsite of San Ygnacio. No major improvements are projected and no regionalization is projected for the District in providing wastewater treatment and collection.

6.3 Lopeno Community

Density of residences in the Community of Lopeno has reached the maximum allowed under the County's subdivision rule for allowing septic tanks as the means for wastewater treatment. In order to provide a community treatment facility for Lopeno which would be sufficient until the year 2030, it is recommended the County construct a package wastewater treatment plant or a Step Aeration system with irrigation. The size of the treatment facility must be 0.05 mgd, average flow rates, with approximately 7,000 feet of 6-inch collection lines, manholes, services, cleanouts and approximately 13,000 feet of 8-inch interceptor line to the plant. Please refer to Table 4-1 for the projected wastewater flows for the Lopeno community.

CHAPTER 7 - FINANCIAL

7.1 Projected Implementation Costs

The estimated costs shown for the recommended improvements are based on 1995 costs. Improvements are quantified for (1) Zapata County Waterworks and the Townsite of Zapata area, (2) San Ygnacio MUD, (3) Siesta Shores WCID, (4) Lopeno Community and (5) Falcon Rural WSC. Tables 7-1 through 7-6, which follow, list the estimated construction quantities and projected development costs for improvements to these areas' water and wastewater facilities.

7.1.1 Zapata County Waterworks Water and Wastewater

The following quantities and costs are based on providing service to the existing subdivisions around the Townsite of Zapata with enough distribution, pumping and collection capacities estimated for the period 1995 to 2030. It is estimated that the County can obtain grants from various State and Federal agencies to fund at least 75 percent of the project costs and may borrow the remaining 25 percent for 100 percent funding. Funding programs by various agencies are outlined in future sections of this Chapter. Recommended water improvements to the Zapata County Waterworks facilities are shown on Map 8, "Proposed Water System Improvements". Recommended wastewater system improvements are shown on Maps 9 and 10, "Proposed Wastewater System Improvements".

Table 7-1
 Implementation Costs
 Zapata County Waterworks
 Water Distribution
 Year 1995 - 2030

Description	Quantity	Unit Costs	Total Costs
Water Main Line - 6" (Incl. FH & services)	26,000 LF	\$28.00	\$728,000
Subtotal			\$728,000
Contingencies @ 15%			\$109,200
Administration @ 5%			\$36,400
Engineering, Surveying, Mapping & Inspection @ 15%			\$109,200
Water Rights - 1805.80 ac-ft*		\$1,000.00	\$1,805,800
Legal & Financial @ 5%			\$36,400
Total Estimated Costs			\$2,825,000
Estimated Waterworks Share @ 25% after grants			\$706,250

* This number is the total requirement for Zapata Co. Waterworks and Zapata County WCID Hwy 16E less the existing ownership.

Table 7-2
Implementation Costs
Zapata County Waterworks
Wastewater Collection
Year 1995 - 2030

Description	Quantity	Unit Costs	Total Costs
Lift Stations	15 Ea	\$15,000.00	\$225,000
Force Main Line - 6"	22,000 LF	\$12.00	\$264,000
Force Main Line - 8"	15,000 LF	\$16.00	\$240,000
Force Main Line - 10"	5,100 LF	\$20.00	\$102,000
Gravity Trunk Lines - 6"	123,300 LF	\$18.00	\$2,219,400
Gravity Trunk Lines - 8"	62,500 LF	\$20.00	\$1,250,000
Gravity Trunk Lines - 12"	14,600 LF	\$22.00	\$321,200
Gravity Trunk Lines - 15"	11,500 LF	\$24.00	\$276,000
Gravity Trunk Lines - 18"	6,000 LF	\$28.00	\$168,000
Creek Channel Crossing	2,500 LF	\$150.00	\$375,000
Land, Easements and Rights of Way	3.0 Ac	\$3,000.00	\$9,000
Subtotal			\$5,449,600
Contingencies @ 15 %			\$817,440
Administration @ 5 %			\$272,480
Engineering, Surveying, Mapping & Inspection @ 15 %			\$817,440
Legal & Financial @ 5 %			\$272,480
Total Estimated Costs			\$7,629,440
Estimated Zapata County Costs @ 25 % after grants			\$1,907,360

7.1.2 Falcon Rural Water Supply Corporation

Recommended improvements to the Falcon Rural WSC's water supply system consist of providing water service to the Cox Camp area on Falcon Reservoir and purchasing additional water rights to cover the projected diversion demands for the planning period. Table 7-3, which follows, outlines these quantities and estimated 1995 costs. Recommended improvements to the WSC's facilities are shown on Map 7, "Proposed Water System Improvements - Falcon Rural WSC", in the Map Packet of this report.

Table 7-3
Implementation Costs
Falcon Rural Water Supply Corporation*
Water Rights and Supply Lines
Zapata County, Texas
Year 1995 - 2030

Description	Quantity	Unit Costs	Total Costs
Water Main Line - 6" to Cox Camp	10,000 LF	\$18	\$180,000.00
Subtotal			\$180,000
Contingencies @ 15%			\$27,000
Administration @ 5%			\$9,000
Engineering, Surveying, Mapping & Inspection @ 15%			\$27,000
Legal & Financial @ 5%			\$9,000
Water Rights	300 ac-ft	\$1,000	\$300,000
Land, Easements and Rights of Way	10 Acres	\$3,000	\$30,000
Total Estimated Costs			\$582,000

7.1.3 San Ygnacio Municipal Utility District - Water

Recommended improvements to the San Ygnacio MUD's water supply system consist of the extension of 2 miles (11,000 LF) of 4-inch water main along near Highway 83 in the Ramireno WSC area to residents who are requesting service and purchasing water rights to cover the demands for the planning period. Table 7-4, which follows, outlines the quantities and estimated costs for implementing the recommended improvements. Recommended improvements to the MUD's water system are shown on Map 8, "Proposed Water System Improvements - San Ygnacio MUD".

Table 7-4
Implementation Costs
San Ygnacio Municipal Utility District
Water Rights and Supply Lines
Zapata County, Texas
Year 1995

Description	Quantity	Unit Costs	Total Costs
Water Main Line - 4"	11,000 LF	\$10	\$110,000
Subtotal			\$110,000
Contingencies @ 15 %			\$16,500
Administration @ 5 %			\$5,500
Engineering, Surveying, Mapping & Inspection @ 15 %			\$16,500
Legal & Financial @ 5 %			\$5,500
Water Rights	63 ac-ft	\$1000	\$63,000
Total Estimated Costs			\$217,000

7.1.4 Lopeno Community

Located in south Zapata County on Highway 83 near the Starr County line, Lopeno is isolated from larger communities with regional wastewater treatment facilities and is unable to connect a regional facility. Since this community is located near Falcon Reservoir, it will be necessary to construct treatment facilities such as package treatment plants which will obtain effluent qualities better than the 10 ppm BOD and 15 ppm TSS to prevent polluting the reservoir.. Estimated quantities and associated projected implementation costs are shown in the following Tables 7-5. Recommended improvements within these communities, which omit minor collection lines, are shown on Map 10, Proposed Wastewater Improvements - Falcon and Lopeno Communities. Table 7-6 is the projected implementation costs for the Siesta Shores WCID wastewater improvements. Table 7-7 is the total projected implementation costs for each of the County's utilities for various periods.

Table 7-5
Implementation Costs
Lopeno Community
Wastewater Collection and Treatment
1995-2030

Description	Quantity	Unit Costs	Total Costs
Treatment Plant	0.05 MGD	\$3.00/gal	\$150,000
Collection Lines - 6"	7000 LF	\$18.00	\$126,000
Gravity Trunk Lines - 8"	10,000 LF	\$20.00	\$200,000
Subtotal			\$476,000
Contingencies @ 15%			\$71,400
Administration @ 5%			\$23,800
Engineering, Surveying, Mapping & Inspection @ 15%			\$71,400
Legal & Financial @ 5%			\$23,800
Land, Easements and Rights of Way	12 Ac	\$3,000.	\$36,000
Total Estimated Costs			\$702,400

Table 7-6
Implementation Costs*
Siesta Shores WCID
Wastewater Treatment and Collection
Water Rights
1995-2030

Description	Quantity	Unit Costs	Total Costs
Wastewater Treatment Plant	0.50 mgd		\$1,158,752
Lift Stations	9		\$540,000
Collection Lines - 6"	104,550 LF	\$19.00	\$1,986,450
Collection Lines - 8"	7,580	\$26.00	\$197,080
Collection Lines - 10"	8,530	\$26.00	\$238,840
Collection Lines - 12"	6,300	\$28.00	\$163,800
Collection Lines - 15"	840	\$49.00	\$41,160
Collection Lines - 18"	1,670	\$50.00	\$83,500
Collection Lines - 21"	1,570	\$58.00	\$91,060
Collection Lines - 24"	1,900	\$68.00	\$129,200
Force Mains 4", 6", 8", 10"	24,700		\$233,300
Manholes	290	\$1,500.00	\$435,000
Services	1,780	\$250.00	\$445,000
SUBTOTAL			\$5,743,142
Land			\$248,250
Engineering, Survey, Inspection, Permits			\$514,000
Fiscal, Legal and Administrative			\$65,711
Contingencies			\$428,897
SUBTOTAL WASTEWATER			\$7,000,000
Water Rights 318.5 ac-ft @ \$1,000/ac-ft**			\$318,500
TOTAL			\$7,318,500

* These costs were taken from the WCID's engineer's cost estimate in his application to the USDA/Rural Development for funding of the wastewater treatment and collection project.

** Water rights and costs are calculated from projections within this report in previous sections.

Table 7-7
 Projected Implementation Costs by Period
 Water and Wastewater Improvements
 Zapata County, Texas

Water & Wastewater Utility	Year 1995-96			Year 2010			Total Estimated Costs
	Water	Wastewater	Subtotal	Water	Wastewater	Subtotal	
Zapata County Waterworks	\$2,825,000	\$3,629,440	\$6,454,440		\$4,000,000	\$4,000,000	\$10,454,440
San Ygnacio MUD	\$217,000		\$217,000				\$217,000
Falcon Rural WSC	\$582,000		\$582,000				\$582,000
Siesta Shores WCID		\$7,318,500	\$7,318,500				\$7,318,500
Lopeno Community		\$702,400	\$702,400				\$702,400
Total Estimated Costs	\$3,624,000	\$11,650,340	\$15,274,340		\$4,000,000	\$4,000,000	\$19,274,340

7.2 Financial Analyses

7.2.1 Zapata County Waterworks

Since the water and wastewater facilities are owned and operated by the County, it is estimated that costs to the County for making the recommended improvements will be 25 percent of the total project costs. The County has several sources for financial assistance in financing the projects. These sources include the Texas Water Development Board's Economically Distressed Areas Program, (EDAP), TWDB Water and Sewer Loan Funds, the TWDB/EPA SRF program, USDA/Rural Development and the Texas Department of Housing and Community Affairs (CDBG Block Grants).

Included in this analysis are improvements recommended for the Townsite of Zapata, the Colonias, other subdivisions around the Townsite of Zapata and the community of Lopeno. Lopeno Community is included in the County's overall costs because Lopeno is not located within or near the service area of a wastewater collection and treatment provider and the County is in the position to obtain and provide financial assistance to this community for wastewater treatment.

7.2.2 Falcon Rural Water Supply Corporation

Proposed improvements to the Falcon Rural WSC water supply system consist of extending a 6-inch supply main south from Highway 83 to Cox Camp and the purchase of water rights to cover the demands for the planning period.

The water supply corporation could obtain funding from loans from the Texas Water Development Fund or a grant/loan from the USDA/Rural Development. It is not anticipated that this project would qualify for the EDAP financial assistance since the WSC would not be supplying Colonias within Zapata County.

7.2.3 San Ygnacio Municipal Utility District

Proposed improvements to the San Ygnacio MUD water supply system consist of extending a 4-inch supply main south along US Highway 83 to connect residents who have asked to be connected to the Ramireno WSC water supply system. Included in the costs are the water rights which will cover the projected demands.

The MUD could obtain funding from loans from the Texas Water Development Fund, or a grant/loan from the USDA/Rural Development. It is not anticipated that this project would qualify for the EDAP financial assistance since the MUD would not be supplying Colonias within Zapata County. However, it is anticipated that the WSC could obtain a 50 percent grant from the USDA/Rural Development. Consequently, the costs to the MUD are assumed to be 50 percent of the total cost of implementing the proposed improvements.

7.3 Effect of Projects on Water and Wastewater Rates

The average monthly water and sewer bills for the customers of the water and wastewater treatment providers will increase by the amounts shown in the following Table 7-7. Existing rate structures of each utility can be modified to specific rates when improvements are planned and engineered. These rates are based on making improvements which will provide service through a 20-year planning period.

Table 7-7

Projected Average Monthly Water and Wastewater Bills
 Zapata County Water and Wastewater Treatment Utilities
 Zapata County, Texas
 1995 - 2030

Utility	Average Monthly Utility Bill				
	Existing	Proposed Improvements		Total	
		1995	2010	1995	2010
Zapata County Waterworks	\$20.50	\$4.77	\$4.63	\$25.27	\$29.90
Falcon Rural WSC	\$27.00	\$5.40	\$16.00	\$32.40	\$48.40
San Ygnacio MUD	\$28.10	\$30.45	--	\$58.55	
Falcon Community	--	\$2.02	--	\$2.02	
Lopeno Community	--	\$2.04	--	\$2.04	

7.4 Sources of Funding

Sources of funding and financial assistance varies for each of the different utilities. The following sections outline the agencies which normally fund municipal and rural water and wastewater projects.

7.4.1 Zapata County Waterworks

Zapata County Waterworks is a utility owned and operated by a Public Subdivision of the State of Texas which may obtain funding from any available source. These sources include the following:

- a. Sale of Revenue Bonds - The County would finance 100 percent of the projects without any assistance from a State or Federal agency.
- b. Texas Water Development Board - Through the EDAP financial assistance, the County can obtain grants to provide water and wastewater service to Colonias. Grants for the portions of projects which provide service to subdivisions other than Colonias would be proportioned by amount of usage by the Colonias.
- c. USDA/Rural Development - The County can obtain grants and loans from the USDA/Rural Development for the planning and construction of water and wastewater treatment, water supply, storage, and wastewater collection facilities. Programs which the USDA/Rural Development and the EDAP have, include funding for house connections and onsite bathroom additions in Colonias.
- d. Texas Department of Housing and Community Affairs - The County may obtain grants from the TDH & CA for construction of the utilities as well as streets, signage and drainage improvements.

7.4.2 San Ygnacio MUD and Falcon Rural WSC

Funding sources for these two utilities are limited primarily to financing through the sale of bonds or to grants and loans from the USDA/Rural Development. No Colonias were identified within these utilities' service areas and, consequently, financial assistance through the TWDB's EDAP program may not be available.

CHAPTER 8 - ENVIRONMENTAL

8.1 Introduction

Zapata County is located in the Western Rio Grande Plain major land resource area as identified in the Starr, Jim Hogg and Webb Counties USDA Soils Surveys. No Soil Survey was published for Zapata County by the USDA. The land surface is nearly level to rolling. Elevations in the county range from 300 feet to about 560 feet above sea level. The average rainfall is 19.8 inches. The mean annual temperature is about 73 degrees. The growing season is about 300 days per year. Drainage in the county is by way of arroyos (streams) that generally run in a southwesterly direction to the Rio Grande River and Falcon Reservoir. Almost all of the population reside within three miles of the Rio Grande River and U.S. Hwy. 83. The water and wastewater projects proposed in this report will be located near the Rio Grande River, generally near the Townsite of Zapata.

8.2 Project Description

The purpose of this project is to provide a general plan for water and sanitary sewer service to the populated areas of Zapata County. Currently, only about 45 percent of the permanent residences of Zapata County are served by sanitary sewers. The remainder and most of the transient population rely on individual septic systems. Much of the area is subdivided into lots of 5000 square feet. The Texas Department of Health Standards state that residential lots utilizing individual subsurface septic systems should have a minimum surface area of 15,000 square feet.

Septic tank installations are more prone to failure in high density areas and areas of poor soils due to saturation in the drain fields; such are the conditions that prevail in Zapata County. Failure of the septic tank systems is a cause of public health hazards. Surfacing sewage presents an environment for spreading disease, can create odor problems and provide a medium for growth of mosquitos.

The proposed projects in this report generally will consist of new or expanded treatment plants, new collection and distribution lines and associated lift stations, pump stations and water storage facilities. The improvements associated with the water system will generally be on land that is already owned by the water districts or in the highway and road right-of-ways. The environmental effects of the proposed water improvements will be minimal.

The wastewater system improvements will have more of an effect on the environment. The discharge from the treatment plants will increase, and manholes and lift stations will have to be built in the floodplain. Currently, both wastewater treatment plants in Zapata County utilize some form of surface irrigation for disposal of the treated effluent. This practice is expected to continue in the future.

8.3 Geology and Soils

The proposed projects in this report will be located in portions of the county that have Zapata - Maverick and Copita- Zapata soils. As was discussed in Section 1.11 in Chapter 1 of this report, Zapata soils are generally shallow over strongly cemented caliche of the Claiborne group and are not suitable for septic systems. Even so, approximately 55% of the population of Zapata County rely on septic systems. Closely spaced septic systems can saturate the shallow soils resulting in septic effluent migrating along the top of the caliche layer to Falcon Reservoir. The Soils are listed below for information and reference.

8.3.1 Copita - Brennan

This association covers 14% of the County. It is made up of about 60% Copita and 30% Brennan soils. This association is mainly located in the eastern portions of the County. Copita soils have moderate permeability and bedrock at depths of 25 to 40 inches, Brennan soils have slight permeability.

8.3.2 Copita - Zapata

This association makes up 16% of the County. This association is located in the western central portion of the County. These soils are moderately permeable, but are not good for septic tanks. Zapata soils contain caliche at depths of 8 to 12 inches and Copita soils have bedrock at depths of 25 to 40 inches.

8.3.3 Delmita - Zapata

This association is found in 6% of the County. It is located in the eastern portion of the County. Delmita soils have indurated caliche at 20 to 40 inches and Zapata soils contain caliche at depths of 8 to 12 inches, which makes it a poor soil for septic tank use.

8.3.4 Nueces - Comitas

This association makes up 16% of the County. Nueces soils are not good for septic system use due to moderately slow permeability. This soil association is found in the central northwestern portion of the County. Comitas soils consist of loamy sands with very slight limitations for septic system use.

8.3.5 Zapata - Maverick

This association is found in 11% of the County. Zapata soils generally occur on ridges or on higher parts of the landscape. These are gently sloping, light brownish - gray soils that are very shallow over strongly cemented caliche. Maverick soils are moderately deep, undulating soils on uplands. Internal drainage is slow and permeability is slow. This soil association is located along the Rio-Grande from the north county line to the south, and is not suitable for septic systems.

8.3.6 Maverick - Catarina

This soil is found in 37% of the County. It consists of 55% - 70% Maverick and 20% - 40% Catarina soils. Catarina soils exhibit very slow permeability and are susceptible to flooding. Maverick soils have slow permeability and are not suitable for septic systems.

8.3.7 Environmental Problems associated with These Soils

The area around the Falcon Mesa subdivision includes several RV-parks and lodges. During the winter tourist season, from September to April, approximately 5000 people reside. There are no sanitary sewers in this area and the people rely exclusively on septic systems. The Townsite of Zapata's raw water intake structure is near these developments and high fecal coliform counts have been recorded. This area will require a completely new sewer system which will include several lift stations. This will greatly reduce the negative environmental impact of the septic systems.

Siesta Shores, Falcon Estates and the Black Bass subdivision will also need sewer service. These subdivisions are adjacent to Falcon Reservoir, thereby negatively affecting the water quality if the septic systems aren't functioning properly.

8.4 Ground Water

Due to a lack of aquifers and ground water in Zapata County, pollution of the ground water from the disposal of wastewater is not a major concern. Historically, ground water has not been a major source of water for the residents in Zapata County and records from certain water wells indicate the ground water is high in minerals and solids and is limited in quantity. Figures 5-1 and 5-2 show the location of the major and minor aquifers in Texas. As can be seen from these figures, the Gulf Coast Aquifer slightly crosses the eastern edge of Zapata County. There is very little existing population in this area, which would not produce enough wastewater to pollute the underground aquifer. The remainder

of the County has no major or minor aquifers. Groundwater is not available for municipal water supplies.

8.5 Surface Water

Municipal water suppliers in Zapata County withdraws 100 percent of their supply from the Rio Grande River and International Falcon Reservoir. Quality records and standards for the stream are contained in the Texas Water Commission's 31 TAC Chapter 307, Surface Water Quality Standards as Segment 2303, from Falcon Dam in Starr County to the confluence of the Arroyo Salado (Mexico) in Zapata County. The Texas Natural Resource Conservation Commission has published draft reports of the water quality of the Rio Grande at Falcon Reservoir and at locations downstream of the Falcon Reservoir Dam. The Segment Classification is "Water Quality Limited" because it is a public water supply reservoir and designated water uses are (1) Contact Recreation, (2) High Quality Aquatic Habitat and (3) Public Water Supply. A summary of the water chemistry for Segment 2303 is shown in Figure 8-1.

8.5.1 Wastewater Discharges in Zapata County

There is one domestic wastewater discharge point in Zapata County. Zapata County Waterworks is permitted to discharge 0.8 MGD into the Rio Grande River at the Townsite of Zapata. There are no industrial wastewater discharges or individual discharge points. The San Ygnacio wastewater treatment plant is permitted for surface irrigation of the treated effluent. Copies of the wastewater discharge permits for Zapata County Waterworks and San Ygnacio MUD are included in Appendix D.

RIO GRANDE BASIN		USES				CRITERIA						
SECTENT NUMBER	SECTENT NAME	RECREATION	AQUATIC LIFE	DOMESTIC WATER SUPPLY	OTHER	CHLORIDE (mg/L) Annual average not to exceed	SULFATE (mg/L) Annual average not to exceed	TOTAL DISSOLVED SOLIDS (mg/L) Annual average not to exceed	DISSOLVED OXYGEN (mg/L)	pH RANGE	FECAL COLIFORM (#/100 mL) Thirty-day geometric mean not to exceed	TEMPERATURE (°F) Not to exceed
2301	Rio Grande Tidal	CR	E						5.0	6.5-9.0	200	95
2302	Rio Grande Below Falcon Reservoir	CR	II	PS		270	350	880	5.0	6.5-9.0	200	90
2303	International Falcon Reservoir	CR	II	PS		140	300	700	5.0	6.5-9.0	200	93
2304	Rio Grande Below Amistad Reservoir	CR	II	PS		200	300	1,000	5.0	6.5-9.0	200	95
2305	International Amistad Reservoir	CR	H	PS		150	270	800	5.0	6.5-9.0	200	88
2306	Rio Grande Above Amistad Reservoir	CR	II	PS		300	570	1,550	5.0	6.5-9.0	200	93
2307	Rio Grande Below Riverside Diversion Dam	CR	II	PS		300	550	1,500	5.0	6.5-9.0	200	93
2308	Rio Grande Below International Dam	NCR	I			250	450	1,400	3.0	6.5-9.0	2,000	95
2309	Devils River	CR	E	PS		30	20	300	6.0	6.5-9.0	200	90
2310	Lower Pecos River	CR	II	PS		1,000	500	3,000	5.0	6.5-9.0	200	92
2311	Upper Pecos River	CR	II			7,000	3,500	15,000	5.0	6.5-9.0	200	92
2312	Red Bluff Reservoir	CR	II			6,000	3,500	15,000	5.0	6.5-9.0	200	90
2313	San Felipe Creek	CR	II	PS		25	30	500	5.0	6.5-9.0	200	90
2314	Rio Grande Above International Dam	CR	II	PS		340	600	1,800	5.0	6.5-9.0	200	92

* The dissolved oxygen criterion in the upper reach of Segment 2307 (Riverside Diversion Dam to the end of the rectified channel below Fort Quitman) shall be 3.0 mg/L when headwater flow over the Riverside Diversion Dam is less than 35 ft³/s.

FIGURE 8-1

Zapata County Waterworks is currently operating under the following waste discharge standards imposed by the Texas and EPA NPDES permit:

30-DAY AVG.

BOD5 (max.)	10 mg/l
T.S.S. (max.)	15 mg/l
Dissolved Oxygen (min.)	4 mg/l

When the treatment plant is expanded, it is expected that an additional discharge limitation of 3 mg/l ammonia will be added to the permit to control nitrification.

San Ygnacio MUD is currently operating under the following waste discharge standards:

30-DAY AVG.

BOD5 (max.)	100 mg/l
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8.6 Availability of Water Rights

It is beyond the scope of this study to determine at which point in the future availability of water rights will become critical for diversions from the Rio Grande River in Zapata County because (1) water rights may be bought, sold and transferred up and down the river, (2) all demands, existing and future, from Lake Amistad to the Gulf of Mexico would have to be analyzed and compared to the total available water rights in Texas, (2) free pumping of excess conservation storage is a factor in annual water availability and (4) the contractual sale, or lease, of water rights. The Rio Grande Watermaster states that at present there is not a shortage of water rights for sale, but no analyses have been made and no reports exist that may indicate when availability of water rights will be limited or nonexistent.

8.7 Floodplains and Wetlands

The floodplains and wetlands which may will be affected by the proposed projects are shown on maps located in the Map packet. If any of the future projects require fill in

wetlands areas or structures to be constructed in navigable waters, then a 404 permit from the U.S. Army Corps of Engineers will be required. Additional wetlands information can be obtained from the Texas Natural Resources Information System.

This report discusses general improvements to the water and wastewater service in the County. A detailed Environmental Impact Document will be required for projects outlined in this report during the planning and engineering phases.

8.8 Endangered Animal and Plant Species

Appendix H of this report is a listing of the endangered animal and plant species as inventoried by the U. S. Department of the Interior, Fish and Wildlife Service and the Texas Parks and Wildlife Department's Natural Heritage Program Data Base. Additional information on these endangered species may be obtained from the U. S. Department of the Interior and the Texas Parks and Wildlife Department and from the U.S. Fish and Wildlife Service. As part of each project's Environmental Impact Document or SEIS, a biologist can report on the presence of threatened and endangered species.

APPENDIX A

**SOUTH TEXAS DEVELOPMENT COUNCIL
AND
TEXAS WATER DEVELOPMENT BOARD**

**POPULATION PROJECTIONS
AND
PROJECTED WATER DEMANDS**

1994 CONSENSUS-BASED WATER PLANNING:

Forecasts of Municipal Water Demands Executive Overview

OVERVIEW

In Texas, the use of conservation plans and strategies by cities and water utilities is expected to occur for several reasons. Most importantly, conservation is increasingly recognized as the most cost-effective approach for meeting future water demands. Additionally, many conservation strategies are simply good management. Thus, these strategies are being used more and more by utilities. This brief summarizes how the TWDB, TNRCC, and TPWD estimated the potential range of water conservation savings expected over the next 50 years and presents new water demand forecasts, taking into account the estimated water conservation savings.

The 1990 state water plan's municipal demand projections assumed that municipal per capita water use would decline by a statewide average of 15 percentage. This assumption was based upon certain water conservation strategies already being pursued by some major utilities as well as expectations about increasing reliance upon conservation strategies by the municipal sector. However, revisions of the 1990 water demand forecasts are necessary for three basic reasons: First, the state's population growth forecasts have been revised. Secondly, the three agencies have acquired better data on water use characteristics and on the potential water savings attributable to a range of conservation strategies. Thirdly, potential water conservation savings vary from city to city, and this variation needed to be determined in order to develop more valid water demand forecasts. For the 1994 forecasts, individual and unique water conservation savings were estimated for each municipality with a population of 1000 or more, as well as for the State as a whole.

ESTIMATING MUNICIPAL DEMANDS

Municipal water demand represents all those uses pumped into a system for residential, commercial, public, and institutional uses. Municipal demands are forecasted by multiplying daily per capita water use times population and then annualizing this number. To reflect estimated water conservation savings, per capita water use is reduced. For water supply planning purposes, a "below average" rainfall year, or "dry year" is used as the base per capita use. Use of a "dry year" reflects additional urban irrigation demands resulting from below average rainfalls.

The statewide potential savings range from 32.7 gallons per capita per day to 44 gallons per capita per day, or 18% to 25% (using the base dry year of 1984, or 179 gallons per capita per day).

WATER CONSERVATION SCENARIOS

Three scenarios were examined to estimate the amount of water conservation savings expected to occur over the next 50 years. For each scenario, water conservation savings were estimated for four categories of water use. Table 1 lists each use and the savings, in either gallons per capita per day (gpcd) or as a percentage reduction, associated with that use. Table 2 describes the 3 conservation scenarios.

TABLE 1:

<u>General Categories of Municipal Water Use:</u>	<u>Potential Conservation Savings:</u>	
	<u>Most likely</u>	<u>Advanced:</u>
(a) Indoor water use (plumbing uses)	20.5 gpcd	21.7 gpcd
(b) Seasonal water use	7.0% of seasonal use	20% of average seasonal use
(c) Dry year urban irrigation use	10.5% of dry year use	20% of dry year use
(d) Other municipal uses	5.0% of average use	7.5% of average use

TABLE 2:

Conservation scenarios:

- Scenario 1:** **Base savings:** Only savings associated with the 1991 plumbing fixtures bill was estimated. This ranges from 20.5 to 21.7 gallons per capita per day.
- Scenario 2:** **Most likely savings:** What is expected to occur: Savings attributable to the 1991 plumbing fixtures bill plus some additional savings based upon the estimated cost-effectiveness of additional conservation measures.
- Scenario 3:** **Advanced water conservation:** The maximum "technical potential" for water conservation savings without restricting uses to minimum drinking water and sanitation needs. That is, commercial, public, and some urban irrigation uses are still occurring even with the implementation of advanced conservation measures.

The water savings attributable to the 1991 plumbing fixtures is absolute: it ranges from 20.5 gpcd to 21.7 gpcd. However, water conservation savings in gallons for seasonal use, dry year urban irrigation use, and other uses depend upon the specific per capita water use characteristics of a region or individual city. For example, City A's average per capita use may be 180 gpcd and City B's average use may be 150 gpcd. For City A, the advanced, or maximum, conservation savings realized by reducing "other" municipal uses, such as commercial uses, would be 7.5% of average use--for City A, 13.5 gpcd. However, City B's advanced conservation savings, while also 7.5% of average use, is 11.25 gpcd.

The difference between the most likely and advanced scenarios is critical. In many cases, it may not be feasible for a utility to pursue advanced conservation strategies because these may be cost-prohibitive, unnecessary because of adequate supplies, or for other reasons.

ESTIMATED CONSERVATION SAVINGS

For the 1994 forecasts, individual and unique water conservation savings were estimated for each municipality with a population of 1000 or more, as well as for the State as a whole. Table 3 summarizes the water conservation savings for the State as a whole, using the 1984 as the dry, or base, year. The 1984 State per capita use was 179 gpcd. Again, this is the number used for water supply and drought planning purposes. Average, or "normal" per capita water use for the State was calculated as the average for the 1987-1991 timeframe and is 170 gpcp. Seasonal use is estimated to be 22.5% of average year use, i.e., 38.25 gpcd. Dry year use is 9 gallons per capita per day--the difference between 179 and 170. So, for example, in the "most likely" scenario, seasonal use of 38.25 is reduced by 7%--i.e., 2.7 gpcd. For each utility, a similar analysis was performed to allow for regional and local variations in water use characteristics.

TABLE 3: Statewide estimation of water conservation savings

<u>Categories of Municipal Water Use:</u>	<u>Potential Conservation Savings:</u>	
	<u>Most likely</u>	<u>Advanced:</u>
(a) Indoor water use (plumbing uses)	20.5 gpcd	21.7 gpcd
(b) Seasonal water use	2.7 gpcd	7.7 gpcd
(c) Dry year urban irrigation use	1.0 gpcd	1.8 gpcd
(d) Other municipal uses	8.5 gpcd	12.8 gpcd
TOTAL SAVINGS:	32.7 gpcd	44.0 gpcd
	18% savings	25% savings

using 179 gpcd as the base

THE TRANSITION FROM PLANNING TO MANAGEMENT

The 1994 TWDB, TNRCC and TPWD water conservation savings and water demand estimates are provided as guides for regional and local water planners and managers. Utility specific conservation savings for both the most likely and advanced scenarios have also been estimated and are available to guide regional and local planners and managers in the selection of specific water conservation goals and conservation strategies.

The selection of specific water conservation goals and strategies to achieve those goals must be based upon the unique water use characteristics of that utility and the cost-effectiveness of conservation measures. Both the TWDB and the TNRCC are expected to continue to require conservation plans in their programs. These plans specifically identify the conservation measures to be implemented by the water managers. While both agencies have set minimum requirements for water conservation plans, the selection of most conservation strategies is left to the discretion of the regional and local water managers. This allows these managers to select those conservation measures which are best suited for a given utility or region in order to achieve specific conservation goals.

TABLE 1

General Categories
of Municipal Water Use

Potential Conservation Savings

	<u>Most likely</u>	<u>Advanced:</u>
(a) Indoor water use (plumbing uses)	20.5 gpcd	21.7 gpcd
(b) Seasonal water use	7.0% of seasonal use	20% of seasonal use
(c) Dry year urban irrigation use	10.5% of dry year use	20% of dry year use
(d) Other municipal uses	5.0% of average use	7.5% of average use

TABLE 3
EXAMPLE ESTIMATION OF WATER CONSERVATION SAVINGS

<u>Categories of Municipal Water Use</u>	<u>Potential Conservation Savings:</u>	
	<u>Most likely</u>	<u>Advanced:</u>
(a) Indoor water use (plumbing uses)	20.5 gpcd	21.7 gpcd
(b) Seasonal water use	2.7 gpcd	7.7 gpcd
(c) Dry year urban irrigation use	1.0 gpcd	1.8 gpcd
(d) Other municipal uses	8.5 gpcd	12.8 gpcd
TOTAL SAVINGS:	32.7 gpcd	44.0 gpcd
	18% savings	25% savings
	<i>using 179 gpcd as typical base use</i>	

TABLE 2
CONSERVATION SCENARIOS

- Scenario 1: **Base savings:** Only savings associated with the 1991 plumbing fixtures bill was estimated. This ranges from 20.5 to 21.7 gallons per capita per day.
- Scenario 2: **Most likely savings:** What is expected to occur: Savings attributable to the 1991 plumbing fixtures bill plus some additional savings based upon the estimated cost-effectiveness of additional conservation measures.
- Scenario 3: **Advanced water conservation:** The maximum "technical potential" for water conservation savings without restricting uses to minimum drinking water and sanitation needs. That is, commercial, public, and some urban irrigation uses are still occurring even with the implementation of advanced conservation measures.

BREFING PAPER ON POPULATION PROJECTIONS
FOR THE CONSENSUS WATER PLAN
SUBMITTED TO THE DEMAND/DROUGHT TECHNICAL
ADVISORY COMMITTEE

L OVERVIEW:

Currently, Texas ranks as the third most populous state in the nation with a population estimate of approximately 18.0 million people. Most anlyast are anticipating that Texas will surpass the State of New York as the second most populous state by as early as 1995.

From 1950 to 1990, the state's population increased by 9.3 million people resulting in a more than doubling of the state's population over this 40 year period (7.7 million in 1950 and 16.9 million in 1990). The growth trend over this period reflects a cycle of a decade of accelerated growth followed by a decade of slow to moderate growth as shown below:

1950-1960 - 24.2% increase
1960-1970 - 16.9% increase
1970-1980 - 27.1% increase
1980-1990 - 19.4% increase

The accelerated growth in population during the decade of the 1970s was fueled by the large increase of people moving to Texas from other locales (migration) as a result of a booming state economy. As the economy slowed during the 1983-1988 period, net migration declined to the point that the state experienced net out-migration during several years in the late 1980s. Whereas the population growth of the 1970s can be attributed to high levels of net migration into the state, population growth during the 1980s can be attributed more to the natural increase in the state's population.

The latest estimates of Texas population (1990-1992) indicate that the state is experiencing substantial levels of growth above that of the latter years of the 1980s. A comparsion of annual population growth over these years is presented below:

Year	Increase
1985-1986	312,000
1986-1987	102,886
1987-1988	55,995
1988-1989	143,008
1990-1991	361,854
1991-1992	307,286
1992-1993	378,350

The following sections of this briefing paper will address the data sources, assumptions, and procedures for developing the population projections

II DATA SOURCES:

Information from the State Data Center, Dr. Steve Murdock, Ph.D., Chief Demographer was used in the development of the population projections for the 1996 State Water Plan.

- 1) The 1990 population by cohort (age, sex, and race/ethnic groups) modified for age and race/ethnicity,
- 2) The 1990 institutional populations (prison populations, college populations, military populations, and other populations in institutional arrangements) by cohort,
- 3) Fertility rates for women by age (10-49) and race/ethnic groups,
- 4) Survival rates by single years of age by sex and race/ethnic groups, and
- 5) Migration rates by single year estimates.

III ASSUMPTIONS:

- 1) Fertility rates will decline over time from previous levels such that: Anglo fertility rates are trended downward through the year 2010 and held constant at 2010 rates through the year 2050; Black fertility rates are trended downward through the year 2030 and held constant at the 2030 rate through the year 2050; Hispanic fertility rates are trended downward through the year 2030 and held constant at the 2030 rate through the year 2050, and the Other population fertility rates are trended downward through the year 2030 and held constant at the 2030 rate through the year 2050.
- 2) State survival rates are assumed to follow national trends over the projection period.
- 3) Future net migration is set to the 1980-1990 base period rates and are varied from this base data set reflective of the approved scenarios.

III PROJECTION PROCEDURES:

Fertility rates, survival rates, migration rates, and institutional populations were developed by Dr. Steve Murdock and provided to Board staff for use in developing population projections for the 1996 State Water Plan. Given the projected rates, the computations of future populations were completed using a cohort-component technique. This technique provided computations on an individual year and age basis by sex and race/ethnic group.

The cohorts used in the projection analyses are defined as single-year-of-age cohorts by sex and race/ethnic groups (Anglo, Black, Hispanic, and Other). Anglos are defined as White Non-Spanish-origin persons; Blacks are defined as Black Non-Spanish-origin persons; Hispanics are defined as Spanish-origin of all racial and ethnic groups; and Others are defined as persons of other race/ethnic groups not of Spanish origin. All cohorts are of single age/years (0 to 75+) for both sexes for each of the racial/ethnic groups

Institutional populations are populations that are assumed not to participate in the same demographic processes as the base population and generally tend to move in and out these institutional arrangements in fixed intervals. Consequently, these populations are removed from the base population for computing future cohort populations and are then added back to the projected base population to obtain the projected total population. These populations are defined as college populations, prison populations, military populations, and other institutional populations.

As previously mention, the technique for projecting population is a cohort-component technique which uses the separate cohorts and components of cohort change (fertility, mortality, and migration) to calculate future populations. The projections of each cohort are then summed to the total population. The following equation defines the accounting process for the projections:

$$P_{t2} = P_{t1} + B_{t1-t2} - D_{t1-t2} + M_{t1-t2}$$

Where: P_{t2} = The projected population for time period $t2$.

P_{t1} = The population at base year $t1$.

B_{t1-t2} = The calculated number of births during the time interval $t1-t2$.

D_{t1-t2} = The calculated number of deaths during the time interval $t1-t2$.

M_{t1-t2} = The amount of net migration occurring during the time interval $t1-t2$.

Scenarios:

Three scenarios based on varying the 1980-1990 migration rates were used to project future populations. From this range of projections, staff from the three agencies (TWDB, TNRCC, and TPWD) along with the State Demographer are currently selecting the most likely growth patterns for each of the 254 counties for the purpose of recommending a most likely set of population projections.

