TOD	Transit Oriented Development
TxDOT	Texas Department of Transportation
UP	Union Pacific
v/c	vehicles to capacity ratio

Glossary

Access management	The planning, design, and implementation of land use and transportation strategies (such as regulation of interchanges, intersections, driveways and median openings to a roadway) to manage the flow of traffic between the road and surrounding land.
Actions	Governing principles that directly implement the City of Tomball's goals and vision statement. Actions are statements of definite course
Annexation	The act of a city adding land and extending its municipal boundary.
Build out	When all land within the planning area has been developed according to appropriate land uses
Circulation	The movement of people and products within a defined area.
Clustering	Condensing development in one area to preserve another area.
Compendium	A concise, yet comprehensive, compilation of existing conditions data and related information.

Comprehensive plan	A statement of public policy and an expression of the community's vision used to guide future growth and redevelopment.
Consumer Price Index	A program that produces monthly data on changes in the prices paid by urban consumers of a representative basket of goods and services.
Context sensitive design	An approach by which development fits its physical setting and preserves scenic, aesthetic, historic, environmental, and similar resources.
County island	An unincorporated area that is surrounded, but not included, within municipal boundaries.
Crime Prevention Through Environmental Design (CPTED)	A multi-disciplinary approach to deterring criminal behavior through environmental design.
Cultural resources	Encompass archaeological, traditional, and built environment resources, including but not necessarily limited to buildings, structures, objects, districts, and sites.
Density	A measure of people or buildings in a particular area.
Density bonus	A planning tool that encourages developers to increase the density of a development (without increasing the total dwelling units) in order to preserve open space or provide park and recreational amenities.
Extraterritorial jurisdiction (ETJ)	The land beyond the city's limits that the city has limited governing authority and may annex.

Fee-in-lieu	A system where a City allows an entity to pay a fee instead of implementing a requested measure.
Goals	Broad expressions of the type of community desired by the people who live, work, and play in Tomball. The goals will guide the long-range development of the community. Goals provide general direction and serve as a description of a desired future. Typically, goals are ongoing and timeless. Goals are fundamental and provide the "big picture" of what the City wants for its future.
Level of service (LOS)	The qualitative rating system used to describe the adequacy of the road network at a specific intersection or street segment, based on factors including travel time, freedom to maneuver, driver comfort, and interruptions; LOS A is used to describe the best traffic conditions while LOS F denotes gridlock. *LOS can also be used to describe transit and bicycle/pedestrian networks.*
Multimodal transportation	Integrated use of multiple forms of transport including car, truck, boat, air, bike, etc.
Municipal Planning Area	The combined area of the incorporated city and extraterritorial jurisdiction.
Objectives	Desired end that relates to a stated goal, which if accomplished in conjunction with other actions, causes a goal to be achieved.
Pedestrian oriented neighborhood design	Development that promotes walkability and pedestrian-friendly activities.

Rain garden	a shallow depression that is planted with native wetland or wet prairie wildflowers and grasses; rain gardens are used to mitigate drainage and flooding by capturing runoff from impervious surfaces such as roofs, driveways, parking lots and roads.
Scrivener's error	A minor error in notation or spelling on a document that, upon correction by the maker of the error, would not affect the intent of the document or its legal validity.
Toll	A fee charged to users to cover the operational cost and/or expansion of an amenity.
Transferring of development rights	A land use regulatory tool under which development rights can be severed from a tract of land and sold in a market transaction. The parcel from which the rights are transferred is then permanently restricted as to future development, and the purchaser of the rights may assign them to a different parcel to gain additional density.
Transit Oriented Development (TOD)	The creation of compact, walkable communities centered around high quality transit systems, such as a commuter rail station.
Zoning	A land use regulatory tool to classify districts or parcels of land.

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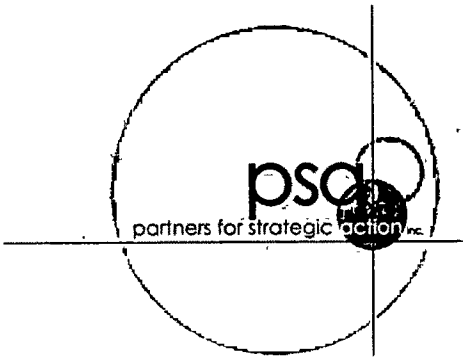

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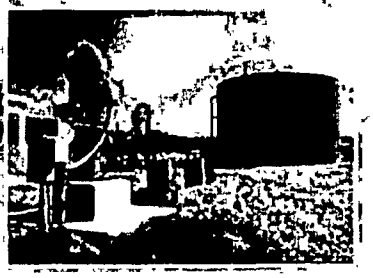
North Harris County
REGIONAL WATER
Authority

Groundwater Reduction Plan



May 2009

Turner Collie & Braden Inc.
Engineers • Planners • Project Managers

and

ARCADIS

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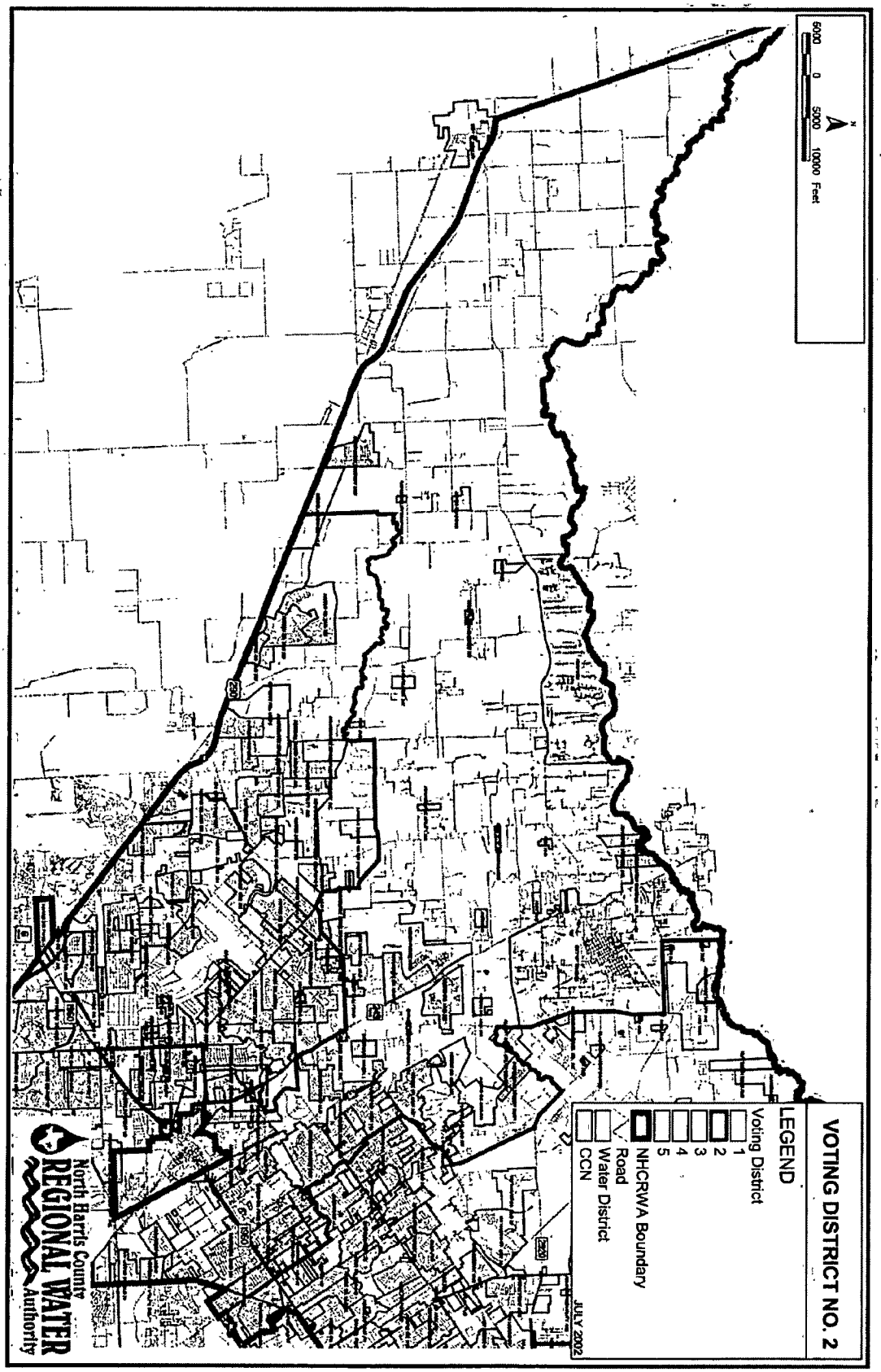

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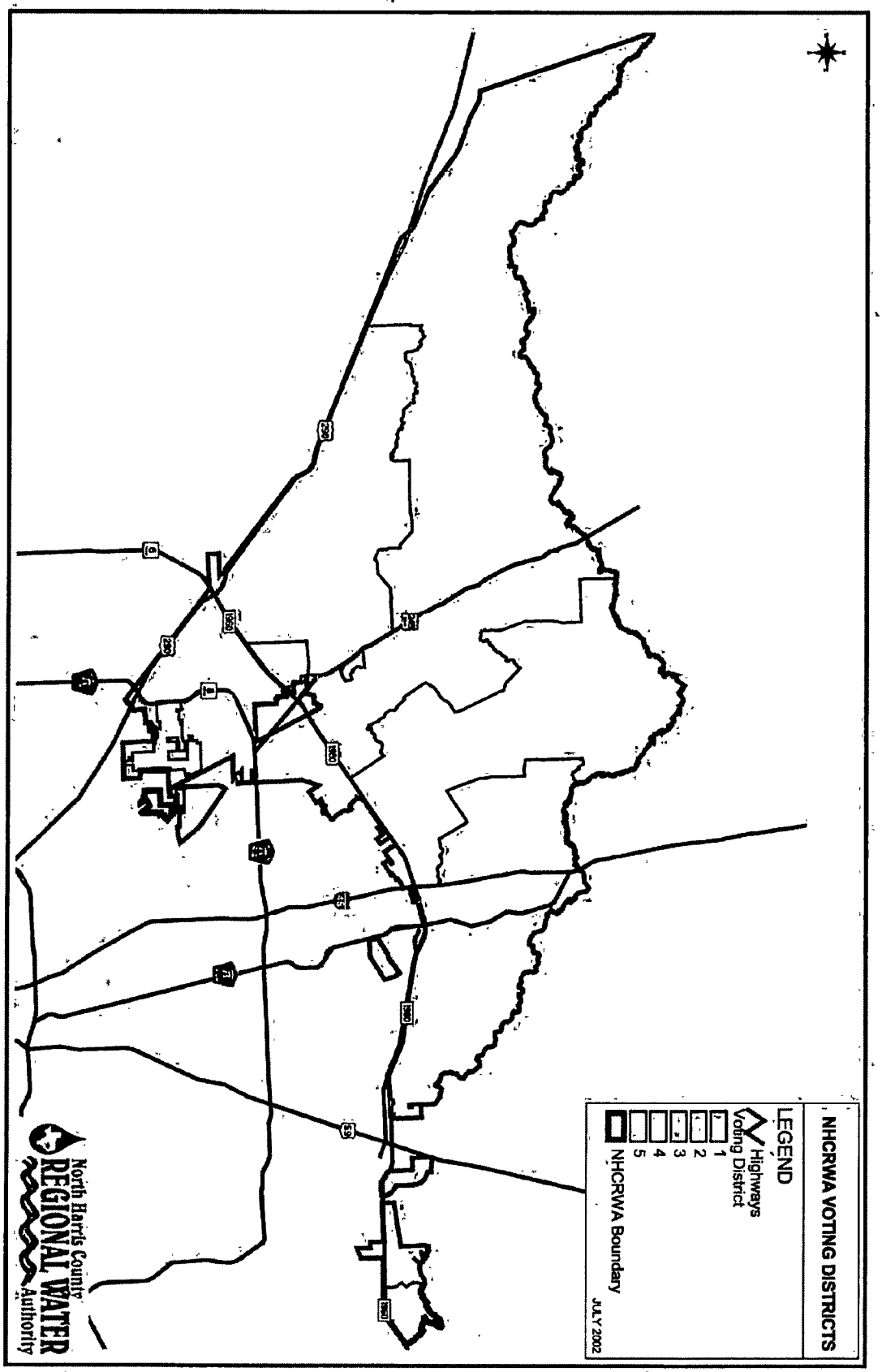

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EXECUTIVE SUMMARY

The North Harris County Regional Water Authority (NHCRWA) is a governmental agency created by House Bill 2965 of the 76th Texas Legislature. One of the primary missions of the NHCRWA is to deliver an alternate water supply that reduces groundwater withdrawal by the NHCRWA's fee-paying customers and gain compliance with the mandates of the Harris-Galveston Coastal Subsidence District (HGCSD). The NHCRWA has 160 political subdivisions that include cities, Municipal Utility District's (MUD), Public Utility District's (PUD), Water Control and Improvement District (WCID), Utility District's (UD), etc., (collectively referred to as MUDs) as well as independent well owners that combined have a total of 1,612 groundwater wells within the NHCRWA. The total year 2000 well pumpage within the NHCRWA as reported to HGCSD was over 25 billion gallons.

