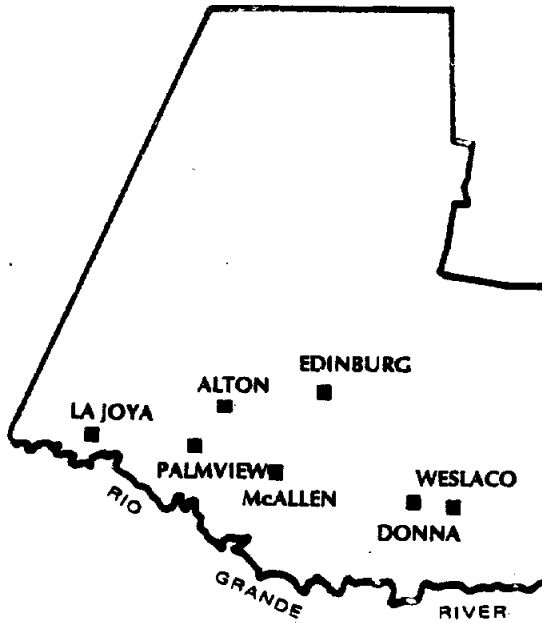


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**REGIONAL WATER SUPPLY AND  
WASTEWATER DISPOSAL PLAN  
FOR HIDALGO COUNTY**

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January 1990



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**TEXAS WATER DEVELOPMENT BOARD**

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# Turner Collie & Braden Inc.

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January 12, 1990

Mr. Sonny Kretzschmar, P.E.  
Texas Water Development Board  
P.O. Box 13231, Capitol Station  
Austin, Texas 78711-3231


Attn: Mr. Jim Fries

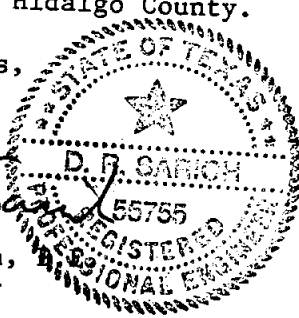
Dear Mr. Kretzschmar:


Submitted herein is the final report evaluating water supply and wastewater disposal facilities needs for selected rural areas of Hidalgo County. These areas have been identified as having the highest potential for extension of service from existing municipal facilities or, alternately, construction of new, independent facilities. This report is divided into several sections with Section VI presenting feasible water and wastewater projects. A separate report, prepared by Melden & Hunt, Inc., has been developed which discusses projects in the City of Mission area.

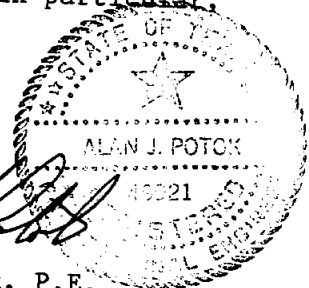
Turner Collie & Braden Inc., the primary subcontractor to Mike Lopez & Associates, as well as the secondary subcontractors, L. L. Rodriguez & Associates, Inc. and Salinas & Associates, Inc., appreciate the opportunity to have accomplished this important assignment for the Texas Water Development Board, the Hidalgo County Water Development Board and, in particular, the citizens of Hidalgo County.

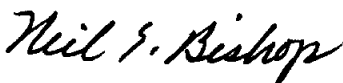
Very truly yours,

  
Donald R. Sarich,  
Project Engineer



  
Alan J. Potok, P.E.  
Project Director





Neil E. Bishop, Ph.D., P.E.  
Senior Vice President

DRS:AJP:NEB:bem  
Enclosure

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INTRODUCTION

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Project Authorization

This investigation was authorized by the Hidalgo County Water Board through board action dated May 19, 1988. Funding for the study was obtained from a 75 percent participatory grant from the Texas Water Development Board to the Hidalgo County Water Development Board under contract number 8-483-628. The grant is part of the Regional Planning Grants Program funds designated under the Texas Water Bill of 1985.

Project Overview

In January 1987, a reconnaissance level study of water supply and wastewater disposal needs of the Colonias of the Lower Rio Grande Valley was completed and submitted to the Texas Water Development Board. The study area encompassed the tri-county area of Cameron, Hidalgo, and Willacy counties with particular emphasis placed on unincorporated areas of the counties. On a county-by-county basis, Hidalgo County was found to contain the majority of unincorporated community, or colonia, developments, and hence the largest colonia population. These primarily residential subdivisions have been in existence for some years with accelerated growth occurring in the past decade. A number of the older subdivisions have matured into recognized communities such as the communities of Alton, Palmview, and Palmhurst to the north and west of the City of Mission. Like their more rural counterparts, these densely populated areas similarly lack adequate water and wastewater facilities.



The study area for the current effort includes the unincorporated areas of Hidalgo County and those incorporated areas who, by participation, requested to be included in the grant application to the Texas Water Development Board.

### Project Objectives

The primary objective this investigation is to identify water and wastewater projects that in the near term can benefit the Colonias situation and to prepare the requisite justification to obtain funding for construction of these projects through available assistance programs.

This study is an extension of the reconnaissance level study and identifies feasible alternatives to providing water and wastewater facilities for Hidalgo County. While the previous study served only to identify the magnitude of the current problem, this study selects appropriate water supply and wastewater facilities alternatives as well as presents a conceptual plan for implementation of proposed alternatives. By contract, the study area shown in Figure I-1 includes both the unincorporated areas of Hidalgo County plus the incorporated places which have chosen to participate--the cities of Edinburg, San Juan, Palmview/Alton, and Donna.

The planning period for the study has been established as the 31-year period of 1989 (current) through 2020. Specifically, the study addresses the following project objectives.

- ° Evaluate water supply and wastewater needs for Hidalgo County.





- ° Identify feasible alternatives to meet the needs identified above.
- ° Determine appropriate financial plans and institutional organizations to implement recommend alternatives.
- ° Develop a project implementation plan and schedule for the planning area.
- ° Determine appropriate alternatives to extend the City of Mission's water supply and wastewater systems.
- ° Develop a water conservation plan.
- ° Prepare a report of the proposed regional water supply and wastewater plan.

### Project Organization

A study team consisting of local consultants familiar with the existing water and wastewater system needs of the County (L. L. Rodriguez & Associates, Inc., Richard Salinas & Associates, Inc., and Melden and Hunt, Inc.), a local management firm (Mike Lopez & Associates, Inc.), and the consultant for the previous colonia study (Turner, Collie & Braden Inc) were assembled to undertake this project. Because the thrust of the study was to identify feasible water and wastewater system alternatives, the team efforts were concentrated on the more urban areas where the higher population density is more likely to make a regional system cost-effective on a per household basis.

Other than the management firm whose primary functions were to gather and disseminate project information and coordinate public input, the technical effort was divided among the consulting engineers. L. L. Rodriguez & Associates, Inc. (LRA) was to evaluate and study communities of the Edinburg/Donna/Weslaco and



nearby area; Richard Salinas & Associates, Inc. (RSA) was to determine needs and recommend improvements in the Alton/Palmview/Palmhurst area; Melden and Hunt, Inc. (MH) was to investigate future requirements of the City of Mission; and Turner Collie & Braden Inc. (TCB) was to study the San Juan and adjacent communities area. TCB had the added responsibility of coordinating the study efforts.

### Project Approach

As noted previously, this study is a feasibility investigation designed to identify technically sound and cost-effective projects which can be prioritized and an initial phase of implementation scheduled.

Within each study subarea shown on Figure I-2, groupings of colonias were identified, based on the results of the previous study, which appeared as possible candidates for detailed evaluation. Potential water and sewage treatment facilities were identified, alternative facilities plans were examined, then probable construction costs developed based on unit costs applicable to the Rio Grande Valley area.

Projections of future needs of the colonia groupings were based on the maximum number of lots within the existing subdivision boundaries. Based on growth factors developed by the TWDB representing total growth in the county, individual study groupings, for the most part, are expected to be fully developed by the end of the planning period (2020).



Per capita water demand of colonia and incorporated area residents was estimated based on information obtained from the water supply corporations and municipal suppliers. These estimates generally coincided with the widely accepted planning values of 100 gallons per capita per day (gpcd) for wastewater contribution and 130 gpcd for water demand. These demand estimates were applied to the population projections to derive estimates of total water demand and wastewater service needs that will be required in the future.

An inventory of existing colonia conditions indicates that although only a fraction of the communities studied suffer from inadequate or nonexistent potable water needs (the majority have inadequate fire protection). The most serious problems are those associated with inadequate waste disposal techniques. In all unincorporated areas and in some incorporated areas such as Alton and Palmview, the predominant form of wastewater treatment remains inadequate septic tank systems and, in some cases, pit latrines.

The general approach was to emphasize utilization of existing municipal wastewater treatment facilities for those communities which lie close to municipalities with excess capacity and who are willing to except wastewater generated from outlying developed areas. In those cases where excess existing capacity is not available, or adjacent communities are not willing to accept additional wastewater loading, alternative methods of collection and disposal were investigated.



The initial approach consisted of defining the system of improvements necessary to provide service only to those colonias identified and ignoring the adjacent land use and potential for development. The logic to this approach was that (1) the existing community wastewater systems were not capable of accommodating wastewater flows resulting from future development without significant alteration (2) that this would define the cost to provide service to the colonias and (3) the improvements could be classified as improving service to existing population and not projected future population. The capability of the municipality systems to accept wastewater flows from the individual systems was evaluated in terms of providing service to the individual colonia groups and as a cumulative impact of all of the groups.

Population projections through the planning period 2020 were extracted from information obtained by the Texas Water Development Board. The TWDB issued two projections for growth. Because of the economic conditions in Mexico combined with recent changes in immigration laws within the United States, and recent growth trends identified by cities in Hidalgo County, it was considered prudent to use the higher TWDB projections for this current study. The projections for the study area, shown in Figure I-3, assume roughly a 3.1 percent annual growth rate over the planning period with a slightly lower growth rate in the cities and a slightly higher growth rate in the unincorporated areas.

An assumption was made that further promulgation of colonia developments would be prohibited by Hidalgo county ordinances now



in place. As a result, no additional colonia developments were planned and most of the existing colonias were projected to build out prior to the end of the planning period.

Probable capital costs were calculated and are presented for individual alternative projects. Costs are presented in terms of total, annual, and monthly per connection dollars applicable to discrete projects. These estimates take into consideration engineering design, land acquisition, legal, and construction costs. All costs are based on current (1989) costs of construction using labor and material rates for the South Texas area. Annual operating and maintenance costs also are presented, as well as the estimated monthly per connection charges for operation and maintenance.

An analysis was made of the latest data available on current eligibility requirements and funding availability associated with those federal and state programs found to be applicable for financial participation in proposed projects. An analysis was also made of the applicability of various entities to participate as operators of the proposed systems.



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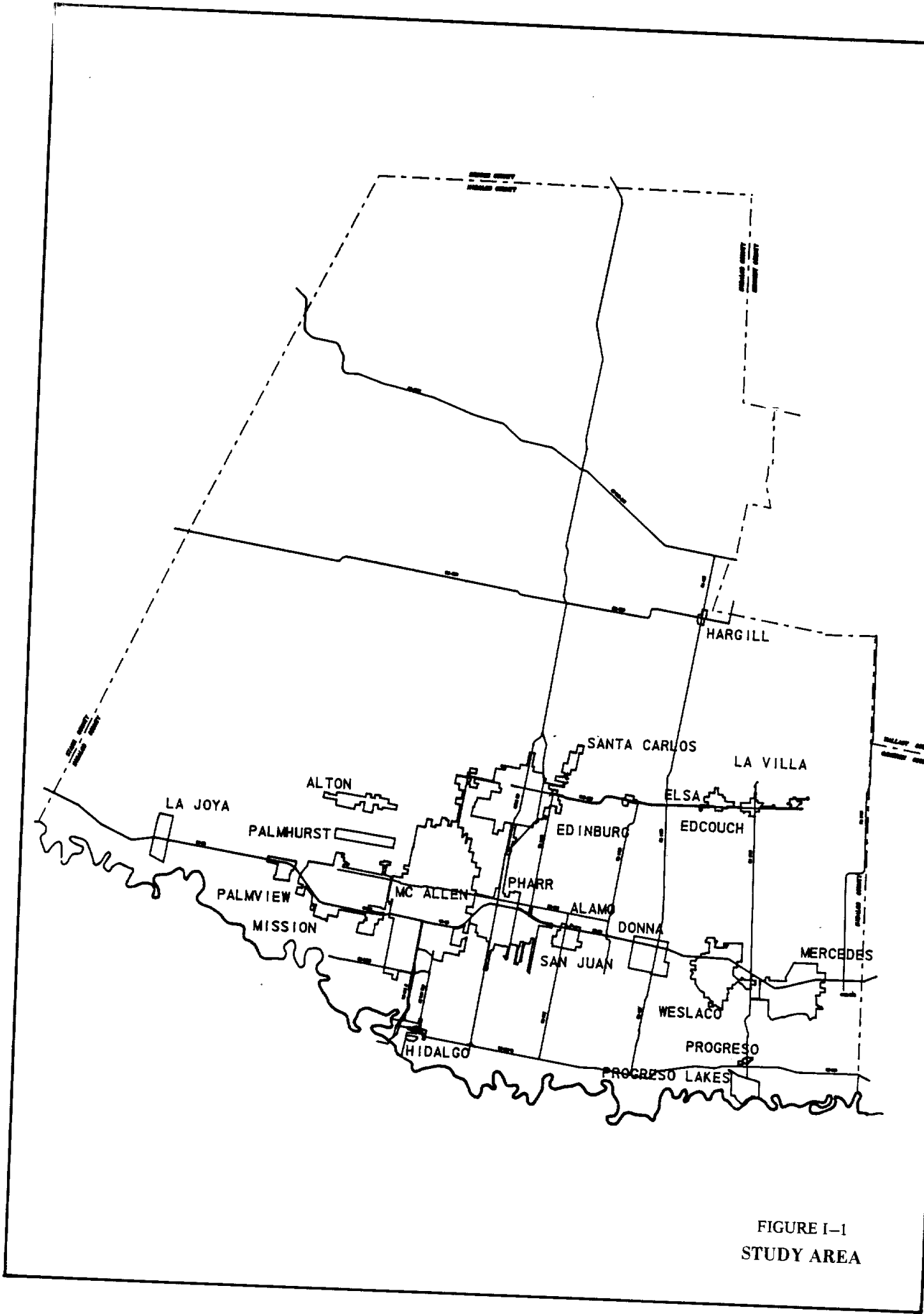
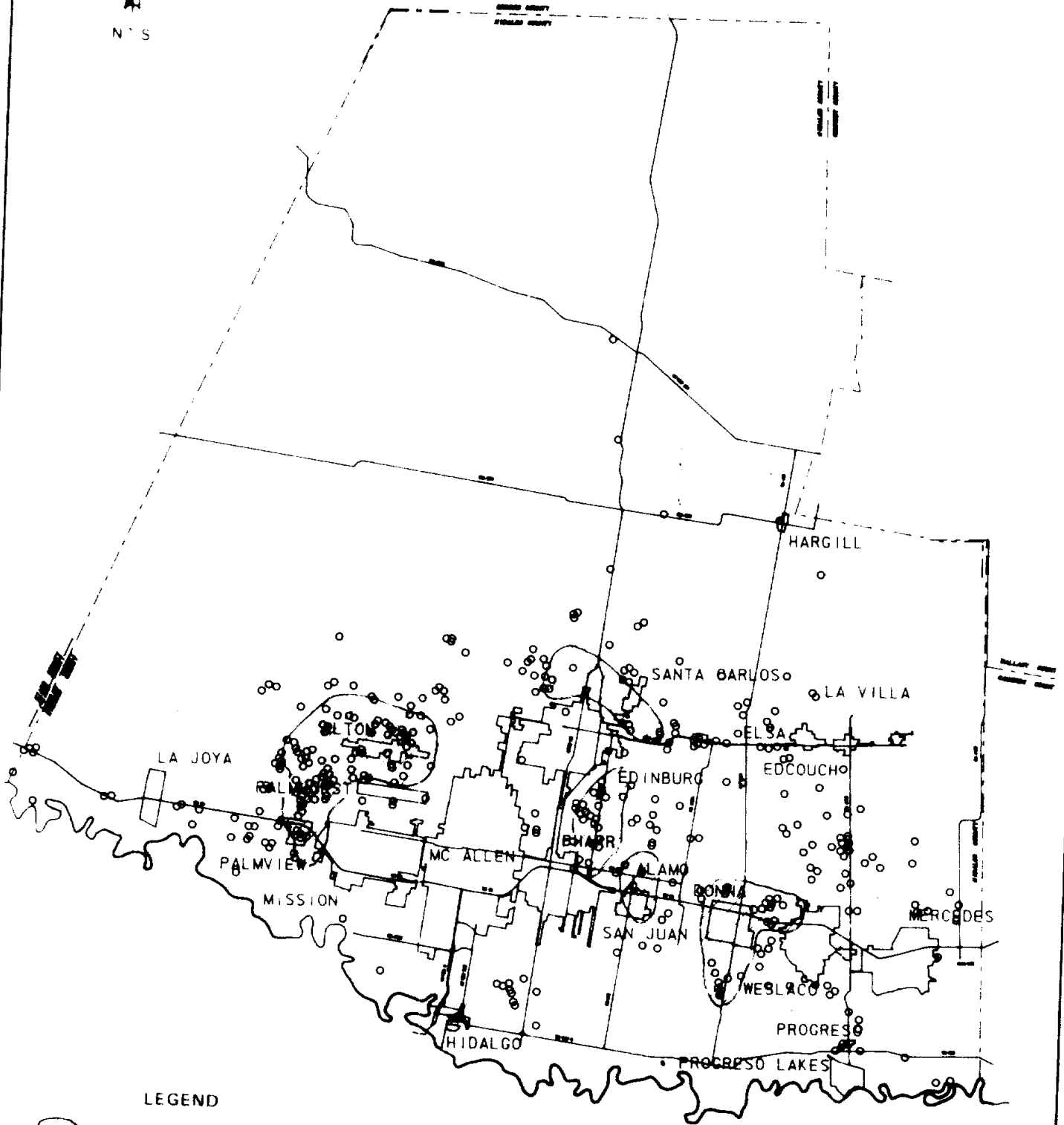



FIGURE I-1  
STUDY AREA



LEGEND

 AREAS OF STUDY


 COLONIAS

FIGURE I-2  
COLONIAS IN  
HIDALGO COUNTY

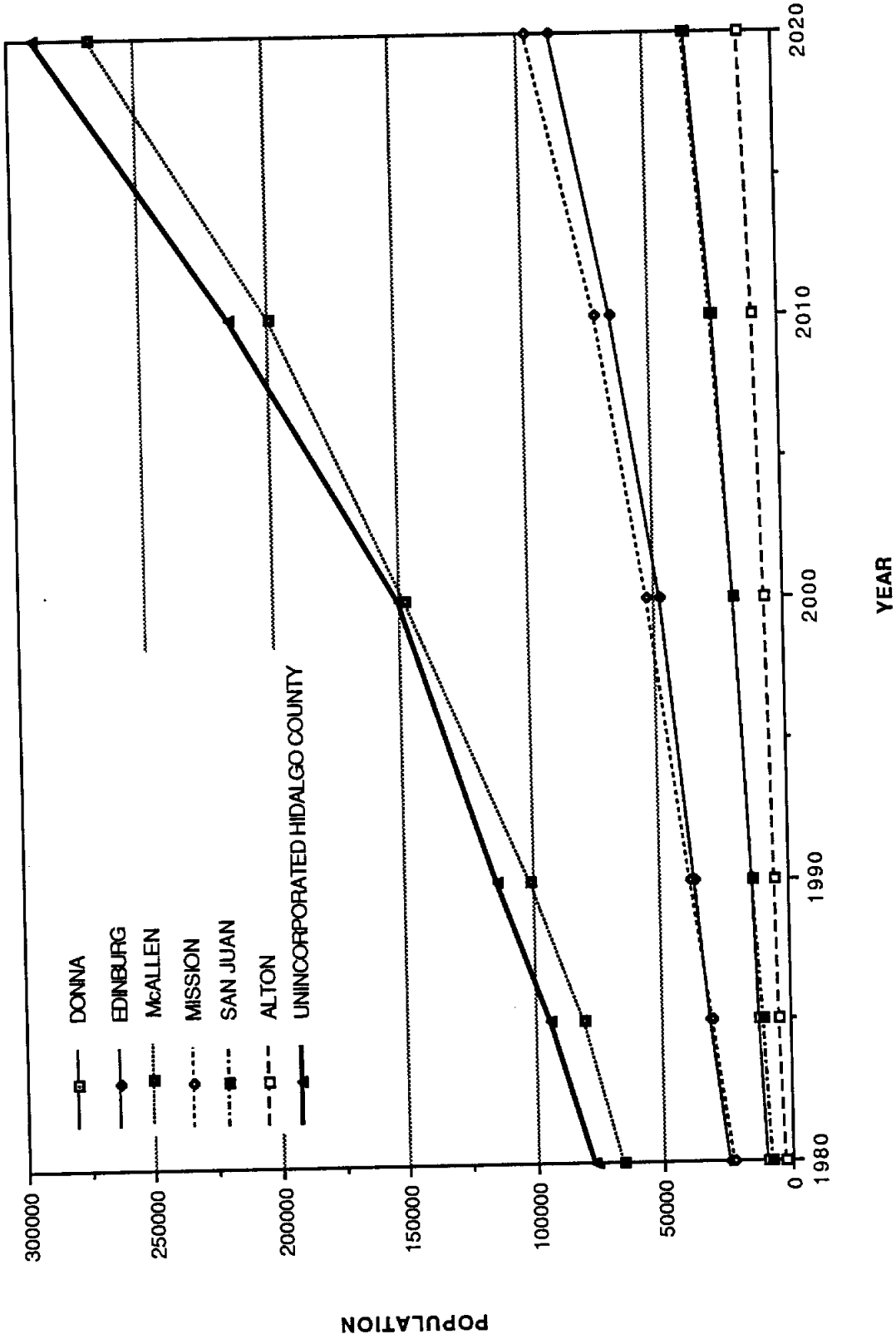


FIGURE I-3  
 TWDB POPULATION PROJECTIONS  
 HIGH POPULATION SERIES



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WATER RESOURCES

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### Sources of Supply

Although there is some groundwater used for potable purposes in Hidalgo County, most of the water, for both potable and irrigation uses, comes from the Rio Grande. While groundwater reserves are available, the poor quality of the water source precludes widespread use for domestic supply.

Surface water, therefore, remains the predominant water supply source in Hidalgo County. Surface water supplies for rural use (irrigation and domestic) and urban domestic use the water rights of the property to be served for treatment and resale. When a new area is subdivided, as is the case with the various colonias, the water rights associated with the land being subdivided (rights originally used to irrigate the land) are "loaned" to the water supplier, who uses the rights to acquire new water. If land is transferred without accompanying water rights, additional rights must be purchased separately in order for the water supplier to serve the area. Thus, the issue of water rights must be addressed at the same time when discussing water supply sources within the County.

### Groundwater Resources

The groundwater resources existing within the Hidalgo County region include the Chicot and the Evangeline aquifers as well as the alluvial sand of the Rio Grande. A generalized geologic cross-section of the project region illustrating the subsurface features of these aquifers is presented in Figure II-1.



The Chicot aquifer extends along the upper Texas coast and generally consists of discontinuous layers of sand and clay. In the Hidalgo County area the aquifer extends from the alluvium deposits of the Rio Grande to the top of the Evangeline aquifer and reaches base depths of approximately 1,000 feet below mean sea level (msl) with outcroppings in the central portion of Hidalgo County. The large sand inclusions of the Chicot make it a productive supplier of high quality groundwater along the upper Texas coast. However, in the Lower Rio Grande valley, the sand content diminishes and the availability of fresh water is greatly reduced.

The Evangeline aquifer is typically wedge shaped and has a high sand-clay ratio. The aquifer dips in a predominantly easterly direction with depths ranging between 300 to 2,500 feet below msl in Hidalgo County. It exists as a water table aquifer on the western side of the County and as a confined aquifer on the eastern side. The Evangeline ranges in thickness from 400 to 1,000 feet near its outcrop in Starr County and approximately 2,000 feet near the coastline.

Because the Chicot and Evangeline aquifers are geologically similar, the basis for separating them is primarily a difference in hydraulic conductivity, which in part causes a difference in the altitudes of the potentiometric surfaces in the two aquifers. Another noted contrast between the two aquifers is that unlike the Chicot, the Evangeline aquifer maintains an abundance of good quality ground water in the Lower Rio Grande Valley region. On



the other hand, much of the aquifer is under water table conditions in Hidalgo County. As a result, it is subject to pollutants and poor water quality in shallow wells, as well as fluctuations in water surface. Additionally, much of the population resides in the southern portions of Hidalgo County where alluvium deposits are much thicker and shield the Evangeline from use by shallow wells.

Surface alluvium deposits along the Rio Grande and its main tributaries usually consist of unconsolidated deltaic sands, silts, clays, and gravel. The thickness of the alluvium deposits range up to 300 feet near the river. These deposits were once an important source of water in the region as it yielded moderate to large quantities of fresh water for irrigation, public supply, and industry. However, with the completion of the Falcon Reservoir 60 miles northwest of McAllen in 1954, the reliance on the alluvium as a major supply source has diminished.

#### Groundwater Quality

Recent chemical analysis of the groundwater pumpage from several active wells in southern Hidalgo County indicates that water quality is marginally acceptable within the limits presented in Table II-1 (Saenz, 1989). These wells, owned by the City of Hidalgo and the Military Highway Water Supply Corporation, are drilled to depths of 240 to 340 feet. Hence, the pumpage is generally from either the Chicot aquifer or the surface alluvial deposits of the Rio Grande. Most other wells in



the County, including those of private homeowners, are drilled at substantially shallower depths. As such, it is expected that the Evangeline aquifer is presently not used as a water supply source in Hidalgo County.

Historical groundwater quality data for the region indicate that most of the readily available supply sources located near the land surface are slightly saline having high sulfate, chloride, and sodium contents. The dissolved solids content generally increases with depth except in areas where saline water overlies fresh water. In these areas the dissolved solids content decreases with depth before increasing again as the base of the fresh to slightly saline water is approached. Much of the pumpage is also characterized as being slightly alkaline (Wood et al., 1971). According to a 1977 Lyndon B. Johnson School of Public Affairs' Report, the water supply sources of the Lower Rio Grande Valley are being threatened with contamination from domestic waste. Previous reports indicate that officials from both the Hidalgo and Cameron County Health Departments have indicated that many of the existing septic and latrine systems in the region were often improperly installed or located in areas unsuitable for their use. Consequently, it is not unusual for pathogens and other organic pollutants to escape from these systems and infiltrate into the local groundwater supply.



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### Groundwater Utilization

Within Hidalgo County, groundwater is usually pumped for crop irrigation and private homeowner use. Municipal potable water supplies are usually obtained from the Rio Grande. The City of Hidalgo is the only remaining municipality totally reliant upon groundwater for its potable water supply. The Military Highway Water Supply Corporation is the only major supplier of water in Hidalgo County which supplements surface water from the Rio Grande with groundwater. Those households not currently being serviced by a municipality or a local water supply corporation will often maintain private wells. These wells are often of shallow depth and yield water of poor quality. Local farming operations also rely upon groundwater via private wells for crop irrigation and for maintaining livestock. However, high dissolved solids concentrations often precludes the widespread use of groundwater for extensive irrigation.

### Surface Water Resources

#### Source of Supply

The Rio Grande is the only perennial stream in Hidalgo County, and its waters, which include all the water flowing in the river and its tributaries, constitute the entire available supply of surface water to the County which has been developed. The Rio Grande supply itself has been fully developed by construction of several reservoirs along the Texas/Mexico border and along the New Mexico/Mexico border. The reservoirs are operated



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by the International Boundary and Water Commission acting on requests issued by the Texas Watermaster or his Mexican equivalent. The Watermaster maintains records of all water rights as they pertain to supply in the Rio Grande; is a party to the transfer of water rights and their use; allocates and delivers water to the various users upon request; and assesses fees for storage and supply of the water.

#### Availability of Supply

The water allocation from the Rio Grande is regulated by the International Boundary Commission which has jurisdiction both in Mexico and the United States. Allocation of water between the two countries is based on a 1944 treaty wherein water that is generated from run-off of tributary streams within the United States is allocated to the United States as is a portion of run-off generated directly into the Rio Grande and a portion of the run-off generated from the Mexican side of the watershed. Individual rights to these allocations are defined by a Texas State Court adjudication and judgement in 1971, commonly referred to as the Stanley Decision (Valley Water Suit Judgement). The Stanley Decision allocated the Rio Grande water rights among Water Control and Improvement Districts, municipalities, and some private property owners. The maximum allocation to municipalities was based on the assumption that growth of the cities would not exceed 50 percent of their 1965 population. In many cases, this anticipated growth has already been exceeded. As a result, the cities are likely to use their water rights to serve property



within their corporate limit, rather than to serve the rural areas outside these limits.

All available surface water is stored in reservoirs along the Rio Grande and is delivered to the users upon request by making withdrawals from their individual accounts. The two reservoirs that supply water to Hidalgo County are the Falcon Reservoir and the Amistad Reservoir. Allocation of water between Mexico and the United States from the water available in these reservoirs is:

	<u>Amistad</u>	<u>Falcon</u>
U.S.	56.2 percent	58.6 percent
Mexico	43.8 percent	41.4 percent

For the purpose of establishing accounts in the Amistad and Falcon Reservoirs, the two reservoirs are considered to be a single storage system. Accounts in the Lower and Middle Rio Grande Valley are based on a water right's annual authorization in acre-feet. When there is adequate water to do so, the Watermaster maintains a reserve in the reservoirs of 225,000 acre-feet of water for domestic, municipal, and industrial uses; an operating reserve of between 380,000 acre-feet and 275,000 acre-feet; and the accounts for all irrigation uses. The operating reserve is necessary to provide for loss of water due to seepage, evaporation, conveyance, and emergency conditions.

Allocations from the reservoirs are based on the usable storage within the system. Allocations are prioritized in the following sequence.





- To provide 225,000 acre-feet for domestic, municipal, and industrial use.
- To fulfill irrigation and mining allottees.
- To maintain an appropriate operating reserve.
- To fulfill mining and irrigation allocations.

When sufficient water is not available within the system to supply the requested allotments, the mining and irrigation allocations are prorated according to the following table of water rights holders.

<u>Certificate of Adjudication</u>	<u>Annual Authorization (Acre-feet)</u>	
	<u>Unprorated</u>	<u>Prorated</u>
23-802	33,948.85	20,000
23-837	4,375.00	3,656
23-850	3,750.00	2,000
23-851	2,522.5	1,642

It is possible that fluctuations in storage of water will alter the prorated amounts by a percentage of the water available in the system.

Water Rights

Water rights on the U.S. side from these two reservoirs are totally allocated. The majority of these water rights are owned by municipalities, irrigation districts, or public water supply corporations. Irrigation districts, which own 90 percent of the water rights in the reservoir system, are chartered by the State and supply water to properties located remotely from the Rio Grande through a system of canals. Water Supply Corporations have service areas adjudicated to them. When cities claimed their corporate limits as service areas, the Water Supply



Corporations claimed and were certified for service to the unincorporated areas. A certain conflict exists between the various parties owning water rights. The irrigation districts only use approximately 50 percent of their annual allocation leaving a surplus which they can barter with whomever needs the water. The cities are trying to expand their service areas through annexation. In a sense, they are moving into the Water Supply Corporation service areas. The Water Supply Corporations are asking for replacement value on existing lines that the cities are not able to use because of the line sizes and nonfire-rated pipe.

Allocation of the water from the reservoirs operates basically on a monthly basis based on projected demand, river flow, and evaporation. When possible, supply is taken from the Falcon Reservoir as a means of keeping the Amistad Reservoir full. This is because the Amistad Reservoir occupies a smaller surface area and is deeper, making it subject to less water loss through evaporation.

Water rights are considered to be a type "A" or type "B," depending on seniority, and the procedure of adjudication upon which they were obtained. Municipalities are guaranteed their allocated water whereas irrigation rights are subject to availability. When the Amistad and Falcon reservoirs are full, holders of class "A" rights are entitled to 0.6 acre-foot of water for each 1.0 acre-foot of water right. Class "B" holders are entitled to 0.5 acre-foot of water per acre-foot of water right.



Water rights can be converted from irrigation to municipal type use. One acre-foot of class "A" water right can be converted to 0.5 acre-foot of municipal water right. One acre foot of class "B" can be converted to 0.4 acre-foot of municipal water right.

Because the water in the basin is totally allocated, there is a value associated with water rights. Class "A" rights are valued between \$600 to \$800 per acre-foot. Class "B" rights are valued between \$400 and \$600 per acre-foot. The annual assessment for storage and supply of the water is \$.085 per acre-foot for irrigation water right and \$.105 per acre-foot of municipal water right.

### Water Suppliers

Many cities own and operate the water supply and distribution systems within their corporate limits. The rural portions of the counties, however, generally receive their water from one of four public water supply corporations operating within Hidalgo County. These water supply corporations, whose service areas are shown on Figure II-2, own water rights and supply domestic water to the majority of the colonias through a series of small diameter distribution mains. The intent of these mains is to supply only water for domestic consumption and is not intended for fire protection. The municipal systems, on the other hand are designed for fire protection as well as domestic consumption. As a result, the storage and distribution system that is adequate for



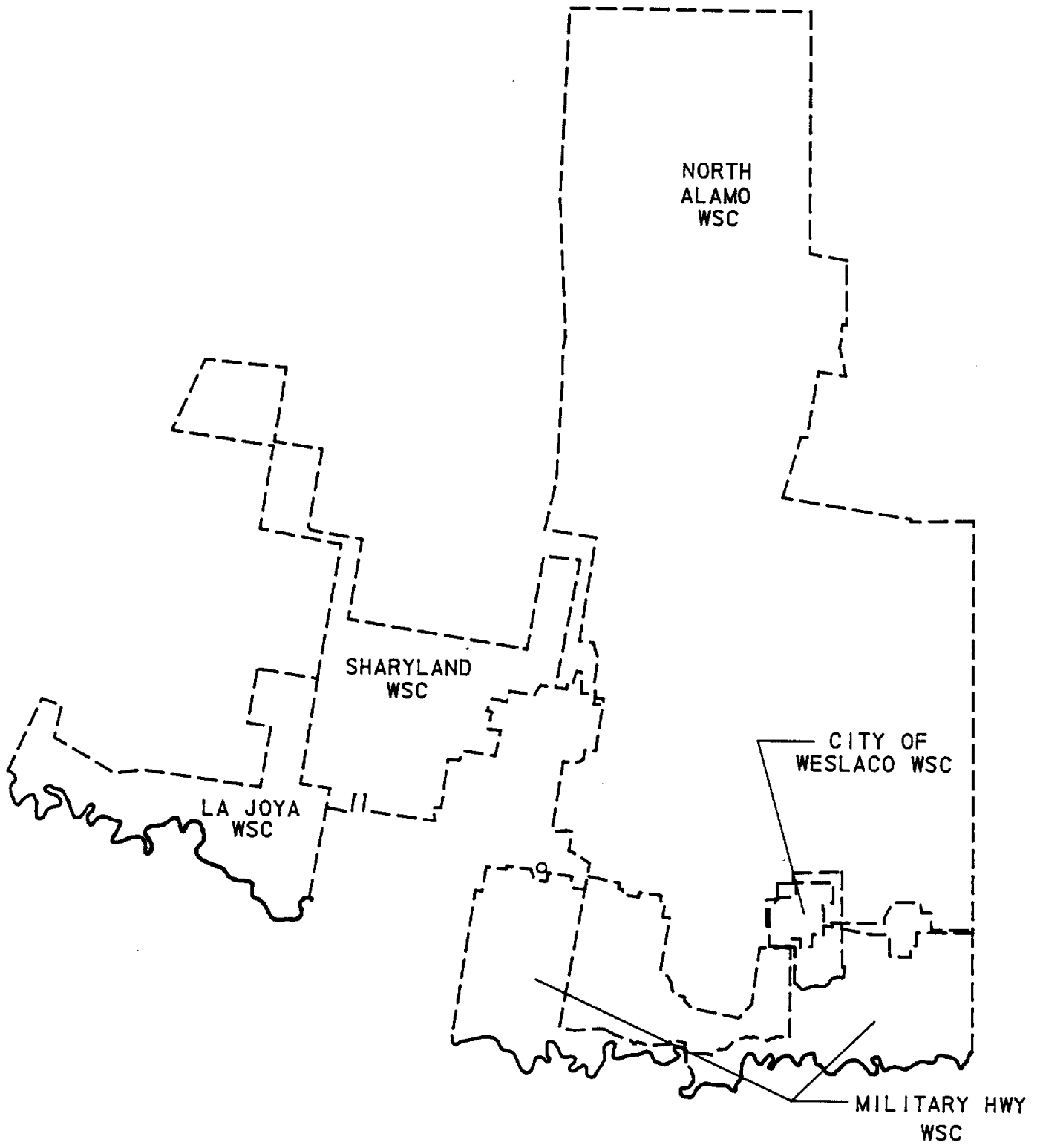


FIGURE II-2

**WATER SUPPLY CORPORATION  
SERVICE AREA**

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the purpose of the water supply corporation is not adequate for the properties within a corporate limits.

This capability of the system to deliver water is a major issue in the cities' efforts to expand both water and wastewater service to properties outside their corporate limits. Water supply is viewed as the means of insuring collection of fees for debt retirement of any debt incurred from construction of the wastewater system in the Colonias. Therefore, the cities would prefer to control the right to supply water to the customers of their wastewater service system. But in attempting to purchase the supply and distribution system from the water supply corporations, there is usually a significant difference of opinion as to the value of the system.



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**TABLE II-1 - SELECTED GROUNDWATER QUALITY CRITERIA GUIDELINES**

Chemical Parameters

<u>Description</u>	<u>Concentration</u>
Magnesium (Mg)	Should not exceed 125 ppm
Chloride (Cl)	Should not exceed 250 ppm
Sulfate (SO4)	Should not exceed 250 ppm
Fluoride (F)	Must not exceed 1.5 ppm
Dissolved Solids:	
Fresh	Less than 1,000 ppm
Slightly Saline	1,000 to 3,000 ppm
Moderately Saline	3,000 to 10,000 ppm
Very Saline	10,000 to 35,000 ppm
Brine	Greater than 35,000 ppm

ppm - parts per million

Source: Wood et al., 1971



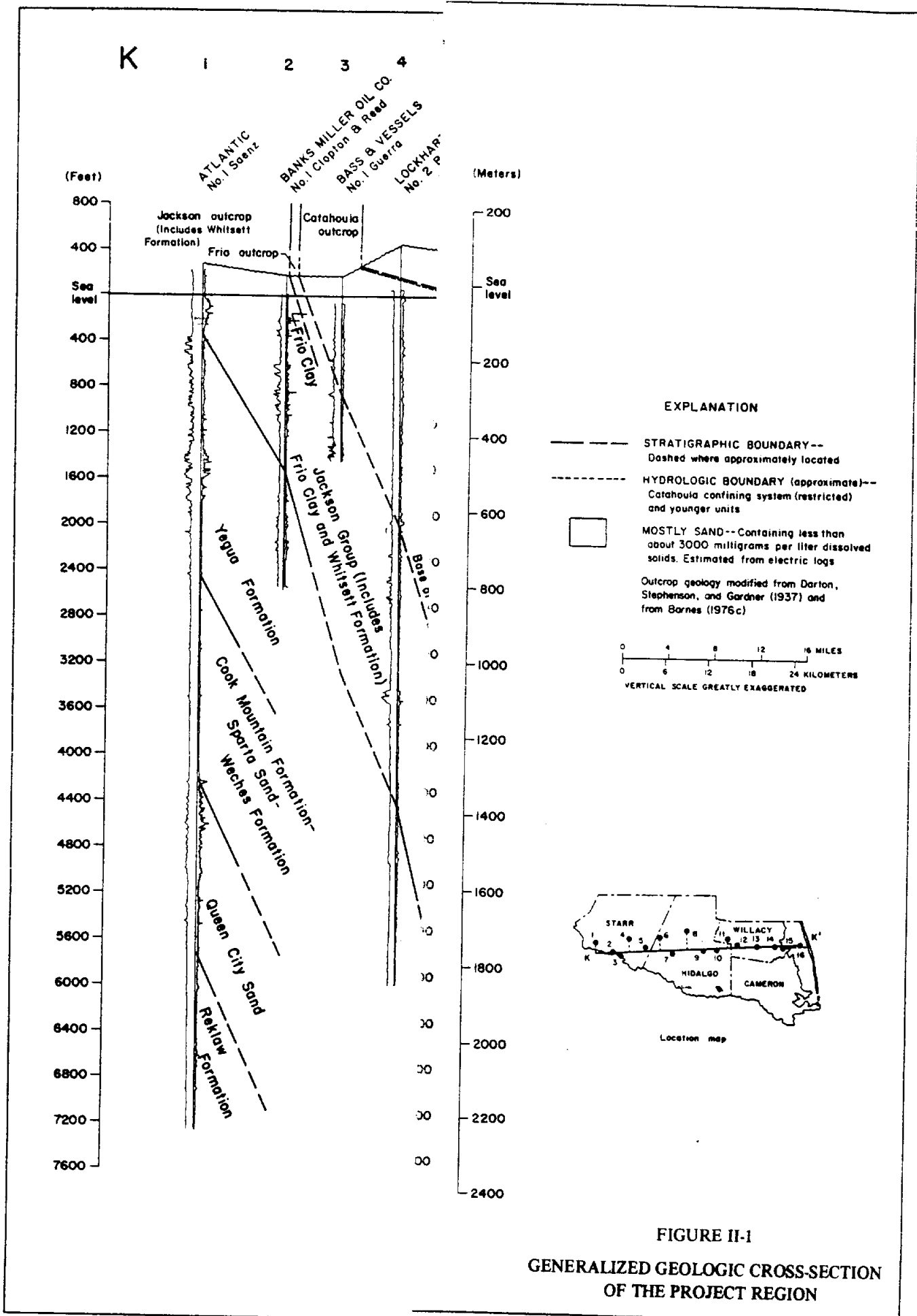


FIGURE II-1  
GENERALIZED GEOLOGIC CROSS-SECTION  
OF THE PROJECT REGION

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EXISTING FACILITIES

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### Water Supply Facilities

Other than those individuals with private wells, urban and rural residents are provided with domestic supply from either municipal treatment facilities or facilities owned and operated by one of the various water supply corporations. For the most part, municipalities serve only those residents within their corporate limits. Figure II-2 presents an overview of the service area boundaries of the water supply corporations and municipalities that supply potable water within the County. Table III-1 summarizes the existing municipal and water supply corporation facilities which supply water to colonias in Hidalgo County. Table III-2 shows the numbers of colonias and total connections (colonia and noncolonia) served by each major water supplier. Monthly water service costs for a typical residential user served by each supplier are also provided.