- I. Scenario I: Zero net migration over the projection period.
Only the natural increase in population is assumed.
- II. Scenario II: One-half of the 1980-1990 net migration was assumed
over the projection period.
- III. Scenario III: The 1980-1990 net migration was assumed
over the projection period.

BRIEFING PAPER ON MANUFACTURING WATER REQUIREMENTS
PROJECTIONS FOR
THE CONSENSUS WATER PLAN DEMAND/DROUGHT COMMITTEE

I. OVERVIEW

The Texas manufacturing sector consist of more than 20 thousand production facilities which produce goods for both national and international markets. Manufactured products range from food and clothing to refined petroleum products and computers. The importance of water, in terms of amounts required to manufacture products, varies widely among the many manufacturing industries in Texas. Some processes require direct consumption as part of the products other require very little consumption but may use large volumes for cooling or cleaning purposes. Historically, five industries have accounted for about 90 percent of the State's manufacturing water use. These industries are Food and Kindred Products, Pulp and Paper Products, Chemicals, Petroleum Refining, and Primary Metals.

With respect to geographical location of major manufacturing water use areas, ten counties currently account for about 75 percent of the State's manufacturing water use. These counties are Harris, Brazoria, Harrison, Nueces, Morris, Cass, Jefferson, Jasper, Tarrant, and Galveston.

Because of the importance of the State's manufacturing sector in terms of employment and income to many regional economies, analyses of future use and availability of water for these industries are important in order to insure the continued economic vitality of many regional economies. The following sections of this briefing paper will address data sources, assumptions, and anticipated levels of industrial water use efficiencies which were used and incorporated in the Board's manufacturing water requirement projections.

II. DATA SOURCES

The following data sources were used in the development of the manufacturing water requirement projections for the 1996 State Water Plan:

- 1) The Texas Water Development Board's annual manufacturing water use by county data base.
 - 2) The Texas Employment Commission's Reported Employment and Earning data tapes by firm and county.
 - 3) The U.S. Bureau of Economics Analysis' projections of regional (MSA) employment and earnings (1988-2040).
 - 4) Texas Economic Forecast's projections of state manufacturing output by 2-digit SIC (1980-2020).
- * The Board's manufacturing water use data base provided the necessary industry water use information for each county. This data base is comprised of manufacturing firm's reported annual water use by geographical location (county).
 - * Regional projections of employment and earnings, defined as labor and proprietor's income, prepared by the U.S. Bureau of Economic Analysis for all Metropolitan Statistical Areas (MSA) and for the State provided the necessary information for regional distribution of the State's manufacturing output. This projection series is for the period 1988-2040.
 - * Projections of State manufacturing output by 2-digit Standard Industrial Classification (SIC) prepared by Texas Economic Forecast (Perryman Consultants) provided the necessary information on projected State manufacturing output for distribution to the regional levels (MSAs and NONMSA). These projections were based on three scenarios regarding oil prices: 1) Low Oil Prices; 2) High Oil Prices; and 3) Baseline forecast.
 - * The earnings and employment data by SIC and county prepared by the Texas Employment Commission was used to distribute the regional 2-digit manufacturing output to the county level 2-digit industry for those counties within each MSA.

III. ASSUMPTIONS

The series of manufacturing water requirement projections are based on specific assumptions regarding growth and water requirements. These assumptions are presented below:

- 1) Industry growth (positive or negative) is reflective of future expansion of existing capacity within the industry and future new firm locations within a specific locale.

BRIEFING PAPER ON IRRIGATION WATER USE PROJECTIONS

I OVERVIEW

Irrigated agriculture is the largest consumer of water in Texas. In 1990, irrigation consumed approximately 10 million acre-feet, and accounted for almost 65% of total water demanded in the state. However, while municipal and industrial water demands have steadily increased, irrigation water demand has decreased. From 1980 to 1990, irrigation water demand has declined 20%. The Texas Water Development Board (TWDB) believes this trend will continue through the projection period, 1990-2050. Contributing factors to decreased irrigation water demand include: dwindling agricultural subsidies; increasing groundwater pumping costs due to declining ground water tables; increasing competition for water from municipal, industrial, and environmental uses; and weakening farming profitability.

The TWDB staff, with technical assistance from Bruce McCarl Ph.D. of Texas A&M University, developed a linear programming model that would evaluate the many factors affecting irrigation water demand. The model allocates agricultural acreage to competing crops based on profitability and resource restrictions, such as agricultural land limitations, water availability, and historical cropping patterns.

II SCENARIOS

The Technical Advisory Committee initially approved five scenarios to encompass a range of parameters affecting irrigated agriculture. The TWDB, TNRCC, and TDPW, with approval from the Technical Advisory Committee, chose scenarios II, III, and IV as scenarios containing the most realistic assumptions. Only scenarios II, III, and IV have been provided in the irrigation water demand projections. They are labeled Series I, II, III respectively on the data sheets.

Scenario I

- assumes crop yields, crop prices, and production costs are constant over time. This assumption implies that the relative profitability of different crops does not change over time.
- assumes deficiency payments for crops in the federal farm program are cut in half.
- assumes aggressive adoption of advanced irrigation technology in the first decade, 1990-2000. It also assumes more irrigated acres are converted to more water efficient irrigation systems.

Scenario II

- assumes crop yields, crop prices, and production costs increase over time. This assumption does not necessarily imply that crops become more profitable over time. Rather, a crop's profitability will be determined by the relative change in crop yields, crop price and production costs.
- assumes deficiency payments for crops in the federal farm program are cut in half.
- assumes aggressive adoption of advanced irrigation technology in the first decade. It also assumes more irrigated acres are converted to more water efficient irrigation systems.

Scenario III

- assumes crop yields, crop prices, and production costs increase over time.
- assumes deficiency payments for crops in the federal farm program are cut in half.
- assumes moderate adoption of advanced irrigation technology over the first two decades rather than in the first decade. It also assumes less irrigated acres are converted to more efficient irrigation systems than under scenario I and II.

Scenario IV

- assumes crop yields, crop prices, and production costs increase over time.
- assumes deficiency payments for crops in the federal farm program are cut in half.
- assumes no additional adoption of advanced irrigation technology than is currently in place.

Scenario V

- assumes crop yields, crop prices, and production costs increase over time.
- assumes deficiency payments for crops in the federal farm program are cut in half.
- assumes moderate adoption of advanced irrigation technology.
- assumes irrigated crop water requirements increase in drought conditions.

DATA SOURCES

The following data sources were used to develop the forecast parameters in the model.

1. The Texas A&M Crop Enterprise Budgets, Texas A&M University.

These budgets furnished crop yields, prices, production costs, and irrigation water requirements.

2. Irrigation Specialist from Texas A&M and the Texas Water Development Board.

These specialist provided irrigation capital, energy, labor, and repairs costs for furrow, surge, side-roll, center pivot and LEPA irrigation systems in the model. They also provided information on irrigation technology adoption rates.

3. Texas Agricultural Statistics Service, Texas County Statistics.

This database provided historical irrigated and non-irrigated crop acres and cropping patterns.

4. Food and Agricultural Policy Research Institute (FAPRI), 1993 U.S. Agricultural Outlook.

FAPRI provided forecasted agricultural prices, yields, and production costs.

5. Texas Water Development Board, Survey of Irrigation in Texas from 1958-1989.

This source provided historical ground and surface water availability.

**DEFINITIONS FOR POPULATION
AND MUNICIPAL WATER USE PROJECTIONS**

MIGRATION RATE .0: Assumes no net migration over the projection period for the county.

MIGRATION RATE .5: Assumes 50% of the net migration (positive or negative) over the period 1980-1990 for the county.

MIGRATION RATE 1.0: Assumes 100% of the net migration (positive or negative) over the period 1980-1990 for the county.

MOST LIKELY SERIES: The population growth pattern for the county selected from the three migration scenarios by staff of TWDB, TNRCC, and Parks and Wildlife as the most likely to occur.

AVERAGE RAINFALL: The average annual per capita water use associated with average rainfall conditions over the period 1987-1991 and no additional implementation of water conservation practices and programs.

BELOW AVERAGE RAINFALL: The highest annual per capita water use associated with below average rainfall conditions (dry) over the period 1982-1991 constrained not to exceed more than 25% above the average annual per capita use associated with average rainfall conditions over the period 1987-1991 and no additional implementation of water conservation practices and programs.

AVERAGE/CONSERVATION: Average rainfall condition per capita water use with the most likely conservation scenario which includes the plumbing code legislation impact along with other potential water savings from other conservation practices such as xeriscape, outside watering efficiencies, leak detection, etc..

BELOW AVERAGE/CONS: Below average rainfall condition per capita water use with the most likely conservation scenario which includes the plumbing code legislation impact along with other potential water savings from other conservation practices such as xeriscape, outside watering efficiencies, leak detection, etc..

AVERAGE/ADVANCED CONS: Average rainfall condition per capita water use with potential water savings associated with accelerated implementation of conservation practices and programs.

BELOW AVERAGE/ADVANCED: Below average rainfall condition per capita water use with potential water savings associated with accelerated implementation of conservation practices and programs.

PLUMBING CODE ONLY:

AVERAGE/CONSERVATION: Average rainfall condition per capita water use with potential water savings over the projection period associated with the implementation of the plumbing code legislation without additional potential water savings from other conservation practices and programs.

BELOW AVERAGE/CONS: Below average rainfall condition per capita water use with potential water savings over the projection period associated with the implementation of the plumbing code legislation without additional potential water savings from other conservation practices and programs.

AVERAGE/ADVANCED: Average rainfall condition per capita water use with potential water savings over the projection period associated with accelerated implementation of the plumbing code legislation without additional potential water savings from other conservation practices and programs.

BELOW AVERAGE/ADVANCED: Below average rainfall condition per capita water use with potential water savings over the projection period associated with accelerated implementation of the plumbing code legislation without additional potential water savings from other conservation practices and programs.

2) Historical interactions of oil price changes and industry activity is assumed over the projection period.

3) The specific levels of industrial water use efficiencies, recently prepared under contract for the Board by a nationally-known industrial water conservation consultant, will be attained within the next 20 years. These industry water use efficiencies expressed as a percentage reduction in an industry's water use per unit of output are presented below:

- * Food and Kindred Products (SIC 20): 10% reduction by the year 2000 and 20% reduction by the year 2010.
- * Chemicals (SIC 28): 10% reduction by the year 2000 and a 17% reduction by the year 2010.
- * Pulp and Paper (SIC 26): 20 % reduction by the year 2000 and a 30% reduction by the year 2010.
- * Petroleum Refining (SIC 29): 10% reduction by the year 2000 and a 17% reduction by the year 2010.
- * Electrical Machinery (SIC 36): 20% reduction by the year 2000 and a 40% reduction by the year 2010.

V. SCENARIOS

Four series of projections of manufacturing water requirements were developed for four scenarios approved by the Technical Advisory Committee. These four scenarios are presented below:

- * Low Oil Price Scenario: Oil prices would remain stable in the \$13-\$17 per barrel range for West Texas Intermediate Crude.
- * Baseline Scenario: Oil prices would remain stable in the \$17-\$23 per barrel range for West Texas Intermediate Crude.
- * High Oil Prices Scenario: Oil prices would remain stable in the mid to high \$20s for West Texas Immediate Crude. A scenario of this nature would permit a more robust recovery of the oil industry, but does not lend itself to a sustained surge in oil field activity as experienced in the early 1980s with oil prices in the \$30-\$35 range.
- * No Growth Scenario: There will be no expansion in any industry above current capacity and no new firm location in Texas over the projection period.

PROJECTIONS OF POPULATION AND MUNICIPAL WATER USE
 WATER USE UNITS: ACRE-FEET PER YEAR
 *** DRAFT -- SUBJECT TO REVISION ***

COUNTY: 253 ZAPATA
 SOUTH TEXAS DEVELOPMENT COUNCIL

SERIES	HISTORICAL		PROJECTED					
	1980	1990	2000	2010	2020	2030	2040	2050
Population	6628	9279						
Municipal	1282	1852						
* MIGRATION RATE .0								
Population.....								
Average Rainfall			10373	11596	12731	13496	14214	14836
Below Average Rainfall			2324	2601	2857	3027	3187	3326
			2908	3254	3575	3786	3986	4161
Average/Conservation								
Below Average/Cons			2222	2359	2462	2561	2644	2761
Average/Advanced Cons			2782	2960	3108	3245	3365	3499
Below Average/Advanced			2143	2201	2261	2365	2470	2562
			2689	2765	2824	2973	3100	3219
(With Plumbing Code Only)								
Average/Conservation								
Below Average/Cons			2269	2474	2660	2767	2864	2973
Average/Advanced Cons			2852	3127	3377	3527	3664	3808
Below Average/Advanced			2234	2419	2601	2736	2849	2957
			2817	3072	3317	3496	3648	3791
* MIGRATION RATE .5								
Population.....								
Average Rainfall			11606	14632	18070	21581	25985	29546
Below Average Rainfall			2601	3282	4056	4840	5824	6623
			3254	4106	5073	6055	7286	8285
Average/Conservation								
Below Average/Cons			2476	2944	3475	4071	4841	5471
Average/Advanced Cons			3103	3719	4375	5165	6158	6968
Below Average/Advanced			2398	2763	3192	3761	4497	5107
			2999	3476	4007	4739	5668	6418
(With Plumbing Code Only)								
Average/Conservation								
Below Average/Cons			2528	3091	3735	4385	5214	5928
Average/Advanced Cons			3181	3916	4753	5600	6676	7591
Below Average/Advanced			2499	3001	3691	4357	5214	5895
			3153	3863	4709	5572	6676	7557
* MIGRATION RATE 1.0								
Population.....								
Average Rainfall			13328	18900	26399	35353	48159	66036
Below Average Rainfall			2987	4235	5925	7929	10795	14803
			3737	5304	7412	9919	13505	18518
Average/Conservation								
Below Average/Cons			2829	3782	5018	6630	8917	12228
Average/Advanced Cons			3560	4761	6358	8421	11358	15574
Below Average/Advanced			2739	3549	4634	6154	8335	11414
			3431	4468	5831	7756	10504	14344
(With Plumbing Code Only)								
Average/Conservation								
Below Average/Cons			2900	3968	5427	7144	9662	13249
Average/Advanced Cons			3650	5032	6914	9135	12372	16965
Below Average/Advanced			2855	3904	5362	7137	9662	13175
			3605	4969	6850	9127	12372	16890
* MOST LIKELY SERIES								
Population.....								
Average Rainfall			13328	18900	26399	35353	48159	66036
Below Average Rainfall			2987	4239	5925	7929	10795	14803
			3737	5304	7412	9919	13505	18518
Average/Conservation								
Below Average/Cons			2829	3782	5018	6630	8917	12228
Average/Advanced Cons			3560	4761	6358	8421	11358	15574
Below Average/Advanced			2739	3549	4634	6154	8335	11414
			3431	4468	5831	7756	10504	14344
(With Plumbing Code Only)								
Average/Conservation								
Below Average/Cons			2900	3968	5427	7144	9662	13249
Average/Advanced Cons			3650	5032	6914	9135	12372	16965
Below Average/Advanced			2855	3904	5362	7137	9662	13175
			3605	4969	6850	9127	12372	16890

PROJECTIONS OF POPULATION AND MUNICIPAL WATER USE
WATER USE UNITS: ACRE-FEET PER YEAR
*** DRAFT -- SUBJECT TO REVISION ***

COG : 19 SOUTH TEXAS DEVELOPMENT COUNCIL
COUNTY: 253 ZAPATA
CITY : 757 COUNTY-OTHER

SERIES	----- HISTORICAL -----		----- PROJECTED -----					
	1980	1990	2000	2010	2020	2030	2040	2050
Population	2822	2160						
Water Use	331	487						
* MIGRATION RATE .0								
Population.....			2029	2128	2251	2505	2733	2852
Average Rainfall			427	448	474	528	576	601
Below Average Rainfall			534	560	593	659	719	751
Average/Conservation			409	408	408	443	471	492
Below Average/Cons			511	510	514	561	600	626
Average/Advanced Cons			395	377	371	407	438	454
Below Average/Advanced			493	474	464	511	554	575
(With Plumbing Code Only)								
Average/Conservation			418	427	441	477	511	530
Below Average/Cons			525	539	560	609	655	680
Average/Advanced Cons			411	415	429	471	508	527
Below Average/Advanced			518	527	547	603	652	677
* MIGRATION RATE .5								
Population.....			2270	2685	3194	4006	4997	5681
Average Rainfall			478	565	673	844	1052	1196
Below Average Rainfall			598	707	841	1055	1315	1495
Average/Conservation			458	508	576	705	868	980
Below Average/Cons			572	641	726	893	1103	1247
Average/Advanced Cons			442	475	526	651	806	910
Below Average/Advanced			552	599	658	821	1013	1152
(With Plumbing Code Only)								
Average/Conservation			468	535	619	763	935	1063
Below Average/Cons			587	677	787	974	1198	1362
Average/Advanced Cons			460	523	608	754	935	1056
Below Average/Advanced			580	665	776	965	1198	1355
* MIGRATION RATE 1.0								
Population.....			2606	3468	4667	6562	9260	12697
Average Rainfall			549	730	983	1382	1950	2674
Below Average Rainfall			686	913	1229	1727	2438	3342
Average/Conservation			523	653	831	1147	1597	2190
Below Average/Cons			654	820	1051	1455	2033	2788
Average/Advanced Cons			505	610	763	1058	1494	2034
Below Average/Advanced			633	769	962	1338	1877	2574
(With Plumbing Code Only)								
Average/Conservation			534	684	899	1242	1732	2375
Below Average/Cons			671	866	1145	1588	2220	3044
Average/Advanced Cons			525	672	883	1235	1732	2361
Below Average/Advanced			663	855	1129	1580	2220	3029
* MOST LIKELY SERIES								
Population.....			2606	3468	4667	6562	9260	12697
Average Rainfall			549	730	983	1382	1950	2674
Below Average Rainfall			686	913	1229	1727	2438	3342
Average/Conservation			523	653	831	1147	1597	2190
Below Average/Cons			654	820	1051	1455	2033	2788
Average/Advanced Cons			505	610	763	1058	1494	2034
Below Average/Advanced			633	769	962	1338	1877	2574
(With Plumbing Code Only)								
Average/Conservation			534	684	899	1242	1732	2375
Below Average/Cons			671	866	1145	1588	2220	3044
Average/Advanced Cons			525	672	883	1235	1732	2361
Below Average/Advanced			663	855	1129	1580	2220	3029

PROJECTIONS OF POPULATION AND MUNICIPAL WATER USE
 WATER USE UNITS: ACRE-FEET PER YEAR
 *** DRAFT -- SUBJECT TO REVISION ***

COG : 19 SOUTH TEXAS DEVELOPMENT COUNCIL
 COUNTY: 253 ZAPATA
 CITY : 672 ZAPATA

SERIES	----- HISTORICAL -----		----- PROJECTED -----					
	1980	1990	2000	2010	2020	2030	2040	2050
Population	3806	7119						
Water Use	951	1365						
* MIGRATION RATE .0								
Population.....			8344	9468	10480	10991	11481	11984
Average Rainfall			1897	2153	2383	2499	2611	2725
Below Average Rainfall			2374	2694	2982	3127	3267	3410
Average/Conservation			1813	1951	2054	2118	2173	2269
Below Average/Cons			2271	2450	2594	2684	2765	2873
Average/Advanced Cons			1748	1824	1890	1958	2032	2108
Below Average/Advanced			2196	2291	2360	2462	2546	2644
(With Plumbing Code Only)								
Average/Conservation			1851	2047	2219	2290	2353	2443
Below Average/Cons			2327	2588	2817	2918	3009	3128
Average/Advanced Cons			1823	2004	2172	2265	2341	2430
Below Average/Advanced			2299	2545	2770	2893	2996	3114
* MIGRATION RATE .5								
Population.....			9336	11947	14876	17575	20988	23865
Average Rainfall			2123	2717	3383	3996	4772	5427
Below Average Rainfall			2656	3399	4232	5000	5971	6790
Average/Conservation			2018	2436	2899	3366	3973	4491
Below Average/Cons			2531	3078	3649	4272	5055	5721
Average/Advanced Cons			1956	2288	2666	3110	3691	4197
Below Average/Advanced			2447	2877	3349	3918	4655	5266
(With Plumbing Code Only)								
Average/Conservation			2060	2556	3116	3622	4279	4865
Below Average/Cons			2594	3239	3966	4626	5478	6229
Average/Advanced Cons			2039	2516	3083	3603	4279	4839
Below Average/Advanced			2573	3198	3933	4607	5478	6202
* MIGRATION RATE 1.0								
Population.....			10722	15432	21732	28791	38899	53339
Average Rainfall			2438	3509	4942	6547	8845	12129
Below Average Rainfall			3051	4391	6183	8192	11067	15176
Average/Conservation			2306	3129	4187	5483	7320	10038
Below Average/Cons			2906	3941	5307	6966	9325	12786
Average/Advanced Cons			2234	2939	3871	5096	6841	9380
Below Average/Advanced			2798	3699	4869	6418	8627	11770
(With Plumbing Code Only)								
Average/Conservation			2366	3284	4528	5902	7930	10874
Below Average/Cons			2979	4166	5769	7547	10152	13921
Average/Advanced Cons			2330	3232	4479	5902	7930	10814
Below Average/Advanced			2942	4114	5721	7547	10152	13861
* MOST LIKELY SERIES								
Population.....			10722	15432	21732	28791	38899	53339
Average Rainfall			2438	3509	4942	6547	8845	12129
Below Average Rainfall			3051	4391	6183	8192	11067	15176
Average/Conservation			2306	3129	4187	5483	7320	10038
Below Average/Cons			2906	3941	5307	6966	9325	12786
Average/Advanced Cons			2234	2939	3871	5096	6841	9380
Below Average/Advanced			2798	3699	4869	6418	8627	11770
(With Plumbing Code Only)								
Average/Conservation			2366	3284	4528	5902	7930	10874
Below Average/Cons			2979	4166	5769	7547	10152	13921
Average/Advanced Cons			2330	3232	4479	5902	7930	10814
Below Average/Advanced			2942	4114	5721	7547	10152	13861

TEXAS WATER DEVELOPMENT BOARD
 PLANNING DIVISION

PROJECTIONS OF IRRIGATION WATER USE
 WATER USE UNITS: ACRE-FEET PER YEAR

*** DRAFT -- SUBJECT TO REVISION ***

COG: 19 SOUTH TEXAS DEVELOPMENT COUNCIL

SERIES #	----- HISTORICAL -----			----- PROJECTED -----					
	1980	1985	1990	2000	2010	2020	2030	2040	2050
COUNTY: 124 JIM HOGG									
Series 1	0	500	150	146	141	137	133	129	125
Series 2				145	140	135	130	125	121
Series 3				147	143	140	137	134	131
COUNTY: 214 STARR									
Series 1	30855	22818	48152	42158	40970	39815	38693	37603	36544
Series 2				41934	40536	39185	37879	36617	35396
Series 3				41899	40469	39087	37753	36464	35219
COUNTY: 240 WEBB									
Series 1	18150	5500	5980	5803	5631	5465	5303	5146	4994
Series 2				5771	5568	5373	5185	5004	4828
Series 3				5689	5411	5148	4897	4658	4431
COUNTY: 253 ZAPATA									
Series 1	4840	4400	2229	2163	2099	2036	1976	1917	1861
Series 2				2151	2075	2002	1932	1864	1799
Series 3				2136	2047	1961	1880	1801	1726

APPENDIX B

WATER CONSERVATION

&

EMERGENCY DEMAND MANAGEMENT PLAN

**WATER CONSERVATION AND
EMERGENCY DEMAND MANAGEMENT PLAN**

**ZAPATA COUNTY/ZAPATA COUNTY WATERWORKS
ZAPATA, TEXAS**

October 1994
(Revised February 1995)
(Revised May 1996)

Prepared by:

POST, BUCKLEY, SCHUH & JERNIGAN, INC.
5999 Summerside Drive
Suite 202
Dallas, Texas 75252

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I. INTRODUCTION

These Water Conservation and a Emergency Demand Management Plans are prepared as a part of a Regional Water and Wastewater Study performed for Zapata County in conjunction with a Regional Study grant from the Texas Water Development Board. The origin of the requirements for a Water Conservation Plan and a Emergency Demand Management Plan is action taken by the 69th Texas Legislature in 1985. The conservation requirements were established by House Bill (HB) 2 and House Joint Resolution (HJR) 6. On November 5, 1985, Texas voters approved an amendment to the Texas Constitution that provided for the implementation of HB 2.

These plans address the water conservation measures identified in 31 TAC Chapter 288 of the Texas Water Commission Permanent Rules, titled "Water Conservation Plan, Guidelines and Requirements".

A. Planning Area and Project Description

The planning area consists of the area generally in and around the Townsite of Zapata, where the County has established a service area for the Zapata County Waterworks utility. Included in this area are the following subdivisions:

1. The unincorporated area of the Townsite of Zapata;
2. Falcon Lakes Estates Subdivision;
3. Black Bass Subdivision;
4. Falcon Shores Subdivision;
5. Lakefront Lodge Subdivision;
6. Falcon Mesa Colonia;
7. Medina Colonia;
8. Cuellar Colonia;

B. Utility Evaluation Data

1. Population of service area (1994 Est.): 8,000.
2. Area of service area - approximately: 12,000 acres.
3. Number of equivalent 5/8 inch meter connections in service area (May, 94) - approximately: 2,600.
4. Net rate of new connection additions per year (new connections less disconnects) - approximately: 100.
5. Water use information:
 - a. Water production for 1993: 392.980 MG/yr.
 - b. Average monthly water production: 32.748 MG/mo.
 - c. Monthly wholesale water sales to one Water Improvement and Control District in 1993 are shown in the following Table:

Month	Zapata County - Hwy 16E WCID Water Sales (MG)	Total Water Sales (MG)
January	0.692	22.845
February	0.807	21.928
March	0.877	24.746
April	0.847	32.940
May	0.752	30.149
June	0.837	33.210
July	0.822	38.108
August	1.572	47.126
September	1.612	49.438
October	1.249	31.866
November	0.961	30.496
December	1.143	30.128
TOTAL	12.171	392.980

- d. Average daily water use: 1,076,658 gpd

- e. Peak daily use: 1,893,458 gpd
 - f. Peak to average use ratio (avg. daily summer use divided by annual avg. daily use): 1.44
 - g. Unaccounted for water (% of water production) approximately: 33%.
6. Wastewater information
- a. Percent of potable water customers sewered by Zapata County Waterworks wastewater treatment system: 43%
 - b. Percent of potable water customers who have septic tanks or other privately operated sewage disposal system: 60%
 - c. Percent of potable water customers sewered by another wastewater utility - NONE
 - d. Percent of total potable water sales to the three categories described in 6.a., 6.b. and 6.c.
 - I. Percent of total sales Zapata County Waterworks serves: 100%
 - ii. Percent of total sales to customers who are on septic tanks or private disposal systems: 57%
 - iii. Percent of total sales to customers who are on other wastewater treatment systems: NONE
 - e. Average daily volume of wastewater treated: 176,000 gal.
 - f. Peak daily wastewater volume: 578,000 gal.
 - g. Estimated percent of wastewater flows to the treatment plant that originates from the following categories:

Residential	87%
Industrial and Manu.	0%
Commercial/Instit.	13%
Stormwater	0%

7. Safe annual yield of water supply: 1.084.20 ac. ft. (Limited to number of water rights owned.)
8. Peak daily design capacity of water system: 4.0 MGD (Est.)
9. Major high volume water customers:

<u>Customer</u>	<u>Gallons per month</u>
Public Entities	300,000 (avg)
Oil Companies	750,000 (avg)
RV Parks	500,000 (avg)
Hwy 16E WCID	1,500,000 (avg)

10. Population Estimates: (Zapata Townsite & Zapata County WCID-Hwy 16E)

Year	Zapata* Townsite	Zapata County WCID-Hwy 16E
1990	7119**	
1995	7878	379
2000	8686	418
2005	9478	457
2010	10340	499
2015	11238	541

11. Percent of water supply connections in system metered: 100%
12. Water or wastewater rate structure:
The County's rate structure for the various categories of residential, commercial, public, industrial and wholesale is included in Appendix A of this Conservation Plan.
13. Annual revenue from water and wastewater (1993): \$792,912.
14. Public involvement in planning process
Public at large - Public Hearing Held: _____, 1996.

C. Goals of the Program

The need for the Program is supported by the fact that reductions in water use by as much as 25 % have been achieved in communities where conservation practices have been implemented. Communities that have used Emergency Demand Management programs have achieved short-term reductions in excess of 50% during drought emergency situations. Because the onset of emergency conditions is often rapid, it is important that the County be prepared in advance.

The goals for the program are based on demonstrated performance in other communities where conservation levels have been between 5 % and 15 %, and where responses to drought conditions have avoided hardships and economic losses due to water shortages.

Based on the 1993 estimated population within the service area of 8,000 and the 1993 water use of 392,980,000 gallons, the per capita water usage is approximately 135 gallons per day. It is the goal of this conservation plan to reduce water usage by 15 % or approximately 20 gallons per capita per day.

It is the goal of the Emergency Demand Management program to reduce water consumption by a factor of 35 % or 47 gallons per capita per day during periods of critical shortages.

II. LONG-TERM WATER CONSERVATION PLAN

A. Plan Elements

1. Education and Information

Public education and dissemination of information is the single most important feature of this plan. It is essential that customers be aware of the available methods to conserve their most precious and finite resource. All

printed literature relating to the County's program will be in a bilingual format whenever possible. See "Water Conservation Retrofit Program", "Water Conserving Landscaping" and "Emergency Demand Management Plan" below for additional educational requirements.

a. First Year Program

After adoption of this plan, an informational brochure will be mailed to all existing customers with the monthly billing. The mailing will occur twice in the first year and contain, at a minimum, an outline describing the information shown in the Appendix attached hereto. In addition to the two (2) mailings, a flyer will be prepared and distributed in a major local newspaper. Local newspapers, radio and television stations will be requested to run news items announcing adoption of the plan and describe the main plan components.

b. Long-Term Program

The County will take an active role in periodically distributing literature to its customers. The Texas Water Development Board maintains printed material which is available for such purposes. At a minimum, an annual mailing will be conducted which will contain information relating to the purpose and methods of conservation and Emergency Demand Management plans. Local newspapers, radio and television stations will be requested to run occasional items related to water conservation. Such requests will not be limited only to high water usage periods but will occur throughout the year.

c. Information to New Customers

Each new customer will receive a brochure, at a minimum, an outline describing the information shown in the Appendix attached hereto.

2. Water Conservation Plumbing Code

Plumbing Codes: Builders and plumbers are required to utilize water conserving plumbing fixtures in construction in accordance with Chapter 376, *Water Saving Performance Standards* of the State of Texas Health Code. Copies of this code may be obtained by contacting the Texas Natural Resource Conservation Commission, TNRCC, at (512) 239-6020. The requirements as of January 1, 1994, for the residential and commercial fixtures are:

Tank-type toilets	No more than 1.6 gallons per flush
Flush valve toilets	No more than 1.6 gallons per flush
Tank-type urinals	No more than 1.0 gallons per flush
Flush valve urinals	No more than 1.0 gallons per flush
Shower heads	No more than 2.5 gpm @ 80 psi
Lavatory and kitchen faucets	No more than 2.20 gpm @ 60 psi
All hot water lines	Insulated

Swimming pools

New pools must have recirculating filtration equipment.

The County will commit to incorporating these water conservation standards into any plumbing code that may be adopted in the future.

3. Water Conservation Retrofit Program

Retrofit Programs: The County will make information available through its education program for plumbers and customers to use when purchasing and installing plumbing fixtures, lawn watering equipment or water using appliances. The County will also encourage local hardware and plumbing supply stores to stock water conserving fixtures. Information will be provided to customers and plumbers regarding the benefits of retrofit devices such as low-flow shower heads or toilet dams that reduce water use by replacing or modifying existing fixtures or appliances.

4. Conservation-Oriented Water Rate Structure

Water Rate Structure - The present water rate structure is located in Appendix A of this Conservation Plan

5. Universal Metering and Meter Repair and Replacement

Universal metering: All water users, including the County and other un-billed users, will be metered. In addition, the County will continue to have a master meter. For new multi-family dwellings that are easily metered individually (such as duplexes and fourplexes) or apartments with more than five living units or apartments, each living unit should be metered separately. A regularly scheduled maintenance program of meter testing

and repair or replacement will be implemented in accordance with the following time intervals:

1. Production (master) meters - test once a year
2. Meters larger than 1" - test once a year
3. Meters 1" or smaller - test every 10 years

Most important, metering can provide an accurate accounting of water uses throughout the system which both the utility and customers are metered. In addition, the utility may be able to identify and bill previously un-billed users and thereby, generate additional revenues. Metering and meter repair and replacement, coupled with an annual water accounting or auditing, will be used in conjunction with other programs such as leak detection and repair and, thereby, save significant quantities of water.

6. Water Conserving Landscaping

Water Conserving Landscaping: Annual in-home water use in some locales accounts for an average of 65 percent of total residential use, while the remaining 35 percent is used for exterior residential purposes, such as lawn watering and car washing. However, during the summer months, as much as 50 percent of the water used in urban areas is applied to lawns and gardens and adds greatly to the peak demands experienced by most water utilities. In order to reduce the demands placed on the system by landscape watering, the County will encourage local nurseries and landscaping professionals to stock and use low water using plants and lawn irrigation equipment. The County will further encourage water conserving landscaping by residential customers and commercial establishments engaged in the sale or installation of landscape plants or watering equipment.

7. Water Audits and Leak Detection

Leak Detection and Repair: A continuous leak detection, location, and repair program can be an important part of a water conservation plan. An annual water accounting or audit will be part of the program. Sources of unaccounted for water include defective hydrants, abandoned services, unmetered water used for fire fighting or other municipal uses, inaccurate or leaking meters, illegal hook-ups, unauthorized use of fire hydrants, and leaks in the mains and services. Once located, corrective repairs or actions will be undertaken. An effective leak detection, location, and repair program will generally pay for itself, especially in an older system.

The County will continue to prepare a monthly accounting of its water production and customer use. This will give the County an indication of the amount of resources that should be devoted to meter testing and leak detection activities.

8. Recycling and Reuse

The County has evaluated the potential of recycling and reuse because these methods may be used to increase water supplies in the service area. Reuse can be especially important where the use of treated effluent from an industry or a municipal system or agricultural return flows replace an existing use that currently requires fresh water from a utilities supply. Recycling of in-plant process or cooling water can reduce the amount of fresh water required by many industrial operations.

The County will continue to periodically evaluate potential recycled water markets.

9. Means of Implementation and Enforcement

Implementation and Enforcement: The County has the authority and means to implement and enforce the provisions of the conservation program. Administration and enforcement will be provided by County personnel. The County's Business Manager will serve as the Administrator of the conservation program effectiveness. The Administrator will oversee the execution and implementation of all elements of the program. He will be responsible to supervise the keeping of adequate records for program verification.

The County will adopt the final approved plan and commit to maintain the program for the duration of the County's financial obligation to the State of Texas.

B. Annual Reporting

The Administrator will file an annual report with the Executive Administrator of the Texas Water Development Board. The first annual report is due within sixty (60) days after the anniversary date of a loan closing and no later than the same date for each consecutive year. The report will address the implementation progress, public information which has been issued, public response, and quantitative effectiveness of the program expressed as production and sales results.

C. Contracts with Other Political Subdivisions

The County will, as part of contracts for both water sales and wastewater services with any political subdivision, require that entity to adopt applicable provisions of the County's conservation and Emergency Demand Management plan. The only exception would be where that entity already has a plan in effect which has been approved by the Texas Water Development Board. Such arrangements must be assured prior to delivery of actual service by the County.

III. Emergency Demand Management PLAN

Drought and other uncontrollable circumstances can disrupt the normal availability of the County's water supply. Although the current supply is adequate, it can become contaminated, or through a disaster, be destroyed. During drought periods, consumer demand is usually higher than in normal conditions. Failure of system components can also present emergency management requirements.

As with the conservation portion of this plan, the Administrator will have the authority to execute decisions relating to Emergency Demand Management measures. After adoption of this program, the Administrator will have pre-approved authority to impose mandatory water use restrictions in accordance with this plan.

A. Trigger Conditions

1. Mild Condition

The County will initiate Emergency Demand Management measures upon occurrence of the following conditions:

- a. Daily water demand exceeds 3 million gallons per day for three consecutive days, or;
- b. Distribution pressure remains below 45 p.s.i. for more than 6 consecutive hours, or;
- c. River water elevation drops below regulatory minimum elevation, requiring use of emergency intake pumps.

2. Moderate Condition

- a. Daily water demand exceeds 3.3 million gallons per day for three consecutive days, or;
- b. Distribution pressure remains below 40 p.s.i. for more than 6 consecutive hours, or;

- c. Ground storage reservoir remains below 80 percent of total storage for more than 2 consecutive days.
- d. River water elevation drops below intake structure elevation.

3. Severe Condition

- a. Daily water demand exceeds 3.5 million gallons per day for three consecutive days, or;
- b. Failure or essential system component is imminent potentially causing immediate health or safety hazard.

B. Emergency Demand Management Measures

1. Mild Condition

- a. Through the media, inform the public that a trigger condition has been reached, and that they are requested to implement water use reduction measures. Suggested steps which can be taken will be provided by the County through the news media.
- b. Notify major water users of the situation and request voluntary use reductions.
- c. Institute and publicize a voluntary law watering schedule.
- d. During winter months, request water users to insulate pipes in lieu of continuously running water to prevent freezing.

2. Moderate Condition

- a. Continue implementing all Mild Condition actions.
- b. Prohibit car, window, and pavement washing, except when a bucket is used and continuously running water is minimized.
- c. Unless essential for public health or safety, the following activities will be prohibited:

- I. Street washing
 - ii. Fire hydrant flushing
 - iii. Filling swimming pools
 - iv. Watering athletic fields
- d. Implement the mandatory lawn watering schedule. Customers with even numbered street addresses may water on even numbered days of the month. Customers with odd numbered street addresses may water on odd numbered days of the month. Watering is limited to the hours of 6:00 p.m. to 10:00 a.m. and 8:00 p.m. to 10:00 p.m.

3. Severe Condition

- a. Continue implementing all Moderate Condition actions.
- b. Prohibit all outdoor water use unless essential for public health or safety.
- c. Impose maximum limits for water use.
- d. Impose monetary fines for violators of prescribed maximum use limits. Notify each customer of this action.

C. Information and Education

Information regarding the Emergency Demand Management Plan will be provided along with the "Education and Information" described in the Water Conservation Plan, above. Notification to the public of impending or existing trigger conditions will be conducted through the media. Local newspapers, radio and television stations will be requested to run items related to the cause of the trigger conditions along with voluntary or mandatory public actions. When trigger conditions have passed, the public will be so notified.

D. Initiation Procedures

The Emergency Demand Management Plan will be implemented upon adoption. The Administrator will establish specific enforcement actions, maximum water use limits, and monetary penalties for non compliance by water users within 60 calendar days of loan closing. The Emergency Demand Management Regulation will be amended to include these features.

E. Termination Notification Actions

After thorough evaluation by the Administrator, and determination has been made that the trigger conditions for particular status no longer exist, the public will be informed that specific trigger conditions have passed and that the situation has lessened in severity.

F. Means of Implementation

The Administrator will have the responsibility to monitor water supply and distribution conditions. If it becomes apparent that a trigger condition has occurred, he will immediately notify the entities described in "Information and Education", above and commence Emergency Demand Management actions.