The HGCSD is an underground water conservation district that was created for the purpose of regulating the withdrawal of groundwater in Harris and Galveston Counties to minimize land subsidence. Their 1999 District Regulatory Plan divides the district into three regulatory areas. Areas 1 and 2 have gained substantial compliance with the requirements of the plan. The NHCRWA is located in Area 3 and must meet the following regulatory schedule:

- Complete certification of Groundwater Reduction Plan (GRP).
- Begin construction of infrastructure by January 2005.
- Meet 30 percent conversion to alternate water source by January 2010.
- Meet 70 percent conversion to alternate water source by January 2020.
- Meet 80 percent conversion to alternate water source by January 2030.

The area that is under the jurisdiction of the NHCRWA is expected to experience significant growth. The actual population and water demand for the year 2000 and projected populations and water demands for the years 2010, 2020, and 2030 are shown in the following table.

NHCRWA Population and Water Demand Data[1]

Year	Population	Water Demand (mgd)
2000	397,000	69.2 [2]
2010	488,000	79.4
2020	608,000	98.0
2030	688,000	110.7

[1] See *Table 3*
[2] See *Table 4*, HGCSD's year 2000 pumpage

The NHCRWA has entered into a contract with the City of Houston (COH) to buy capacity in the raw water, treatment, and transmission system facilities owned or contracted by the COH. The treated surface water source will be the Northeast Water Purification Plant (NEWPP). The contract

is a long-term agreement that will satisfy the NHCRWA's requirements for an alternative source of water through at least 2030. Initially, the NEWPP will be a 40-mgd facility, with a phased expansion of approximately 40 million gallons per day (mgd). The plant is designed as a comparatively constant flow facility, with a 6-hour storage capacity and very little capacity to accommodate peak flows. The COH requires that water be metered at the point(s) at which it is taken by the NHCRWA. The NHCRWA intends to deliver water from the COH meter point to the NHCRWA's ground storage tanks. The NHCRWA will re-pressurize the water for distribution to its customers.

The NHCRWA will build its primary water transmission lines from the COH delivery points to its boundary in two construction phases. One transmission line will be constructed initially to satisfy the 2010 through 2019 conversion requirements. A second transmission line will be constructed to meet the requirements for 2020 through 2030. Other entities may pay a pro-rata share for capacity in the NHCRWA's transmission pipe. The Central Harris County Water Users Consortium and the West Harris County Regional Water Authority have been identified as possible participants at this time. The NHCRWA requested its primary water distribution system be sized and designed to provide all wholesale customers water at system pressure (55 to 65 pounds per square inch). Rates of water consumption vary widely throughout the year. Since the NEWPP will supply water at a comparatively constant rate, peaking requirements of wholesale customers will be provided from water sources within the NHCRWA Service Area.

A periphery connection will be made to each MUD from the NHCRWA primary distribution system. This is based on assumption that all MUD distribution systems have a large diameter line where the NHCRWA could connect to it. Refilling the wholesale customer's ground storage tank with water will require construction of a short supply line at its water plant, from its distribution system to its ground storage tank. Although this line will be closed any time the MUD booster pumps are operating, the NHCRWA's primary distribution system will be designed to still deliver average daily flow under normal conditions. The distinct advantage of system pressure delivery, as viewed by the NHCRWA, is the opportunity for some customers to phase out the operation of their groundwater wells, or its entire water plant(s), i.e., wells, storage tanks, and pumps. The latter is beneficial because of deteriorating water plants and the ability to take advantage of a regional source of supply. However, peak day operations of the system will be complex and rely heavily on instrumentation, controls, and predictive real time modeling to determine use of groundwater wells. It will also require that the operators be able to activate and deactivate individual wells to maximize the use of surface water.

The NHCRWA proposes to construct regional water plants and regional wells with collection lines to its regional water plants. This additional infrastructure is necessary to offset the wholesale customer's option to phase out its wells or entire water plants. The proposed additional wells will be submitted for permits through the various regulatory agencies for approval.

The area that will be served in 2010 is the central portion of the NHCRWA. The area is roughly bounded by SH 249 on the west, Spring Cypress Road on the north, IH 45 on the east, and FM 1960 and Bammel North Houston Road on the south. This area was chosen because of the high population density, economics of serving the area of greatest water demand and because several MUDs need an

alternate source of water to alleviate existing groundwater quality or quantity issues. The estimate of probable project cost for the 2010 system including engineering, land acquisition, permits, transmission lines, storage tanks, pumping stations, and distribution piping is $181.6 million, excluding interest, financing costs, and water capacity purchase.

The 2020 and 2030 conversion areas will spread outward from the initial area. The estimates of probable costs for 2020 and 2030 are $402.1 million and $29.1 million, respectively, and $612.7 million total for all three decades, excluding interest, financing costs and water capacity purchase. The above estimates of probable costs were developed using Region H Water Planning Group 1999 unit values.

The NHCRWA anticipates that water reuse and early/over conversion may generate credits against the total amount of surface water that must be used to achieve compliance. The NHCRWA reserves the right to submit for consideration an amended GRP in the future discussing these concepts along with a methodology of applying credits.

SECTION 1 – INTRODUCTION

The North Harris County Regional Water Authority (NHCRWA) has developed this Groundwater Reduction Plan (GRP) to demonstrate its commitment to meeting the groundwater conversion requirements of the Harris-Galveston Coastal Subsidence District (HGCSD).

A. HGCSD'S 1999 DISTRICT REGULATORY PLAN – AMENDED 9-12-01

The HGCSD was created in 1975 as an underground water conservation district under Article XVI, Section 59 of the Texas Constitution. The charge of the HGCSD is to regulate withdrawal of groundwater in Harris and Galveston Counties for the purpose of reducing the rate of land subsidence. Regulatory procedures for the minimization of subsidence have been implemented in a series of District Regulatory Plans. The most recent plan is the 1999 District Regulatory Plan as amended on September 12, 2001.

The 1999 District Regulatory Plan divides the HGCSD into three Regulatory Areas (see *Exhibit 1*). The Regulatory Areas have been reconfigured from the previous plan to generally reflect converted versus unconverted areas. The 1999 District Regulatory Plan requires that non-exempt municipal utility districts and individual well owners within Area 3 prepare a GRP to identify how they will replace groundwater demand with alternate sources of water according to the following schedule:

1. Beginning in January 2003, a permittee (or a group of permittees operating under a single permit, within the same regulatory area) will be required to submit a GRP to the District for certification.

2. Beginning in January 2005, a permittee will be required to provide the District with evidence that construction of the infrastructure defined within the permittee's certified GRP has started.

3. Beginning in January 2010, a permittee (or a group of permittees operating under a single permit, within the same regulatory area) shall be required to reduce and maintain their groundwater withdrawals to comprise no more than 70 percent of the permittee's total water demand.

4. Beginning in January 2020, a permittee (or a group of permittees operating under a single permit, within the same regulatory area) shall be required to reduce and maintain their groundwater withdrawals to comprise no more than 30 percent of the permittee's total water demand.

5. Beginning in January 2030, and continuing thereafter, a permittee (or a group of permittees operating under a single permit, within the same regulatory area) shall be required to reduce and maintain their groundwater withdrawals to comprise no more than 20 percent of the permittee's total water demand.

A disincentive fee shall be applied to any groundwater withdrawals that constitute greater than 20 percent of a permittee's (or a group of permittees operating under a single permit within the same

regulatory area) total water demand if a permittee has not developed and received certification of a GRP by the permit renewal date or if a permittee is not able to provide evidence of construction of the infrastructure defined within the permittee's certified GRP by January 2005 (Item 2 of this section).

Similarly, a disincentive fee shall be applied to any groundwater withdrawals that constitute greater than 20 percent of a permittee's (or a group of permittees operating under a single permit within the same regulatory area) total water demand if a permittee is not in compliance with the reduction schedule found in Items 3, 4, and 5 of this section.

B. HISTORY OF NHCRWA

House Bill 2965 of the 76th Texas Legislature created the NHCRWA. A map of the NHCRWA boundary is shown in *Exhibit 2*. The NHCRWA is located within the HGCSD Regulatory Area 3. One of the NHCRWA's missions is to identify an alternate long-term supply of water for its customers to comply with the 1999 District Regulatory Plan. House Bill 1110 of the 77th Texas Legislature updated the initial legislation including changes to the inclusion of certain territories and eminent domain sections. Copies of both these house bills are provided in *Appendix A*.

The NHCRWA's GRP identifies the alternate water supply source. The areas within its boundaries that will be converted to the alternate supply to meet the HGCSD conversion schedule, plans for distributing water to meet the 2010 conversion requirement and for phasing construction of the distribution system to meet 2020 and 2030 goals, estimated costs of constructing the new facilities, and a method of financing the construction are all included in the GRP.

C. DESCRIPTION OF NHCRWA AND ITS CUSTOMERS

As shown in *Exhibit 2*, the boundaries of NHCRWA are essentially US 290 on the west, the Harris County line on the north (Spring Creek), FM 1960 and Bammel-North Houston on the South, and western shores of Lake Houston of the east. The NHCRWA has 158 political subdivisions within its boundaries that include municipal utility districts (MUDs) and public utility districts (PUDs), water control and improvement districts, fresh water supply districts, water supply corporations, municipalities, etc. (collectively referred to as MUDs), as well as independent well owners that have a combined total of 1,612 groundwater wells within the NHCRWA. The total year 2000 well pumpage within the NHCRWA as reported to HGCSD, was over 25 billion gallons. See *Table 1* for a further breakdown of the well production. There are currently approximately 250 entities, MUDs and independent well owners, with one or more groundwater wells that produce a cumulative total of 5 million gallons per year or more. The NHCRWA's fee-paying customers for this GRP include those entities whose cumulative annual groundwater well production is equal to or greater than 5 million gallons. However, this minimum flow rate is one of several factors that may include or exempt MUDs or independent well owners from being a customer to the NHCRWA.

The NHCRWA mailed Geographical Information System (GIS) Questionnaires to MUDs and independent well owners in November 2000. The returned GIS Questionnaires were completed to

various degrees. This limited data assisted in establishing unit demand factors calculated by review of well pumpage rates with existing and future connections, water plant facility sizes, and more. Results of these questionnaires show there were over 100 water plants and 150 system interconnects for either normal or emergency water system operations. In the future, additional questionnaires may be mailed requesting an update of earlier information and gathering other data, such as typical water use patterns, peaking factors, and disinfection and treatment systems.