While the water service rates vary somewhat among the various water supply corporations, the average residential unit pays over \$20 per month for water. For many, the average monthly bill is about \$30. While these include both colonias and other subdivision residents, interviews with the water supply corporations indicate an average monthly water bill closer to \$15 for only the colonia residents.

More detailed information regarding individual areas studied can be found in the individual alternative plan sections.



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### Wastewater Facilities

A majority of the colonia residents in Hidalgo County obtain wastewater treatment through the use of private, on-site septic or latrine systems. In fact, the Hidalgo County Health Department estimates that as many as 60 percent of the colonia residents have septic systems, 30 percent have latrines, and the remaining 10 percent have centralized, regional collection and treatment facilities (Garcia, 1986). A regional wastewater system is one that collects wastewater from one large or several separate service areas, for example, political subdivisions, and transmits it to a single facility for treatment and disposal. Most of the incorporated cities in Hidalgo County are currently served by such facilities. These existing regional facilities offer some potential for extending service into those nearby areas which are presently served by substandard facilities.

According to officials from the County Health Department, many of the existing septic and latrine systems are malfunctioning due to improper installation and are possibly creating environmental health problems (Garcia and Rodriguez, 1986). The Texas Department of Health (TDH) has indicated that some septic tank systems within the colonias were installed on lots less than half the size of the State's minimum requirement for a septic/absorption field system of 15,000 square feet. In addition, septic systems have been installed in areas with unsuitable soils, i.e., soils having seasonal high groundwater tables and/or low percolation rates.



The reconnaissance-level study investigated several alternative methods of wastewater collection and disposal for the colonias. Other studies have determined that in areas where financial resources are limited and housing densities are low, offsite sewerage systems are generally too expensive for the residents to afford and many times are not necessary to properly dispose of the waste. Facility plans for rural areas of the United States completed in the 1970s showed that the total cost (not including treatment) of conventional gravity sewers averaged more than \$30 per month for housing densities less than one unit per acre and more than \$20 per month for housing densities less than two units per acre. Monthly charges much above \$20 are considered excessive in rural areas, including the study area, where median incomes are generally significantly lower than in urban areas. Because most conventional onsite disposal systems cost less than \$20 per month, onsite septic systems have been generally used and are prevalent in Hidalgo County.

The 1986 study grouped the existing colonias into five classifications. Classification 1 colonias included those colonias or close groupings of colonias that were within a one-mile radius of an existing corporate boundary or regional treatment service area. Classification 2 colonias or close groupings of colonias were those that contained more than 200 persons and have a relative housing unit density greater than one equivalent dwelling unit per acre and whose location is greater than one mile from an existing corporate boundary or regional treatment system.



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Classifications 3, 4, and 5 include the remaining colonias and generally were those of lower densities and further removed from existing treatment facilities. As noted previously, this study focuses exclusively on the Classification 1 and 2 colonias or colonia groupings, therefore, those areas addressed are most likely to be economically and feasibly served by centralized treatment facilities during the planning period.



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**TABLE II-1 - SELECTED GROUNDWATER QUALITY CRITERIA GUIDELINES**

Chemical Parameters

<u>Description</u>	<u>Concentration</u>
Magnesium (Mg)	Should not exceed 125 ppm
Chloride (Cl)	Should not exceed 250 ppm
Sulfate (SO4)	Should not exceed 250 ppm
Fluoride (F)	Must not exceed 1.5 ppm
Dissolved Solids:	
Fresh	Less than 1,000 ppm
Slightly Saline	1,000 to 3,000 ppm
Moderately Saline	3,000 to 10,000 ppm
Very Saline	10,000 to 35,000 ppm
Brine	Greater than 35,000 ppm

ppm - parts per million

Source: Wood et al., 1971



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TABLE III-2 - MAJOR SUPPLIERS OF WATER TO THE COLONIAS

<u>Water Supply Corporation</u>	<u>Colonias Served</u>	<u>Monthly Charge for 13,500 Gal.*</u>	<u>Total Connections**</u>	<u>Water Rights (acre-feet)</u>
Military Highway	33	\$30.50	4,000	300
Sharyland	88	\$25.88	7,246	3,800
La Joya	48	\$26.35	3,642	1,000
City of Weslaco	9	\$17.18	5,500	N/A
North Alamo	149	\$21.20	9,689	6,000

\*Average monthly usage per residential connection based on 100 gallons per day per person and 4.5 persons per household.  
 \*\*Includes residential and commercial connections for both colonias and others.

Source: TWDB 1986 Reconnaissance Level Study of the Colonias



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MANAGEMENT AGENCIES

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Entities to Manage and Operate Utility Systems

The types of entities currently serving the colonias of Hidalgo County include the following.

- ° Regional Authorities
- ° Incorporated Cities
- ° Nonprofit Water Supply Corporations
- ° Utility Districts
- ° County Government

In considering which entities are best suited to manage and operate new or expanded utilities to serve colonias in the future, the following considerations should be taken into account.

Regional Authorization

There are two regional authorities within Hidalgo County which are capable of managing and operating regional water and wastewater facilities; the Rio Grande Valley Pollution Control Authority and the recently developed Hidalgo County Water Development Board. A brief discussion of the history and function of these two organizations follows.

In 1967, the State created the Rio Grande Valley Pollution Control Authority "for the purposes of gathering, transporting, treating, and disposing of waste....that may cause impairment of the quality of waters in the State." The boundaries of the Authority include all of Cameron and Hidalgo counties. The Authority is prohibited from storing or distributing water for





municipal use or irrigation. Although the Authority may issue revenue bonds, it is prohibited from levying a tax.

While the Authority was formed and a Board of Directors appointed (for two-year terms), there is no indication that the Authority ever undertook the construction or acquisition of any waste disposal facilities. However, it is a potential financial vehicle and operating entity to develop and provide waste disposal service to rural subdivisions of the region. This Authority could also develop regional wastewater treatment facilities and trunklines to accept and treat wastewater collected by the various cities in Hidalgo County. Its region-wide jurisdiction gives it the broad representation and responsibility to regionalize wastewater treatment plants without regard to local political boundaries or jurisdictions. At the same time, the ability to receive and treat wastewater collected by the local jurisdictions would allow the Authority to operate and yet not be a threat to those municipalities which operate their own systems.

While the Authority could act as a recipient of funds from most federal and state programs, it cannot itself become a taxing entity. Financing would be limited to revenue-supported funding. It seems unlikely that such an authority could receive the necessary voter approval to become a taxing entity at this time.

The Hidalgo County Water Development Board was formed in 1988 as a non-profit corporation. The Board is composed of representatives from each municipality in Hidalgo County. According to its Articles of Incorporation, the purpose of the Board is



"... to perform charitable activities within the meaning of Internal Revenue Code Section 501(c)(3) and Texas Tax Code Section 11.18(c)(1)." Specifically, the Board (corporation) was organized to benefit the low-income, rural areas of Hidalgo County. Duties of the corporation are to prepare grant applications and coordinate plans and specifications for construction of water and wastewater system improvements for rural development. Additionally, the Board is to assist cities and other governmental bodies in extension of their existing facilities to rural portions of the County. Like the Rio Grande Valley Pollution Control Authority, the Board can act as a recipient of funds from most federal and state programs, but cannot itself become a taxing entity.

#### Incorporated Cities

Most of the offsite wastewater utilities currently providing service to rural subdivisions are owned and operated by the incorporated cities and towns throughout Hidalgo County. Because most of the incorporated cities already have established sewerage systems in place, these systems offer the most obvious method of attempting to "regionalize" by extending them to nearby rural subdivisions. The majority of the colonia population resides within the extra territorial jurisdiction (ETJ) of an adjacent city. Annexation can be advantageous to both parties provided the annexation increases the city's tax revenue and extension of services can be provided without increased cost to city residents. There are, however, several concerns regarding leaving



the responsibility to serve the colonias to individual cities. For one, the colonias are, by definition, in rural locations, at least when they are subdivided. While some colonias are close enough in proximity to be served by an existing system, the majority are beyond the generally practical distance to receive service. In some cases, because an existing treatment facility is opposite the colonia needing service, extensive improvement to the city's sewer infrastructure would be required to transport added wastewater flow. Additionally, left to the discretion of individual cities, priorities for extensions to serve each colonia will be made in the best interests of the city, which may not be in the best interests of the colonias and their residents. Finally, most of the colonias, even those located near cities, currently receive their water from one of the water supply corporations. With no way to control payment for sewer service (this is often accomplished in many cities by turning off water supply), there is a reluctance to extend sewer service even if such service is available.

#### Nonprofit Water Supply Corporations

While Water Supply Corporations (WSCs) are the major supplier of water to the colonias, only Military Highway WSC, with its new treatment plant at Progreso, is currently prepared to offer sewage service to its customers. Yet because of their important position as water suppliers and potential future water suppliers of newly developed colonias, there is a certain logic and administrative efficiency in extending the WSC's role to include sewage



service generally. Major limitations for the WSCs are their lack of authority and restrictive eligibility for certain grant programs. These limitations restrict their right of eminent domain and, as a result, right-of-way and other land acquisition requirements of the utility can be seriously restricted. There is also a concern that by providing sewage service, the WSCs may lose their tax exempt status.

#### Utility Districts

Perhaps the most flexible and unrestricted entity for providing utility services to the colonias and other rural (and urban) subdivisions of Hidalgo County is the special utility district. The special utility district was specifically designed by the Legislature in 1983 to "purchase, own, hold, lease, and otherwise acquire sources of water," and sell it to various users, including "towns, cities, and other political subdivisions of this state, to private business entities, and to individuals." The special utility district can also provide sanitary sewer service and fire-fighting activities.

The utility district as a subdivision of the State of Texas, qualifies for most federal and state grant and loan programs. It has the right to condemn property (eminent domain) and to gain rights-of-way across and along public roads. The special utility district's service area may include more than one county and all or any part of any city or other public agency. The land comprising the district need not be contiguous and may consist of areas separated by land not included in the district. It is also



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significant that there are specific provisions for converting nonprofit water supply corporations into special utility districts.

There appears to be at least two major concerns regarding the creation of special utility districts to provide water and wastewater service in the Lower Rio Grande Valley. First is the general concern for establishing "another layer of government" in the area. However, if a district is formed to replace one or more WSCs and/or small municipal utility districts, it could actually reduce the total number of entities serving the area. A more subtle concern involves public representation. The WSCs, as nonprofit corporations, are controlled by boards of directors who are elected by the "owners" who are de facto the customers of the WSC. Citizenship is not a requirement to vote for or be a director of a WSC. If converted to a special utility district, on the other hand, the board of directors must be U.S. citizens and are elected by the registered voters that live in the district. Because of the large number of resident aliens living in the area, it is feared that many who are currently directors of the WSCs and possibly some of the current directors would be disenfranchised if the WSCs were converted to special utility districts.

#### Hidalgo County Government

The existing Hidalgo County government has authority over private septic systems and inspects private systems and offers permits. The County also has subdivision regulations prohibiting



the development of subdivisions without potable water availability.

Counties in Texas have authority to construct and operate wastewater collection and treatment facilities. However, limitations on their taxing and bonding capacity and other legal questions concerning the specific extent of their powers in these areas have generally limited any large scale county involvement in these areas. Hidalgo County currently does not operate water supply or wastewater treatment facilities.

Because of their county-wide jurisdiction and historical responsibility for other public services in rural areas, county governments can be considered as potential candidates to serve the rural colonias. However, because they have no current involvement or experience in these activities, a new layer of government within the current county government structure would be required, and most likely new enabling legislation. The primary advantage in the county actively participating in the management and operation of water and sewerage facilities lies in the potential for coordinated training of personnel, reduced labor requirements, lower bond ratings, and access to funding programs designated for regional planning efforts.



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STATEMENT OF THE PROBLEM

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General

Throughout the Rio Grande Valley of Texas there has been a history of rural subdivision development, which has accelerated during the past decade. These primarily residential developments are referred to as "colonias." The colonias of the Lower Rio Grande Valley are rural subdivisions characterised by substandard housing and inadequate plumbing. Most began as subdivisions of 5- to 50-acre agricultural tracts. The final lots are typically 50' x 100' or smaller. While most were in rural parts of the valley when originally developed, several have become recognized as communities or have been annexed into adjacent cities.

A total of 335 colonia developments were identified in Hidalgo County by a 1986 study conducted by the Texas Water Development Board. The population in these colonias was estimated to be 51,804 persons with an estimated 150,805 persons projected to reside in the colonias by the year 2020 (see Figure I-1). In addition, the incorporated communities of Alton, Palmview, and Palmhurst are without sewerage service and represent an additional 12,815 persons. Water service exists in the majority of the colonias, but the quantity and quality of the water in many cases is inadequate. Wastewater disposal is comprised of either septic tanks or latrines even though the soils are not conducive to this type of service and the area serves as an outcrop of the Evangeline aquifer. Projections for water consumption associated with the TWDB growth estimates for the





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county indicate that 30,286 acre-feet of water will be required in the unincorporated areas (Figure V-1).

The technical aspects of the colonias however, comprise only a portion of the problem as is any related technical solution only a part of the overall solution. The problem of the colonias is compounded by the financial inability of the residents to pay for improvements; the need to insure proper management and operation of the facilities; the jurisdictional conflict between water supply agencies; the relationship between colonias without ability to pay and those existing and future affluent subdivisions adjacent to the colonias who also require service; and the conservation of resources available.

Any final solution to the colonias problems in water and wastewater must address all of these issues. In developing this facilities plan, significant effort was expended in attempting to coordinate the various parties involved in water supply and wastewater disposal. Cities were identified as key players to the solutions because of their existing management and operational capabilities. Water supply corporations must play a role because they currently supply water for domestic consumption to many of the colonias. The colonias nearer the cities are the more populated and, therefore, are valuable to the water supply corporations to help defray the cost of providing service to more remote areas. The cities on the other hand, are concerned about providing wastewater service to the colonias without the ability



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to insure payment of operational costs through the control of water.

Financial assistance will be necessary to make repayment of any loans viable. The State of Texas and Farmers Home Administration are viewed as potential entities with the capability to provide assistance.

### Identification of Issues

Throughout the course of the planning effort, discussions were held with the entities that will likely be involved in the final solutions. These include the cities, water supply corporations, TWDB fund managers, and representatives of the colonias. The solutions that are presented reflect a concurrence of opinion that, if the related issues can be addressed, the agencies will cooperate in a solution to the problems.

The following issues were identified in these coordination meetings.

- ° The difficulty of collecting for sewer service if water is provided by another entity. In providing sewer service to the Lull area via the Edinburg wastewater system, Edinburg staff are agreeable to taking over the water system if that option is available. In other areas, North Alamo Water Supply Corporation (NAWSC), Sharyland WSC (SWSC), and city staffs indicated a general consensus that an arrangement could be developed to allow the water supply corporation to collect sewer fees. The terms of the agreement would allow the corporations to shut off the water for nonpayment of bills and would provide for a fee for the collection process.
- ° The need for new system customers to pay for their "fair share." Indications were that additional indebtedness caused by incorporation of non-city areas into the city's system should be accomplished in such a manner that Colonia customers would be required to pay for these amounts in their bills.



- ° Construction of water and wastewater systems to city standards will intensify the pressure for rural subdivision development. The County's current rules require that all lots be at least one-half acre to allow septic tanks and leaching fields to conform with State health department standards. Edinburg staff has indicated that approximately 30 to 40 percent of the land within their city limits is now vacant. By providing infrastructure in these areas (colonias), additional growth outside the city is encouraged. Some cities indicated that new systems need to be oversized to accommodate additional development in each watershed. An impact fee has been suggested to help repay for the oversizing.
- ° Acceptance of non-conventional (innovative/alternative technologies) collection systems by entities charged with their maintenance.
- ° The water supply corporations have indicated a general reluctance to provide sewer service to rural residents. The current regulations to some extent exempt water supply facilities from ad valorem taxes. No such exemption is available to providers of sewer service.
- ° NAWSC staff indicated that processing time for FHA funding is very lengthy; they have not received funding for projects for which requests were submitted three years ago. They indicated that local officials have requested that consideration be given to providing fire protection in the WSC service areas. NAWSC will not allow fire hydrants on its system without the cities accepting liability for damage to the WSC supply lines. Current FHA design guidelines allow only capacity equivalent to 1.5 times the demand of the current population.
- ° SWSC indicated that they require oversizing or increased standards on their system at the request of a city during the development process. Costs are borne by the land developers. In the case of their projects, SWSC will oversize and increase design standards if the cost of the increase is provided by the cities.
- ° The projected \$25 to \$30 per month sewer bill to serve the colonias was felt by most residents to be infeasible. NAWSC staff indicated that they average approximately 6 percent of accounts being delinquent each month.
- ° City of Pharr staff indicated that lack of right-of-way or easements in unplatted areas has slowed implementation of collection system projects.



- The City of Pharr indicated that it has required plumbing code conformance for all structures connecting to its system. Staff indicated they will work with the County to gain compliance in the Lopezville area.
- The City of Pharr indicated that it does not currently fund structural improvements to dwellings to allow connection to the sewer system. It does, however, provide a sewer tap revolving loan program to assist in the cost of plumbing modifications.
- The City of Donna was reluctant to add additional colonia areas to its system due to a lack of sufficient capacity at its wastewater treatment plant.
- The City of Donna was reluctant to provide wastewater service without providing water service.
- Weslaco city staff indicated that they have used TDCA funds to provide indoor plumbing. Cost of indoor plumbing, including connection to a sewer generally cost between \$1,600 and \$1,900.
- Weslaco city staff indicated there would be little opposition to annexation and providing services if outside funding sources were available. They indicated concern if only loan funds were available.
- Weslaco staff indicated a willingness to consider I/A technology for collection systems.
- Weslaco city staff indicated that it is currently working on an agreement to settle water rights issues with the water district. This will allow the conversion of agricultural water rights to municipal water rights for existing and newly developed areas.
- Cities in general would favor legislation empowering them with the right of eminent domain over the WSCs, allowing them to condemn the water systems within their ETJs and thus giving them access to water customers and the water rights. The WSCs on the other hand are opposed to this concept because they need the customers in the densely populated areas to supplement the cost of providing service to more remote areas.
- WSCs may be willing to sell portions of their service areas to the cities. However, there is a discrepancy in value of the system. From the WSC point of view, the system represents a loss of customer base and, therefore, is worth the



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replacement cost of the system in a new location. Because the systems are small diameter however, they are of little use to the cities. In addition, the TWDB will only participate in helping fund acquisition of the water system.



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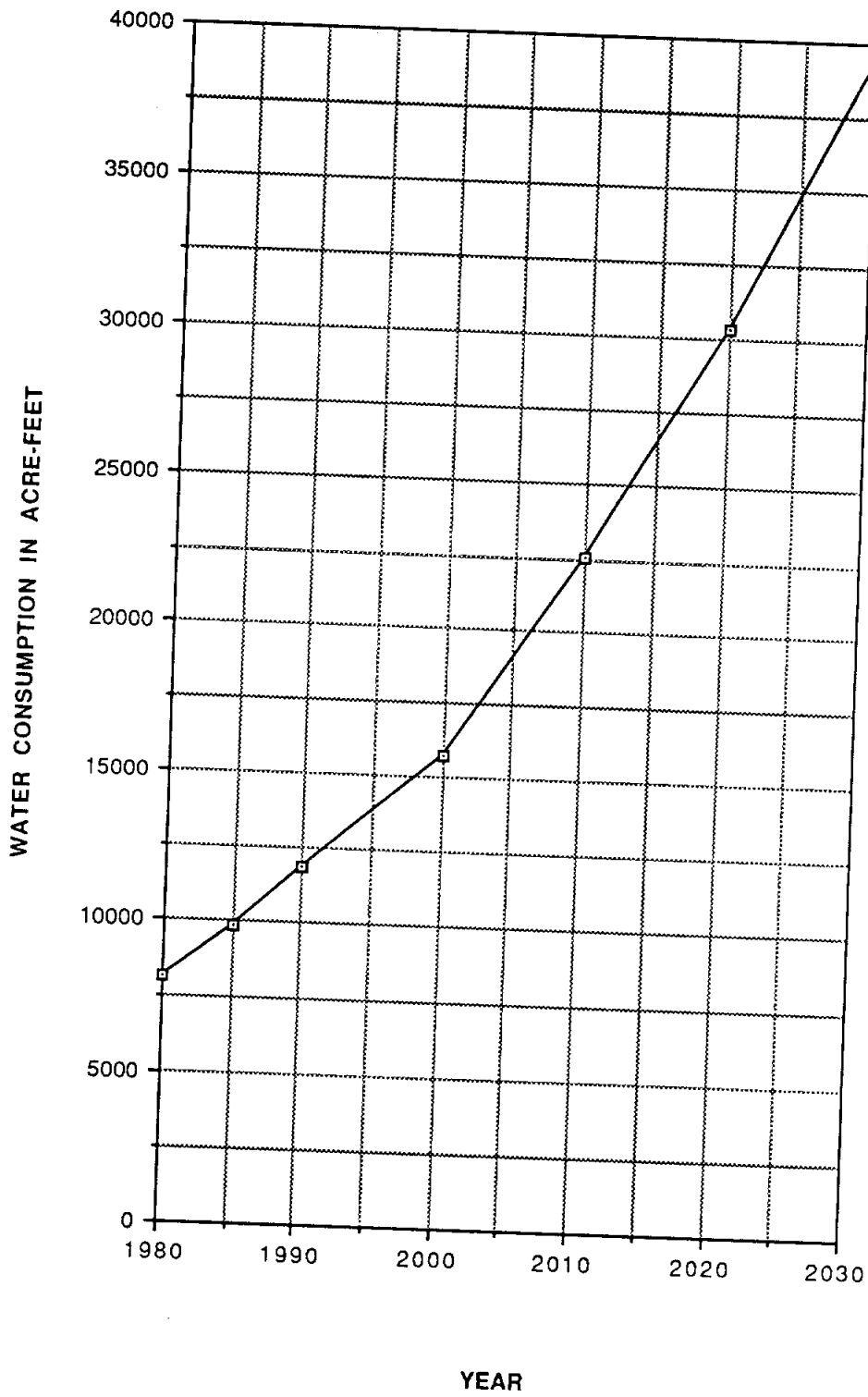


FIGURE V-1

WATER CONSUMPTION IN UNINCORPORATED  
HIDALGO COUNTY

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WATER AND WASTEWATER  
FACILITY NEEDS

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Alternative projects to service the colonias are described in the following subsections of the report. Each subsection is grouped according to the individual city or entity identified as a reasonable supplier of water or wastewater service. The subsections to follow include the following:

- ° San Juan
- ° Edinburg
- ° Pharr
- ° Donna
- ° Weslaco
- ° Alton/Palmview

A separate report evaluates the City of Mission as a regional provider of water supply and wastewater disposal services for selected colonia areas. This report, while submitted under separate cover, is a part of the overall Hidalgo County study effort.





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**SAN JUAN****1.0 - Description of the Colonias**

The City of San Juan, Texas is located in the central part of Hidalgo County along the major highway U.S. 183. In the late 1970s the City participated in a 208 Water Quality Program developed by the Lower Rio Grande Development Council that established a planning area defined on Figure VI-1. In 1983, a facility plan for the City of San Juan was completed by Sigler, Winston, Greenwood and Associates Inc. That plan identified necessary improvements to the City's wastewater collection and treatment system. Three unsewered subdivisions, Santa Fe, Small No. 1, and Small No. 2, were defined within the planning area. The facilities plan identified projected growth within the City through the year 2000 and identified alternative methods for providing sewerage service. The plan concluded that an aerated lagoon system with water hyacinths was the best treatment option.

In January 1988, an amendment to the Facilities Plan for San Juan was prepared by Noe Garza Engineers Inc. This amendment identified certain changes in the character of the planning area and recommended construction of a 1.15-mgd oxidation ditch treatment facility. In September 1988, the EPA awarded a construction grant to the City for construction of that facility. In addition, the construction program includes modification to a lift station and installation of a collection system in the Small No. 1 and Small No. 2 subdivisions.



In the current planning effort, four additional subdivisions within the original facilities planning area have been identified as requiring sewerage service. The subdivisions are Las Brisas, Paradise Park, Arguello No. 1, and Arguello No. 2. All four subdivisions are located within the corporate limits of San Juan north of U.S. 183. The subdivisions have access to water, though the water is supplied by the North Alamo Water Supply Corporation rather than the City of San Juan.

Although the four subdivisions are located within the City, their character of housing, lack of streets and drainage (except for Las Brisas), and lack of sewerage service classifies them as colonias. This study defines the requirements for providing sewerage service to these colonias.

#### Population and Housing

Paradise Park, Arguello No. 1, Arguello No. 2 and Las Brisas are within the city limits on the north-central edge of the City. The existing population in each colonia was determined by a drive-through survey house count and assuming 4.5 persons per dwelling unit, consistent with the population density determined in the 1986 reconnaissance survey. The TWDB projection for growth in the City of San Juan estimated a population of 34,894 in the year 2020. This represents a growth rate of 3.2 percent annually.

Future population in the four colonias was estimated by taking the total number of platted lots multiplied by the density factor of 4.5 persons per dwelling unit. Assuming a growth rate



of 3.2 percent, the year in which each colonia would be built out was estimated.

The existing and build-out population projections are as follow.

<u>Colonia</u>	<u>Number of Lots Occupied</u>	<u>Total Number of Lots</u>	<u>1988 Population</u>	<u>Build-out Population</u>	<u>Build-out Year</u>
Las Brisas	92	150	414	675	2002
Paradise Park	14	28	63	126	2008
Arguello No. 1	19	29	86	131	2000
Arguello No. 2	20	24	90	108	1993

Tax Rates

The subdivisions are subject to the following tax rates.

Hidalgo County	\$0.5651 per \$100 AV
Pharr/San Juan Independent School District	\$0.8644 per \$100 AV
San Juan Property Tax	\$0.8003 per \$100 AV

Current indebtedness of outstanding bond issues in the City of San Juan is approximately \$277,651.

Employment Rate

The current unemployment rate in the San Juan area is 16.5 according to the local Texas Employment Commission office. The total labor force is 4,483, of which 3,745 are employed.

Utility Service Rates

The following utility service rates are effective within the subdivisions.

Magic Valley Electric Coop

North Alamo Water Supply Corporation

\$11 first 3,000 gallons  
 \$1.50 next 2,000 gallons  
 \$0.80 next 1,000 gallons



City of San Juan Water Service  
(for comparison only)

\$7 first 2,000 gallons  
\$0.50 next 1,000 gallons

Structural Capability

The drive-through survey of the subdivisions indicates each of the four colonias varies in housing character. The structures in Las Brisas all appear to have plumbing conducive to connection to a sewer system. In the Paradise Park area, however, we estimate that 30 percent of the structures will require additional plumbing fixtures and in Arguello No. 1 and Arguello No. 2, 60 percent of the structures will need plumbing modifications.

Assessed Value

The Hidalgo County assessors office records indicate the following average assessed valuations for the properties within the respective subdivisions.

<u>Subdivision</u>	<u>Average</u>	
	<u>Lot Value</u>	<u>Lot Plus Dwelling Unit</u>
Las Brisas	\$5,474	\$18,634
Arguello No. 1	\$2,715	\$16,194
Arguello No. 2	\$3,836	\$14,679
Paradise Park	\$2,500	\$16,387

2.0 - Inventory of Existing Infrastructure

Water Supply

Although the colonias are located within the corporate limits of San Juan, water is supplied by the North Alamo Water Supply Corporation (NAWSC). An 8-inch distribution line from the City's system is, however, located on the west side of San Juan road adjacent to the subdivisions. The City of San Juan has indicated



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that it wants to provide water service to the colonias in an effort to control billings before it will supply sewerage service.

The City operates a 6.0-mgd water treatment plant in the center of town. Raw water is supplied by Hidalgo County Irrigation District No. 2. The City received a user allocation of 1,330 acre-feet of water through adjudication and an additional 1,000 acre-feet through conversion of land from irrigation to municipal use. Raw water supply is supplemented by an 800-gpm groundwater well located at the plant. The plant has four carbon filters, two operating at 1.5 mgd and two operating at 1.0 mgd. The clear well at the plant has a 1.0 mg capacity. In addition to the 1.0-mg clear well, the system also has two 150,000-gallon elevated storage tanks, one of which is located approximately one-quarter mile south of Las Brisas. The system has 2,760 connections and experiences an average flow rate of 1.5 mgd.

Water to Las Brisas and Paradise Park (No. 2) is supplied by the NAWSC. As a result, water in these colonias is available for domestic consumption only. Water is not supplied to Paradise Park No.1 or to the Arguello subdivisions. The distribution mains in Las Brisas are 6 inches in diameter. In Paradise Park No. 2 there are 2 inch diameter mains. No fire protection is provided.



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### Wastewater System

The City has made several improvements to its facilities through the EPA Construction Grants Program. The improvements are detailed in the Facility Plan No. C-481563-01 (Sigler, Winston, Greenwood and Associates, Inc.) and in Amendment No. 1 to The Facility Plan (Noe Garza Engineers, Inc.). Much of the grant was to fund improvements to the system for the area North of I-83 (this area comprises all of the colonias). These improvements are as follows.

- ° Granada Village Lift Station (capacity 0.288 mgd)
- ° Small No. 1 Collection System
- ° Small No. 2 Collection System
- ° Conveyance Lines From Small No. 1 and Small No. 2 to the Granada Village Lift Station
- ° 8-inch Pressure Main Connecting Granada Village Lift Station to Existing Collection System (1,660 ft.)
- ° Santa Fe Subdivision Collection System
- ° 15-inch Gravity Sewer Line From Santa Fe Subdivision to the existing Collection System (450 ft.)

South of I-83, the proposed improvements are as follows.

- ° Aldrich Park Lift Station (capacity 1.18 mgd)
- ° 15-inch Pressure Main Connecting Aldrich Park Lift Station to Treatment Plant
- ° New Clarifier and Modification of Existing Stabilization Ponds to Increase Capacity to 1.15 mgd

All of the proposed improvements have been completed with the exception of the following.



- Small No. 1 Collection System
- Small No. 2 Collection System
- New Clarifier and Modification of Existing Stabilization Ponds

The construction of these facility improvements is imminent. Currently, the wastewater treatment facilities used by all residing in the colonias are individual septic systems or pit latrines.

3.0 - Existing and Future Flow Projections

Existing Demands

Using average flow rates and the known number of connections the current water use in San Juan is approximately 544 gallons per connection. The 1983 facilities plan had determined an average wastewater flow of 96.8 gpcd based on a population of 5,677 persons. Assuming a 77 percent return flow, this would indicate a average population density of 4.3 persons per dwelling unit (which compares well to the 4.5 assumed) and a water consumption of 126 gpcd. For design purposes, per capita flow rates of 130 gpcd for water and 100 gpcd for wastewater were used. Using these numbers, the existing demands for the water and wastewater service in the four colonias are estimated as below.

<u>Colonia</u>	<u>Number of Lots Occupied</u>	<u>1988 Population</u>	<u>Existing Average Water Demand</u>	<u>Existing Average Wastewater Flow</u>
Las Brisas	92	414	53,820 gpd	41,400 gpd
Paradise Park	14	63	8,190 gpd	6,300 gpd
Arguello No. 1	19	86	11,180 gpd	8,600 gpd
Arguello No. 2	20	90	11,700 gpd	9,000 gpd
			84,890	65,300



### Future Demands

Future demands were calculated by applying the same factors to the build-out population projections and are as follow.

<u>Colonia</u>	<u>Total Number of Lots</u>	<u>Build-Out Population</u>	<u>Build-Out Average Water Demand</u>	<u>Build-Out Average Wastewater Flow</u>
Las Brisas	150	675	87,750 gpd	67,500 gpd
Paradise Park	28	126	16,380 gpd	12,600 gpd
Arguello No. 1	29	131	17,030 gpd	13,100 gpd
Arguello No. 2	24	108	14,040 gpd	10,800 gpd
			<i>146,200</i>	<i>114,200</i>

### 4.0 - Alternative Evaluations

#### Water Service

Two alternatives were considered as feasible approaches to insuring an adequate supply of water to the colonias. Since domestic water supply is currently available from the NAWSC, the first alternative would include maintaining a status quo but supplementing the domestic water with fire protection mains supplied from the City of San Juan. This alternative would involve construction of 6 inch water lines within all of the four subdivisions. Under this arrangement, the NAWSC would continue to bill for water consumption, however, the City would bill for maintenance of its fire protection system. The advantages to this alternative include no need for the City to acquire water rights. The disadvantages include additional cost of a dual water system and the implications on the capability of the City to enforce payment for sewer service.





The second alternative for water service is for the City to acquire the right to provide service to the colonias. This will involve negotiation with the NAWSC to acquire not only the lines and meters, but also the user allocation of water to support the development.

The NAWSC is willing to consider selling respective portions of its water system to the City on the valuation basis of assuming the total WSC indebtedness divided by the total number of users. This figure is currently just under \$1,000 per customer. Given the number of customers served in Las Brisas and Paradise Park and assuming \$1,000 per dwelling unit, the cost of system acquisition would be approximately \$106,000.

A new system of 6-inch water mains will have to be constructed in three of the four subdivisions (Las Brisas already has 6-inch mains) to satisfy fire protection needs. Figure VI-2 summarizes the extent of improvements anticipated.

The disadvantages of this alternative include the additional cost associated with acquisition of the NAWSC system. The advantages to this approach include a single management entity for water and wastewater. Costs for the two alternatives are presented as follow.

**Approximate Construction Costs for Alternative 1 Water Supply**

8,310 L.F.	6-inch PVC Water Main	\$5.40/ft.	\$ 44,874
4 Ea.	6-inch Tapping Sleeve and Valve	\$900/ea.	3,600
16 Ea.	Fire Hydrants	\$950/ea.	15,200
150 sf.	Pavement Crossing	\$20/sf.	3,000
7 Ea.	CI Footings	\$1,800/sf.	12,600



Approximate Construction Costs for Alternative 1 Water Supply  
(Cont'd)

6 Ea.	6-inch Gate Valve and Box	\$900/ea.	5,400
42 Ea.	Driveway Replacement	\$300/ea.	12,600
	Total Water System Improvements		\$ 97,274
	Engineering (10 Percent)		9,727
	Contingencies (20 Percent)		19,455
	TOTAL		\$126,456

Approximate Construction Costs for Alternative 2 Water Supply

5,180 L.F.	6-inch PVC Water Main	\$5.40/ft.	\$ 27,972
4 Ea.	6-inch Tapping Sleeve and Valve	\$900/ea.	3,600
2 Ea.	6-inch Gate Valve and Box	\$400/ea.	800
9 Ea.	Fire Hydrants	\$950/ea.	8,550
120 sf.	Pavement Crossing	\$20/sf.	2,400
3 Ea.	CI Footings	\$1,800/sf.	5,400
1 Ea.	Disconnect Existing System	\$900/ea.	900
106 Ea.	Acquire Existing System	\$1,000/ea.	106,000
	Total Water System Improvements		\$155,622
	Engineering (10 Percent)		15,562
	Contingencies (20 Percent)		31,124
	TOTAL		\$202,308

Wastewater Service

Only one alternative for providing wastewater was considered, namely for the colonias to be connected to the City of San Juan wastewater collection and treatment system. To estimate the cost of improvements, it was necessary to evaluate the impact the additional flows would have on the City's current collection system. The criteria used to evaluate this impact were as follow.

- ° Consider the existing population only.
- ° Examine the system assuming a two hour peak flow of 153.9 gpcd as reported in the 1983 Facilities Plan.
- ° Assume a population density of 3.5 persons per dwelling unit in the City.



- ° Assume a population density of 4.5 persons per dwelling unit in the colonias.
- ° After considering the existing population, assume full development of subdivisions within the City.

The contributing flow from each of the subdivisions upstream of the Granada Village lift station was computed based on house counts. The pump station has a capacity of 0.288 mgd. Table VI-1 summarizes the total contributing flow under existing conditions. As indicated by the table, the existing Granada Village lift station needs to be replaced even if the colonias are not brought into the system.

Using the identical criteria, but assuming full occupancy conditions as indicated on Table VI-2, the Granada Village Lift Station should be designed for a capacity of 0.73 mgd to be able to provide for the ultimate flows of the on-line subdivisions, as well as that of the colonias.

To assimilate the four colonias not considered in the City's existing facility plan with the existing wastewater treatment facilities, the following improvements will be necessary.

- ° Gravity Sewer Collection Lines for Each Development
- ° A Trunk Line Connecting the Collection Systems to the Granada Village Lift Station
- ° Replacement of the existing 0.288-mgd Granada Village Lift Station With a New One (0.73-mgd design capacity)

Based on the projected additional contribution of the four colonias, no additional expansion of the 1.15-mgd oxidation ditch treatment facility currently being constructed is necessary.



The build-out design flows from Arguello No. 1, Arguello No. 2, Paradise Park and Las Brisas are 0.04 mgd, 0.03 mgd, 0.04 mgd and 0.20 mgd respectively. Eight-inch sewer collection lines will adequately handle the sewage from each subdivision. For a schematic of the line layout, see Figure VI-1. A summary of the required lines follows.

<u>Colonia Served</u>	<u>Dia.</u>	<u>Total Length</u>	<u>No. of Manholes</u>	<u>Avg. Slope</u>	<u>Rated Capacity</u>
Paradise Park and Arguello No. 1	8"	1,450'	4	.33%	0.45 mgd
Arguello No. 2	8"	1,450'	4	.33%	0.45 mgd
Las Brisas	8"	6,800'	19	.33%	0.45 mgd

Approximately 2,550 feet of 8-inch trunk line from Paradise Park to Granada Village Lift Station will also need to be constructed. The line will require about 6 manholes and should have an average slope of 0.33 percent to obtain a capacity of 0.45 mgd.

The probable cost for construction of the facilities described above is presented in Table VI-3. Two separate costs are provided for expanding the Granada Village lift station. One cost assumes the lift station is expanded to include only the additional flows under existing conditions. The second cost assumes the lift station is built to assimilate full development of the contributing subdivisions.

The probable amortized costs are shown in Table VIII-1 for the average number of connections. These costs assume the cost for these improvements are to be borne entirely by the four colonias with an 8 percent interest rate 20-year indebtedness.