IV. LEGAL AND REGULATORY COMPONENTS

Copies of legal and regulatory documents are contained in the Appendix.

A. Plan Adoption Resolution

(Required)

B. Emergency Demand Management Ordinance/Regulations

(Required) (Sample Attached)

APPENDIX A

WATER AND WASTEWATER USER RATES

Table A-1
Average Monthly Water and Wastewater Charges
Zapata County Public Water Suppliers
1993 Data

Utility	Rates		
	Water	Wastewater	Total
Falcon Rural WSC	\$27.00	N/A	\$27.00
Ramireno WSC	18.50	N/A	18.50
San Ygnacio MUD	18.50	\$9.60	28.10
Siesta Shores WCID	28.15	(Service 1997)	28.15
Zapata County Waterworks	15.50	5.00	20.50
Zapata County WCID - Hwy 16E	33.00	N/A	33.00

APPENDIX B

WATER CONSERVATION METHODS

EDUCATION AND INFORMATION

The most readily available and lowest cost method of promoting water conservation is to inform water users about ways to save water inside homes and other building, in landscaping and lawn uses, and in recreational uses. In some locales, in-home water use accounts for an average of 65 % of total residential use, while the remaining 35 % is used for exterior residential purposes such as lawn watering and car washing. Average residential in-home water use data for Texas indicates that about 40 % is used for toilet flushing, 35 % for bathing, 11 % for kitchen uses, and 14 % for clothes washing. Water saving methods that can be practiced by the individual water user are listed below.

In the Bathroom, Customers Should be Encouraged to:

- Take a shower instead of filling the tub and taking a bath. Showers usually use less water than tub baths.
- Install a low-flow shower head which restricts the quantity of flow at 60 psi to no more than 3.0 gallons per minute.
- Take short showers and install a cutoff valve or turn the water off while soaping and back on again only to rinse.
- Do not use hot water when cold will do. Water and energy can be saved by washing hands with soap and cold water; hot water should only be added when hands are especially dirty.
- Reduce the level of the water being used in a bath tub by one or two inches if a shower is not available.
- Turn water off when brushing teeth until it is time to rinse.
- Do not let the water run when washing hands. Instead, hands should be wet, and water should be turned off while soaping and scrubbing and turned on again to rinse. A cutoff valve may also be installed on the faucet.
- Keep a container of drinking water in the refrigerator. Running water from the tap until it is cool is wasteful. Better still, both water and energy can be saved by

keeping cold water in a picnic jug on a kitchen counter to avoid opening the refrigerator frequently.

- Use a small pan of cold water when cleaning vegetables rather than letting the faucet run.
- Use only a little water in the pot and put a lid on it for cooking most food. Not only does this method save water, but food is more nutritious since vitamins and minerals are not poured down the drain with the extra cooking water.
- Use a pan of water for rinsing when hand washing dishes rather than a running faucet.
- Always keep water conservation in mind, and think of other ways to save in the kitchen. Small kitchen savings from not making too much coffee or letting ice cubes melt in a sink can add up in a year's time.

In the Laundry, Customers should be Encouraged to:

- Wash only a full load when using an automatic washing machine (32 to 59 gallons are required per load).
- Use the lowest water level setting on the washing machine for light loads whenever possible.
- Use cold water as often as possible to save energy and to conserve the hot water for uses which cold water cannot serve. (This is also better for clothing made of today's synthetic fabrics.)

For Appliances and Plumbing, the Customer Should be Encouraged to:

- Check water requirements of various models and brands when considering purchasing any new appliance that uses water. Some use less water than others.
- Check all water line connections and faucets for leaks. If the cost of water is 1.00 per 1,000 gallons, one could be paying a large bill for water that simply goes down the drain because of leakage. A slow drip can waste as much as 170 gallons of water EACH DAY, or 5,000 gallons per month, and can add as much as \$5.00 per month to the water bill.
- Shampoo hair in the shower. Shampooing in the shower takes only a little more water than is used to shampoo hair during a bath and much less than shampooing and bathing separately.

- Hold hot water in the basin when shaving instead of letting the faucet continue to run.
- Test toilets for leaks. To test for a leak, a few drops of food coloring can be added to the water in the tank. The toilet should not be flushed. The customer can then watch to see if the coloring appears in the bowl within a few minutes. If it does, the fixture needs adjustment or repair.
- Use a toilet tank displacement device. A one-gallon plastic milk bottle can be filled with stones or with water, recapped, and placed in the toilet tank. This will reduce the amount of water in the tank but still provide enough for flushing (Bricks which some people use for this purpose are not recommended since they crumble eventually and could damage the working mechanism, necessitating a call to the plumber). Displacement services should never be used with new low-volume flush toilets.
- Install faucet aerators to reduce water consumption.
- Never use the toilet to dispose of cleansing tissues, cigarette butts, or other trash. This can waste a great deal of water and also places an unnecessary load on the sewage treatment plant or septic tank.
- Install a new low-volume flush toilet that uses 3.5 gallons or less per flush when building a new home or remodeling a bathroom.

In the Kitchen, Customers Should be Encouraged to:

- Use a pan of water (or place a stopper in the sink) for rinsing pots, pans, and cooking implements when cooking rather than turning on the water faucet each time a rinse is needed.
- Never run the dishwasher without a full load. In addition to saving water, expensive detergent will last longer, and a significant energy savings will appear on the utility bill.
- Use the sink disposal sparingly, and never use it for just a few scraps.
- Learn to replace faucet washers so that drips can be corrected promptly. It is easy to do, costs very little and can represent a substantial amount saved in plumbing and water bills.
- Check for water leakage that the customer may be entirely unaware of, such as a leak between the water meter and the house. To check, all indoor and outdoor

faucets should be turned off, and the water meter should be checked. If it continues to run or turn, a leak probably exists and needs to be located.

- Insulate all hot water pipes to avoid the delays (and wasted water) experienced while waiting for the water to "run hot".
- Be sure the hot water heater thermostat is not set too high. Extremely hot settings waste water and energy because the water often has to be cooled with cold water before it can be used.
- Use moisture meter to determine when house plants need water. More plants die from over-watering than from being on the dry side.

For Out-of-Door Use, Customers Should be Encouraged to:

- Water lawns early in the morning during the hotter summer months. Much of the water used on the lawn can simply evaporate between the sprinkler and the grass.
- Use a sprinkler that produces large drops of water, rather than a fine mist, to avoid evaporation.
- Turn soaker hoses so the holes are on the bottom to avoid evaporation.
- Water slowly for better absorption, and never water on windy days.
- Forget about watering the streets or walks or driveways. They will never grow a thing.
- Condition the soil with compost before planting grass or flower beds so that water will soak in rather than run off.
- Fertilize lawns at least twice a year for root stimulation. Grass with a good root system makes better use of less water.
- Learn to know when grass needs watering. If it has turned a dull grey-green or if footprints remain visible, it is time to water.
- Do not water too frequently. Too much water can overload the soil so that air cannot get to the roots and can encourage plant diseases.
- Do not over-water. Soil can absorb only so much moisture and the rest simply runs off. A timer will help, and either a kitchen timer or an alarm clock will do.

An inch and one-half of water applied once a week will keep most Texas grasses alive and healthy.

- Operate automatic sprinkler systems only when the demand on the water supply is lowest. Set the system to operate between four and six a.m.
- Do not scalp lawns when mowing during hot weather. Taller grasses hold moisture better. Rather, grass should be cut fairly often, so that on 1/2 to 3/4 inch is trimmed off. A better looking lawn will result.
- Use a watering can or hand water with the hose in small areas of the lawn that need more frequent watering (those near walks or driveways or in especially hot, sunny spots).
- Learn what types of grass, shrubbery, and plants do best in the area and in which parts of the lawn and then plant accordingly. If one has a heavily shaded yard, no amount of water will make roses bloom. In especially dry sections of the state, attractive arrangements of plants that are adapted to arid or semi-arid climate should be chosen.
- Consider decorating areas of the lawn with rocks, gravel, wood chips, or other materials now available that require no water at all.
- Do not "sweep" walks and driveways with the hose. Use a broom or rake instead.
- Use a bucket of soapy water and use the hose only for rinsing when washing the car.

APPENDIX C

MODEL SUBDIVISION ORDINANCE

Instructions on Adoption of Model Subdivision Rules

These model rules were developed under the authority of Section 16.343 of the Texas Water Code.

The county must adopt and enforce these model rules before the county, water districts or water supply corporations located within the county and outside the boundaries of a municipality can participate in the Economically Distressed Areas financial assistance programs under Section 15.407 of the Water Code or Subchapter K, Chapter 17, of the Texas Water Code. Rules adopted by the commissioners court under this section must apply to all the unincorporated area of the county.

The county must become an authorized agent of the Texas Department of Health for the administration of an on-site waste disposal permitting program in accordance with Chapter 366 of the Texas Health and Safety Code. If not already authorized, the county should contact the appropriate regional office of the Texas Department of Health for additional information on the delegation procedure.

The county must follow the Open Meetings Act, Tex. Rev. Civ. Stat. Ann. art 6252-17 (Vernon 1989), relative to the adoption of these rules. The Water Code Section 16.350 requires that the county by order or ordinance adopt and enter the model rules in the minutes of a meeting of the commissioners court and publish

notice of that action in a newspaper with general circulation in the county. Local Government Code Section 233.003 establishes procedural requirements for counties adopting setback regulations.

The Model Subdivision Rules are not intended to be a complete county Subdivision Order. In keeping with the provisions of Senate Bill 2, the model rules apply only to residential developments with tracts of ~~one~~^{five} acres or less. No provision is made in these rules for roads and drainage. It is intended that each county develop its own standards for subdivisions with tracts of more than ~~one~~^{five} acres, road and drainage standards, or other requirements that the county has authority to regulate. Each county will be responsible for implementing these rules into their other lawful regulations. Counties are reminded that Section 16.350 of the Water Code requires the county commissioners to adopt the rules in the form of model rules developed under Section 16.350. Counties that want to enact road standards may wish to consult "Standard Specifications for Construction of Highways, Streets and Bridges" that is adopted by the State Department of Highways and Urban Transportation. The financial guarantees of Section 3.4 are to guarantee construction of water and wastewater facilities. The financial guarantees under Section 3.4 are in addition to any local requirements for financial guarantees for construction of roads adopted pursuant to Section 232.004 of the Local Government Code.

The Model Rules establish minimum standards for water and wastewater facilities for residential developments where the lots are ~~one~~^{five} acres or less. The rules do not specify the procedural requirements of subdivision approval. Counties must adopt their own procedural system for subdivision approval which may include review and approval of both a preliminary and final plat.

For properly platted subdivisions, cities and counties are required by Sections 212.0115 and 232.0046 Local Government Code, to issue certificates stating that the plat has been reviewed and approved. Cities and counties may adopt rules necessary to administer this certificate process.

There are several places in these model rules where the county will need to complete definitions and fill in blank spaces with the appropriate information.

The county may need to repeal some or parts of its other rules that duplicate or conflict with the model subdivision rules. The section entitled "Repealer" may be deleted, if no repeals are required.

The county may revise or delete Subsections 2.3(b)(4) and (5) of these model rules to eliminate the references to areas which are not within the jurisdiction of the county.

As minimum state standards change, counties receiving financial assistance under the Economically Distressed Areas Program will be required to amend their rules.

The county may retype these model rules and change the way the chapters are numbered and sections are structured to be consistent with its other regulations. Prior EA permission for these changes is not necessary. Counties need not follow the exact format of the model rules.

A municipality may adopt the model rules by making appropriate substitutions on the Model Rules. The language of Section 212.004(a) Local Government Code should be substituted for Section 1.5(a) of the Model Rules. The definition of extraterritorial jurisdiction should follow the definition contained in Chapter 42 Local Government Code. The appropriate municipal approval entity should be substituted for county officials and the commissioners court. Municipalities are reminded that they may adopt rules relating to water supply and sewer services within their extraterritorial jurisdiction that are more strict than those provided for in the model rules; see Section 16.350(d) Texas Water Code.

The attorney general shall prepare a list briefly describing the powers and duties given to the counties of this state regarding the regulation of land use, the regulation of structures, the platting and subdividing of land, and the

provision and regulation of water, sewer, and other utility service to residential property. This list also must contain a citation to the law under which each power or duty is established. On a biennial basis, the attorney general shall update the list and send a copy to the county judge of each county in the state.

MODEL SUBDIVISION RULES

May 30, 1990

CHAPTER 1 GENERAL AND ADMINISTRATIVE PROVISIONS

Section 1.1 Authority and Scope of Rules.

These rules are adopted under the authority of Chapter 232 of the Local Government Code, and Section 16.342 of the Texas Water Code. Notwithstanding any provision to the contrary, these rules apply only to residential developments with tracts of ~~one~~^{five} acres or less.

Section 1.2 Purpose.

It is the purpose of these rules to promote the public health of the county residents, to ensure that adequate water and wastewater facilities are provided in subdivisions within the jurisdiction of this county, and to establish the minimum standards for water and wastewater facilities.

Section 1.3 Effective Date.

These rules become effective on the _____ day of _____, 19____.

Section 1.4 Repealer.

The _____ (regulations) (ordinance) adopted on the _____ day of _____, 19____, are hereby repealed, except as to such sections which are retained herein.

Section 1.5 Plat Required.

(a) The owner of a tract of land located outside the limits of a municipality who divides the tract into two or more parts to lay out a subdivision of the tract, including an addition, or to

lay out suburban lots or building lots, and to lay out streets, alleys, squares, parks or other parts of the tract intended to be dedicated to public use or for the use of purchasers or owners of lots fronting on or adjacent to the streets, alleys, squares, parks, or other parts must have a plat of the subdivision prepared.

(b) (1) No subdivided land shall be sold or conveyed until the subdivider:

(A) has received approval of a final plat of the tract; and

(B) has filed and recorded with the county clerk of the county in which the tract is located a legally approved plat.

(2) A division of a tract is defined as including a metes and bounds description, or any description of less than a whole parcel, in a deed of conveyance or in a contract for a deed, using a contract of sale or other executory contract, lease/purchase agreement, or using any other method to convey property.

Section 1.6 Supersession.

These rules supersede any conflicting regulations of the county.

Section 1.7 Severability.

If any part or provision of these regulations, or application thereof, to any person or circumstance is adjudged invalid by any court of competent jurisdiction, such judgment shall be confined in its operation to the part, provision, or application directly

involved in the controversy in which such judgment shall have been rendered and shall not affect or impair the validity of the remainder of these regulations or the application thereof to other persons or circumstances. The county commissioners court hereby declares that it would have enacted the remainder of these regulations without any such part, provision or application.

Section 1.8 Conflict of Interest.

(a) Any member of the county commissioners court who has a substantial interest in a subdivided tract shall file, before a vote or decision regarding the approval of a plat for the tract, an affidavit stating the nature and extent of the interest and shall abstain from further participation in the matter. The affidavit must be filed with the county clerk.

(b) For the purposes of this section a person with substantial interest is one who:

(1) has an equitable or legal ownership interest in the tract with a fair market value of two thousand five hundred dollars (\$2,500) or more;

(2) acts as a developer of the tract;

(3) owns ten percent (10%) or more of the voting stock or shares of or owns either ten percent (10%) or more or \$5,000 or more of the fair market value of a business entity that:

(A) has an equitable or legal ownership interest in the tract with a fair market value of \$2,500 or more;
or

(B) acts as a developer of the tract; or

(4) receives in a calendar year funds from a business entity described by subdivision (3) that exceed ten percent (10%) of the person's gross income for the previous year.

(c) A person also is considered to have a substantial interest in a subdivided tract if the person is related in the first degree by consanguinity or affinity to another person who, under subsection (b), has a substantial interest in the tract.

(d) For the purposes of this section, a tract includes the subdivided tract as a whole, not an individual lot.

(e) The finding by a court of a violation of this section of these rules does not render voidable an action of the commissioners court unless the measure would not have passed the commissioners court without the vote of the member who violated this section.

Section 1.9 Definitions. The following words and terms, when used in these rules, shall have the following meanings.

Commissioners court, or court, the _____ County Commissioners Court.

Drinking water, all water distributed by any agency or individual, public or private, for the purpose of human consumption or which may be used in the preparation of foods or beverages or for the cleaning of any utensil or article used in the course of preparation or consumption of food or beverages for human beings.

Engineer, a person licensed and authorized to practice engineering in the State of Texas under The Texas Engineering Practice Act.

Final plat, a map or drawing and any accompanying material of a proposed subdivision prepared in a manner suitable for recording in the county records and prepared as described in these regulations.

Lot, an undivided tract or parcel of land contained within a block and designated on a subdivision plat by an alpha-numeric identification and having frontage or access to an existing or proposed private or public street.

Non-public water system, any water system supplying water for domestic purposes which is not a public water system.

Platted, recorded with the county in an official plat record.

Public water system, a system for the provision to the public of piped water for human consumption, which includes all uses described under the definition for drinking water. Such a system must have a potential for at least fifteen (15) service connections or serve at least twenty five (25) individuals at least sixty (60) days out of the year. This term includes any collection, treatment, storage, and distribution facilities under the control of the operator of such system and used primarily in connection with such system; and any collection or pretreatment storage facilities not under such control which are used primarily in connection with such system. Two or more systems with each having a potential to serve less than fifteen (15)

connections or less than twenty five (25) individuals but owned by the same person, firm, or corporation and located on adjacent land will be considered a public water system when the total potential service connections in the combined systems are fifteen (15) or greater or if the total number of individuals served by the combined systems total twenty five (25) or more at least sixty (60) days out of the year.

Purchaser, shall include purchasers under executory contracts for conveyance of real property.

Sanitarian, a person registered as a Professional Sanitarian by the Texas Department of Health under the authority of Vernon's Ann. Tex. Civ. Stat. Article 4477-3.

Sewerage facilities, the devices and systems which transport domestic wastewater from residential property, treat the wastewater, and dispose of the treated water in accordance with the minimum state standards contained or referenced in these rules.

Subdivider, any owner of land or authorized agent thereof proposing to divide or dividing land so as to constitute a subdivision.

Subdivision, any tract of land divided into two or more parts for the purpose of laying out lots, or suburban lots, or building lots, and streets, alleys, squares, parks, or other portions intended for public use or for the use of the purchasers or owners of lots fronting thereon or adjacent thereto. A

subdivision includes re-subdivision (replat) of land which was previously divided.

Water facilities, any devices and systems which are used in the supply, collection, development, protection, storage, transmission, treatment, and/or retail distribution of water for safe human use and consumption.

CHAPTER 2 MINIMUM STANDARDS

Section 2.1. Scope of standards. The establishment of residential developments with tracts of ~~two~~^{five} acres or less where the water supply and sewer services do not meet the minimum standards of this Chapter are prohibited. Subdivisions with tracts of ~~two~~^{five} acres or less are presumed to be residential developments unless the land is restricted to nonresidential uses on the final plat and all deeds and contracts for deeds.

Section 2.2. Water Facilities Development

(a) Public Water Systems.

(1) Where drinking water is to be supplied to a subdivision from a central system, the water quality and system design, construction and operation shall meet the minimum criteria set forth in 25 TAC 337.201 - 337.212, "Rules and Regulations for Public Water Systems", and 25 TAC 337.1 -337.18, "Drinking Water Standards Governing Drinking Water Quality and Reporting Requirements for Public Water Supply Systems."

(2) Subdividers who propose to supply drinking water by connecting to an existing central system must provide a

written agreement with the public water purveyor. The agreement must accommodate the total flow anticipated from the ultimate development and occupancy of the proposed subdivision for a minimum of thirty (30) years.

(b) Non-public water systems. Where individual wells are proposed for the supply of drinking water to residential establishments, the following conditions and requirements shall be observed:

(1) a test well or wells located so as to be representative of the quality of water generally available from the supplying aquifer shall be drilled by the subdivider and the produced waters sampled and submitted to a private laboratory for a complete chemical and bacteriological analysis of the parameters on which there are drinking water standards. The results of such analyses shall be made available to prospective property owners.

(2) the water quality of individual wells must, after treatment, meet the standards of quality for community water systems established by 25 TAC Sections 337.3, 337.4, 337.10, and 337.14.

(c) Transportation of potable water. The conveyance of potable water by transport truck or other mobile device to supply the domestic needs of the subdivision is not an acceptable method, except on an emergency basis. Absence of a water system meeting the standards of these rules due to the negligence of the subdivider does not constitute an emergency.

Section 2.3. Wastewater Disposal

(a) Organized Sewerage Facilities.

(1) Subdividers who propose the development of an organized wastewater collection and treatment system must obtain a permit to dispose of wastes from the Texas Water Commission in accordance with 31 TAC Chapter 305 "Consolidated Permits" and obtain approval of engineering planning materials for such systems under 31 TAC Chapter 317 "Design Criteria for Sewerage Systems" from the Texas Water Commission.

(2) Subdividers who propose to dispose of wastewater by connecting to an existing permitted facility must provide a written agreement with the permittee. The agreement must accommodate the total flow anticipated from the ultimate development and occupancy of the proposed subdivision for a minimum of thirty (30) years. Engineering plans for the proposed wastewater collection lines must be approved by the Texas Water Commission prior to construction.

(b) On-site Facilities

(1) On-site facilities which serve single family or multi-family residential dwellings with anticipated wastewater generations of one thousand (1,000) gallons per day up to five thousand (5,000) gallons per day must be designed by a registered professional engineer or registered professional sanitarian.

(2) Proposals for on-site sewerage facilities for the on-site disposal of sewage in the amount of five thousand (5,000) gallons per day or greater must be presented to the Texas

Water Commission for determination of the necessity for a wastewater permit from that agency. Each such disposal facility must be designed by a registered professional engineer.

(3) On-site sewerage facilities not required to obtain a wastewater permit from the Texas Water Commission must apply for and receive a permit from the Texas Department of Health or its authorized agent as required by the procedures established in 25 TAC 301.101 through 301.109.

(4) On-site Sewage Disposal Near Lakes. On-site sewerage facilities proposed near lakes must be licensed and installed in strict accordance with requirements established by the Texas Water Commission in their rules 31 TAC Chapter 285.

(5) On-site Wastewater Disposal in Recharge Zones. On-site sewerage facilities proposed within aquifer recharge zones must be licensed and installed in strict accordance with requirements established by the Texas Water Commission in 31 TAC Chapter 313 and applicable Texas Department of Health regulations.

(6) Review, Inspection and Permitting of On-Site Sewerage Facilities. The Texas Department of Health or its authorized agent shall review proposals for on-site sewage disposal systems and make inspections of such systems as necessary to assure that the system is in compliance with Chapter 366 of the Texas Health and Safety Code and rules 25 TAC Sections 301.11 through 301.17 and any additional applicable sections, "Construction Standards for On-site Sewerage Facilities." In

addition to the unsatisfactory on-site disposal systems listed in 25 TAC 301.16, pit privies and portable toilets are not acceptable waste disposal systems for lots platted under these rules.

Section 2.4 Greywater Systems for Reuse of Treated Wastewater.

(a) Organized or Municipal Sewerage Systems. Any proposal for sewage collection, treatment and disposal which includes greywater reuse shall meet minimum criteria of 31 TAC, Chapter 310.1 - 310.17, "Use of Reclaimed Water," promulgated and administered by the Texas Water Commission.

(b) On-Site Sewerage Facilities. Any proposal for on-site sewage disposal which includes provisions for greywater use shall meet the minimum criteria of 25 TAC, Chapter 301, Section 301.17, contained within the "Construction Standards for On-Site Sewerage Facilities" promulgated by the Texas Department of Health.

Section 2.5 Sludge Disposal. The disposal of sludge from water treatment and wastewater treatment facilities shall meet the criteria of 25 TAC, Chapter 325, Subchapters N and X, and 31 TAC Chapter 317.

Section 2.6 Setbacks. In areas that lack a nationally recognized fire code as listed in Section 235.002 Local Government Code (Acts 1989, 71st Leg., ch. 296) and lack water lines sized for fire protection, setbacks from roads and right-of-ways shall be a minimum of ten (10) feet, setbacks from

adjacent property lines shall be a minimum of five (5) feet, and shall not conflict with separation or setback distances required by rules governing public utilities, on-site sewerage facilities, or drinking water supplies.

Section 2.7 Number of Dwellings Per Lot. No more than one single family detached dwelling shall be located on each tract. A notation of this restriction shall be placed on the face of the final plat. This restriction shall be placed in all deeds and contracts for deeds for real estate sold within the subdivision. Notice of this restriction must be given by the seller to purchasers prior to execution of any binding agreement for sale or conveyance of any real estate. Proposals which include multi-family residential shall include adequate, detailed planning materials as required for determination of proper water and wastewater utility type and design.

CHAPTER 3 PLAT APPROVAL

Section 3.1 Applications for Plat Approval.

(a) Owner representation. An application for approval of a plat shall be filed with the county by the record owner of the property to be subdivided or the duly authorized agent of the record owner.

(b) Standards. All plats with a tract or tracts of ~~one~~^{five} acres or less for residential developments shall comply with the minimum standards of Chapter 2 of these rules.

Section 3.2 Final engineering report. The final plat shall be accompanied by an engineering report bearing the signed and dated seal of a professional engineer registered in the State of Texas. The engineering report shall discuss the availability and methodology of providing water facilities and wastewater treatment to individual lots within the subdivision. A detailed cost estimate per lot acceptable to the county shall be provided for those unconstructed water supply and distribution facilities and wastewater collection and treatment facilities which are necessary to serve the subdivision. The plan shall include a construction schedule for each significant element needed to provide adequate water or wastewater facilities. If financial guarantees are to be provided under Section 3.4 of this Chapter, the schedule shall include the start dates and completion dates.

(A) Non-public water systems. Where individual wells are proposed for the supply of drinking water to residences establishments, the subdivider shall include the quantitative and qualitative results of sampling the test wells in accordance with Section 2.2 of these rules. The results of such analyses shall be made available to the prospective property owners. The engineer shall issue a statement concerning the availability of groundwater supplies to serve the fully developed subdivision over the next thirty (30) years. Such statement may be based on information available from the Texas Water Development Board's Groundwater Unit of the Water Data Collection

and Planning Division. The description of the needed sanitary control easement shall be included.

(B) On-site sewerage facilities. Where private on-site sewerage facilities are proposed, the final engineering report shall include the soils information and percolation test results required for a Subdivision Construction Authorization under Chapter 8 of the county's rules for On-Site Sewerage Facilities.

(C) Centralized public water systems.

(I) Where water supplies are to be provided by an existing political subdivision of the state, including a city, municipal utility district, water control and improvement district, nonprofit water supply corporation, or an existing investor-owned water supply corporation, the subdivider shall furnish an executed contractual agreement between the subdivider and the governing board of the entity or owner of the utility to the effect that necessary arrangements have been made by the subdivider and the entity for the provision of a sufficient water supply to serve the ultimate needs of the subdivision for a term of not less than thirty (30) years. Before final plat approval, plans and specifications for the proposed water facilities system shall have been approved by all entities having jurisdiction over the proposed project. Entities having jurisdiction, in this instance, may include the political subdivision in addition to the Texas Department of Health and the County Health Department. If groundwater is to be the source of

the water supply, the final engineering report shall include a groundwater availability study which shall include comments regarding the long term (30 years) quantity and quality of the available groundwater supplies relative to the ultimate needs of the subdivision.

(II) Where there is no existing entity or owner to construct and maintain the proposed water facilities and distribution facilities, the subdivider shall establish an investor-owned utility and obtain a Certificate of Convenience and Necessity (CCN) from the Texas Water Commission and include evidence of the CCN issuance with the plat. Before final plat approval, plans and specifications for the proposed water facilities system shall have been approved by all entities having jurisdiction over the proposed project. If groundwater is to be the source of the water supply, the final engineering report shall include a groundwater availability study which shall include an analysis of the long term (30 years) quantity and quality of the available groundwater supplies relative to the ultimate needs of the subdivision. If surface water is the source of supply then the final engineering report shall include evidence that sufficient water rights have been obtained and dedicated to satisfy the ultimate fully developed needs of the subdivision.

(D) Centralized sewerage facilities.

(I) Where wastewater treatment capacity is to be provided by a political subdivision of the state,

including a city, municipal utility district, water control and improvement district or nonprofit water supply corporation, or an existing investor-owned water supply corporation, the subdivider shall furnish evidence of a contractual agreement between the subdivider and the governing board of the entity or owner of the utility to the effect that necessary arrangements have been made by the subdivider and the entity for the provision of sufficient wastewater treatment capacity to serve the ultimate full build-out needs of the subdivision for a term of not less than thirty (30) years. Before final plat approval, an appropriate permit to dispose of wastes shall have been obtained from the Texas Water Commission and plans and specifications for the proposed wastewater collection and treatment facilities shall have been approved by all entities having jurisdiction over the proposed project.

(II) Where there is no existing entity or owner to construct and maintain the proposed wastewater treatment and collection facilities, the subdivider shall establish an investor-owned utility by obtaining a Certificate of Convenience and Necessity (CCN) from the Texas Water Commission. Before final plat approval, a wastewater treatment permit authorizing the treatment of the wastewater for the ultimate build-out population of the subdivision shall have been obtained from the Texas Water Commission and plans and specifications for the proposed wastewater collection and treatment facilities shall

have been approved by all entities having jurisdiction over the proposed project.

Section 3.3 Additional Information. A county may, at its option, require additional information necessary to determine the adequacy of proposed water and wastewater improvements as part of the plat approval process. Such information may include, but not be limited to:

- (a) layout of proposed street and drainage work
- (b) legal description of the property
- (c) existing area features
- (d) topography
- (e) flood plains
- (f) description of existing easements
- (g) layout of other utilities
- (h) notation of deed restrictions
- (i) public use areas
- (j) proposed area features

Section 3.4 Financial Guarantees for Improvements.

(a) Applicability. If an adequate public or non-public water system or wastewater facility is not available from another entity, or are not constructed by the subdivider, to serve lots intended for residential purposes of ~~one~~^{five} acres or less at the time final plat approval is sought, then the commissioners court shall require the owner of the subdivided tract to execute an agreement with the county secured by a bond or other alternative financial guarantees such as a cash deposit or a letter of credit. Lots of

~~one~~ ^{five} acres or less are presumed to be for residential purposes unless the land is restricted to nonresidential uses on the final plat and all deeds and contracts for deeds.

(b) Bonds. The bond shall meet the following requirements:

(1) The bond or financial guarantee shall be payable to the county judge of the county, in his official capacity, or the judge's successor in office.

(2) The bond or financial guarantee shall be in an amount determined by the commissioners court to be adequate to ensure proper construction or installation of the public or non-public water facilities, and wastewater facilities to service the subdivision, including reasonable contingencies, but in no event shall the amount of the bond be less than the total amount needed to serve the subdivision as established by the engineer who certifies the plat.

(3) The bond shall be executed with sureties as may be approved by the county commissioners court. The county shall establish criteria for acceptability of the surety companies issuing bonds that include but are not limited to:

(A) registration with the Secretary of State and be authorized to do business in Texas; and

(B) authorization to issue bonds in the amount required by the county commissioners court and:

(C) rating of at least B from Best's Key Rating Guide; or if the surety company does not have any such

rating due to the length of time it has been a surety company, the surety company must demonstrate eligibility to participate in the surety bond guarantee program of the Small Business Administration and must be an approved surety company listed in the current United States Department of Treasury Circular 570. Such bonds shall meet the criteria contained in the rules and regulations promulgated by the United States Department of Treasury.

(4) The bond shall be conditioned upon construction or installation of water and wastewater facilities meeting the criteria established by Chapter 2 of these rules and upon construction of facilities within the time stated on the plat, or on the document attached to the plat for the subdivision, or within any extension of time granted by the county commissioners court.

(c) Letter of credit. A letter of credit shall meet the following requirements:

(1) Any letter of credit submitted as a financial guarantee for combined amounts greater than \$10,000 and less than \$250,000 must be from financial institutions which meet the following qualifications:

(A) Bank qualifications:

(I) Must be federally insured,

(II) Sheshunoff rating must be ten or better and primary capital must be at least six percent (6.0%) of total assets, and

(III) Total assets must be at least twenty-five million dollars.

(B) Savings and loan association qualifications:

(I) Must be federally insured,

(II) Tangible capital must be at least one and a half percent (1.5%) of total assets and total assets must be greater than twenty-five million dollars, or tangible capital must be at least three percent (3.0%) of total assets if total assets are less than twenty-five million dollars,

(III) Sheshunoff rating must be thirty or better.

(C) Other financial institutions qualifications:

(I) the letter of credit must be 110% collateralized by an investment instrument that would meet the qualifications for a county investment,

(II) the investment instrument must be registered in the county's name and the county must receive safekeeping receipts for all collateral before the letter of credit is accepted.

(2) Any letter of credit submitted as a financial guarantee for combined amounts greater than \$250,000 must be from financial institutions which meet the following qualifications:

(A) Bank qualifications:

(I) Must be federally insured,

(II) Sheshunoff rating must be thirty or better and primary capital must be at least seven percent (7.0%) of total assets, and

(III) Total assets must be at least seventy-five million dollars.

(B) Savings and loan association qualifications:

(I) Must be federally insured,

(II) Tangible capital must be at least three percent (3.0%) of total assets and total assets must be greater than seventy-five million dollars, or tangible capital must be at least five percent (5.0%) of total assets if total assets are less than seventy-five million dollars,

(III) Sheshunoff rating must be thirty or better.

(C) Other financial institutions qualifications:

(I) the letter of credit must be 110% collateralized by an investment instrument that would meet the qualifications for a county investment,

(II) the investment instrument must be registered in the county's name and the county must receive safekeeping receipts for all collateral before the letter of credit is accepted.

(3) The letter of credit shall list as sole beneficiary the county judge of the county, in his official

capacity, or the judge's successor in office, and must be approved by the county judge of the county. The form of the letter of credit shall be modeled after the form in Exhibit A to these rules.

(4) The letter of credit shall be conditioned upon installation or construction of water and wastewater facilities meeting the criteria established under Chapter 2 of these rules and upon construction of facilities within the time stated on the plat, or on the document attached to the plat for the subdivision, or within any extension of time granted by the county commissioners court.

(d) Financial guarantee. The county will determine the amount of the bond, letter of credit, or cash deposit required to ensure proper construction of adequate water and wastewater facilities in the subdivision.

Section 3.5 Review and Approval of Final Plats.

(a) Scope of review. The county will review the final plat to determine whether it meets the standards of Chapter 2 and the requirements of Chapter 3.

(b) Disapproval authority. The commissioners court shall refuse to approve a plat if it does not meet the requirements prescribed by or under these rules.

(c) Prerequisites to approval. Final plat approval shall not be granted unless the subdivider has accomplished the following:

(1) dedicated the sites for the adequate water and wastewater treatment facilities to the appropriate political subdivision or investor owned utility responsible for operation and maintenance of the facilities, and

(2) provided evidence that the water facilities and wastewater facilities have been constructed and installed in accordance with the criteria established within these rules and the approvals from the Texas Health Department and Texas Water Commission, as appropriate, of the plans and specifications for such construction, including any change orders filed with these agencies, or

(3) obtained all necessary permits for the proposed water facilities and wastewater facilities and has entered into a financial agreement with the county secured by a bond or other alternative financial guarantee such as a cash deposit or letter of credit for the provision of water and sewerage facilities with the bond or financial guarantee meeting the criteria established in Chapter 3 of these rules.

Section 3.6 Time Extensions For Providing Facilities

(a) Reasonableness. The commissioners court of the county may extend, beyond the date specified on the plat or on the document attached to the plat, the date by which the required water and sewer service facilities must be fully operable if the court finds the extension is reasonable and not contrary to the public interest.

(b) Timeliness. If the facilities are fully operable before the expiration of the extension period, the facilities are considered to have been made fully operable in a timely manner.

(c) Unreasonableness. An extension is not reasonable if it would allow a residence in the subdivision to be inhabited without water or sewer services that meet the standards of Chapter 2 of these rules.

CHAPTER 4 ENFORCEMENT

Section 4.1 Oversight. The owner, by submitting a plat, acknowledges the authority of the county and state agencies to lawfully enter and inspect property for purposes of execution of their statutory duties. Such inspection will not release the owner from any obligation to comply with the requirements of these rules.

Section 4.2 General Enforcement Authority of County.

(a) Legal Action. At the request of the commissioners court, a county attorney or other prosecuting attorney may file an action in a court of competent jurisdiction to:

(1) enjoin the violation or threatened violation of a requirement established by or adopted by the commissioners court under Chapter 232 of the Local Government Code; or

(2) recover damages in an amount adequate for the county to undertake any construction or other activity to bring about compliance with a requirement established by or adopted by the commissioners court under Chapter 232.

(b) Offense. A person commits an offense if the person knowingly or intentionally violates a requirement established by or adopted by the commissioners court under Chapter 232. An offense under this section is a Class B misdemeanor.

Section 4.3 Enforcement Of Subdivision Rules By Counties.

(a) Civil Penalty. A person who violates a rule adopted by a county pursuant to Section 16.343 of the Water Code is subject to a civil penalty of not less than \$50 nor more than \$1,000 for each violation and for each day of a continuing violation but not in excess of \$5,000 per day.

(b) Criminal Penalty. A person commits an offense if the person knowingly or intentionally violates a rule adopted pursuant to Section 16.343 of the Water Code by a county or municipality. A member of the commissioners court commits an offense if the member violates Section 1.8 of these rules.

(c) Offense Class. An offense under subsection (b) of this section is a Class B misdemeanor. An offense under Section 1.8 of these rules is a Class A misdemeanor.

Section 4.4 Injunction. In addition to other remedies, the attorney general, the county or district attorney of the county in which the violation occurred, or other local officials are authorized to apply to the district court for and the court in its discretion may grant the state or political subdivision without bond or other undertaking, any injunction that the facts may warrant including temporary restraining orders, temporary

injunctions after notice and hearing, and permanent injunctions enjoining a violation of the rules.

Section 4.5 Enforcement of Model Rules by Attorney General. In addition to enforcement by a political subdivision, the attorney general may bring suit to enforce a rule adopted under Section 16.350 of the Water Code, to recover the penalty provided by Section 16.352 of the Water Code, to obtain injunctive relief to prevent the violation or continued violation of a political subdivision's rules, or to enforce the rules, recover the criminal penalty, and obtain injunctive relief.

Section 4.6 Enforcement of Engineering Certificate.

(a) Attorney General Action. The attorney general may take any action necessary to enforce a requirement imposed by or under Section 232.0035 or 232.0036 of the Local Government Code, or to ensure that the water and sewer service facilities are constructed or installed to service a subdivision in compliance with the model rules adopted under Section 16.343, Water Code.

(b) Civil Penalty. A person who violates Section 232.0035 or 232.0036 of the Local Government Code, or fails to timely provide for the construction or installation of water or sewer service facilities that the person described on the plat or on the document attached to the plat, as required by Section 232.0035 is subject to a civil penalty of not less than \$500 nor more than \$1,000 plus court costs and attorney's fees.

(c) Offense. An owner of a tract of land commits an offense if the owner knowingly or intentionally violates a

requirement imposed by or under Section 232.0035 or 232.0036 of the Local Government Code or fails to timely provide for the construction or installation of water or sewer service facilities that the person described on a plat or on a document attached to a plat, as required by Section 232.0035. An offense under this subsection is a Class B misdemeanor.

(d) Definition. A reference in this section to an "owner of a tract of land" does not include the owner of an individual lot in a subdivided tract of land.

EXHIBIT A

IRREVOCABLE LETTER OF CREDIT NO.