SECTION 2 – POPULATION AND WATER DEMAND PROJECTIONS

This section discusses the sources of data for population projections and the methodology that was used to develop water demands based on the population projections. The water demands were used to determine the quantity of water that will be converted to an alternate source in 2010, 2020, and 2030. The demands were also used to size the piping for the transmission and distribution systems.

Sources of population and water demand data that are readily available include the Region H plan and the 1996 HGCSD report entitled *Update of Population and Water Demand Forecasts for the Harris-Galveston Coastal Subsidence District* (HGCSD 1996 Report). The Region H projections are not considered to be detailed enough to assess growth in small areas within the NHCRWA. This study used year 2000 census data and projections specific to the NHCRWA to more accurately reflect the conditions within the NHCRWA boundary. The NHCRWA received a letter from Reliant Energy to exclude the Wharton Power Plant in the NHCRWA GRP. Since the City of Jersey Village contracted 750,000 gallons per day (gpd) of water from the City of Houston, this amount is excluded from the NHCRWA's GRP. Only water demand projections over the contract amount are included in the NHCRWA GRP for the City of Jersey Village in the design of the proposed distribution system.

A. POPULATION PROJECTIONS

The population projections used in the GRP were taken from the Small Area Model-Houston (SAM-Houston) developed by the University of Houston Center for Public Policy (UH CPP). This is the same methodology upon which the *HGCSD 1996 Report* estimates of population projections were made. SAM-Houston combines modeling strategy with statistical processing of a wide variety of data sources about the Houston area. The SAM-Houston model allocates metropolitan-wide population and employment forecasts to each census tract in the five-county metropolitan area (Fort Bend, Harris, Liberty, Montgomery, and Waller Counties); the census tracts are shown in *Exhibit 3*. The projections are provided in 10-year increments through the year 2030. The UH CPP updated the SAM-Houston model with year 2000 census data combined with 1990 census land-use and employment data. The U.S. Census Bureau had not released its 2000 land-use and employment data.

Some SAM-Houston model projections appeared to have some anomalies in the projections that may not accurately reflect the growth that is occurring within the NHCRWA. The anomalies consisted of census tracts that showed either population decreases from 2000 to 2010 or tracts that showed population decreases over the entire period through 2030. In the case where 2010 population is lower than 2000, 2020, or 2030 populations, growth for 2010 and 2020 were interpolated using a straight-lined projection to 2030. Approximately 21 percent of the census tracts were affected by this correction. In the second case, no growth was assumed for the 30-year period rather than a declining population. Approximately 12 percent of the census tracts were affected by this correction. Professor Steven Craig, UH CPP, reviewed and approved these corrections (Craig March 2002). The existing and projected population projections, as shown in *Table 2*, are 397,074 for 2000; 487,499 for 2010; 607,576 for 2020; and 688,111 for 2030.

B. WATER DEMAND PROJECTIONS

Water demand projections were calculated using the UH CPP census tract population and employment forecasts, unit demand factors, and other pumpages. Based on the *HGCSD 1996 Report* on population and water demand projections for the HGCSD's service area, it is assumed unit demand factors would be similar to future unit demand factors for population at 150 gallons per capita per day and employment at 27 gallons per employee per day. Comparatively, the GIS survey respondents, which represented approximately 75 percent of the MUDs and independent well owners, indicate an annual average water usage of 471 gpd per connection and approximately 3.91 connections per acre. It is assumed that the pumpages for HGCSD coded "industrial" and "other" non-public uses will remain constant for future years. Year 2000 well pumpage data within the NHCRWA was collected by the HGCSD and is presented in *Appendix B*. The water demand calculated using the demand factors stated compared very favorably with the actual water use recorded in year 2000.

To plan the 2010, 2020, and 2030 service areas of the NHCRWA's primary distribution system, the NHCRWA was divided into seven planning regions as shown in *Exhibit 4*. The planning region boundaries were defined using the major roads and usage density, i.e., the number of MUDs within a planning region. Planning Regions 1 through 5 were divided up so that the majority of surface water conversion would occur here to meet HGCSD's reduction goals. The remaining conversion amounts came from Planning Regions 6 and 7.

The existing and projected water demands for 2000, 2010, 2020, and 2030, shown in *Table 3*, are 65.3 million gallon per day (mgd), 79.4 mgd, 98.0 mgd, and 110.7 mgd, respectively. The required surface water conversion volume is 30 percent of total demand from 2010 through 2019, 70 percent of total demand from 2020 through 2029, and 80 percent of total demand for 2030 and thereafter. The projected surface water demands the NHCRWA must meet or exceed for 2010, 2020, and 2030 are 23.8 mgd, 68.6 mgd, and 88.6 mgd, respectively. The years 2019 and 2029 are critical years because the percent surface water conversion over the decade in which they occur must be at or above 30 and 70 percent, respectively. The surface water conversion goals for 2019 and 2029 are 28.8 mgd and 76.6 mgd, respectively. These annual average daily flow rates are the minimum flows necessary to meet the HGCSD's requirements.

To meet the projected surface water conversion goals for each construction phase, it was necessary to first determine the overall water demands for each fee-paying customer within the NHCRWA, i.e., MUDs and independent well owners with 5.0 million gallons per year (gpy) or greater. Known entities within NHCRWA were projected with water demands if their cumulative Year 2000 pumpages were 5.0 million gpy or greater. In addition, undeveloped Areas A to E, as shown in *Exhibit 7*, were projected with water demands to meet anticipated growth. The 2010 Service Area, shown in *Exhibit 6*, contains 47 wholesale customers, i.e., MUDs and independent well owners receiving surface water. The 2020 Service Area includes the 2010 Service Area, shown in *Exhibit 7*, and contains 74 additional wholesale customers for a cumulative total of 121. The 2030 Service Area includes the 2010 and 2020 Service Areas, shown in *Exhibit 7*, and contains 16 more wholesale customers for a cumulative total of 137.

Table 4 is a list of all the MUDs and independent well owners within NHCRWA as of year 2000 having cumulative well pumpages 5.0 million gallons per year or greater. This table is divided into four parts: existing and projected water demands per 2010, 2020, and 2030 Service Areas and a list of the entities and their projected water demands that are not within the 2030 Service Area. The water demand projections in *Table 4* are based on several factors including growth rate projections from the UH CPP average per Planning Region, HGCSD's year 2000 pumpage, MUD ultimate build-out connections, unit demand factors of 471 gpd per connection, and 3.91 connections per acre. Connections include residential, commercial, irrigation, and industrial connections. The flows generated were used to design the primary transmission and distribution systems for ultimate development conditions of the 2030 Service Area. The proposed design of the distribution system is sized large enough to accommodate future demands so the need for additional parallel piping can be averted.

There are three water projection terms used in this GRP. A projection by the UH CPP is based on census tract population projections and unit water demand factors established in the TC&B 1996 Report. This projection developed the surface water annual average daily flow (ADF) conversion goals for each decade through 2030, which will be referred to as a *CPP conversion goal.* The ADF projections for MUDs and independent well owners will be referred to as *Owner projection* used in development of the primary water distribution network model. The wholesale treated water supply contract with the City of Houston (COH) necessary to meet the CPP conversion goal will be referred to as the *Contract amount.* This last term will be discussed later in *Section 4 – Water System Alignment, Construction Schedule, and Costs.* The CPP conversion goals shown in *Table 3* are less than Owner projections in *Table 4.* For example, for year 2019 in the 2010 Service Area, the CPP conversion goal in *Table 3* is 28.8 mgd, versus the Owner projection in *Table 4* of 38.4 mgd. The proposed 2010, 2020, and 2030 service areas were developed through consensus of the NHCRWA's General Manager and a Technical Advisory Group composed of engineers who work with the MUDs. Further discussions about system operations are found in Section 4.

SECTION 3 – WATER SOURCE, CONTRACT, AND REFUSE

The purposes of this section are to identify the NHCRWA's alternative water supplier, discuss the source of water, and review the provisions of the proposed water supply contract.

A. INTRODUCTION

A May 2001 report entitled *Evaluation of Recommended Water Supply Alternatives for North Harris County Regional Water Authority* by Turner Collie & Braden Inc. evaluated six alternative sources of surface water supply for NHCRWA. This report provided the following:

1. A preliminary relative evaluation of numerous alternative water supply sources.
2. A comparative cost analysis of the alternatives.
3. Identification of potential sources of supply and calculation of the relative magnitude of costs associated with those sources as a means to compare and evaluate each option as a future source of water for the Authority.
4. Identification of the potential issues that would have to be resolved for each alternative.
5. Refined number of alternatives to be analyzed in greater depth, and refined cost information for those selected alternatives to serve the NHCRWA's short-term (Year 2010 Service Area) and long-term (Year 2050 Service Area) water demands.

Three of these sources were eliminated because they were not feasible. The remaining alternative sources included the COH, the Brazos River Authority, and the Chambers-Liberty Counties Navigation District. The report concluded that the NHCRWA participate with the COH in the phased construction of the Northeast Water Treatment Plant to treat raw water currently owned by the COH, and associated phased construction for transmission and distribution. This option provided the least responsibility for the NHCRWA because it will not have to operate the treatment plant or meet the increasingly stringent federal and state mandates for drinking water quality. In addition, the NHCRWA would benefit from the greater economies of scale by obtaining its water from a larger treatment facility, which would reduce the cost per 1,000 gallons treated. The analyses were based on assumptions of costs, since no firm COH charges were available for treated water.

B. COH SURFACE WATER SYSTEM

The supplier of wholesale treated surface water to the NHCRWA will be the COH. The COH was identified as the regional provider of surface water for Region H in the Senate Bill 1 planning study that was completed in 2001. The COH offered to supply treated surface water to the NHCRWA to meet HGCSD requirements. The COH and the NHCRWA have entered into a long-term contract in which the COH will provide water to the Authority.

The COH began implementing a long-term surface water supply in the 1950s. It comprises raw water facilities, surface water purification plants, and a distribution system that supplies surface water to Harris County and portions of Galveston County. The implementation of the COH surface

water system has been instrumental in making the conversion from groundwater to surface water possible.

Raw Water Facilities

The COH has an available surface water supply of 1,258,829 acre-feet per year (ac-ft/yr) as indicated in the Region H Planning Group *Task 3 Report* by Brown & Root/Turner Collie & Braden Inc. Most of this supply consists of water rights in Lake Conroe, Lake Houston, and Lake Livingston. Year 2000 surface water withdrawals for all users in Harris County totaled 598,561 ac-ft/yr. The 2030 surface water demand for the NHCRWA and other users in the unincorporated portion of Area 3 is estimated to be approximately 179,000 ac-ft/yr. Therefore, the COH has adequate reserve supply to serve the NHCRWA and other users in Area 3.

Lake Houston was the first part of the raw water system to be built. The lake, which is solely owned by the COH, was put into operation in 1954. It impounds the East and West Forks of the San Jacinto River. It was constructed to supply the East Water Purification Plant (EWPP) and industrial raw water customers. It has a yield of 168,000 ac-ft/yr, and the water rights to the yield are 100-percent owned by the COH.

Lake Livingston was completed in 1969. The project was implemented through a partnership with the Trinity River Authority. The lake has a yield of 1,255,500 ac-ft/yr, and the COH has rights to withdraw 902,800 ac-ft/yr.

The Coastal Water Authority (CWA) delivers raw water from the Trinity and San Jacinto Rivers to the COH. The CWA uses pump stations, canals, and transmission lines to deliver raw water to the COH water purification plants and to industrial raw water customers.

Lake Conroe was put into operation in 1972. It was constructed in partnership with the San Jacinto River Authority (SJRA). The lake impounds the West Fork of the San Jacinto River upstream of Lake Houston. Its 99,950 ac-ft/yr of yield is shared by the COH and the SJRA. The COH has rights to 67,029 ac-ft/yr that serves to supplement the yield of Lake Houston. SJRA owns the remaining 32,921 ac-ft/yr of the Lake Conroe yield.