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## Recommendations

The following recommendations are made regarding water and wastewater service to the four colonias.

- ° The City of San Juan should acquire the NAWSC water system as it affects the four colonias.
- ° The water distribution system improvements outlined should be constructed.
- ° The wastewater system improvements should be constructed including expansion of the Granada Village lift station to 0.73 mgd capacity.

The combined probable cost for water and wastewater improvements is approximately \$620,258. Under existing development conditions, the cost to retire this indebtedness is approximately \$35.78 per household in the four colonias. The cost for each colonia is outlined in Table VIII-1. It is believed that these costs, combined with the operation and maintenance cost of \$14/cap/mo. will exceed the capability of the residents to pay. Financial assistance to bring the combined payment into the order of \$40 per month as described by Valley Interfaith will be necessary.

## EDINBURG

### 1.0 Description of Colonias

Eleven colonias were identified within the City of Edinburg's extra territorial jurisdiction (ETJ). The colonias are located to the north and east of the City proper. Six of the colonias, however, are of closer proximity to Pharr and Lopezville than to the City of Edinburg. Water service and wastewater treatment



options for these six colonias are discussed in the Pharr/Lopezville section of the report. In this section, service options for the five colonias closest to the City of Edinburg are analyzed. These five colonias were analyzed as three distinct groups (A, B, and C) based on relative location to one another.

The first group, Group A, is the Lull subdivision. The Lull subdivision is located on the north side of Monte Cristo Road (FM 1925) approximately one mile west of Expressway 281. The subdivision is platted as a 77-acre unit with 348 lots.

The second group, Group B, is comprised of the Crouse Subdivision and Roberta Tagle colonias. Group B is located near Mile 17-1/2 Road and Jackson Road. The Crouse Subdivision is platted as a 10-acre unit with 10 lots. Roberta Tagle is an unplatted area estimated to be 20 acres.

The third group, Group C, includes the Schunior Subdivision and Colonia Garza No. 2 which are located at the intersection of Schunior Road and Kenyon Road. Neither of the two colonias is platted. Schunior subdivision is estimated to be 17 acres in area and Colonia Garza No. 2 approximately 32 acres.

### Population and Housing

Population in the Colonias was estimated by first counting the number of houses via a drive-by survey, and then multiplying the number of houses by 4.5 persons per dwelling unit (a density factor determined in the 1986 reconnaissance study). In some



cases, structures are partially constructed or uninhabited. To gain an accurate count of the number of dwelling units, electrical meters were counted whenever possible. The existing population in each colonia is summarized in the following table.

Existing Population in the Colonia Groups

<u>Colonia</u>	<u>Number of Units Occupied</u>	<u>Maximum Number of Units</u>	<u>1988 Population</u>	<u>Build-Out Population</u>	<u>Year of Build-Out</u>
Group A Lull	267	367	1,202	1,652	1997
Group B Crouse	13		194		
Roberta Tagle	43	76	58	342	1997
Group C Schunior	47		211		
Garza No. 2	42	129	189	580	1999
			1254	2376	

Tax Rates

The subdivisions are subject to the following tax rates:

Hidalgo County and Drainage District	\$0.5951 per \$100 AV
Edinburg Independent School District	\$0.755 per \$100 AV
Water District No. 1	\$16.00 per lot or acre

Employment Rate

The current unemployment rate for the Edinburg area is 14.3 percent according to the local Texas Employment Commission office.

Structural Capability

A drive-through survey of the colonias indicates varying degrees of privies and septic tank facilities. The number of



housing units anticipated to require additional plumbing to accommodate a sewerage system is as follows:

<u>Colonia</u>	<u>Number of Lots</u>	<u>Number of Privies</u>	<u>Number of Septic Tanks</u>	<u>Number Requiring Plumbing</u>
Group A Lull	267	36	231	36
Group B Crouse Roberta Tagle	43 13	0 0	43 13	0 0
Group C Schunior Garza No. 2	47 4	5 0	42 4	5 0

Assessed Value

The Hidalgo County Assessors office records indicate the following average assessed valuations for the properties within the respective subdivisions:

<u>Colonia</u>	<u>Average Values</u>	
	<u>Lot Value</u>	<u>Lot Plus Dwelling Unit</u>
Group A Lull	\$ 3,500	\$18,208
Group B Crouse Roberta Tagle	\$ 8,710	\$27,505
Group C Schunior Garza No. 2	N/A N/A	N/A N/A





## 2.0 Inventory of Existing Infrastructure

### Water Supply

Each of the colonias is located outside of the corporate limits of Edinburg but within the City's ETJ. Accordingly, water service to the colonias is supplied by rural water supply corporations, not the City. The Lull community is supplied water through the Lull Water Supply Corporation. The LWSC purchases its treated water on a wholesale basis from the City of Edinburg. Water to the Group B colonias is supplied by the Sharyland Water Supply Corporation. The North Alamo Water Supply Corporation supplies water to the Group C colonias. The water distribution systems within the colonias comprise 2-inch and 4-inch mains and are for domestic consumption only.

The City of Edinburg operates a 8.0 MGD capacity water treatment plant. The City has 6,574 acre-feet of water rights as a result of adjudication and property conversion which it receives as a user allotment from Hidalgo County Irrigation District No. 1. The City currently uses approximately 95 percent of its allotment. The recent average and peak-day pumping rates from the plant are 3.72 mgd and 6.81 mgd respectively. No immediate expansions of the plant capacity are planned, although the long term plans for Edinburg anticipate plant expansion. Based on a water and sewer rate study conducted by L.L. Rodriguez and Associates Inc., the current water use rate is 555 gallons per connection per day with a total number of connections being 2670.



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The city's system includes 3.5 million gallons of ground storage and 1.75 million gallons of elevated storage.

The NAWSC water-use rate study indicates an average consumption of 502 gallons per connection per day. The corporation's current debt is approximately \$11 million with a monthly debt service of \$70,000. The NAWSC provides utility service to the Group C colonias via a 2-inch and 4-inch lines along Schunior Road and a 4-inch line along Kenyon Road.

The SWSC recently completed a system expansion that was funded through the FHA. Water service is projected on the basis of 500 gallons per connection per day. Service is provided to the Group B colonias through a 4-inch main along Jackson Road and Mile 17-1/2 Road. According to the corporation staff, the corporation meets with all requirements for State Department of Health approval dealing with storage, treatment capacity, and pumpage.

### Sewerage Service

As indicated previously, sewerage service within the colonias is comprised primarily of septic tanks. A few properties are equipped with privies only. The city of Edinburg operates a 4.5 mgd wastewater treatment plant. The plant is currently functioning at an average rate of approximately 2.7 mgd. There are no plans for plant expansion in the near future.



### 3.0 Existing and Future Flow Projections

#### Existing Demands

Water demands and wastewater contributions anticipated from the colonias under existing conditions of development are approximated using the house count determined from the drive-by survey and recorded consumption rates on a per dwelling unit basis. Since the City of Edinburg is considered as a potential source for service, and since it is the only local entity providing complete water and sewer service, the rates determined for the City were used to estimate service needs in the colonias. Water demand is based on 555 gallons per connection. Wastewater contribution is based on the State Department of Health criteria of 100 gpcpd. The following table summarizes the water demands and wastewater contributions determined for the existing colonias using the design criteria.

<u>Colonia</u>	<u>Number of Units Occupied</u>	<u>1988 Popu- lation</u>	<u>Existing Average Water Demand</u>	<u>Existing Average Waste- water Flow</u>
Group A Lull	267	1,202	148,185	120,200
Group B Crouse	43	194	23,865	19,400
Roberta Tagle	13	58	7,215	5,800
Group C Schunior	47	211	26,085	21,100
Garza No. 2	42	189	23,310	18,900
TOTALS	412	1,854	228,600	185,400



Future Demands

Future demands were calculated by applying the same factors to the build out populations for the colonias. In some of the unplatted colonias, total build-out is assumed to occur at a density of 4 lots per acre in response to the sewer service. Without sewer service, build-out densities would occur at 2 lots per acre in accordance with recent regulations concerning septic tank installation as issued by the Texas Department of Health.

<u>Colonia</u>	<u>Number of Lots</u>	<u>Build Out Population</u>	<u>Average Water Demand</u>	<u>Average Waste-water Flow</u>
Group A Lull	367	1,652	203,685	165,200
Group B Crouse Roberta Tagle	76	342	42,180	34,200
Group C Schunior Garza No. 2	129	580	71,595	58,000
			<i>217,260</i>	<i>157,400</i>

4.0 Alternative Evaluations

Discussions with the City of Edinburg indicate a willingness to provide both water and sewage service to the Lull community if it will not increase the cost to City taxpayers and that it can be shown to be financially feasible. The City has also indicated that it does not want to consider I/A alternatives for wastewater systems because of concerns over increased maintenance costs associated with these alternatives. The City expressed a general desire in providing service to the other colonia groups.



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**Group A**

The City of Edinburg's water system is adequate to meet the current needs of Lull without further expansion. However, the distribution lines within the subdivision are inadequate to meet city and state standards for supply and pressure. The City has indicated that it plans to loop an 8-inch water line along FM 1925 and then south on Sugar Road (see Figure VI-4). Additional water rights of about 228 acre-feet will be required to serve the area.

A review of the City's sewer system indicates that it has the conveyance and treatment capacity to service Lull. Discussions with City staff indicate a desire to use an existing lift station located on Sugar Road just north of Mile 17. The lift station reportedly has adequate capacity to serve the Lull area. Two alternative sewer alignments were considered. The first alternative involves connecting to the City's system. The second alternative includes construction of a small package plant to serve as interim treatment facility. The plant would ultimately be taken out of service when additional development justifies construction of gravity trunk lines connecting to the City's system.

Talks with city staff also indicated a concern over providing service to Lull without provision for additional areas of growth. In response to these concerns, both alternatives consider providing service for the vacant areas between Lull and the lift station on Sugar Road. A land area of approximately 400 acres is located along Sugar Road and Monte Cristo Road which could



eventually tie into the proposed improvements. Based on 4 dwelling units per acre and 4.5 persons per dwelling unit, this vacant area equates to approximately 7,200 persons when built out. The additional system loadings would require improvements to the sewer system as indicated on Figure VI-4. This additional area would not, of itself, require additional modifications to the water system.

Cost Estimates (Group A)

The cost to provide water and sewer service to Lull Subdivision is presented in the following tables. Additionally, costs are provided assuming the additional vacant land between the City and Lull is provided for as well. Costs to provide water and sewer service to the Lull Subdivision are:

ALTERNATIVE 1 - Integration with the City of Edinburg systems

Offsite Sewer

300 L.F.	20 inch Borecase	\$ 60	\$ 18,000
4,900 L.F.	6 inch Force Main	10	49,000
2 Ea.	Small Lift Stations	25,000	50,000
3,600 L.F.	8-inch Sanitary Sewer	12	<u>43,600</u>
Subtotal			\$ 160,000

Onsite Sewer

5,300 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 64,000
6,300 L.F.	6-inch Sanitary Sewer	10	63,000
375 Ea.	Wyes and Service lines	600	<u>225,000</u>
Subtotal			\$ 352,000

Offsite Water

5,300 L.F.	8-inch Water Line	\$ 10	\$ 53,000
1 Ea.	Thrust Block	2,000	<u>2,000</u>
Subtotal			\$ 55,000



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**Onsite Water**

7,500 L.F.	8-inch Water Line	\$ 10	\$ 75,000
5,200 L.F.	6-inch Water Line	8	42,000
375 Ea.	Plumbing Fixtures	250	<u>94,000</u>

Subtotal			\$ 211,000
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Subtotal Improvements			\$ 778,000
Engineering (10 percent)			78,000
Contingencies (25 percent)			195,000
Acquisition of System			262,000
Acquisition of Water Rights			<u>143,000</u>

TOTAL COST OF IMPROVEMENTS			\$1,456,000
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**ALTERNATIVE 1 - with Cost to Provide Service to Additional Acreage**
**Offsite Sewer for Additional Acreage**

5,400 L.F.	15-inch Sanitary Sewer	\$ 30	\$ 162,000
3,000 L.F.	8-inch force main	15	45,000
1 Ea.	Medium Lift Station	50,000	<u>50,000</u>

Subtotal			\$ 257,000
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Engineering (10 percent)			26,000
Contingencies (25 percent)			<u>64,000</u>

Cost to Serve Additional Acreage			\$ 347,000
Cost to Serve Lull Subdivision (Alternative 1)			\$1,456,000
Total Cost to Serve Lull and Additional Acreage			\$1,803,000

**ALTERNATIVE 2 - Interim Package Plant Option**
**Offsite Sewer**

1,000 L.F.	6-inch Force Main	\$ 10	\$ 10,000
1 Ea.	Small Lift Stations	25,000	25,000
0.17 mgd	Treatment Plant	1.82/gal	<u>309,000</u>

Subtotal			\$ 344,000
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**Onsite Sewer**

5,300 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 64,000
6,300 L.F.	6-inch Sanitary Sewer	10	63,000
375 Ea.	Wyes and Service Lines	600	<u>225,000</u>

Subtotal			\$ 352,000
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<u>Offsite Water</u>			
5,300 L.F.	8-inch Water Line	\$ 10	\$ 53,000
1 Ea.	Thrust Block	2,000	<u>2,000</u>
Subtotal			\$ 55,000
<u>Onsite Water</u>			
7,500 L.F.	8-inch Water Line	\$ 10	\$ 75,000
5,200 L.F.	6-inch Water Line	8	42,000
375 Ea.	Plumbing Fixtures	250	<u>94,000</u>
Subtotal			\$ 211,000
Subtotal Improvements			\$ 962,000
Engineering (10 percent)			96,000
Contingencies (25 percent)			241,000
Acquisition of System			262,000
Acquisition of Water Rights			<u>143,000</u>
<b>TOTAL COST OF IMPROVEMENTS</b>			<b>\$1,704,000</b>

ALTERNATIVE 2 - with Cost to Provide Service to Additional Acreage

Cost to Serve Additional Acreage	\$ 347,000
Cost to Serve Lull Subdivision (Alternative 2)	\$1,704,000
Cost to Serve Lull and Additional Acreage	<u>\$2,051,000</u>

Group B Colonias

Two alternatives were considered for water supply to the Group B colonias. One alternative is to continue supply from the SWSC - under which conditions domestic water only would be provided. The second alternative would be to extend the City of Edinburg system - under which case it would be necessary for the City to negotiate with SWSC to acquire the existing system and the right to provide service. In either case, new, large water lines are required to meet insurance requirements for fire protection. To provide service to this area, the City projects that it would have to expand its water treatment capability to replace





the availability of capacity to existing property within the City and, in addition, would have to acquire water rights of approximately 85 acre feet to supply the area with water. As a result of these obstacles, it appears most feasible for the area to continue receiving water from the SWSC until the area develops to the point where the cost of extending the City's system can be borne by the residents.

The only alternative considered to provide sewer service is connection to the City of Edinburg's sewer system. The SWSC indicated it was not interested in providing sewer service but that it would assist the City in billing for sewer service. The build out demand of slightly more than 0.06 mgd from these colonias makes successful operation of a small package plant somewhat questionable. For the City to provide sewage service, force mains, lift stations and lateral connections will be required as described in Figure VI-4. As indicated earlier, City staff is reluctant to consider I/A methods of sewage collection and treatment due to the increased maintenance costs associated with these alternatives.

The City has indicated a general desire to provide sewer service to the Group B colonias during the study period horizon. However, several issues must be addressed before this can become a reality. These issues include:

- ° Some assurance of bill collection
- ° The need for new customers to pay their "fair share"



The City also expressed the concern that extension of a sewer system to this area will increase pressure for rural development and that any system that is designed should accommodate the additional growth. This is of additional concern to the City who estimate that 40 percent of land within the current City limits is vacant.

### Cost Estimates (Group B)

The following costs are presented for water and wastewater service to the Group B colonias.

#### Water System Improvements (connection to City of Edinburg)

10,200 L.F.	8-inch Water Line	\$ 12	\$ 122,000
1 Ea.	Thrust Block	2,400	<u>2,000</u>
Subtotal Offsite Water			\$ 124,000
Engineering (10 percent)			12,000
Contingencies (25 percent)			31,000
Acquisition of Systems			56,000
Acquisition of Water Systems			<u>28,000</u>
TOTAL OFFSITE WATER IMPROVEMENTS			\$ 251,000

#### Sewer System Improvements (connection to City of Edinburg)

3,800 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 46,000
3,000 L.F.	4-inch Force Main	10	30,000
1 Ea.	Medium Lift Station	50,000	50,000
80 Ea.	Wyes and Service Lines	\$ 600	<u>48,000</u>
Subtotal			\$ 174,000
Engineering (10 percent)			17,000
Contingencies (25 percent)			<u>44,000</u>
TOTAL SEWER SYSTEM IMPROVEMENTS			\$ 235,000



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Group C

Two alternates are available for water supply to the Group C colonias, continued supply by the NAWSC or incorporation into the City of Edinburg water system. The NAWSC is adequate to meet the current needs of the area. However, the distribution line sizes are inadequate for fire protection purposes. The NAWSC has indicated it is seeking FHA funds to improve and expand its system. However, no improvements are planned in this area.

If the Group C colonias were to obtain water service from the City of Edinburg it would require the City purchase the existing NAWSC system as well as approximately 109 acre-feet of water rights. Acquisition of the system is assumed to cost approximately \$1000 per connection according to NAWSC personnel. Water rights are valued at approximately \$600 per acre foot. Obtaining these water rights will be difficult since the NAWSC is currently seeking additional water rights to meet the needs of its service area.

Only one alternative to providing long term sewerage service to the Group C colonias was considered, that is, tying to the City of Edinburg System. The City has indicated a willingness to provide service to this area provided the same concerns stated for Group B are met. Two possible configurations for line routing were evaluated. The first alignment utilizes an existing 33-inch sewer located on M Road. Sufficient capacity exists within the sewer system at this point to accommodate additional flows projected from the colonias. The second alternative would



utilize an existing lift station on Doolittle road. The lift station has sufficient capacity to accommodate flows from the project area. The alignments for sewer service are shown on Figures VI-4 and VI-5.

Talks with City staff have indicated a concern about future development in the rural areas once sewer and water systems are constructed. The City has indicated that the system designed for this area may have to be oversized to accommodate additional development.

A review of the area indicates large vacant tracts of land. An additional service area of 210 acres, roughly outlined in Figure VI-5, could reasonably be served by a sewer along the proposed alignment. Based on four dwelling units per acre and 4.5 persons per dwelling unit, a maximum population of 3,780 persons could be expected at eventual build out. This population would contribute an average flow of 378,000 gallons per day.

The line sizes proposed to serve the area will have to be increased to accommodate flows projected from this additional acreage. A 12-inch gravity line along with 6-inch force mains will be used to service tie to the existing 33-inch sewer on M Road.

#### Cost Estimates (Group C)

The costs to provide water and sewer to the area are summarized below. The costs for water would only be realized if the option of connecting to the City system were to be implemented.



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 Water System Improvements (Connection to City of Edinburg)

5,300 L.F.	8-inch Water Line	\$ 12	\$ 64,000
1 Ea.	Thrust Block	2,000	<u>2,000</u>
Subtotal			\$ 66,000
Engineering (10 percent)			7,000
Contingencies (25 percent)			17,000
Acquisition of NAWSC System			89,000
Acquisition of Water Rights			<u>48,000</u>
TOTAL COST OF WATER SYSTEM			\$ 227,000

System Improvements - (Connect to City of Edinburg)

Alternative 1 - (Gravity Main at M Road)

4,400 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 53,000
1,000 L.F.	4-inch Force Main	10	10,000
130 Ea.	Wyes and Service Lines	600	78,000
1 Ea.	Small Lift Station	25,000	<u>25,000</u>
Subtotal			\$ 166,000
Engineering (10 percent)			17,000
Contingencies (25 percent)			<u>42,000</u>
TOTAL COST SEWER SYSTEM IMPROVEMENTS (Alternative 1)			\$ 225,000

Alternative 2 - (Force Main to Existing Lift Station)

1,500 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 18,000
2,820 L.F.	4-inch Force Main	10	28,000
130 Ea.	Wyes and Service Lines	600	78,000
1 Ea.	Medium Lift Station	50,000	<u>50,000</u>
Subtotal			\$ 174,000
Engineering (10 percent)			17,000
Contingencies (25 percent)			<u>44,000</u>
TOTAL SEWER SYSTEM IMPROVEMENTS (Alternative 2)			\$ 235,000

Sewer System Costs - (Oversized to Serve 200 Acres)

4,200 L.F.	12-inch Sanitary Sewer	\$ 18	\$ 76,000
3,000 L.F.	8-inch Sanitary Sewer	12	36,000
1,000 L.F.	6-inch Force Main	12	12,000
1 Ea.	Medium Lift Station	50,000	<u>50,000</u>
Subtotal			\$ 174,000



Engineering (10 percent)	17,000
Contingencies (25 percent)	44,000
TOTAL SEWER SYSTEM IMPROVEMENTS (Oversized)	\$ 235,000

## PHARR/LOPEZVILLE

### 1.0 Description of Colonias

Thirteen colonias are located close enough to the City of Pharr and its utility service areas to be considered for service by either Pharr or Lopezville. The colonias are located to the north and east of the City proper. Of the 13 colonias, however, seven are located within the City of Edinburg extra territorial jurisdiction (ETJ). However, their proximity to Pharr and Lopezville make service by these communities more logical. The 13 colonias were analyzed as two distinct groups based on relative location.

One group, designated as Group D, comprises the Closner, Terry, Countryview Estates No. 2, Thompson Road, and El Castilleja subdivisions, is located along Wisconsin and San Juan Roads. None of the colonias in this group are platted. As a result, projections of growth and population are based on an area of approximately 140 acres. A total of 154 dwelling units currently exist in the service area.

The second group, Group E, is located along I Road and Raul Longoria Road (FM 1426). This group is comprised of several platted subdivisions including Villa del Mundo, El Charro No. 1, Mesquite Acres, Arco Iris No. 2, and Aldamas No. 1 and No. 2. Unplatted colonias in the group include Lopezville, North



Lopezville, and Las Palmas. The unplatted areas comprise approximately 30 acres.

### Population and Housing

Population in the Colonias was estimated by first counting the number of houses via a drive by survey and then multiplying by an average of 4.5 persons per dwelling unit as determined in the 1986 reconnaissance study. In some cases, structures exist as partially constructed or uninhabited. To gain an accurate judge of population, electrical meters were counted wherever possible. The existing population in each colonia is summarized in below.

#### Existing Population in the Colonia Groups

<u>Colonia</u>	<u>Number of Units Occupied</u>	<u>Total Number of Units</u>	<u>1988 Population</u>	<u>Build-Out Population</u>	<u>Year of Build-Out</u>
<b>Group D</b>					
Closner	55	55	248		
Terry	15	15	68		
Countryview					
Estates No. 2	61	61	275		
Thompson Road	12	12	54		
El Castilleja	<u>11</u>	<u>11</u>	<u>48</u>		
	154	348	693	1,566	2,012
<b>Group E</b>					
Villa Del Mundo	81		365		
El Charro No. 1	115		517		
Mesquite Acres	24		108		
Arco Iris No. 2	55		248		
Aldamas No. 1					
and No. 2	57		257		
Lopezville	179		806		
N. Lopezville	86		387		
Las Palmas	<u>33</u>		<u>147</u>		
	630	840	2,835	3,780	1,996
			3528	5546	



PROVIDING MANAGEMENT AND TECHNICAL ASSISTANCE

1101 North Cage • Suite 4 "A" • Pharr, Tx. 78577  
(512) 787-0256

Tax Rates

The subdivisions are subject to the following tax rates:

Hidalgo County and Drainage District	\$0.5951 per \$100 AV
Edinburgh Independent School District	\$0.755 per \$100 AV
Water District No. 1	\$16.00 per lot or acre
Pharr, San Juan, Alamo, I.S.D.	\$0.86444 per \$100 AV

Employment Rate

The current unemployment rate is 14.3 percent for the Edinburg area and 14.9 percent for the Pharr area according to the local Texas Employment Commission office.

Utility Service Rates

The following utility service rates are effective within the colonia groups:

Magic Valley Electric Coop	\$7.00 per mo + \$0.06686/KWH (winter)
	\$7.00 per mo + \$0.072893/KWH (summer)
North Alamo Water Supply	\$11.00 first 3,000 gal
	\$1.50 per 1,000 gal next 2,000 gal
	\$1.00 per 1,000 gal next 2,000 gal
	\$0.80 per 1,000 gal over 7,000 gal

Structural Capability

A drive through survey of the colonias indicates the only privies existing are in Arco Iris No. 2 where there are approximately five. All other subdivisions appeared to operate off septic tank systems.





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### Assessed Value

Because many of the colonias are not recorded plats, the Hidalgo County Assessors office did not have records of property value on many of the subdivisions. The average lot value for those subdivisions that are platted was found to be assessed at \$5,481. Lots with improvements on them had an average assessment of \$10,839. The average property will pay about \$236 per year in taxes.

### 2.0 Inventory of Existing Infrastructure

#### Water Supply

The colonias are all located outside of the corporate limits of Edinburg and Pharr but within the Cities' ETJ. Accordingly, water service to the colonias is supplied by one of the rural water supply corporations, in this case the North Alamo Water Supply Corporation. The water distribution systems within the colonias are therefor comprised of 2-inch or 4-inch mains and supply water used for domestic consumption only. However, the system is inadequate to provide fire protection. The NAWSC supplies water to the area via 6 inch mains along Owassa Road, I Road, and San Juan Road. A 3-inch line is located on Minnesota Road and smaller lines are located on Alberta Road and Canton Road. The City of Edinburg has a 10-inch water line along I Road that goes south to Alberta Road.

The closest water service lines to the Group E colonias are located in the City of Pharr at the intersection of Earling Road



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and Fir Avenue. Both 10- and 12-inch lines are present at this intersection which is 1.5 miles from the colonias in Group E.

The City of Edinburg operates a 8.0 MGD capacity water treatment plant located along "M" Road between Schunior Street and Chapin Road. The City has 6,574 acre-feet of water rights as a result of adjudication and property conversion which it receives as a user allotment from Hidalgo County Irrigation District No. 1. The City currently uses approximately 95 percent of its allotment. The current average and peak day pumping rates from the plant are 3.72 mgd and 6.81 mgd respectively. No expansion of the plant is planned in the near future although the long term plans for Edinburg do anticipate plant expansion. Based on a water and sewer rate study conducted by L.L. Rodriguez and Associates Inc., the current water use rate is 555 gallons per connection per day with a total number of connections being 2,670. The City's system includes 3.5 million gallons of ground storage and 1.75 million gallons of elevated storage.

The NAWSC water plant capacity is rated at 10.5 MGD. The current average pumping from the plant is approximately 5.5 MGD. There is sufficient capacity in the plant to provide water for domestic consumption by the Group D and Group E colonias. The NAWSC has plan to expand its plant capacity by 4 MGD within the next few years.

The NAWSC water use rate study indicates an average consumption of 502 gallons per connection per day. The corporation's



current debt is approximately \$11 million with a monthly debt service of \$70,000.

### Sewerage Service

As indicated previously, sewerage service within the colonias is comprised primarily of septic tanks with some privies. The city of Edinburg operates a 4.5 mgd wastewater treatment plant. The plant is currently functioning at an average rate of approximately 2.7 mgd. There are no current plans for plant expansion.

The City of Pharr operates a 3.5 mgd waste treatment plant. Existing flows in the plant average 2.1 mgd. The City of Pharr is planning an extension of a force main from a lift station located in the northeast corner of Lopezville (reference exhibits 3 and 4). This lift station will convey sewage through a 6-inch force main to a planned lift station at Fir and Earling Roads. The capacity of the lift station is capable of conveying anticipated flows from the Group E colonias.

### 3.0 Existing and Future Flow Projections

#### Existing Demands

Water demands and wastewater contributions anticipated from the colonias under existing conditions of development are approximated using the house count determined from the drive by survey and recorded consumption rates on a per dwelling unit basis. Since the NAWSC is considered as a potential source for service, and since it is the only local entity providing water service, the rates determined for the NAWSC were used to project service



needs in the colonias. For water, demand is based on 502 gallons per connection. Wastewater contribution is approximated at a rate of 100 gpcpd in compliance with the State Department of Health criteria. The following table summarizes the projected demand and contribution anticipated from the existing colonias.

<u>Colonia</u>	<u>Number of Units Occupied</u>	<u>1988 Population</u>	<u>Existing Average Water Demand (gal/day)</u>	<u>Existing Average Wastewater Flow (gal/day)</u>
Group D				
Closner	55	248	27,610	24,800
Terry	15	68	7,530	6,800
Countryview				
Estates No. 2	61	274	30,622	27,400
Thompson Road	12	54	6,024	5,400
El Castilleja	11	50	5,522	5,000
Group E				
Villa Del Mundo	81	365	40,662	36,500
El Charro No. 1	115	517	57,730	51,700
Mesquite Acres	24	108	12,048	10,800
Arco Iris No. 2	55	248	27,610	24,800
Aldamas No. 1				
and No. 2	57	257	28,614	25,700
Lopezville	179	806	89,858	80,600
N. Lopezville	86	387	43,172	38,700
Las Palmas	33	147	16,566	14,700
	630	2,835	316,260	283,500

### Future Demands

Future demands were calculated by applying the same factors to the build-out populations for the colonias. In some of the unplatted colonias, total build out is assumed to occur at a density of 4 lots per acre in response to the sewer service. Without sewer service, build out densities would occur at 2 lots per



acre in accordance with recent regulations concerning septic tank installation as issued by the Texas Department of Health.

<u>Colonia</u>	<u>Number of Lots</u>	<u>Build- Out Popu- lation</u>	<u>Average Water Demand</u>	<u>Average Waste- water Flow</u>
Group D				
Closer	169	761	84,838	76,100
Terry	35	157	17,570	15,700
Countryview Estates No. 2	81	365	40,662	36,500
Thompson Road	32	144	16,064	14,400
El Castilleja	31	139	15,562	13,900
	348	1,566	174,696	156,600
Group E				
Villa Del Mundo	82	369	41,164	36,900
El Charro No. 1	153	689	76,806	68,900
Mesquite Acres	24	108	12,048	10,800
Arco Iris No. 2	77	346	38,654	34,600
Aldamas No. 1 and No. 2	85	383	42,670	38,300
Lopezville	199	895	99,898	89,500
N. Lopezville	126	567	63,252	56,700
Las Palmas	94	423	47,188	42,300
	840	3,780	421,680	378,000

#### 4.0 Alternative Evaluations

Although water and wastewater service could potentially be provided by either the City of Pharr or the City of Edinburg, neither community has expressed interest in immediately expanding their infrastructure to accommodate the colonias. Technical solutions presented include these cities as ultimate suppliers of services recognizing that several issues of concern must be addressed before the cities will agree to the concept. These issues include:

- Making sure the persons benefiting from the services pay for the benefit and that the burden of payment is not transferred to city taxpayers.



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- Enforcement that all persons must connect to the service when it is provided.
  - Enforcement of bill collection.

#### Group D

Two alternates are available for water supply to the Group D colonias, continued supply by the NAWSC or incorporation into the City of Edinburg system. If the City of Edinburg is to become a supplier, it must first negotiate with the NAWSC to obtain an agreement to release the area from the NAWSC service area. Acquisition of the NAWSC system is approximated at \$1,000 per connection according to NAWSC personnel. In addition, the City would need to acquire 195 acre-feet of additional water rights valued at approximately \$600 per acre-foot. Once acquired, the distribution system would need to be supplemented or replaced with larger diameter mains in order to comply with city and insurance requirements for fire protection. If the City was to extend service to the Group D colonias a potential alignment for an 8-inch water line is shown on Exhibit 3.

Based on the projected growth rate of the City of Edinburg it appears that in the near term water service should continue to be provided by NAWSC. As growth occurs, it may be feasible for the City to service the area.

Two alternatives were also considered for providing sewer service to the Group D colonias. The first alternative would be to extend the City of Edinburg system through a series of force mains and lift stations to service the area. The City of



Edinburg sewer plant as capacity to accommodate protected flows from the development. However, this will require pumping the sewage uphill virtually the entire way. An alignment of the necessary improvements is shown on **Figure VI-6**.

The second alternative would be to extend the City of Pharr sewer system planned for the Lopezville area. The improvements proposed by the City of Pharr can accommodate the projected flows from the Group D colonias. However, an agreement between the City of Pharr and the City of Edinburg will have to be worked out since some of the colonias are within Edinburg's ETJ. The alignment of improvements for this alternative are shown in **Figure VI-6**.

A third alternative considered was construction of a small package plant constructed as shown on **Figure VI-6**. The 0.2 MGD plant would require maintenance and some form of administrative and management structure to operate the facility.

The NAWSC has indicated a reluctance to provide sewer service to the colonias because of the lack of revenues obtained from the colonias compared to the cost of the system.

Talks with City staff also indicated a concern of providing service to the Group D colonias without provision for additional areas of growth. A review of the area indicates large vacant areas between the colonias and the cities. A land area of approximately 400 acres is located along Sugar Road and Monte Cristo Road which could eventually tie into the proposed improvements. Based on 4 dwelling units per acre and 4.5 persons per



dwelling unit, this vacant area equates to approximately 7,200 persons when built-out. The additional system loadings would require additional improvements to the sewer system as indicated on Figure VI-6. This additional area would not, of itself, require additional modifications to the water system.

### Cost Estimates (Group D)

The cost to provide water and sewer service to the Group D colonias are presented in the following tables. Alternative costs are provided assuming the additional vacant land between the City and Group D are included.

#### ALTERNATIVE 1

##### Water System Improvements (connection to City of Edinburg)

8,400 L.F.	8-inch Water Line	\$	12	\$101,000
350 Ea.	Plumbing Fixtures		250	88,000
1 Ea.	Pump Station		30,000	<u>30,000</u>
Subtotal Water Improvements				\$219,000
Engineering (10 percent)				22,000
Contingencies (25 percent)				55,000
Acquisition of System				154,000
Acquisition of Water Rights				<u>117,000</u>
TOTAL WATER IMPROVEMENTS				\$567,000

##### Sewer System Improvements (connection to City of Edinburg)

9,000 L.F.	8-inch Sanitary Sewer	\$	12	\$108,000
4,000 L.F.	6-inch Force Main		12	48,000
2 Ea.	Small Lift Station		25,000	50,000
350 Ea.	Wyes and Service Lines		600	<u>210,000</u>
Subtotal				\$416,000
Engineering (10 percent)				42,000
Contingencies (25 percent)				<u>104,000</u>
TOTAL SEWER SYSTEM IMPROVEMENTS				\$562,000
ALTERNATIVE 1 TOTAL COSTS				\$1,129,000





ALTERNATIVE 2

Sewer System Improvements (connection to Pharr/Lopezville)

10,500 L.F. 8-inch Sanitary Sewer	\$	12	\$126,000
6,500 L.F. 6-inch Force Main		12	78,000
3 Ea. Small Lift Station		25,000	75,000
350 Ea. Wyes and Service Lines		600	<u>210,000</u>
Subtotal			\$489,000
Engineering (10 percent)			50,000
Contingencies (25 percent)			<u>122,000</u>
<b>TOTAL SEWER SYSTEM IMPROVEMENTS</b>			<b>\$661,000</b>

Cost to Provide Service to Additional Acreage (to Edinburg)

Offsite Sewer

1,600 L.F. 12-inch Sanitary Sewer	\$	18	\$ 29,000
4,000 L.F. 10-inch Sanitary Sewer		15	60,000
3,200 L.F. 8-inch Sanitary Sewer		12	38,000
1,600 L.F. 8-inch Force Main		15	24,000
2,000 L.F. 6-inch Force Main		12	24,000
2 Ea. Small Lift Station		25,000	<u>50,000</u>
Subtotal			\$225,000
Engineering (10 percent)			23,000
Contingencies (25 percent)			<u>56,000</u>
<b>TOTAL COST OF IMPROVEMENTS</b>			<b>\$304,000</b>

Group E Colonias

Three alternatives were considered for water supply to the Group E colonias. One alternative is to continue supply from the NAWSC under which conditions domestic water only would be provided. The second alternative would be to extend the City of Edinburg system under which case it would be necessary for the City to negotiate with NAWSC to acquire the existing system and the right to provide service. In addition, the City would need



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to acquire 472 acre-feet of additional water rights valued at approximately \$600 per acre-foot. The third alternative would be to extend the City of Pharr system under which case the same conditions applicable to the City of Edinburg would apply. In either case, new, large water lines are required to meet insurance requirements for fire protection. The City of Pharr has indicated a strong interest in providing sewer service and ultimately water service to the area.

The only alternative considered to provide sewer service is connection to the City of Pharr's sewer system. The NAWSC indicated it was not interested in providing sewer service but that it would assist the City in billing for sewer service. The build out demand of slightly less than 0.4 mgd from these colonias makes successful operation of a small package plant somewhat questionable unless the operation can be managed by one of the cities. For the City to provide sewage service will require force mains, lift statons and lateral connections as described in Figure VI-7. As indicated earlier, City staff is reluctant to consider I/A methods of sewage collection and treatment due to the increased maintenance costs associated with these alternatives.

The City of Pharr is planning on constructing a new waste treatment plant to service the north area of Pharr, including the Group E area, but no time frame has been established. The lack of easements in the area has slowed the implementation of sewer installation. After review of I/A methods, City officials have



indicated that unless there is a significant savings in operational costs, the City would prefer a conventional sewer system for the colonias. The City has established a \$900 connection fee per unit for service laterals.

The proposed alignment for sewer improvements are shown on Figure VI-7.

### Cost Estimates (Group E)

The following costs are presented for water and wastewater service to the Group E colonias.

#### Water System Improvements (connection to City of Pharr)

17,000 L.F.	8-inch Water Line	\$ 12	\$ 204,000
1 Ea.	Ditch Crossing	20,000	20,000
1 Ea.	Pump Station	30,000	30,000
7,000 lbs.	Thrust Block	1.20	<u>8,000</u>
Subtotal Offsite Water			\$ 262,000
Engineering (10 percent)			26,000
Contingencies (25 percent)			67,000
Acquisition of NAWSC System			630,000
Acquisition of Water Rights			<u>283,000</u>
TOTAL OFFSITE WATER IMPROVEMENTS			\$1,268,000

#### Sewer System Improvements (connection to City of Pharr)

10,200 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 122,000
1,600 L.F.	4-inch Force Main	8	13,000
2 Ea.	Small Lift Station	25,000	50,000
840 Ea.	Wyes and Service Lines	900	<u>756,000</u>
Subtotal			\$ 941,000
Engineering (10 percent)			94,000
Contingencies (25 percent)			<u>235,000</u>
TOTAL SEWER SYSTEM IMPROVEMENTS			\$1,270,000



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DONNA/WESLACO1.0 Description of Colonias

Ten colonias were identified within the City of Donna's extra-territorial jurisdiction (ETJ). The colonias are located to the south and west of the City proper. The colonias are divided into three groups designated as Groups F, G, and K. Although they are with the City of Donna ETJ, their remote location from any sewer service makes them potential candidates for formation of a separate utility district to obtain service. They are more closely linked to a fourth group of colonias (Group H) that is actually within the City of Weslaco's ETJ. As a result, the four groups are discussed together in this section of the report.

The Group F colonias are comprised of two platted subdivisions, Walston Farms and Highland Farms, located along Hutto Road about 3/4 mile north of Expressway U.S. 83 (see exhibit 5). A total of 130 lots are platted within the two colonias. However, even though Highland Farms is platted with 16 lots, there currently exists 37 dwelling units.

The second group (Group G) is comprised of the Alvarez subdivision and the La Blanca Heights subdivision, both of which are unplatted. Group G is located along the extension of North 11th Street (Old La Blanca Road) south of Mile 10 Road in Donna.

Group K is made up of four subdivisions and two unplatted subdivisions which are located between FM 493 and Spur 431 and



along La Blanca Road south of Donna. The platted subdivisions are Avila I.B., Tierra Prieta, and Balli No. 2. The unplatted subdivision are Scissors and Pan Filo Martinez.

The fourth group (Group H) includes three platted subdivisions and two unplatted subdivisions which are located northwest of Weslaco between Victoria Road and 5-1/2 Mile Road. The platted subdivisions are Barbosa Lopez 1, 2, and 3; Victoria Acres; and Delta Courts. The two unplatted colonias are Colonia Del Noreste and Chapa No. 1. All five of the colonias in this group are located within the City of Weslaco ETJ.

None of the colonias in the four groups is currently in the annexation process.