TO: , Texas

DATE: , 19

We hereby authorize you to draw at sight on NAME AND LOCATION OF BANK for the account of NAME OF CUSTOMER (the "Customer"), up to the aggregate amount of DOLLARS (\$) (the "Stated Amount") available by our draft, accompanied by a certification by the County administrator, any Assistant County administrator, the Director of Financial Services, the Assistant Director of Financial Services, the Director of the Office of Land Development Services, or any Assistant Director of the Office of Land Development Services that the following condition exists:

"A Condition of Draw exists under the Subdivision Construction Agreement dated , 19 , by and between Subdivider and the County of (the "Agreement"). County is in substantial compliance with the terms of said Agreement and has calculated the amount of this draft in accordance with the terms of the Agreement."

Drafts must be drawn and presented by or on [EXPIRATION DATE] by the close of business of the Issuer of this credit and must specify the date and number of this credit. Drafts will be honored within five calendar days of presentment. We hereby engage all drawers that drafts drawn and presented in accordance with this credit shall be duly honored. Partial draws are permitted and the letter of credit shall be reduced by the amount of such partial draws as well as by any reduction letters authorized by the County. The sum of such partial draws shall on no account exceed the Stated Amount of this credit, and upon any draw or reduction letter which exhausts this credit, the original of this credit will be surrendered to us.

Except as expressly stated, this credit shall be subject to the Uniform Customs and Practice for Documentary Credits (1983 Revision), International Chamber of Commerce (Publication No. 400).

This credit is irrevocable prior to its expiration date unless both parties consent to revocation in writing.

Address of Issuer:

Officer

Issuer

Signature, Authorized

SUBDIVISION CONSTRUCTION AGREEMENT

1. Parties. The parties to this Subdivision Construction Agreement (the "Agreement") are (individually and collectively, the "Subdivider") and the _____ County, Texas (the "County").

2. Effective Date. This Agreement is effective on the date the County approves the final plat for the subdivision described in Paragraph 3 of this agreement by the Planning Commission's approval of the plat in accordance with County ordinances (the "Effective Date").

Recitals

3. Subdivider is the owner of the land included in the proposed final subdivision plat of the subdivision, as shown in County's File Number (the "Subdivision") and more particularly described by the metes and bounds description attached and incorporated into this Agreement as Exhibit A (the "Property"); and

4. Subdivider seeks authorization from the County to subdivide the Property in accordance with the requirements imposed by Texas statute and the County's ordinances, regulations, and other requirements; and

5. County ordinances require the completion of various improvements in connection with the development of the Subdivision to protect the health, safety, and general welfare of the community and to limit the harmful effects of substandard subdivisions; and

6. The purpose of this Agreement is to protect the County from the expense of completing subdivision improvements required to be installed by the Subdivider; and

7. This agreement is authorized by and consistent with state law and the County's ordinances, regulations, and other requirements governing development of a subdivision.

IN CONSIDERATION of the foregoing recitals and the mutual covenants, promises, and obligations by the parties set forth in this Agreement, the parties agree as follows:

Subdivider's Obligations

8. Improvements. The Subdivider agrees to construct and install, at Subdivider's expense, all subdivision improvements required to

comply with County orders, ordinances, regulations, and policies governing subdivision approval, specifically including without limitation those improvements listed on Exhibit B attached and incorporated by reference into this Agreement (collectively, the "Improvements," any one of which is an "Improvement"). All Improvements shall be constructed in conformity to the County's requirements, procedures, and specifications, pursuant to construction plans, permits, and specifications approved by the County prior to commencement of construction, and subject to inspection, certification, and acceptance by the County.

9. Completion. Unless a different time period is specified for a particular Improvement in Exhibit B, construction of all the Improvements shall be completed no later than three (3) years after the Effective Date (the "Completion Date"); provided, however, that if the Subdivider or the Issuer delivers to the County no later than the Completion Date a substitute Letter of Credit satisfying the criteria established by Paragraph 11 and which has an expiration date no earlier than one year from the Completion Date, then the Completion Date shall be extended to the expiration date of that substitute Letter of Credit or any subsequent substitute Letter of Credit provided in accordance with this Paragraph. Upon completion of each of the Improvements, the Subdivider agrees to provide to the County a complete set of construction plans for the Improvements, certified "as built" by the engineer responsible for preparing the approved construction plans and specifications.

10. Warranty. The Subdivider warrants the Improvements constructed by Subdivider or Subdivider's agents, contractors, employees, tenants, or licensees will be free from defects for a period of one (1) year from the date the County accepts the dedication of a completed Improvement or group of Improvements (the "Warranty Period"), as such Improvement or group of Improvements is separately identified and listed on Exhibit B, except the Subdivider does not warrant the Improvements for defects caused by events outside the control of the Subdivider or the Subdividers's agents, contractors, employees, tenants, or licensees. The Subdivider agrees to repair any damage to the Improvements before and during the Warranty Period due to private construction-related activities. As a condition of the County's acceptance of dedication of any of the Improvements, the County may require the Subdivider to post a maintenance bond or other financial security acceptable to the County to secure the warranty established by this Agreement. If the Improvements have been completed but not accepted, and neither the Subdivider nor Issuer is then in default under this Agreement or the Letter of Credit, at the written request of the Subdivider or the Issuer the County shall complete, execute, and deliver to the Issuer a reduction letter documenting that the Stated Amount has been reduced to an amount equal to the face amount of the maintenance bond or other financial security acceptable to the County.

11. Security. To secure the performance of Subdivider's obligations under this Agreement, Subdivider agrees to provide adequate financial guarantees of performance in the form of a surety bond acceptable to the County, a cash deposit to be held by the County in escrow, or an irrevocable letter of credit in the amount of _____ Dollars (\$) (the "Stated Amount"), which amount is the estimated total cost of constructing each of the Improvements as shown on Exhibit B. If a letter of credit is provided pursuant to this Agreement, it shall be in a standard form acceptable to the County, shall have an expiration date no earlier than one year from the date of its issuance, and shall be issued by a financial institution having a rating equivalent to the minimum acceptable rating established under the County's financial institution rating system in effect at the time the initial letter of credit is issued pursuant to this Agreement (the "Issuer"). During the term of this Agreement and subject to the terms of Paragraph 22 of this Agreement, the County may revise the standard form letter of credit it reasonably considers acceptable and necessary to secure the performance of Subdivider's obligations under this agreement. A letter of credit satisfying the criteria of this Paragraph (and any substitute or confirming letter of credit) is referenced to in this agreement as the "Letter of Credit".

12. Reduction In Letter of Credit. After the acceptance of any Improvement, the amount which the County is entitled to draw on the Letter of Credit shall be reduced by an amount equal to ninety percent (90%) of the Quoted cost of the accepted Improvement, as shown on Exhibit B. Upon completion of an Improvement, at the written request of Subdivider or Issuer, and if neither the Subdivider nor Issuer is then in default under this agreement or the Letter of Credit, the County shall complete, execute, and deliver to the Issuer a reduction letter verifying the acceptance of the Improvement and documenting that the Stated Amount has been reduced by stating the balance of the Stated Amount remaining after the reduction required by the first sentence of this Paragraph. No later than sixty (60) days after its receipt of a written request to reduce the Stated Amount submitted by the Subdivider or the Issuer, the County shall determine the Estimated Remaining Cost and shall complete, execute, and deliver to the Issuer a reduction letter documenting that the Stated Amount has been reduced to the Estimated Remaining Cost if the County determines the Stated Amount exceeds the Estimated Remaining Cost. Notwithstanding the preceding sentence, the County shall not be required to authorize reductions in the Stated Amount more frequently than every ninety (90) days. As used in this Paragraph, "Estimated Remaining Cost" means the amount the County estimates to be the cost of completing all Improvements incomplete as of the time of such estimate.

County's Obligations

13. Inspection and Certificate The County agrees to inspect Improvements during and at the completion of construction and, if completed in accordance with the standards and specifications for such Improvements, to certify the Improvements as being in compliance with County standards and specifications. The inspections and certifications will be conducted in accordance with standard County policies and requirements. The Subdivider grants the County, its agents, employees, officers, and contractors an easement and license to enter the Property to perform such inspections as it deems appropriate.
14. Notice of Defect. The County will provide timely notice to the Subdivider whenever inspection reveals that an Improvement is not constructed or completed in accordance with the standards and specifications for health or safety, and the notice of defect includes a statement explaining why the defect creates such immediate and substantial harm, the cure period may be shortened to no less than five (5) days and the County may declare a default under this Agreement if not satisfied that the defect is cured after the cure period. Any cure period should be reasonable in relation to the nature of the default.
15. Use of Proceeds. The County will disburse funds drawn under the Letter of Credit only for the purposes of completing the Improvements in conformance with the County's requirements and specifications for the Improvements, or to correct defects in or failures of the Improvements. The Subdivider has no claim or rights under this Agreement to funds drawn under the Letter of Credit or any accrued interest earned on the funds. All funds obtained by the County pursuant to one or more draws under the Letter of Credit shall be maintained by the County in an interest bearing account or accounts until such funds, together with accrued interest thereon (the "Escrowed Funds"), are disbursed by the County. The County may disperse all or portions of the Escrowed Funds as Improvements are completed and accepted by the County, or in accordance with the terms of a written construction contract between the County and a third party for the construction of Improvements. Escrowed Funds not used or held by the County for the purpose of completing an Improvement or correcting defects in or failures of an Improvement, together with interest accrued thereon, shall be paid by the County to the Issuer of the Letter of Credit no later than sixty (60) days following the County's acceptance of the Improvement or its decision not to complete the Improvement using Escrowed Funds, whichever date is earlier.
16. Return of Excess Escrowed Funds. No later than sixty (60) days after its receipt of a written request from the Subdivider or the Issuer to return Excess Escrowed Funds to the Issuer, the County shall disburse to the Issuer from the Escrowed Funds all

Excess Escrowed Funds. For purposes of this Paragraph, "Excess Escrowed Funds" means the amount of Escrowed Funds exceeding one hundred ten percent (110%) of the estimated cost of constructing Improvements the County intends to construct but which have not been accepted, as such cost is shown on Exhibit B. Notwithstanding the first sentence in this Paragraph, the County shall not be required to disburse Excess Escrowed Funds more frequently than every ninety (90) days.

17. Cost Participation by County. If the County and Subdivider agree the County will participate in the expense of installing any of the Improvements, the respective benefits and obligations of the parties shall be governed by the terms of a Community Facilities Construction Agreement executed by the parties thereto, and the terms of that agreement shall control to the extent of any inconsistency with this Agreement.

18. Conditions of Draw on Security. The County may draw upon any financial guarantee posted in accordance with Paragraph 11 upon the occurrence of one or more of the following events:

- a. Subdivider's failure to construct the Improvements in accordance with Paragraph 8 of this Agreement;
- b. Subdivider's failure to renew or replace the Letter of Credit at least forty-five (45) days prior to the expiration date of the Letter of Credit;
- c. Subdivider's failure to replace or confirm the Letter of Credit if the Issuer fails to maintain the minimum rating acceptable to the County, in accordance with Paragraph 11 of this Agreement; or
- d. Issuer's acquisition of the Property or a portion of the Property, through foreclosure or an assignment or conveyance in lieu of foreclosure.

The County shall provide written notice of the occurrence of one or more of the above events to the Subdivider, with a copy provided to the Issuer. Where a Letter of Credit has been provided as the financial guarantee, with respect to an event described by subparagraph (a), the County shall provide notice to the Subdivider and the Issuer of the specific default and the notice shall include a statement that the County intends to perform some or all of Subdivider's obligations under Paragraph 8 for specified Improvements if the failure is not cured. The notice with respect to a default under subparagraph (a) shall be given no less than twenty (20) days before presentation of a draft on the Letter of Credit, unless, in the reasonable opinion of the County, the failure creates an immediate and substantial harm to the public health or safety, in which case the notice shall state why the failure creates an immediate and substantial

harm to the public health or safety, and shall be given no less than five (5) days before presentation of a draft on the Letter of Credit. In the event of a draw based on subparagraph (a), the County shall be entitled to draw in the amount it considers necessary to perform Subdivider's obligations under Paragraph 8, up to the amount allocated according to Exhibit B for any improvement it states its intent to construct or complete in accordance with the standards and specifications for such improvement. The subdivider hereby grants to the County, its successors, assigns, agents, contractors, and employees, a nonexclusive right and easement to enter the Property for the purposes of constructing, maintaining, and repairing such improvements. Where a Letter of Credit has been provided as the financial guarantee, with respect to an event described by subparagraph (b), (c), or (d), the notice shall be given no less than twenty (20) days before presentation of a draft on the Letter of Credit. In lieu of honoring a draft based on an event described in subparagraph (b) or (c), the Issuer or the Subdivider may deliver to the County a substitute Letter of Credit if the event is described by subparagraph (b) or a substitute or confirming Letter of Credit if the event is described by subparagraph (c). If the Issuer has acquired all or a portion of the Property through foreclosure or an assignment or conveyance in lieu of foreclosure, in lieu of honoring a draft based on an event described in subparagraph (d), the Issuer may deliver to the County a substitute or confirming Letter of Credit.

19. Procedures for Drawing on the Letter of Credit. The County may draw upon the Letter of Credit in accordance with Paragraph 18 by submitting a draft to the Issuer in compliance with the terms of the Letter of Credit governing such draft. The Letter of Credit must be surrendered upon presentation of any draft which exhausts the Stated Amount of such Letter of Credit. The County may not draft under a Letter of Credit unless it has substantially complied with all its obligations to the Issuer under this Agreement and has properly completed and executed the draft in strict accordance with the terms of the Letter of Credit.

20. Measure of Damages. The measure of damages for breach of this Agreement by the Subdivider is the reasonable cost of completing the Improvements in conformance with the County's requirements, procedures, and specifications. For Improvements upon which construction has not begun, the estimated cost of the Improvements shown on Exhibit B will be prima facie evidence of the minimum cost of completion; however, neither that amount or the amount of the Letter of Credit establishes the maximum amount of the Subdivider's liability.

21. Remedies. The remedies available to the County, the

Subdivider, and Issuer under this Agreement and the laws of Texas are cumulative in nature.

22. Provisions for the Benefit of Issuer. The provisions of Paragraphs 9, 10, 11, 12, 15, 16, 18, 19, 21, 22, 23, 25, 26, 27, 28, 29, 30, 32, and 36 of this Agreement for the benefit of the Issuer may not be modified, released, diminished, or impaired by the parties without the prior written consent of the Issuer.

23. Third Party Rights. No person or entity who or which is not a party to this Agreement shall have any right of action under this Agreement, nor shall any such person or entity other than the County (including without limitation a trustee in bankruptcy) have any interest in or claim to funds drawn on the Letter of Credit and held in escrow by the County in accordance with this Agreement. Notwithstanding the preceding sentence, the Issuer shall have a right of action to enforce any provision of this Agreement where the Issuer is specifically named as a beneficiary of such provision pursuant to Paragraph 22.

24. Indemnification. The Subdivider hereby expressly agrees to indemnify and hold the County harmless from and against all claims, demands, costs, and liability of every kind and nature, including reasonable attorney's fees for the defense of such claims and demands, arising from any breach on the part of Subdivider of any provision in this Agreement, or from any act or negligence of Subdivider or Subdivider's agents, contractors, employees, tenants, or licensees in the construction of the Improvements. The Subdivider further agrees to aid and defend the County if the County is named as a defendant in an action arising from any breach on the part of Subdivider of any provision in this Agreement, or from any act of negligence of Subdivider or Subdivider's agents, contractors, employees, tenants, or licensees in the construction of the Improvements, except where such suit is brought by the Subdivider. The Subdivider is not an employee or agent of the County. Notwithstanding anything to the contrary contained in this agreement, the Subdivider does not agree to indemnify and hold the County harmless from any claims, demands, costs, or liabilities arising from any act or negligence of the County, its agents, contractors, employees, tenants, or licensees.

25. No Waiver. No waiver of any provision of this Agreement will be deemed or constitute a waiver of any other provision, nor will it be deemed or constitute continuing waiver unless expressly provided for by a written amendment to this Agreement; nor will the waiver of any default under this agreement be deemed a waiver of any subsequent defaults of the same type. The failure at any time to enforce this Agreement or covenant by the County, the Subdivider, or the Issuer, their heirs, successors or assigns, whether any violations thereof are known or not, shall not constitute a waiver or estoppel of the right to do so.

26. Attorney's Fees. Should either party or the Issuer, to the extent Issuer is named as specific beneficiary, be required to resort to litigation to enforce the terms of this agreement, the prevailing party, plaintiff or defendant, shall be entitled to recover its costs, including reasonable attorney's fees, court costs, and expert witness fees, from the other party. If the court awards relief to both parties, each will bear its own costs in their entirety.

27. Assignability. The benefits and burdens of this Agreement are personal obligations of the Subdivider and also are binding on the heirs, successors, and assigns of the Subdivider. The Subdivider's obligations under this Agreement may not be assigned without the express written approval of the County. The County's written approval may not be withheld if the Subdivider's assignee explicitly assumes all obligations of the Subdivider under this Agreement and has posted the required security. The County agrees to release or reduce, as appropriate, the Letter of Credit provided by the Subdivider if it accepts substitute security for all or any portion of the Improvements. The County, in its sole discretion, may assign some or all of its rights under this Agreement, and any such assignment shall be effective upon notice to the Subdivider and the Issuer.

28. Expiration. This Agreement shall terminate upon the expiration of the approval of the proposed final plat of the Subdivision or if the Subdivision is vacated by the Subdivider.

29. Notice. Any notice required or permitted by this Agreement is effective when personally delivered in writing or three (3) days after notice is deposited with the U.S. Postal Service, postage prepaid, certified with return receipt requested, and addressed as follows:

if to Subdivider:

Attn-

if to County:

Attn:

if to the Issuer:

at Issuer's address shown on the
Letter of Credit

The parties may, from time to time, change their respective addresses listed above to any other location in the United States for the purpose of notice under this Agreement. A party's change of address shall be effective when notice of the change is

provided to the other party in accordance with the provisions of this Paragraph.

30. Severability. If any part, term, or provision of this Agreement is held by the courts to be illegal, invalid, or otherwise unenforceable, such illegality, invalidity, or enforceability shall not affect the validity of any other part, term, or provision, and the rights of the parties will be construed as if the part, term, or provision was never part of this Agreement.

31. Personal Jurisdiction and Venue. Personal jurisdiction and venue for any civil action commenced by either party to this Agreement or the Issuer, whether arising out of or relating to the Agreement or the Letter of Credit, will be deemed to be proper only if such action is commenced in District Court for _____ County, Texas, or the United States District Court for the _____ District of Texas, _____ Division. The Subdivider expressly waives any right to bring such an action in or to remove such an action to any other court, whether state or federal. The Issuer, by providing a Letter of Credit pursuant to the terms of this Agreement, expressly waives any right to bring such an action in or to remove such an action to any other court, whether state or federal.

32. Release Upon Completion. Upon acceptance of all Improvements, the County agrees: (a) to complete, execute and deliver to the Subdivider and the Issuer a release in recordable form releasing the Subdivider and Subdivider's heirs, successors and assigns, and the Property from all provisions of this Agreement except those contained in Paragraph 10, and (b) to return to the Issuer the Letter of Credit and any Escrowed Funds not expended or obligated by the County for the completion of the Improvements

33. Captions Immaterial. The numbering, order, and captions or headings of the paragraphs of this agreement are for convenience only and shall not be considered in construing this agreement.

34. Entire Agreement. This Agreement contains the entire agreement between the parties and correctly sets forth the rights, duties, and obligations of each to the other as of the Effective Date. Any oral representations or modifications concerning this Agreement shall be of no force or effect excepting a subsequent written modification executed by both parties.

35. Authorization to Complete Blanks. By signing and delivering this agreement to the appropriate official of the County, the Subdivider authorizes completion of this Agreement by filling in the Effective Date below.

36. Binding Agreement. The execution and delivery of this agreement and the performance of the transactions contemplated thereby have been duly authorized by all necessary corporate and governmental action of the County. This Agreement has been duly executed and delivered by each party, and constitutes a legal, valid, and binding obligation of each party enforceable in accordance with the terms as of the effective Date. These representations and agreements are for the benefit of the Issuer, and have been relied on by the Issuer in issuing the Letter of Credit.

EXECUTED by the parties to be effective as of the day of
 , 19

County Official

Subdivider

[SIGNATURES OF THE PARTIES TO BE ACKNOWLEDGED]

EXHIBITS:

EXHIBIT A: METES AND BOUNDS DESCRIPTION OF PROPERTY

EXHIBIT B: SUBDIVISION IMPROVEMENTS

Subdivision Improvements. Subdivider and County agree the following improvements are required in connection with the approval and development of the Subdivision (collectively, the "Subdivision Improvements"). Subdivider agrees to deliver a financial guarantee acceptable in form and substance to the County in an amount equal to the Estimated Cost of Completion listed below, as follows:

<u>Description of Improvement(s)</u>	<u>Estimated Cost of Completion</u>
--------------------------------------	-------------------------------------

- a)
- b)
- c)

APPENDIX D

**WASTEWATER DISCHARGE PERMITS
ZAPATA COUNTY WATERWORKS
AND
SAN YGNACIO MUNICIPAL UTILITY DISTRICT**



PERMIT NO. 13383-01

TEXAS WATER COMMISSION
Stephen F. Austin State Office Building
Austin, Texas

This minor amendment supersedes and replaces Permit No. 13383-01 approved July 31, 1989 and is reissued pursuant to 31 TAC 305.96(b).

PERMIT TO DISPOSE OF WASTES
under provisions of Chapter 26
of the Texas Water Code

I. Name of Permittee:

A. Name

Zapata County Water Control and
Improvement District

B. Address

P.O. Box 93
San Ygnacio, Texas 78067

II. Type of Permit: Regular _____ Amended XXX

III. Nature of Business Producing Waste: Municipality

IV. General Description and Location of Waste Disposal System:

Description: The treatment facility consists of a facultative lagoon with a surface area of 2.16 acres and two stabilization/storage ponds with a total surface area of 3.43 acres and the storage capacity is 35.1 acre-feet. An additional 9.7 acre-feet of storage would be obtained by increasing the depth in the facultative lagoon from 6 to 10 feet. The total storage capacity would be 44.9 acre-feet. Effluent is used to irrigate approximately 72 acres of pastureland.

Location: The plant site is located approximately 1/2 mile east of U.S. Highway 83 and 2 1/2 miles north-northeast of the City of San Ygnacio, Zapata County, Texas. The irrigation site is located to the north and east of the plant site.

This permit and the authorization contained herein shall expire at midnight, February 9, 1998.

APPROVED, ISSUED, AND EFFECTIVE this 28th day of March, 1990.

ATTEST: Brenda W. Jester

Billy
For the Commission

FACILITY COMPLETED OPERATIONAL 12-91
NOTIFICATION RECEIVED 8-8-91

V. Conditions of the Permit: No discharge of pollutants to surface water in the State is authorized.

Character: Treated Domestic Sewage Effluent

Volume: 30-day Average - 0.194 MGD from the treatment system

Quality: The following degree of treatment shall be required:

A. <u>Parameter</u>	Effluent Concentrations (Not to Exceed) Single Grab
BOD ₅ , mg/l	100

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units.

B. Monitoring Requirements:

<u>Parameter</u>	<u>Monitoring Frequency</u>	<u>Sample Type</u>
Flow, MGD	Five/week	Instantaneous
BOD ₅ , mg/l	One/month	Grab
pH	One/month	Grab

The monitoring shall be done after the final treatment unit and prior to irrigation. These records shall be maintained on a monthly basis and be available at the plant site for inspection by authorized representatives of the Commission for at least three years.

Drainage Area: The plant site and irrigated land are located in the drainage area of the Rio Grande in Segment No. 2304 of the Rio Grande Basin.

VI. SPECIAL PROVISIONS:

1. This permit is granted subject to the policy of the Commission to encourage the development of areawide waste collection, treatment and disposal systems. The Commission reserves the right to amend this permit in accordance with applicable procedural requirements to require the system covered by this permit to be integrated into an areawide system, should such be developed; to require the delivery of the wastes authorized to be collected in, treated by or discharged from said system, to such areawide system; or to amend this permit in any other particular to effectuate the Commission's policy. Such amendments may be made when the changes required are advisable for water quality control purposes and are feasible on the basis of waste treatment technology, engineering, financial, and related considerations existing at the time the changes are required, exclusive of the loss of investment in or revenues from any then existing or proposed waste collection, treatment or disposal system.
2. These public sewerage facilities shall be operated and maintained by a sewage plant operator holding a valid certificate of competency issued pursuant to state law.
3. The permittee is authorized to dispose of the digested sludge at a permitted Texas Department of Health (TDH) landfill or registered sludge disposal site. The sludge from the treatment process shall be disposed of in accordance with all the applicable rules of the TDH. The permittee shall ensure that the disposal of sludge does not cause any contamination of the ground or surface waters in the State. The permittee shall keep records of all sludges removed from the wastewater treatment plant site. Such records will include the following information:
 - a. Volume of sludge disposed
 - b. Date of disposal
 - c. Identity of hauler
 - d. Location of disposal site
 - e. Method of final disposal

The above records shall be maintained on a monthly basis and be available at the plant site for inspection by authorized representatives of the Commission for at least three years.

The disposal of the sludge at the plant site is a violation of this permit.

4. The permittee shall maintain and operate the treatment facility in order to achieve optimum efficiency of treatment capability. This shall include required monitoring of effluent flow and quality as well as appropriate grounds and building maintenance.

VI. SPECIAL PROVISIONS: (Cont'd)

5. Irrigation practices shall be designed and managed so as to prevent ponding of effluent or contamination of ground and surface waters and to prevent the occurrence of nuisance conditions in the area. Tail-water control facilities shall be provided to prevent the discharge of any wastewater from the irrigated land, as required.
6. Application rates for the irrigated land shall not exceed 4.2 acre-feet/acre/year. The permittee is responsible for providing equipment to determine application rates and maintaining accurate records of the volume of effluent applied as irrigation water. These records shall be made available for review by the Texas Water Commission and shall be maintained for at least three years.
7. All irrigation practices shall receive approval from the Texas Water Commission.
8. Holding ponds shall conform to the Texas Water Commission "Design Criteria for Sewerage Systems" requirements for stabilization ponds with regard to construction and levee design, and a minimum of 2 feet of freeboard shall be maintained.
9. Monitoring requirements contained in the permit are suspended from the effective date of the permit until plant startup. The permittee shall provide written notice to the Austin Office, Water Quality Division, Applications Unit and the District Office of the Commission forty-five (45) days prior to plant startup.
10. An annual representative soil sample from the root zone of the irrigated site shall be required. Sampling procedures shall employ accepted techniques of soil science for obtaining representative analytical results. Analysis shall be performed for pH, total nitrogen, potassium, phosphorus and conductivity. Prior to commencing irrigation disposal, permittee shall obtain representative soil samples from the root zones of the irrigation disposal site. The Permittee shall submit the result of the soil samples to Austin Office, Water Quality Division, Enforcement Section and the District Office of the Commission during September of each year.
11. The permittee shall maintain a long term contract with the owner(s) of any irrigated land which is authorized for use in this permit, or own the land authorized for irrigation.
12. Adequate signs shall be erected stating that the irrigation water is from a non-potable water supply. Said signs shall consist of a red slash superimposed over the international symbol for drinking water accompanied by the message "Do not drink the water" in both English and Spanish. All piping transporting the effluent shall be clearly marked with these same signs.
13. Spray fixtures for the irrigation system shall be of such design that they cannot be operated by unauthorized personnel.

VI. SPECIAL PROVISIONS: (Cont'd)

14. Facilities for the retention of treated or untreated wastewater shall be adequately lined to control seepage. The following methods of pond lining are acceptable.
 - a. In-situ clay soils or placed and compacted clay soils meeting the following requirements:
 - 1) More than 30% passing a No. 200 mesh sieve
 - 2) Liquid limit greater than 30%
 - 3) Plasticity index greater than 15
 - 4) A minimum thickness of 2 feet
 - b. Membrane lining with a minimum thickness of 20 mils, and an underdrain leak detection system.
 - c. An alternate method of pond lining may be utilized with prior approval from the Executive Director.

The permittee shall furnish certification by a Texas Registered Professional Engineer that the completed pond lining meets the appropriate criteria above prior to utilization of the facilities. The certification shall be sent to the Enforcement Section, Water Quality Division of the Texas Water Commission.

VII. STANDARD PROVISIONS:

1. This permit is granted in accordance with the Texas Water Code and the rules and other Orders of the Commission and the laws of the State of Texas.
- 2.a. The permittee shall report any noncompliance to the Executive Director (attention: Water Quality Division, Enforcement Section) which may endanger human health or safety, or the environment. Report of such information shall be provided orally within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission of such information shall also be provided within five (5) working days of the time the permittee becomes aware of the noncompliance. The written submission shall contain a description of the noncompliance and its cause; the potential danger to human health or safety, or the environment; the period of noncompliance, including exact dates and times; if the noncompliance has not been corrected, the anticipated time it is expected to continue; and, steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.
- b. Any noncompliance which is 40% over the permitted effluent limitations shall be reported orally within 24 hours and in writing to the District Office within five (5) working days of becoming aware of the condition.

VII. STANDARD PROVISIONS: (Cont'd)

3. Acceptance of this permit constitutes an acknowledgement and agreement that the permittee will comply with all the terms, provisions, conditions, limitations and restrictions embodied in this permit and with the rules and other Orders of the Commission and the laws of the State of Texas. Agreement is a condition precedent to the granting of this permit.
4. Prior to any transfer of this permit, Commission approval must be obtained. The Commission should be notified, in writing, of any change in control or ownership of facilities authorized by this permit. Such notification should be sent to the Permit Applications Unit in the Water Quality Division.
5. The application pursuant to which the permit has been issued is incorporated herein; provided, however, that in the event of a conflict between the provisions of this permit and the application, the provisions of the permit shall control.
6. The permittee is subject to the provisions of 31 TAC 305.125.
7. Whenever flow measurements for any sewage treatment facility in the state reaches 75 percent of the permitted average daily flow for three consecutive months, the permittee must initiate engineering and financial planning for expansion and/or upgrading of the wastewater treatment and/or collection facilities. Whenever, the average daily flow reaches 90 percent of the permitted average daily flow for three consecutive months, the permittee shall obtain necessary authorization from the Texas Water Commission to commence construction of the necessary additional treatment and/or collection facilities. In the case of a wastewater treatment facility which reaches 75 percent of the permitted average flow for three consecutive months, and the planned population to be served or the quantity of waste produced is not expected to exceed the design limitations of the treatment facility, the permittee will submit an engineering report supporting this claim to the executive director. If in the judgment of the executive director the population to be served will not cause permit noncompliance, then the requirements of this section may be waived. To be effective, any waiver must be in writing and signed by the director of the water quality division of the Texas Water Commission, and such waiver of these requirements will be reviewed upon expiration of the existing permit. However, any such waiver shall not be interpreted as condoning or excusing any violation of any permit parameter.
8. The permittee shall remit an annual waste treatment inspection fee to the Commission as required by 31 TAC Chapter 305 (Subchapter M). Failure to pay this fee may result in revocation of this permit.



TEXAS WATER COMMISSION
Stephen F. Austin State Office Building
1700 N. Congress Ave.
Austin, Texas 78711

PERMIT NO. 10462-001
(corresponds to
NPDES PERMIT NO. TX0070211)

This is a renewal of Permit
No. 10462-001, approved
November 10, 1987.

PERMIT TO DISPOSE OF WASTES
under provisions of Chapter 26
of the Texas Water Code

Zapata County

whose mailing address is

Box 2824
Zapata, Texas 78076

is authorized to treat and dispose of wastes from the wastewater treatment facilities located approximately 1/2 mile east of U.S. Highway 83 on Third Avenue in the City of Zapata in Zapata County, Texas

to International Falcon Reservoir in Segment No. 2303 of the Rio Grande Basin

only in accordance with effluent limitations, monitoring requirements and other conditions set forth herein, as well as the rules of the Texas Water Commission ("Commission"), the laws of the State of Texas, and other orders of the Commission. The issuance of this permit does not grant to the permittee the right to use private or public property for conveyance of wastewater along the herein described discharge route. This includes property belonging to but not limited to any individual, partnership, corporation or other entity. Neither does this permit authorize any invasion of personal rights nor any violation of federal, state, or local laws or regulations. It is the responsibility of the permittee to acquire property rights as may be necessary to use the herein described discharge route.

This permit and the authorization contained herein shall expire at midnight, five years after the date of Commission approval.

ISSUED DATE: APR 8 1993

ATTEST:

Maria A. Vasquez

John Hall
For the Commission

FINAL EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Outfall Number 001

1. During the period beginning upon the date of issuance and lasting through the date of expiration, the permittee is authorized to discharge subject to the following effluent limitations:

The daily average flow of effluent shall not exceed 0.8 million gallons per day (MGD); nor shall the average discharge during any two-hour period (2-hour peak) exceed 786 gallons per minute (gpm).

Effluent Characteristic	Discharge Limitations		Minimum Self-Monitoring Requirements	
	Daily Avg mg/l(lbs/day)	7-day Avg mg/l	Daily Max mg/l	Report Daily Avg. & Daily Max. Measurement Frequency Sample Type
Flow, MGD	Report	N/A	Report	Continuous Totalizing meter
Biochemical Oxygen Demand (5-day)	10(67)	15	25	35 One/week Composite
Total Suspended Solids	15(100)	25	40	60 One/week Composite

2. The effluent shall contain a chlorine residual of at least 1.0 mg/l and shall not exceed a chlorine residual of 4.0 mg/l after a detention time of at least 20 minutes (based on peak flow), and shall be monitored daily by grab sample. An equivalent method of disinfection may be substituted only with prior approval of the Commission.

3. The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored twice per month by grab sample.

4. There shall be no discharge of floating solids or visible foam in other than trace amounts and no discharge of visible oil.

5. Effluent monitoring samples shall be taken at the following location(s): Following the final treatment unit.

6. The effluent shall contain a minimum dissolved oxygen of 4.0 mg/l and shall be monitored once per week by grab sample.

DEFINITIONS AND STANDARD PERMIT CONDITIONS

As required by Title 31 Texas Administrative Code (TAC) Chapter 305 certain regulations appear as standard condition in waste discharge permits. All definitions contained in Section 26.001 of the Texas Water Code shall apply to this permit and are incorporated herein by reference. Additional definitions of words or phrases used in this permit are as follows:

1. **Flow Measurements**
 - a. **Daily average flow** - the arithmetic average of all determinations of the daily discharge within a period of one calendar month. The daily average flow determination shall consist of determinations made on at least four separate days. If instantaneous measurements are used to determine the daily discharge, the determination shall be the average of all instantaneous measurements taken during a 24-hour period or during the period of daily discharge if less than 24 hours. Daily average flow determination for intermittent discharges shall consist of a minimum of three flow determinations or days of discharge.
 - b. **Instantaneous flow** - the measured flow during the minimum time required to operate the flow measuring device.
 - c. **2-hour peak (domestic wastewater treatment plants)** - the maximum flow sustained for a two hour period during the period of daily discharge. Multiple measurements of instantaneous maximum flow within a two-hour period may be compared to the permitted 2-hour peak flow.
 - d. **Daily maximum flow** - the highest total flow permitted for a 24-hour period.
2. **Concentration Measurements**
 - a. **Daily average concentration** - the arithmetic average of all effluent samples, composite or grab as required by this permit, within a period of one calendar month, consisting of at least four separate representative measurements. (i) for domestic wastewater treatment plants - When four samples are not available in a calendar month, the arithmetic average (weighted by flow) of all values in the previous four consecutive month period consisting of at least four measurements shall be utilized as the daily average concentration. (ii) for all other wastewater treatment plants - When four samples are not available in calendar month, the arithmetic average (weighted by flow) of all values taken during the month shall be utilized as the daily average concentration.
 - b. **7-day average concentration** - the arithmetic average of all effluent samples, composite or grab, within a period of one calendar week, consisting of at least three separate measurements.
 - c. **Daily maximum concentration** - the maximum concentration measured on a single day (by composite sample).
 - d. **Fecal Coliform bacteria** - the number of colonies per 100 milliliters effluent.
3. **Sample Type**
 - a. **Composite sample** - a sample made up of a minimum of three effluent portions collected in a continuous 24-hour period or during the period of daily discharge if less than 24 hours, and combined in volumes proportional to flow collected no closer than two hours; or a sample continuously collected, proportional to flow, in a continuous 24-hour period or during the period of daily discharge if less than 24 hours.
 - b. **Grab sample** - an individual sample collected in less than 15 minutes.
4. **Treatment Facility (facility)** - Wastewater facilities used in the conveyance, storage, treatment, recycling, reclamation and/or disposal of municipal sewage, industrial wastes, agricultural wastes, recreational wastes or other wastes including sludge handling or disposal facilities under the jurisdiction of the Commission.
5. The term "sludge" shall mean the solids and precipitates separated from wastewater by unit processes, which are not regulated as hazardous waste.

MONITORING AND REPORTING

1. Self-Reporting

31 TAC §305.125(17) Monitoring results shall be provided at the intervals specified in the permit.

Unless otherwise specified in this permit or otherwise ordered by the Commission, the permittee shall conduct effluent sampling and reporting in accordance with 31 TAC §§319.4-319.7.

Unless otherwise specified, a monthly effluent report must be submitted each month by the 20th day of the following month for each discharge which is described by this permit whether or not a discharge is made for that month. Knowingly making any false statement on any such report may result in the imposition of criminal and/or civil penalties as provided by State law.

2. Test Procedures

Test procedures for the analysis of pollutants shall comply with procedures specified in 31 TAC §§319.10-319.11. Measurements, tests, and calculations shall be accurately accomplished in a representative manner.

3. Records of Results

31 TAC §305.125(11) Monitoring and reporting requirements are as follows:

- (a) Monitoring samples and measurements shall be taken at times and in a manner so as to be representative of the monitored activity.
- (b) Monitoring and reporting records, including strip charts and records of calibration and maintenance, copies of all records required by the permit, and the certification required by 40 Code of Federal Regulations §264.73(b)(9) shall be retained at the facility site for a period of three years from the date of the record or sample, measurement, report, or certification. This period may be extended at the request of the executive director.
- (c) Records of monitoring activities shall include the following:
 - (i) date, time and place of sample or measurement;
 - (ii) identity of individual who collected the sample or made the measurement;
 - (iii) date of analysis;
 - (iv) identity of the individual and laboratory who performed the analysis;
 - (v) the technique or method of analysis; and
 - (vi) the results of the analysis or measurement.

The period during which records are required to be kept shall be automatically extended to and through the final disposition of any administrative or judicial enforcement action that may be instituted against the permittee.

4. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit using approved analytical methods as specified above, the results of such monitoring that indicate permit noncompliance shall be included in the calculation and reporting of the value submitted on the required monthly effluent report. The results of such monitoring that indicate permit compliance may also be reported and included in calculations. Increased frequency of sampling shall be indicated on the report.

5. Calibration of Instruments

All automatic flow measuring and/or recording devices and/or totalizing meters required by the permit for measuring permit limited flows shall be accurately calibrated by a trained person at plant startup and as often thereafter as necessary to ensure accuracy, but not less often than annually unless authorized by the Executive Director for a longer period. Such person shall verify in writing that the device is operating properly and giving accurate results. Copies of the verification shall be kept at the plant site for at least three years.

6. Compliance Schedule Reports

31 TAC §305.125(18) Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of the permit shall be submitted no later than 14 days following each schedule date.

7. Noncompliance Notification

- a. 31 TAC §305.125(9) Unless specified otherwise, the permittee shall report any noncompliance to the executive director which may endanger human health or safety, or the environment. Report of such information shall be provided orally within 24 hours from the time the permittee becomes aware of the noncompliance. A written submission of such information shall also be provided within five working days of the time the permittee becomes aware of the noncompliance. The written submission shall contain a description of the noncompliance and its cause; the potential danger to human health or safety, or the environment; the period of noncompliance, including exact dates and times; if the noncompliance has not been corrected, the anticipated time it is expected to continue; and, steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.