The Wallisville Saltwater Barrier (WSB) was put into operation in 1999. Before the barrier was built, a portion of the water released from Lake Livingston could not be withdrawn to prevent the intrusion of saltwater into the lower Trinity River. The barrier prevents saltwater intrusion and allows the COH and other users to use the water that was previously allowed to flow into the Gulf of Mexico. The COH is now permitted to divert 38,000 acre-feet per year from the WSB.

The COH also has authority to divert an additional 83,000 acre-feet per year of Trinity River water from two other rights.

Two future projects will have an impact on the raw water system. The Luce Bayou project will allow water from the Trinity River to be transferred to Lake Houston for subsequent use in the San

Jacinto Basin. Allens Creek Reservoir will develop the COH's first surface water supply project in the Brazos River Basin.

Surface Water Purification Plants

The EWPP is the largest surface water treatment facility in the COH system. Plant I at the EWPP was put in service in the late 1950s. Two additional plants have been built at the site to bring the total treatment capacity to 300 mgd. The plant uses conventional treatment processes to treat water from the San Jacinto River and the Trinity River. Improvements are planned to re-rate the plant to a capacity of 350 mgd.

The Southeast Water Purification Plant (SEWPP) was put into operation in 1990 at a rated capacity of 80 mgd. The ownership of this plant is divided between several entities that include the COH. The SEWPP also uses conventional water treatment processes. It treats water provided by the CWA from the Trinity River. The plant is in the process of being re-rated to a capacity of 120 mgd. Plant design is currently underway to establish a rated capacity of 200 mgd.

The Northeast Water Purification Plant (NEWPP) is currently under construction with an initial capacity of 40 mgd. The second construction phase will expand the plant to a capacity of 80 mgd and will be used predominantly by the NHCRWA, to a lesser extent by the COH, and possibly by the Central Harris County Water Users Consortium. This second construction phase will be operational before 2010. The NEWPP will use conventional treatment processes to treat water that is withdrawn from Lake Houston.

Distribution System

The COH water distribution system includes over 200 miles of large diameter water transmission lines. Generally speaking, the EWPP serves the east and central portions of the COH service area, and the SEWPP serves the southern part of the COH system and portions of Galveston County.

Several transmission projects are underway to enable the transmission of surface water to the northwestern part of the COH service area. These projects will also enable the COH to supply surface water to west Harris County.

Water from the NEWPP will be used to supplement the EWPP service area and to supply water to north and west Harris County.

C. LOCATION OF WATER SOURCES AND TREATMENT

Treated surface water for the NHCRWA will be supplied from the NEWPP. The location of the plant is shown in *Exhibit 5*. The first 40-mgd module of the plant is now under construction, and it is estimated to be operational in 2004. The NEWPP will treat raw water from Lake Houston using conventional treatment processes to produce water that meets or exceeds U.S. Environmental

Protection Agency and Texas Commission on Environmental Quality (TCEQ) standards for drinking water.

The NEWPP will be expanded in the future to supply potable water to its non-COH customers. An additional 40-mgd module, for a total of 80 mgd, is necessary to supply the COH and the NHCRWA in the year 2010. Because the COH will also be supplying the West Harris County Regional Water Authority and a group of MUDs in Area 3, it is necessary that the total commitments not exceed the capacity available at the NEWPP. The COH already has plans for this expansion and will authorize the work after executing an agreement with the NHCRWA. Future expansions at the NEWPP may be required to meet the NHCRWA's needs in 2020 and 2030.

D. COH AND NHCRWA WATER CONTRACT PROVISIONS

The Water Supply Contract (the "Contract") with the COH includes the following principles:

1. The NHCRWA will purchase a pro-rata share of capacity of the COH untreated water facilities in sufficient quantity to ensure compliance with the Subsidence District's 1999 Regulatory Plan. The COH untreated water facilities include water rights, reservoirs, canals, storage, and pumping. Capacities will be designated and reserved at least five (5) years in advance of the milestone dates of 2010, 2020 and 2030 or whenever the NHCRWA requires an increase in its then-current demand allocation. The NHCRWA must purchase all of its initial 2010 untreated water supply capacity by December 31, 2009. The purchase price for the initial existing untreated water facilities allocation will be at the actual cost of the outstanding debt of the untreated water facilities in existence at the time of the Contract execution in accordance with the formula set forth in the Contract. For the 2010 capacity, the NHCRWA has the option to tender a lump sum payment to the COH prior to the date water is delivered or make annual payments for a period of time not to exceed 15 years by requesting negotiation of a separate agreement with the COH. It is the NHCRWA's intention to make a lump sum payment to the COH. In the event the COH constructs or acquires new untreated water facilities subsequent to the Contract execution or if the NHCRWA increases its demand allocation in existing untreated water facilities, the NHCRWA shall owe the COH an additional annual amount for its pro-rata share of the costs of such existing facilities or for such new untreated water facilities. The COH will provide 180 days' written notice to the NHCRWA regarding construction of any new untreated water facilities in order to provide the NHCRWA with the opportunity to increase its demand allocation.

   Future untreated water capacity will be reserved five (5) years in advance of the next milestone (2020 or 2030) or at any time additional capacity is needed by the NHCRWA. All payments for untreated water facilities capacity shall be calculated and paid in accordance with the formulas set forth in the Contract.

2. The NHCRWA will purchase a pro-rata share of capacity of the COH treatment plant facilities designated to serve the NHCRWA's service area in sufficient quantity to ensure compliance with the Subsidence District's 1999 Regulatory Plan. The treatment plant designated to serve the NHCRWA Service Area is the NEWPP, located just west of Lake Houston. Capacities will be designated and reserved a minimum of five (5) years in advance of the milestone dates of 2010, 2020, and 2030. The purchase price for capacity will be calculated and paid in accordance with the formulas set forth in the Contract. For the 2010 capacity of 31 mgd, the NHCRWA has the option to tender a lump sum capital payment by no later than July 1, 2003 or make annual interest payments and make the lump sum capital payment prior to receiving treated water. It is the intention of the NHCRWA to tender the lump sum capital payment to the COH of $51.5 million on or before July 1, 2003, pursuant to the Contract provisions.

   Future treated water capacity will be purchased at the time of the reservation by providing a capital payment for the additional capacity to the COH within 60 days after either receiving COH consent to the increased capacity or within 60 days of receiving an estimate from the COH of the capital payment for additional capacity in newly constructed treated water facilities, as specifically set forth in the Contract.

3. The NHCRWA will purchase a pro-rata share of capacity of the transmission line facilities designated to serve the NHCRWA's Service Area in sufficient quantity to ensure compliance with the Subsidence District's 1999 Regulatory Plan. The transmission line designated to initially serve the NHCRWA is an 84-inch-diameter line that is being constructed along Beltway 8 between the NEWPP and US 59. Capacities will be designated and reserved a minimum of five (5) years in advance of the milestone dates of 2010, 2020, and 2030. The purchase price will be the NHCRWA's pro-rata share of actual cost of the transmission line at the time of reservation. The NHCRWA's initial pro-rata share of the transmission line cost is included in the treatment water facilities cost of $51.5 million, as described in paragraph 2 above.

   Future transmission line capacity will be calculated and purchased in the same manner as the treated water facilities, as described in paragraph 2 above.

4. The NHCRWA will pay a pro-rata share of the COH's annual operation and maintenance costs of each of the above components (i.e., the untreated water facilities and treated water facilities) based on the percent of capacity purchased and in accordance with the formula reflected in the Contract. The annual operation and maintenance costs will be identified by the COH in an annual budget. The NHCRWA will make monthly payments to the COH based on the average annual operation and maintenance budget, along with providing an operation and maintenance reserve.

5. The NHCRWA will purchase a specific capacity in the COH water facilities designated to serve the NHCRWA's Service Area. If for some reason the COH cannot meet its customers' demands due to drought conditions or operational issues, the available supply will be allocated among its customers. Should the drought or the restricted delivery be over an extended period, the NHCRWA has the ability to engage certain groundwater facilities to meet its customer demands.

The above-described supply system and wholesale contract will provide a reliable source of water to meet the HGCSD regulatory requirements. A copy of the NHCRWA Contract with the COH can be found in *Appendix C.*

E. RECLAIMED WATER REUSE

The NHCRWA was established to meet the mandates for reduction of groundwater pumpage established by the HGCSD. The legislation creating the NHCRWA provides authority for conservation, protection, recharge, prevention of waste of groundwater, and reduction of groundwater withdrawals. The appropriate use of reclaimed water for irrigation is a viable method of reducing groundwater pumpage. The NHCRWA commissioned a separate feasibility study to analyze the potential benefits of using reclaimed water as an alternative water source.

The use of reclaimed water within the State of Texas is governed by regulations established by the TCEQ (30 TAC 210). These regulations provide guidance and standards for all aspects of reclaimed water-use projects including, but not limited to, authorizations, storage requirements, irrigation practices, distribution systems, quality criteria, and allowable applications. Existing owners of wastewater treatment plants within the NHCRWA were contacted to determine interest in providing reclaimed water for irrigation projects. In addition, potential reclaimed water irrigation users were contacted as part of the feasibility study. The preliminary contacts with both potential providers and potential users were positive and warrant a continuation of discussions.

Although the use of reclaimed water in lieu of potable water appears to be possible, the details concerning delivery infrastructure and pricing methodology have not been completed. The feasibility and extent of reclaimed water use will be determined as these details are addressed in the future. For the purposes of the GRP, no credit has been taken for reclaimed water use as a portion of the reduction of groundwater pumpage in the GRP. The NHCRWA reserves the right to submit an amended GRP for consideration and approval incorporating reclaimed water use and a concept for calculating credits towards groundwater withdrawal reduction.

F. WATER CONSERVATION

Water conservation is a means of reducing long-term demand. The NHCRWA has prepared a Water Conservation Plan to address strategies that can be used by it and the MUDs to reduce demand. A copy of the plan can be found in *Appendix D.*

G. EARLY/OVER CONVERSION

The NHCRWA may choose to accelerate its groundwater conversion. Several customers within the NHCRWA have indicated an interest in obtaining alternate water to reduce their dependency on existing wells prior to 2010. The NHCRWA will seek credit from the HGCSD for such early conversion. If approved, these groundwater credits would be banked for future use and applied during future HGCSD conversion requirements. The application of the groundwater credits could provide the NHCRWA the opportunity to postpone capital investment for water system infrastructure.

In addition, after 2010, the NHCRWA may choose to supply more water from its alternate supply than is required to meet the minimum requirement for groundwater reduction. Again, if it is approved by HGCSD, this could result in over conversion and the accumulation of groundwater credits. These groundwater credits could also be banked for future use and applied as required to postpone capital investment for water system infrastructure. The groundwater credits would also serve to balance surface water availability with total annual water demand during years of high water demand. The GRP may be amended in the future to address the subject of groundwater credits.

SECTION 4 – WATER SYSTEM ALIGNMENT, CONSTRUCTION SCHEDULE, AND COSTS

A. DEVELOPMENT OF WATER DISTRIBUTION NETWORK MODEL PARAMETERS AND ASSUMPTIONS

All of the NHCRWA pipes for the primary transmission system were sized for 1.3 times ADF to provide additional flow for the 2030 Service Area's ultimate development or during emergency conditions. The NHCRWA's primary distribution system was modeled using ultimate development water demands of the 2030 Service Area. The model parameters described below are based on the extensive experience of the engineering consultants on the NHCRWA's Consultant Advisory Committee in the planning and design of an individual MUD and large water systems.