Population and Housing

Population in the Colonias was estimated by first counting the number of houses via a drive-by survey and then multiplying by an average of 4.5 persons per dwelling unit as determined in the 1986 reconnaissance study. In some cases, structures exist as partially constructed or uninhabited. To gain an accurate judge of population, electrical meters were counted wherever possible. The existing population in each colonia is summarized below.

Existing Population in the Colonia Groups

<u>Colonia</u>	<u>Number of Units Occupied</u>	<u>Maximum Number of Lots</u>	<u>1988 Population</u>	<u>Build-Out Population</u>	<u>Year of Build-Out</u>
Group F	110	151	495	680	1997
Walston Farms					
Highland Farms					



<u>Colonia</u>	<u>Number of Units Occupied</u>	<u>Maximum Number of Lots</u>	<u>1988 Population</u>	<u>Build-Out Population</u>	<u>Year of Build-Out</u>
Group G Alvarez La Blanca Heigts	50	84	225	378	2003
Group H Barbosa Lopez Victoria Acres Delta Courts Del Noreste Chapa No. 1	235	490	1,058	2,205	2009
Group K Avila I.B. Tierra Bella Tierra Prieta Balli No. 2 Scissors Pan Filo Martinez	455	543	2,048	2,444	1993

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Tax Rates

The subdivisions are subject to the following tax rates.

Hidalgo County and Drainage District	\$0.5951	per \$100 AV
Donna Independent School District	\$0.74	per \$100 AV
Water District No. 9	\$0.22	per \$100 AV
Weslaco Independent School District	\$0.82	per \$100 AV

Employment Rate

The current unemployment rate for the Donna area is 17.0 percent, according to the local Texas Employment Commission office. In the Weslaco area, unemployment is currently 15.1 percent.

Utility Service Rates

The following utility service rates are effective within the subdivisions.

Magic Valley Electric Corp.	\$7.00 + \$0.06686/KWH (winter)
	\$7.00 + \$0.072893/KWH (summer)



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North Alamo Water Supply Corp. \$11.00 first 3,000 gallons  
 \$ 1.50 per 1,000 gallons  
 next 2,000 gallons  
 \$ 1.00 per 1,000 gallons  
 next 2,000 gallons  
 \$0.80 per 1,000 gallons  
 over 7,000 gallons

### Structural Capability

A drive-through survey of the colonias indicates varying degrees of privies and septic tank facilities. The Group H colonias rely entirely on privies; whereas, the Group G colonias appears to have entirely septic tanks. If privies are used, it is anticipated that connection to a sewerage system will require modifications to house plumbing in some structures. The extent of housing units anticipated to require additional plumbing to accommodate a sewerage system is as follows.

<u>Colonia</u>	<u>Number of Lots</u>	<u>Number of Privies</u>	<u>Number of Septic Tanks</u>	<u>Number of Requiring Plumbing</u>
Group F				
Walston Farms				
Highland Farms	110	7	103	7
Group G				
Alvarez				
La Blanca Heights	50	0	50	0
Group H				
Barbosa Lopez				
Victoria Acres				
Delta Courts				
Del Noreste				
Chapa No. 1	235	82	153	82



<u>Colonia</u>	<u>Number of Lots</u>	<u>Number of Privies</u>	<u>Number of Septic Tanks</u>	<u>Number of Requiring Plumbing</u>
Group K				
Avila I.B.				
Tierra Bella				
Tierra Prieta				
Balli No. 2				
Scissors				
Pan Filo Martinez	455	64	391	64

Assessed Value

The Hidalgo County Assessors office records indicate the following average assessed valuations for the properties within the respective subdivisions.

<u>Colonia</u>	<u>Average Lot Value</u>	<u>Lot Plus Dwelling Unit</u>	<u>Average Taxes</u>
Group F			
Walston Farms			
Highland Farms	\$4,665	\$14,481	\$225
Group G			
Alvarez			
La Blanca Heights	\$5,332	\$25,318	\$394
Group H			
Barbosa Lopez			
Victoria Acres			
Delta Courts			
Del Noreste			
Chapa No. 1	\$4,954	\$14,464	\$237
Group K			
Avila I.B.			
Tierra Bella			
Tierra Prieta			
Balli No. 2			
Scissors			
Pan Filo Martinez	\$3,835	\$14,760	\$230





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## 2.0 Inventory of Existing Infrastructure

### Water Supply

The colonias are all located outside of the corporate limits of Donna or Weslaco, but are within the Citys' ETJ. Accordingly, water service to the colonias is supplied by the North Alamo Water Supply Corporation. The water distribution systems within the colonias are, therefore, comprised of 2-inch or 4-inch mains and supply water used for domestic consumption only. The NAWSC has a 6-inch line supplying water to the Walston Farms subdivision and a 6-inch main along Mile 6-1/2 Road. Smaller diameter mains are in the vicinity, as indicated on Figure VI-8. NAWSC also provides water to Group K via 2-1/2-inch lines along Old La Blanca Road and Mile 9-1/2 north, and plans to install a 4-inch line along Old La Blanca Road. The NAWSC indicated that it intends to supply water to the Group H colonias. However, a field check indicated water meters already exist on the lots.

The City of Weslaco has a 12-inch line located at Mile 9 north and Mile 5-1/2 west.

The City of Weslaco operates a 7.5-mgd capacity water treatment plant located at Mile 4 west and Mile 8-1/2 north. The plant is currently operating at an average flow of 4.5 mgd. The City has 5,240 acre-feet of water rights as a result of adjudication and property conversion which it receives as a user allotment from Hidalgo County Irrigation District No. 9. The City has recently contracted with Irrigation District No. 9 to designate an additional 1,940 acre-feet of water rights for the City of



Weslaca. A review of the City of Donna's water system indicates it is not capable of extending service to the area of any of the colonia groups.

The NAWSC water-use rate study indicates an average consumption of 502 gallons per connection per day. The corporation's current debt is approximately \$11 million, with a monthly debt service of \$70,000. The NAWSC plant capacity is 10.5 mgd, of which it operates at an average flow rate of 5.5 mgd.

### Sewerage Service

As indicated previously, sewerage service within the colonias is comprised primarily of septic tanks with some privies. The city of Donna operates a 1.5-mgd wastewater treatment plant and is planning an expansion of 1.0 mgd. According to City officials, sufficient capacity is not available to serve the colonias at this time.

The City of Weslaco's sewer plant has a capacity of 3.0 mgd. The current flow rate is approximately 60 percent of capacity. Sufficient plant capacity exists to serve the colonias in this area if sewer service is provided.

## 3.0 Existing and Future Flow Projections

### Existing Demands

Water demands and wastewater contributions anticipated from the colonias under existing conditions of development are approximated, using the house count determined from the drive by



survey and recorded consumption rates on a per dwelling unit basis. Since the NAWSC has the highest potential as a source for water service, the demand rates determined for the NAWSC were used to project service needs in the colonias. For water, demand is based on 502 gallons per connection. Wastewater contribution is approximated at a rate of 100 gpcpd in compliance with the State Department of Health criteria. The following table summarizes the projection demand and contribution anticipated from the existing colonias.

<u>Colonia</u> <u>Flow</u>	<u>Number</u> <u>of Lots</u> <u>Occupied</u>	<u>1988</u> <u>Popu-</u> <u>lation</u>	<u>Existing</u> <u>Water</u> <u>lation</u> <u>Demand</u>	<u>Average</u> <u>Wastewater</u> <u>Demand</u>
Group F Walston Farms Highland Farms	110	495	55,220	49,500
<u>Colonia</u>	<u>Number</u> <u>of Lots</u> <u>Occupied</u>	<u>1988</u> <u>Popu-</u> <u>lation</u>	<u>Existing</u> <u>Water</u> <u>Demand</u>	<u>Average</u> <u>Wastewater</u> <u>Flow</u>
Group G Alvarez La Blanca Heights	50	225	25,100	22,500
Group H Barbosa Lopez Victoria Acres Delta Courts Del Noreste Chapa No. 1	235	1,058	117,970	105,800
Group K Avila I.B. Tierra Bella Tierra Prieta Balli No. 2 Scissors Pan Filo Martinez	455	2,048	228,410	204,750

426,700

382,850



Future Demands

Future demands were calculated by applying the same factors to the build out populations for the colonias. In some of the unplatted colonias, total build-out is assumed to occur at a density of 4 lots per acre in response to the sewer service. Without sewer service, build-out densities would occur at 2 lots per acre in accordance with recent regulations concerning septic tank installation as issued by the Texas Department of Health.

<u>Colonia</u>	<u>Number of Lots</u>	<u>Build-Out Population</u>	<u>Average Water Demand</u>	<u>Average Wastewater Flow</u>
Group F				
Walston Farms				
Highland Farms	151	680	75,802	68,000
Group G				
Alvarez				
La Blanca Heigts	84	378	42,168	37,800
<u>Colonia</u>	<u>Number of Lots</u>	<u>Build Out Population</u>	<u>Average Water Demand</u>	<u>Average Wastewater Flow</u>
Group H				
Barbosa Lopez				
Victoria Acres				
Delta Courts				
Del Noreste				
Chapa No. 1				
Scissors	490	2,205	245,980	220,550
Group K				
Avila I.B.				
Tierra Bella				
Tierra Prieta				
Balli No. 2				
Pan Filo Martinez	543	2,444	272,586	244,350

*42,168*      *37,800*



**4.0 Alternative Evaluations**

Discussions with the cities of Donna and Weslaco indicate that neither is able nor willing to provide either water or sewage service to the colonia groups studied. The NAWSC, currently providing water, is not interested in pursuing wastewater development. As a result, the only alternative examined for these four groups of colonias was the creation of a separate municipal utility district, or at least creation of a separate management entity to operate a wastewater system. It appears the most feasible alternative for water supply is to maintain service from the NAWSC.

The largest consolidation of population is in the Group H colonias. An initial effort for sewage facilities construction would contain this group. Phasing of improvements could extend the system to include the colonias in groups F, G, and K, as well as the intervening lands. Figures VI-8 and VI-9 show the alignment of proposed facilities, assuming a separate management entity is formed to operate the systems.

**Cost Estimates (Group F)**

The cost to provide sewer service to Group F are presented in the following tables.

**Costs to Provide Sewer Service to the Group F Colonias  
Sewer System Improvements**

5,800 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 70,000
5,200 L.F.	4-inch Force Main	10	52,000
2 Ea.	Small Lift Station	25,000	50,000
75,000 Gal.	Treatment Plant	2.50	188,000
150 Ea.	Wyes and Service Lines	600	90,000
3,000 L.F.	6-inch Force Main	12	<u>36,000</u>



Subtotal Improvement	\$486,000
Engineering (10 percent)	49,000
Contingencies (25 percent)	<u>122,000</u>
<b>TOTAL COST OF IMPROVEMENTS</b>	<b>\$657,000</b>

**Cost Estimates (Group G)**

The following costs are presented wastewater service to the Group G colonias.

**Sewer System Improvements (Connection to Treatment Plant in Group H)**

5,000 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 60,000
3,000 L.F.	6-inch Force Main	12	36,000
1 Ea.	Small Lift Station	25,000	25,000
40,000 Gal.	Treatment Plant	3.10	124,000
84 Ea.	Wyes and Service Lines	600	<u>50,000</u>
Subtotal Improvements			\$295,000
Engineering (10 percent)			30,000
Contingencies (25 percent)			<u>74,000</u>
<b>TOTAL COST OF IMPROVEMENTS</b>			<b>\$399,000</b>

**Cost Estimates (Group H)**

The costs to provide sewer service to the area are summarized below.

**ALTERNATIVE NO. 1**

**Group H Offsite Satellite Treatment Plant Alternate**

<u>Description</u>	<u>Estimate Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
12-inch Sanitary Sewer	1,000	LF	\$ 20	\$ 20,000
10-inch Sanitary Sewer	5,000	LF	15	75,000
8-inch Sanitary Sewer	7,000	LF	10	70,000
Standard Manhole	46	Ea	1,000	46,000
Gravel Bed	9,000	LF	5	45,000
6-inch Force Main	100	LF	10	1,000
Wyes and Service Lines	490	Ea	600	294,000



<u>Description</u>	<u>Estimate Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Total</u>
Lift Station	1	Ea	50,000	50,000
Treatment Plant	225,000	Gal	1.25	281,000
TS&P	1,300	LF	7	91,000
Subtotal				\$ 973,000
Engineering (10 percent)				\$ 97,000
Contingencies (25 percent)				\$ 243,000
TOTAL				\$1,313,000

ALTERNATIVE NO. 2

Alternate Tieing to City of Weslaco

8-inch Sanitary Sewer	9,500	LF	\$ 10	\$ 95,000
Manhole	27	Ea	1,000	27,000
Gravel Bedding	9,500	LF	5	48,000
6-inch Force Main	3,500	LF	10	35,000
Lift Station	2	Ea	50,000	100,000
TS&P	9,000	Lf	7	6,000
Treatment Plant Capacity	225,000	Gal.	1.25	281,000
Wyes and Service Lines	490	Ea.	600	294,000
Subtotal				\$ 886,000
Engineering (10 percent)				\$ 87,000
Contingencies (25 percent)				\$ 222,000
TOTAL				\$1,195,000

Cost Estimates (Group K)

The costs to provide sewer service to the Group K colonias are summarized below.

Sewer System Improvements (Avila IB, Pan Filo Martinez, and Scissors connect to City of Donna S.T.P.)

9,800 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 81,600
4,200 L.F.	10-inch Sanitary Sewer	15	63,000
1,300 L.F.	6-inch Force Main	12	16,000
2,500 L.F.	4-inch Force Main	8	20,000
3 Ea.	Lift Station	25,000	75,000
145,000 Gal.	Treatment Plant Improv.	2	363,000
322 Ea	Wyes & Service Lines	600	193,000



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Subtotal Improvements	\$ 848,000
Engineering (10 percent)	85,000
Contingencies (25 percent)	<u>212,000</u>
<b>TOTAL COST OF IMPROVEMENTS</b>	<b>\$1,145,000</b>

Sewer System Improvements (southern portion of Group K connects to New S.T.P.)

3,500 LF	8-inch Sanitary Sewer	\$ 12	\$ 42,000
2,000 LF	6-inch Force Main	10	20,000
1 Ea	Lift Station	35,000	35,000
110,000 Gal.	Treatment Plant	2	275,000
221 Ea	Wyes & Service Lines	600	<u>133,000</u>
Subtotal Improvements			\$505,000
Engineering (10 percent)			51,000
Contingencies (25 percent)			<u>126,000</u>
<b>TOTAL COST OF IMPROVEMENTS</b>			<b>\$682,000</b>

**WESLACO**

1.0 Description of Colonias

In addition to the group of colonias described in the previous section to this report, three other colonia groups were identified within the City of Weslaco's extra territorial jurisdiction (ETJ). A total of 16 colonias were identified in areas surrounding the City. The colonia groupings are designated as Group I, Group J, and Group L.

The Group I colonias is comprised of three platted subdivisions, Martin, Flora, and Expressway Heights located along Expressway U.S. 83 between mile 6 west and Midway Road (see Figure VI-8). A total of 205 lots are platted within the three colonias. The City of Weslaco is considering annexation of Expressway Heights subdivision sometime next year.





The second group, Group J, is also comprised of three platted subdivisions, Rosedale Heights, Midway Village, and La Palma No. 1. The group is located west of Weslaco along Mile 7 north between Mile 7 west and Mile 6 1/2 west.

The third group, Group L, includes five platted subdivisions and five unplatted subdivisions which are located northwest of Weslaco along Mile 3 west and Mile 12 North. The platted subdivisions are Sunrise No. 2, Puesta Del Sol, Mesquite No. 1, La Paloma Units 1 and 2, and Sunrise Hill. The unplatted subdivisions include El Leon, Colonia Tijerina, Mile Doce West, Olivarez No. 4, and Mile Doce.

### Population and Housing

Population in the Colonias was estimated by first counting the number of houses via a drive by survey and then multiplying by an average of 4.5 persons per dwelling unit as determined in the 1986 reconnaissance study. In some cases, structures exist as partially constructed or uninhabited. To gain an accurate judge of population, electrical meters were counted wherever possible. The existing population in each colonia is summarized below.

<u>Colonia</u>	<u>Number of Units Occupied</u>	<u>Maximum Number of Units</u>	<u>1988 Popu- lation</u>	<u>Build- Out Popu- lation</u>	<u>Year of Build- Out</u>
Group I					
Martin	11	27	50	122	
Flora	20	20	90	90	
Expressway Heights	<u>200</u>	<u>200</u>	<u>900</u>	<u>900</u>	
	231	247	1,040	1,112	1990



<b>Group J</b>					
Rosedale Heights	23	42	104	189	
Midway Village	31	75	140	338	
La Palma No. 1	<u>157</u>	<u>170</u>	<u>706</u>	<u>765</u>	
	211	287	950	1,292	1997
<b>Group L</b>					
Puesta Del Sol	109	193	491	869	
Mesquite No. 1s	29	48	130	216	
La Paloma No. 1	40	40	180	180	
La Paloma	31	56	140	252	
Sunrise Hill	274	350	1,233	1,575	
El Leon	10	15	45	67	
Tijerina	21	27	94	122	
Mile Doce West	29	35	131	157	
Olivarez	3,110	37	139	167	
Mile Doce	<u>          </u>	<u>16</u>	<u>45</u>	<u>71</u>	
	584	817	2,628	3,676	1998

*21612      6000*

**Tax Rates**

The subdivisions are subject to the following tax rates:

Hidalgo County and Drainage District	\$0.5951 per \$100 AV
Water District No. 9	\$0.22 per \$100 AV
Weslaco Independent School District	\$0.82 per \$100 AV

**Employment Rate**

The current unemployment rate for the Weslaco area is 15.0 percent according to the local Texas Employment Commission office.

**Utility Service Rates**

The following utility service rates are effective within the Subdivisions:

Magic Valley Electric Coop	\$7.00 + \$0.06686/KWH (winter)
	\$7.00 + \$0.072893/KWH (summer)
North Alamo Water Supply Corporation	\$11 first 3,000 gal
	\$1.50/1,000 next 2,000 gal
	\$1.00/1,000 next 2,000 gal
	\$0.80/1,000 over 7,000 gal



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### Structural Capability

A drive through survey of the colonias indicates varying degrees of privies and septic tank facilities. The Group L colonias rely entirely on privies whereas the Group I and J colonias appear to have primarily septic tanks. If privies are used, it is anticipated that connection to a sewerage system will require modifications to house plumbing in some structures. The extent of housing units anticipated to require additional plumbing to accommodate a sewerage system is as follows:

<u>Colonia</u>	<u>Number of Lots</u>	<u>Number of Privies</u>	<u>Number of Septic Tanks</u>	<u>Number of Requiring Plumbing</u>
Group I				
Martin				
Flora				
Expressway Heights	231	15	216	15
Group J				
Rosedale Heights				
Midway Village				
La Palma No. 1	211	15	196	15
Group L				
Puesta Del Sol				
Mesquite No. 1s				
La Paloma No. 1				
La Paloma No. 2				
Sunrise Hill				
El Leon				
Tijerina				
Mile Doce West				
Olivarez No. 4				
Mile Doce	584	273	311	273



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**Assessed Value**

The Hidalgo County Assessors office records indicate the following average assessed valuations for the properties within the respective subdivisions:

<u>Colonia</u>	<u>Average</u>		
	<u>Lot Value</u>	<u>Lot Plus Dwelling Unit</u>	<u>Taxes</u>
Group I			
Martin			
Flora			
Expressway Heights	\$4,099	\$19,918	\$326
Group J			
Rosedale Heights			
Midway Village			
La Palma No. 1	\$4,243	\$16,249	\$266
Group L			
Puesta Del Sol			
Mesquite No. 1s			
La Paloma No. 1			
La Paloma No. 2			
Sunrise Hill			
El Leon			
Tijerina			
Mile Doce West			
Olivarez No. 4			
Mile Doce	\$3,536	\$10,492	\$172

**2.0 Inventory of Existing Infrastructure**
**Water Supply**

The colonias are all located outside of the corporate limits of Weslaco but are within the Citys' ETJ. Accordingly, water service to the colonias is supplied by the North Alamo Water Supply Corporation. The water distribution systems within the colonias are therefore comprised of 2-inch or 4-inch mains and



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supply water for domestic consumption only. The NAWSC has an 8-inch line on Mile 6 Road supplying water to the Group I colonias. The City of Weslaco has a 12-inch water line located at Mile 6 and U.S. 83. The Group J colonias are supplied water through a 3-inch NAWSC line on Mile 6-1/2 and a 4-inch line along Midway Road. The closest City of Weslaco main is a 12-inch line located along Mile 6-1/2 from Mile 7 to Mile 8. The Group L colonias are supplied water through a 4-inch NAWSC line on Mile 3 West and a 6-inch line along Mile 11 North. The closest City of Weslaco main is a 16-inch line along Mile 9 North at Mile 3-1/2 West approximately 4 miles away.

The City of Weslaco operates a 7.5 MGD capacity water treatment plant located. The plant is current operating at a average flow of 4.5 MGD. The city has 5,240 acre-feet of water rights as a result of adjudication and property conversion which it receives as a user allotment from Hidalgo County Irrigation District No. 9. The City has recently contracted with Irrigation District No. 9 to designate an additional 1940 acre-feet of water rights for the City of Weslaco.

The NAWSC plant capacity is 10.5 MGD of which it operates at an average flow rate of 5.5 MGD. A NAWSC water use rate study indicates an average consumption of 502 gallons per connection per day. The corporation's current debt is approximately \$11 million with a monthly debt service of \$70,000.



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### Sewerage Service

As indicated previously, sewerage service within the colonias is comprised primarily of septic tanks with some privies. The city of Weslaco operates a 3.0 mgd wastewater treatment plant that is operating at 60 percent of capacity. The part of the City's distribution system closest to the colonia groups is shown on Figure VI-8. While the final determination to provide sewer service to the colonias is one of economics, the City of Weslaco has indicated a desire to serve the colonias as a means of expanding their current infrastructure capability.

### 3.0 Existing and Future Flow Projections

#### Existing Demands

Water demands and wastewater contributions anticipated from the colonias under existing conditions of development are approximated using the house count determined from the drive by survey and recorded consumption rates on a per dwelling unit basis. Since the NAWSC has the highest potential as a source for water service, the demand rates determined for the NAWSC were used to project service needs in the colonias. For water, demand is based on 502 gallons per connection. Wastewater contribution is approximated at a rate of 100 gpcpd in compliance with the State Department of Health criteria. The following table summarizes the projection demand and contribution anticipated from the existing colonias.



<u>Colonia</u>	<u>Number of Units Occupied</u>	<u>1988 Popu- lation</u>	<u>Existing Average Water Demand</u>	<u>Existing Average Wastewater Flow</u>
Group I				
Martin	11	50	5,522	5,000
Flora	20	90	10,040	9,000
Expressway Heights	200	900	100,400	90,000
	231	1,040	115,962	104,000
Group J				
Rosedale Heights	23	104	11,546	10,400
Midway Village	31	140	15,562	14,000
La Palma No. 1	157	706	78,814	70,600
	211	950	105,922	95,000
Group L				
Puesta Del Sol	109	491	54,718	49,100
Mesquite No. 1s	29	130	14,558	13,000
La Paloma No. 1	40	140	20,080	14,000
La Paloma No. 2	31	1,233	15,562	123,300
Sunrise Hill	274	45	137,548	4,500
El Leon	10	94	5,020	9,400
Tijerina	21	131	10,542	13,100
Mile Doce West	29	139	14,558	13,900
Olivarez No. 4	31	45	15,562	4,500
Mile Doce	10		5,020	
	584	2,628	293,168	262,800
TOTALS	1,026	4,618	515,052	461,800

### Future Demands

Future demands were calculated by applying the same factors to the build out populations for the colonias. In some of the unplatted colonias, total build out is assumed to occur at a density of 4 lots per acre in response to the sewer service. Without sewer service, build out densities would occur at 2 lots per acre in accordance with recent regulations concerning septic tank installation as issued by the Texas Department of health.



<u>Colonia</u>	<u>Number of Units</u>	<u>Build- Out Popu- lar</u>	<u>Average Water Demand</u>	<u>Average Waste- water Flow</u>
Group I				
Martin	27	122	13,554	12,200
Flora	20	90	10,040	9,000
Expressway Heights	200	900	100,400	90,000
	247	1,112	123,994	111,200
Group J				
Rosedale Heights	42	189	21,084	18,900
Midway Village	75	338	37,650	33,800
La Palma No. 1	170	765	85,340	76,500
	287	1,292	144,074	129,200
Group L				
Puesta Del Sol	193	869	96,886	86,900
Mesquite No. 1s	48	216	24,096	21,600
La Paloma No. 1	40	180	20,080	18,000
La Paloma No. 2	56	252	28,112	25,200
Sunrise Hill	350	1,575	175,700	157,500
El Leon	15	67	7,530	6,700
Tijerina	27	122	13,554	12,200
Mile Doce West	35	157	17,570	15,700
Olivarez No. 4	37	167	18,574	16,700
Mile Doce	16	71	8,032	7,100
	817	3,676	410,134	367,600
TOTALS	1,350	6,080	678,202	600,000

#### 4.0 Alternative Evaluations

Discussions with the City of Weslaco indicate that the City is willing to extend water and sewer service to the colonias as a means of extending its infrastructure capability. However, the extensions are based on economics and the ability of the colonias to pay for the services. After review of alternative I/A methods





of wastewater collection and treatment, the City has indicated that unless substantial savings were to result from installation of an I/A approach, it would prefer a conventional gravity system. The NAWSC has indicated it is not interested in pursuing wastewater development. The alternatives considered for these groups of colonias reflect these opinions of the service entities.

#### Group I

Two alternatives were considered for water supply to the Group I colonias. The first solution would be to continue service from the NAWSC. Under this alternative, water would be available for domestic consumption only, with the exception of Expressway Heights which is currently receiving water from the City. The City has indicated that it intends to annex Expressway Heights in the near future. In doing so, fire protection would have to be provided involving either installation of separate fire mains or conversely, transportation of water through trucking equipment.

The second solution would be for the City to extend water service from its existing 12-inch line at U.S. 83. The improvements necessary under this alternative, shown on Figure VI-8 would include replacement of all lines within the colonias and acquisition of the existing NAWSC system approximated at \$1,000 per connection. In addition, approximately 139 acre-feet of additional water rights to serve the property would have to be



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obtained. Service to the Group I colonias would not require expansion to the City's existing treatment plant.

As part of its annexation of Expressway Heights, the City of Weslaco intends to extend its sewerage system to service the development. If oversized, this would make service available to the rest of the colonias in Group I. The improvements necessary, shown on Figure VI-8, would include a lift station and gravity trunk lines. These improvements would likely have to accommodate adjacent vacant land area in addition to the colonias. It is anticipated that an area of 80 acres could be accommodated within the planning period.

The alternative to connection to the City of Weslaco sewer system is creation of a separate 0.1 mgd treatment plant to serve the Group I colonias and adjacent land. The alternative would require creation of a separate management entity, such as a municipal utility district, to operate the facilities. Since the City is planning on annexing Expressway Heights, permission to create a separate management entity may also be required from the City.

#### Cost Estimates (Group I)

The cost to provide water and sewer service to the Group I colonias is presented in the following tables. Alternative costs are provided assuming the additional vacant land between the City and the Group I colonias is provided for.



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**Water System Improvements (connection to City of Weslaco)**

4,500 L.F.	8-inch Water Line	\$ 12	\$ 54,000
1 Ea.	Thrust Block	1,000	1,000
Subtotal Improvements			\$ 55,000
Engineering (10 percent)			6,000
Contingencies (25 percent)			14,000
Acquisition of System			231,000
Acquisition of Water Rights			834,000
TOTAL COST OF IMPROVEMENTS			\$1,140,000

**Sewer System Improvements (connection to City of Weslaco)**

5,500 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 66,000
250 Ea.	Wyes and Service Lines	600	150,000
Subtotal Improvements			\$ 216,000
Engineering (10 percent)			22,000
Contingencies			54,000
TOTAL COST OF IMPROVEMENTS			\$ 292,000

**Group J**

Alternatives to providing water service to the Group J colonias are similar to that for the Group I colonias namely, continued service from NAWSC or connection to the City of Weslaco system. The City of Weslaco has not expressed a strong interest in extending its water system to this area. However, the system does appear to have the necessary capacity and extension of water to the Group J colonias would be compatible with the City's objectives for growth. The improvements necessary to serve the area are shown on Figure VI-8.



The City is interested in extending sewer service to this area. The City's current growth pattern is to the north and extension of service to this area would benefit that growth trend. The improvements shown on Figure VI-8 are those necessary to provide service to the colonias in Group J. However, the City should consider the vacant lands in between the colonias and the end of the existing sewer system. It is anticipated that 100 acres of vacant land could develop and make use of the the sewer improvements during the planning period. The improvements necessary to accommodate this additional growth are shown on Figure VI-8.

#### Cost Estimates (Group J)

The following costs are presented for water and wastewater service to the Group J colonias.

#### Water System Improvements (connection to City of Weslaco)

5,300 L.F.	8-inch Water Line	\$ 12	\$ 64,000
1 Ea.	Thrust Block	2,000	<u>2,000</u>
Subtotal Improvements			\$ 66,000
Engineering (10 percent)			7,000
Contingencies (25 percent)			17,000
Acquisition of System			211,000
Acquisition of Water Rights			<u>97,000</u>
TOTAL OFFSITE WATER IMPROVEMENTS			\$398,000

#### Sewer System Improvements (connection to City of Weslaco)

6,500 L.F.	8-inch Sanitary Sewer	\$ 12	\$ 38,000
45,000 L.F.	6-inch Force Main	12	54,000
1 Ea.	Small Lift Station	40,000	40,000
290 Ea.	Wyes and Service Lines	600	<u>174,000</u>
Subtotal			\$346,000



Engineering (10 percent)	34,600
Contingencies (25 percent)	86,500
<b>TOTAL SEWER SYSTEM IMPROVEMENTS</b>	<b>\$467,100</b>

### Group L

The alternatives for water and sewer available to the Group L colonias appear to be similar to those for Group I and Group J. However, the nearest City of Weslaco facilities are 4 miles from the colonia group making near term extension of these facilities impractical. As a result, it is anticipated the most logical method of providing water service is the continued service by the NAWSC and that of sewage disposal to be by construction of a separate package plant. The facilities necessary for this alternative, shown in Figure VI-10 will require some form of administration and management. This could be accomplished either by creation of a special district or acceptance by the City of Weslaco to operate the plant.

### Cost Estimates (Group L)

The costs to provide water and sewer to the area are summarized below.

#### Sewer System Improvements (Connect to Satellite Plant)

1,250 L.F.	12-inch Sanitary Sewer	\$ 18.00	\$ 23,000
1,250 L.F.	10-inch Sanitary Sewer	15.00	19,000
9,000 L.F.	8-inch Sanitary Sewer	12.00	108,000
100 L.F.	4-inch Force Main	10.00	1,000
1 Ea.	Small Lift Station	25,000.00	25,000
400,000 Gal.	Treatment Plant	1.25	500,000
820 Ea.	Wyes and Service Lines	600.00	492,000
<b>Subtotal Improvements</b>			<b>\$1,168,000</b>



Engineering (10 percent)	117,000
Contingencies (25 percent)	292,000
<b>TOTAL COST OF IMPROVEMENT</b>	<b>\$1,577,000</b>

## **ALTON/PALMVIEW**

### **I. Description of Colonias**

The study area encompasses a "band" of colonias plus the incorporated cities of Palmview and Alton in the southwest portion of Hidalgo County. The area lies generally northwest of the City of McAllen and west of the City of Mission. For alternative study and evaluation, the area has been divided into two large service areas, termed Alton Area and Palmview Area, based on existing topography, watershed boundaries, and colonia clustering.

Within and adjacent to the City of Alton in the northern study area lie 45 colonias. Twenty-five of the colonias are Classification 1 or 2 colonias identified in the 1986 reconnaissance study. Besides these colonias, 20 additional colonias have been identified which were not included under any classification heading from the previous study. None of the colonias, including the incorporated areas, are currently served by a centralized sanitary sewer system. Instead, existing wastewater treatment is provided either by inadequate septic tanks and absorption fields or pit latrines. Water service is provided by either La Joya Water Supply Corporation (WSC), Sharyland WSC, or private wells.



The Palmview study area contains an estimated 105 colonias, including those inside the incorporated City of Palmview. Forty of the colonias are Classification 1 or 2 colonias identified in the reconnaissance level study. Like its Alton area counterpart, the remaining 65 colonias previously were not tabulated. Again, none of the area receives adequate wastewater treatment, relying totally on septic tank or pit latrine systems. The Palmviw area also is supplied water by either Sharyland WSC, La Joya WSC, or private wells.

Alternative methods of wastewater disposal have been investigated for the area. The Alton (north) study area is bordered approximately by FM 494 on the east, FM 1924 on the south, Minnesota Road on the west, and FM 681 on the north (see Figure VI-11). This proposed service area encompasses about 11,900 acres. The Palmview (south) study area is bordered on the north by a line midway between FM 676 and FM 1924, Highway 374 on the south, FM 492 on the west, and Los Ebanos Road and the corporate limits of Mission on the east. The area contains about 9,200 acres. The total service area is approximately 21,100 acres, but may be modified to include or exclude certain areas.

The City of McAllen lies directly southeast of Alton, and McAllen's extraterritorial jurisdictional boundary presently overlaps and includes the southern city limits of Alton. The two cities have worked closely in the past, when faced with jurisdictional questions of properties in the overlap area. In fact,



McAllen's current wastewater master plan considers inclusion of Alton for future service. The City of Mission is directly east of Palmview, and a portion the City's ETJ extends into the study area.

Population and Housing

The reconnaissance level study of the Lower Rio Grande Valley colonias found, through resident interviews, that the population density for the colonias is 4.5 persons per household. This factor was used to estimate both the current and future population of the colonias. The number of existing housing units was determined by counting housing structures during a drive-through survey of the colonias. The build-out number of housing units was determined by counting the number of platted lots within the service area. The total existing and build-out populations of the identified colonias in the north and south service areas are as follows.

<u>Service Area</u>	<u>Approx. Number of Colonias</u>	<u>Number of Lots Occupied</u>	<u>Total # of Lots</u>	<u>1988 Population</u>	<u>Build-Out Population</u>
Alton Area	45	976	2,387	4,402	10,749
Palmview Area	105	1,142	4,102	6,972	18,039
				<i>11,374</i>	<i>28,788</i>

Table VI-4 present a breakdown of this information by colonia for each area, respectively. It is important to note that these estimates do not account for the total population in the defined area or the total number of platted lots, only the existing, occupied colonia developments.





The build-out population presented above is estimated based on the total number of existing unoccupied lots, and is expected to occur well before the end of the planning period (year 2020). In order to determine a future 2020 population for the study area, some assumptions concerning future development were made. Future population estimates (1988 high series) for rural portions of Hidalgo County and the incorporated limits of Alton were obtained from the Texas Water Development Board (TWDB). From 1988 to 2020, rural populations are expected to increase from 111,784 to 289,178, or by 259 percent. Projecting the existing rural area population of 1,737 by the 259 percent growth factor plus the projected TWDB Alton population, yields an estimated north study area population of 17,314. A similar calculation for the south study area yields a future population of 17,797. It is important to note that the projected population using the TWDB data matches closely with projected population for this area based on the existing number of lots (18,037 from Table VI-4 and VI-5).

#### Employment Rate

Current estimates of unemployment in rural portions of Hidalgo County are about 15 percent. Recent applications for funding of various improvements in the Alton area placed 98 percent of the populace at or below poverty level.



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### Utility Service Rates

The following utility service rates are in effect in the study area.

Electricity  
(Magic Valley Electric)

Water Service (Sharyland WSC)	\$18 for the first 3,000 gal.
	\$1.50/1000 gal. 3000-5000 gal.
	\$1.25/1000 gal. 6000-50000 gal
	\$1.00/1000 gal. 50000-100000 gal.

Water (La Joya WSC)	\$10.50 for the first 3000 gal.
	✓\$1.40/1000 gal. 3000-5000 gal.
	✓\$1.50/1000 gal. 6000-50000 gal.
	✓\$1.70/1000 gal. 50000-100000 gal.

### Structural Capability

Drive through surveys of the area indicate that many of the dwelling units utilize pit latrines for wastewater disposal. Actual counts cannot be determined without a door-to-door survey; however, it is estimated that as many as 15 percent of the existing residences, or 171 dwelling units in the south service area and 146 dwelling units in the north service area, use this method of disposal. In order to serve these units with centralized sewer service, indoor plumbing will be required.

## II. Inventory of Existing Infrastructure

### Water Service

Existing water service is provided by La Joya WSC to residents in the western sections of the service area and by Sharyland WSC in the incorporated limits of Alton and other eastern sections. A few residents rely on private groundwater wells for their supply. Since the area is supplied primarily by the rural



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WSCs, water distribution lines are characteristically small, usually no larger than 4-inch, with the majority being 3-, 2-, 1.5-, or 1.25-inches in diameter. With such small sizes, fire demands cannot be accommodated.

### Wastewater Service

There are no centralized collection and treatment facilities within the planning area. As noted previously, wastewater service is provided by the individual homeowner and consists of either septic tank systems or pit latrines. Most, if not all, of the septic tank systems are on lots smaller than the Texas Department of Health's minimum lot size of one-half acre for septic tank systems.

The City of McAllen to the east operates three wastewater treatment plants. The closest is a 2.0-million-gallon-per day (mgd) facility approximately 4 miles east of Alton. The plant is planned to be expanded, in 1991, to 4.0 mgd and will eventually be expanded to 8.0 mgd. These expansion programs are planned to serve the rapidly growing northwest sectors of the City and its ETJ. Alton lies along the perimeter of the ETJ, but is included in the City's long range planning.

The City of Mission operates a 3.5-mgd wastewater treatment plant located southeast of Palmview. Discussions with the City Manager of Mission indicate, however, that due to existing limitations excess capacity is not available to provide service to the Palmview area.



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### III. Existing and Projected Demand

#### Water

Based on the TWDB water demand projections for rural Hidalgo County, the current average water demand is 111 gallons per capita per day or about 500 gallons per connection. For the total study area, this demand equates to approximately 1,059,000 gallons per day currently and 3,897,000 gpd by year 2020. Considering only the identified colonias future water demand is approximately 3,109,600 gpd.

#### Wastewater

Wastewater demand projections are based on the Texas Department of Health recommended criteria of 100 gallons per capita per day, 4.5 persons per dwelling unit, and the projected study area population. Peak wastewater flow is estimated using a peaking factor of 1.5. These criteria are generally consistent with the City of McAllen's design criteria, except the City utilizes a factor of 4.0 dwelling units per acre when sizing collection systems for rural areas in lieu of a population criteria. Using the estimated population projections, the study area has an existing average wastewater contribution of 0.44 mgd in the Alton area and 0.51 mgd in the Palmview area. Projected demands are 1.73 mgd and 1.81 mgd, respectively. Future peak wastewater flows will approximate 2.60 mgd and 2.72 mgd, respectively.



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#### IV. Alternative Evaluation

##### Water Service

Water service is currently provided in the area by the rural water supply corporations. Given the remoteness of most areas from the incorporated cities, future water service is most likely to be provided by extension of WSC waterlines into the undeveloped areas. The WSCs will need to obtain additional water rights in order to serve the future population, as well as to provide for periodic water plant and waterline expansions.

##### Wastewater Service

Three centralized wastewater service alternatives initially were investigated for each study area (Alton and Palmview). One of the alternatives provides for oversizing of collection lines to accommodate future development, consistent with the TWDB population projections through the year 2020. The remaining two alternatives consider service to only the existing identified colonias without allowances for future infill development. Each of these alternatives is discussed below. Following review of the draft report, a fourth alternative was suggested by representatives of the City of Alton for the Alton study area. A discussion of this alternative is presented with the three initial alternatives in the following section.

##### ALTON STUDY AREA

Alternative 1 proposes a centralized collection and treatment system to serve the needs of the study area population through



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2020 and provides some additional collection capacity beyond what is required for the 45 identified colonias. Collection lines, as shown on Figure VI-11, are proposed for construction in a minimum of two phases. Phase 1 lines would serve the immediate Alton area and nearby colonias. The Phase 2 lines would be constructed as funds become available and can be constructed in one or more phases.

Wastewater treatment under Alternative 1 can be provided by one of two options. Option 1 utilizes the City of McAllen's Wastewater Treatment Plant No. 3 which is consistent with the City's long range planning for the area. Option 2 considers construction of a new regional treatment plant just east of the present city limits of Alton.