- b. Any noncompliance which is 40% over the permitted effluent limitation shall be reported orally within 24 hours and in writing to the District Office within 5 working days of becoming aware of the condition.
- c. 31 TAC §305.125(12) Any noncompliance other than that specified in this section, or any required information not submitted or submitted incorrectly, shall be reported to the executive director as promptly as possible. (This requirement means to report these types of noncompliance on the monthly self-report form)

2. Signatories To Reports

31 TAC §305.125(14) All reports and other information requested by the executive director shall be signed by the person and in the manner required by 31 TAC §305.128 (relating to Signatories to Reports).

PERMIT CONDITIONS

1. General

- a. 31 TAC §305.125(19) Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in an application or in any report to the executive director, it shall promptly submit such facts or information.
- b. This permit is granted on the basis of the information supplied and representations made by the permittee during the application process and in reliance upon the accuracy and completeness of that information and those representations. After notice and opportunity for a hearing, this permit may be modified, suspended, or revoked, in whole or in part in accordance with 31 TAC 305.61-305.68, during its term for cause including, but not limited to, the following:
 - (i) Violation of any terms or conditions of this permit;
 - (ii) Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or
 - (iii) A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
- c. 31 TAC §305.125(6) The permittee shall furnish to the executive director, upon request and within a reasonable time, any information to determine whether cause exists for amending, revoking or, suspending, or terminating the permit. The permittee shall also furnish to the executive director, upon request, copies of records required to be kept by the permit.

2. Compliance

- a. 31 TAC §305.124 Acceptance of the permit by the person to whom it is issued constitutes an acknowledgement and agreement that such person will comply with all the terms and conditions embodied in the permit, and the rules and other orders of the commission.
- b. 31 TAC §305.125(1) The permittee has a duty to comply with all conditions of the permit. Failure to comply with any permit condition constitutes a violation of the permit and the Texas Water Code or the Texas Solid Waste Disposal Act, and is grounds for enforcement action, for permit amendment, revocation or suspension, or for denial of a permit renewal application or of an application for a permit for another facility.
- c. 31 TAC §305.125(3) It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.
- d. 31 TAC §305.125(4) The permittee shall take all reasonable steps to minimize or correct any adverse impact on the environment resulting from noncompliance with the permit and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.
- e. 31 TAC §305.125(8) Authorization from the commission is required before beginning any change in the permitted facility or activity that would result in noncompliance with other permit requirements.
- f. 31 TAC §305.125(15) A permit may be amended, suspended and reissued, or revoked for cause. The filing of a request by the permittee for a permit amendment, suspension and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

5. There shall be no unauthorized bypasses of wastewater. For purposes of this permit a bypass is considered the discharge of untreated or partially treated wastewater which exceeds the permit limits and is not caused solely by an act of God. Routing wastewater around a treatment unit or units resulting in a discharge which does not exceed permit limits is not a bypass. In the event that a discharge of partially or untreated wastewater is anticipated to cause a violation of permit limits application shall be submitted to the Commission for authorization to discharge untreated or partially treated wastewater pursuant to Section 26.0191 of the Texas Water Code and 31 TAC 305.21-305.30.

3. Inspections and Entry

- a. 31 TAC §305.125(10) Inspection and entry shall be allowed as prescribed in the Texas Water Code, Chapters 26, 27 and 28, and the Texas Solid Waste Disposal Act, Texas Civil Statutes, Article 4477-7, §7.
- b. The members of the commission and employees and agents of the commission are entitled to enter any public or private property at any reasonable time for the purpose of inspecting and investigating conditions relating to the quality of water in the state. Members, employees, or agents acting under this authority who enter private property shall observe the establishment's rules and regulations concerning safety, internal security, and fire protection, and if the property has management in residence, shall notify management or the person then in charge of his presence and shall exhibit proper credentials. If any member, employee, or agent is refused the right to enter in or on public or private property under this authority, the executive director may invoke the remedies authorized in Texas Water Code Section 26.123.

4. Permit Amendment

- a. 31 TAC §305.125(7) The permittee shall give notice to the executive director prior to physical alterations or additions to the permitted facility if such alterations or additions would require a permit amendment or result in a violation of permit requirements.
- b. Prior to any facility modifications, additions and/or expansions of a permitted facility that will increase the plant capacity beyond the permitted flow, the permittee must apply for and obtain proper authorization from the Commission before commencing construction.
- c. 31 TAC §305.125(2) The permittee must apply for an amendment or renewal prior to expiration of the existing permit in order to continue a permitted activity after the expiration date of the permit. Authorization to continue such activity will terminate upon the effective denial of said application.
- d. Prior to accepting wastes which are not described in the permit application or which would result in a significant change in the quantity or quality of the existing discharge, the permittee must report the proposed changes to the Commission. The permittee must apply for a permit amendment reflecting any necessary changes in permit conditions, including effluent limitations for pollutants not identified and limited by this permit.
- e. Texas Water Code §26.029(b) After a public hearing, notice of which shall be given to the permittee, the Commission may require the permittee, from time to time, for good cause, to conform to new or additional conditions. The Commission shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Commission may grant additional time.

5. Permit Transfer

- a. Prior to any transfer of this permit, Commission approval must be obtained. The Commission shall be notified, in writing, of any change in control or ownership of facilities authorized by this permit. Such notification should be sent to the Permit Application Unit in the Water Quality Division.
- b. 31 TAC §305.125(13) A permit may be transferred only according to the provisions of 31 TAC §305.64 (relating to Transfer of Permits) and 31 TAC 305.97 (relating to Action on Application for Transfer).

6. Relationship to Hazardous Waste Activities

This permit does not authorize any activity of hazardous solid waste storage, processing, or disposal which requires a permit or other authorization pursuant to the Texas Solid Waste Disposal Act, Article 4477-7, Vernon's Annotated Texas Civil Statutes.

7. Relationship to Water Rights

Disposal of treated effluent by any means other than discharge directly to the waters in the state must be specifically authorized in this permit and may require a permit pursuant to Chapter 11 of the Texas Water Code.

8. Property Rights

31 TAC §305.125(16) A permit does not convey any property rights of any sort, or any exclusive privilege.

9. Permit Enforceability

The conditions of this permit are severable, and if any provision of this permit, or the application of or provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

OPERATIONAL REQUIREMENTS

1. 31 TAC §305.125(5) The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of the permit.

2. Unless otherwise specified in this permit or otherwise ordered by the Commission, the permittee shall comply with all provisions of 31 TAC §§319.21 - 319.29 concerning the discharge of certain hazardous metals, and upon request of the executive director, the permittee shall take samples of the final effluent and provide proper analysis of such samples in order to demonstrate compliance with these rules.

3. In accordance with 31 TAC §335.6:

a. The permittee shall notify the Executive Director in writing of any closure activity or facility expansion at least 90 days prior to conducting such activity.

b. Closure activities include those associated with any pit, pond, lagoon, or surface impoundment regulated by this permit.

4. The permittee is responsible for installing prior to plant startup, and subsequently maintaining, adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failures by means of alternate power sources, standby generators, and/or retention of inadequately treated wastewater.

5. Unless otherwise specified, the permittee shall provide a readily accessible sampling point and, where applicable, an effluent flow measuring device or a means by which effluent flow may be determined based upon influent measuring.

6. The permittee shall remit an annual waste treatment inspection fee to the Commission as required by 31 TAC 305 (Subchapter M). Failure to pay this fee may result in revocation of this permit.

7. Documentation

For all written notifications to the Commission required of the permittee by this permit, the permittee shall keep and make available a copy of each such notification, upon the same basis as self-monitoring data are required to be kept and made available.

8. 31 TAC §305.126 whenever flow measurements for any domestic sewage treatment facility reach 75 percent of the permitted average daily flow for three consecutive months, the permittee must initiate engineering and financial planning for expansion and/or upgrading of the domestic wastewater treatment and/or collection facilities. Whenever the average daily flow reaches 90 percent of the permitted average daily flow for three consecutive months, the permittee shall obtain necessary authorization from the Commission to commence construction of the necessary additional treatment facilities. In the case of a domestic wastewater treatment facility which reaches 75 percent of the permitted daily average flow for three consecutive months, and the planned population to be served or the quantity of waste produced is not expected to exceed the design limitations of the treatment facility, the permittee shall submit an engineering report supporting this claim to the Executive Director of the Commission. If in the judgment of the Executive Director the population to be served will not cause permit noncompliance, then the requirement of this section may be waived. To be effective, any waiver must be in writing and signed by the Executive Director or his or her designee, and such waiver of these requirements will be reviewed upon expiration of the existing permit. However, any such waiver shall not be interpreted as condoning or excusing any violation of any permit parameter.

9. Sewage treatment plants shall be operated and maintained by sewage plant operators holding a valid certificate of competency as defined in 31 TAC 325.1.

10. Plans and Specifications Approval

The plans and specifications for domestic sewage collection and treatment works associated with the discharge authorized by this permit must be approved pursuant to State law, and failure to secure approval before commencing construction of such works or making a discharge therefrom is a violation of this permit and each day of discharge is an additional violation until approval has been secured.

OTHER REQUIREMENTS

1. This Category C facility shall be operated and maintained by a chief operator or operator in responsible charge holding a valid Class C certificate of competency or higher issued pursuant to 31 TAC Chapter 325. All shift supervisors and other plant operators shall be certified in accordance with the provisions of the Chapter therein. Note, Class D certificates are not renewable at any activated sludge facility, regardless of size, or any trickling filter or RBC facility with a permitted flow greater than 100,000 gallons per day.
2. The permittee shall comply with the following sludge requirements:
 - A. The permittee is authorized to dispose of sludge at a co-disposal landfill or a commercial land application site permitted by the Texas Department of Health/Texas Water Commission. The disposal of sludge by land application on property owned, leased or under the direct control of the permittee is a violation of the permit.
 - B. The permittee shall use only those sewage sludge disposal practices that comply with the federal regulations for landfills and solid waste disposal established at 40 CFR Part 257 and 258 and in accordance with all the applicable rules of the Texas Water Commission.
 - C. The permittee shall handle and dispose of sewage sludge in accordance with all applicable state and federal regulations to protect public health and the environment from any reasonable anticipated adverse effects due to any toxic pollutants which may be present.
 - D. If an applicable "acceptable management practice" or numerical limitation for pollutants in sewage sludge promulgated under Section 405(d)(2) of the Clean Water Act is more stringent than the sludge pollutant limit or acceptable management practice in this permit, or controls a pollutant not listed in this permit, this permit may be modified or revoked and reissued to conform to the requirements promulgated under Section 405(d)(2). In accordance with 40 CFR 122.41, one year following promulgation of the technical sludge regulations (40 CFR 503), the facility must be in compliance with all requirements regardless of whether the permit is modified to incorporate these standards.
 - E. Sewage Sludge Management Practices
 - i. Disposal of sewage sludge shall not cause a discharge to waters in the State, including ground water or cause non-point source pollution of waters in the State. Sludge shall not be applied closer than 200 feet to any natural or artificial body of water.
 - ii. Disposal of sewage sludge shall not cause or contribute to the taking of any endangered or threatened species of plant, fish or wildlife.
 - iii. Disposal of sewage sludge shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species.

- iv. Sludge shall not be applied under provisions of this section on land within a designated 100 year flood plain.
- F. The permittee shall give 180 days prior notice to the Executive Director of any change planned in the sewage sludge disposal practice.

G. Reporting Requirements

The permittee shall keep records of all sludge disposal activities. Such records will include the following information:

- i. Amount of sludge disposal dry weight (tons or, if land applied, lbs/acre) at each disposal site.
- ii. Date(s) of disposal.
- iii. Identity of hauler(s).
- iv. Location of disposal site(s).
- v. Method of final disposal.
- vi. Owner of disposal site.
- vii. Texas Department of Health/Texas Water Commission permit number.

The above records shall be maintained on a monthly basis and shall be reported to the Austin Office, Watershed Management Division, Municipal Permits Unit and the District Office in May of each year. The permittee shall maintain the above records for five years and shall be made available to the Texas Water Commission upon request.

3. The permittee is authorized to use the treated effluent from this facility to irrigate the Los Ebanos Golf Course (See Attachment "A") in accordance with the following provisions.

A. Application rates for the irrigated land shall not exceed 4.2 acre-feet/acre/year. The permittee is responsible for providing equipment to determine application rates and maintaining accurate records of the volume of effluent applied as irrigation water. These records shall be made available for review by the Texas Water Commission and shall be maintained for at least three years.

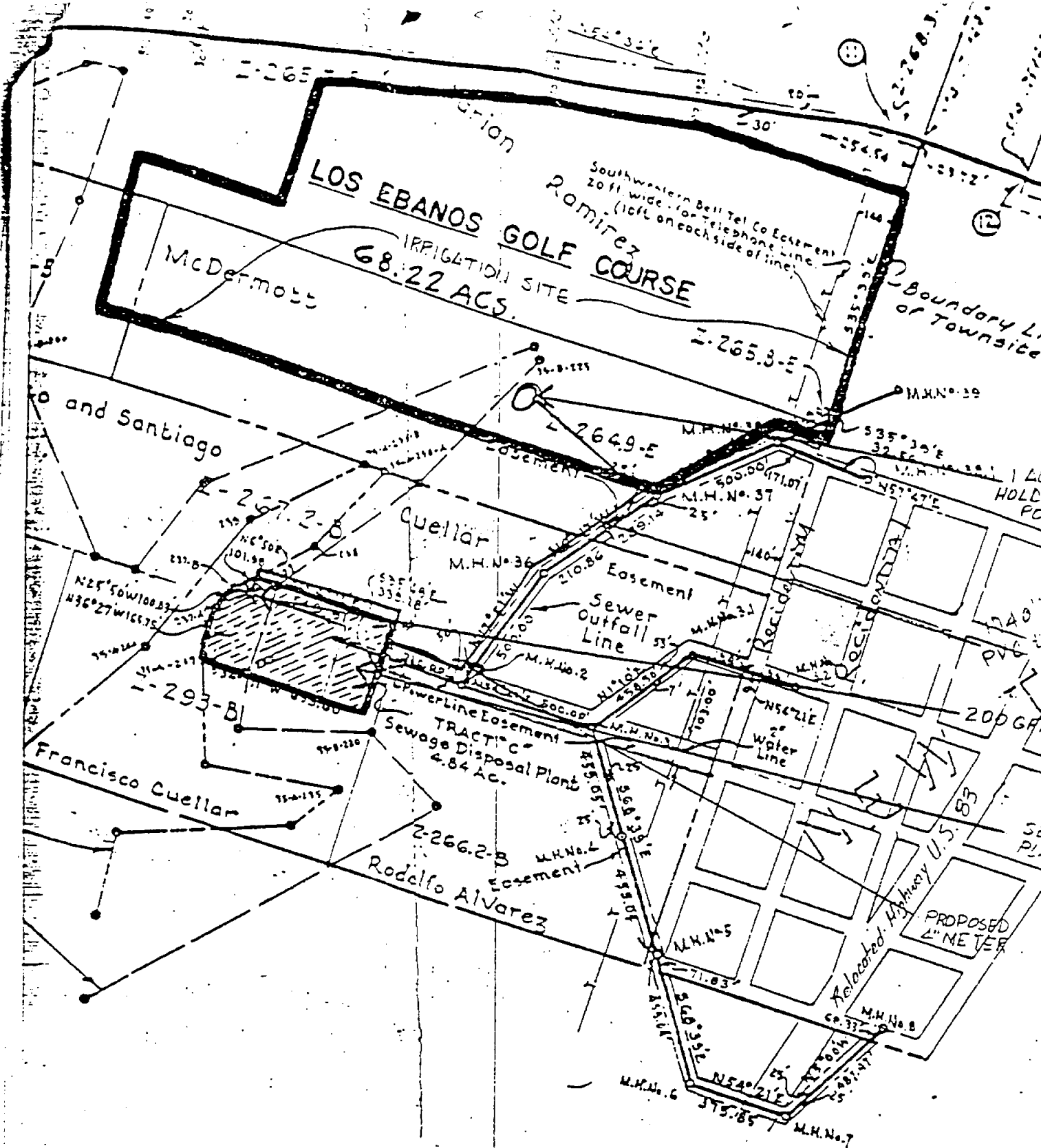
B. The permittee shall obtain representative soil samples from the root zones of the irrigation disposal site and analyze the samples as outlined in the following paragraph.

Annual-analyses of composite soil samples taken from the root zone of the irrigated site shall be made. Obtain 10 to 15 cores for each composite sample. Obtain a composite sample for each zone of soil depth per 60 acres per uniform soil type. Each soil boring shall be separated into three samples according to the following depth zones: 0 to 6 inches, 6 to 18 inches and 18 to 30 inches below the ground surface. Each zone shall be thoroughly mixed prior to being analyzed. Sampling procedures shall employ accepted techniques of soil science for obtaining representative analytical results.

Analysis shall be performed for pH, and extractable nitrates, extractable potassium, extractable phosphorus.

The Permittee shall submit the results of the soil sample analyses to the Austin Office, Watershed Management Division, Enforcement Section and the District Office of the Commission during September of each year.

- C. Irrigation practices shall be designed and managed so as to prevent ponding of effluent or contamination of ground and surface waters and to prevent the occurrence of nuisance conditions in the area. Tailwater control facilities shall be provided as necessary to prevent the discharge of any wastewater from the irrigated land.
- D. If the effluent is to be transferred to a holding pond or tank, re-chlorination prior to the effluent being delivered into the irrigation system will be required. A trace chlorine residual shall be maintained in the effluent at the point of irrigation application.
- E. Adequate signs shall be erected stating that the irrigation water is from a non-potable water supply. Said signs shall consist of a red slash superimposed over the international symbol for drinking water accompanied by the message "Do not drink the water" in both English and Spanish. All piping transporting the effluent shall be clearly marked with these same signs.
- F. Spray fixtures for the irrigation system shall be of such design that they cannot be operated by unauthorized personnel.
- G. Irrigation with effluent shall be accomplished only when the area specified is not in use.
- H. Permanent transmission lines shall be installed from the holding pond to each tract of land to be irrigated utilizing effluent from that pond.
- I. Issuance on this permit does not convey any water rights to the county for the irrigation authorized in this permit. A secondary use permit approved by the Commission may be required to authorize the use of effluent for irrigation.
- J. The flow shall be measured prior to irrigation.



ATTACHMENT "A"
(N.T.S.)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VI
1445 ROSS AVENUE, SUITE 1200
DALLAS, TEXAS 75202

June 14, 1991

CERTIFIED MAIL: RETURN RECEIPT REQUESTED (P 323 412 331)

REPLY TO: 6W-PS

Mr. Adrian R. Ramirez
Director of Utilities
Zapata County Waterworks
Box 2824
Zapata, Texas 78076

Re: NPDES Permit No. TX0070211-Zapata County Waterworks

Dear Mr. Ramirez:

Your National Pollutant Discharge Elimination System (NPDES) permit is enclosed. The draft permit which we previously sent you received no comments. The effective date and the expiration date of this final permit appears on the cover page.

Should you have any questions concerning the permit, please feel free to contact the Permits Branch at the above address or telephone (214) 655-7190.

Enclosure

cc: (with permit)
TWC

Permit No. TX0070211

AUTHORIZATION TO DISCHARGE UNDER THE
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended by the Water Quality Act of 1987 (Public Law No. 100-4, et. seq.), hereinafter called the "Act",

Zapata County Waterworks
Box 2824
Zapata, Texas 78076

is authorized to discharge from a facility located approximately one-half mile south of U.S. Highway 83 and Third Avenue in the City of Zapata, Zapata County, Texas,

to receiving waters named Falcon Reservoir in Segment No. 2303 of the Rio Grande Basin,

the discharge is located on that water at the following coordinates:

Latitude: 26° 58' 08" N
Longitude: 99° 59' 24" W

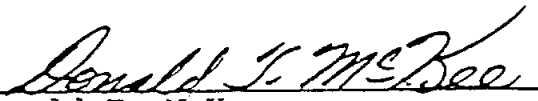
in accordance with effluent limitations, monitoring requirements and other conditions set forth in Parts I, II, and III hereof.

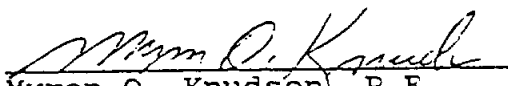
This permit shall become effective on June 15, 1991

This permit and the authorization to discharge shall expire at midnight, June 14, 1996

Prepared by:

Signed this 14th day of June 1991


Donald T. McKee
Municipal Permit Section
(6W-PM)


Myron O. Knudson, P.E.
Director
Water Management Division
(6W)

SECTION A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

Final Effluent Limits

During the period beginning on the effective date of this permit and lasting through date of expiration, the permittee is authorized to discharge from outfall serial number 001.

Such discharges shall be limited and monitored by the permittee as specified below:

<u>Effluent Characteristics</u>	<u>Discharge Limitations</u>		
	kg/day(lbs/day) 30-day Avg.	Other Units (Specify) 30-day Avg. 7-day Avg.	
Flow	N/A	*	*
Biochemical Oxygen Demand (5-day)	30 (67)	10 mg/l	15 mg/l
Total Suspended Solids	45 (100)	15 mg/l	25 mg/l
Dissolved Oxygen (Minimum)	N/A	4 mg/l	N/A
Fecal Coliform Bacteria (Colonies/100 ml)	N/A	200	400

<u>Effluent Characteristics</u>	<u>Monitoring Requirements</u>	
	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow*	Continuous	Totalizing meter
Biochemical Oxygen Demand (5-day)	One/week	3-hr. composite
Total Suspended Solids	One/week	3-hr. composite
Dissolved Oxygen	One/week	Grab
Fecal Coliform Bacteria	One/quarter	Grab

* Flow must be monitored and reported.

The pH shall not be less than 6.0 standard units nor greater than 9.0 standard units and shall be monitored by grab samples collected at the frequency shown above for Total Suspended Solids.

There shall be no discharge of floating solids or visible foam in other than trace amounts.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the discharge from the final treatment unit.

SECTION B. MONITORING AND REPORTING

1. The permittee shall effectively monitor the operation and efficiency of all treatment and control facilities and the quantity and quality of the treated discharge.

2. Monitoring information required shall be on Discharge Monitoring Report Form EPA 3320-1, as required in Part III, D.4, and shall be submitted quarterly. Each quarterly submittal shall include separate forms for EACH month of the reporting period.

a. Reporting periods shall end on the last day of the months March, June, September and December.

b. The first Discharge Monitoring Report(s) shall represent facility operations from the effective date of the permit through the last day of the current reporting period.

c. Thereafter, the permittee is required to make regular quarterly reports as described above and shall submit those reports no later than the 28th day of the month following each reporting period.

3. If any 7-day average or daily maximum value exceeds the effluent limitations specified in Part I.A., the permittee shall report the excursion in accordance with the requirements of Part III, D.

4. Any 30-day average, 7-day average or daily maximum value reported in the required Discharge Monitoring Report which is in excess of the effluent limitation specified in Part I, A. shall constitute evidence of violation of such effluent limitation and of this permit.

5. Other measurements of oxygen demand (e.g., TOC and COD) may be substituted for five-day Biochemical Oxygen Demand (BOD5) or for five-day Carbonaceous Biochemical Oxygen Demand (CBOD5), as applicable, where the permittee can demonstrate long-term correlation of the method with BOD5 or CBOD5 values, as applicable. Details of the correlation procedures used must be submitted and prior approval granted by the permitting authority for this procedure to be acceptable. Data reported must also include evidence to show that the proper correlation continues to exist after approval.

SECTION A. OTHER REQUIREMENTS

1. CONTRIBUTING INDUSTRIES AND PRETREATMENT REQUIREMENTS

a. The following pollutants may not be introduced into the treatment facility:

- (1) Pollutants which create a fire or explosion hazard in the publicly owned treatment works (POTW), including, but not limited to, wastestreams with a closed cup flashpoint of less than 140 degrees Fahrenheit or 60 degrees Centigrade using the test methods specified in 40 CFR 261.21;
- (2) Pollutants which will cause corrosive structural damage to the POTW, but in no case discharges with pH lower than 5.0, unless the works are specifically designed to accommodate such discharges;
- (3) Solid or viscous pollutants in amounts which will cause obstruction to the flow in the POTW, resulting in interference;
- (4) Any pollutant, including oxygen demanding pollutants (e.g., BOD), released in a discharge at a flow rate and/or pollutant concentration which will cause interference with the POTW;
- (5) Heat in amounts which will inhibit biological activity in the POTW resulting in interference but in no case heat in such quantities that the temperature at the POTW treatment plant exceeds 40 degrees Centigrade (104 degrees Fahrenheit) unless the Approval Authority, upon request of the POTW, approves alternate temperature limits;
- (6) Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
- (7) Pollutants which result in the presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems; and
- (8) Any trucked or hauled pollutants, except at discharge points designated by the POTW.

b. The permittee shall require any indirect discharger to the treatment works to comply with the reporting requirements of Sections 204(b), 307, and 308 of the Act, including any requirements established under 40 CFR Part 403.

c. The permittee shall provide adequate notice of the following:

- (1) Any new introduction of pollutants into the treatment works from an indirect discharger which would be subject to Sections 301 and 306 of the Act if it were directly discharging those pollutants; and
- (2) Any substantial change in the volume or character of pollutants being introduced into the treatment works by a source introducing pollutants into the treatment works at the time of issuance of the permit.

Any notice shall include information on (i) the quality and quantity of effluent to be introduced into the treatment works, and (ii) any anticipated impact of the change on the quality or quantity of effluent to be discharged from the POTW.

2. SEWAGE SLUDGE REQUIREMENTS

- a. The permittee shall use only those sewage sludge disposal practices that comply with the federal regulations for landfills and solid waste disposal established at 40 CFR 257.
- b. The permittee shall handle and dispose of sewage sludge in accordance with all applicable state and federal regulations to protect public health and the environment from any reasonably anticipated adverse effects due to any toxic pollutants which may be present.
- c. If an applicable "acceptable management practice" or numerical limitation for pollutants in sewage sludge promulgated at Section 405(d)(2) of the Clean Water Act is more stringent than the sludge pollutant limit or acceptable management practice in this permit, or controls a pollutant not listed in this permit, this permit may be modified or revoked and reissued to conform to the requirements promulgated at Section 405(d)(2). In accordance with 40 CFR 122.41, one year following promulgation of the technical standards for sludge use and disposal, the facility must be in compliance with all requirements regardless of whether the permit is modified to incorporate these standards.
- d. Sewage Sludge Management Practices
 1. Sewage sludge, if land applied, shall not be spread when soil is saturated, frozen or covered with ice, or during rain or when precipitation is imminent.

2. Disposal of sewage sludge shall not cause a discharge to waters of the United States or cause non-point source pollution of waters of the United States.
 3. Disposal of sewage sludge shall not cause any underground drinking water source to exceed the limitations at 40 CFR 257, Appendix I.
 4. Disposal of sewage sludge shall not cause or contribute to the taking of any endangered or threatened species of plant, fish or wildlife.
 5. Disposal of sewage sludge shall not result in the destruction or adverse modification of the critical habitat of endangered or threatened species.
 6. Disposal of sewage sludge in a floodplain shall not restrict the flow of the base flood, reduce the temporary storage capacity of the floodplain, or result in a washout of solid waste, so as to pose a hazard to human life, wildlife or land and water uses.
- e. The permittee shall give 120 days prior notice to the Director of any change planned in the sewage sludge disposal practice. Any change shall include any planned physical alterations or additions to the permitted treatment works, changes in the permittee's sludge use or disposal practice, and also alterations, additions, or deletions of disposal sites. These changes may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional disposal sites not reported during the permit application process or absent in the existing permit. Change in the sludge use or disposal practice may be cause for modification of the permit in accordance with 40 CFR 122.62(a)(1).
- f. Pathogen Control (If Land Applied)
1. Sewage sludge or septic tank pumpings that are applied to the land surface or incorporated into the soil shall be treated by a Process to Significantly Reduce Pathogens (PSRP) or a Process to Further Reduce Pathogens (PFRP) prior to application. Processes to significantly reduce pathogens include aerobic digestion, air drying, anaerobic digestion, composting, lime stabilization and other approved methods, as defined at 40 CFR 257, Appendix II. Processes to further reduce pathogens include composting, heat drying, heat treatment, thermophilic aerobic digestion and other approved methods, as defined at 40 CFR 257, Appendix II. If PSRP is conducted, public access to

the facility shall be controlled for at least 12 months, and grazing by animals whose products are consumed by humans shall be prevented for at least one month.

2. The permittee shall report annually on the Discharge Monitoring Report in the month the permit is effective the level of disinfection attained (i.e., PSRP or PFRP) if land applied.
3. A detailed description of all treatment processes including information such as residence time, temperature, and volatile solids reduction used to achieve PSRP and/or PFRP, or any other data which is necessary to demonstrate the pathogen reduction level of sludge, must be kept on site for purposes of inspection.

PART III
STANDARD CONDITIONS FOR NPDES PERMITS

SECTION A. GENERAL CONDITIONS

1. **Introduction**
In accordance with the provisions of 40 CFR Part 122.41, et. seq., this permit incorporates by reference ALL conditions and requirements applicable to NPDES Permits set forth in the Clean Water Act, as amended, (hereinafter known as the "Act") as well as ALL applicable regulations.
2. **Duty to Comply**
The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
3. **Toxic Pollutants**
 - a. Notwithstanding Part III.A.5, if any toxic effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is promulgated under Section 307(a) of the Act for a toxic pollutant which is present in the discharge and that standard or prohibition is more stringent than any limitation on the pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition.
 - b. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the Act for toxic pollutants within the time provided in the regulations that established those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.
4. **Duty to Reapply**
If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application shall be submitted at least 180 days before the expiration date of this permit. The Director may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date. Continuation of expiring permits shall be governed by regulations promulgated at 40 CFR Part 122.6 and any subsequent amendments.
5. **Permit Flexibility**
This permit may be modified, revoked and reissued, or terminated for cause in accordance with 40 CFR 122.62-64. The filing of a request for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.
6. **Property Rights**
This permit does not convey any property rights of any sort, or any exclusive privilege.
7. **Duty to Provide Information**
The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.
8. **Criminal and Civil Liability**
Except as provided in permit conditions on "Bypassing" and "Upsets", nothing in this permit shall be construed to relieve the permittee from civil or criminal penalties for noncompliance. Any false or materially misleading representation or concealment of information required to be reported by the provisions of the permit, the Act, or applicable regulations, which avoids or effectively defeats the regulatory purpose of the Permit may subject the Permittee to criminal enforcement pursuant to 18 U.S.C. Section 1001.
9. **Oil and Hazardous Substance Liability**
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the Act.
10. **State Laws**
Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law or regulation under authority preserved by Section 510 of the Act.
11. **Severability**
The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

SECTION B. PROPER OPERATION AND MAINTENANCE

1. **Need to Halt or Reduce not a Defense**
It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. The permittee is responsible for maintaining adequate safeguards to prevent the discharge of untreated or inadequately treated wastes during electrical power failure either by means of alternate power sources, standby generators or retention of inadequately treated effluent.
2. **Duty to Mitigate**
The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

3. **Proper Operation and Maintenance**
- The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by permittee as efficiently as possible and in a manner which will minimize upsets and discharges of excessive pollutants and will achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of this permit.
 - The permittee shall provide an adequate operating staff which is duly qualified to carry out operation, maintenance and testing functions required to insure compliance with the conditions of this permit.
4. **Bypass of Treatment Facilities**
- Bypass not exceeding limitations.** The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Parts 111.B.4.b. and 4.c.
 - Notice**
 - Anticipated bypass.** If the permittee knows in advance of the need for a bypass, it shall submit prior notice, if possible at least ten days before the date of the bypass.
 - Unanticipated bypass.** The permittee shall, within 24 hours, submit notice of an unanticipated bypass as required in Part 111.D.7.
 - Prohibition of bypass**
 - Bypass is prohibited, and the Director may take enforcement action against a permittee for bypass, unless:
 - Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
 - There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass which occurred during normal periods of equipment downtime or preventive maintenance; and,
 - The permittee submitted notices as required by Part 111.B.4.b.
 - The Director may allow an anticipated bypass after considering its adverse effects, if the Director determines that it will meet the three conditions listed at Part 111.B.4.c(1).
5. **Upset Conditions**
- Effect of an upset.** An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Part 111.E.5.b. are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.
 - Conditions necessary for a demonstration of upset.** A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
 - An upset occurred and that the permittee can identify the cause(s) of the upset;
 - The permitted facility was at the time being properly operated;
 - The permittee submitted notice of the upset as required by Part 111.D.7; and,
 - The permittee complied with any remedial measures required by Part 111.B.2.
 - Burden of proof.** In any enforcement proceeding, the permittee seeking to establish the occurrence of an upset has the burden of proof.
6. **Removed Substances**
Solids, sewage sludges, filter backwash, or other pollutants removed in the course of treatment or wastewater control shall be disposed of in a manner such as to prevent any pollutant from such materials from entering navigable waters.
7. **Percent Removal**
For publicly owned treatment works, the 30-day average percent removal for Biochemical Oxygen Demand and Total Suspended Solids shall not be less than 85 percent unless otherwise authorized by the permitting authority in accordance with 40 CFR 133.103.
- SECTION C. MONITORING AND RECORDS**
1. **Inspection and Entry**
The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by the law to:
 - Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;
 - Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 - Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices or operations regulated or required under this permit; and
 - Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.
2. **Representative Sampling**
Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.
3. **Retention of Records**
The permittee shall retain records of all monitoring

information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of the Director at any time.

4. Record Contents

Records of monitoring information shall include:

- a. The date, exact place, and time of sampling or measurements;
- b. The individual(s) who performed the sampling or measurements;
- c. The date(s) and time(s) analyses were performed;
- d. The individual(s) who performed the analyses;
- e. The analytical techniques or methods used; and
- f. The results of such analyses.

5. Monitoring Procedures

- a. Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, unless other test procedures have been specified in this permit or approved by the Regional Administrator.
- b. The permittee shall calibrate and perform maintenance procedures on all monitoring and analytical instruments at intervals frequent enough to insure accuracy of measurements and shall maintain appropriate records of such activities.
- c. An adequate analytical quality control program, including the analyses of sufficient standards, spikes, and duplicate samples to insure the accuracy of all required analytical results shall be maintained by the permittee or designated commercial laboratory.

6. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10% from true discharge rates throughout the range of expected discharge volumes.

SECTION D. REPORTING REQUIREMENTS

1. Planned Changes

a. Industrial Permits

The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required only when:

- (1) The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR Part 122.29(b); or,
- (2) The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants which are subject neither to effluent limitations in the permit, nor to

notification requirements listed at Part III.D.10.a.

b. Municipal Permits

Any change in the facility discharge (including the introduction of any new source or significant discharge or significant changes in the quantity or quality of existing discharges of pollutants) must be reported to the permitting authority. In no case are any new connections, increased flows, or significant changes in influent quality permitted that will cause violation of the effluent limitations specified herein.

2. Anticipated Noncompliance

The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements

3. Transfers

This permit is not transferable to any person except after notice to the Director. The Director may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under the Act.

4. Discharge Monitoring Reports and Other Reports

Monitoring results must be reported on Discharge Monitoring Report (DMR) Form EPA No. 3320-1 in accordance with the "General Instructions" provided on the form. The permittee shall submit the original DMR signed and certified as required by Part III.D.11 and all other reports required by Part III.D. to the EPA at the address below. Duplicate copies of DMR's and all other reports shall be submitted to the appropriate State agency(ies) at the following address(es):

EPA:

Water Management Division
Enforcement Branch (6W-E)
U.S. Environmental Protection
Agency, Region 6
1445 Ross Avenue
Dallas, TX 75202-2733

New Mexico:

Program Manager
Surface Water Section
Surface Water Quality Bureau
Environmental Improvement Division
New Mexico Health and
Environment Department
1190 Saint Francis Drive
Santa Fe, NM 87503

Oklahoma (Industrial Permits):

Director
Oklahoma Water Resources Board
P.O. Box 53585
Oklahoma City, OK 73152-3585

Louisiana:

Assistant Secretary for Water
Water Pollution Control Division
Louisiana Department of
Environmental Quality
P.O. Box 44091
Baton Rouge, LA 70804-4091

5. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR Part 136 or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Discharge Monitoring Report (DMR). Such increased monitoring frequency shall also be indicated on the DMR.

6. Averaging of Measurements

Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified by the Director in the permit.

7. Twenty-Four Hour Reporting

a. The permittee shall report any noncompliance which may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the permittee becomes aware of the circumstances. A written submission shall be provided within 5 days of the time the permittee becomes aware of the circumstances. The report shall contain the following information:

- (1) A description of the noncompliance and its cause;
- (2) The period of noncompliance including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and,
- (3) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

b. The following shall be included as information which must be reported within 24 hours:

- (1) Any unanticipated bypass which exceeds any effluent limitation in the permit;
- (2) Any upset which exceeds any effluent limitation in the permit; and,
- (3) Violation of a maximum daily discharge limitation for any of the pollutants listed by the Director in Part II (industrial permits only) of the permit to be reported within 24 hours.

c. The Director may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

8. Other Noncompliance

The permittee shall report all instances of noncompliance not reported under Parts III.D.4 and D.7 and Part I.B (for industrial permits only) at the time monitoring reports are submitted. The reports shall contain the information listed at Part III.D.7.

9. Other Information

Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Director, it shall promptly submit such facts or information.

10. Changes in Discharges of Toxic Substances

All existing manufacturing, commercial, mining, and silvicultural permittees shall notify the Director as soon as it knows or has reason to believe:

- a. That any activity has occurred or will occur which would result in the discharge, on a routine or

frequent basis, of any toxic pollutant listed at 40 CFR Part 122, Appendix D, Tables II and III (excluding Total Phenols) which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

- (1) One hundred micrograms per liter (100 µg/l);
- (2) Two hundred micrograms per liter (200 µg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/l) for 2,4 -dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
- (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application; or
- (4) The level established by the Director.

b. That any activity has occurred or will occur which would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":

- (1) Five hundred micrograms per liter (500 µg/l);
- (2) One milligram per liter (1 mg/l) for antimony;
- (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application; or
- (4) The level established by the Director.

11. Signatory Requirements

All applications, reports, or information submitted to the Director shall be signed and certified.

a. All permit applications shall be signed as follows:

- (1) For a corporation - by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:
 - (a) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation; or,
 - (b) The manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
- (2) For a partnership or sole proprietorship - by a general partner or the proprietor, respectively.
- (3) For a municipality, State, Federal, or other public agency - by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:
 - (a) The chief executive officer of the agency, or
 - (b) A senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

b. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

- (1) The authorization is made in writing by a person described above;
- (2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. A duly authorized representative may thus be either a named individual or an individual occupying a named position; and,
- (3) The written authorization is submitted to the Director.

c. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

12. Availability of Reports

Except for applications, effluent data, permits, and other data specified in 40 CFR 122.7, any information submitted pursuant to this permit may be claimed as confidential by the submitter. If no claim is made at the time of submission, information may be made available to the public without further notice.