The proposed system pressure option was modeled to maintain a minimum system pressure from the NHCRWA at the delivery point of 55 to 65 pounds per square inch (psi), with NHCRWA pump station pressures between 80 and 100 psi. As more of the Districts phase out their plants and rely on the NHCRWA for their entire water source, the NHCRWA will install additional wells, well collection lines, and storage and pumping facilities at locations within the system that are established to maximize the capacities of the existing lines by providing flows from multiple directions. The proposed additional wells will be submitted for permits through the various regulatory agencies for approval. The sizing of the primary distribution system was a combination of both maximum daily rates, depending on the percent of wholesale customers choosing to phase out their well or their wells and water plants. The peaking factor of 2.0 or 4.2 times ADF provides necessary flows for peaking or emergency conditions. The NHCRWA Consultant Advisory Committee projected the phasing out of MUDs' groundwater wells only or wells and water plants at varying percentages for each decade. The table percentages below were used in model analyses through ultimate development of the 2030 Service Area.

Time Period	Wholesale Customers with Water Plants	Wholesale Customers without Wells and Water Plants
2010 to 2019	80%	20%
2020 to 2030	70%	30%

Computer analyses were conducted to develop the primary transmission system and distribution system. The modeling software used was the University of Kentucky "KYPipe2000 Graphical User Interface" (PIPE2000). Computer model input includes pipe sizes, pipe length, node data, Hazen-Williams coefficients, minor losses, and various GIS shape files of roads and wholesale customers within the NHCRWA. A node is a point of water demand or, in this case, water input into one or more MUDs. Pumps are modeled as fixed-grade nodes. Node data consists of water demands, elevations, and pipe interconnections. The maximum allowable velocity used for sizing pipe in the PIPE2000 models was 5 feet per second (fps) for peak hour flow for all model analyses. A velocity of 5 fps or less will reduce the cost impacts of water hammer, surge suppression devices, leakage repair, thrust blocking, and other maintenance costs.

Five fps is the generally accepted maximum velocity for good, cost-effective design because of these factors (Cesario 1995)

Projected water demand values for each MUD are entered at each node in gallons per minute (gpm). Node elevations were taken from USGS quadrant maps. Node elevations are not intended to match the exact natural ground elevations in the service area. Rather, the elevations are used only to give a basis for preparing a reasonable computer model. Natural ground elevations over the study area range from approximately 100 feet at the east end of the NHCRWA to approximately 220 feet at the west end of the NHCRWA. The difference in elevation greatly affects the pumping system required to deliver water to the service area. Pipe sizes were chosen to overcome pressure losses due to elevation changes, friction head losses from the motion of water over the interior surface of the pipe, and minor losses from sudden changes in flow direction or changes in pipe size. During peaking demands, two pressure planes are needed.

B. PROPOSED NHCRWA SURFACE WATER SYSTEM

Proposed Primary Transmission System

The NHCRWA will build its primary water transmission lines from the COH delivery points to its boundary in two construction phases. One transmission line will be constructed initially to satisfy the 2010 through 2019 conversion requirements. A second transmission line will be constructed to meet the requirements for 2020 through 2030. In general, the proposed primary transmission system will be a low-pressure system that will deliver water through an air gap into the NHCRWA's ground storage tanks.

To meet 2010 to 2019 water demands, the COH will provide water through an 84-inch-diameter transmission line from the NEWPP to near the intersection of Sam Houston Toll Road (Beltway 8) and US 59 (Eastex Freeway). The NHCRWA has entered into a contract with the COH to purchase a pro-rata share of capacity of this transmission pipeline. The NHCRWA will connect at this point and construct its own transmission pipe to the west. Other entities may pay a pro-rata share for capacity in the NHCRWA's transmission pipe. The Central Harris County Water Users Consortium and the West Harris County Regional Water Authority have been identified as possible participants. The proposed location of these pipes is shown in *Exhibit 5*.

Beginning at the end of the 84-inch-diameter pipe at Beltway 8 and Eastex Freeway, the NHCRWA proposes to construct a 60-inch pipe to convey the 2010 through 2019 volumes of water to the 2010 Service Area, as shown in *Exhibit 5*. This will be done without any intermediate booster pumping. The line size may increase if additional entities wish to have capacity in the line. The pipe alignment proposed would extend west along the right-of-way of Beltway 8 until it reaches TC Jester Road, where it will turn to the north. The pipe alignment proposed would be constructed in the right-of-way of TC Jester Road and terminates south of FM 1960, where the water will discharge into groundwater storage tanks at the proposed pump station.

The 2020 through 2030 proposed transmission system, from the NEWPP to the proposed pump stations, will convey only water for wholesale customers within the NHCRWA. An 84-inch-diameter transmission pipe is proposed to be constructed beginning at the NEWPP, align along the right-of-way of Beltway 8, and extend west parallel to the existing 84-inch-diameter transmission line to Hardy Road. At this intersection, the NHCRWA proposes a portion of the water would be diverted north along the right-of-way of Hardy Road through a 54-inch-diameter pipe to discharge into ground storage tanks at the proposed pump station near the intersection of Hardy Road and Candleridge Street. The remaining water will be diverted through a 72-inch-diameter pipeline extending west from Hardy Road along the right-of-way of Beltway 8. This pipeline ultimately reduces to a 60-inch pipeline that terminates near SH 249. This line would discharge into the ground storage tanks at the proposed pump station near this latter intersection. The locations of these proposed pipes and water plants are shown in *Exhibit 5*. The transmission sizes depicted in *Exhibit 5* may change depending on the pattern of growth within NHCRWA, as well as revised population and flow projections and volumes of water required by potential co-participants in the lines.

Proposed Primary Distribution System

The NHCRWA's proposed primary distribution system is described as a "high pressure" system. The system as planned provides a supply of water to the perimeter of the MUD's boundary but makes no provision for addressing water system operations within the MUD's water system. The NHCRWA system includes construction of a meter at the point of connection to the wholesale customer. The operating pressure in some areas of the NHCRWA system will be higher than 75 psi. At these locations where the MUD is tying to the NHCRWA system, a pressure-reducing valve will be required. This cost is anticipated in the NHCRWA system.

MUD water plants reaching their useful life may choose replacement, while others may choose to phase out their aging water plants if they are within the service area of the 2010, 2020, or 2030 phased construction. Those MUDs choosing to phase out their water plants will rely on the NHCRWA to provide sufficient water quantity, capacity, and storage to meet its needs. It is assumed that the individual MUD would continue to operate its individual pipe network. Initial discussions with TCEQ regarding this concept has led to a preliminary conclusion that the NHCRWA would be able to maintain its status as a wholesale supplier of water, not a retail supplier. Before a MUD can abandon its water plant facilities, the MUD and possibly the NHCRWA must receive approval from TCEQ of meeting applicable requirements of a retail supplier. A previous discussion with TCEQ indicated that the NHCRWA would be able to maintain its wholesale water supplier status as long as the water is metered before entering the MUD and the MUD meters the water consumption of its customers (TCEQ, 2001).

Operation of Primary Distribution System

The NHCRWA primary distribution system will provide for the alternative supply of water that meets the requirements of the Subsidence District Regulatory Plan. As mentioned in Section 2, the CPP conversion goal relates to the UH CPP census tract population projections and unit water demand factors to determine surface water conversion goals. The CPP conversion goal for 2019 is

28.8 mgd, as shown in *Table 3*, while the Owner projection is 38.4 mgd, as shown in *Table 4*. To minimize the infrastructure required, it is proposed that the 2010 Service Area be equal to or greater than the surface water conversion requirement. Although it was requested, no data has been provided that allows for the calculation of a daily pattern of water usage within an individual MUD. Consequently, a comparative evaluation of MUDs in the vicinity of the NHCRWA was used to approximate the hourly pattern of water use within the NHCRWA. Seasonal and daily variations in water usage are important in calculating the volume of supply delivered and the volume of storage necessary to equalize the delivery of water within the system.

Low demand periods include seasonal variations as well as after long tropical storm events during the summer. The NHCRWA Service Areas will not consume the entire contract amount (a constant supply of surface water) during low demand periods. On the other hand, during high demand periods, the Contract amount must be augmented by groundwater production. Typical high demands occur during the summer months or for fire demands. Since the contract amount is anticipated to be constant, this means the CPP projected goals cannot be met by contracting for the minimum volume of water from the COH. This is exemplified by the following illustration:

> The Owner projection of the annual average daily flow for the 2010 Service Area in year 2019 is 38.4 mgd. If 28.8 mgd (CPP conversion goal) is being purchased from the COH and the total surface water demand of the 2010 Service Area in December 2019 is only 23.5 mgd, then only 23.5 mgd could be used. Conversely in August, the surface water demand could be 63.0 mgd, but the COH would supply only 28.8 mgd. In effect, an average of 28.8 mgd could not be met because of the deficit in the winter months. Some incremental amount of surface water will be necessary to ensure the full conversion requirements are met.

During the initial period, 2010 to 2019, the NHCRWA has the option of expanding the service area such that the average demand is more than the 28.8 mgd CPP conversion goal. This would allow the NHCRWA to purchase less water from the COH and yet still use a minimum of 23.5 mgd during winter months. However, it will be more economical to purchase additional surface water supplies, approximately 2.0 mgd above the CPP conversion goal projection of 28.8 mgd, than to construct significant expansions to the primary distribution system.

From analysis of typical MUD use patterns, the average daily flow of water in winter months, December to February, can be as low as 61 percent. Consequently, contract amount must be approximately 31.0 mgd to meet the CPP conversion goal projection of 28.8 mgd. Although this may be the contracted amount, not all of this water would be used during low demand periods. In the summer months, all of the contracted water would be used. From review of the wholesale customer locations, it does not appear that adequate primary distribution system infrastructure can be built for the relatively small dollar amount of capital investment necessary to acquire additional surface water. It is recommended therefore, that the incremental water plant capacity be purchased from the COH.

On a daily delivery basis, water storage is necessary to equalize the delivery of water throughout high and low periods of demand. The NEWPP has only a 6-hour storage capacity. Additional

storage will be required within the NHCRWA. It is anticipated that during the initial phase of construction, sufficient storage exists within the individual wholesale customers to offset any deficit. However, on the assumptions that 20 percent of the wholesale customers will phase out their water plant facilities in the next 20 years, a storage volume to replace this vacated storage is recommended.

Throughout the daily period, water will be provided to the system at a constant flow rate. During periods of low demand, water will flow into the wholesale customer's storage tanks and the storage constructed by the NHCRWA. Since some districts will depend solely on the NHCRWA system for supply, peak demands to these districts must be met. This will require that service pumping capacity be increased, or that flow to the other districts is restricted. Once the peak demands have passed to ADF levels or lower, then the original wholesale customers will be supplied surface water again. This oscillation of selected wholesale customers in the service area that receive surface water is referred to as the "balloon effect," which can be accomplished through use of SCADA-controlled valves.

An alternative is to provide additional supply of water through regional groundwater wells such that the system supply of the NHCRWA primary distribution system is capable of meeting the average flow requirements of 80 percent of the MUDs in the service area and 100 percent of the peak requirements in 20 percent of the districts. It is anticipated that in the latter stages of implementation, groundwater supply owned and operated by the NHCRWA will be a significant part of the NHCRWA system implementation. However, in the initial phases, the amount of groundwater supplied by the NHCRWA will be a minimal amount unless more wholesale customers elect to abandon their own facilities.

For daily demand patterns during ADF conditions, there will be fluctuations in demand so that some hours of the day will experience demand conditions that are above ADF. This increase in demand will cause increased velocities and subsequently increased head losses for that period of time. During moderate increases in hourly water demands (1.5 times ADF or less), either the NHCRWA will increase its pumping rate out of its ground storage tanks to a higher level in order to continue to meet demands for a short period of time, or the individual MUDs' booster pumps will turn on to increase the pressure to meet the minimum state requirements. For the first scenario, the NHCRWA will draw down its storage because ADF is all that is coming into its tanks. However, this storage can be replenished during hours when the demand is less than ADF, and there should be no net effect.