Selection of Option 1 requires construction of a conveyance system, either pump stations and gravity sewers or a single pump station and force main, to the McAllen plant. While new gravity sewers would provide service for additional development along its route, the force main/pump station has been selected due to lower cost and the fact it provides service only for the study area. Other options were explored and discussed, such as utilizing the City's existing infrastructure, with McAllen officials, however, the proposed alternatives were agreed upon as the better approach to providing service. Because of the larger service area, operation and maintenance costs for this option are expected to be



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significantly lower than for Option 2. Current O&M costs for McAllen residents are reported to be \$6.00 to \$7.00 per connection.

Selection of Option 2 does not require the additional expense of a conveyance system, however, as noted above, O&M costs are higher (estimated at \$15.00 to \$20.00 per connection) due to additional administrative, labor and miscellaneous costs. Discussions of each option with personnel from both Alton and McAllen indicate that selection of Option 1 over Option 2 is preferred.

As an incentive for the City of McAllen to participate in the plan, dollars used to construct the pump station/force main system could be used instead to construct new oversized gravity lines in the area between Alton and the McAllen plant, thus providing service to the study area as well as additional residents outside of the identified colonias. Suggestion of this plan to the City of McAllen has been met with approval.

Figure VI-11 presents the routing of the proposed force/main system along with preliminary routings of proposed gravity sewers from working drawings of McAllen's wastewater master plan. The following table shows the estimated quantities and costs for proposed facilities.



ALTERNATIVE 1  
OPTION 1 - ALTON AREA

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
24-inch Trunk Line	3,500 ft.	\$ 60/L.F.	\$ 210,000
21-inch Trunk Line	5,000 ft.	50/L.F.	250,000
18-inch Trunk Line	2,500 ft.	45/L.F.	113,000
15-inch Trunk Line	8,000 ft.	30/L.F.	240,000
12-inch Trunk Line	2,500 ft.	18/L.F.	45,000
8-inch Trunk Line	209,000 ft.	12/L.F.	2,508,000
18-inch Force Main	28,000 ft.	30/L.F.	840,000
Service Laterals	4,316	600 Ea.	2,590,000
Small Lift Station	40	25,000 Ea.	1,000,000
Large Lift Station	1	100,000 Ea.	100,000
Wastewater Treatment Facility	1.94 mgd	1/gal.	1,940,000
Subtotal			\$ 9,836,000
Engineering (10 percent)			984,000
Contingencies (25 percent)			2,459,000
TOTAL			\$13,279,000

Of this total, Phase 1 probable costs are approximately \$7.8 million as itemized below.

ALTERNATIVE 1  
OPTION 1 - ALTON AREA - PHASE 1

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
24-inch Trunk Line	3,500 ft.	\$ 60/L.F.	\$ 210,000
21-inch Trunk Line	5,000 ft.	50/L.F.	250,000
18-inch Trunk Line	2,500 ft.	45/L.F.	113,000
15-inch Trunk Line	8,000 ft.	30/L.F.	240,000
12-inch Trunk Line	2,500 ft.	18/L.F.	45,000
8-inch Trunk Line	84,000 ft.	12/L.F.	1,008,000
18-inch Force Main	28,000 ft.	30/L.F.	840,000
Service Laterals	1,194	600 Ea.	1,432,000
Small Lift Station	19	25,000 Ea.	475,000
Large Lift Station	1	100,000 Ea.	100,000
Wastewater Treatment Facility	1.07 mgd	1/gal.	1,070,000





Subtotal	\$ 5,783,000
Engineering (10 percent)	578,000
Contingencies (25 percent)	<u>1,446,000</u>
TOTAL	\$ 7,807,000

Alternative 2 is similar to Alternative 1 except that collection lines are sized to serve only the identified 45 colonias and not additional development, either existing isolated residences or potential future development. Again Options 1 and 2 apply with regard to wastewater treatment with corresponding reductions in size of a regional treatment plant or conveyance facilities. For this alternative, a future 1.07 mgd regional plant, or alternately, the same capacity at the McAllen plant is required. Probable construction costs are summarized below.

ALTERNATIVE 2 - ALTON AREA

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
18-inch Trunk Line	8,000 ft.	\$ 45 L.F.	\$ 360,000
15-inch Trunk Line	10,500 ft.	30 L.F.	315,000
10-inch Trunk Line	2,500 ft.	15 L.F.	38,000
8-inch Trunk Line	53,500 ft.	12 L.F.	642,000
12-inch Force Main	28,000 ft.	25 L.F.	700,000
4-inch Force Main	31,000 ft.	10 L.F.	310,000
Service Latest	2,387	600 Ea.	1,432,000
Small Lift Station	13	25,000 Ea.	325,000
Large Lift Station	1	100,000 Ea.	100,000
Wastewater Treatment Facility	1.07 mgd	1 Gal.	<u>1,070,000</u>
SUBTOTAL			5,292,000
Engineering (10 percent)			529,000
Contingencies (25 percent)			<u>1,323,000</u>
TOTAL			\$7,144,000



The third alternative investigated, Alternative 3, proposes construction of four sub-regional facilities for the study area. Again these treatment plants and their associated collection systems would serve only the projected populations of the identified colonias. Figure VI-\_\_\_ presents the locations of proposed facilities. The following table summarizes probable costs for this alternative.

ALTERNATIVE 3 - ALTON AREA - PLANT 1

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
10-inch Trunk Line	7,500 ft.	15/L.F.	\$ 113,000
8-inch Trunk Line	18,000 ft.	12/L.F.	216,000
Service Laterals	885	600 Ea.	531,000
Small Lift Station	3	25,000 Ea.	75,000
Wastewater Treatment Facility	0.40 mgd	1.25 Gal.	<u>500,000</u>
Subtotal			\$1,435,000
Engineering (10 percent)			144,000
Contingencies (25 percent)			<u>359,000</u>
TOTAL			\$1,938,000

ALTERNATIVE 3 - ALTON AREA - PLANT 2

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
12-inch Trunk Line	2,000 ft.	18/L.F.	\$ 36,000
10-inch Trunk Line	7,500 ft.	15/L.F.	113,000
8-inch Trunk Line	19,500 ft.	12/L.F.	234,000
4-inch Force Main	5,000 ft.	10/L.F.	50,000
Service Laterals	1,169	600 Ea.	701,000
Medium Lift Station	1	50,000 Ea.	50,000
Small Lift Station	2	25,000 Ea.	50,000
Wastewater Treatment Facility	0.53 mgd	1.25 Gal.	<u>663,000</u>
SUBTOTAL			1,897,000



Engineering (10 percent)	190,000
Contingencies (25 percent)	<u>474,000</u>
TOTAL	\$2,561,000

ALTERNATIVE 3 - ALTON AREA - PLANT 3

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
8-inch Trunk Line	8,000 ft.	12/L.F.	\$ 96,000
4-inch Force Main	8,000 ft.	10/L.F.	80,000
Service Laterals	239	600 Ea.	143,000
Small Lift Station	2	25,000 Ea.	50,000
Wastewater Treatment Facility	0.11 mgd	2.00 Gal.	<u>220,000</u>
Subtotal			\$ 589,000
Engineering (10 percent)			59,000
Contingencies (25 percent)			<u>147,000</u>
TOTAL			\$ 795,000

ALTERNATIVE 3 - ALTON AREA - PLANT 4

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
8-inch Trunk Line	17,000 ft.	12/L.F.	\$ 204,000
Service Laterals	239	600 Ea.	143,000
Small Lift Station	1	25,000 Ea.	25,000
Wastewater Treatment Facility	0.11 mgd	2.00 Gal.	<u>220,000</u>
Subtotal			\$ 592,000
Engineering (10 percent)			59,000
Contingencies (15 percent)			<u>148,000</u>
TOTAL			\$ 799,000

TOTAL ALTERNATIVE 3 PROBABLE COST

\$6,093,000



A mentioned previously, a fourth alternative was suggested for study for this area after local review of the draft report. Alternative 4 proposes a regional plant to serve the most concentrated areas of development, namely the City of Alton and colonias primarily north and adjacent to the existing corporate limit. This alternative was suggested to reduce the cost of service to individual users while providing service to the more densely populated areas. The proposed service area includes 35 of the 45 colonias addressed in Alternatives 1 through 3. The colonias to be served are included in the first two sections of Table VI-4; "City of Alton" and "North of Alton."

This alternative proposes construction of a regional plant east of Alton (near Mile 4-1/2 Road) with outfall to a proposed new drainage channel parallel to Mile 6 Road. Because of the distance to the channel, effluent pumping is anticipated the following table summarizes probable costs.

ALTERNATIVE 4 - ALTON AREA

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
10-inch Trunk Line	5,300 ft.	\$ 45/L.F.	\$ 239,000
15-inch Trunk Line	5,300 ft.	30/L.F.	159,000
12-inch Trunk Line	2,800 ft.	18/L.F.	50,000
8-inch Trunk Line	31,200 ft.	12/L.F.	375,000
Service Laterals	2,125	600 Ea.	1,275,000
Small Lift Stations	13	25,000 Ea.	325,000
Wastewater Treatment Facility (including Effluent Pumping)	0.96 mgd	1.25	<u>1,200,000</u>
Subtotal			<u>\$3,623,000</u>



Engineering (10 percent)	362,000
Contingencies (25 percent)	906,000
<b>TOTAL</b>	<b>\$4,891,000</b>

Figure VI-14 present a layout of proposed improvements. Table VIII-1 provides estimated per unit monthly cost for all alternatives discussed in this section.

#### PALMVIEW STUDY AREA

Alternative 1 for the Palmview service area provides facilities to accommodate future projected growth through the planning period. For this alternative, as well as Alternative 2, new wastewater treatment facilities are proposed for construction since existing treatment works are not available for service extension. Implementation of the alternative will require a 1.81 mgd treatment plant constructed in the extreme southern part of the service area as shown on Figure VI-15. A tabulation of probable construction costs is presented below.

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
21-inch Trunk Line	2,500 ft.	50/L.F.	\$ 125,000
18-inch Trunk Line	4,500 ft.	45/L.F.	203,000
15-inch Trunk Line	5,500 ft.	30/L.F.	165,000
10-inch Trunk Line	7,000 ft.	15/L.F.	105,000
8-inch Trunk Line	88,000 ft.	12/L.F.	1,056,000
6-inch Force Main	9,500 ft.	12/L.F.	114,000
Service Laterals	4,102	600 Ea.	2,461,000
Small Lift Station	4	25,000 L.S.	100,000
Medium Lift Station	1	50,000 L.S.	50,000
Wastewater Plant	1.85 mgd	1 Gal.	1,850,000
<b>Subtotal</b>			<b>\$ 6,229,000</b>
Engineering (10 percent)			623,000
Contingencies (25 percent)			1,557,000
<b>TOTAL</b>			<b>\$ 8,409,000</b>



Alternative 2 is similar to Alternative 1 except several smaller centralized facilities are proposed to provide service only to the existing colonias. Figure VI-16 shows the locations of proposed treatment plants and collection systems. Probable construction costs are presented below. Table VIII-1 presents estimated monthly costs per dwelling unit.

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
12-inch Trunk Line	2,500 ft.	18/L.F.	\$ 45,000
10-inch Trunk Line	4,500 ft.	15/L.F.	68,000
8-inch Trunk Line	18,000 ft.	12/L.F.	216,000
6-inch Force Main	4,500 ft.	12/L.F.	54,000
Service Laterals	1,882	600 Ea.	1,129,000
Large Lift Station	1	100,000 L.S.	100,000
Small Lift Station	1	25,000 L.S.	25,000
Wastewater Plant	0.85 mgd	1.0 Gal.	850,000
SUBTOTAL			\$2,487,000
Engineering (10 percent)			249,000
Contingencies (25 percent)			622,000
TOTAL			\$3,358,000

OPTION 2 - PALMVIEW AREA - PLANT 2

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
8-inch Trunk Line	9,000 ft.	12/L.F.	\$ 108,000
Service Connections	542	600 Ea.	325,000
Wastewater Plant	0.24 mgd	1.5 Gal.	360,000
SUBTOTAL			793,000
Engineering (10 percent)			79,000
Contingencies (25 percent)			198,000
TOTAL			\$1,070,000



OPTION 2 - PALMVIEW AREA - PLANT 3

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
8-inch Trunk Line	7,000 ft.	12/L.F.	\$ 84,000
Service Connections	307	600 Ea.	184,000
Wastewater Plant	0.14 mgd	1.9 Gal.	<u>266,000</u>
SUBTOTAL			\$534,000
Engineering (10 percent)			53,000
Contingencies (25 percent)			<u>134,000</u>
TOTAL			\$721,000

OPTION 2 - PALMVIEW AREA - PLANT 4

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
8-inch Trunk Line	15,500 ft.	12/L.F.	\$ 186,000
Service Connections	563	600 Ea.	338,000
Wastewater Plant	0.25 mgd	1.5 Gal.	<u>375,000</u>
Subtotal			\$ 899,000
Engineering (10 percent)			90,000
Contingencies (25 percent)			225,000
TOTAL			\$1,214,000

OPTION 2 - PALMVIEW AREA - PLANT 5

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
8-inch Trunk Line	12,000 ft.	12/L.F.	\$ 144,000
4-inch Force Main	4,500 ft.	10/L.F.	45,000
Service Connections	491	600 Ea.	295,000
Small Lift Station	1	25,000 L.S.	25,000
Wastewater Plant	0.22 mgd	1.6 Gal.	<u>352,000</u>
Subtotal			\$ 861,000
Engineering (10 percent)			86,000
Contingencies (25 percent)			215,000
TOTAL			\$1,162,000



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OPTION 2 - PALMVIEW AREA - PLANT 6

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Probable Cost</u>
8-inch Trunk Line	16,000 ft.	12/L.F.	\$192,000
Service Connections	317	600 Ea.	190,000
Wastewater Plant	0.14 mgd	1.9 Gal.	<u>266,000</u>
Subtotal			648,000
Engineering (10 percent)			65,000
Contingencies (25 percent)			<u>162,000</u>
TOTAL			\$875,000
GRAND TOTAL (OPTION 2)			\$8,400,000




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 PROVIDING MANAGEMENT AND TECHNICAL ASSISTANCE

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**TABLE VI-1 - SAN JUAN COLONIAS - WASTEWATER CONTRIBUTION  
FROM EXISTING DEVELOPMENTS AT CURRENT OCCUPANCY**

<u>Subdivision</u>	<u>Lots Occupied</u>	<u>Population</u>	<u>Flow (mgd)</u>
Small #1*	60	270	0.042
Small #2*	92	414	0.064
Sioux Terrace S.	29	102	0.016
Sioux Terrace	71	249	0.038
Granada Village	53	186	0.029
Encino Heights*	65	293	0.045
Hazel Subdivision	35	123	0.019
Salazar Subdivision	38	133	0.020
San Juan Del Norte	72	252	0.039
Chula Vista	97	340	0.052
Azteca Acres	<u>47</u>	<u>165</u>	<u>0.025</u>
Subtotals in City	659	2,527	0.389
Las Brisas	92	414	.041
Paradise Park	14	63	.006
Arguello #1	19	86	.009
Arguello #2	<u>20</u>	<u>90</u>	<u>.009</u>
Subtotal From Colonias	145	653	.065
Total Flow	804	3,180	.454

\*Subdivisions using the 4.5 population density factor.



**TABLE VI-2 - SAN JUAN COLONIAS - WASTEWATER CONTRIBUTION  
FROM EXISTING DEVELOPMENTS AT FULL OCCUPANCY**

<u>Subdivision</u>	<u>Number of Lots</u>	<u>Build-out Population</u>	<u>Design Load (mgd)</u>
Las Brisas*	150	675	0.104
Paradise Park*	28	126	0.019
Arguello #1*	29	131	0.020
Arguello #2*	24	108	0.017
Small #1*	78	351	0.054
Small #2*	140	630	0.097
Sioux Terrace S.	44	154	0.024
Sioux Terrace	106	371	0.057
Granada Village	79	277	0.042
Encino Heights*	97	437	0.067
Hazel Subdivision	52	182	0.028
Salazar Subdivision	56	196	0.030
San Juan Del Norte	108	378	0.058
Chula Vista	145	508	0.078
Azteca Acres	<u>70</u>	<u>245</u>	<u>0.038</u>
Totals	659	4,768	0.733

\*Subdivisions using the 4.5 population density factor.



**TABLE VI-3 - PROBABLE CONSTRUCTION COSTS OF WASTEWATER FACILITIES TO SERVE SAN JUAN COLONIAS**

<u>Item</u>	<u>Quantity</u>	<u>Unit Cost</u>	<u>Estimated Cost</u>
8-inch Collection Lines	9,700'	\$14.00/l.f.	\$135,800
8-inch Trunk Line	2,550'	\$14.00/l.f.	35,700
Lift Station	1	\$150,000	<u>150,000</u>
Total Wastewater Improvements			\$321,500
Engineering (10 percent)			32,150
Contingencies (20 percent)			<u>64,300</u>
Total			\$417,950



PROVIDING MANAGEMENT AND TECHNICAL ASSISTANCE

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TABLE VI-4 - COLONIA INFORMATION SUMMARY

GROUP COLONIA	1988 DU	1988 POP	VACANT LOTS	MAX # OF DU	MAX POP	88 WATER DEMAND GPD	88 SEWER DEMAND GPD	MAX WATER DEMAND GPD	MAX SEWER DEMAND GPD	WATER SUPPLIER	
<b>ALTON AREA</b>											
CITY OF ALTON:											
COLONIA NAME	ID #										
ALTON NORTHWEST	51	230	188	239	1076	23000	23000	107600	107600	SWSC	
ALTON ORIGINAL TOWNSITE	125	563	178	303	1364	56300	56300	136400	136400	SWSC	
ALTON WEST	46	207	0	46	207	20700	20700	20700	20700	SWSC	
ARMSTRONG ALTON	32	144	5	37	167	14400	14400	16700	16700	SWSC	
DUDE HILL #2	12	54	10	22	99	5400	5400	9900	9900	SWSC	
FALCON HEIGHTS	2	9	63	65	293	900	900	29300	29300	SWSC	
FIVE MILE ROAD	17	77	7	24	108	8547	7700	11988	10800	SWSC	
FIVE MILE ROAD #2	35	158	9	44	198	17538	15800	21978	19800	SWSC	
FIVE MILE ROAD #3	12	54	6	18	81	5994	5400	8991	8100	SWSC	
INSPIRATION ROAD	37	167	9	46	207	18537	16700	22977	20700	SWSC	
MAYBERRY ESTATES	12	54	0	12	54	5994	5400	5994	5400	SWSC	
PALM LAKE ESTATES #3	14	63	73	87	392	6993	6300	43512	39200	SWSC	
PALM LAKE ESTATES #4	15	68	116	131	590	7548	6800	65490	59000	SWSC	
RANCHO GRANDE ESTATES	6	27	60	66	297	2997	2700	32967	29700	SWSC	
SALAS	15	68	5	20	90	7548	6800	9990	9000	SWSC	
SERDA	40	180	45	85	383	19980	18000	42513	38300	SWSC	
TIERRA ESTATES #2	7	32	41	48	216	3552	3200	23976	21600	SWSC	
TROSPER	65	293	15	80	360	32523	29300	39960	36000	SWSC	
TROSPER TERRACE	7	32	3	10	45	3552	3200	4995	4500	SWSC	
ALTON HEIGHTS	41	185	7	48	216	20535	18500	23976	21600	SWSC	
<b>SUBTOTAL</b>	<b>20</b>	<b>591</b>	<b>2665</b>	<b>840</b>	<b>1431</b>	<b>6443</b>	<b>282538</b>	<b>266500</b>	<b>679907</b>	<b>644300</b>	
<b>NORTH OF ALTON'S NORTH CITY LIMITS BETWEEN SHARYLAND RD. &amp; S.H. - 107 CONT'D</b>											
COLONIA NAME	ID #										
BRYAN ACRES	195	20	90	N/A	20	90	9990	9000	9000	9000	SWSC
VAL VERDE NORTH	228	5	23	29	34	153	2553	2300	15300	15300	SWSC
CITRUS SHADOWS	229	1	5	19	20	90	555	500	9990	9000	SWSC
CANTU JOSE	214	22	99	0	22	99	10989	9900	10989	9900	SWSC
PALM LAKE	5008	54	243	164	218	981	26973	24300	108891	98100	UNKN
RANCHO CHAPARAL	5009	31	140	0	31	140	15540	14000	15540	14000	UNKN
LOS NIÑOS	228	0	0	20	20	90	0	0	9990	9000	SWSC
STEWART PLACE SUBD	323	8	36	2	10	45	3996	3600	4995	4500	SWSC
STEWART PLACE COMMUNITY	3052	9	41	45	54	243	4551	4100	26973	24300	SWSC
JARDIN TERRACE	308	1	5	29	30	135	555	500	14985	13500	SWSC
TRI-CITY ESTATES	5010	28	126	45	73	329	13986	12600	36519	32900	UNKN
TIERRA ESTATES SUBD	195	25	113	86	111	500	12543	11300	55500	50000	SWSC
UNKNOWN(LOT 45-9)	5006	6	27	5	11	50	2997	2700	5550	5000	UNKN
NUOVO ALTON RESUBD	5007	6	27	16	22	99	2997	2700	10989	9900	UNKN
M & S (LOT 44-10)	6015	8	36	10	18	81	3996	3600	8991	8100	SWSC
<b>SUBTOTAL</b>	<b>15</b>	<b>224</b>	<b>1011</b>	<b>470</b>	<b>694</b>	<b>3125</b>	<b>112221</b>	<b>101100</b>	<b>344202</b>	<b>312500</b>	

TABLE VI-4 - COLONIA INFORMATION SUMMARY (cont'd.)

GROUP COLONIA	1988 DU	1988 POP	VACANT LOTS	MAX # OF DU	MAX POP	88 WATER DEMAND GPD	88 SEWER DEMAND GPD	MAX WATER DEMAND GPD	MAX SEWER DEMAND GPD	WATER SUPPLIER	
BETWEEN MI. 3 1/2 & MI 4 1/2 BETWEEN FM 492 & LA HOMA RD											
COLONIA NAME	ID#										
ACEVEDO #3	342	41	185	21	62	279	20535	18500	30969	27900	LJWSC
WALTON	192				10	45	0		4995	4500	LJWSC
ROCKY	200	0	0	11	11	50	0		5550	5000	LJWSC
CULA VISTA ACRES	205	17	77	19	36	162	8547	7700	17982	16200	LJWSC
BASHAM #5	235	28	126	12	40	180	13986	12600	19980	18000	SWSC
BASHAM #8/COUNTRY EST.E.	268	34	153	6	40	180	16983	15300	19980	18000	SWSC
HINOJOSA, ARIEL #3	198	8	36	3	11	50	3996	3600	5550	5000	LJWSC
BASHAM #4	236	20	90	8	28	126	9990	9000	13986	12600	SWSC
LA HOMA GROVE ESTATES	248	13	59	0	13	59	6549	5900	6549	5900	SWSC
CHACON ESTATES #1	188				11	50	0	0	5550	5000	LJWSC
SUBTOTAL	10	161	726	80	262	1181	80586	72600	131091	118100	
ALTON AREA TOTALS	45	976	4402	1390	2387	10749	475345	440200	1155200	1074900	

TABLE VI-4 - COLONIA INFORMATION SUMMARY (cont'd.)

GROUP COLONIA	1988 DU	1988 POP	VACANT LOTS	MAX # OF DU	MAX POP	88 WATER DEMAND GPD	88 SEWER DEMAND GPD	MAX WATER DEMAND GPD	MAX SEWER DEMAND GPD	WATER SUPPLIER		
<b>CITY OF PALMVIEW SERVICE AREA</b>												
COLONIA NAME	ID#											
PALMVIEW PARADISE		12	54	24	36	162	5994	5400	17982	16200	LJWSC	
J.O. SUBD. #1		29	131	16	45	203	14541	13100	22533	20300	LJWSC	
GARZA EST.		4	18	6	10	45	1998	1800	4995	4500	LJWSC	
WEST HIGHWAY SUBD.		18	81	1	19	86	8991	8100	9546	8600	LJWSC	
PALMVIEW COMMERCIAL PLAZA		0	0	17	17	77	0	0	8547	7700	LJWSC	
R. RUIZ		7	32	13	20	90	3552	3200	9990	9000	LJWSC	
BASHAM W/H PARK		19	86	14	33	149	9546	8600	16539	14900	LJWSC	
TRIPLE "D" HOME PLACE		28	126	13	41	185	13986	12600	20535	18500	LJWSC	
MISSION WEST EST.		3	14	38	41	185	1554	1400	20535	18500	LJWSC	
SOUTH MINNESOTA ROAD		21	95	31	52	234	10545	9500	25974	23400	LJWSC	
SOUTH MINNESOTA ROAD #2		8	36	16	24	108	3996	3600	11988	10800	LJWSC	
SOUTH MINNESOTA ROAD #3		18	81	10	28	126	8991	8100	13986	12600	LJWSC	
AKIN DEVELOPMENT SUBD.		14	63	15	29	131	6993	6300	14541	13100	LJWSC	
WEST VIEW HEIGHTS		2	9	12	14	63	999	900	6993	6300	LJWSC	
MARLA SUBD.		9	41	29	38	171	4551	4100	18981	17100	LJWSC	
PALMA ALTA SUBD.		8	36	6	14	63	3996	3600	6993	6300	LJWSC	
SUBTOTAL		16	200	903	261	461	2078	100233	90300	230658	207800	
<b>SOUTH OF PALMVIEW</b>												
COLONIA NAME	ID#											
ACEVEDO #4		774	41	185	44	85	383	20535	18500	42513	38300	LJWSC
UNKNOWN		5020	15	68	19	34	153	7548	6800	16983	15300	LJWSC
UNKNOWN (JIMENEZ)		5021	24	108	1	25	113	11988	10800	12543	11300	LJWSC
SUBTOTAL		3	80	361	64	144	649	40071	36100	72039	64900	
<b>EAST OF PALMVIEW</b>												
COLONIA NAME	ID#											
CUARTO VIENTO		756	27	122	13	40	180	13542	12200	19980	18000	UNKNOWN
HILDA #1		770	80	360	9	89	401	39960	36000	44511	40100	LJWSC
CARLOS		767	53	239	0	53	239	26529	23900	26529	23900	LJWSC
LAKESIDE		754	7	32	5	12	54	3552	3200	5994	5400	LJWSC
LA CAMELLA		760	34	153	49	83	374	16983	15300	41514	37400	LJWSC
SUBTOTAL		5	201	906	76	277	1248	100566	90600	138528	124800	

TABLE VI-4 - COLONIA INFORMATION SUMMARY (cont'd.)

GROUP COLONIA	1988 DU	1988 POP	VACANT LOTS	MAX # OF DU	MAX POP	88 WATER DEMAND GPD	88 SEWER DEMAND GPD	MAX WATER DEMAND GPD	MAX SEWER DEMAND GPD	WATER SUPPLIER	
<b>NORTH OF PALMVIEW</b>											
COLONIA NAME	ID#										
LA HOMA ROAD	740	43	194	9	52	234	21534	19400	25974	23400	LJWSC
RAMIREZ ESTATES	748	21	95	13	34	153	10545	9500	16983	15300	LJWSC
BASHAM #15	987	34	153	18	52	234	16983	15300	25974	23400	UNKNOWM
HINOJOSA, ARIEL #1	751	9	41	7	16	72	4551	4100	7992	7200	LJWSC
SUBTOTAL	4	107	483	47	154	693	53613	48300	76923	69300	
<b>MILE 3 &amp; LA HOMA ROAD</b>											
GROUP #4											
COLONIA NAME	ID#										
RODRGUEZ	263				8	36			3600	3600	SWSC
LEAL, CARLOS	262	37	167	13	50	225	16700	16700	22500	22500	SWSC
NORTH COUNTRY EST. #2	277	14	63	10	24	108	6300	6300	10800	10800	SWSC
BASHAM #10	255	29	131	15	44	198	13100	13100	19800	19800	UNKNOWM
BASHAM #1	251	14	63	6	20	90	6300	6300	9000	9000	SWSC
BASHAM #2	254	17	77	1	18	81	7700	7700	8100	8100	SWSC
CAVASOS, ALEX	260	16	72	14	30	135	7200	7200	13500	13500	UNKNOWM
VILLA CAPRI	261	6	27	15	21	95	2700	2700	9500	9500	SWSC
PALM DRIVE NORTH	203	0	0	13	13	59	0	0	5900	5900	LJWSC
REGAL ESTATES	197	9	41	34	43	194	4100	4100	19400	19400	LJWSC
CAYNE	269	16	72	10	26	117	7200	7200	11700	11700	SWSC
RANDOLPH/BARNETT #2	278	17	77	5	22	99	7700	7700	9900	9900	SWSC
HINOJOSA ARIEL #2	275	15	68	21	36	162	6800	6800	16200	16200	SWSC
BASHAM #11	245	18	81	10	28	126	8100	8100	12600	12600	UNKNOWM
JOHNSON, PAUL	746	45	203	56	101	455	20300	20300	45500	45500	SWSC
LA HOMA ROAD NORTH	747	74	333	38	112	504	33300	33300	50400	50400	UNKNOWM
ACEVEDO, DANIEL	749	4	18	30	34	153	1800	1800	15300	15300	SWSC
RANDOLPH/BARNETT #1	25	18	81	4	22	99	8100	8100	9900	9900	SWSC
BASHAM #6	256	12	54	12	24	108	5400	5400	10800	10800	SWSC
BASHAM #7	994	23	104	15	38	171	10400	10400	17100	17100	SWSC
BASHAM M/B	6021	19	86	14	33	149	8600	8600	14900	14900	SWSC
SUBTOTAL	21		1819	336	747	3364	181800	181800	336400	336400	

TABLE VI-4 - COLONIA INFORMATION SUMMARY (cont'd.)

GROUP COLONIA		1988 DU	1988 POP	VACANT LOTS	MAX # OF DU	MAX POP	88 WATER DEMAND GPD	88 SEWER DEMAND GPD	MAX WATER DEMAND GPD	MAX SEWER DEMAND GPD	WATER SUPPLIER
BETWEEN MILE 3 & 4 WEST OF LA HOMA ROAD											
COLONIA NAME	ID#										
BAZAN, ENRIQUE	333	16	72	14	30	135	7992	7200	14985	13500	LJWSC
CELSO	334	21	95	3	24	108	10545	9500	11988	10800	WELL
BASHAM #12	343	27	122	26	53	239	13542	12200	26529	23900	LJWSC
LA PALOMA SITES	336	14	63	14	28	126	6993	6300	13986	12600	LJWSC
UNKNOWN (BASHAM #16)	986				41	185	0		20535	18500	UNKNOWN
BASHAM #13	335	17	77	12	29	131	8547	7700	14541	13100	WELL
MUNOZ ESTATES	337	6	27	63	69	311	2997	2700	34521	31100	LJWSC
SUBTOTAL		7	101	132	274	1235	50616	45600	137085	123500	
COLONIAS IN PALMVIEW AREA FROM NEW INFORMATION											
COLONIA NAME	ID#										
ACEVEDO ESQUIEL JR #2		26	117	4	30	135	11700	11700	13500	13500	
ALYSONDERS		4	18	25	29	131	1800	1800	13100	13100	
AMERICANA GROVES #1		9	41	19	28	126	4100	4100	12600	12600	
BASHAM #18		4	18	24	28	126	1800	1800	12600	12600	
BREYFOGLE #1		6	27	4	10	45	2700	2700	4500	4500	
CANADIANA ESTATES		13	59	29	42	189	5900	5900	18900	18900	
CHAPA JOSEFINA L.		0	0	9	9	41	0	0	4100	4100	
COUNTRY CORNER ESTATES		16	72	3	19	86	7200	7200	8600	8600	
DEL NORTE		10	45	16	26	117	4500	4500	11700	11700	
DINA'S		2	9	9	11	50	900	900	5000	5000	
ELDORODO ACRES		4	18	125	129	581	1800	1800	58100	58100	
FOUR SURE ALL RIGHT #1		18	81	38	56	252	8100	8100	25200	25200	
FRANCIS		9	41	6	15	68	4100	4100	6800	6800	
GARZA NICK		4	18	20	24	108	1800	1800	10800	10800	
GARZA SUBDIVISION		0	0	12	12	54	0	0	5400	5400	
GOODWIN ACRES #1		8	36	12	20	90	3600	3600	9000	9000	
GOODWIN ACRES #2		11	50	14	25	113	5000	5000	11300	11300	
GOODWIN ACRES #3		4	18	1	5	23	1800	1800	2300	2300	
GOODWIN HEIGHTS		58	261	30	88	396	26100	26100	39600	39600	
GOODWIN WEST #1		5	23	6	11	50	2553	2300	5550	5000	
GOODWIN WEST #2		3	14	2	5	23	1554	1400	2553	2300	
GOODWIN WEST #3		13	59	20	33	149	6549	5900	16539	14900	
GREEN GATE GROVES		0	0	424	424	1908	0	0	211788	190800	
HILDA #2		28	126	16	44	198	13986	12600	21978	19800	
HILDA #3		16	72	6	22	99	7992	7200	10989	9900	
KOUNTRY HILL ESTATES		39	176	17	56	252	19536	17600	27972	25200	
LA CAMELIA "A"		22	99	27	49	221	10989	9900	24531	22100	
LA PALMA		16	72	10	26	117	7992	7200	12987	11700	
LAMPLIGHT M/H		32	144	183	215	968	15984	14400	107448	96800	
MAIER		8	36	3	11	50	3996	3600	5550	5000	
MARIA		9	41	29	38	171	4551	4100	18981	17100	



TABLE VI-4 - COLONIA INFORMATION SUMMARY (cont'd.)

GROUP COLONIA	1988 DU	1988 POP	VACANT LOTS	MAX # OF DU	MAX POP	88 WATER DEMAND GPD	88 SEWER DEMAND GPD	MAX WATER DEMAND GPD	MAX SEWER DEMAND GPD	WATER SUPPLIER
NORTH BENSON PALM R.V. PARK	0	0	175	175	350	0	0	38850	35000	
PALM ACRES ESTATES	3	14	13	16	72	1554	1400	7992	7200	
PALM DRIVE NORTH #2	0	0	18	18	81	0	0	8991	8100	
PALMERINA	9	41	5	14	63	4551	4100	6993	6300	
PASEO DE PALMAS	4	18	16	20	90	1998	1800	9990	9000	
PATAL ESTATES R.V. PARK	0	0	108	108	486	0	0	53946	48600	
RAMIREZ #1	5	23	15	20	90	2553	2300	9990	9000	
RAMIREZ #2	15	68	5	20	90	7548	6800	9990	9000	
RAMIREZ #3	10	45	14	24	108	4995	4500	11988	10800	
RAMIREZ #4	8	36	12	20	90	3996	3600	9990	9000	
ROYAL PALMS ESTATES	0	0	50	50	225	0	0	24975	22500	
SNOWBIRD ESTATES	2	9	18	20	90	999	900	9990	9000	
SNOWBIRD ESTATES #2	11	50	45	56	252	5550	5000	27972	25200	
SOTIRA ESTATES	0	0	55	55	248	0	0	27528	24800	
SOUTH MINNESOTA ROAD PH. 2	8	36	8	16	72	3996	3600	7992	7200	
SUNNY HAVEN ESTATES	18	81	38	56	252	8991	8100	27972	25200	
TIERRA LINDA	44	198	291	335	1508	21978	19800	167388	150800	
VALLE HERMOSO ESTATES	1	5	9	10	45	555	500	4995	4500	
<b>SUBTOTAL</b>	<b>49</b>	<b>453</b>	<b>2045</b>	<b>2045</b>	<b>8772</b>	<b>216776</b>	<b>204500</b>	<b>943651</b>	<b>877200</b>	
<b>PALMVIEW AREA TOTALS</b>	<b>105</b>	<b>1142</b>	<b>6972</b>	<b>2508</b>	<b>4102</b>	<b>18039</b>	<b>743675</b>	<b>697200</b>	<b>1935284</b>	<b>1803900</b>
<b>ALTON AREA TOTALS</b>	<b>45</b>	<b>976</b>	<b>4402</b>	<b>1390</b>	<b>2387</b>	<b>10749</b>	<b>475345</b>	<b>440200</b>	<b>1155200</b>	<b>1074900</b>
<b>GRAND TOTALS</b>	<b>150</b>	<b>2118</b>	<b>11374</b>	<b>3898</b>	<b>6489</b>	<b>28788</b>	<b>1219020</b>	<b>1137400</b>	<b>3090484</b>	<b>2878800</b>

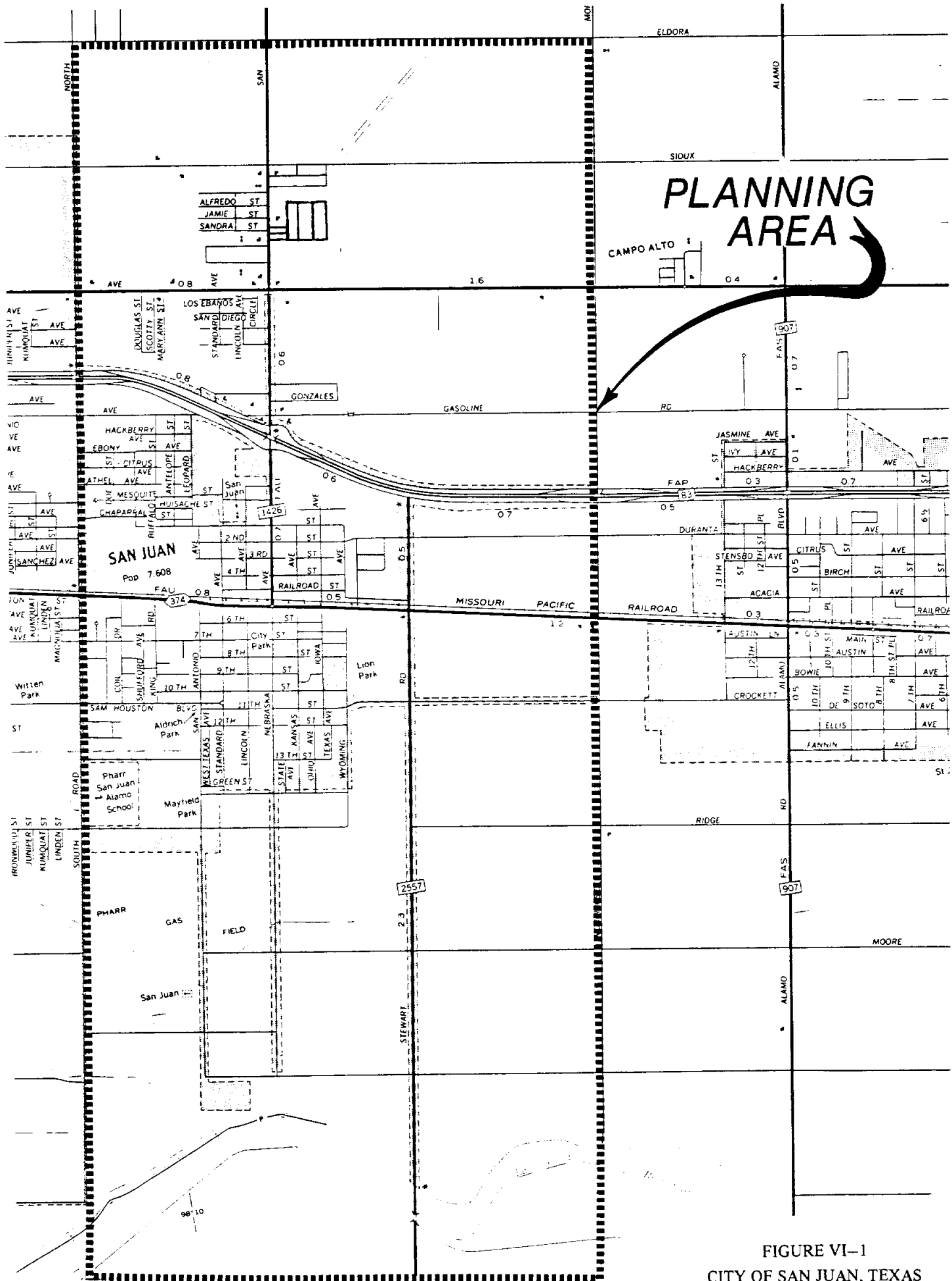


FIGURE VI-1  
 CITY OF SAN JUAN, TEXAS  
 FACILITIES PLANNING AREA

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FINANCING ALTERNATIVES

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S  
C  
C  
M  
V

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Overview

Perhaps the most difficult and controversial part of a water supply or wastewater disposal program is the determination of how the implementation of the program should be financed and how it should be managed. In the case of the colonias and some incorporated areas of Hidalgo County, the poverty level of many of the residents, their rural location, and the many other capital demands of the area make these particularly difficult questions. Without workable answers to these questions, any capital development program obviously remains only a plan.