SECTION E. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS

1. Criminal

a. Negligent Violations

The Act provides that any person who negligently violates permit conditions implementing Section 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than \$2,500 nor more than \$25,000 per day of violation, or by imprisonment for not more than 1 year, or both.

b. Knowing Violations

The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a fine of not less than \$5,000 nor more than \$50,000 per day of violation, or by imprisonment for not more than 3 years, or both.

c. Knowing Endangerment

The Act provides that any person who knowingly violates permit conditions implementing Sections 301, 302, 303, 306, 307, 308, 318, or 405 of the Act and who knows at that time that he is placing another person in imminent danger of death or serious bodily injury is subject to a fine of not more than \$250,000, or by imprisonment for not more than 15 years, or both.

d. False Statements

The Act provides that any person who knowingly makes any false material statement, representation, or certification in any application, record, report, plan, or other document filed or required to be maintained under the Act or who knowingly falsifies, tampers with, or renders inaccurate, any monitoring device or method required to be maintained under the Act, shall upon conviction, be punished by a fine of not more than \$10,000, or by imprisonment for not more than 2 years, or by both. If a conviction of a person is for a violation committed after a first conviction of such person under this paragraph, punishment shall be by a fine of not more than \$20,000 per day of violation, or by imprisonment of not more than 4 years, or by both. (See Section 309.c.4 of the Clean Water Act)

2. Civil Penalties

The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to a civil penalty not to exceed \$25,000 per day for each violation.

3. Administrative Penalties

The Act provides that any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the Act is subject to an administrative penalty, as follows:

a. Class I Penalty

Not to exceed \$10,000 per violation nor shall the maximum amount exceed \$25,000.

b. Class II Penalty

Not to exceed \$10,000 per day for each day during which the violation continues nor shall the maximum amount exceed \$125,000.

SECTION F. DEFINITIONS

All definitions contained in Section 502 of the Act shall apply to this permit and are incorporated herein by reference. Unless otherwise specified in this permit, additional definitions of words or phrases used in this permit are as follows:

1. "Act" means the Clean Water Act (33 U.S.C. 1251 et. seq.), as amended.
2. "Administrator" means the Administrator of the U.S. Environmental Protection Agency.
3. "Applicable effluent standards and limitations" means all state and Federal effluent standards and limitations to which a discharge is subject under the Act, including, but not limited to, effluent limitations, standards or performance, toxic effluent standards and prohibitions, and pretreatment standards.
4. "Applicable water quality standards" means all water quality standards to which a discharge is subject under the Act.
5. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility.
6. "Daily Discharge" means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in terms of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the sampling day. For pollutants with limitations expressed

in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the sampling day. "Daily discharge" determination of concentration made using a composite sample shall be the concentration of the composite sample. When grab samples are used, the "daily discharge" determination of concentration shall be arithmetic average (weighted by flow value) of all samples collected during that sampling day.

7. "Daily Average" (also known as monthly average) discharge limitations means the highest allowable average of "daily discharge(s)" over a calendar month, calculated as the sum of all "daily discharge(s)" measured during a calendar month divided by the number of "daily discharge(s)" measured during that month. When the permit establishes daily average concentration effluent limitations or conditions, the daily average concentration means the arithmetic average (weighted by flow) of all "daily discharge(s)" of concentration determined during the calendar month where C = daily concentration, F = daily flow and n = number of daily samples; daily average discharge =

$$\frac{C_1F_1 + C_2F_2 + \dots + C_nF_n}{F_1 + F_2 + \dots + F_n}$$

8. "Daily Maximum" discharge limitation means the highest allowable "daily discharge" during the calendar month.
9. "Director" means the U.S. Environmental Protection Agency Regional Administrator or an authorized representative.
10. "Environmental Protection Agency" means the U.S. Environmental Protection Agency.
11. "Grab sample" means an individual sample collected in less than 15 minutes.
12. "Industrial user" means a nondomestic discharger, as identified in 40 CFR 403, introducing pollutants to a publicly owned treatment works.
13. "National Pollutant Discharge Elimination System" means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 318, 402, and 405 of the Act.
14. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
15. "Sewage sludge" means the solids, residues, and precipitates separated from or created in sewage by the unit processes of a publicly owned treatment works. Sewage as used in this definition means any wastes, including wastes from humans, households, commercial establishments, industries, and storm water runoff, that are discharged to or otherwise enter a publicly owned treatment works.
16. "Treatment works" means any devices and systems used in the storage, treatment, recycling and reclamation of municipal sewage and industrial wastes of a liquid nature to implement Section 201 of the Act, or necessary to recycle or reuse water at the most economical cost over the estimated life of the works, including intercepting sewers, sewage collection systems, pumping, power and other equipment, and their appurtenances,

extension, improvement, remodeling, additions, and alterations thereof.

17. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.
18. For fecal coliform bacteria, a sample consists of one effluent grab portion collected during a 24-hour period at peak loads.
19. The term "MGD" shall mean million gallons per day.
20. The term "mg/l" shall mean milligrams per liter or parts per million (ppm).
21. The term "µg/l" shall mean micrograms per liter or parts per billion (ppb).
22. Municipal Terms:
- "7-day average", other than for fecal coliform bacteria, is the arithmetic mean of the daily values for all effluent samples collected during a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The 7-day average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar week.
 - "30-day average", other than for fecal coliform bacteria, is the arithmetic mean of the daily values for all effluent samples collected during a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month. The 30-day average for fecal coliform bacteria is the geometric mean of the values for all effluent samples collected during a calendar month.
 - "24-hour composite sample" consists of a minimum of 12 effluent portions collected at equal time intervals over the 24-hour period and combined proportional to flow or a sample collected at frequent intervals proportional to flow over the 24-hour period.
 - "12-hour composite sample" consists of 12 effluent portions collected no closer together than one hour and composited according to flow. The daily sampling intervals shall include the highest flow periods.
 - "6-hour composite sample" consists of six effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.
 - "3-hour composite sample" consists of three effluent portions collected no closer together than one hour (with the first portion collected no earlier than 10:00 a.m.) and composited according to flow.

APPENDIX E

PUBLIC HEARING TRANSCRIPT

9408—Notice of Special or Regular Meeting of Commissioners' Court and Return—Class 3 (976) ©

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HART

NOTICE OF MEETING OF THE

COMMISSIONERS' COURT OF ZAPATA COUNTY, TEXAS

Notice is hereby given that a Special meeting of the above named Commissioners' Court will be held on the 25th day of October, 1994, at 8:00 A. M., in the County Courthouse Annex I, Zapata Texas, at which time the following subjects will be discussed, to-wit:

- 1. PUBLIC HEARING -- Accept public comments on Zapata County water and wastewater regional planning study.
- 2. Call meeting to order
- 3. Discussion and action on authorizing Nelson Corporation to submit for water and wastewater specific Colonias Planning Grant to be submitted to Texas Water Development Board.
- 4. Request by Fire Department, J. J. Meza, for capital building improvements--

awnings, cabinets and glass door.

Date of this the 20th day of October, 1994.

CONSUELO R. VILLARREAL
COUNTY CLERK

1994 OCT 20 PM 3:33

FILED

ZAPATA COUNTY TEXAS

BY CAR

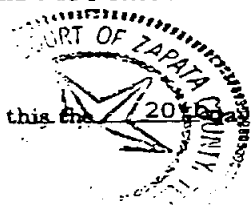
INPUT

Commissioners' Court of Zapata County, Texas

By David Morales
David Morales, County Judge

I, the undersigned, County Clerk, do hereby certify that the above Notice of Meeting of the above named Commissioners' Court, is a true and correct copy of said Notice, and that I posted a true and correct copy of said Notice on the bulletin board at the Courthouse door of Zapata County, Texas, at a place readily accessible to the general public at all times on the 20th day of October, 1994, and said Notice remained so posted continuously for at least 72 hours preceding the scheduled time of said Meeting.

Dated this the 20th day of October, 1994.



County Clerk Zapata County, Texas

By Consuelo R. Villarreal
Consuelo R. Villarreal, County Clerk
Res: Colina A. Rodriguez

5. Request by Fire Department, J.J. Mesa, to purchase cellular phones for Fire EMS and Emergency Management.
6. Discussion and action to approve the Zapata County Waterworks to purchase a back hoe through the Galveston-Houston Area Council.
7. Approval of Resolution for installation of sidewalks on the townsite of Zapata along U.S. Hwy. 83.
8. Approval of Resolution requesting the widening of F.M. 496.
9. Discussion and action to change name from Los Lobos Road to Old Falcon Road.
10. Adjourn.

**THE STATE OF TEXAS
COUNTY OF ZAPATA
IN THE COMMISSIONERS COURT OF ZAPATA COUNTY, TEXAS**

Be it remembered, that on this the 25th., day of October, A. D., 1994, the Commissioners' Court of Zapata County, Texas, convened in SPECIAL SESSION of said Court, at the regular meeting place thereof, in the Courthouse Annex I of Zapata, Texas, with the following members of said Court, to-wit:

PRESENT:

Hon. David Morales	County Judge
Jose Luis Flores	Commissioner, Precinct No. 1
Angel Garza	Commissioner, Precinct No. 2
Arturo A. Figueroa, Jr.	County Attorney

ABSENT:

Felix Garcia	Commissioner, Precinct No. 4
Consuelo R. Villarreal	County Clerk

(Absent due to death in the family. Marissa G. Rodriguez present for Mrs. Villarreal).

VISITORS:

Marissa G. Rodriguez, Elsa S. Gutierrez, Luisa Mata, Alejandro R. Ramirez, Mario Gonzalez-Davis, J. J. Meza and Andy Wells.

WHEREUPON, the following Orders and Proceedings were had by said Court,
to-wit:

**PUBLIC HEARING ACCEPT PUBLIC COMMENTS ON ZAPATA COUNTY
WATER AND WASTEWATER REGIONAL PLANNING STUDY**

MEETING CALLED TO ORDER AT 8:15 A.M.

ORDER AUTHORIZING NELSON CORPORATION TO SUBMIT FOR WATER AND WASTEWATER SPECIFIC COLONIAS PLANNING GRANT TO BE SUBMITTED TO TEXAS WATER DEVELOPMENT BOARD

Motion was made by Commissioner Garza, seconded by Commissioner Flores, to authorize Nelson Corporation to submit for water and wastewater specific Colonias Planning Grant to be submitted to Texas Water Development Board.

The above motion, being put to a vote, was approved by the affirmative vote of all members of the Court.

ORDER APPROVING REQUEST BY FIRE DEPARTMENT FOR CAPITAL BUILDING IMPROVEMENTS

Motion was made by Commissioner Flores, seconded by Commissioner Garza, to approve the request by the Fire Department for capital building improvements for awning, cabinets and glass door.

The above motion, being put to a vote, was approved by the affirmative vote of all members of the Court.

ORDER APPROVING REQUEST BY FIRE DEPARTMENT TO PURCHASE CELLULAR PHONES FOR FIRE EMS AND EMERGENCY MANAGEMENT

Motion was made by Commissioner Flores, seconded by Commissioner Garza, to approve the request by the Fire Department to purchase one cellular phone for Fire EMS and one cellular phone for Emergency Management.

The above motion, being put to a vote, was approved by the affirmative vote of all members of the Court.

ORDER APPROVING THE ZAPATA COUNTY WATERWORKS TO PURCHASE A BACK HOE THROUGH THE GALVESTON-HOUSTON AREA COUNCIL

Motion was made by Commissioner Flores, seconded by Commissioner Garza, to approve the Zapata County Waterworks to purchase a backhoe through the Galveston-Houston Area Council.

The above motion, being put to a vote, was approved by the affirmative vote of all members of the Court.

ORDER APPROVING RESOLUTION FOR INSTALLATION OF SIDEWALKS ON

THE TOWNSITE OF ZAPATA ALONG U. S. HWY 83

Motion was made by Commissioner Flores, seconded by Commissioner Garza, to approve a Resolution for the installation of sidewalks on the townsite of Zapata along U. S. Hwy 83.

The above motion, being put to a vote, was approved by the affirmative vote of all members of the Court.

ORDER APPROVING RESOLUTION REQUESTING THE WIDENING OF F. M. 496

Motion was made by Commissioner Flores, seconded by Commissioner Garza, to approve a Resolution requesting the widening of F. M. 496.

The above motion, being put to a vote, was approved by the affirmative vote of all members of the Court.

ORDER APPROVING CHANGE OF NAME FROM LOS LOBOS ROAD TO OLD FALCON ROAD

Motion was made by Commissioner Flores, seconded by Commissioner Garza, to approve the change of name from Los Lobos Road to Old Falcon Road.

The above motion, being put to a vote, was approved by the affirmative vote of all members of the Court.

ADJOURN

Motion to adjourn made by Commissioner Flores, seconded by Commissioner Garza, and being put to a vote, was approved by the affirmative vote of all members of the Court.

There being no further business for disposition at this term, the Court adjourned.

David Morales
DAVID MORALES, COUNTY JUDGE
ZAPATA COUNTY, TEXAS

ATTEST:

Consuelo R. Villarreal
CONSUELO R. VILLARREAL, COUNTY CLERK
ZAPATA COUNTY, TEXAS

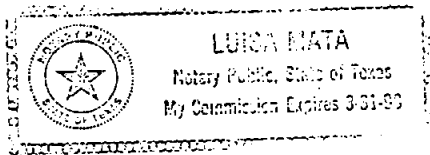
ZAPATA COUNTY NEWS

STATE OF TEXAS
COUNTY OF ZAPATA

Before me, the undersigned authority, on this day personally appeared Robert M. McVey, the Owner/Editor of the
(Name) (Title)
Zapata County News, a newspaper having general circulation in
Zapata County, Texas, who being by me duly sworn, deposes and says
that the foregoing attached notice was published in said newspaper
on the following date(s), to wit: Oct 20, 1994.

Robert M. McVey

Subscribed and sworn to before me this the 29 day of
November, 1994, to certify which witness my hand
and seal of office.



Luiza Mata
Notary Public in and for

Zapata County, Texas

PUBLISHER'S AFFIDAVIT

Citation By Publication

The State of Texas

To: All Persons Interested in the Welfare of Elda Bustamante, Mentally Incompetent:

You (and each of you) are hereby commanded to appear before the County Court of Zapata "County at the Courthouse thereof, in Zapata, Texas, at or before 9:00 a.m. on 31st day of October, 1994, which date is at least 10 days after the date of this Citation, in order that you may participate in a hearing concerning an APPLICATION FOR CONSENT TO ADOPT ELDA BUSTAMANTE, A MENTALLY INCOMPETENT PERSON, FILED BY CARMEN B. GONZALEZ, GUARDIAN OF THE PERSON AND ESTATE OF ELDA BUSTAMANTE AND JAIME GONZALEZ IN CAUSE NO. 693, STYLED IN RE: GUARDIANSHIP OF THE PERSON AND ESTATE OF ELDA BUSTAMANTE, A MENTALLY IMCOMPETENT.

FAILURE TO ATTEND THE ABOVE MENTIONED HEARING WILL RESULT IN A WAIVER OF ALL RIGHT WHICH MAY BE AFFECTED THEREBY.

Notice of Public Hearing

Notice is hereby given that on Oct. 25, 1994, Zapata County will conduct a public hearing at 9:00 o'clock (a.m.) at Court House Annex-Commissioners Court Room, Hidalgo and 7th, Zapata, Texas, 78076, relating to the Regional Water and Wastewater Study and Draft Report for Zapata County.

The Project consists of the development and production of a Report for the Zapata County Regional Water and Wastewater Study performed through a grant the County received from the Texas Water Development Board in 1994. The Study and Report will outline the regional water and wastewater needs of Zapata County and the general costs for providing water and wastewater services to inhabitants of Zapata County.

A copy of the Report relating to the Zapata County Regional Water and Wastewater Study is available for public review at the Judge's Office which is located at The Courthouse, Hidalgo and 7th, Zapata, Texas, 78076, during regular business hours.

One of the purposes of the hearing is to discuss the potential environmental impacts of the proposed projects and alternatives to them.

Each participant in the Public Hearing will be allowed no more than five minutes (5) to present comments.

signed/
Honorable David Morales
County Judge
Zapata County

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APPENDIX F

**ZAPATA COUNTY WATERWORKS
PUMPING RECORDS**

ZAPATA COUNTY WATERWORKS TOTAL PUMPAGE

1993

<u>MONTH</u>	<u>TOTAL/MONTH</u>	<u>MAXIMUM/DAY</u>	<u>AVERAGE/DAY</u>	<u>MINIMUM/DAY</u>
JANUARY	35,670,000	1,548,000	1,151,000	698,000
FEBRUARY	38,313,000	2,187,000	1,368,000	961,000
MARCH	39,831,000	2,006,000	1,285,000	517,000
APRIL	46,197,000	2,234,000	1,540,000	1,103,000
MAY	47,390,000	2,191,000	1,529,000	759,000
JUNE	47,108,000	2,179,000	1,570,000	799,000
JULY	62,130,000	2,644,000	2,004,000	1,211,000
AUGUST	74,722,000	2,863,000	2,410,000	1,890,000
SEPTEMBER	52,860,000	2,691,000	1,762,000	1,270,000
OCTOBER	54,817,000	2,254,000	1,768,000	920,000
NOVEMBER	47,917,000	2,411,000	1,597,000	588,000
DECEMBER	47,250,000	2,136,000	1,524,000	843,000

TOTAL GAL./YR. : 594,205,000

MAX. PUMPAGE/DAY : 2,863,000

MIN. PUMPAGE/DAY : 517,000

MONTHLY REPORT

Division of Water Hygiene
1100 West 49th Street
Austin, Texas 78756

WATER WORKS OPERATION FOR
SURFACE WATER SUPPLIES

Name of System Zapata County Waterworks County ZAPATA
Water System I.D. # 2530002 Month of JANUARY 1993

Stn. No.	Total Pumpage in 1000 Gallons	ANALYSIS							CHEMICAL TREATMENT			
		RAW			TREATED				mg/l		Chlorine Residual, mg/l	
		Turbidity	Alkalinity	pH	Turbidity	Alkalinity	pH	Hardness	Alum	Lime	Distribution	Plant
1057	11.0	114	8.2	0.6	110	7.8	240	31.49	2.85		3.5	
942	11.0	114	8.2	0.7	110	7.7	234	22.91	3.18		2.9	
977	11.0	118	8.1	0.6	112	7.7	238	25.77	3.07		3.4	
1229	11.0	116	7.9	0.6	112	7.7	234	25.56	1.63		3.3	
1326	11.0	116	7.9	0.4	112	7.7	236	23.78	1.51		3.4	
1354	12.0	114	8.0	0.7	110	7.7	236	24.09	1.48		3.1	
698	11.0	110	8.0	0.7	108	7.7	230	24.91	4.29		3.1	
1492	10.0	112	8.0	0.5	110	7.8	232	24.35	2.01		3.4	
1160	12.0	110	7.8	0.5	110	7.7	234	27.91	2.58		3.3	
923	13.0	112	7.9	0.6	110	7.7	236	28.97	3.25		3.0	
1392	12.0	116	7.9	0.6	112	7.8	238	21.97	2.15		3.2	
985	12.0	116	8.2	0.6	112	7.8	236	24.45	3.04		3.4	
867	10.0	116	8.0	0.6	106	7.8	246	32.22	6.91	3.2	3.3	
1274	11.0	114	8.0	0.6	110	7.8	244	26.45	2.35		3.0	
1230	11.0	114	8.0	0.6	110	7.8	240	28.27	2.44		3.0	
1013	9.0	120	8.0	0.6	116	7.8	242	25.45	2.96		3.5	
1136	9.0	114	7.9	0.6	110	7.8	246	24.29	2.64		3.4	
1036	9.0	110	7.9	0.6	104	7.9	248	20.25	2.96		3.5	
1367	10.0	110	7.9	0.5	100	7.7	246	17.63	2.19		3.4	
1181	11.0	116	7.9	0.5	114	7.7	240	16.45	1.69		3.4	
1256	11.0	116	7.9	0.5	112	7.7	240	17.18	1.59		3.5	
998	10.0	116	8.5	0.6	106	7.9	226	28.11	2.0		2.8	
1407	10.0	116	8.0	0.5	108	7.9	232	23.77	1.43		2.1	
1098	12.0	112	8.1	0.6	110	7.8	236	26.35	1.83		3.4	
955	10.0	112	7.9	0.6	116	7.7	238	27.49	2.34		3.5	
1548	11.0	114	7.9	0.6	114	7.8	240	23.01	2.87		3.4	
1356	11.0	122	8.0	0.6	116	7.8	240	25.47	2.21	1.1	3.0	
1339	11.0	118	8.0	0.6	116	7.7	242	24.0	2.24		3.2	
840	12.0	124	7.9	0.5	110	7.7	246	24.98	2.38		3.5	
989	13.0	120	8.0	0.6	116	7.8	236	23.04	2.02		3.4	
1356	12.0	118	8.0	0.5	114	7.8	236	23.45	1.47		2.9	
35270*	339	3570	247.9	17.9	3436	240.7	7376	764.49	78.56	20.0	100.2	
1151	11.0	115	8.0	0.58	111	7.76	238	24.62	2.53	2.5	3.23	
1548	13.0	124	8.5	0.7	116	7.9	248	32.22	6.91	3.5	3.5	
698	8.0	110	7.8	0.4	100	7.7	226	16.45	1.43	1.0	2.1	

BACTERIOLOGICAL CONTROL
SAMPLE RESULTS

Raw Water, MPN Weekly
Number: 1 Results: Found

Treated Water at Plant,
Minimum 3 days per week if distribution and plant chlorine residual not reported.

Number: Results:

Distribution System
Number: 8 Results: Not Found

CHEMICALS USED
Alum 7,262 lbs
Lime 725 lbs
Chlorine 2,550 lbs

Active Water Services _____ Latest Chemical Analysis Date: _____

Remarks _____

Prepared by Russel Sal Benavides Certificate No. 457-27-5646

All reports due by the 15th of the following month.

MONTHLY REPORT

Division of Water Hygiene
1100 West 49th Street
Austin, Texas 78756

WATER WORKS OPERATION FOR SURFACE WATER SUPPLIES

Name of System ZAPATA COUNTY WATER WORKS COUNTY ZAPATA
Water System I.D. # 2530002 Month of FEBRUARY 1993

Date of Month	Total Pumpage in 1000 Gallons	ANALYSIS							CHEMICAL TREATMENT			
		RAW			TREATED				mg/l		Chlorine Residual, mg/l	
		Turbidity	Alkalinity	pH	Turbidity	Alkalinity	pH	Hard. $\frac{ppm}{lbm}$	Alum	Lime	Distribution	Plant
1	1414	11.0	116	7.9	0.6	110	7.8	236	26.71	1.41		3.3
2	1346	11.0	112	7.9	0.7	116	7.7	236	22.27	1.48		3.5
3	1208	12.0	116	7.9	0.6	118	7.8	238	25.81	1.65		3.4
4	1002	10.0	118	7.9	0.5	116	7.8	242	27.52	1.99		3.5
5	1445	10.0	118	8.2	0.6	114	7.8	244	27.80	1.39		3.5
6	961	10.0	108	7.9	0.5	86	7.7	236	23.33	2.08		3.2
7	1057	11.0	118	8.0	0.6	116	7.7	234	21.53	1.89		3.2
8	1532	11.0	118	8.2	0.6	114	7.9	236	18.78	1.30		3.4
9	1146	11.0	118	8.2	0.6	112	7.8	240	26.58	1.74		3.4
10	1399	10.0	116	8.0	0.7	112	7.7	236	46.28	4.29		3.4
11	1449	10.0	116	8.2	0.6	112	7.7	242	20.94	2.07		3.5
12	1571	10.0	114	8.0	0.1	112	7.8	242	14.12	1.91	2.63	3.0
13	1239	9.0	116	8.1	0.1	112	7.8	244	15.10	2.42		3.5
14	1521	10.0	114	7.9	0.5	110	7.8	242	11.82	1.97		2.9
15	1539	10.0	116	8.0	0.1	112	7.8	240	13.24	3.90		3.4
16	1472	7.0	114	8.2	0.1	108	7.8	236	11.97	4.07		3.2
17	1483	7.0	114	8.0	0.4	110	7.8	244	12.69	1.35		2.2
18	1154	7.0	110	7.9	0.7	96	7.9	230	12.47	1.73		3.2
19	1097	7.0	112	7.9	0.5	96	7.9	234	13.12	1.82		3.1
20	1350	7.0	112	7.9	0.4	114	7.8	234	11.72	1.11		2.5
21	1386	7.0	110	8.0	0.4	106	7.8	220	11.85	1.08		2.9
22	1726	7.0	114	8.1	0.4	110	7.8	222	11.89	.87		3.2
23	1780	7.0	112	8.0	0.4	106	7.8	224	11.79	.84		3.5
24	1307	7.0	112	8.0	0.5	112	7.8	226	12.84	1.53		3.5
25	2187	7.0	116	8.0	0.5	112	7.9	224	12.88	.91		3.1
26	1281	7.0	118	7.9	0.4	114	7.8	230	14.23	1.56	2.0	3.4
27	1295	7.0	114	7.9	0.5	112	7.8	222	16.94	2.31		3.5
28	966	7.0	114	7.9	0.4	112	7.8	220	13.90	3.10		3.2
29												
30												
31												
Total	38313	246	3206	224	13.0	3080	218.3	6554	510.13	53.76	18.5	91.6
1	1368	8.79	114.5	8.0	.46	110	7.8	234	18.22	1.52	2.31	3.27
2	2187	12.0	118	8.2	0.7	118	7.9	244	46.28	4.29	3.5	3.5
3	961	6.0	108	7.9	0.1	86	7.7	230	11.72	.84	2.0	2.5

BACTERIOLOGICAL CONTROL SAMPLE RESULTS

Raw Water, MPN Weekly
Number: 1 Results: FOUND

Treated Water at Plant,
Minimum 3 days per week if distribution and plant chlorine residual not reported.

Number: Results:

Distribution System
Number: 8 Results: NOT FOUND

CHEMICALS USED
Alum 5696 lbs
Lime 600 lbs
Chlorine 2250 lbs

Latest Chemical Analysis Date: _____

Active Water Services _____

Remarks _____

Submitted by Luan Luis Benavides

Certificate No. 45727-5646

All reports due by the 15th of the following month.

MONTHLY REPORT

State Department of Health
 Division of Water Hygiene
 1100 West 49th Street
 Austin, Texas 78756

WATER WORKS OPERATION FOR SURFACE WATER SUPPLIES

Name of System ZAPATA COUNTY WATERWORKS County ZAPATA
 Water System I.D. # 2530002 Month of MARCH 19 93

Date	Total Pumpage in 1000 Gallons	ANALYSIS							CHEMICAL TREATMENT			
		RAW			TREATED				mg/l		Chlorine Residual, mg/l	
		Turbidity	Alkalinity	pH	Turbidity	Alkalinity	pH	Hardness	Alum	Lime	Distribution	Plant
1197	7.0	104	7.9	0.5	96	7.8	236	10.12	2.5		3.5	
783	7.0	108	7.9	0.5	110	7.9	238	12.14	1.9		3.3	
517	8.0	112	7.9	0.5	116	7.8	232	31.77	2.9		3.5	
963	8.0	120	8.0	0.5	116	7.8	232	15.44	1.6		3.3	
652	7.0	118	7.9	0.6	108	7.8	236	18.94	2.3		2.5	
1496	10.0	116	7.9	0.6	114	7.8	240	9.62	2.0		2.8	
1306	9.0	114	7.9	0.6	116	7.8	240	11.48	2.3		3.4	
1411	9.0	116	7.9	0.5	104	7.8	242	11.30	4.3		3.3	
1819	12.0	126	8.0	0.7	114	7.8	242	10.22	1.7		3.5	
2006	10.0	120	8.0	0.6	110	7.7	244	10.16	1.5		3.3	
1428	9.0	114	8.0	0.6	112	7.8	240	13.77	1.1	3.1	2.5	
1173	10.0	118	7.9	0.6	114	7.8	236	9.81	1.3		3.3	
1326	13.0	118	7.9	0.7	110	7.8	242	8.60	1.1		3.3	
1448	13.0	118	7.9	0.8	112	7.8	236	7.67	1.0		3.4	
1462	10.0	120	7.9	0.5	114	7.7	242	8.61	1.0		2.8	
1505	8.0	114	8.1	0.7	110	7.8	240	9.56	1.0		2.5	
958	9.0	110	8.1	0.5	108	7.8	240	11.01	1.6		2.6	
1514	8.0	112	8.0	0.5	110	7.8	242	10.60	1.0		3.5	
1350	8.0	116	8.0	0.6	114	7.8	242	9.33	1.7		3.1	
1310	8.0	112	8.0	0.6	110	7.7	240	9.61	1.1		3.5	
1240	8.0	112	8.0	0.7	114	7.9	240	8.22	1.2		3.4	
1414	8.0	110	7.7	0.7	112	7.8	250	7.63	1.1		2.9	
987	7.0	106	7.8	0.9	96	7.8	250	9.72	1.5		3.2	
966	7.0	112	7.8	0.7	110	7.8	244	7.70	1.6		3.3	
1580	7.0	108	7.8	0.3	92	7.8	252	12.14	1.0		3.3	
1265	4.0	116	7.7	0.3	98	7.7	260	15.55	1.2		3.3	
1301	5.0	114	7.4	0.4	108	7.9	256	14.84	1.5		3.1	
1281	8.0	112	7.8	0.4	110	7.7	242	15.54	1.6		2.7	
1504	5.0	110	7.7	0.4	108	7.7	246	14.51	1.3	3.0	3.5	
1295	8.0	116	7.9	0.5	114	7.7	242	15.74	4.6		3.5	
1374	6.0	116	8.0	0.4	108	7.7	250	15.27	4.4		3.0	
39831	256	3538	244.7	17.40	3388	241.3	7514	383.91	55.3	24.4	99.1	
1285	8.3	114	7.89	.56	109	7.78	242.5	12.38	1.78	3.1	3.3	
2006	13.0	126	8.1	.9	116	7.9	260	31.77	4.6	3.5	3.3	
517	4.0	104	7.4	.3	92	7.7	232	7.63	1.0	2.0	2.5	

BACTERIOLOGICAL CONTROL SAMPLE RESULTS

Raw Water, MPN Weekly
 Number: 1 Results: Found

Treated Water at Plant,
 Minimum 3 days per week if distribution and plant chlorine residual not reported.

Number: Results:

Distribution System
 Number: 8 Results: Not Found

CHEMICALS USED
 # Alum 3,896 lbs.
 # Lime 575 lbs.
 # Chlorine 3,000 lbs.

Active Water Services _____ Latest Chemical Analysis Date: _____

Remarks _____

Prepared by Juan Jose Benavides Certificate No. 457-27-5646

All reports due by the 15th of the following month.

MONTHLY REPORT

Division of Water Hygiene
1100 West 49th Street
Austin, Texas 78756

WATER WORKS OPERATION FOR SURFACE WATER SUPPLIES

Name of System ZAPATA COUNTY Waterworks
Water System I.D. # 2530002

County ZAPATA
Month of April 19 93

Date of Month	Total Pumpage in 1000 Gallons	ANALYSIS							CHEMICAL TREATMENT			
		RAW			TREATED				me/l		Chlorine Residual, mg/l	
		Turbidity	Alkalinity	pH	Turbidity	Alkalinity	pH	Hardness	Alum	Lime	Distribution	Plant
1	1474	4.0	120	8.0	0.3	110	7.8	244	17.02	4.07		2.6
2	1649	8.0	124	8.0	0.4	136	7.7	248	15.85	3.64		2.8
3	1398	10.0	124	7.9	0.5	128	7.8	248	15.18	2.14		2.9
4	1530	7.0	136	7.8	0.4	140	7.8	254	14.34	1.96		3.2
5	1456	7.0	122	8.0	0.3	116	7.7	256	18.45	2.06		3.3
6	2082	8.0	148	7.9	0.4	140	7.8	258	16.41	1.44		3.2
7	1607	8.0	140	7.9	0.5	132	7.8	252	25.0	1.87		2.8
8	1667	7.0	138	7.8	0.3	130	7.7	240	25.53	1.80		2.4
9	1238	9.0	116	7.9	0.3	114	7.8	252	23.24	1.61		3.5
10	1239	8.0	118	7.9	0.4	116	7.8	250	20.81	1.61		3.4
11	1229	8.0	116	7.9	0.3	116	7.7	250	18.05	1.63		3.5
12	1231	8.0	118	7.8	0.3	118	7.7	250	17.53	1.62		2.9
13	1914	8.0	114	7.9	0.4	116	7.6	250	18.48	1.04		3.5
14	1103	14.0	124	7.9	0.3	114	7.6	240	19.57	1.81		3.3
15	1459	14.0	118	7.8	0.4	114	7.7	250	17.26	2.05	3.5	3.1
16	1546	10.0	118	7.8	0.3	114	7.6	250	17.06	1.94		3.1
17	1592	15.0	122	7.9	0.5	118	7.6	250	18.08	1.88		3.1
18	1362	11.0	122	8.0	0.4	116	7.6	250	19.37	2.20		3.0
19	1631	11.0	122	7.8	0.3	118	7.6	250	18.53	1.94		2.6
20	1680	10.0	124	7.9	0.3	110	7.7	250	20.91	1.78		3.1
21	1479	10.0	128	7.8	0.3	120	7.7	248	19.46	4.05		3.5
22	1691	10.0	124	8.0	0.3	120	7.8	250	19.44	3.55		3.5
23	1613	10.0	130	7.9	0.4	120	7.7	250	20.07	3.72		3.1
24	1641	11.0	130	7.9	0.4	124	7.7	252	19.58	3.65		3.3
25	2234	13.0	128	7.9	0.4	120	7.7	250	19.05	2.68		3.2
26	1618	12.0	124	7.9	0.4	116	7.7	246	18.53	3.71		3.5
27	1986	12.0	120	7.8	0.4	116	7.7	264	18.11	3.02		3.3
28	1174	14.0	144	7.9	0.4	120	7.6	264	20.43	5.11		3.3
29	1527	13.0	124	7.9	0.5	120	7.7	260	21.20	7.85	2.5	3.3
30	1747	15.0	126	7.7	0.4	130	7.7	250	23.00	5.23		3.3
31												
31	46197	30.5	3762	236.5	11.20	3622	231.1	7526	575.24	182.56	23.9	94.6
31	1540	10.7	125	7.9	.37	121	7.7	251	19.17	2.75	3.0	3.2
31	2234	15.0	148	8.0	.5	140	7.8	264	25.53	7.85	3.5	3.5
31	1103	4.0	114	7.7	.3	110	7.6	240	19.34	1.04	2.0	2.4

BACTERIOLOGICAL CONTROL SAMPLE RESULTS

Raw Water, MPN Weekly
Number: 1 Results: 700 and

Treated Water at Plant,
Minimum 3 days per week if distribution and plant chlorine residual not reported.

Number: Results:

Distribution System
Number: 8 Results: Not Found

CHEMICALS USED
* Alum 7359 lbs
* Lime 1050 lbs
* Chlorine 2250 lbs

Latest Chemical Analysis Date: _____

Active Water Services _____

Remarks _____

By Juan Pal Benavides

Certificate No. 45727-5646

All reports due by the 15th of the following month.

MONTHLY REPORT

WATER WORKS OPERATION FOR SURFACE WATER SUPPLIES

Division of Water Hygiene
1100 West 49th Street
Austin, Texas 78756

Name of System Zapata County Waterworks
Water System I.D. # 2530002

County ZAPATA
Month of MAY 19 93

Stn. No.	Total Pumpage in 1000 Gallons	ANALYSIS							CHEMICAL TREATMENT			
		RAW			TREATED				mg/l		Chlorine Residual, mg/l	
		Turbidity	Alkalinity	pH	Turbidity	Alkalinity	pH	Hard.	Alum	Lime	Distribution	Plant
1244	11.0	140	7.8	0.4	130	7.7	260	23.61	4.8		3.2	
1233	16.0	148	7.8	0.4	130	7.7	264	23.83	4.9		3.5	
1550	12.0	136	7.9	0.3	120	7.7	268	25.76	3.9		3.1	
2028	12.0	130	7.9	0.4	122	7.8	256	27.20	5.9		3.2	
1533	12.0	120	7.8	0.4	104	7.7	256	29.65	3.9		3.5	
1864	11.0	120	7.8	0.4	104	7.7	256	28.95	6.4		3.5	
1399	11.0	118	7.9	0.6	96	7.7	246	29.14	4.3		3.2	
11353	10.0	116	7.9	0.5	104	7.8	246	27.97	4.4		2.6	
2191	12.0	120	7.9	0.5	106	7.7	250	26.34	2.7		2.7	
1133	17.0	120	7.9	0.6	124	7.7	248	33.34	5.3		3.5	
1240	15.0	120	7.9	0.5	116	7.7	260	34.33	4.8		3.2	
1166	16.0	120	7.9	0.5	118	7.8	258	37.54	5.1		3.1	
1685	12.0	118	7.9	0.4	118	7.8	256	33.80	7.1	2.4	2.9	
1919	10.0	120	7.8	0.5	116	7.6	254	29.06	3.1		2.9	
1387	10.0	122	7.8	0.4	118	7.7	250	28.09	4.3		3.1	
1550	10.0	120	7.8	0.4	112	7.6	240	27.54	3.9		3.4	
2183	10.0	120	7.8	0.4	110	7.6	240	22.74	2.8		2.5	
1456	15.0	110	7.8	0.4	100	7.8	246	27.16	8.3		3.3	
1562	13.0	110	7.8	0.4	90.6	7.7	244	32.78	3.8		3.6	
2189	13.0	118	7.8	0.4	112	7.7	250	30.40	2.7		3.5	
1401	14.0	120	7.9	0.4	110	7.7	246	30.88	4.3		3.1	
1770	13.0	124	7.9	0.5	120	7.7	254	33.74	3.4		3.5	
1305	12.0	128	7.9	0.4	124	7.7	254	33.99	4.6		3.0	
1459	17.0	124	7.9	0.4	114	7.7	260	31.64	4.1		3.5	
1565	17.0	124	7.9	0.3	114	7.7	260	35.63	3.8		3.2	
759	9.0	112	7.8	0.3	110	7.8	250	41.07	7.9		2.7	
1290	11.0	114	7.9	0.3	110	7.8	254	41.36	4.7	2.0	3.5	
1223	13.0	112	7.9	0.3	106	7.8	254	40.97	2.4		3.5	
1450	14.0	110	7.8	0.3	108	7.7	240	33.90	2.1		3.3	
1725	15.0	108	7.8	0.4	104	7.7	238	34.06	3.5		3.4	
1528	15.0	114	7.8	0.4	112	7.7	244	33.35	3.9		2.9	
47350	398	3736	243.4	12.80	3498	239.2	7964	969.47	137.1	17.40	99.0	
1529	12.84	120.52	7.85	0.41	112.84	7.72	257.74	31.27	4.42	2.2	3.19	
2191	17.0	148	7.9	0.6	130	7.8	268	41.86	8.3	5.5	3.5	
759	9.0	108	7.8	0.3	96	7.6	238	22.74	2.1	1.2	2.5	

BACTERIOLOGICAL CONTROL SAMPLE RESULTS

Raw Water, MPN Weekly
Number: 1 Results: Found

Treated Water at Plant,
Minimum 3 days per week if distribution and plant chlorine residual not reported.