As MUDs elect to abandon their total water plant facilities, their total supply of water will come from the NHCRWA system. As the demand for water from NHCRWA increases, decisions based on cost and reliability will dictate whether or not the NHCRWA supplements its supply by purchasing additional treated surface water or by constructing groundwater wells that supply a regional pumping plant. The latter path is currently anticipated in the GRP. In doing so, the NHCRWA will have to address potential problems associated with mixing of groundwater and surface water in the pipelines, as opposed to the ground storage tanks. In such cases, potential problems of taste, odor, color or even toxicity are possibilities. However, these conditions will be resolved during final design after testing of source water quality is confirmed. The NHCRWA's approach will be to provide a

consistent quality of water to its customers to allow the customers to resolve individual problems based on their operating policies.

A March 2001 study by Jones & Carter, Inc., entitled *MUD Interface Study for Surface Water Conversion* (*J&C 2001 Report*) stated the COH's recent experience in the blending of surface water with indigenous groundwater does not cause any problems regarding water potability. Although the COH has managed to provide relatively consistent and high quality water to its ratepayers, it took several years for the COH to attain this degree of quality and consistency. A wholesaler-retailer relationship between separate entities injects significant complexity in controlling the quality of water in the distribution systems.

Management oversight of all of the supplies to the system will be coordinated by the NHCRWA to properly meet demand. To maximize use of contracted water, and based on limitations of the NEWPP design, the MUDs water contract with NHCRWA should attempt to equalize water volumes on a monthly and daily basis. This will mean that either the number of MUDs being provided water in winter months will be different than the number of MUDs being provided water in summer months or the amount of surface water being supplied in each MUD will differ monthly. In either case, the NHCRWA will closely monitor the operation of the system to ensure that the required percent conversion will be met at the end of the year.

Additionally, the NHCRWA will need to closely coordinate the abandonment of water facilities with the MUDs so that regional facilities can be appropriately sized and located and be brought on-line in a timely manner.

Proposed 2010 Primary Distribution System Alternatives

The primary distribution system recommended is the alternative "Distribution System with Regional Water Plant." To be conservative, the recommended alternative involves more infrastructures at a higher cost. However, the NHCRWA will consider the second alternative after further study during design.

1. Primary Distribution System with the Regional Water Plant Alternative

The recommended primary distribution system will include construction of a regional water plant near Louetta Road between Cutten Road and the railroad track east of SH 249, as shown in *Exhibit 6*. This primary system assumes at least 80 percent of the wholesale customers operate and maintain their wells and water plants through 2019, reducing to possibly 70 percent by 2030. For the wholesale customers who choose to phase out their wells or wells and water plants, the NHCRWA proposes constructing additional infrastructure to meet those needs. This would involve the NHCRWA becoming the owner and/or operator of nearby groundwater wells with high capacity and/or installing regional groundwater wells, collection lines, and a regional water plant located near Louetta Road. The proposed regional wells will be submitted for permits through the various regulatory agencies for approval. This regional infrastructure is necessary to compensate for the

reduction of the wholesale customers' water supply and storage needed for their water demands as well as provide ADF for customers retaining their water plants.

Constructing the regional facilities will allow the NHCRWA to minimize balloon effects and maximize flows to the designated service areas. During emergency conditions, e.g., a line break, the regional water plant's storage and wells would be able to adequately address these conditions for those wholesale customers without wells or water plants. Those with water plants who have a line break would be able to adequately use their own wells and storage.

2. *Primary Distribution System without the Regional Water Plant Alternative*

This primary distribution system alternative may minimize the balloon effect, maximize the balloon effect, or be somewhere in between. During peak demand days, adequate supplies and capacity would be provided to the wholesale customers without wells or wells and water plants. To compensate for the storage and capacity used by those without this infrastructure, those with water plants would receive less than ADF or some would receive none at all, initiating the balloon effect. Between these two alternatives, this alternative would minimize the capital costs to the NHCRWA while maximizing the use of the infrastructure constructed.

The NHCRWA total flow from the NEWPP will be the total flow consumed by the wholesale customers, with priority given to those customers without wells or wells and water plants. Remaining surface water would be distributed in a way that will negate stagnation of the primary distribution system. This may mean one or more MUDs will not receive any surface water during peaking of the water system.

C. METHODOLOGY FOR LOCATING PHASED CONSTRUCTION

The *J&C 2001 Report* described several factors that should be considered for locating the 2010 Service Area within the NHCRWA. The main factor was to provide service to certain MUDs that are currently experiencing water quality or quantity problems. These areas are located predominantly between FM 1960 and Louetta Road and between IH 45 and SH 249. The proposed distribution system for the 2010 conversion requirements encompasses these areas. Another factor was to consolidate the selected service area that will be converted to surface water. In the distribution system, MUDs closest to or adjacent to the NHCRWA's distribution facilities were converted so that areas further out in the NHCRWA's boundaries will not be required to convert to surface water.

Phased construction, described below, is for report purposes only. Actual construction will be spread out over each decade prior to meeting the HGCSD's conversion mandates. The draft Project Schedule for the NHCRWA 2010 Conversion Program previously submitted by NHCRWA is presented in *Appendix E*. The estimates of probable costs that follow were developed using Region H Water Planning Group 1999 unit values.

D. YEAR 2010 PHASED CONSTRUCTION

The central portion of the NHCRWA was chosen to be the 2010 Service Area under all scenarios because of the higher population density and because the majority of water quality and quantity problems exist in this area. The 2010 to 2019 construction phased (2010 Service Area) proposes to include 47 MUDs with owner-projected water demands in year 2019 of 38.4 mgd (see *Table 4*). NHCRWA proposes constructing its first primary transmission line to supply the water volumes to meet the surface water conversion requirements for the 2010 through 2019 water demands. The COH surface water contract amount needed for the 2010 Service Area is 31.0 mgd to meet the CPP conversion goal projection of 28.8 mgd for year 2019.

The NHCRWA pump station near T.C. Jester and FM 1960 will only be supplied with water from NEWPP. One regional water plant is proposed for the year 2010 phased construction, owned and operated by the NHCRWA. A regional water plant location is proposed near Louetta Road between Cutten Road and the railroad track east of SH 249, as shown in *Exhibit 6*. In addition, NHCRWA proposes constructing eight regional groundwater wells to facilitate meeting peak water demands for those MUDs who phased out their water plants. The regional water plant will provide the additional storage and booster pump capacity for this groundwater. The total storage capacity needed for year 2010 construction phase is in two parts. The total storage at the delivery point near T.C. Jester and FM 1960 (delivery storage) is 5 million gallons (mg). The total storage at the regional water plants (regional storage) is 8 mg.

The estimate of probable total project cost for the proposed primary transmission system, discussed previously, is about $62,648,000, as shown in *Table 5*. The estimate of probable total project cost for the proposed pump station, regional water plant, regional groundwater wells and collection lines, distribution system, and MUD interconnection is about $118,905,000, as shown in *Table 7*. The total estimate of probable costs is about $181,553,000 for the 2010 construction phase, excluding interest and financing costs as well as the costs for acquiring surface water.

E. YEAR 2020 PHASED CONSTRUCTION

The 2020 to 2029 construction phase (2020 Service Area) proposes to include 74 additional MUDs, bringing the total number of wholesale customers to 121. The Owner projected water demand in year 2029 for the 2020 Service Area is approximately 96.2 mgd. NHCRWA proposes constructing its second transmission line to supply the water volumes to meet the surface water conversion requirements of not only the 2020 through 2029 water demands, but the 2030 water demands as well. Therefore, the COH surface water contract amount needed for the 2030 Service Area is 102.0 mgd to meet the HGCSD conversion goal of 88.6 mgd for year 2030.

Three new regional water plants are proposed at the following preliminary locations and are shown in *Exhibit 7*. The proposed locations for these regional water plants are for general locating purposes only. Future siting investigations will be necessary to determine the final locations.

- Near Spring Cypress Road and the northeast corner of Bilma Public Utility District.
- Near Boudreaux Road and approximately one mile east of Huffsmith Kohrville Road.

- Near the intersection of Telge Road and Jarvis Road.

These regional water plants and pump stations are sized through year 2029 phased construction. The regional water plants will be supplied with surface water from the NHCRWA's three primary pump stations as well as groundwater from 21 proposed regional groundwater wells owned and operated by the NHCRWA. A few MUDs may provide their excess groundwater capacity and storage to the NHCRWA (NHCRWA 2002). This may reduce the number of regional groundwater wells that the NHCRWA will need to construct. For year 2029 construction phase, the proposed additional delivery storage is 10 mg for total delivery storage of 15 mg. The proposed additional regional storage is 21 mg for total regional storage of 29 mg.

The estimate of probable total project cost for the proposed primary transmission system is about $133,974,000, as shown in *Table 6*. The estimate of probable total project cost for the proposed pump stations, regional water plants, regional groundwater wells and collection lines, distribution system, and MUD interconnection is about $268,084,000, as shown in *Table 8*. The total estimate of probable costs is about $402,058,000 for the 2020 construction phase, excluding interest and financing costs as well as the costs for acquiring surface water.

F. YEAR 2030 PHASED CONSTRUCTION

The distribution system expands to its 2030 Service Area limits on both the east and west sides. The 2030 construction phase expands with 16 additional MUDs bringing the total number of wholesale customers to 137. The Owner projected water demand in the year 2030 Service Area is 7.5 mgd, but for the 2030 Service Area, the Owner projected water demand is 104.8 mgd. As previously mentioned, the COH surface water contract amount needed for the 2030 Service Area is 102.0 mgd to meet the HGCSD conversion goal of 88.6 mgd for year 2030.

This phase construction does not include a new transmission pipe or any new pump stations or regional water plants. However, the pump stations and water plants infrastructure increases to meet the higher water demands including three groundwater wells. For year 2030 construction phase, the proposed additional delivery storage is 6 mg for total delivery storage of 21 mg. The proposed additional regional storage is 3 mg for total regional storage of 32 mg. The estimate of probable total project cost for the proposed distribution system, groundwater wells, storage tank expansion, water plant, and pump station expansion, as shown in *Table 9*, is about $29,068,000, excluding interest and financing costs as well as the costs for acquiring surface water.

The NHCRWA may choose to combine the 2030 Phased Construction with the 2020 Phased Construction.

SECTION 5 – GRP FINANCING

Pursuant to the provisions of House Bill 2965, the NHCRWA's creation legislation, as amended by House Bill 1110 (collectively referred to as "H.B. 2965" or the "Legislation"), the NHCRWA may fund its projects through three sources, including revenue notes, revenue bonds, and capital contributions received from utility districts located within the NHCRWA. Each of these funding sources is outlined below.

The first source of funding for the NHCRWA projects is through the issuance of revenue notes. Section 5.01 of H.B. 2965 authorizes the NHCRWA to borrow money on negotiable notes issued by the NHCRWA secured solely by revenue sources of the NHCRWA. The revenue sources specified in H.B. 2965 include tolls, charges, and fees imposed by the NHCRWA; revenue from the sale of water, water/sewer services, or any other service or product of the NHCRWA; grants and gifts; revenue from the ownership and operation of the NHCRWA's works, improvements, facilities, plants, or equipment; and revenue from contracts between the NHCRWA and any person, including a local government.

The second source of funding available to the NHCRWA is through the issuance of bonds secured by all or part of the revenue derived from any source, including the sources outlined above, to carry out the powers and authority of the NHCRWA pursuant to Section 5.02 of the Legislation. Bonds of the NHCRWA may be issued through a public, private, or negotiated sale. Bonds issued by the NHCRWA must be approved by the Attorney General of the State of Texas and registered by the State Comptroller's office. However, bonds or notes of the NHCRWA are <u>not</u> subject to review and approval by the TCEQ.