Water and wastewater development programs historically have been funded with general tax revenues and general obligation debt, most often at the federal level. Most major water impoundments constructed throughout the country during this century have been financed with federal funding, often as flood control and conservation projects. Since 1972, the Federal Water Pollution Control Act (later known as the Clean Water Act) has provided literally billions of dollars of federal money in the form of grants for the construction of wastewater treatment plants in an effort to improve water quality and control pollution.

On the other hand, transmission and collection lines and annual operation and maintenance expenses of both water and wastewater systems traditionally have been the financial responsibility of state and local governments or of the utilities themselves. Most of these costs, in turn, are passed on to the utility user in some form of user charge.



In analyzing the options available for financing proposed improvements presented in this study, several factors must be considered. Centralized water supply and distribution or centralized wastewater collection and treatment, for example, require relatively high initial costs with lesser recurring costs (operation, maintenance, and replacement). Some costs may qualify for various financial programs, while others do not. Ability, or inability, to pay may significantly limit user charges as a potential revenue source, thus limiting the participation in loan or grant programs. Existing municipal and utility service areas, facilities, and financial commitments also influence the choice of financing and management structures and on which procedures appear most reasonable for future development. This section of the report examines some of financing and management options available to implement needed water and sewerage improvements needed for the study area.

#### Potential Programs for Financing Colonia Utility Development

There are some state and federal programs that have been used or potentially could be used to assist in financing water or wastewater system development in Hidalgo County. The following is a brief description of the programs which appear to have the greatest potential.



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## Federal Programs

### Clean Water Act Construction Grants For Wastewater Treatment Works

Historically, the most important program assisting in the financing of wastewater treatment facilities has been the federal construction grants program administered by the Environmental Protection Agency. This program has been the major financial participant in new wastewater treatment plant development throughout the country since its inception in 1972. Most of the treatment plant capacity now located in the Rio Grande Valley has been financed through this program. However, in recent years lack of available funding has essentially limited the program's participation to assistance in completion of projects that are currently under development. Expansion of the City of San Juan's wastewater and collection facilities, for example, are to be completed with a combination of federal grant funds and a local financial share.

Unfortunately, the Clean Water Act grant program is being phased out and replaced by a revolving loan fund. Initial "seed" money for the loan program comes from federal capitalization grants, however, once the loan program is established, federal participation is expected to cease.

### Farmers Home Administration's Program for Rural Communities

The Farmers Home Administration (FmHA) has grant and loan programs specifically designed to assist in financing water and wastewater systems for rural communities. By regulation, grants



cannot exceed 75 percent of eligible project costs. The actual percentage of a grant is related to household income with the highest percentage applied to the lowest income applicants. Facilities financed by FmHA must be designed to serve primarily rural residents. The financing is not available to any "area" or any city or town with a population in excess of 10,000. The grants and loans are available to political subdivisions of the State and also to nonprofit organizations which are "utility-type" organizations serving rural communities. This latter ability has made these programs very useful to the nonprofit water supply corporations that currently provide service to the colonias in Hidalgo County. In fact, FmHA is the primary, if not the only, financing agency or institution used by most of these water suppliers.

In order to be eligible for financial assistance from FmHA's rural water and wastewater disposal programs, the applicant must be unable to finance the project from its own resources or to find reasonable financing through commercial credit institutions. Grant funds cannot be used to pay for interest on loans or to pay operations and maintenance expenses. Loans are made at an interest rate not to exceed 5 percent if the facilities to be financed are needed to meet minimum health and sanitary standards and the median household income of the service area is below the poverty level.



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### Housing and Urban Development Community Development Block Grants

The Department of Housing and Urban Development (HUD) has two broad categories of Community Development Block Grants--formula grants, which are allocated directly to larger cities (over 50,000 population) and urban counties (over 200,000 population); and project grants for smaller cities which, in most cases (including Texas), are administered by the states. In the case of Texas, these grant funds are administered by the Texas Department of Community Affairs.

The objectives of both these programs are very broad, as are the types of projects they support. Their purpose is to enhance the living environment and economic opportunities of both low and moderate income persons. Because of this, these grant funds seldom go to single major projects but most often are allotted to many relatively small projects which are unable to qualify for other types of funding. In 1987, Brownsville, McAllen and Harlingen in the Lower Rio Grande Valley received approximately \$1.5 million in Community Development Block Grants from HUD.

### State Programs

#### The State Water Pollution Control Revolving Fund

The State Revolving Fund (SRF) is a perpetual fund through which the Texas Water Development Board (TWDB) provides low-interest loans to Texas communities for the construction of wastewater treatment works. Eligible projects include construction of new treatment plants, interceptor sewers and repairs to





existing collection systems. In addition to construction funding, loans can also include funds for planning and design. As noted above, the SRF program replaces the federal construction grants program and is managed by the state with minimal federal oversight. Current (FY 1989) interest rates are 5.5 percent and the maximum term of SRF loans is twenty years after project completion.

In order to apply for assistance, "an entity must be an interstate agency, city, town, county, district, river authority, association, or other public body created by or pursuant to state law which has the authority to treat sewage." The entity also must be or have applied to become a designated waste management agency before the Texas Water Commission. Among other requirements the applicant additionally must satisfy the following.

- ° Have a cost-effective, eligible project which is included on the Project Priority List.
- ° Prepare a water conservation plan and SRF engineering report.
- ° Document the existence of a dedicated source of funds for repayment.
- ° Implement a user charge system and demonstrate that it has the financial and managerial capability.
- ° Obtain an environmental determination in compliance with the National Environmental Policy Act.

Recent changes to the SRF legislation allow for a reserve fund to be established from SRF repayments for loans to eligible applicants which qualify as "hardship" cases. In evaluating hardship, the TWDB considers severity of the public health



problem, alternative funding sources imposing a hardship on the community, median household income, and area unemployment. Should an entity qualify, certain priority ranking and project rating requirements of the program can be waived, as well as completion of the SRF engineering plan. In FY 1989, approximately \$200 million dollars was earmarked for SRF projects. With funding requests from around the state in excess of \$640 million for FY 1990, there are numerous projects which will likely remain unfunded this year. If Colonias projects are to be funded through the SRF, hardship status will certainly be required.

#### Texas Community Development Program

The funds the Texas Department of Community Affairs (TDCA) receives from the HUD Community Development Block Grant Program (see above) go to fund the Texas Community Development Program. There are three major funds under the program: the Community Development Project Fund, the Area Revitalization Fund, and the Emergency/Urgent Need Fund.

The Community Development Project Fund allocates funds among the state's 24 planning regions to cities and counties for "public facilities/services and housing assistance projects." Water and sewer construction projects are eligible under this program but, as with other financial assistance programs, operating and maintenance expenses are not. The Area Revitalization Fund provides statewide competition for projects to cities and counties who have not applied under the Community Development



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Project Fund Program. The Emergency/Urgent Need Fund is established to respond to natural disasters and to projects that pose a threat to the immediate health and safety of the local residents. The maximum allowed in any one grant is \$500,000.

Texas Water Development Board's Financial Assistance and Water Bond Insurance Programs

Under the Texas Water Code, the Texas Water Development Board (TWDB) administers programs of financial assistance for projects involving "water conservation, water development, and water quality enhancement" as well as flood control and drainage. These programs are for loans and loan insurance and do not currently include construction grants. Matching grants are available for planning and engineering some of these facilities. These programs are separate from the State Revolving Loan Fund (SRF) which was initiated at the federal level.

The TWDB's financial assistance and bond insurance programs are available to any "political subdivision" of the State which specifically includes "any nonprofit water supply corporation." The Board has considerable latitude regarding the terms and conditions of loans made, including interest deferral or the capitalization of interest and can make loans for durations of 50 years.

The TWDB can acquire, lease, construct, or reconstruct projects with funds from the so-called "state participation account" and thus own up to 50 percent of a project. In turn, the state can "sell, transfer, or lease its ownership" to an eligible



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applicant. This can be undertaken so long as the TWDB can reasonably "expect that the state will recover its investment in the facility."

### New Programs

#### Texas Senate Bill No.2

While the TWDB currently has no grant program for facility construction, such programs have been and are presently being considered in the legislature. Senate Bill 2, currently under consideration, would amend the Texas Water Code, Chapter 15, to create an "Economically Distressed Area Fund" as a subfund of the Water Assistance Fund to provide loans and grants for water and wastewater facilities in economically distressed areas. Eligible counties would be required to meet several test conditions, including having (1) per capita income 15 percent below the state average, (2) unemployment rate 15 percent below state average, and (3) adopted model rules. Counties adjacent to eligible counties and to the international border would be eligible for assistance. Amendment to Chapter 16 of the Code would authorize the Texas Water Commission, the Texas Health Department and the TWDB to adopt rules (for subsequent adoption by applicants) to assure that standards for safe and sanitary water and sewer services were met. The rules would further assure that adequate drinking water and sewage facilities were available and would provide civil penalties and injunctive relief for violation of the rules. The Bill would also amend Chapter 17 of the Code to dedicate 5 percent of authorized but unissued water development



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bonds in the Water Development Fund for similar purposes. Up to 5 percent of the allocated money in either fund could be utilized for planning grants.

Texas Water Resources Finance Authority

As a result of refinancing existing and committed political subdivision bonds, the Texas Water Development Board will recognize approximately \$41 million in revenue. Hearings were conducted in late April to receive public comment on how to spend the funds. At the current time, lawmakers are targeting grants and loans for water and wastewater projects in economically distressed areas. Projects dealing with public health and regional planning will likely receive a priority.

H.R. 3524

H.R. 3524, the "Colonia Water and Sewage Service Act" is a resolution currently pending in Congress intended to deal with the colonias problem. The bill was introduced by Rep. Solomon Ortiz on October 21, 1987. The bill would provide targeted funds through two existing FmHA programs, the water and sewage grant program, and a separate program that aids low income housing. The pending legislation would increase funding for these two programs by \$20 million each of which \$5 million would be for grants and \$15 million would be for loans.

H.R. 2046

The House recently approved a bill authorizing the Secretary of State, acting through the International Boundary and Water



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Commission, to conclude agreements with Mexico concerning pollution of the Rio Grande. The bill is to focus on certain border cities and authorizes "such sums as may be necessary" to fund U.S. share of planning, constructing, operating and maintaining facilities recommended in the agreements. Reynosa, Mexico and Hidalgo, Texas are noted as cities to receive consideration.

#### Infrastructure Bills

Several bills have been introduced to assist municipalities in financing infrastructure improvements to water and sewer systems. One bill, H.R. 2801 would authorize the Federal Government to pay 25 percent of the debt service. The bill was intended to aid localities by defraying a portion of the debt incurred by communities in restoring public works.

#### Funding Requirements

Because the ultimate use of funds will often influence the method best suited for securing the funding, the financial needs of the typical water or wastewater service should be examined by use category. In this way, a financial program can be established which may comprise a variety of financing sources, each designed to accommodate a separate funding need.

#### Funding Operations and Maintenance Costs

The costs of operating and maintaining a water or wastewater system are daily costs that require a continuous flow of funds. The anticipated operations and maintenance (O&M) expenses for a fiscal period are generally budgeted prior to the beginning of



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the period. These budgeted funding needs are then converted to per-unit costs for collection purposes.

If the O&M expenses are to be financed through user charges, the budgeted figures can be converted into monthly charges per gallon of water used or per service connection. Revenues derived from these charges are then used to finance the O&M expenses incurred during the period. Obviously, the ability of this financing method to accurately generate needed funds is dependent on the accurate projection of O&M expenses, volume of water consumed, and number of active connections during the budget period. Since the volume of water used is often related to weather conditions, long term demand projections and, therefore, derived revenue can be lesser or greater than anticipated.

With monthly water bills averaging \$8 to \$30 in Hidalgo County, it is doubtful that colonia customers will be able to pay in excess of \$10 to \$15 per month more for wastewater service. Systems with average O&M costs in excess of this amount would probably need to be subsidized to be feasible.

If O&M expenses are to be subsidized with tax revenues, the budgeted O&M expenses need to be added to other financing needs to be covered by the specific tax involved. While tax generated revenue is not considered to be as "fair and equitable" as user charges in paying for utility operations, taxes are generally a more reliable and predictable form of revenue generation.



Debt financing is almost never used to finance O&M expenses. In fact most bond covenants will specifically prohibit bond funds from being used for O&M expenses.

### Capital Funding of New Systems

The major funding need of a new utility system is for financing design and construction of new facilities. These new facilities may be an entirely new facility or expansion to an existing system. Whether a water supply or wastewater disposal system, the facilities can generally be divided into three categories: (1) Treatment or supply plants, (2) collection or distribution facilities, and (3) onsite service lines and plumbing. Each category may be financed somewhat differently, depending upon the specific circumstances involved.

Some characteristics that are common to all facility financing will tend to influence the funding alternatives to be considered. First, during construction, there is generally a requirement for a relatively large capital funding commitment over a relatively short time period. Second, the amount of funds required for a specific project can usually be quite accurately estimated before a financing commitment is made. Third, most new facilities will be useful and productive over an extended time period far beyond the initial funding time frame.

Because of these common characteristics, most financing of new facilities will involve some form of debt. By issuing debt, the utility can obtain the relatively large initial investment required for construction and amortize repayment of the debt over





the estimated useful life of the system. In this way, the repayment of the debt takes the form of annual payments similar to the annual depreciation expense of the newly financed facility. Those entering the system after it is built are required to share its initial cost in the form of amortized debt service as part of their annual user fees.

While grants may become available to help fund a portion of the capital costs, some of these costs will likely require local debt financing. It follows that most, if not all, of the customers' affordable monthly charge will need to be allotted to paying O&M costs, little, if any, user charge revenue is left with which to amortize the local share of the capital costs.

Justification for using general tax revenue in support of capital funding of wastewater facilities can be made based on general public benefits received. The potential pollution and health hazards created by poor wastewater disposal methods is widespread and can affect the entire county. While a case can be made that those who create the problem (the colonia residents) should pay to correct it, if they cannot afford the cost and no correction is undertaken the problem extends far beyond the individual residence discharging the wastewater.

An alternative to general tax support to fund necessary facility expansion is enforcement of subdivision ordinances requiring developers to pay for the necessary improvements. This has the effect having the buyer of the property pay, as the developer's costs are passed on to the buyer in terms of a higher



purchase price. This financing method has two major drawbacks. It, of course, is not applicable to financing facilities to serve existing residences. In addition, the problems of affordability and enforceability again arise. Those who cannot afford the higher property values will have to live elsewhere. Past experience shows that to reduce property prices to an affordable range, some developers may move to more remote rural areas where subdivision restrictions do not apply or are not enforced. Thus, the problem is not resolved, only dispersed.

#### Capital Funds for Repair and Replacement of Existing Systems

Probably the most ignored or abused funding requirements of water and wastewater utility systems are those required for facility repair and replacement (R&R). Wastewater systems in particular often are in need of facility replacement or repair that goes unfulfilled due to lack of required funding. This type of financial oversight generally results in a system which operates ineffectively.

Financing system repair and replacement needs generally differs from new facility financing. While the funding needs for R&R can be significant, especially as a system ages, R&R funding is not as predictable or preplanned as funding new or expanded facilities. Therefore, R&R financing usually makes use of a reserve fund created by regular periodic contributions until the fund reaches some preset balance. Thereafter, contributions are made only as necessary to retain the preset balance.



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IMPLEMENTATION PROGRAM

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VI

The results of the study summarize six projects where parties have identified the terms under which they can agree to provide service to certain colonias. These projects include the following.

<u>Colonias Names</u>	<u>City Providing Service</u>	<u>Cost</u>
Lull	Edinburgh	\$1,704,000
Las Brisas	San Juan	295,000
Alton	Alton	4,891,000
Arguello #1	San Juan	98,000
Arguello #2	San Juan	111,000
Paradise Park	San Juan	116,000

In these cases, with the exception of Alton, proper management of facilities will be accomplished by entities already operating water and wastewater systems. Project funding will require grant and loan participation to reduce the cost to a level that residents of the colonias can afford. Representatives of the colonias have indicated that costs for water and sewer should not exceed \$40 per month. Since monthly operating and maintenance costs for a water system typically range about \$7-15 per month and for wastewater systems about \$5-15 per month, this means the debt retirement for the systems is limited to approximately \$10-28 per month.

Other projects that have been investigated in this study do not necessarily have a city willing to provide service without first receiving some form of guaranty that the systems can be constructed and maintained without additional cost to the city's current taxpayers. Historic trends on tax and bill collection



indicate to city officials that without some means of enforcement, bill collections range as low as 50 to 60 percent. One method of enforcement acceptable to the cities is to control the use of water. To do this however, the non profit water supply corporations operating in the area have to be willing to release their rights to serve the colonias. This is difficult to the WSC's because not only does it reduce their customer operating base, but also, because the colonias nearer the cities are the most populated, would result in higher operating costs for the remainder of their water systems. Cities would be willing to annex the portion of the water supply system within their ETJ's but, because both the WSC and the city are created by the State, the City is not empowered to do so under the current laws.

In some cases the WSC has offered to provide a billing service to the city and to enforce payment of sewer bills by control of the water. However, this approach is a duplication of cost to the residents of the colonias since the cities already operate their own billing departments. The attached Figures VIII-1 and VIII-2 indicate alternatives that utilize existing political entities created by the Texas Legislature as a buffer between the cities and the WSC's. As indicated previously in the discussion of management agencies, both Utility Districts or the Hidalgo County Water Development Board are empowered to own and operate water and sewer systems. The flowcharts suggest these entities could be established to include a group of colonias or other developments within a defined area. The Utility District (or

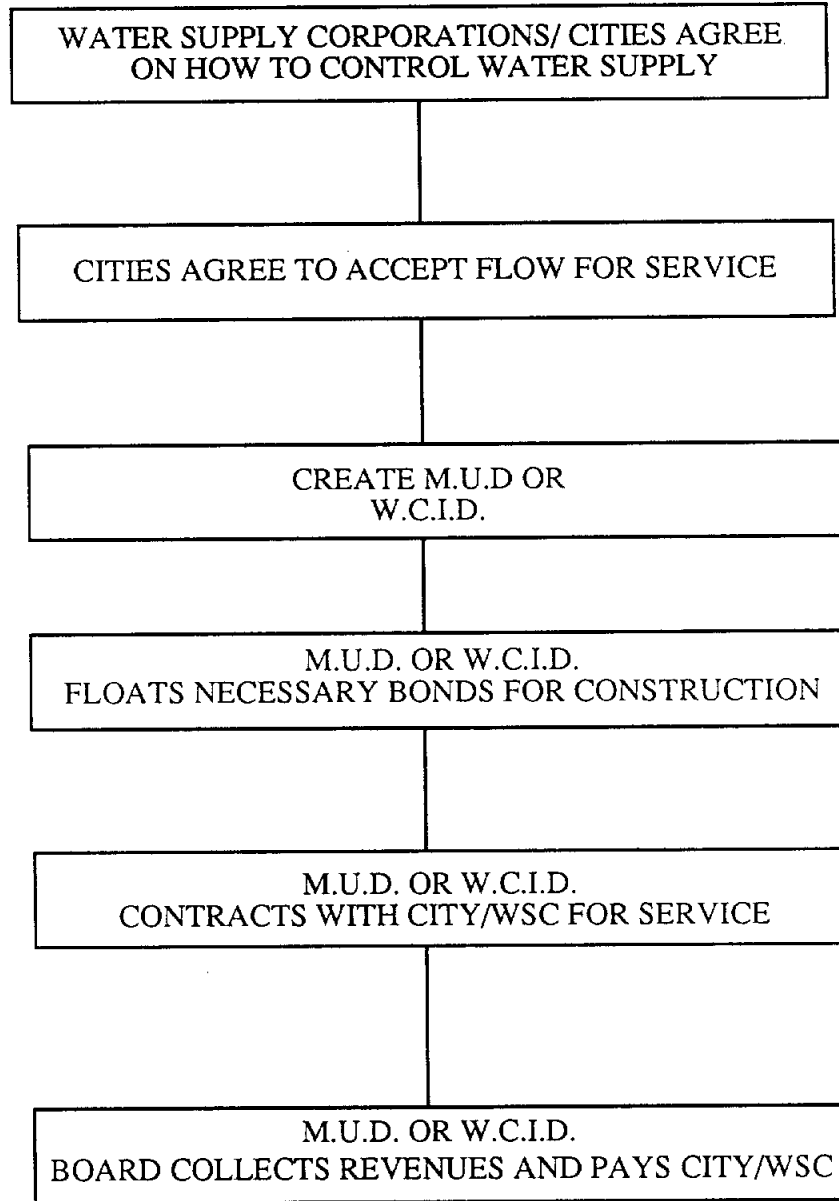


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HCWDB) could then enter into agreement with a city for sewer service and guaranty payment. They could do likewise to with a WSC for water service. It would then be the responsibility of the Utility District (or HCWDB) to collect bills from its residents. The disadvantages to this concept are that it creates a new level of fiscal management and it turns the responsibility for bill collection to a new entity of the State. However, in areas such as Alton, Palmview, Edinburgh, or the more rural areas, the concept of an overall entity to operate and manage the system is a cost-effective means of reducing capital and operating costs, as well as a means of obtaining financing.



# Implementation Plan (Use of M.U.D.)



# Implementation Plan (Use of Hidalgo County Water Development Board )

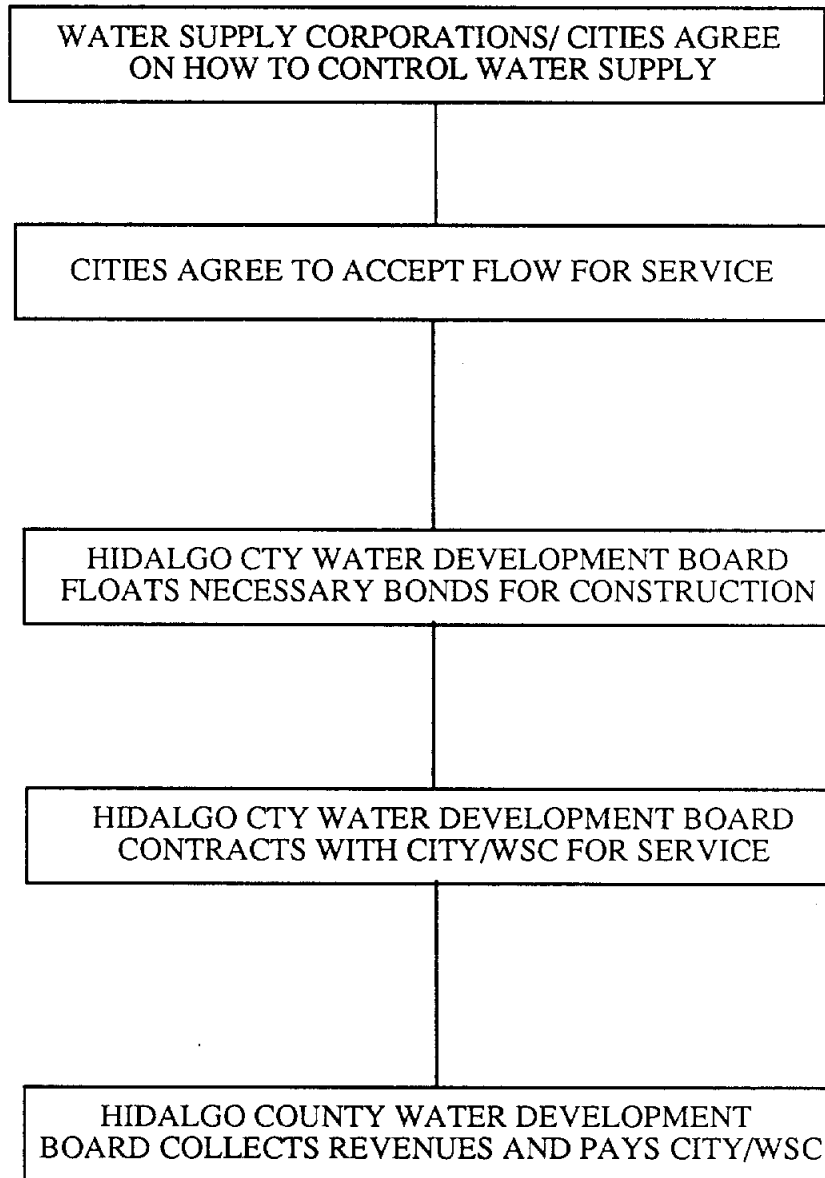
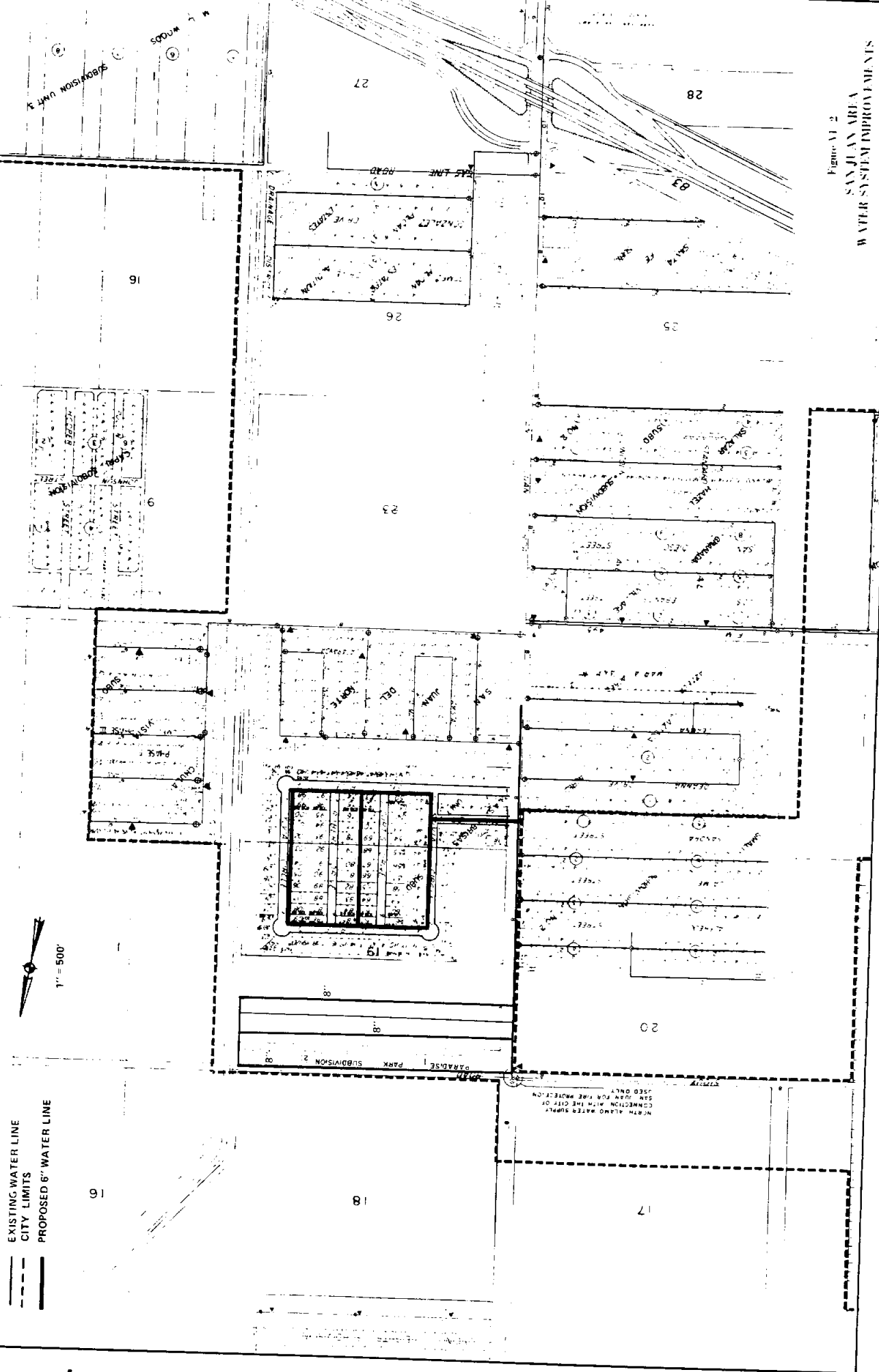




Figure VI-2  
 SAN JUAN AREA  
 WATER SYSTEM IMPROVEMENTS



EXISTING WATER LINE  
 CITY LIMITS  
 PROPOSED 6" WATER LINE

1" = 500'

NORTH ALAMO WATER SUPPLY  
 CONNECTION WITH THE CITY OF  
 SAN JUAN FOR FIRE PROTECTION  
 (REVERSE SIDE ONLY)

PARADISE 1 PARK  
 SUBDIVISION 2

SUBDIVISION UNIT 3  
 W. L. WOODS

DRAINAGE DITCH  
 OFF LINE ROAD  
 CONCRETE  
 CHUTE  
 12" DIA.  
 10' LONG  
 12" DIA.  
 10' LONG

SAN JUAN  
 FIRE PROTECTION  
 12" DIA.  
 10' LONG  
 12" DIA.  
 10' LONG

12" DIA.  
 10' LONG  
 12" DIA.  
 10' LONG

DEL  
 JUAN  
 SAN JUAN  
 FIRE PROTECTION

12" DIA.  
 10' LONG  
 12" DIA.  
 10' LONG  
 12" DIA.  
 10' LONG

16

18

17

16

26

25

27

28

23

22

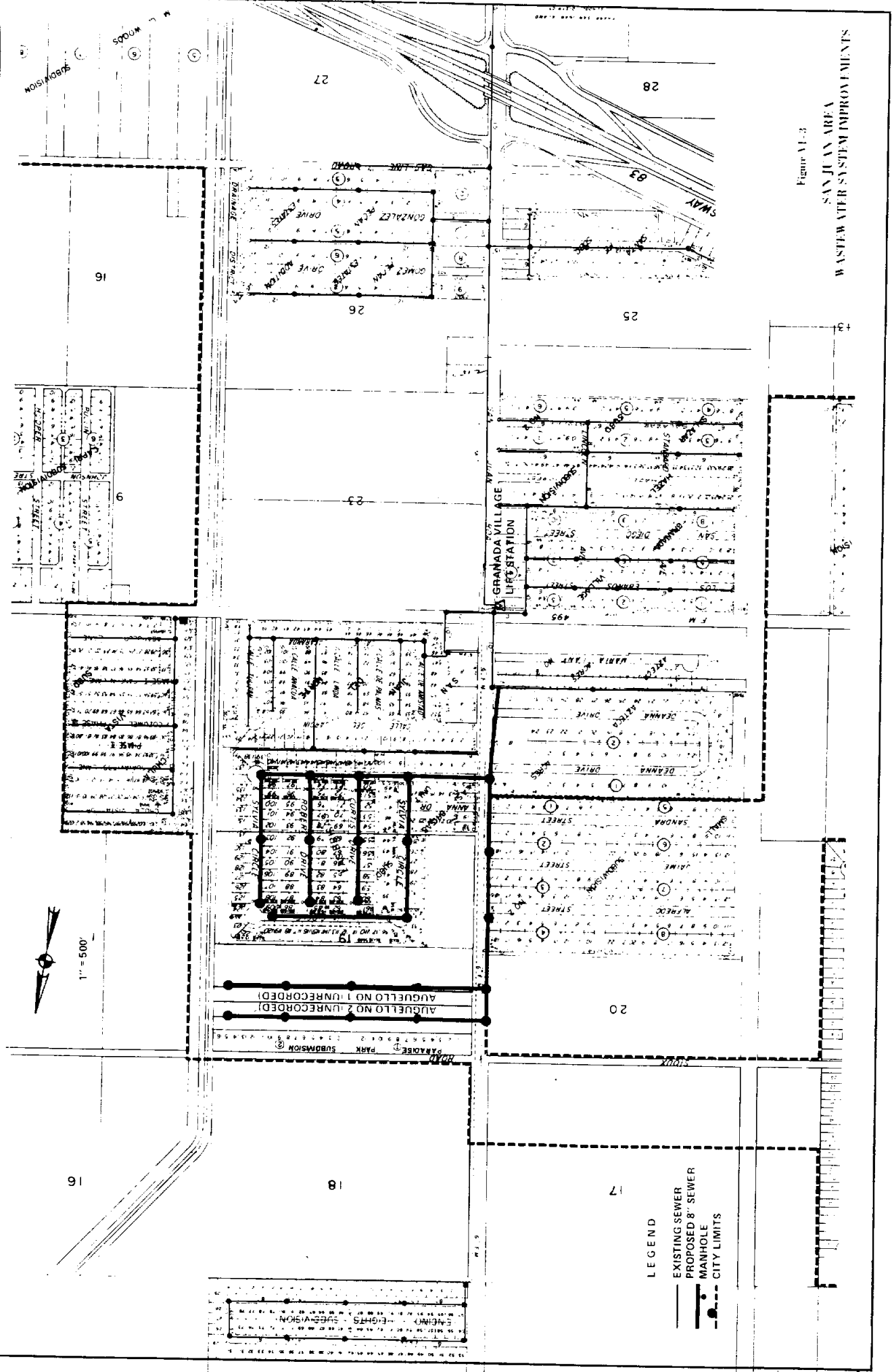
20

19

6

9

Figure VI-3  
 SAN JUAN AREA  
 WASTEWATER SYSTEM IMPROVEMENTS



1" = 2000'