Number: Results:

Distribution System
Number: Results:
5 Not Found

CHEMICALS USED
Alum 12 172 lbs
Lime 1700 lbs
Chlorine 4050 lbs

Active Water Services: _____ Latest Chemical Analysis Date: _____

Remarks: _____

Prepared by Juan Jose Bonavides Certificate No. 457-27564

MONTHLY REPORT

DIVISION OF WATER
1100 West 49th Street
Austin, Texas 78756

WATER WORKS OPERATION FOR SURFACE WATER SUPPLIES

Name of System Zapata County Waterworks County Zapata
 Water System I.D. # 2530002 Month of JUNE 19 93

Date of month	Total Pumpage in 1000 Gallons	ANALYSIS							CHEMICAL TREATMENT			
		RAW			TREATED				mg/l		Chlorine Residual, mg/l	
		Turbidity	Alkalinity	pH	Turbidity	Alkalinity	pH	Hardness	Alum	Lime	Distribution	Plant
1	1954	13.0	114	7.8	0.3	110	7.7	250	38.05	3.07		2.8
2	1979	11.0	108	7.8	0.3	100	7.7	256	43.93	3.03		1.8
3	2150	12.0	122	7.8	0.4	114	7.6	254	39.32	2.79		2.9
4	2116	15.0	120	7.8	0.4	120	7.7	264	36.83	2.83	2.9	2.9
5	1972	13.0	112	7.6	0.4	108	7.7	242	37.40	3.04		2.9
6	2014	18.0	116	7.9	0.4	106	7.7	264	40.78	5.95		3.1
7	2070	20.0	112	7.9	0.4	108	7.7	258	41.71	2.50		2.7
8	2171	18.0	116	7.9	0.5	110	7.7	254	39.21	5.52		3.3
9	2179	14.0	104	7.9	0.6	90	7.8	246	35.22	5.50		3.3
10	2157	15.0	108	7.9	0.7	100	7.8	252	51.14	5.56		3.3
11	1828	13.0	108	7.8	0.1	94	7.7	256	56.61	6.36		3.5
12	1192	15.0	110	7.8	0.3	100	7.7	250	35.21	5.03		3.5
13	1416	16.0	110	7.9	0.2	100	7.7	260	40.82	4.23		3.0
14	1256	15.0	114	7.9	0.3	112	7.7	258	31.50	4.77		3.3
15	1157	12.0	104	7.9	0.4	114	7.8	262	58.04	5.18		3.3
16	1750	10.0	110	7.8	0.1	104	7.7	256	62.35	3.48		3.4
17	1296	13.0	100	7.8	0.2	90	7.7	242	46.72	9.25		3.5
18	1377	14.0	114	7.9	0.1	112	7.7	236	36.83	8.71		3.3
19	1562	12.0	110	7.8	0.2	100	7.6	252	29.40	3.84		2.9
20	1301	11.0	110	7.8	0.2	108	7.8	240	34.75	4.61		2.9
21	799	12.0	96	7.6	0.2	96	7.7	248	62.58	15.01		2.7
22	1444	12.0	118	8.0	0.1	106	7.7	260	46.08	4.15		3.3
23	913	13.0	110	7.9	0.1	100	7.7	258	40.98	6.57		2.8
24	1269	12.0	110	7.9	0.2	108	7.7	254	39.78	4.72	2.2	3.5
25	1203	16.0	118	7.9	0.2	112	7.7	252	37.88	4.98		3.5
26	1444	11.0	118	7.9	0.4	98	7.7	252	38.36	4.15		3.5
27	1383	12.0	110	7.8	0.2	100	7.8	250	34.85	3.34		3.5
28	1081	13.0	108	7.9	0.2	98	7.7	240	38.60	5.55		3.5
29	1196	9.0	100	7.8	0.1	98	7.7	230	42.81	5.01		3.4
30	1479	10.0	104	7.9	0.1	88	7.7	224	51.80	8.11		3.4
31												
total	47188	460	3314	7.85	0.28	3098	7.71	250.7	42.32	5.28	2.6	3.14
av.	1570	13.3	110.5	7.85	0.28	103.3	7.71	250.7	42.32	5.28	2.6	3.14
max.	2179	20.0	122	8.0	0.7	120	7.8	264	62.58	15.01	3.5	3.5
min.	799	9.0	96	7.6	0.1	88	7.6	224	29.40	2.79	1.5	1.8

BACTERIOLOGICAL CONTROL SAMPLE RESULTS

Raw Water, MPN Weekly
 Number: 1 Results: Found

Treated Water at Plant, Minimum 3 days per week if distribution and plant chlorine residual not reported.

Number: Results:

Distribution System
 Number: Results:
8 NOT FOUND

CHEMICALS USED
 # Alum 16,536 lbs.
 # Lime 1,950 lbs
 # Chlorine 5,100 lbs

Latest Chemical Analysis Date: _____

of Active Water Services _____

eral Remarks _____

mitted by Juan José Benavides

Certificate No. 457-27-564

All reports due by the 15th of the following month.

Name of System: Zapata County Waterworks TWS ID No.: 2530002
 Name of Plant: 2530002 Month/Year: July
 or Plant No.: 2530002

Number of Connections: 2547

DATE	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES			DISINFECTION PROCESS DATA			FINISHED WATER ANALYSES									
			NTU	pH	Alk	D1	D2	Mg/L	pH	Alk	TURBIDITY						DISINFECTANT	
											1	2	3	4	5	6	Lowest Residual	Time*
1	1392	1584	11.0	7.9	112	0.2	3.0		7.7	99	0.1	0.1	X	0.1	0.1	0.1	3.0	
2	1995	1985	11.0	7.9	107	0.8	3.0		7.7	100	0.1	0.1	0.1	0.1	0.1	0.2	3.0	
3	1375	1641	10.0	7.8	105	0.8	3.5		7.8	97	0.1	X	X	0.1	0.1	0.1	3.5	
4	1391	1731	11.0	7.8	105	0.5	3.5		7.7	99	0.3	X	X	0.1	0.2	0.3	3.5	
6	2155	2098	13.0	7.9	108	0.6	3.5		7.7	97	0.1	0.2	0.1	0.1	0.1	0.1	3.5	
6	1211	1569	11.0	7.8	109	1.5	3.5		7.7	103	0.1	X	X	0.1	0.2	0.1	3.5	
7	2154	2264	11.0	7.8	109	1.0	3.5		7.8	101	0.1	0.2	0.1	0.1	0.1	0.1	3.5	
8	2062	2136	16.0	7.8	112	1.5	3.5		7.7	106	0.1	0.1	0.3	0.1	0.1	0.1	3.5	
8	1457	1831	17.0	7.8	114	0.5	3.5		7.7	104	0.1	0.2	X	0.1	0.1	0.1	3.5	
10	2169	2227	16.0	7.8	112	1.0	3.0		7.7	105	0.1	0.1	0.1	0.1	0.1	0.1	3.0	
11	1983	2176	15.0	7.9	110	0.8	2.5		7.7	101	0.1	0.1	0.1	0.1	0.1	0.1	2.5	
12	1424	1789	14.0	7.8	116	0.4	3.5		7.7	102	0.2	0.2	X	0.1	0.1	0.2	3.5	
13	2184	2400	15.0	7.8	107	1.2	3.0		7.7	98	0.2	0.2	0.2	0.2	0.2	0.2	3.0	
14	2131	2385	16.0	7.9	108	1.5	3.5		7.7	98	0.1	0.1	0.1	0.1	0.1	0.3	3.5	
16	1949	2198	15.0	7.8	111	0.3	3.0		7.6	107	0.3	0.2	0.1	0.1	0.1	0.1	3.0	
16	2134	2390	20.0	7.8	115	0.5	2.8		7.6	107	0.1	0.2	0.3	0.2	0.2	0.2	2.8	
17	2026	2273	19.0	7.6	120	0.8	3.0		7.7	111	0.5	0.8	0.4	0.2	0.4	0.3	3.0	
18	1778	2145	17.0	7.7	120	0.2	2.5		7.7	107	0.3	0.3	X	0.2	0.2	0.2	2.5	
18	2303	2552	15.0	7.7	110	0.6	2.5		7.7	161	0.7	0.7	0.2	0.2	0.3	0.1	2.5	
20	2040	2413	14.0	7.6	100	0.6	3.0		7.7	96	0.1	0.2	0.2	0.3	0.1	0.1	3.0	
21	1875	2530	16.0	7.5	101	1.0	3.5		7.6	96	0.1	0.1	0.1	0.1	0.1	0.1	3.5	
22	2190	1937	16.0	7.6	112	1.2	2.5		7.6	99	0.3	0.3	0.5	0.2	0.1	0.2	2.5	
23	2102	3227	16.0	7.7	113	0.5	3.0		7.5	95	0.3	0.4	0.2	0.1	0.1	0.3	3.0	
24	2644	2558	18.0	7.8	112	0.3	2.0		7.7	102	0.7	0.3	0.4	0.3	0.3	0.1	2.0	
25	2100	2679	13.0	7.7	113	1.0	3.5		7.7	102	0.1	0.1	0.3	0.2	0.3	0.3	3.5	
26	2186	2415	13.0	7.8	115	2.5	3.5		7.6	102	0.3	0.3	0.4	0.4	0.1	0.2	3.5	
27	2548	2748	14.0	7.7	104	1.0	2.8		7.6	98	0.2	0.2	0.1	0.2	0.2	0.1	2.8	
28	2196	2669	13.0	7.8	105	0.6	3.5		7.7	96	0.2	0.2	0.2	0.1	0.3	0.2	3.5	
29	2326	2546	13.0	7.8	107	1.5	3.5		7.7	96	0.2	0.3	0.3	0.1	0.2	0.1	3.5	
30	2375	2686	15.0	7.7	108	1.0	3.5		7.6	93	0.2	0.3	0.1	0.2	0.2	0.1	3.5	
31	2277	2719	15.0	7.8	104	1.3	2.8		7.6	97	0.1	0.2	0.3	0.3	0.2	0.3	2.8	
TOTAL	62,130	70,501	Disinfectant No. 1: <u>Cl₂</u>			Total No. of Turbidity Readings: <u>176</u>												
AVG	2,004	2,274	Disinfectant No. 2: <u>Cl₂</u>			No. above 0.5 NTU: <u>4</u>			No. above 1.0 NTU: <u>0</u>									
MAX	2644	3227	Disinfectant No. 3: <u>N/A</u>			* NOTE: ONLY use the "TIME" column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.												
MIN	1211	1569	Distribution Disinfectant: <u>Cl₂</u>															

Submitted by: Luan Sai Benard Date: Aug. 20, 1993

ADDITIONAL REPORTING REQUIREMENTS ON THE FRONT OF THIS FORM

Name of System: Zapata County WW PWS ID No.: 2530022
 Name of Plant: Zapata C. Water Works Month/Year: August Number of Connections: 2598
 or Plant No.:

DATE	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES			DISINFECTION PROCESS DATA			FINISHED WATER ANALYSES									
			NTU	pH	Alk	D1	D2	D3	pH	Alk	TURBIDITY							
											1	2	3	4	5	6	Lowest Residual	Time*
										2	6	10	2	6	10			
1	2369	2415	13	7.7	111	1.0	3.5	X	7.6	101	0.3	0.1	0.1	0.1	0.1	0.1	3.5	
2	2222	2710	14	7.8	106	0.4	3.5	X	7.6	99	0.2	0.2	0.2	0.2	0.2	0.5	3.5	
3	2407	2603	13	7.6	101	1.5	3.5	X	7.7	94	0.2	0.2	0.2	0.1	0.4	0.2	3.5	
4	2335	2732	14	7.6	106	0.6	1.8	X	7.7	98	0.3	0.4	0.1	0.1	0.2	0.2	1.8	4hr
5	2405	2618	15	7.7	106	0.8	3.5	X	7.7	104	0.4	0.3	0.1	0.1	0.2	0.1	3.5	
6	2653	2792	16	7.8	107	1.3	3.2	X	7.7	98	0.1	0.2	0.2	0.1	0.2	0.1	3.2	
7	1990	2498	13	7.8	101	1.0	3.5	X	7.7	99	0.1	0.1	0.1	0.1	0.1	0.1	3.5	
8	2685	2731	16	7.8	105	1.8	3.5	X	7.7	101	0.1	0.1	0.1	0.1	0.1	0.1	3.5	
9	2365	2716	14	7.9	97	0.7	3.5	X	7.6	100	0.1	0.1	0.1	0.1	0.1	0.1	3.5	
10	2403	2661	15	7.7	108	0.0	2.5	X	7.6	103	0.1	0.1	0.1	0.1	0.1	0.2	2.5	
11	2863	2772	13	7.8	111	2.0	3.5	X	7.7	105	0.1	0.2	0.2	0.1	0.2	0.2	3.5	
12	1890	2687	14	7.8	112	1.5	3.5	X	7.7	107	0.2	0.1	0.1	0.1	0.2	0.2	3.5	
13	2668	2741	16	7.8	109	1.5	3.0	X	7.7	100	0.2	0.3	0.3	0.2	0.2	0.2	3.0	
14	2383	2782	15	7.8	110	1.5	3.5	X	7.7	103	0.3	0.2	0.1	0.1	0.2	0.3	3.5	
15	2329	2677	14	7.8	108	0.5	3.0	X	7.7	101	0.3	0.2	0.1	0.1	0.1	0.1	3.0	
16	2451	2680	16	7.8	102	1.5	3.5	X	7.6	98	0.2	0.3	0.3	0.1	0.1	0.3	3.5	
17	2320	2685	16	7.8	111	1.5	3.5	X	7.6	101	0.4	0.4	0.2	0.3	0.1	0.2	3.5	
18	2497	2694	18	7.8	104	1.5	3.0	X	7.6	97	0.2	0.3	0.2	0.3	0.3	0.3	3.0	
19	2514	2784	17	7.8	106	1.5	3.5	X	7.6	98	0.3	0.3	0.2	0.2	0.1	0.1	3.5	
20	2687	2831	16	7.8	109	1.0	3.0	X	7.7	100	0.1	0.1	0.2	0.2	0.1	0.1	3.0	
21	2416	2791	15	7.8	102	1.5	3.0	X	7.7	97	0.1	0.2	0.2	0.1	0.1	0.1	3.0	
22	2412	2693	16	7.8	101	1.0	3.5	X	7.7	95	0.1	0.1	0.1	0.1	0.1	0.1	3.5	
23	2349	2601	16	7.8	104	0.7	3.2	X	7.6	97	0.2	0.2	0.1	0.1	0.1	0.1	3.2	
24	2287	2629	13	7.7	105	3.0	3.5	X	7.7	98	0.2	0.2	0.1	0.1	0.1	0.2	3.5	
25	2451	2731	18	7.7	101	1.0	2.5	X	7.7	97	0.1	0.1	0.1	0.1	0.1	0.1	2.5	
26	2664	2794	18	7.8	107	0.5	2.5	X	7.6	101	0.1	0.1	0.1	0.1	0.1	0.1	2.5	
27	2404	2725	16	7.8	107	1.8	2.5	X	7.6	100	0.1	0.1	0.1	0.1	0.1	0.1	2.5	
28	2268	2550	13	7.7	105	1.0	3.0	X	7.7	94	0.1	0.1	0.1	0.1	0.1	0.1	3.0	
29	2487	2679	14	7.7	110	0.5	3.5	X	7.7	97	0.1	0.1	0.1	0.1	0.1	0.1	3.5	
30	2392	2665	14	7.8	107	0.5	3.0	X	7.6	98	0.1	0.1	0.1	0.1	0.1	0.1	3.0	
31	2156	2395	19	7.8	107	0.8	1.8	X	7.6	99	0.1	0.1	0.1	0.1	0.1	0.1	1.8	12hrs
TOTAL	74722	83062									Total No. of Turbidity Readings: <u>186</u>							
AVG	2410	2679									No. above 0.5 NTU: <u>0</u> No. above 1.0 NTU: <u>0</u>							
MAX	2963	2831									* NOTE: ONLY use the "TIME" column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.							
MIN	1890	2395																

Submitted by: [Signature] Date: 9/10/93

ADDITIONAL REPORTING REQUIREMENTS ON THE FRONT OF THIS FORM

Name of System: ZAPATA COUNTY W.W. PWS ID No.: 2530002
 Name of Plant: _____ Month/Year: September Number of Connections: 2601
 or Plant No.: _____

DATE	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES			DISINFECTION PROCESS DATA			FINISHED WATER ANALYSES									
			NTU	pH	Alk	D1	D2	D3	pH	Alk	TURBIDITY						DISINFECTANT	
											1 2:00 A.M.	2 6:00 A.M.	3 10:00 A.M.	4 2:00 P.M.	5 6:00 P.M.	6 10:00 P.M.	Lowest Residual	Time ⁺
1	2677	2823	18	7.8	105	0.4	2.5	X	7.7	97	0.1	0.1	0.1	0.1	0.1	0.2	2.5	
2	1982	2461	15	7.7	104	0.3	2.5	X	7.6	101	0.3	0.2	X	0.2	0.1	0.1	2.5	
3	2691	2754	17	7.7	110	1.0	2.8	X	7.7	106	0.1	0.1	0.1	0.1	0.1	0.2	2.8	
4	1817	2224	15	7.8	110	0.2	3.0	X	7.7	101	0.2	X	X	0.2	0.1	0.2	3.0	
5	2191	2454	16	7.8	105	.0	2.5	X	7.7	99	0.2	0.2	0.2	X	0.1	0.2	2.5	
6	2251	2487	12	7.8	109	1.5	2.5	X	7.7	106	0.2	0.1	0.1	0.1	0.1	0.2	2.5	
7	1383	1582	11	7.7	100	0.8	3.5	X	7.7	106	0.2	0.2	X	X	0.1	0.2	3.5	
8	1687	1634	13	7.8	108	.0	3.0	X	7.7	101	0.1	0.1	0.1	X	0.1	0.1	3.0	
9	1530	1652	16	7.8	109	1.0	3.5	X	7.7	105	0.1	X	X	0.2	0.1	0.2	3.5	
10	1270	1472	16	7.8	108	0.3	3.5	X	7.7	106	0.2	X	X	0.1	0.1	0.2	3.5	
11	1377	1538	16	7.8	106	0.5	3.5	X	7.7	105	0.1	0.1	X	X	0.1	0.2	3.5	
12	1520	1734	15	7.7	104	0.5	3.5	X	7.7	104	0.1	X	X	0.1	0.1	0.1	3.5	
13	1914	2011	16	7.8	107	0.2	2.0	X	7.7	107	0.1	X	X	0.2	0.2	0.3	2.0	
14	1692	1869	16	7.8	109	0.3	2.0	X	7.8	108	0.2	X	X	0.2	0.2	0.2	2.0	
15	1498	1781	14	7.7	114	0.2	2.0	X	7.6	108	0.2	X	X	0.2	0.2	0.2	2.0	
16	1781	1978	13	7.8	110	0.3	2.5	X	7.7	105	0.2	0.1	0.1	X	0.1	0.1	2.5	
17	1717	1949	15	7.8	111	0.4	3.5	X	7.7	106	0.3	X	X	0.2	0.1	0.2	3.5	
18	2067	2159	14	7.8	109	0.2	3.0	X	7.7	107	0.1	0.1	X	0.3	0.2	0.1	3.0	
19	1970	2261	12	7.7	106	1.5	3.5	X	7.7	102	0.2	0.2	X	0.2	0.1	0.2	3.5	
20	2030	2217	10	7.7	108	0.2	3.0	X	7.7	102	0.2	0.2	X	0.1	0.2	0.2	3.0	
21	1558	1699	9	7.8	103	0.9	3.5	X	7.7	97	0.2	X	X	0.1	0.2	0.2	3.5	
22	1466	1666	8	7.7	100	0.2	3.0	X	7.7	95	0.2	X	X	0.2	0.1	0.1	3.0	
23	1553	1681	9	7.7	102	0.3	2.5	X	7.7	97	0.1	X	X	0.2	0.1	0.1	2.5	
24	1456	1609	6	7.7	96	0.5	2.5	X	7.7	89	0.1	X	X	0.1	0.1	0.1	2.5	
25	1627	1682	10	7.8	102	0.3	3.0	X	7.7	99	0.1	X	X	0.2	0.1	0.2	3.0	
26	1512	1825	11	7.8	98	0.3	3.5	X	7.7	93	0.2	X	X	0.2	0.1	0.1	3.5	
27	1821	1826	13	7.7	100	0.5	2.5	X	7.7	97	0.2	X	X	0.2	0.1	0.2	2.5	
28	1629	1944	12	7.7	107	0.5	2.5	X	7.7	107	0.2	X	X	0.2	0.1	0.1	2.5	
29	1628	1746	10	7.7	101	0.2	2.0	X	7.7	99	0.2	X	X	0.2	0.2	0.2	2.0	
30	1565	1856	11	7.7	102	0.8	2.0	X	7.6	101	0.2	X	X	0.2	0.2	0.2	2.0	
31																		
TOTAL	52860	58574	Disinfectant No. 1: <u>Cl₂</u>			Total No. of Turbidity Readings: <u>133</u>												
AVG	1762	1952	Disinfectant No. 2: <u>Cl₂</u>			No. above 0.5 NTU: <u>0</u> No. above 1.0 NTU: <u>0</u>												
MAX	2691	2823	Disinfectant No. 3: <u>N/A</u>			* NOTE: ONLY use the "TIME" column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.												
MIN	1270	1472	Distribution Disinfectant: <u>Cl₂</u>															

Submitted by: Ruan Qui Benavides Date: 10-11-93

ADDITIONAL REPORTING REQUIREMENTS ON THE FRONT OF THIS FORM

Name of System: ZAPATA County Waterworks ID No: 253000
 Name of Plant or Plant No.: 2530002 Month/Year: Nov. 1993 Number of Connections: 2,663

DATE	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES			DISINFECTION PROCESS DATA			FINISHED WATER ANALYSES									
			NTU	pH	Alk	D1	D2	D3	pH	Alk	TURBIDITY						DISINFECTANT	
											1	2	3	4	5	6	Lowest Residual	Time †
1	1492	1811	15.9	7.8	108	0.5	3.0	X	7.7	103	0.1	X	X	X	0.2	0.2	0.2	3.0
2	1513	1574	14.5	7.8	109	1.3	3.0	X	7.7	104	0.2	X	X	X	0.2	0.2	0.2	3.0
3	1599	1688	16.0	7.7	102	1.0	3.0	X	7.7	103	0.3	X	X	X	0.3	0.2	0.2	3.0
4	1656	1727	15.0	7.8	107	0.5	3.0	X	7.7	103	0.3	X	X	X	0.1	0.2	0.2	3.0
5	1397	1694	10.0	7.7	102	0.3	3.0	X	7.8	100	0.1	X	X	X	0.3	0.2	0.2	3.0
6	1654	1563	14.0	7.8	109	0.5	3.0	X	7.8	105	0.2	X	X	X	0.2	0.3	0.3	3.0
7	1034	1280	15.0	7.7	104	1.5	2.5	X	7.7	101	0.4	X	X	X	0.2	0.2	0.2	2.5
8	1694	2029	13.0	7.8	100	2.0	3.0	X	7.7	104	0.2	X	X	X	0.2	0.2	0.2	3.0
9	1864	1959	13.0	7.8	106	1.5	2.5	X	7.7	104	0.2	0.2	X	X	0.4	0.3	0.4	2.5
10	1403	1520	13.0	7.8	111	1.7	3.5	X	7.7	102	0.5	X	X	X	0.1	0.1	0.2	3.5
11	1387	1588	13.0	7.7	105	1.0	3.5	X	7.7	104	0.3	X	X	X	0.2	0.1	0.3	3.5
12	1941	2062	10.0	7.7	107	0.8	3.0	X	7.7	102	0.2	0.2	X	X	0.3	0.3	0.4	3.0
13	1479	1653	11.0	7.7	107	0.1	3.5	X	7.7	103	0.4	X	X	X	0.2	0.3	0.3	3.5
14	1631	1828	10.0	7.7	105	0.3	3.5	X	7.7	97	0.3	X	X	X	0.2	0.3	0.3	3.5
15	1921	2145	10.0	7.7	105	1.5	3.5	X	7.7	98	0.2	0.2	X	X	0.1	0.1	0.2	3.5
16	2033	2152	13.0	7.8	105	1.5	3.0	X	7.8	101	0.2	0.2	X	X	0.3	0.3	0.3	3.0
17	1727	1627	11.0	7.8	105	1.5	3.5	X	7.8	100	0.4	X	X	X	0.3	0.2	0.3	3.5
18	1688	2181	9.0	7.8	104	0.8	3.5	X	7.8	100	0.2	0.2	X	X	0.1	0.2	0.3	3.5
19	2165	2374	13.0	7.8	104	0.7	3.0	X	7.8	101	0.3	0.4	X	X	0.2	0.2	0.3	3.0
20	1756	1995	13.0	7.8	107	0.8	3.5	X	7.7	102	0.3	X	X	X	0.2	0.2	0.3	3.5
21	1526	1711	13.0	7.8	104	0.8	3.5	X	7.7	101	0.2	X	X	X	0.2	0.2	0.3	3.5
22	1568	1630	15.9	7.8	104	0.8	3.5	X	7.7	103	0.2	X	X	X	0.1	0.2	0.3	3.5
23	1739	1992	11.0	7.7	103	0.4	2.5	X	7.7	102	0.2	X	X	X	0.3	0.2	0.2	2.5
24	1819	1910	9.0	7.8	104	0.5	2.5	X	7.7	101	0.2	0.2	X	X	0.2	0.2	0.2	2.5
25	1340	1417	9.0	7.8	105	0.8	3.5	X	7.8	99	0.2	X	X	X	0.2	0.1	0.3	3.5
26	588	725	14.0	7.8	101	1.0	3.0	X	7.8	100	0.1	X	X	X	0.1	0.1	0.3	3.0
27	1939	2003	9.0	7.8	102	0.7	3.5	X	7.7	105	X	0.2	0.2	0.2	0.1	0.2	0.3	3.5
28	669	1149	10.0	7.7	105	1.0	3.5	X	7.7	102	0.2	X	X	X	0.2	0.1	0.3	3.5
29	2411	2205	11.0	7.8	106	0.7	3.0	X	7.7	103	0.2	0.2	0.1	0.1	0.1	0.1	0.3	3.0
30	1284	1564	11.0	7.8	105	0.8	3.0	X	7.7	105	0.2	X	X	X	0.2	0.2	0.2	3.0
31																		

TOTAL	47917	52756
AVG	1597	1758
MAX	2411	2374
MIN	588	725

Disinfectant No. 1:	C12
Disinfectant No. 2:	C12
Disinfectant No. 3:	N/A
Distribution Disinfectant:	C12

Total No. of Turbidity Readings: 116
 No. above 0.5 NTU: 0 No. above 1.0 NTU: 0

* NOTE: ONLY use the "TIME" column to show the length of time that the disinfectant residual entering the distribution system fall below acceptable levels.

Submitted by: [Signature] Date: Nov/93

ADDITIONAL REPORTING REQUIREMENTS ON THE FRONT OF THIS FORM

Name of System: Essex County Waterworks IJS ID No.: 2530002
 Name of Plant or Plant No.: 2530002 Month/Year: October Number of Connections: 2,628

DATE	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES			DISINFECTION PROCESS DATA			FINISHED WATER ANALYSES									
			NTU	pH	Alk	D1	D2	D3	pH	Alk	TURBIDITY						DISINFECTANT	
											1 2.0 11.0	2 6.0 11.0	3 10.0 11.0	4 2.0 11.0	5 6.0 11.0	6 10.0 11.0	Lowest Residual	Time [†]
1	1838	1874	12.0	7.7	98	0.5	2.5	X	7.7	97	0.1	X	X	0.2	0.2	0.2	2.0	
2	1616	1937	11.0	7.7	103	0.2	1.5	X	7.7	100	0.2	X	X	0.1	0.1	0.1	1.5	
3	1740	1884	10.0	7.7	98	0.3	3.2	X	7.6	102	0.2	X	X	0.1	0.1	0.1	3.2	
4	1419	1549	9.0	7.6	97	0.1	2.5	X	7.6	93	0.1	X	X	0.1	0.1	0.1	2.5	
5	1495	1561	14.0	7.7	103	0.5	3.5	X	7.7	95	0.1	X	X	0.1	0.1	0.1	3.5	
6	1592	1895	10.0	7.7	105	0.5	3.0	X	7.7	106	0.1	X	X	0.1	0.1	0.1	3.0	
7	1562	1656	11.0	7.7	99	0.7	3.0	X	7.7	96	0.2	X	X	0.1	0.1	0.1	3.0	
8	1579	2283	12.0	7.7	98	1.0	3.0	X	7.7	97	0.1	0.1	0.1	0.1	0.1	0.1	3.0	
9	1797	2125	12.0	7.7	100	0.8	3.0	X	7.7	98	0.2	0.2	X	0.1	0.1	0.2	3.0	
10	1801	1846	12.0	7.7	106	0.5	2.5	X	7.6	99	0.2	0.2	X	0.1	0.1	0.1	2.5	
11	1649	1877	11.0	7.7	104	0.5	2.0	X	7.7	96	0.1	X	X	0.2	0.1	0.1	2.0	
12	1622	1941	12.0	7.8	103	0.5	3.5	X	7.7	100	0.3	X	X	0.1	0.1	0.1	3.5	
13	2032	2159	12.0	7.8	102	1.0	2.5	X	7.7	98	0.1	0.2	0.2	0.1	0.1	0.1	2.5	
14	1975	2050	12.0	7.7	105	0.5	2.5	X	7.7	101	0.2	0.2	X	0.2	0.2	0.2	2.5	
15	1600	1821	12.0	7.7	102	0.5	3.0	X	7.7	98	0.2	X	X	0.2	0.1	0.1	3.0	
16	1937	2067	13.0	7.7	99	0.5	3.0	X	7.7	102	0.1	0.2	X	0.2	0.1	0.1	3.0	
17	2071	2355	13.0	7.7	99	0.2	3.0	X	7.7	97	0.1	X	X	0.1	0.1	0.1	3.0	
18	1744	1999	10.0	7.8	103	0.2	3.0	X	7.7	98	0.3	X	X	0.2	0.1	X	3.0	
19	1939	2336	9.0	7.8	106	0.5	3.5	X	7.7	102	0.2	0.1	X	0.1	0.1	0.1	3.5	
20	1706	1905	11.0	7.8	107	0.2	2.5	X	7.7	102	0.1	0.1	X	0.2	0.2	0.2	2.5	
21	2089	2208	10.0	7.7	104	1.0	3.0	X	7.7	99	0.1	0.1	0.1	0.1	0.1	0.1	3.0	
22	1444	1568	13.0	7.8	110	0.6	3.0	X	7.7	102	0.2	X	X	0.2	0.2	0.3	3.0	
23	1795	1948	17.0	7.8	108	1.0	3.0	X	7.7	102	0.2	X	X	0.1	0.1	0.2	3.0	
24	1826	2005	16.0	7.8	106	0.8	3.0	X	7.7	103	0.2	X	X	0.2	0.2	0.2	3.0	
25	1770	2001	14.0	7.8	105	0.8	1.8	X	7.7	104	0.2	X	X	0.2	0.2	0.2	1.8	
26	2254	2633	14.0	7.8	103	0.5	3.0	X	7.7	102	0.3	0.3	0.2	0.1	0.1	0.1	3.0	
27	2052	2241	15.0	7.8	106	0.8	3.5	X	7.7	103	0.1	0.1	0.1	0.1	0.1	0.1	3.5	
28	1652	1718	13.0	7.7	107	1.5	3.5	X	7.7	104	0.1	0.1	X	0.1	0.1	0.1	3.5	
29	1805	1889	15.0	7.8	105	0.5	2.5	X	7.7	103	0.2	0.2	X	0.2	0.1	0.1	2.5	
30	920	1216	16.0	7.7	104	0.6	3.0	X	7.7	101	0.2	X	X	0.2	0.2	X	3.0	
31	1893	1910	16.0	7.8	105	0.8	3.5	X	7.7	102	0.2	X	X	0.2	0.2	0.1	3.5	
TOTAL	574817	60795	Disinfectant No. 1: <u>Cl₂</u>			Total No. of Turbidity Readings: <u>136</u>												
AVG	1.768	1.961	Disinfectant No. 2: <u>Cl₂</u>			No. above 0.5 NTU: <u>0</u> No. above 1.0 NTU: <u>0</u>												
MAX	2254	2633	Disinfectant No. 3: <u>10/12</u>			* NOTE: ONLY use the "TIME" column to show the length of time that the disinfectant residual entering the distribution system fall below acceptable levels.												
MIN	920	1216	Distribution Disinfectant: <u>Cl₂</u>															

Submitted by: [Signature] Date: 10/15/05

ADDITIONAL REPORTING REQUIREMENTS ON THE FRONT OF THIS FORM

Name of System: Zapata Water works PWS ID No.: 2530002
 Name of Plant or Plant No.: Zapata Water works Month/Year: Dec. 1993 Number of Connections: 2671

DATE	RAW WATER PUMPAGE (MGD)	TREATED WATER PUMPAGE (MGD)	RAW WATER ANALYSES			DISINFECTION PROCESS DATA			FINISHED WATER ANALYSES									
			NTU	pH	Alk	D1	D2	D3	pH	Alk	TURBIDITY						DISINFECTANT	
											1 2:00 A.M.	2 6:00 A.M.	3 10:00 A.M.	4 2:00 P.M.	5 6:00 P.M.	6 10:00 P.M.	Lowest Residual	Time*
1	2136	2264	14.0	7.8	107	1.5	3.0	X	7.6	102	0.2	0.3	0.2	X	0.3	0.3	3.0	
2	1600	1776	12.0	7.8	107	0.8	3.5	X	7.7	105	0.3	X	X	X	0.2	0.2	3.5	
3	1540	1766	8.0	7.8	106	1.2	3.5	X	7.7	104	0.3	X	X	0.2	0.2	0.2	3.5	
4	1631	1749	10.0	7.8	106	1.0	1.5	X	7.7	101	0.2	X	X	X	0.2	0.2	1.5	1hr
5	1495	1674	8.0	7.7	107	0.4	2.5	X	7.7	103	0.2	X	X	X	0.1	0.1	2.5	
6	1578	1716	11.0	7.8	104	0.3	3.5	X	7.7	102	0.1	0.1	X	X	0.1	0.2	3.5	
7	1566	1676	13.0	7.8	108	1.0	3.5	X	7.7	107	0.2	X	X	X	0.2	0.2	3.5	
8	1482	1496	12.0	7.8	111	0.8	3.0	X	7.7	109	0.2	X	X	X	0.2	0.2	3.0	
8	1651	1991	12.0	7.8	111	0.7	3.5	X	7.7	107	0.2	X	X	X	0.2	0.2	3.5	
10	1614	2022	10.0	7.8	106	1.8	3.0	X	7.6	107	0.2	X	X	0.2	0.2	0.2	3.0	
11	1833	1847	13.0	7.8	108	1.3	3.0	X	7.6	103	0.2	0.2	X	X	0.2	0.2	3.0	
12	1409	1566	13.0	7.7	107	0.7	3.0	X	7.6	103	0.2	X	X	X	0.2	0.2	3.0	
13	1620	1945	10.0	7.7	108	0.6	2.5	X	7.7	96	0.2	X	X	0.1	0.1	0.2	2.5	
14	1653	1691	11.0	7.8	109	0.4	3.5	X	7.8	106	0.3	X	X	0.2	0.1	0.3	3.5	
15	1817	2046	12.0	7.9	110	1.0	3.0	X	7.8	108	0.3	0.3	0.2	X	0.1	0.1	3.0	
16	1902	2104	12.0	7.8	108	0.8	3.5	X	7.7	107	0.1	0.1	X	0.2	0.1	0.3	3.5	
17	1858	2078	13.0	7.8	105	1.0	3.0	X	7.8	105	0.2	X	X	0.2	0.1	0.2	3.0	
18	1040	1057	14.0	7.8	108	0.8	2.5	X	7.8	104	0.2	X	X	X	0.2	0.2	2.5	
19	1718	1915	10.0	7.7	108	0.2	3.0	X	7.7	106	0.1	X	X	X	0.2	0.2	3.0	
20	1353	1348	10.0	7.8	107	0.5	2.5	X	7.7	106	X	X	X	0.3	0.2	0.1	2.5	
21	1334	1529	10.0	7.8	107	0.6	3.0	X	7.7	105	0.2	X	X	0.1	0.1	0.1	2.0	
22	843	997	13.0	7.8	106	1.5	3.0	X	7.7	102	0.2	X	X	X	0.2	3.0		
23	2079	2258	9.0	7.8	106	1.0	3.5	X	7.7	105	0.1	0.1	0.2	0.1	0.1	0.1	3.5	
24	1325	1319	15.0	7.8	106	0.5	3.0	X	7.7	105	0.1	X	X	X	0.3	0.2	3.0	
25	870	1079	11.0	7.8	105	1.0	3.5	X	7.7	105	X	X	X	X	0.1	0.1	3.5	
26	1140	1406	11.0	7.8	105	2.0	3.0	X	7.7	105	0.1	X	X	X	0.1	0.1	3.0	
27	1525	1432	12.0	7.8	103	0.5	3.5	X	7.7	103	0.1	0.1	X	X	0.1	0.1	3.5	
28	1614	1903	9.0	7.8	104	0.5	2.5	X	7.7	102	0.2	X	X	X	0.1	0.1	2.5	
29	928	1087	9.0	7.7	105	0.7	2.5	X	7.7	102	0.1	X	X	X	0.1	2.5		
30	1476	1530	12.0	7.8	105	0.6	0.7	X	7.7	102	0.1	0.1	0.1	0.1	X	0.7	1.5hr	
31	1620	1741	13.0	7.8	105	0.5	3.0	X	7.7	102	0.1	0.1	X	X	0.1	3.0		
TOTAL	47,250	52,028	Disinfectant No. 1: <u>Cl₂</u>			Total No. of Turbidity Readings: <u>109</u>												
AVG	1,524	1678	Disinfectant No. 2: <u>Cl₂</u>			No. above 0.5 NTU: <u>0</u> No. above 1.0 NTU: <u>0</u>												
MAX	2,136	2,264	Disinfectant No. 3: <u>N/A</u>			* NOTE: ONLY use the "TIME" column to show the length of time that the disinfectant residual entering the distribution system fell below acceptable levels.												
MIN	843	997	Distribution Disinfectant: <u>Cl₂</u>															