The third source of funding for projects of the NHCRWA is from receipt of capital contributions from utility districts located within the NHCRWA in accordance with the provisions of H.B. 2965. Section 5.05 of H.B. 2965 requires the NHCRWA to develop procedures for cooperatively funding projects of the NHCRWA that fulfill a governmental purpose of <u>both</u> the NHCRWA and the participating district with funds from utility districts located within the NHCRWA. Specific procedures for utility districts to participate in funding their allocation of the costs of an NHCRWA project are set forth in Section 5.05(b) and (c) of H.B. 2965.

The NHCRWA plans to finance its pro-rata share of the costs of purchasing a surface water supply capacity from the COH (as outlined in Section 3 of this GRP) by issuing bond anticipation notes and/or bonds of the NHCRWA and through the receipt of capital contributions from utility districts located within the NHCRWA. The bonds issued by the NHCRWA will be secured by revenue generated by fees and charges imposed by the NHCRWA for the pumpage of groundwater and the sale of treated surface water to persons, corporations, and political subdivisions of the State of Texas located inside and outside the boundaries of the NHCRWA. In addition, the NHCRWA will also finance the engineering, design, and construction of the surface water transmission and distribution system described in Section 4 of this GRP through the issuance of NHCRWA bonds and receipt of capital contributions from utility districts located within the NHCRWA.

SECTION 6 – GROUNDWATER REDUCTION PLAN MANAGEMENT

The NHCRWA is a governmental agency and a body politic and corporate of the State of Texas created under Section 59, Article XVI of the Texas Constitution and Chapter 49 of Texas Water Code, as amended. House Bill 2965, the creation legislation for the NHCRWA, along with House Bill 1110 amending such legislation (collectively referred to as "H.B. 2965" or the "Legislation"), provides full and complete power and authority for the NHCRWA to prepare, adopt, implement, and manage a GRP that meets the requirements and mandates of the Subsidence District's 1999 Regulatory Plan as summarized below. Copies of the Legislation can be found in *Appendix A*.

Under the provisions of such Legislation, the NHCRWA may provide for the conservation, preservation, protection, recharge, and prevention of the waste of groundwater. The NHCRWA may, for the purpose of reducing groundwater withdrawals and subsidence, acquire or develop surface water and groundwater supplies from both inside and outside its boundaries and may conserve, store, transport, treat, purify, distribute, sell, and deliver water to persons, corporations, political subdivisions, and other entities located both inside and outside the boundaries of the NHCRWA. In addition, the NHCRWA may also enter into contracts with persons, as well as political subdivisions of the State of Texas, for the performance of the rights, powers, and authority given to the NHCRWA under the Legislation.

Specifically, Section 4.01(b)(5) (as amended by H.B. 1110) provides the authority for the NHCRWA to provide for the reduction of groundwater withdrawals by the development, implementation, or enforcement of the provisions contained in the NHCRWA's GRP. In Subsection (e) of Section 4.01, a GRP that is developed, implemented, participated in, or enforced by the NHCRWA is binding on all persons, districts, entities, and wells located within the NHCRWA's boundaries. Any additional persons or districts that may want to be included in the NHCRWA's GRP may enter into a contract with the NHCRWA for such purpose.

The NHCRWA also has eminent domain authority within its boundaries to acquire property of any kind to further the authorized purposes of the NHCRWA. Eminent domain powers may also be exercised outside the boundaries of the NHCRWA to acquire land, easements, or other property for the purposes of pumping, treating, storing, and transporting water. As specified in the Legislation, the NHCRWA may <u>not</u> use eminent domain powers for the purpose of acquiring rights to underground water, water, or water rights. There are other limitations on the NHCRWA's power of eminent domain, which are specifically outlined in Section 4.08 of the Legislation, as amended by H.B. 1110.

The NHCRWA, pursuant to Section 4.02 of the Legislation, may adopt and enforce rules required to implement the provisions of the Legislation. Section 4.03 provides the NHCRWA with full power to establish fees and charges, with certain limitations, that are necessary to enable the NHCRWA to fulfill its regulatory obligations.

The NHCRWA has the power and authority to acquire by purchase, gift, or lease a water treatment or supply system and to design, finance, and construct a water treatment or supply system, both inside and outside of the NHCRWA boundaries, under Section 4.06 of the Legislation. In addition, the

NHCRWA also has the authority to operate, lease, or sell a water treatment or supply system that the NHCRWA has constructed or acquired and may contract with any person to operate and maintain a water treatment or supply system.

The NHCRWA may sell, store, or reuse water or any by-product of the NHCRWA's operations under Section 4.07, thereby enabling the NHCRWA to purchase water from a wholesale source to sell to the MUDs and other entities located inside and outside of its boundaries.

Section 4.09 of the Legislation provides the NHCRWA with authority to enter into a contract with any person or legal entity regarding the performance of any purpose of the NHCRWA, including a contract to jointly construct, finance, own, or operate works, improvements, facilities, plants, equipment or appliances necessary to accomplish the purposes or functions of the NHCRWA. This contractual authority includes the power to purchase or sell water or water rights.

In summary, through the specific provisions of the Legislation, along with the powers, rights, authority, privileges, and functions provided under Chapter 49, Texas Water Code, as amended, the NHCRWA has full, complete and comprehensive powers and authority to prepare, implement, enforce, and manage the GRP required by the HGCSD. The NHCRWA intends to adopt rules and regulations to appropriately implement and manage the NHCRWA GRP. In addition to the proposed rules and regulations, the NHCRWA, as the GRP Manager, will oversee the conversion from groundwater to surface water via the following activities: identify the service areas for the 2010, 2020, and 2030 conversion phases; identify and notify the utility districts that will be using surface water or groundwater; monitor the utility district volumes of groundwater and surface water by way of reading meters, communicating with the utility districts, and adjusting the usage to ensure compliance with the regulatory requirement; and record and document usage throughout the NHCRWA Service Area and report annually to the HGCSD.

The power and authority of the NHCRWA to finance the implementation and management of the GRP are specifically outlined in Section 5.

SECTION 7 – SUMMARY AND CONCLUSIONS

This GRP demonstrates that the NHCRWA is committed to meeting the HGCSD regulatory requirements. The NHCRWA has entered into a long-term agreement with the COH that will provide sufficient surface water to sustain the groundwater conversion process through at least 2030. Construction of the first elements of the NHCRWA's surface water system is expected to begin by January 2005, as required.

The NHCRWA will serve an area that is expected to continue its trend of rapid growth throughout the conversion period. Continued growth is reflected in both the population and water demand projections. Infrastructure planning to distribute surface water to serve NHCRWA's customers is an ongoing process and will need to be flexible to accommodate changes in growth patterns.

The NHCRWA will deliver water to its customers at system pressure. The 2030 NHCRWA system will be capable of supplying peak day and peak hour flows to as many as 30 percent of the MUDs. This will enable MUDs with poor quality groundwater, wells that produce insufficient flow, or obsolete facilities to rely completely on the NHCRWA system to meet all of their water demands. Groundwater will be used to supplement surface water in order to meet peak demands. Regional facilities and some existing MUD and/or independent well owners will supply the supplemental groundwater.

Detailed planning has been prepared for the 2010 system. The source of surface water will be the NEWPP. Treated water will be delivered to the NHCRWA near the intersection of US 59 and Beltway 8. Transmission facilities will be constructed to deliver the water to NHCRWA storage tanks that will be located in the vicinity of TC Jester Road south of FM 1960. The 2010 service area will be the central portion of the NHCRWA, which has the highest population density has the greatest water demand and is where several MUDs need an alternate source of water to alleviate water quality or quantity problems. This area is roughly bounded by SH 249 on the west, Spring Cypress Road on the north, IH 45 on the east, and FM 1960 and Bammel North Houston on the south. The estimate of probable project cost for the 2010 system for engineering, land acquisition, transmission lines from the COH delivery point, storage tanks, pumping stations, water wells, distribution piping, and appurtenances is about $181.6 million, excluding interest and financing costs. This cost also does not include the NHCRWA purchase of capacity in the COH's raw water facilities, NEWPP, and the transmission line to the delivery point.

A preliminary delineation of the 2020 and 2030 service areas has been made. The system will expand west, north, and east to supply additional customers with surface water to meet the conversion requirements. Additional transmission facilities will be constructed so that ultimately there will be three points from which COH surface water is delivered into the NHCRWA distribution system. Additions to the system to meet 2020 and 2030 requirements have estimates of probable project costs of about $402.1 million and about $29.1 million, respectively, and about $612.7 million total for all three conversion phases. These summary costs are shown in *Table 10* and exclude interest and financing costs as well as the costs for acquiring surface water.

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TABLE 1 THE NHCRWA PUMPAGE DISTRIBUTION OF WATER WELL PERMITTEES

Pumpage Range	Number of Wells	Total Pumpage (mgy)
zero volume	395	0
< 2 mgy	784	186
2 - 5 mgy	73	207
5 - 7.5 mgy	40	189
7.5 - 10 mgy	25	168
10 - 15 mgy	27	207
15 - 30 mgy	26	231
30 - 60 mgy	38	1,187
60 - 90 mgy	27	1,401
90 - 120 mgy	27	1,735
> 120 mgy	150	20,311
TOTAL	**1,612**	**25,822**

Notes:
The groundwater well pumpages shown are for MUDs and independent well owners within the NHCRWA.

mgy: million gallons per year

Source: HGCSD 2000 Pumpage Report

TABLE 2 THE NHCRWA ACTUAL AND PROJECTED POPULATIONS

		ACTUAL (1)	PROJECTED (2)		
CENSUS TRACT (3)	PLAN. REG.	2000 POPULATION	2010 POPULATION	2020 POPULATION	2030 POPULATION
240400	2	848	1,215	1,861	2,046
240800	1	7,403	10,851	13,910	16,293
240900	1	6,725	9,811	12,533	14,135
241000	1	7,088	14,302	20,625	26,866
241100	1	14,726	17,002	24,518	31,937
241200	1	5,927	6,261	9,065	12,419
241300	1	3,396	4,642	6,721	9,200
241400	1	5,248	6,584	9,495	12,370
250700	1	6,129	7,511	10,780	13,690
532400	4	2,931	4,353	5,693	6,017
532500	4	4,858	10,426	17,876	19,232
532900	3	2,491	2,937	3,419	3,589
533900	3	1,737	3,369	5,919	6,462
534000	3	278	679	1,188	1,299
534000	4	2,500	6,111	10,688	11,691
534100	3	2,825	5,706	9,138	10,632
534200	4	3,024	3,641	4,979	6,043
550300	2	2,896	4,139	6,754	8,020
550400	2	658	801	1,205	1,654
550700	3	636	1,167	1,743	1,820
551000	3	1,931	2,099	2,625	2,944
551100	2	5,489	6,035	6,602	7,014
551200	3	5,204	6,680	8,832	9,638
551300	3	3,251	4,810	5,883	6,420
551400	3	2,370	3,992	5,744	6,268
551500	4	2,423	2,917	4,448	6,179
551600	4	7,191	8,305	9,419	10,533
551700	4	18,550	21,581	24,613	27,644
551800	4	4,823	6,222	8,298	10,070
551900	4	4,278	4,278	4,278	4,278
552000	4	7,190	7,190	7,190	7,190
552100	5	11,373	13,011	16,404	16,786
552200	5	3,512	4,709	6,802	9,271
552200	7	878	1,177	1,700	2,318
552300	5	8,129	11,128	14,155	14,484
552400	5	4,266	4,377	5,518	5,646
552500	4	2,171	2,504	3,253	3,796
552500	5	5,065	5,842	7,590	8,858
552600	5	4,437	4,503	5,851	6,829
552700	3	1,861	2,330	3,200	3,753
552800	3	7,839	8,178	10,385	11,847
552900	3	6,895	10,389	10,894	11,148