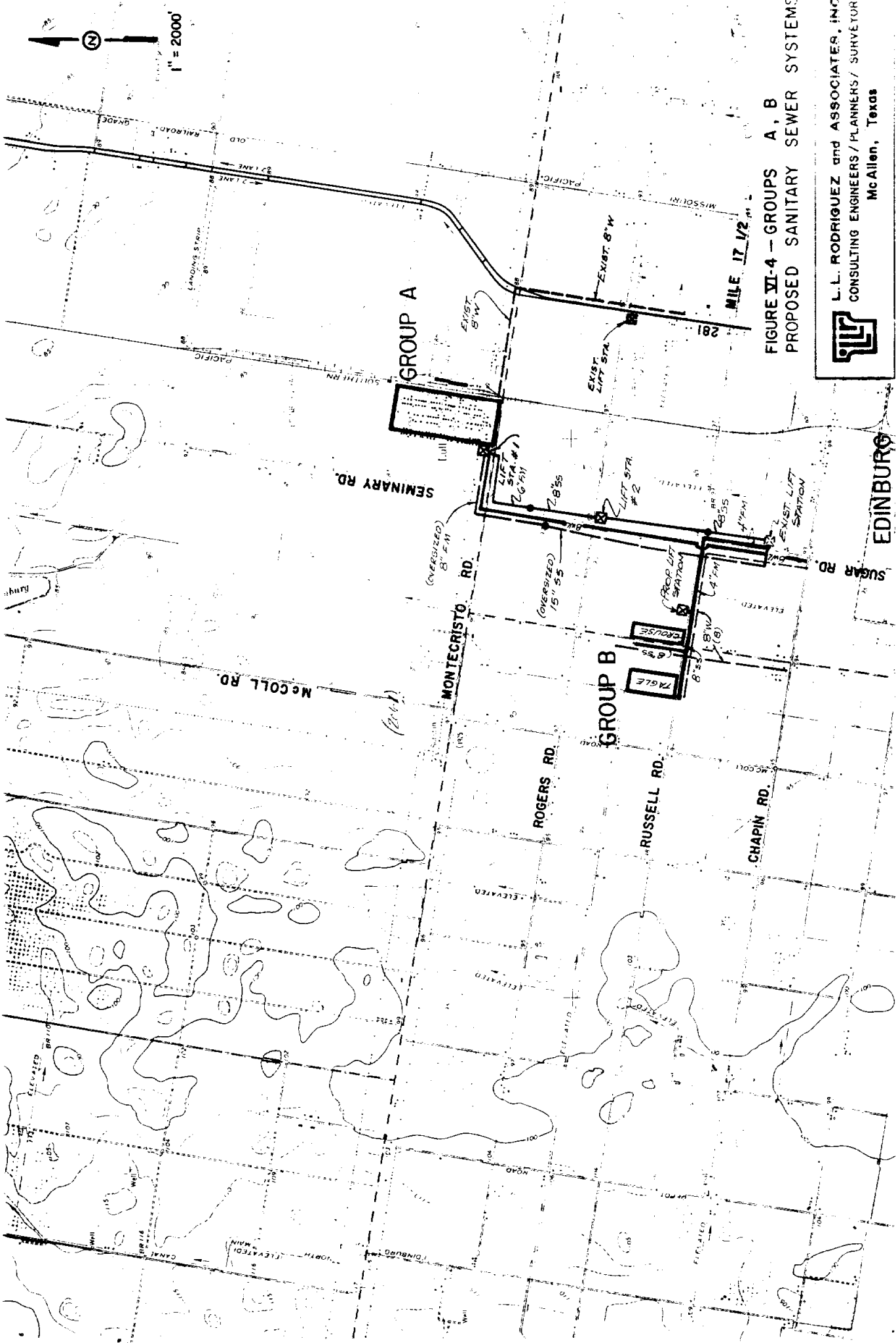


FIGURE VI-4 - GROUPS A, B  
 PROPOSED SANITARY SEWER SYSTEMS



L.L. RODRIGUEZ and ASSOCIATES, INC.  
 CONSULTING ENGINEERS / PLANNERS / SURVEYOR  
 McAllen, Texas

EDINBURG

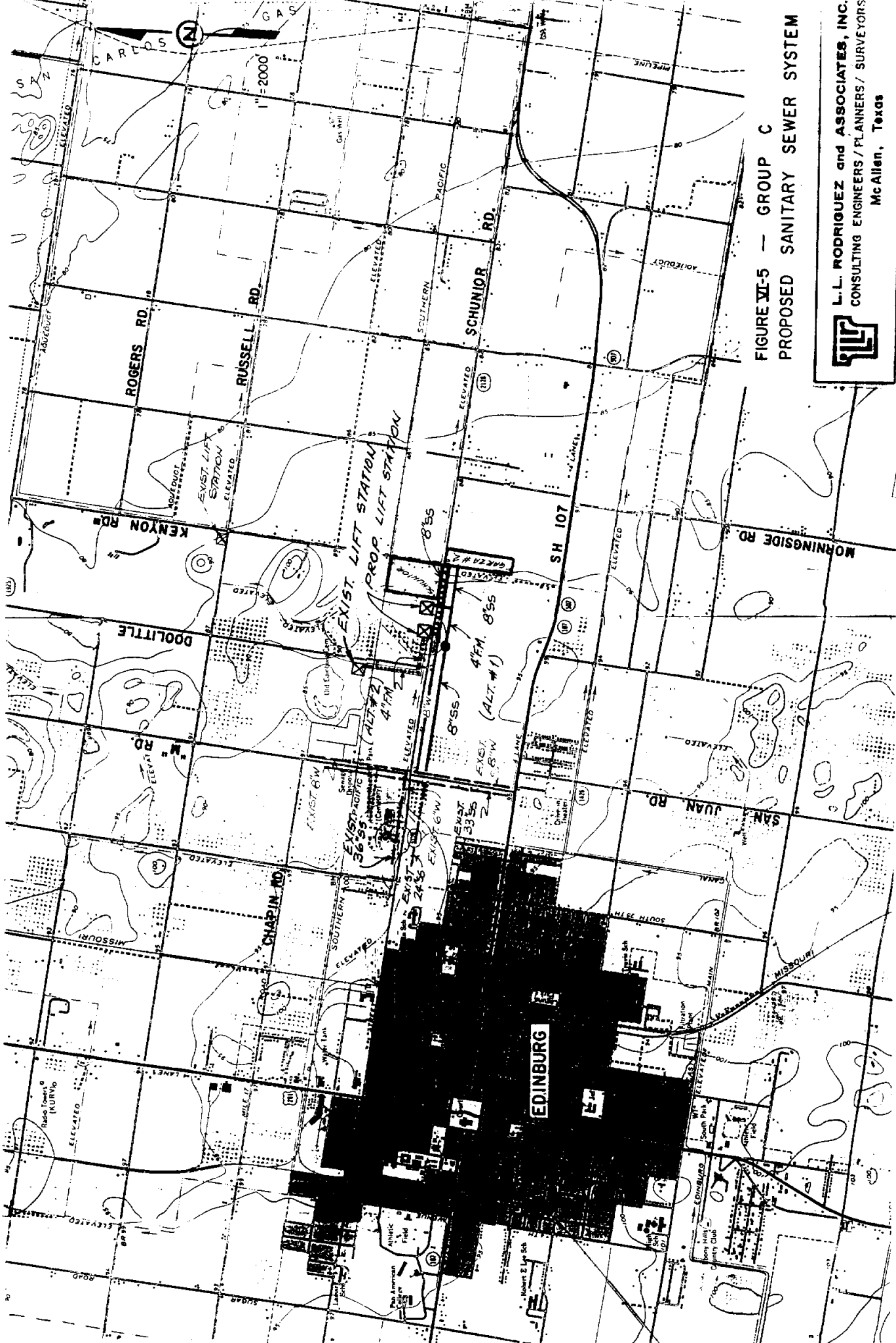



FIGURE VI-5 — GROUP C  
 PROPOSED SANITARY SEWER SYSTEM



L.L. RODRIGUEZ and ASSOCIATES, INC.  
 CONSULTING ENGINEERS / PLANNERS / SURVEYORS  
 McAllen, Texas

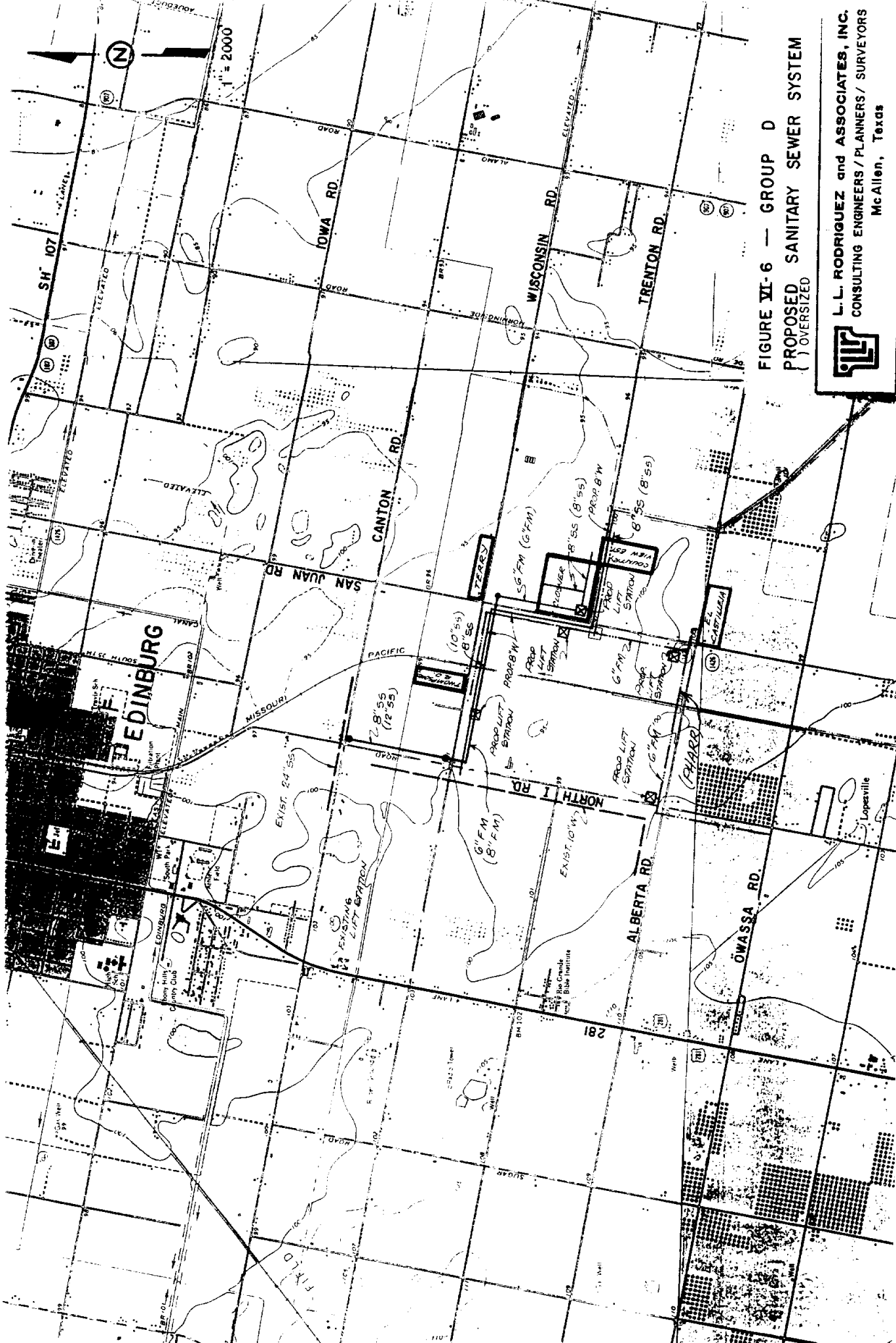


FIGURE VI-6 — GROUP D  
 PROPOSED SANITARY SEWER SYSTEM  
 ( ) OVERSIZED



L.L. RODRIGUEZ and ASSOCIATES, INC.  
 CONSULTING ENGINEERS / PLANNERS / SURVEYORS  
 McAllen, Texas



FIGURE VI-7 — GROUP E  
 PROPOSED SANITARY SEWER SYSTEM



L.L. RODRIGUEZ and ASSOCIATES, INC.  
 CONSULTING ENGINEERS / PLANNERS / SURVEYORS  
 McAllen, Texas

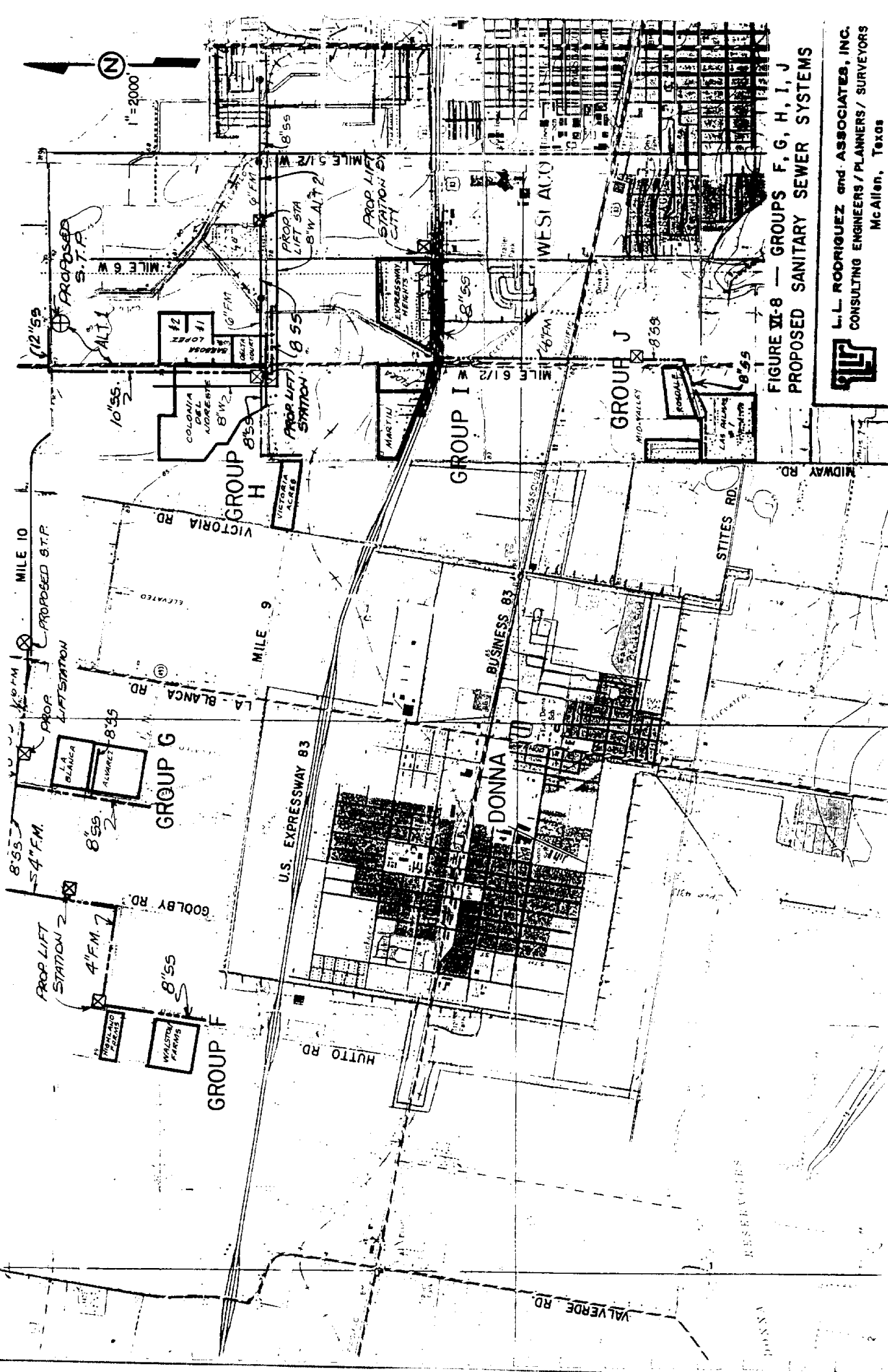


FIGURE VI-8 — GROUPS F, G, H, I, J  
 PROPOSED SANITARY SEWER SYSTEMS



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 CONSULTING ENGINEERS / PLANNERS / SURVEYORS  
 McAllen, Texas



FIGURE VI-9 — GROUP K  
PROPOSED SANITARY SEWER SYSTEM



L. L. RODRIGUEZ and ASSOCIATES, INC.  
CONSULTING ENGINEERS / PLANNERS / SURVEYORS  
McAllen, Texas



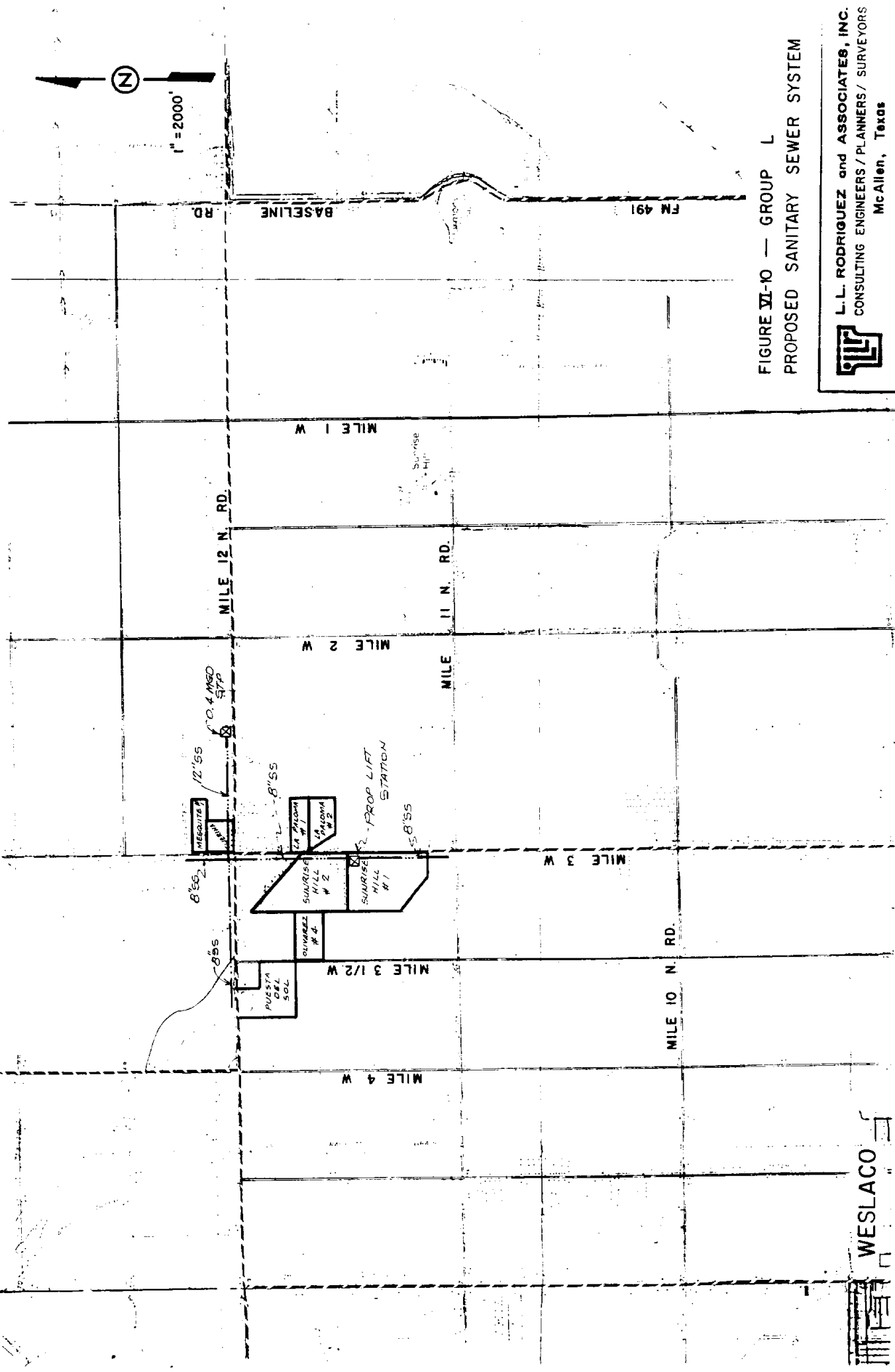




FIGURE VI-10 — GROUP L  
PROPOSED SANITARY SEWER SYSTEM



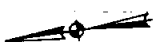
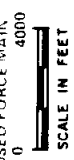
L.L. RODRIGUEZ and ASSOCIATES, INC.  
CONSULTING ENGINEERS / PLANNERS / SURVEYORS  
McAllen, Texas



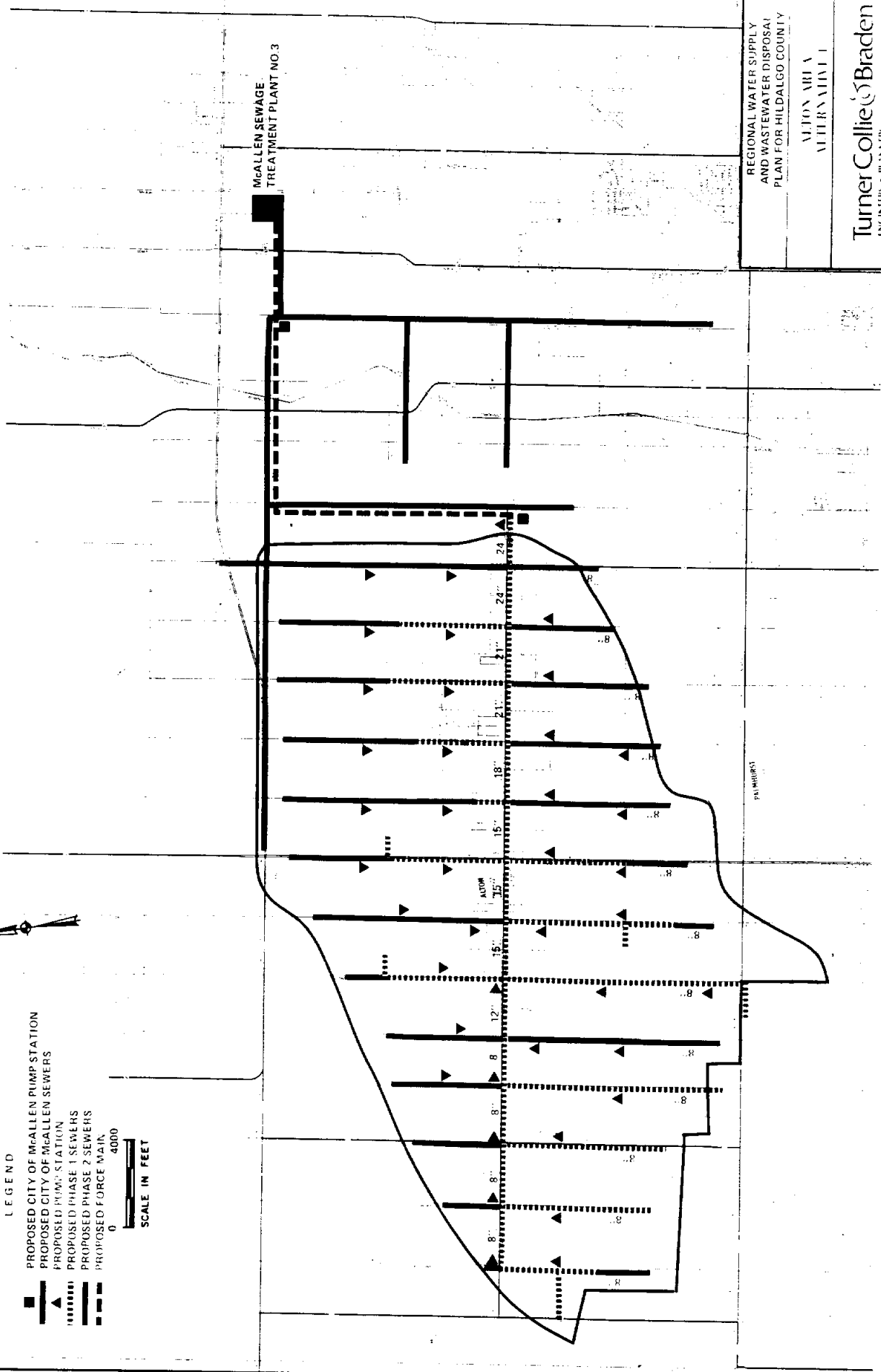
WESLACO

LEGEND

- PROPOSED CITY OF McALLEN PUMP STATION
- ▲ PROPOSED PUMP STATION
- ▬ PROPOSED PHASE 1 SEWERS
- ▬ PROPOSED PHASE 2 SEWERS
- ▬ PROPOSED FORCE MAIN



McALLEN SEWAGE  
TREATMENT PLANT NO. 3



PUMP STATION

REGIONAL WATER SUPPLY  
AND WASTEWATER DISPOSAL  
PLAN FOR HIDALGO COUNTY

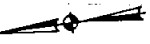
ALTON ARIA  
ALTERNATIVE I

TurnerCollie & Braden Inc.  
ENGINEERS • PLANNERS

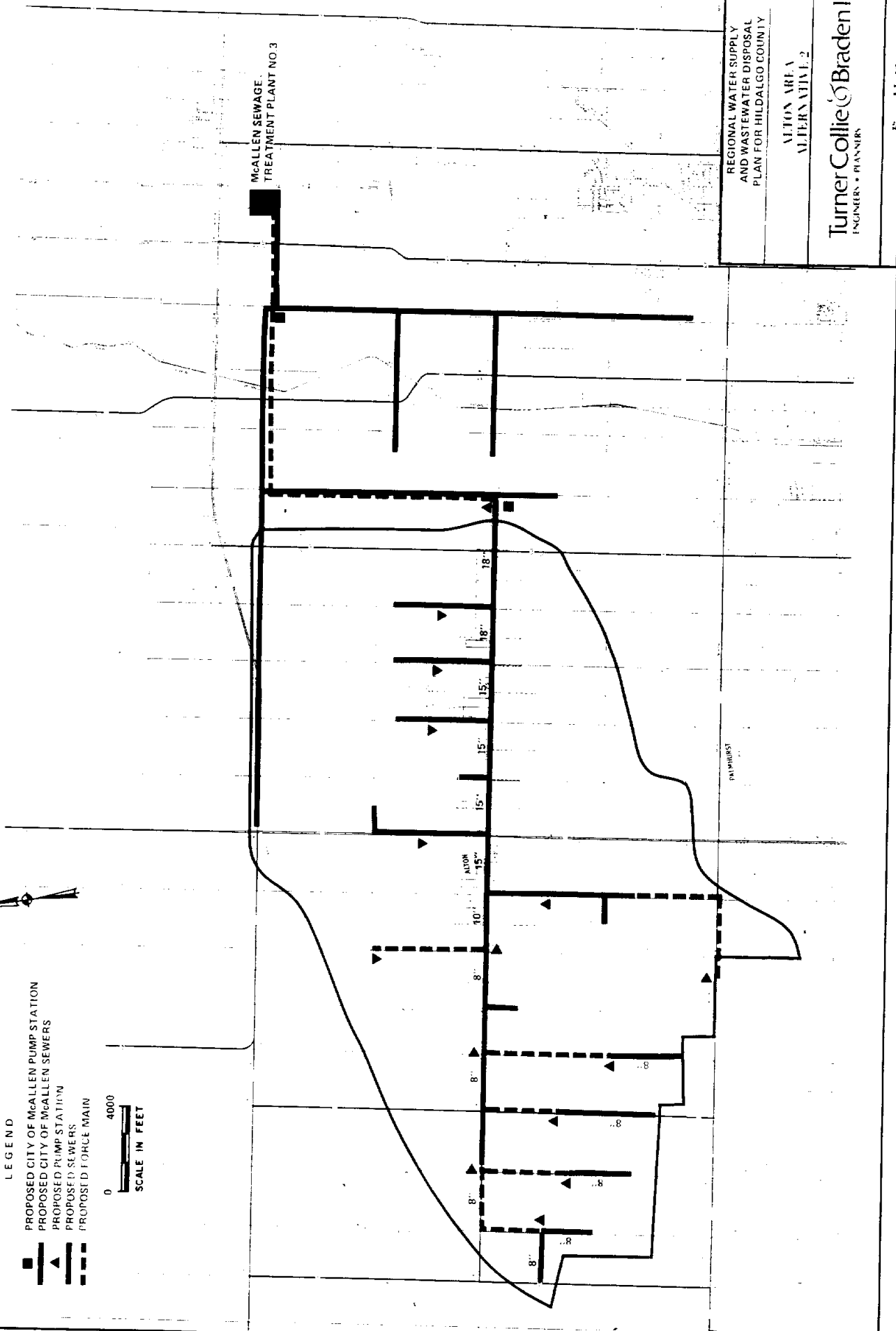
Figure V.1.1

LEGEND

- PROPOSED CITY OF McALLEN PUMP STATION
- ▲ PROPOSED CITY OF McALLEN SEWERS
- ▬ PROPOSED PUMP STATION
- ▬ PROPOSED SEWERS
- ▬ PROPOSED FORCE MAIN



McALLEN SEWAGE  
TREATMENT PLANT NO. 3



DIXIEHURST

REGIONAL WATER SUPPLY  
AND WASTEWATER DISPOSAL  
PLAN FOR HIDALGO COUNTY

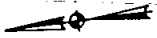
ALTON AREA  
ALTERNATIVE 2

Turner Collie & Braden Inc.  
ENGINEERS • PLANNERS

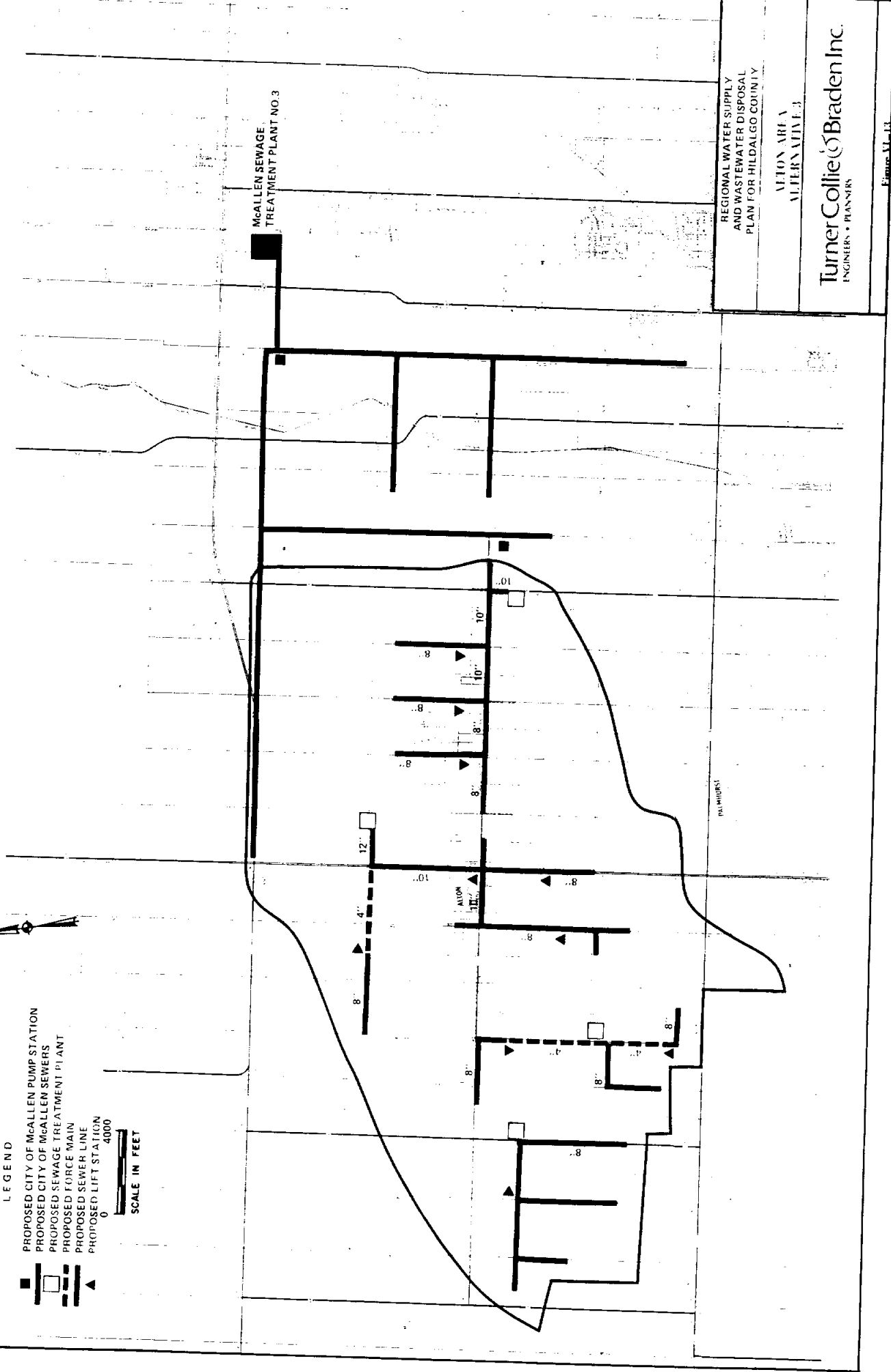
LEGEND

- PROPOSED CITY OF McALLEN PUMP STATION
- PROPOSED CITY OF McALLEN SEWERS
- ▬ PROPOSED SEWAGE TREATMENT PLANT
- ▬ PROPOSED FORCE MAIN
- ▬ PROPOSED SEWER LINE
- ▲ PROPOSED LIFT STATION

SCALE IN FEET  
0 4000



McALLEN SEWAGE TREATMENT PLANT NO. 3



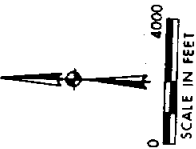
PALMHURST

REGIONAL WATER SUPPLY AND WASTEWATER DISPOSAL PLAN FOR HILDALGO COUNTY

ALTON AREA ALTERNATIVE 3

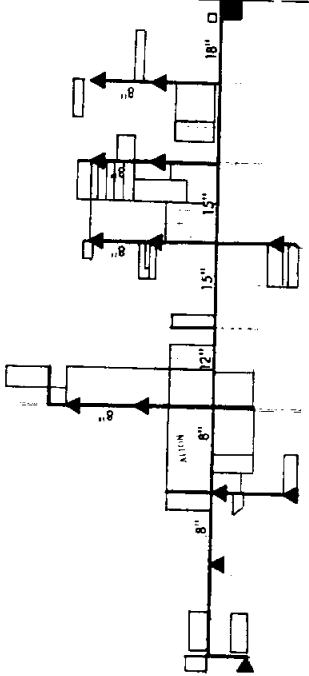
TurnerCollie Braden Inc. ENGINEERS • PLANNERS

Figure VI-13



**LEGEND**

- PROPOSED SEWAGE TREATMENT PLANT
- PROPOSED SEWER LINE
- ▲ PROPOSED LIFT STATION
- COLONIA AREA PROPOSED FOR SERVICE



REGIONAL WATER SUPPLY  
AND WASTEWATER DISPOSAL  
PLAN FOR HILDALGO COUNTY

ALTON AREA  
ALTERNATIVE 1

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Figure VI-14

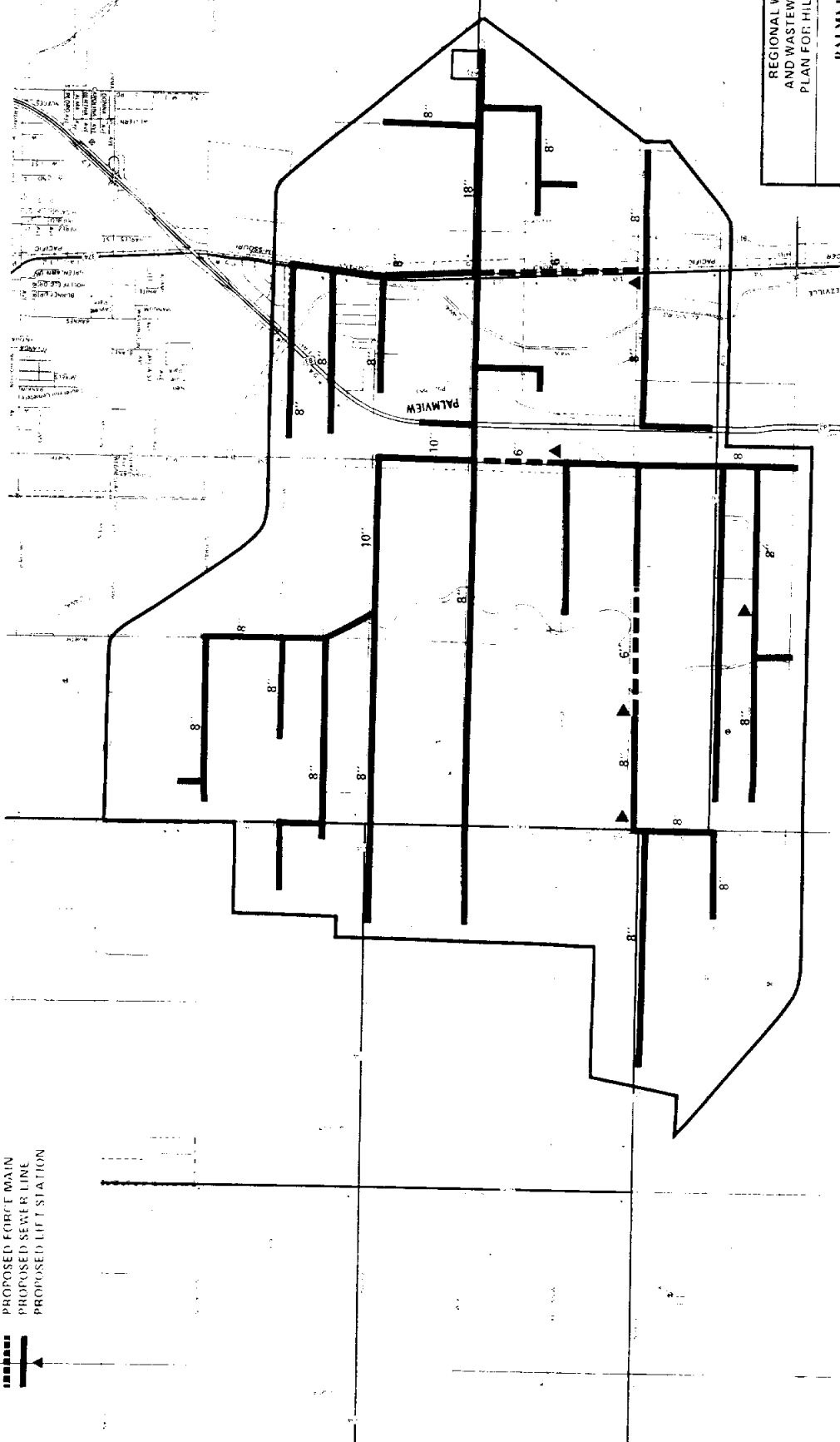
LEGEND

PROPOSED SEWAGE TREATMENT PLANT

PROPOSED FORCE MAIN

PROPOSED SEWER LINE

PROPOSED LIFT STATION



REGIONAL WATER SUPPLY  
AND WASTEWATER DISPOSAL  
PLAN FOR HILDALGO COUNTY

PALMYRA AREA  
ALTERNATIVE I

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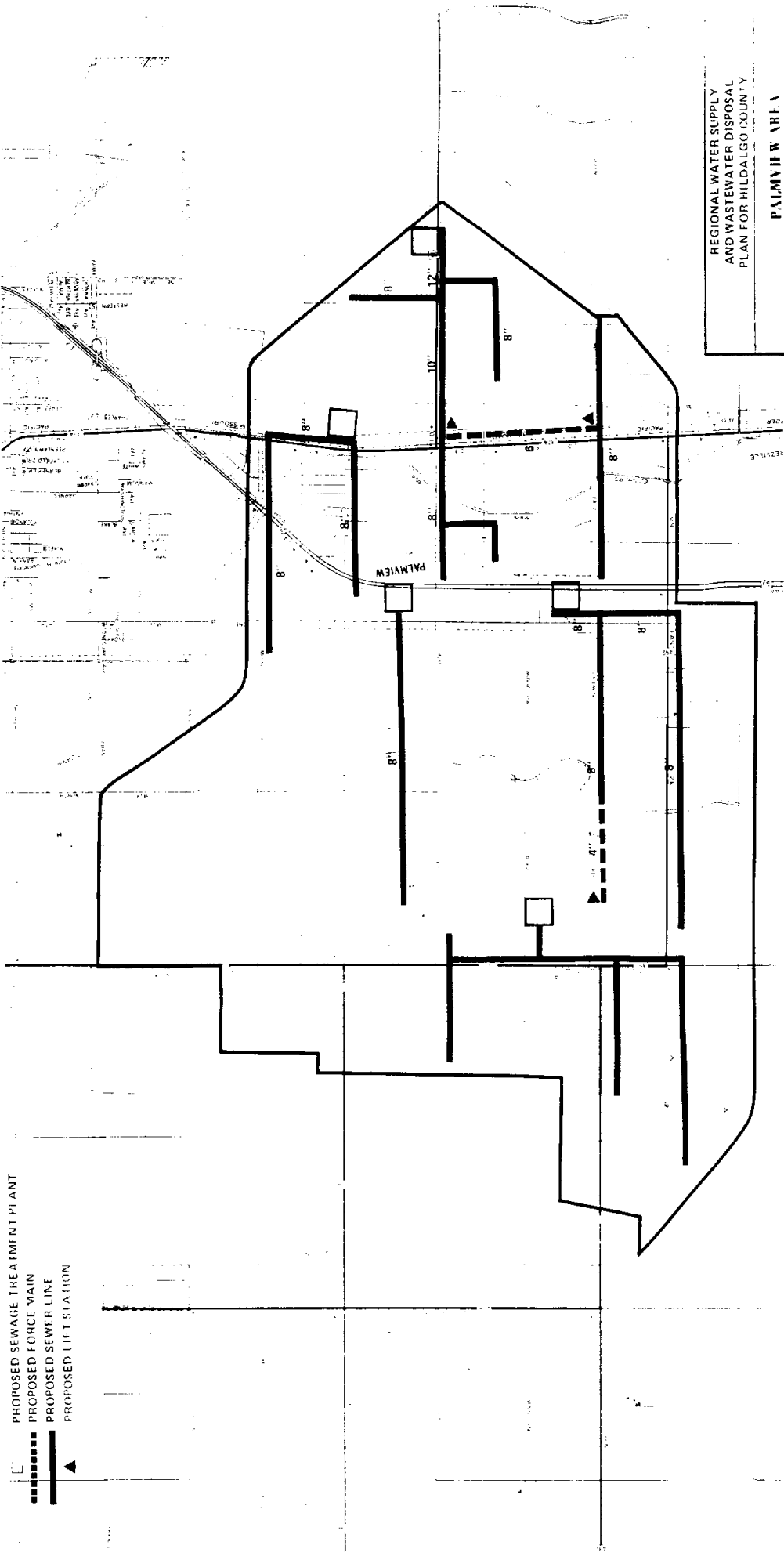
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SCALE IN FEET

Figure 3.1.1



LEGEND

- PROPOSED SEWAGE TREATMENT PLANT
- PROPOSED FORCE MAIN
- ===== PROPOSED SEWER LINE
- ▲ PROPOSED LIFT STATION



REGIONAL WATER SUPPLY  
AND WASTEWATER DISPOSAL  
PLAN FOR HILDALGO COUNTY

PALMVIEW AREA  
ALTERNATIVE 2

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Figure M.L. 16

TABLE VIII-1  
COST SUMMARY OF IMPROVEMENT ALTERNATIVES

COLONIA GROUP	AVERAGE NO. OF CONNECTIONS	WATER SYSTEM CAPITAL COSTS		SEWER SYSTEM CAPITAL COSTS		TOTAL CAPITAL COSTS	MONTHLY WATER SYSTEM DEBT SERVICE	MONTHLY SEWER SYSTEM DEBT SERVICE	MONTHLY TOTAL DEBT SERVICE	MONTHLY WATER O & M	MONTHLY SEWER O & M	MONTHLY TOTAL O & M	MAXIMUM ACCEPTABLE PAID BY GRANTEE	AMOUNT PAID BY GRANTEE	MONTHLY PRESENT VALUE OF GRANT	PRESENT VALUE OF LOAN
		WATER SYSTEM CAPITAL COSTS	SEWER SYSTEM CAPITAL COSTS	WATER SYSTEM DEBT SERVICE	SEWER SYSTEM DEBT SERVICE											
<b>EDINBURG GROUP A</b>																
ALT. 1	317	\$764,000	\$692,000	\$1,456,000	\$20	\$19	\$0	\$10	\$9	\$58	\$40	\$22	\$40	\$40	\$822,000	\$634,000
ALT. 2	317	\$764,000	\$940,000	\$1,704,000	\$70	\$25	\$0	\$10	\$15	\$70	\$40	\$34	\$40	\$40	\$1,270,000	\$434,000
ALT. 1 + add'l increase	1,117	\$764,000	\$1,039,000	\$1,803,000	\$6	\$8	\$0	\$10	\$9	\$33	\$40	\$5	\$40	\$40	\$0	\$1,803,000
ALT. 2 + add'l increase	1,117	\$764,000	\$1,287,000	\$2,051,000	\$6	\$10	\$0	\$10	\$15	\$41	\$40	\$5	\$40	\$40	\$658,000	\$1,393,000
GROUP B w/City Purchase of WSC Water System	66	\$251,000	\$235,000	\$486,000	\$32	\$30	\$0	\$10	\$9	\$81	\$40	\$45	\$40	\$40	\$350,000	\$136,000
GROUP B w/MSC Water	66	\$0	\$235,000	\$235,000	\$0	\$30	\$15	\$0	\$9	\$54	\$40	\$18	\$40	\$40	\$140,000	\$95,000
<b>GROUP C w/City Purchase of WSC Water System</b>																
ALT. 1	109	\$227,000	\$225,000	\$452,000	\$18	\$18	\$0	\$10	\$9	\$55	\$40	\$19	\$40	\$40	\$244,000	\$208,000
ALT. 2	109	\$227,000	\$235,000	\$462,000	\$18	\$18	\$0	\$10	\$9	\$55	\$40	\$19	\$40	\$40	\$244,000	\$218,000
OVERSIZED for C + Add'l A	509	\$227,000	\$340,000	\$567,000	\$4	\$6	\$0	\$10	\$9	\$29	\$40	\$5	\$40	\$40	\$0	\$567,000
<b>GROUP C w/MSC Water</b>																
ALT. 1	109	\$0	\$225,000	\$225,000	\$0	\$18	\$15	\$0	\$9	\$42	\$40	\$6	\$40	\$40	\$77,000	\$118,000
ALT. 2	109	\$0	\$235,000	\$235,000	\$0	\$18	\$15	\$0	\$9	\$42	\$40	\$6	\$40	\$40	\$77,000	\$138,000
OVERSIZED for C + Add'l A	509	\$0	\$340,000	\$340,000	\$0	\$6	\$15	\$0	\$9	\$30	\$40	\$5	\$40	\$40	\$0	\$340,000

\* ASSUMING A 90 % COLLECTION RATE FROM CUSTOMERS



TABLE VIII-1 COST SUMMARY OF IMPROVEMENT ALTERNATIVES (cont'd.)