Submitted by: Luan Garcia Benavides Date: 1-12-94

ADDITIONAL REPORTING REQUIREMENTS ON THE FRONT OF THIS FORM

APPENDIX G

ZAPATA COUNTY GROUND WATER QUALITY DATA

TEXAS WATER DEVELOPMENT BOARD
GROUND WATER DATA SYSTEM

MAR 25 1984

GROUND WATER QUALITY SAMPLES
COUNTY - Zapata

Well	Acquifer	Well Depth (feet)	Date of Collection	pH	Silica (SiO2) MG/L	Calcium (Ca) MG/L	Magnesium (Mg) MG/L	Sodium (Na) MG/L	Potassium (K) MG/L	Carbonate (CO3) MG/L	Bicarb. (HCO3) MG/L	Sulfate (SO4) MG/L	Chloride (Cl) MG/L	Fluoride (F) MG/L	Nitrate (NO3) MG/L	Dissolved Solids MG/L	Spec. Cond. (micromhos) as CaCO3	Hardness Percent Sodium	SAR	RSC	
84 57 101	122CTHIL	275	04/27/1961 U	8.2	29	9	4	362	0	332	162	272	272	0.2	3.2	1004	1730	40	95	25.2	4.7
85 45 901	124LRDO	143	04/20/1961	7.5	13	131	64	1760	0	164	1460	1960	1960	0.7	4.5	5473	8380	86	86	31.5	0
	124LRDO	143	11/15/1971	7.4	14	479	101	1540	0	201	1010	2660	2660	0.9	4.0	5907	12096	67	67	16.7	0
85 45 902	124LRDO	280	12/09/1980	8.5	13	39	22	2005	7	489	1327	1865	1865	0.8	0.2	5519	10920	95	95	63.6	4.5
	124LRDO	280	06/18/1984	8.3	14	62	33	1890	1	436	777	2772	2772	0.6	0.1	5263	10668	93	93	48.2	1.3
	124LRDO	280	07/19/1986	8.4	13	41	23	1882	1	562	1145	1847	1847	0.9	0.1	5231	10557	95	95	58.3	5.4
85 54 701	124RCEX	1900	04/01/1975	8.5	10	4	1	2340	13	2170	18	2330	2330	1.2	0.4	5784	11760	17	99	271.1	36.7
	124RCEX	1900	02/02/1976	8.6	18	4	2	2380	51	2190	4	2390	2390	2.9	0.4	5929	11536	19	99	242.6	37.2
85 61 603	124LRDO	460	02/02/1976	8.5	16	14	13	2730	16	1420	960	2800	2800	1.8	0.4	7249	14140	89	98	176.3	77.0
86 06 501	124LRDO	220	11/16/1971	7.8	15	31	34	480	0	196	660	660	660	0.4	1.5	1615	3003	215	82	14.2	0
	124LRDO	220	12/09/1980	8.3	14	32	36	489	0	194	664	311	311	0.1	1.5	1642	3045	230	82	14.1	0
	124LRDO	220	06/18/1984	8.2	16	16	26	509	1	196	649	304	304	0.1	0.8	1633	3150	187	85	16.7	0
	124LRDO	220	02/18/1986	8.1	16	16	25	500	1	198	654	303	303	0.2	0.5	1628	3087	184	85	16.1	0
86 15 604	124YEGU	210	04/11/1961	7.5	34	110	15	460	7	0	318	528	380	0.3	1.0	1691	2630	336	74	10.9	0
86 15 902	124YEGU	230	04/26/1961	7.5	29	104	17	525	0	334	606	400	400	0.5	1.5	1847	2890	330	77	17.6	0
	124YEGU	230	06/19/1984	8.2	35	175	26	493	1	0	326	701	479	0.5	0.3	2071	3874	545	66	9.2	0
86 15 904	124LRDO	267	06/19/1984	8.2	12	30	5	1319	0	0	116	789	1397	1.0	3.3	3613	7392	95	96	58.7	0
86 16 401	124YEGU	237	04/13/1961 U	7.3	22	89	5	310	0	110	262	392	392	1.2	1.2	1135	1960	243	73	8.7	0
86 16 402	124YEGU	180	04/26/1961 U	7.5	38	129	17	100	0	212	358	45	45	0.1	0.0	791	1130	392	35	2.2	0
	124YEGU	180	06/19/1984	0.8	44	172	20	85	1	0	223	427	60	0.1	0.1	918	1661	515	26	1.6	0
86 16 403	124YEGU	180	11/17/1971	7.1	39	257	29	362	0	372	920	187	187	0.5	0.4	1977	3608	760	50	5.7	0
	124YEGU	180	02/03/1976	8.0	38	255	20	373	0	357	940	192	192	0.1	0.4	1994	3564	770	53	6.1	0
	124YEGU	180	02/16/1983	7.9	43	258	21	371	0	381	952	154	154	0.1	0.0	1986	2010	733	52	6.0	0
86 16 501	124YEGU	220	11/17/1971	7.6	20	92	7	292	0	110	255	389	389	0.7	0.4	1110	2176	260	71	7.9	0
	124YEGU	220	02/03/1976	7.7	19	94	4	305	0	110	248	391	391	0.5	0.4	1115	2174	250	72	8.4	0
	124YEGU	220	17/08/1980	8.2	24	80	5	243	7	0	134	245	291	0.5	0.1	961	1826	221	69	7.1	0
	124YEGU	220	06/20/1984	8.0	23	87	4	298	1	0	118	256	366	0.5	0.1	1113	2160	237	73	8.5	0

* Depth value here reflects the bottom of the SAMPLED INTERVAL which was different from the completed well depth
U after date of collection signifies unbalanced or partial chemical analysis

GROUND WATER QUALITY SAMPLES
COUNTY - Zapata

Well	Apqifier	Well Depth (feet)	Date of Collection	pH	Silica (SiO2) MG/L	Calcium (Ca) MG/L	Magnesium (Mg) MG/L	Sodium (Na) MG/L	Potassium (K) MG/L	Carbonate (CO3) MG/L	Bicarb. (HCO3) MG/L	Sulfate (SO4) MG/L	Chloride (Cl) MG/L	Fluoride (F) MG/L	Nitrate (NO3) MG/L	Dissolved Solids MG/L	Spec. Cond. (microhmoh) as CaCO3	Hardness as CaCO3 MG/L	Percent Sodium	SAR	RSC
86 16 705	124YE01	214	04/13/1961	7.5	16	26	3	421	0	0	176	414	295	0.3	2.8	1264	2080	79	92	20.8	1.3
	124YE01	214	11/17/1971	8.0	17	21	6	490	0	0	220	414	377	0.5	0.4	1434	2730	76	93	24.3	2.1
	124YE01	214	02/03/1976	8.2	19	22	2	500	0	0	220	426	390	0.4	1.3	1468	2730	65	94	27.4	2.3
	124YE01	214	12/06/1980	8.3	17	26	2	450	0	0	203	410	346	0.4	0.1	1351	2544	73	93	22.9	1.9
	124YE01	214	06/19/1984	8.3	18	21	2	496	0	0	211	432	364	0.4	0.1	1427	2730	61	94	27.7	2.3
86 16 706	124YE01	90	04/26/1961 U	7.1	45	342	38	263	0	0	190	920	332	1.5	3.5	2034	2800	1010	36	3.6	0
86 16 707	124YE01	240	06/19/1984	8.2	23	49	5	378	0	0	140	369	332	0.2	0.8	1226	2304	142	85	13.8	0
	124YE01	240	02/18/1986	8.2	22	49	6	372	0	0	140	377	327	0.3	1.0	1223	2352	149	84	13.4	0
86 23 302	124LR00	210	04/11/1961	8.0	13	5	2	1180	3	0	1580	2	920	1.8	2.0	2906	4890	20	99	112.8	25.5
86 23 304	124LR00	210	04/12/1961 U	8.3	15	2	1	607	0	0	582	148	490	0.7	2.8	1552	2680	8	99	87.5	9.4
86 23 501	124LR00	75	06/19/1984	8.0	59	207	32	225	0	0	348	305	363	1.1	40.4	1403	2608	650	43	3.8	0
86 24 101	124LR00	225	04/11/1961 U	8.5	15	6	1	495	0	0	226	288	430	0.8	2.8	1348	2320	18	98	49.3	3.3
	124LR00	225	11/17/1971	9.0	13	6	2	473	18	18	183	291	424	0.7	9.4	1318	2522	23	97	42.7	3.1
	124LR00	225	02/03/1976	8.2	8	14	2	520	0	0	110	319	520	0.4	0.4	1437	2793	41	96	34.4	0.9
86 24 402	124LR00	189	11/18/1971	7.4	24	240	50	1040	0	0	243	1390	1020	0.8	0.4	3894	7548	800	73	16.0	0
	124LR00	189	02/03/1976	7.9	25	257	41	1100	0	0	250	1490	1040	0.2	2.4	4078	7560	810	74	16.8	0
	124LR00	189	12/08/1980	8.1	22	236	46	1061	9	0	198	1476	1025	0.2	<1	3972	7701	778	74	16.6	0
	124LR00	189	06/19/1984	7.9	5	46	41	1154	1	0	88	1403	956	0.2	0.3	3702	7395	418	85	24.6	0
86 24 502	124YE01	300	11/19/1971	7.2	18	374	117	1940	0	0	205	2020	2430	0.9	0.4	7001	13770	1420	74	22.4	0
86 24 503	124YE01	390	06/19/1984	8.1	18	165	16	1257	1	0	251	1221	1173	0.4	3.1	3977	7784	477	85	25.0	0
86 24 702	124LR00	336	11/19/1971	7.2	17	144	48	1230	0	0	215	1510	1060	0.7	0.4	4115	7896	560	82	22.7	0
	124LR00	336	02/03/1976	7.5	16	151	36	1230	0	0	216	1550	1030	0.1	0.4	4118	7672	520	83	23.5	0
	124LR00	336	12/08/1980	8.1	17	150	30	1244	10	0	193	1568	1035	<1	<1	4149	7995	497	84	24.3	0
	124LR00	336	02/19/1986	8.0	14	136	43	1268	1	0	198	1632	1037	0.1	0.1	4228	8344	515	84	24.3	0
86 24 705	124LR00	256	11/19/1971	8.0	19	23	8	393	0	0	275	357	258	0.4	0.4	1194	2208	89	90	18.0	2.7
	124LR00	256	03/11/1974	7.9	20	29	7	409	0	0	272	376	280	0.5	1.2	1256	2352	99	89	17.7	2.4
	124LR00	256	02/03/1976	8.1	17	23	5	424	0	0	287	361	267	0.3	0.4	1238	2304	78	92	20.9	3.1
86 24 706	124LR00	302	04/27/1961 U	7.7	23	68	33	879	0	0	268	1160	560	0.4	0.2	2854	4310	305	86	21.9	0
87 09 101	124JCS	257	11/14/1971	8.2	20	8	2	1210	0	0	610	11	1550	1.2	0.4	3102	6328	27	96	99.1	9.4

* Depth value here reflects the bottom of the SAMPLED INTERVAL which was different from the completed well depth
U after date of collection signifies unbalanced or partial chemical analysis

AQUIFER CODE

AQUIFER NAME

110TRRC
122CTHL
124BGDF
124JCKS
124LRDO
124YEGU
UNKNOWN

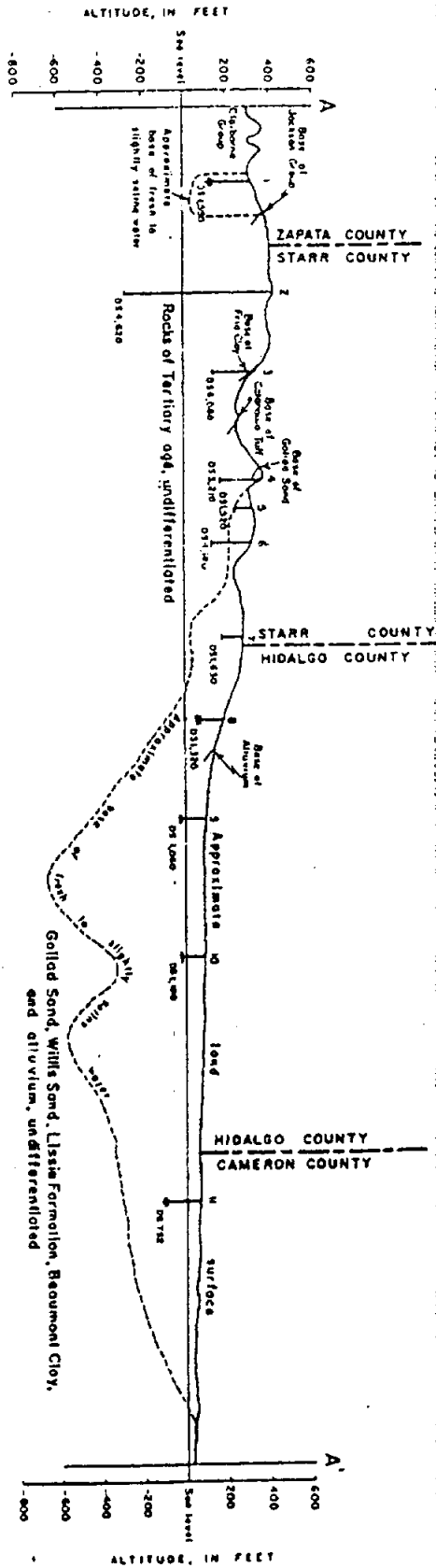
TERRACE DEPOSITS
CATAHOULA FORMATION
BIGFORD FORMATION OF CLAIBORNE GROUP
JACKSON GROUP
LAREDO FORMATION
YEGUA FORMATION
AQUIFER NOT ABLE TO BE DETERMINED

Mar 25 1994

TEXAS WATER DEVELOPMENT BOARD
GROUND WATER DATA SYSTEM

INFREQUENT CONSTITUENT REPORT COUNTY - Zapata

STATE WELL NUMBER	DATE	SAMPLE #	STORET CODE	DESCRIPTION	FLAG	VALUE	CONFIDENCE +OR-
8457101	04/27/1961	1	01045	IRON, TOTAL (UG/L AS FE)		0.	
8545901	04/20/1961	1	01045	IRON, TOTAL (UG/L AS FE)		600.	
8615604	04/11/1961	1	01020	BORON, DISSOLVED (UG/L AS B)		1600.	
8615902	04/26/1961	1	01045	IRON, TOTAL (UG/L AS FE)		400.	
8616402	04/26/1961	1	01045	IRON, TOTAL (UG/L AS FE)		300.	
8616706	04/26/1961	1	01045	IRON, TOTAL (UG/L AS FE)		200.	
8623302	04/11/1961	1	01020	BORON, DISSOLVED (UG/L AS B)		15000.	
8624706	04/27/1961	1	01045	IRON, TOTAL (UG/L AS FE)		100.	



EXPLANATION
 OS - Disturbed terrain, in parts of position
 Salt springs shown thus were known

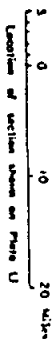


Figure L7
 Section A-A', Lower Rio Grande Basin
 U. S. Geological Survey in cooperation with the Texas Water Commission

200 ft = 200 ft group
Catahoula to the hills - 200 ft - 200 ft
Sulfur River are in parts per million except Specific Conductance, pH, and Percent Solids

Subdivision 72
Lower Rio Grande basin

Well Number	County	Depth (ft)	Date of collection	Specific Conductance (µmhos/cm)	pH	Total Dissolved Solids (TDS) (mg/l)	Total Solids (TS) (mg/l)	Total Suspended Solids (TSS) (mg/l)	Total Hardness (TH) (mg/l)	Calcium (Ca) (mg/l)	Magnesium (Mg) (mg/l)	Sulfate and Sulfide (SO ₄ + S ₂) (mg/l)	Bicarbonate (HCO ₃) (mg/l)	Sulfate (SO ₄) (mg/l)	Chloride (Cl) (mg/l)	Total Chloride (Cl) (mg/l)	Fluoride (F) (mg/l)	Iron (mg/l)	Manganese (Mn) (mg/l)	Total Phosphate (TP) (mg/l)	Boron (B) (mg/l)	Dissolved Silica (mg/l)	Ammonia Nitrogen (mg/l)	Percent Nitrate Nitrogen (mg/l)	Specific Conductance (µmhos/cm)	pH	
72-1	Webb County	400	Ec	13	-	55	0.5	1190	646	344	1200	2.5	1.0	-	-	3090	16	79	78	5210	8.4	-	-	-	-	-	-
72-2	Zapata County	153	Ec	13	0.64	-	131	64	1760	164	160	1960	0.2	4.5	-	570	520	852	2380	7.5	-	-	-	-	-	-	
72-3	Zapata County	118-140	Ec	34	-	110	15	460	71	318	528	380	0.3	1.0	-	1620	336	78	11	2630	7.5	-	-	-	-	-	
72-4	Zapata County	298	Ec	29	0.06	0.14	104	17	525	334	606	400	0.5	1.5	-	1850	370	78	13	2990	7.5	-	-	-	-	-	
72-5	Zapata County	145-157	Ec	22	-	39	51	510	510	110	262	352	-	1.2	-	1440	243	73	86	1960	7.3	-	-	-	-	-	
72-6	Zapata County	159-180	Ec	38	0.00	0.28	129	17	1000	212	358	45	-	0.0	-	791	392	36	22	1130	7.5	-	-	-	-	-	
72-7	Zapata County	172-314	Ec	16	-	-	24	34	421	176	414	295	0.3	2.8	-	1270	79	321	2080	7.5	-	-	-	-	-	-	
72-8	Zapata County	168	Ec	45	0.01	0.17	342	38	263	190	920	332	-	1.5	-	2020	1010	36	56	2800	7.1	-	-	-	-	-	
72-9	Zapata County	174-185	Ec	13	-	5.0	1.7	1180	34	1580	222	920	1.8	2.0	-	2920	20	78	115	4890	8.0	-	-	-	-	-	
72-10	Zapata County	174-185	Ec	15	-	2.0	0.7	607	582	48	490	0.7	2.8	-	-	1530	8	99	93	2680	8.3	-	-	-	-	-	
72-11	Zapata County	185	Ec	15	-	5.5	1.1	495	226	288	430	-	2.8	-	-	1350	18	78	57	2320	8.5	-	-	-	-	-	
72-12	Zapata County	200-202	Ec	23	0.00	0.08	68	33	879	268	1160	500	-	0.2	-	2860	305	36	22	4310	7.7	-	-	-	-	-	
72-13	Zapata County	310	Ec	-	0.26	-	76	20	130	275	39	187	1.8	5.1	-	610	212	-	-	-	-	-	-	-	-	-	-
72-14	Zapata County	42	Ec	-	-	80	26	184	298	123	280	0.4	1.1	-	-	901	307	-	-	-	-	-	-	-	-	-	-
72-15	Zapata County	157	Ec	-	2.1	-	286	81	311	98	94	1094	1.4	1.25	-	1915	1047	-	-	-	-	-	-	-	-	-	-

Analysis River are in parts per million except Specific Conductance, pH, and Percent Solids

W. D. ...

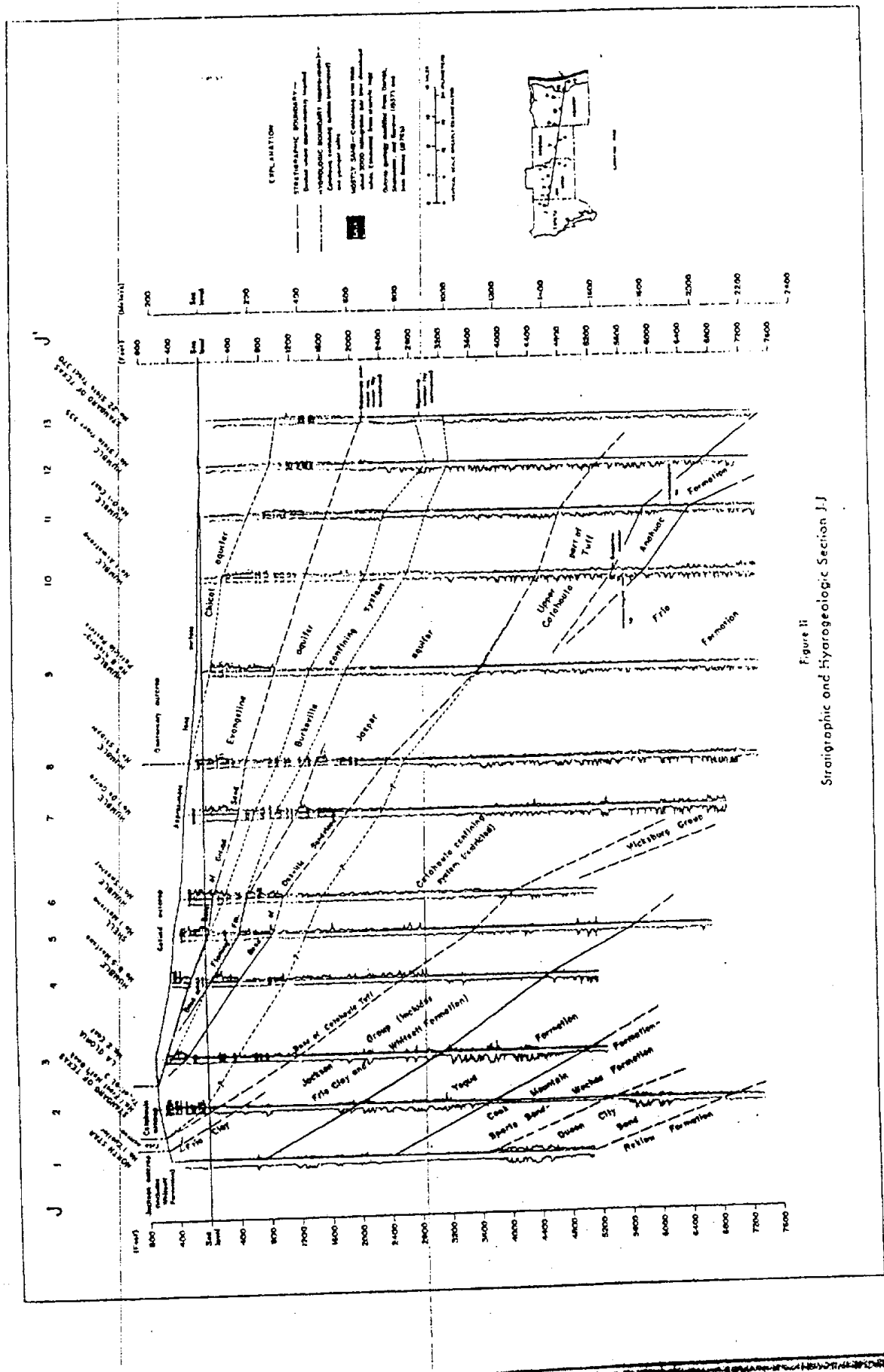


Figure 11
Stratigraphic and Hydrogeologic Section J-J

APPENDIX H

**ZAPATA COUNTY
ENDANGERED SPECIES LISTING
BY
TEXAS PARKS AND WILDLIFE DEPT.
AND
U.S. FISH AND WILDLIFE SERVICE**

TEXAS PARKS AND WILDLIFE DEPARTMENT
 TEXAS NATURAL HERITAGE PROGRAM
 26 AUG 1994
 COMPUTERIZED ELEMENT OCCURRENCES OF SPECIAL CONCERN
 SELECTED COUNTIES

ZAPATA

Scientific/Common Name	Countyname	Global Rank	State Rank	Federal Status	State Status
CACIA RIGIDULA SERIES - BLACKBRUSH SERIES					
003 O'KEEFE LAKE	Zapata	G5	S5		
009 FALCON VILLAGE	Zapata	G5	S5		
Starr					
SCLEPIAS PROSTRATA - PROSTRATE MILKWEED					
003 O'KEEFE LAKE	Zapata	G1	S1	C2	
ARROYO SALADO WEST					
ARDIOSPERMUM DISSECTUM - CHIHUAHUA BALLOON-VINE					
010 FALCON VILLAGE	Zapata	G2	S2		
LITHAREXYLUM SPATHULATUM - MISSION FIDDLEWOOD					
009	Zapata	G2	S2		
011 FALCON VILLAGE	Zapata	G2	S2		
PHOTAPHYTUS RETICULATUS - RETICULATE COLLARED LIZARD					
010 ARROYO SALADO WEST	Zapata	G3	S2	C2	T
011 SAN YGNACIO	Zapata	G3	S2	C2	T
019 ARROYO BURRO	Zapata	G3	S2	C2	T
030 ZAPATA	Zapata	G3	S2	C2	T
031 SAN YGNACIO	Zapata	G3	S2	C2	T
ARROYO BURRO					
ZAPATA NW					
ZAPATA					
032 FALCON VILLAGE	Zapata	G3	S2	C2	T
033	Zapata	G3	S2	C2	T
034 ZAPATA	Zapata	G3	S2	C2	T
035	Zapata	G3	S2	C2	T
036 SAN YGNACIO	Zapata	G3	S2	C2	T
FRANKENIA JOHNSTONII - JOHNSTON'S FRANKENIA					
001 ARROYO CLARENO	Zapata	G2	S2	LE	E
007 LAS OVEJAS CREEK	Zapata	G2	S2	LE	E
MEDYOTIS CORRELLII - CORRELL'S BLUET					
001 ARROYO BURRO	Zapata	G1	S1		
HELIANTHUS PRAECOX SSP HIRTUS - DIMMIT SUNFLOWER					
001 O'KEEFE LAKE	Zapata	G5T1Q	S1	C2	
ARROYO SALADO WEST					
LESQUERELLA THAMNOPHILA - ZAPATA BLADDERPOD					
001 ZAPATA SE	Zapata	G1	S1	C1	
003 LOPENO	Zapata	G1	S1	C1	
PHYSOSTEGIA CORRELLII - CORRELL'S FALSE DRAGON-HEAD					
005 ZAPATA	Zapata	G2	S2	C2	
ROOKERY -					
560 FALCON VILLAGE	Zapata				
564 ZAPATA	Zapata				
STERNA ANTILLARUM ATHALASSOS - INTERIOR LEAST TERN					
002 FALCON VILLAGE	Zapata	G4T2Q	S1	LE	E
RHYMOPHYLLA TEPHROLEUCA - ASHY DOGWEEED					

TEXAS PARKS AND WILDLIFE DEPARTMENT
 TEXAS NATURAL HERITAGE PROGRAM
 26 AUG 1994
 COMPUTERIZED ELEMENT OCCURRENCES OF SPECIAL CONCERN
 SELECTED COUNTIES

Scientific/Common Name # Quadrangle	Countyname	Global Rank	State Rank	Federal Status	State Status
01 O'KEEFE LAKE ARROYO SALADO WEST	Zapata	G1	S1	LE	E
03 AGUA AZUL CREEK EAST	Zapata Webb	G1	S1	LE	E
04 CHARGOS CREEK ESCOBAS	Zapata	G1	S1	LE	E
05 THOMPSONVILLE CHARGOS CREEK	Zapata	G1	S1	LE	E

Records Processed

1

TEXAS PARKS AND WILDLIFE DEPARTMENT
 TEXAS NATURAL HERITAGE PROGRAM
 INCOMPLETE LIST OF RARE VERTEBRATES BY SELECTED COUNTIES
 26 AUG 1994

ZAPATA

Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Status
** AMPHIBIANS					
BUFO DORSALIS	MEXICAN BURROWING TOAD	G5	S2		T
** BIRDS					
BUTOR ALBICAUDATUS	WHITE-TAILED HAWK	G4G5	S2		T
FALCO PEREGRINUS ANATUM	AMERICAN PEREGRINE FALCON	G3T2	S2	LE	E
FALCO PEREGRINUS TUNDRIUS	ARCTIC PEREGRINE FALCON	G3T2	S2	LT	T
CEPHALOTRACHEUS AGLAIAE	ROSE-THROATED BECARD	G4G5	S2		T
PELICANUS OCCIDENTALIS	BROWN PELICAN	G4	S2	LE	E
IBIS ALBIFACIES	WHITE-FACED IBIS	G5	S2	C2	T
Sterna antillarum	INTERIOR LEAST TERN	G4T2Q	S1	LE	E
** FISHES					
CATOSTOMUS ELONGATUS	BLUE SUCKER	G3	S3	C2	T
PHANTOM SHINER	PHANTOM SHINER	GX	SX	3A	E
** REPTILES					
SCINCUS Reticulatus	RETICULATE COLLARED LIZARD	G3	S2	C2	T
OPHEODONTIS CORAISI	INDIGO SNAKE	G5	S3		T
TESTUDO BERLANDIERI	TEXAS TORTOISE	G4	S3		T
SPERMATOPHYTES	KEELED EARLESS LIZARD	G3?	S3?		T
SPERMATOPHYTES	TEXAS HORNED LIZARD	G5	S4	C2	T

5 Records Processed

State

COUNTY: Zapata

ENDANGERED SPECIES

- ***OCELOT (*Felis pardalis*)
- **COATI (*Nasua nasua*)
- *JAGUARUNDI (*Felis yagouaroundi*)
- ***TERN, LEAST, INTERIOR (*Sterna antillarum athalassos*)
- **EAGLE, BALD (*Haliaeetus leucocephalus*)
- **SIREN, LESSER, RIO GRANDE (*Siren intermedia texana*)
- *FROG, WHITE-LIPPED (*Leptodactylus fragilis*)
- *PHANTOM SHINER (*Notropis orca*)
- ***JOHNSTON'S FRANKENIA (*Frankenia johnstonii*)
- ***ASHY DOGWEED (*Dyssodia tephroleuca*)

THREATENED SPECIES

- ***HAWK, GRAY (*Buteo nitidus*)
- ***HAWK, WHITE-TAILED (*Buteo albicaudatus*)
- ***FALCON, PEREGRINE, ARCTIC (*Falco peregrinus tundrius*)
- **HAWK, BLACK-, COMMON (*Buteogallus anthracinus*)
- **HAWK, ZONE-TAILED (*Buteo albonotatus*)
- **STORK, WOOD (*Mycteria americana*)
- **PARULA, TROPICAL (*Parula pitiayumi*)
- *EGRET, REDDISH (*Egretta rufescens*)
- *IBIS, WHITE-FACED (*Plegadis chihi*)
- *WARBLER, GOLDEN-CHEEKED (*Dendroica chrysoparia*)
- *OWL, PYGMY-, FERRUGINOUS (*Glaucidium brasilianum*)
- ***TORTOISE, TEXAS (*Gopherus berlandieri*)
- ***LIZARD, COLLARED, RETICULATE (*Crotaphytus reticulatus*)
- ***LIZARD, HORNED, TEXAS (*Phrynosoma cornutum*)
- ***SNAKE, INDIGO, TEXAS (*Drymarchon corais erebennus*)
- **SNAKE, SCARLET, TEXAS (*Cemophora coccinea lineri*)
- ***TOAD, BURROWING, MEXICAN (*Rhinophrynus dorsalis*)
- **FROG, SHEEP (*Hypopachus variolosus*)
- **BLUE SUCKER (*Cycleptus elongatus*)

***Confirmed species - verified recent occurrence

**Probable species - unconfirmed, but within general distribution pattern of the species

*Possible species - unconfirmed, but at periphery of known distribution of the species

potential based on current & historic ranges

BASIC CODE KEY

FEDERAL STATUS (USES)

- LE - Listed Endangered
- LT - Listed Threatened
- LELT - Listed Endangered in part of range, Threatened in a different part
- PE - Proposed to be listed Endangered
- PT - Proposed to be listed Threatened
- E(S/A) or T(S/A) - Listed Endangered or Threatened on basis of Similarity of Appearance.
- DL - Delisted Endangered/Threatened
- C1 - Candidate, Category 1. USFWS has substantial information on biological vulnerability and threats to support proposing to list as endangered or threatened. Data are being gathered on habitat needs and/or critical habitat designations.
- C1* - C1, but lacking known occurrences
- C1** - C1, but lacking known occurrences, except in captivity/cultivation
- C2 - Candidate, Category 2. Information indicates that proposing to list as endangered or threatened is possibly appropriate, but substantial data on biological vulnerability and threats are not currently known to support the immediate preparation of rules. Further biological research and field study will be necessary to ascertain the status and/or taxonomic validity of the taxa in Category 2.
- C2* - C2, but lacking known occurrences
- C2** - C2, but lacking known occurrences, except in captivity/cultivation
- 3 - Taxa no longer being considered for listing as threatened or endangered. Three subcategories indicate the reasons for removal from consideration.
- 3A - Former Candidate, rejected because presumed extinct and/or habitats destroyed
- 3B - Former Candidate, rejected because not a recognized taxon; i.e. synonym or hybrid
- 3C - Former Candidate, rejected because more common, widespread, or adequately protected
- XE - Essential Experimental Population.
- XN - Non-essential Experimental Population.

STATE STATUS

- E - Listed as Endangered in the State of Texas
- T - Listed as Threatened in the State of Texas
- blank - Not currently listed

GLOBAL RANK (GRANK)

- G1 - Critically imperiled globally, extremely rare, 5 or fewer occurrences. [Critically endangered throughout range.]
- G2 - Imperiled globally, very rare, 6 to 20 occurrences. [Endangered throughout range.]
- G3 - Very rare and local throughout range or found locally in restricted range, 21 to 100 occurrences. [Threatened throughout range.]
- G4 - Apparently secure globally.
- G5 - Demonstrably secure globally.
- GH - Of historical occurrence through its range.
- G#NA - Accidental in North America.
- G#NE - An exotic species established in North America.
- G#T# - "G"= species rank; "T"= rank of variety or subspecies taxa.
- GU - Possibly in peril range-wide, but status uncertain.
- G#G# - Ranked within a range as status uncertain.
- GX - Believed to be extinct throughout range.
- Q - Qualifier denoting questionable taxonomic assignment.
- ? - Not ranked to date; or, Qualifier denoting uncertain rank.
- C - Captive population exists.

STATE RANK (SRANK)

- S1 - Critically imperiled in state, extremely rare, very vulnerable to extirpation, 5 or fewer occurrences.
- S2 - Imperiled in state, very rare, vulnerable to extirpation, 6 to 20 occurrences.
- S3 - Rare or uncommon in state, 21 to 100 occurrences.
- S4 - Apparently secure in state.
- S5 - Demonstrably secure in state.
- SA - Accidental in state.
- SE - An exotic species established in state.
- SH - Of historical occurrence in state. May be rediscovered.
- SN - Regularly occurring, non-breeding status.
- SP - Potential occurrence in state.
- SR - Reported, but without persuasive documentation.
- SRF - Reported in error, but error persists in literature.
- SU - Possibly in peril in state, but status uncertain.
- SX - Apparently extirpated from State.
- SZ - Migratory/transient in state to irregular/dispersed locations.
- ? - Not ranked to date; or, Qualifier denoting uncertain rank.
- C - Captive population exists.



United States Department of the Interior



FISH AND WILDLIFE SERVICE

ECOLOGICAL SERVICES
C/O CCSU, CAMPUS BOX 338
6300 OCEAN DRIVE
CORPUS CHRISTI, TEXAS 78412

September 27, 1994

George Kalmon, P.E.
The Nelson Corporation
1600 Redbud, Suite 302, LB 23
McKinney, Texas 75069

Consultation No. 2-11-94-I-335

Dear Mr. Kalmon:

This responds to your facsimile dated August 26, 1994, requesting information on species Federally listed or proposed for listing as threatened or endangered occurring in Zapata County, Texas. In addition, you requested information regarding wetlands and other important fish and wildlife habitat.

The following list provides information on Federally listed species from the area mentioned in your request. The list has been expanded to include candidate species as well. Candidate species have no protection under the Endangered Species Act; however, the U. S. Fish and Wildlife Service (Service) has substantial information on Category 1 species to support their listing as threatened or endangered. The development and publication of proposed rules for Category 1 species is anticipated. Category 2 species are those for which available information indicates that proposing to list as endangered or threatened is possibly appropriate, but substantial data on biological vulnerability and threats are not currently known to support the immediate preparation of rules. However, actions that might contribute to the listing of candidate species should be avoided. A letter designation that represents the current Federal status of the species follows the species' name. Within the following list, the letters E, T, C1, and C2 represent the status of Endangered, Threatened, Category 1, and Category 2 respectively. Our data indicates that the following species may occur in the area:

Zapata County

ashy dogweed (Thymophylla tephroleuca) - E
interior least tern (Sterna antillarum athalassos) - E
jaguarundi (Felis yagouaroundi) - E
Johnston's frankenia (Frankenia johnstonii) - E
ocelot (Felis pardalis) - E
Gulf Coast hog-nosed skunk (Conepatus leuconotus texensis) - C1
Zapata bladderpod (Lesquerella thamnophila) - C1
Audubon's oriole (Icterus graduacauda audubonii) - C2
Correll's false dragon-head (Physostegia correllii) - C2
Dimmit sunflower (Helianthus praecox ssp. hirtus) - C2
marble-fruited prickly pear (Opuntia engelmannii var. flexospina) - C2
loggerhead shrike (Lanius ludovicianus) - C2
northern gray hawk (Buteo nitidus) - C2
prostrate milkweed (Asclepias prostrata) - C2
reticulate collared lizard (Crotaphytus reticulatus) - C2

Rio Grande lesser siren (Siren intermedia texana) - C2
 Texas horned lizard (Phrynosoma cornutum) - C2
 Texas olive sparrow (Arremonops rufivirgatus rufivirgatus) - C2

The ashy dogweed (Thymophylla tephroleuca) occurs in open mesquite brush and grassy areas on sandy soils in Starr, Webb and Zapata counties. The ashy dogweed is a spreading perennial composite with grayish stems and leaves and bright yellow flowers.

The endangered Johnston's frankenia is characterized as a low sprawling shrub reaching approximately one foot in height. It generally occurs in open or sparsely vegetated rocky gypseous or saline flats and is known from locations in Starr, Webb, and Zapata counties.

The ocelot and jaguarundi inhabit dense native brushland, generally occurring near watercourses, throughout South Texas. Population declines in both species of felids are primarily due to habitat loss associated with clearing of brush. Although the distribution of these endangered cats is limited for the most part to the Rio Grande Valley, a northern population of ocelots may range through portions of Jim Wells, Live Oak, Atascosa and McMullen counties and there have been unconfirmed sightings of jaguarundi in Aransas, Jim Wells, Kleberg, Live Oak and San Patricio counties.

The endangered interior least tern is a small migratory bird that currently breeds during the spring in Texas along portions of the Canadian, Red, Pecos and Rio Grande rivers. Nests are constructed by scraping a depression in the surface of alluvial islands or sandbars along river banks or reservoirs, including several locations on Falcon International Reservoir.

The Zapata bladderpod (Lesquerella thamnophila) occurs in cenizo brush on well-drained sandy loam soils in Starr and Zapata counties. This species is a perennial member of the mustard family that is densely pubescent, narrow-leaved and yellow flowered.

The Gulf Coast hog-nosed skunk historically ranged over a large area in south Texas. This large skunk has a single white stripe running from the head down the length of the back. There are no recent records this animal from South Texas.

Section 7 of the Endangered Species Act requires that all Federal agencies consult with the U.S. Fish and Wildlife Service to ensure that actions authorized, funded or carried out by such agencies do not jeopardize the continued existence of any listed threatened or endangered species or adversely modify or destroy critical habitat of such species. It is the responsibility of the Federal action agency to determine if the proposed project may affect threatened or endangered species. If a "may affect" determination is made, the Federal agency shall initiate the formal section 7 consultation process by writing to: Field Supervisor; U.S. Fish and Wildlife Service; c/o TAMU-CC, Campus Box 338; 6300 Ocean Drive; Corpus Christi, Texas 78412. If no effect is evident, no further consultation is needed; however, we would appreciate the opportunity to review the criteria used to arrive at that determination.

In the event that there is no Federal involvement in any stage of the project, section 9 of the Endangered Species Act still is applicable, making it unlawful for any person subject to the jurisdiction of the United States to "take" any endangered or threatened species. Take is defined in the Act as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct." Harass is defined as "an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to breeding, feeding, or sheltering." Harm is defined as an

act which actually kills or injures wildlife. Such an act includes significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns.

If floodplains are involved with your project, be advised that all Federal agencies are required to comply with Executive Order 11988, regarding national policy on floodplain management. This mandate requires each Federal agency to avoid long and short term impacts to the floodplain and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative.

Executive Order 11990 asserts that each agency shall provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities. We recommend that you contact the U.S. Army Corps of Engineers for permitting requirements under section 404 of the Clean Water Act and Section 10 of the River and Harbor Act if it appears that the proposed project could impact wetlands.

If we can be of further assistance, please contact Tim Cooper of our office at (512) 994-9005.

Sincerely,



THOMAS E. GRAHL
Acting Field Supervisor

APPENDIX I

100 YEAR FLOOD PLAIN MAPS

ZAPATA COUNTY, TEXAS
WATER AND WASTEWATER
REGIONAL PLANNING STUDY
Contract No. 94-483-043

The following maps are not attached to this report. Due to their size, they could not be copied. They are located in the official file and may be copied upon request.

100 YEAR FLOOD PLAIN MAPS

Zapata Se Quadrangle - Texas-Tamaulipas

Zapata Quadrangle - Texas Tamaulipas

Arroyo Clareno Quadrangle Texas – Tamualipas

San Ygnacio Quadrangle

NATIONAL WETLANDS INVENTORY MAPS

Arroyo Valeno, Texas

Arroyo Burro, Texas

Zapata NW, Texas Mexico

Arroyo Clareno, Tex-Mexico

Zapata, Tex-Mex.

Zapata SE, Tex-Mex.

Please contact Research and Planning Fund Grants
Management Division at (512) 463-7926 for copies.