FEARR/ LOPEVILL	COLONIA GROUP	AVERAGE NO. OF CONNECTIONS	WATER SYSTEM		SEWER SYSTEM		TOTAL CAPITAL COSTS	TOTAL SYSTEM COSTS	MONTHLY WATER SERVICE DUTY	MONTHLY SEWERAGE SERVICE DUTY	MONTHLY STCS SERVICE DUTY	MONTHLY WATER SERVICE DUTY	MONTHLY WATER SERVICE DUTY	MONTHLY SEWER SERVICE DUTY	MONTHLY TOTAL DUE	MAXIMUM ACCEPTABLE PAID BY GRANT *	AMOUNT/MO AMOUNT/MO PAID BY GRANT * RESIDENT OF GRANT	PRESENT VALUE	PRESENT VALUE OF LOAN
			CAPITAL COSTS	OPERATING COSTS	CAPITAL COSTS	OPERATING COSTS													
	GROUP D																		
	ALT. 1	251	\$557,000		\$562,000		\$1,119,000	\$19	\$19	\$19	\$0	\$0	\$0	\$57	\$40	\$71	\$40	\$621,000	\$508,000
	ALT. 1 + ADD'L ACREAGE	651	\$567,000		\$866,000		\$1,433,000	\$7	\$11	\$11	\$0	\$0	\$0	\$46	\$40	\$10	\$40	\$767,000	\$666,000
	ALT. 2	251	\$0		\$661,000		\$661,000	\$0	\$22	\$22	\$15	\$0	\$42	\$42	\$40	\$6	\$40	\$177,000	\$484,000
	GROUP E	423	\$1,268,000		\$930,000		\$2,198,000	\$25	\$19	\$19	\$0	\$6	\$5	\$55	\$40	\$19	\$40	\$947,000	\$1,251,000

\* ASSUMING A 90 % COLLECTION RATE FROM CUSTOMERS

TABLE VIII-1 COST SUMMARY OF IMPROVEMENT ALTERNATIVES (cont'd.)

COLUMBIA GROUP	AVERAGE NO. OF CONNECTIONS	WATER SYSTEM CAPITAL COSTS		SEWER SYSTEM CAPITAL COSTS		TOTAL CAPITAL COSTS	MONTHLY WATER SYSTEM DEBT SERVICE		MONTHLY SEWER SYSTEM DEBT SERVICE		MONTHLY WEC BILL	MONTHLY WATER O & M	MONTHLY SEWER O & M	MONTHLY TOTAL DUE	MAXIMUM ACCEPTABLE MONTHLY BILL	AMOUNT PAID BY GRANT	AMOUNT/HO PAID BY RESIDENT	HO PRESENT VALUE OF GRANT	PRESENT VALUE OF LOAN
		\$	000	\$	000		\$	000	\$	000									
DOHNA/ WESLACO	131	\$0	\$613,000	\$0	\$613,000	\$613,000	\$0	\$40	\$0	\$15	\$70	\$40	\$40	\$70	\$40	\$4	\$40	\$525,000	\$88,000
GROUP G	67	\$0	\$399,000	\$0	\$399,000	\$399,000	\$0	\$51	\$0	\$15	\$81	\$40	\$40	\$81	\$40	\$15	\$40	\$355,000	\$44,000
GROUP E																			
ALT. 1	363	\$0	\$1,313,000	\$0	\$1,313,000	\$1,313,000	\$0	\$31	\$0	\$15	\$81	\$40	\$40	\$81	\$40	\$25	\$40	\$1,069,000	\$244,000
ALT. 2	363	\$0	\$1,195,000	\$0	\$1,195,000	\$1,195,000	\$0	\$28	\$0	\$15	\$58	\$40	\$40	\$58	\$40	\$2	\$40	\$941,000	\$254,000
GROUP K	499	\$0	\$1,827,000	\$0	\$1,827,000	\$1,827,000	\$0	\$31	\$0	\$15	\$81	\$40	\$40	\$81	\$40	\$5	\$40	\$1,470,000	\$357,000
WESLACO GROUP I	239	\$1,140,000	\$792,000	\$1,432,000	\$1,432,000	\$1,432,000	\$40	\$10	\$0	\$8	\$70	\$40	\$40	\$70	\$40	\$11	\$40	\$957,000	\$475,000
GROUP J	249	\$398,000	\$336,000	\$734,000	\$734,000	\$734,000	\$14	\$11	\$0	\$8	\$45	\$40	\$40	\$45	\$40	\$9	\$40	\$764,000	\$470,000
GROUP L	249	\$0	\$1,577,000	\$0	\$1,577,000	\$1,577,000	\$0	\$54	\$0	\$15	\$89	\$40	\$40	\$89	\$40	\$3	\$40	\$1,555,000	\$22,000

\* ASSUMING A 90% COLLECTION RATE FROM CUSTOMERS

TABLE VIII-1  
COST SUMMARY OF IMPROVEMENT ALTERNATIVES (cont'd.)

COLONIA GROUP	AVERAGE NO. OF CONNECTIONS	WATER SYSTEM CAPITAL COSTS	SEWER SYSTEM CAPITAL COSTS	TOTAL CAPITAL COSTS	MONTHLY WATER SYSTEM SERVICE DEBT		MONTHLY SEWER SERVICE DEBT		MONTHLY WSC BILL	MONTHLY WATER & SEWER O & M	MONTHLY TOTAL DUE MONTHLY BILL	MAXIMUM ACCEPTABLE PAID BY GRANTEE	AMOUNT/NO MONTH/NO PRESENT VALUE PAID BY RESIDENT	PRESENT VALUE OF GRANT	PRESENT VALUE OF LOAN
					\$	%	\$	%							
SAN JUAN LAS BRISAS ALT. 1 PARADISE PARK	121	\$74,762	\$175,468	\$250,230	\$5	12	\$15	\$7	\$15	\$0	\$39	\$40	\$0	\$0	\$250,230
	21	\$74,818	\$76,775	\$151,593	\$10	31	\$15	\$7	\$15	\$0	\$63	\$40	\$40	\$67,000	\$34,583
	24	\$13,441	\$76,775	\$90,216	\$5	77	\$15	\$7	\$15	\$0	\$54	\$40	\$40	\$51,000	\$39,216
	22	\$13,441	\$89,928	\$103,369	\$5	35	\$15	\$7	\$15	\$0	\$62	\$40	\$40	\$67,000	\$36,369
SAN JUAN LAS BRISAS ALT. 2 PARADISE PARK	121	\$119,600	\$175,468	\$295,068	\$8	12	\$0	\$7	\$0	\$7	\$34	\$40	\$0	\$0	\$295,068
	21	\$39,702	\$76,775	\$116,477	\$16	31	\$0	\$7	\$0	\$7	\$61	\$40	\$40	\$62,000	\$54,477
	24	\$21,502	\$76,775	\$98,277	\$8	27	\$0	\$7	\$0	\$7	\$49	\$40	\$40	\$37,000	\$61,277
	22	\$21,502	\$89,928	\$111,430	\$8	35	\$0	\$7	\$0	\$7	\$57	\$40	\$40	\$54,000	\$57,430

\* ASSUMING A 90 % COLLECTION RATE FROM CUSTOMERS

TABLE VIII-1  
COST SUMMARY OF IMPROVEMENT ALTERNATIVES (cont'd.)

STUDY AREA	COLONIA GROUP	AVERAGE NO. OF CONNECTIONS	WATER SYSTEM CAPITAL COSTS		SEWER SYSTEM CAPITAL COSTS		TOTAL CAPITAL COSTS	MONTHLY WATER SYSTEM DEBT SERVICE		MONTHLY SEWERAGE & DEBT SERVICE		MONTHLY WATER & SEWER O & M	MONTHLY TOTAL DEBT SERVICE	MAXIMUM ACCEPTABLE PAID BY GRANTEE	AMOUNT/NO. MONTHS PAID BY RESIDENTS OF GRANT	PRESENT VALUE OF GRANT	PRESENT VALUE OF LOAN
			WATER SYSTEM CAPITAL COSTS	SEWER SYSTEM CAPITAL COSTS	MONTHLY WATER SYSTEM DEBT SERVICE	MONTHLY SEWERAGE & DEBT SERVICE		MONTHLY WATER SYSTEM DEBT SERVICE	MONTHLY SEWERAGE & DEBT SERVICE								
ALTON STUDY AREA	ALT. 1	2412	\$0	\$13,279,000	\$0	\$13,279,000	\$0	\$47	\$15	\$0	\$7	\$64	\$40	\$33	\$40	\$9,378,000	\$3,901,000
	ALT. 1 (FEASE 1)	1682	\$0	\$7,807,000	\$0	\$7,807,000	\$0	\$39	\$15	\$0	\$7	\$61	\$40	\$25	\$40	\$4,954,000	\$2,853,000
	ALT. 2	1682	\$0	\$7,144,000	\$0	\$7,144,000	\$0	\$36	\$15	\$0	\$7	\$58	\$40	\$22	\$40	\$4,360,000	\$2,784,000
	ALT. 3	1682	\$0	\$6,093,000	\$0	\$6,093,000	\$0	\$31	\$15	\$0	\$15	\$61	\$40	\$25	\$40	\$4,954,000	\$1,139,000
PALMYER STUDY AREA	ALT. 4	1473	\$0	\$4,891,000	\$0	\$4,891,000	\$0	\$28	\$15	\$0	\$15	\$38	\$40	\$22	\$40	\$3,818,000	\$1,073,000
	ALT. 1	2622	\$0	\$8,409,000	\$0	\$8,409,000	\$0	\$27	\$15	\$0	\$15	\$57	\$40	\$21	\$40	\$6,487,000	\$1,922,000
STUDY AREA	ALT. 2	2622	\$0	\$8,400,000	\$0	\$8,400,000	\$0	\$27	\$15	\$0	\$15	\$57	\$40	\$21	\$40	\$6,487,000	\$1,913,000

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WATER CONSERVATION PLAN

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**WATER CONSERVATION AND**

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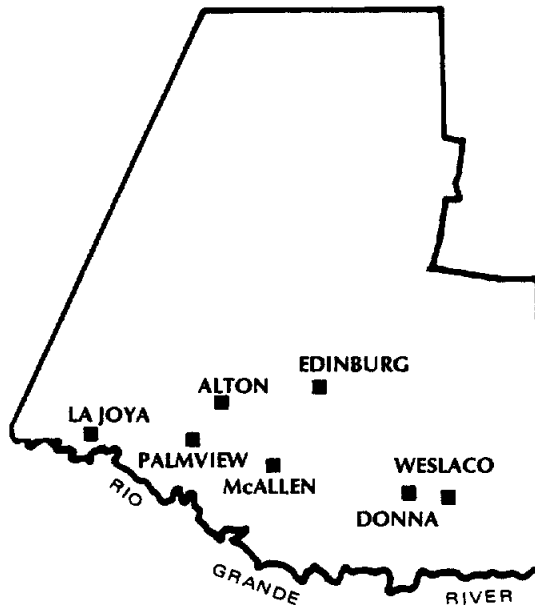
**DROUGHT CONTINGENCY**

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**PLAN FOR HIDALGO COUNTY**

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January 1990



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**TEXAS WATER DEVELOPMENT BOARD**

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Purpose and Goals of the Program

This report addresses the issues of water conservation and drought contingency planning for rural areas of Hidalgo County, Texas. Hidalgo County is currently involved with the preparation of a water supply and wastewater disposal plan whose primary objective is to identify water and wastewater projects to serve the rural, unincorporated areas of the County. The county contains a number of unincorporated, primarily residential communities, locally termed colonias. Four hundred thirty-five such communities have been identified in previous reconnaissance studies with an estimated existing population of 72,000 persons. The current study focuses on certain groups of colonias or larger colonias with sufficient population densities to make extension of existing water and wastewater disposal facilities or construction of new facilities feasible. Existing colonias generally fit the definition of being a subdivision located outside the corporate limits of any city or town; having at least some substandard housing; and, not currently served by a sewer collection line.

A portion of the current study is being funded by a 75 percent participatory grant provided by the Texas Water Development Board to the Hidalgo County Water Development Board. The grant is part of the Regional Planning Grants Program designated under the Texas Water Bill of 1985. As part of the grants program, the Board must prepare and adopt a water conservation and drought contingency program. Furthermore, the County must have a program





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in place before additional funds can be spent to provide the proposed water and wastewater services.

The objective of a conservation program is to reduce the quantity of day-to-day water use activities, insofar as practical, through the implementation of efficient water use practices. Day-to-day water uses include water used for drinking, bathing, cooking, toilet flushing, fire protection, lawn watering, laundry, dishwashing, car washing, and sanitation.

A drought contingency program provides procedures for voluntary and mandatory actions to be implemented to temporarily reduce water demands during a water shortage emergency. Drought contingency procedures include conservation but also may prohibit certain water uses.

The purpose of this report is to present background information on the colonias existing water and wastewater systems, and to discuss alternatives and elements selected for the Water Conservation and Drought Contingency Plan for rural areas of Hidalgo County. The report will also serve to provide procedures and implementation of the Plan. Successfully implemented, the Conservation Plan will reduce water demands, and as a result, reduce wastewater flows to the proposed wastewater treatment plants. The Drought Contingency Plan will provide a known system of procedures to be initiated during drought emergency conditions.

The following specific goals have been identified for this conservation plan.

- 1) a goal to reduce per capita water use or wastewater flows by 10 percent.



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- 2) a goal to reduce unaccounted for water to below 15 percent.
  - 3) a goal to ensure that houses and other structures that are being plumbed for the first time use water efficient plumbing fixtures.
  - 4) Senate Bill 2 requirements for water-efficient plumbing fixtures are complied with by all individual service providers.

### Description of the Planning Area

Hidalgo County is located in the extreme southern part of Texas, bordering the Rio Grande River, which separates the County from the Republic of Mexico. One of the County's most valuable resources is the area's mild climate, making agriculture critical to the economy of the region. Much of the population works in agriculture related jobs throughout the year as fruit and vegetable harvesters, packers, and clothing manufacturers. Because of the area's mild climate and agriculture-related economy, many of the residents are seasonal migrant farm workers who make their winter home in the colonias while employed locally in agriculture and follow the harvest north in the summer.

Due to its proximity to Mexico, about half of the area's population have Spanish surnames and many speak Spanish as their native language. The major population centers in the County are McAllen, Edinburg, Mission, Pharr, and San Juan. Land-use is predominantly cropland, improved pastureland, and rangeland. It is intensely farmed and highly specialized, reflecting the importance of agriculture in the area. Most of the County's area is irrigated with water from the Rio Grande River.



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Many areas that were once cropland and orchards have been converted to single-family residential areas. This trend is expected to continue to accommodate the fast-growing population both the urban areas and the rural colonias.

Most of the colonias began as subdivisions of 5- to 50-acre agricultural tracts. While most were in rural parts of the Rio Grande Valley when originally developed, the cities have grown to meet and annex several colonias in the last few years. Colonias are not a new phenomenon in the Valley, dating back to the early 1900s, although their growth has accelerated in the past twenty years. Several of the older colonias have developed into small towns, both incorporated and unincorporated, throughout the County. It is these unincorporated rural areas to which this water conservation plan is directed.

### Project Description

A variety of projects are proposed to provide wastewater service to the existing colonias. Existing wastewater service is limited to inadequate septic tank systems, or in some cases, pit latrines. Many of the projects involve extension of wastewater collection lines from presently served areas to the colonias. Some projects will involve additions to existing wastewater treatment plants in order to accept additional wastewater loading. At least one project proposes a new regional treatment facility, while others may require construction of smaller package plants. As noted earlier, the primary objective of the



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current planning study is to identify feasible projects for possible funding from outside sources. The number and extent of proposed construction is, therefore, dependent on the availability of funding. A more precise description of proposed projects can be found in the referenced companion study, Water Supply and Wastewater Disposal Plan for Hidalgo County.

#### Problems Associated With Implementation

One of the requirements of the existing contractual agreement with the TWDB is submission of a Water Conservation and Drought Contingency Plan for the study area. In attempting to develop such a Plan in accordance with current guidelines, several problems became readily apparent which may preclude effective implementation. Briefly, these are presented below.

- 1) The need for a water conservation program, by definition, assumes virtually unlimited water supply throughout the study area. In the case of most of areas proposed for water and wastewater projects, potable water is supplied by small diameter distribution lines, which by their very nature, restrict water consumption to potable and domestic needs. Fire protection, provided by large diameter mains and high pressure sources, which allows "extravagant" consumption for lawn irrigation, car washing, and other high water-uses is non-existent in these areas.
- 2) The colonias targeted for water and wastewater projects are characteristically those in low-income (poverty), rural areas. In these areas, cost of the new services alone will deter many from non-essential water use.
- 3) An effective water conservation program requires an evaluation of baseline conditions as a means of measuring the program's effectiveness. In some cases, water supply is proposed for areas where service is currently not available.
- 4) Water service is supplied in most rural areas by Water Supply Corporations. Neither the County nor local



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municipal governments have the authority or facilities to enforce a water conservation program.

- 5) In light of Item 4, there exists a need to first empower the Water Supply Corporations, or conversely, provide legislation that encourages the equitable sale of the water systems to the cities.
- 6) Most important, a public health emergency exists in the more densely populated rural areas of Hidalgo County. The existing wastewater systems, i.e., septic tanks and outdoor latrines, have already failed, causing the health and safety of citizens served to be endangered. The proposed projects are to be implemented to remedy these problems and currently outweigh any water conservation benefits. Attempts to enforce conservation measures are perceived as a deterrent to connection of proposed facilities.

For the above reasons, the colonias projects should be exempted, at least for the present, from implementation of a Water Conservation Plan as a requirement for project funding. However, because of contractual obligations, the following information is provided. This data may serve as a future basis for an implementable plan.



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### Water Use

Because the current planning effort is to identify feasible projects for possible future funding in areas of rural development, this Plan is targeted at providing water conservation and drought contingency measures for that segment of the County population. These areas are typically served by the various water supply corporations (WSC) which have historically provided water to rural areas in Hidalgo County. A reconnaissance level study in 1986 determined that 345 of the 435 identified colonias were supplied water by the WSCs. Of the 90 colonias remaining, 58 had no known source of supply, but visual inspections indicated, with the exception of 5, at least some water service was available in each. The remainder were determined to be served by municipalities, individual wells, or miscellaneous small suppliers.

The existing major WSCs serving Hidalgo County include North Alamo WSC, Sharyland WSC, La Joya WSC, and Military Highway WSC.

### Water Supply

Each WSE holds water right, however, they must purchase additional water to meet their needs. Existing water right allocations include; 1,000 acre-feet for LeJoya WSC, 6,000 acre-feet for North Alamo WSC, 3,800 acre-feet for Sharyland WSC, and 300 acre-feet for Millitary Highway WSC.

Currently all water supplied to the WSCs is surface water originating from the Rio Grande River.



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### Wastewater System

The Hidalgo County Health Department estimates that 60 percent of the colonia residents in the county rely on septic tanks for wastewater treatment. Approximately 30 percent of the colonia residents utilize outdoor pit latrines, while the remaining 10 percent are served by regional wastewater and collection systems. The colonias already receiving wastewater service through a regional facility are not included in the current regionalization study, since as defined for the purposes of this study, a colonia does not have the available adequate wastewater service.

Officials from the Health Department agree that many of the septic and latrine systems in the county were improperly installed and are possibly creating environmental health problems. Information obtained from the Texas Department of Health indicates that some septic tanks within the colonias are installed on lots of 6,000 to 7,000 square feet and, therefore, are not meeting the TDH requirement of at least 15,000 square feet per lot for a septic/absorption field system. In addition, septic systems and latrines are being installed in areas with unsuitable soils with seasonal high groundwater tables or low percolation rates.

### Population and Water-Use Projections

Population and water-use projections for the rural areas of Hidalgo County have been obtained from the TWDB Water Data



Collection, Studies, and Planning Division. Projections, presented as a high and low series, as of September, 1988 are summarized below.

<u>High Population Series</u>					
	<u>1985</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>2020</u>
Population	93,863	113,732	150,212	215,064	289,718
Avg. Water-Use (Ac-Ft)	11,537	14,388	18,832	26,823	35,955
<u>Low Population Series</u>					
	<u>1985</u>	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>2020</u>
Population	93,863	109,301	139,342	185,454	232,349
Avg. Water-Use (Ac-Ft)	11,537	13,792	17,493	23,179	28,953

The above values are inclusive of all rural areas of Hidalgo County and, therefore, are higher than the expected population to derive immediate benefit from the proposed wastewater system improvements.

Water Rate Structure; Metered Connections

Water rates for two of the major water suppliers (North Alamo WSC and Sharyland WSC) are currently based on a declining block rate structure as summarized below. LaJoya WSC and Military Highway WSC each employ inclining block rate structures. The estimated number of existing connections to each system are provided in parenthesis. The total number of connections includes both residential and commercial accounts.

North Alamo WSC (8,918).....\$11 for the first 3000 gallons  
 \$1.50/1,000 gallons 3,000-  
 5,000 gallons





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	\$1.25/1,000 gallons 5,000-7,000 gallons
	\$1.00/1,000 gallons over 7,000 gallons
La Joya WSC (2,775).....	\$10.50 for the first 3,000 gallons
	\$1.40/1,000 gallons 3,000-7,000 gallons
	\$1.50/1,000 gallons 7,000-11,000 gallons
	\$1.70/1,000 gallons over 11,000-14,000 gallons
Military Highway WSC (5,050).....	\$1.90/1,000 gallons 14,000-25,000 gallons
	\$2.10/1,000 gallons 25,000-50,000 gallons
	\$2.25/1,000 gallons 50,000-150,000 gallons
Sharyland WSC (5,500).....	\$18 for the first 3,000 gallons
	\$1.50/1,000 gallons 3,000-6,000 gallons
	\$1.25/1,000 gallons 6,000-50,000 gallons
	\$1.00/1,000 gallons 50,000-100,000 gallons



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The following items have been considered and, when appropriate, incorporated into the Plan.

### Assessment of Supply and Demand Management Potentials

Water conservation measures are often evaluated under two management categories--demand management and supply management. Demand management methods consider water use downstream of the service connection; that is, user-oriented conservation. Demand management provides for education or incentives, such as overall lower water costs, to reduce water consumption by the consumer. This method of conservation generally reduces water revenues since less water is purchased from the water utility.

Supply management methods consider water supply upstream of the customer's service connection. The goal of supply management is to reduce water waste and improve efficiency within the production, treatment, and distribution system. Supply management usually results in decreased cost to the water utility as water system losses are reduced. Both demand and supply management techniques were considered in development of a Water Conservation Plan for rural areas of Hidalgo County.

### Demand Management Alternatives

#### 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 buildings, in landscaping and lawn uses, and in recreational uses. An effective education and



information program can be easily and inexpensively administered by Hidalgo County through cooperative efforts with the water supply corporations. Materials available from the American Water Works Association, the TWDB, and other similar associations can easily be acquired for distribution to customers through hand-outs, mail-outs, bill stuffers, and other sources. Translation of the many available materials into the Spanish language will be necessary to maximize their effectiveness. Distribution of materials to school children, another feasible method, promotes conservation at an early age. Local newspapers are most often used for public service announcements, and the various local publications can be used to print articles concerning water conservation. The use of radio stations in the area, together with public and cable television systems, also can be utilized for this purpose.

#### Plumbing Codes

Water-saving plumbing codes for new construction and replacement of existing plumbing are effective methods of reducing water demands. Water-saving plumbing codes, however, must be adopted and enforced by building inspection to be effective. At the present time, there is no means of enforcing a county-wide water conservation plumbing code within Hidalgo County. Therefore, this method of water conservation is not considered feasible. An alternative to regulation and enforcement is the extension of the education and information program to include information about water-saving devices on a voluntary basis. This alternative is a



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viable method and has been considered for adoption into the Water Conservation Plan.

#### Retrofit Programs

Hidalgo County can 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. Information regarding retrofit devices, such as low-flow shower heads or toilet dams which reduce water use by replacing or modifying existing fixtures or appliances, can be provided to those residents which will be obtaining wastewater service. Because most existing residents have septic tank systems, it is likely that many already practice some measures to reduce overflow to the absorption field. For those residences currently without indoor plumbing, water conserving fixtures can be specified and installed prior to connection to proposed treatment facilities.

#### Water Rate Structures

A water conservation-oriented rate structure usually takes the form of an increasing block rate, although continuously increasing rate structures, peak or seasonal load rates, excess use fees, and other rate forms can be used. The increasing block rate structure is the most commonly used water conservation rate structure. Separate rate structures are usually used for residential, commercial, institutional, and industrial customers.

Except for LaJoya WSC and Military Highway WSC, water supply corporations which supply the rural areas currently use a



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declining block rate structure, which does not promote water conservation practices.

Hidalgo county should encourage the WSCs which do not already do so to review their existing rate structures and adopt a water conservation rate structure. At a minimum, a flat rate structure should be considered to reduce hardship on the lower income rural area families.

#### Water-Conserving Landscaping

In order to reduce the demands placed on a water system by landscape irrigation, the water utility should consider methods that either encourage (by education and information) or require (by regulation) water-conserving landscaping by residential customers and commercial establishments engaged in the sale or installation of landscape plants or watering equipment. In urban communities as much as 35 percent of total residential water use can be traced to exterior uses such as lawn watering and car washing. In many rural colonies landscape water use is already minimized due to a lack of significant landscaping practices, relatively low water pressures delivered through the WSC's small diameter distribution system and the number of septic absorption systems which serve to irrigate portions of the residential properties. In some more affluent incorporated areas served by the WSC's, sprinkler systems are becoming more prevalent, as noted by engineers for the water supply corporations. The continued rise and use of such systems, however, are almost self-limiting in that the small diameter distribution mains (2-, 4-, and 6-inches)



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simply cannot deliver sustained high volumes of water. In these areas, Hidalgo County officials should encourage, through the WSC's, water conserving landscaping practices.

### Supply Management Alternatives

#### Universal Metering

All water users, including the water utility and other public facilities, should be metered. A regularly scheduled maintenance program of meter repair and replacement should be established to maintain meter accuracy. Most important, metering can provide an accurate accounting of water uses throughout the system. In addition, the water utility may be able to locate and bill previously unbilled users. Metering and meter repair and replacement, coupled with an annual water audit, can be used in conjunction with other programs such as leak detection and repair, and thereby save significant quantities of water.

It is not known what proportion of water used in the WSC service areas is being metered, although all known connections have service meters. Given the distribution system is composed of small diameter PVC pipe, illegal connections would not be difficult to obtain and may go undetected for some time. Only through annual water auditing and accurate billing procedures can such connections be determined. Each of the WSC should be encouraged to implement such programs to determine if illegal connections exist.



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### 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 should 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, (where available) and leaks in mains and services. Once located, corrective repairs or actions need to be undertaken.

Each of the WSCs maintains their respective water distribution systems. Waterline breaks are reported by citizens or discovered during routine inspections by WSC personnel. Such leaks are promptly corrected. These measures will continue as part of the Conservation Plan.

### Recycling and Reuse

A water utility should evaluate the potential of recycling and reuse because these methods may be used to increase water supplies within 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 utility's supply. Recycling of in-plant process or cooling water can reduce the amount of fresh water required by many industrial operations.

Reuse or recycling of treated wastewater within rural areas of Hidalgo County has limited potential at the present time. The



costs of small scale recycling and reuse programs which might be applicable in areas receiving centralized wastewater treatment, prohibit their implementation except when there is a significant need to reduce water use. If large regional facilities are constructed, treated effluent should be considered for irrigation of parks, golf courses, or similar areas. The current widespread use of cropland for production of food for direct human consumption precludes disposal of effluent on adjacent lands in many areas.

#### Plan Description

Based on the evaluation of alternatives available to rural areas in Hidalgo County for conserving water, the following elements have been selected as those best suited to the needs of the rural colonies for water conservation.

- ° Demand Management
  - Public Education and Information
  - Retrofit Programs (Installation of New Indoor Plumbing)
- ° Supply Management
  - Universal Metering/Annual Water Auditing
  - Meter Repair and Replacement
  - Leak Detection and Repair
  - Recycling and Reuse

The conservation approach for the rural service areas of Hidalgo County must consider the individual needs of the area residents, many of whom already use minimal quantities of water, simply because they cannot afford more extravagant uses. While Hidalgo County officials will assume a coordinating role in the execution of the Plan, the County will have no direct contact





with the end users of the water. This contact will be possible only through the water supply corporations which serve the areas.

As the implementing agency, Hidalgo County will encourage participation in the Plan by the WSCs. Incentives which will be stressed include possible deferral of construction of new supply facilities as a result of water conservation measures, increased revenues from adoption of water conservation oriented water-rate structures, and potential increases in revenue or net water supply from connection or disconnection, respectively, of previously unauthorized system users.

When the water conservation program is implemented, Hidalgo County will prepare for implementation by the WSCs, or possibly other water suppliers, education and information programs. The methods that will be used to distribute first-year information to the public are as follows:

1. An initial fact sheet explaining the new water conservation program and the contents of the drought contingency plan;
2. Two pamphlets on water conservation issued through mail-outs, bill stuffers, door hangers, or other method of direct issuance;
3. Two corresponding announcements concerning water conservation by newspaper, radio, or cable television articles;
4. Print water conservation tips on water bills six times during the year or implement other information activities;

During subsequent years of the program, technical information on water conservation will be provided semi-annually directly to



the public in the form of pamphlets or bill stuffers. In addition, water conservation information will be made available to plumbers and retail distributors of plumbing fixtures and to new customers when they apply for water service. When appropriate, educational materials will be provided in the Spanish language.

At present, there are no universally enforced plumbing codes in Hidalgo County. However, in accordance with Senate Bill 2, Hidalgo County will require that all recipients of service use water conserving fixtures when installing new fixtures. This provision will be applicable to all homes, businesses, public facilities, and other structures where plumbing fixtures are being installed for the first time as a requirement for state financial assistance.

As part of its retrofit program, Hidalgo County will provide information through its education program for plumbers and customers to use when purchasing and installing plumbing fixtures, lawn watering equipment, or water-using appliances. Information regarding retrofit devices, such as low-flow shower heads or toilet dams which reduce water use by replacing or modifying existing fixtures or appliances, will be provided to those residents which will be obtaining wastewater service.

In addition to these programs, Hidalgo County will encourage adoption of conservation-oriented water rate structures for those entities which do not utilize such structures. Water-conserving landscaping will be emphasized in the education and information program. The practice of universal metering will be supported in



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discussions with water suppliers. Among other benefits, universal metering will provide for a sound database from which water conservation efforts can be measured. The County will consider purchase of leak detection and meter test equipment that can be provided to utilities on a loan basis. Likewise, the County will consider water reuse and recycling when applicable.

#### Implementation of the Water Conservations Plan

Hidalgo County is the most likely agency to assume responsibility for implementation and coordination of water conserving efforts. These efforts will no doubt be complicated by the number of WSCs, customers, and the lack of authority of the County over private water supply entities. Implementation, therefore, must rely on voluntary compliance by the WSCs given the incentives previously noted.

One means of enforcement may be through water sales contracts between major water or wastewater service providers and the water supply corporation purchasing such services. Water sales contracts may be applicable if an "overall entity" is established to implement the Conservation Plan. The applicability of water sales contracts as an enforcement and implementation tool will be explored as new contracts are completed or updated.



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### Introduction

Drought, or a number of other uncontrollable circumstances, can disrupt the normal availability of community or utility water supplies. Even though a city may have an adequate water supply, the supply can become contaminated, or a disaster can disrupt or destroy the supply. During drought periods, consumer demand is often significantly higher than normal. Some older systems, or systems serving rapidly growing areas, may not have the capacity to meet higher than average demands without system failure or other unwanted consequences. System treatment, storage, or distribution failures also can present a city or utility with an emergency demand management situation.

It is important to distinguish drought contingency planning from water conservation planning. While water conservation involves implementing permanent water use efficiency or reuse practices, drought contingency plans establish temporary methods or techniques designed to be used only as long as an emergency exists.

An effective Drought Contingency Plan includes the following six elements:

- ° Trigger conditions signaling the start of an emergency period.
- ° Drought contingency measures.
- ° Information and education.
- ° Initiation procedures.
- ° Termination notification actions.
- ° Means of implementation.



### Trigger Conditions

For the purposes of this Plan, trigger conditions will be considered on an individual WSC system, rather than Hidalgo County as a whole. A description of conditions considered mild, moderate, severe, and critical follow.

- ° Mild conditions are oftentimes discretionary, based on daily monitoring of water demands and weather forecasts and the water plant operator's judgment.
- ° Moderate conditions occur when combined pumpage from water plants is in excess of 85 percent of firm capacity for three days, or 90 percent of firm capacity for one day, or when continually falling elevated storage tank levels occur and storage cannot be replenished over 70 percent of maximum tank volume overnight.
- ° Severe conditions occur when combined pumpage from water plants is in excess of 90 percent of firm capacity for three days, or 95 percent of firm capacity for one day, or when continually falling elevated storage tank levels occur and storage cannot be replenished over 50 percent of maximum tank volume overnight.
- ° Critical conditions are reached when water plant pumpage exceeds 95 percent of firm capacity for three days, or 100 percent of firm capacity for one day, or a major line break or a pump or system failure occurs which causes pressures to drop significantly. Prolonged power outage also constitutes a critical condition.

### Emergency Management Program

The following actions shall be taken by the Water Supply Corporation when trigger conditions are reached.

- ° Mild Conditions
  - Request customers to voluntarily limit amount of water used.
  - Increase monitoring of water supply versus demand.
  - Increase leak detection and repair efforts.



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° Moderate Conditions

- All of the above conditions, plus.
- Request odd/even lawn irrigation on daily basis depending on house address.
- Request no swimming pool refilling, car washing, or other types of outdoor water uses.
- Request that restaurants do not serve water unless requested by customer.

° Severe Conditions

- Continue implementation of all Stage 2 restrictions, except reduce lawn irrigation to every two days; e.g., even house addresses on Sunday and Thursday, odd house addresses on Tuesday and Saturday, etc.
- Request reduction of all outside water use.
- If voluntary efforts do not produce required results, reduce water plant operating pressure to reduce water demand during peak periods if possible.
- Maintain normal pressure during off-peak hours to fill elevated storage tanks.

° Critical Conditions

- Prohibit all public water uses not required for health or safety.
- Prohibit all outside water use.
- Reduce plant operating pressures to maintain a minimum residual of 40 psi in the system when excessive water demands are the cause of critical conditions.
- Isolate remaining elevated storage for fire or emergency reserve.

Information/Education

As a component of the Information/Education section in the Water Conservation Plan, the purpose and effect of the Drought



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Contingency Plan will be communicated to the public through articles in local newspapers, supplemented by pamphlets distributed at the same time and public service announcements on local television.

When trigger conditions appear to be approaching, the public will be notified through publication of articles in local newspapers with information on water-conserving methods. During critical conditions, signs may be posted at public buildings (libraries, schools, etc.).

When trigger conditions have passed, the local newspaper will publish notification that drought contingency measures are abated for that condition, and, if applicable, will outline measures necessary for the reduced condition.

Throughout the period of a trigger condition, regular articles will appear to explain and educate the public on the purpose, cause, and methods of conservation for that condition.

#### Implementation/Enforcement

It will be the responsibility of the water supply corporations with coordination of Hidalgo County Government Officials to monitor the status of the water supply and distribution systems. When a trigger condition is reached, the operating board of the WSC will implement the Drought Contingency Plan.

WSC operating personnel will continue to monitor the water emergency until it is determined that the trigger condition no longer exists. When this occurs, operations personnel will



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notify the respective WSC Boards and the Drought Condition Abatement procedures will be implemented.

Update of Trigger Conditions

Once a year, each WSC with cooperation of the Hidalgo County Government will examine the production requirements and ability to maintain these requirements to determine if trigger conditions need to be re-established.



PROVIDING MANAGEMENT AND TECHNICAL ASSISTANCE

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1101 North Cage • Suite 4 "A" • Pharr, Tx. 78577  
(512) 787-0256



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HIDALGO COUNTY WATER  
DEVELOPMENT BOARD ARTICLES OF  
INCORPORATION

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ARTICLE OF INCORPORATION  
OF  
HIDALGO COUNTY WATER DEVELOPMENT BOARD

ARTICLE I.

The name of the Corporation is HIDALGO COUNTY WATER DEVELOPMENT BOARD.

ARTICLE II.

The Corporation is a non-profit corporation. Upon dissolution, all of the Corporation's assets shall be distributed to the State of Texas or any political subdivision thereof, or an organization exempt from taxes under Internal Revenue Code Section 501(c)(3) for one or more purposes that are exempt under the Texas franchise tax.

ARTICLE III.

The period of its duration is perpetual.

ARTICLE IV.

The purpose for which the Corporation is organized is to perform charitable activities within the meaning of Internal Revenue Code Section 501(c)(3) and Texas Tax Code Section 11.18(c)(1). Specifically, the Corporation is organized to benefit the low income residents of the rural areas of Hidalgo County, Texas. The Corporation shall prepare grant applications and coordinate plans and specifications for construction of water and sewer improvements for rural areas in Hidalgo County, Texas, as well as provide assistance to cities and other governmental bodies in connection with extending and improving water and sewer services to rural areas in Hidalgo County, Texas. The Corporation shall not have the power to engage in any activities, except to an insubstantial degree, that are not in furtherance of the purposes set forth above.

ARTICLE V.

Except as otherwise provided in these Articles, the Corporation shall have all of the powers provided in Vernons Annotated Civil Statutes Article 1396-2.02.

ARTICLE VI.

The Corporation shall have no power to take any action that would be inconsistent with the requirements for a tax exemption under Internal Revenue Code Section 501(c)(3) and related regulations, rulings, and procedures. The Corporation shall have no power to take any action that would be inconsistent with the requirements for receiving tax deductible charitable contributions under Internal Revenue Code Section 170(c)(2) and related regulations, rulings, and procedures. Regardless of any other

provision in these Articles of Incorporation or state law, the Corporation shall have no power to:

1. Engage in activities or use its assets in manners that are not in furtherance of one or more exempt purposes, as set forth above and defined by the Internal Revenue Code and related regulations, rulings, and procedures, except to an insubstantial degree.
2. Serve a private interest other than one that is clearly incidental to an overriding public interest.
3. Devote more than an insubstantial part of its activities to attempting to influence legislation by propaganda or otherwise, except as provided by the Internal Revenue Code and related regulations, rulings, and procedures.
4. Participate in or intervene in any political campaign on behalf of or in opposition to any candidate for public office. The prohibited activities include the publishing or distributing of statements and other direct or indirect campaign activities.
5. Have objectives that characterize it as an "action organization" as defined by the Internal Revenue Code and related regulations, rulings, and procedures.
6. Distribute its assets on dissolution other than for one or more exempt purposes; on dissolution, the Corporation's assets shall be distributed to the state government for a public purpose, or to an organization exempt from taxes under Internal Revenue Code Section 501(c)(3) to be used to accomplish the general purposes for which the Corporation was organized.
7. Permit any part of the net earnings of the Corporation to inure to the benefit of any private shareholder or member of the Corporation or any private individual.
8. Carry on an unrelated trade or business except as a secondary purpose related to the Corporation's primary, exempt, purposes.

#### ARTICLE VII.

The Corporation shall have one class of members and their qualifications shall be as provided in the Bylaws of the Corporation.

ARTICLE VIII.

The address of the registered office of the Corporation is 311 North 15th Street, P. O. Box 220, McAllen, Texas, 78502, and the name of its registered agent is JAMES E. DARLING.

ARTICLE IX.

The number of directors constituting the initial board of directors of the Corporation is three (3) and the names and addresses of the persons who are to serve as the initial directors are:

LUCIANO OZUNA 100 N. Closner Edinburg, Texas 78539	HILDA ADAME 921 Miller Donna, Texas 78537
ARTURO GUAJARDO 709 S. Nebraska San Juan, Texas 78589	

ARTICLE X.

The name and addresses of each incorporator is:

LUCIANO OZUNA 100 N. Closner Edinburg, Texas 78539	HILDA ADAME 921 Miller Donna, Texas 78537
ARTURO GUAJARDO 709 S. Nebraska San Juan, Texas 78589	

Executed this \_\_\_\_\_ day of \_\_\_\_\_, 1989.

INCORPORATORS:

\_\_\_\_\_  
LUCIANO OZUNA

\_\_\_\_\_  
HILDA ADAME

\_\_\_\_\_  
ARTURO GUAJARDO

Sworn to on the \_\_\_\_\_ day of \_\_\_\_\_, 1989, by the above named incorporators.

\_\_\_\_\_  
Notary Public, State of Texas

CORP1:ARTINC.868