TABLE 2 THE NHCRWA ACTUAL AND PROJECTED POPULATIONS *(CONTINUED)*

		ACTUAL (1)	PROJECTED (2)		
CENSUS TRACT (3)	PLAN. REG.	2000 POPULATION	2010 POPULATION	2020 POPULATION	2030 POPULATION
553000	2	8,226	11,111	14,206	16,295
553000	3	914	1,235	1,578	1,811
553100	2	6,314	7,376	7,552	7,727
553200	2	7,246	9,535	9,762	9,989
553300	2	2,892	4,120	4,218	4,316
553400	2	10,711	14,008	17,306	20,603
553500	2	6,701	9,140	9,358	9,576
553600	2	5,182	8,670	10,859	11,111
553700	2	3,654	3,969	4,284	4,599
553800	2	6,403	7,631	10,878	11,131
553800	3	2,744	3,271	4,662	4,770
553900	3	7,432	7,794	8,156	8,517
554000	3	7,254	8,484	11,758	14,723
554100	3	9,761	10,576	12,271	12,557
554200	3	4,401	4,557	6,591	8,984
554300	5	11,086	12,030	12,317	12,603
554400	5	2,730	2,730	2,730	2,730
554400	7	8,189	8,189	8,189	8,189
554500	5	6,248	6,286	6,324	6,362
554500	7	694	698	703	707
554600	5	4,732	4,875	5,018	5,161
554700	5	4,406	4,406	4,406	4,406
554800	3	2,837	3,456	4,075	4,694
554800	6	2,322	2,828	3,334	3,840
554900	2	1,998	2,333	2,668	3,004
554900	6	7,990	9,332	10,673	12,014
555000	2	5,535	5,986	8,172	10,613
555100	2	3,657	4,251	5,803	7,537
555200	2	1,403	1,465	2,000	2,597
555200	6	3,275	3,418	4,666	6,059
555300	6	5,816	5,816	5,816	5,816
555400	6	9,168	9,326	9,485	9,643
555500	5	1,829	2,055	2,281	2,508
555500	7	7,314	8,220	9,125	10,030
555600	7	3,848	3,848	3,848	3,848
555700	7	5,979	5,979	5,979	5,979
555800	7	3,708	3,708	3,708	3,708
555900	7	1,026	1,026	1,026	1,026
Total		**397,074**	**487,499**	**607,576**	**688,111**

TABLE 2 THE NHCRWA ACTUAL AND PROJECTED POPULATIONS *(CONTINUED)*

		ACTUAL (1)	PROJECTED (2)		
CENSUS TRACT (3)	PLAN. REG.	2000 POPULATION	2010 POPULATION	2020 POPULATION	2030 POPULATION

Notes:

(1) Year 2000 data is from the U.S. Bureau of Census.

(2) The 2010, 2020, and 2030 population projections are from Prof. Steven Craig, Un. of Houston - Center for Public Policy (CPP), http://www.uh.edu/cpp/. Prof. Craig said the projections from CPP use both the new census and employment data. Since the US Census Bureau will not release the 2000 employment data until late 2002, the projections shown are based on 2000 census and 1990 employment data.

(3) Census tracts are repeated when the census tracts appear in two different planning regions. *Exhibits 3* and *4* provide a general view of these occurrences.

TABLE 3 THE NHCRWA SURFACE WATER CONVERSION GOALS

Population	**2000**	**2010**	**2019**	**2020**	**2029**	**2030**
Residential (1)	397,074	487,499	595,568	607,576	680,057	688,111
Employment (2)	95,432	117,730	135,946	137,970	160,510	163,015
Water Demands (mgd)						
Residential (3)	58.81	72.37	88.59	90.39	101.26	102.47
Employment (4)	2.58	3.18	3.67	3.73	4 33	4 40
Agricultural - Wells are Exempt (5)	0.00	0.00	0.00	0.00	0.00	0.00
Other - Includes Golf Courses (6)	3.54	3.54	3.54	3.54	3.54	3.54
Industrial (6)	0.32	0.32	0.32	0.32	0.32	0.32
Total (mgd)	**65.25**	**79.41**	**96.12**	**97.97**	**109.45**	**110.73**
Required HGCSD Surface Water Conversion Percentages		30%	30%	70%	70%	80%
Surface Water Conversion Goals (mgd)		**23.82**	**28.83**	**68.58**	**76.62**	**88.58**

Notes:
1. Year 2000 population is from the U.S. Bureau of Census. The University of Houston - Center for Public Policy, provided the population projections.
2. Year 2000 employment data and projections are from *HGCSD 1996 Report.*
3. Residential water demand based on 150 gpcd from *HGCSD 1996 Report.*
4. Employment water demand based on 27 gpcd per report from *HGCSD 1996 Report.*
5. Wells designated as Agricultural by the HGCSD are exempt from inclusion in the GRP.
6. Year 2000 "Other" and "Industrial" water demands based on HGCSD Year 2000 pumpage reports. Assumed pumpages are constant throughout the planning period.

TABLE 4 WHOLESALE CUSTOMERS AND NON-CUSTOMERS WITHIN THE NHCRWA – EXISTING AND PROJECTED ADF WATER DEMAND PER CONSTRUCTION PHASE

PLN REG	OWNER (1)	Year 2000 ADF (2) (gpm)	2010 ADF (gpm)	2019 ADF (gpm)	2020 ADF (gpm)	2029 ADF (gpm)	2030 ADF (gpm)
	47 WHOLESALE CUSTOMERS FOR 2010 SERVICE AREA						
2	Bammel Forest Utility Company	158	201	240	244	270	273
2	BAMMEL U.D.	289	368	410	415	415	415
2	BILMA P.U.D.	473	603	689	698	698	698
2	BRIDGESTONE M.U.D.	610	779	928	945	1,043	1,054
2	Candlelight Service Co. Inc. aka Candlelight Hills and AquaSource Utility, Inc.	228	291	345	350	350	350
2	CNP UTILITY DISTRICT	780	912	912	912	912	912
3	CY-CHAMP P.U.D.	654	826	1,039	1,063	1,175	1,188
3	CYPRESS FOREST P.U.D.	1,067	1,347	1,695	1,734	1,802	1,809
2	CYPRESS KLEIN U.D. (WP to SI HCMUD 316)	550	702	837	852	941	951
2	CYPRESSWOOD UD (SI HCWCID No. 132)	NA	NA	NA	NA	NA	NA
3	FOUNTAINHEAD M.U.D. (WP and SI NWHCMUD 21)	479	587	587	587	587	587
3	HARRIS CO. F.W.S.D. 52	641	809	1,018	1,041	1,096	1,103
2	HARRIS CO. M.U.D. 016	339	432	515	525	579	586
3	HARRIS CO. M.U.D. 024	817	983	983	983	983	983
2	HARRIS CO. M.U.D. 044	286	365	381	383	383	383
3	HARRIS CO. M.U.D. 048	0	135	257	271	392	406
2	HARRIS CO. M.U.D. 104	206	263	314	319	353	357
3	HARRIS CO. M.U.D. 191	155	195	245	251	278	280
3	HARRIS CO. M.U.D. 202	188	237	299	306	338	341
2	HARRIS CO. M.U.D. 211 (SI MUD 233)	NA	NA	NA	NA	NA	NA
2	HARRIS CO. M.U.D. 233 (WP to SI MUD 211)	108	137	164	167	184	186
2	HARRIS CO. M.U.D. 275	112	143	170	173	191	193
5	HARRIS CO. M.U.D. 286	418	469	533	540	540	540
2	HARRIS CO. M.U.D. 316 (SI Cypress Klein UD)	NA	NA	NA	NA	NA	NA
2	HARRIS CO. W.C.I.D. 091	345	440	524	534	542	543
3	HARRIS CO. W.C.I.D. 109	1,120	1,414	1,482	1,490	1,490	1,490
2	HARRIS CO. W.C.I.D. 110	591	753	898	914	1,009	1,020
3	HARRIS CO. W.C.I.D. 114	798	901	901	901	901	901
3	HARRIS CO. W.C I.D. 116	553	639	639	639	639	639
3	HARRIS CO. W.C.I.D. 119	476	601	748	764	764	764
2	HARRIS CO. W.C.I.D. 132 (WP to SI Cypresswood UD)	870	1,084	1,084	1,084	1,084	1,084
3	HEATHERLOCH M.U.D.	415	462	462	462	462	462
2	KLEIN P.U.D. (WP to SI NWHCMUD 36)	501	639	762	775	785	786
3	KLEINWOOD M.U.D.	416	525	660	676	747	755

TABLE 4 WHOLESALE CUSTOMERS AND NON-CUSTOMERS WITHIN THE NHCRWA – EXISTING AND PROJECTED ADF WATER DEMAND PER CONSTRUCTION PHASE *(CONTINUED)*

PLN REG	OWNER (1)	Year 2000 ADF (2) (gpm)	2010 ADF (gpm)	2019 ADF (gpm)	2020 ADF (gpm)	2029 ADF (gpm)	2030 ADF (gpm)
3	LOUETTA NORTH P.U.D.	347	438	551	564	623	630
2	LOUETTA ROAD U.D. (WP to SI Terranova West MUD)	146	186	222	226	250	252
5	MALCOMSON ROAD U.D.	659	739	856	869	924	930
3	NW HARRIS CO. M.U.D. 06	192	243	305	312	345	349
2	NW HARRIS CO. M.U.D. 20	275	351	357	358	358	358
3	NW HARRIS CO. M.U.D. 21 (SI w/ MUD 22 and Fountainhead MUD)	459	580	626	631	631	631
3	NW HARRIS CO. M.U.D. 22 (SI w/ MUD 21)	NA	NA	NA	NA	NA	NA
2	NW HARRIS CO. M.U.D. 36 (SI from Klein PUD)	NA	NA	NA	NA	NA	NA
2	PONDEROSA FOREST U.D.	815	940	940	940	940	940
3	PRESTONWOOD FOREST U.D.	438	532	532	532	532	532
2	SPRING CREEK FOREST P.U.D.	312	398	462	469	469	469
2	TERRANOVA WEST M.U.D. (WP and SI Louetta Road PUD)	289	369	407	412	412	412
2	WESTADOR M.U.D.	715	717	717	717	717	717
	Water Demand at ADF (gpm)	19,292	23,734	26,697	27,026	28,134	28,257
	Water Demand at ADF (mgd)	**27.78**	**34.18**	**38.44**	**38.92**	**40.51**	**40.69**
	73 WHOLESALE CUSTOMERS ADDED FOR 2020 SERVICE AREA						
1	Bayer Water System	53	72	98	100	125	128
3	CHARTERWOOD M.U.D.	347	438	551	564	623	630
4	CITY OF JERSEY VILLAGE (3)	193	403	652	679	807	822
2	Consumers Water Corporation	76	97	115	117	130	131
5	CYPRESS CREEK U.D.	443	496	575	584	621	625
5	EMERALD FOREST U.D. (Very small flow from SI FWSD 61)	491	550	637	647	688	692
5	Enchanted Valley Estates Water Supply	48	48	48	48	48	48
5	FAULKEY GULLY M.U.D.	913	1,022	1,185	1,203	1,279	1,287
1	FOREST POINT MUD	NA	152	289	304	440	456
5	GRANT ROAD P.U.D.	170	191	221	225	239	240
5	HARRIS CO. F.W.S.D. 61 (WP to HCMUD 248 and a little to SI Emerald Forest UD)	1,052	1,179	1,367	1,387	1,475	1,484
5	HARRIS CO. M.U.D. 018	538	602	643	648	648	648
1	HARRIS CO. M.U.D. 043	308	418	568	585	591	592
5	HARRIS CO. M.U.D. 052	NA	45	85	90	130	134
5	HARRIS CO. M.U.D. 069	350	392	454	461	462	462
1	HARRIS CO. M.U.D. 077	0	117	223	234	340	352
1	HARRIS CO. M.U.D. 082	441	599	814	838	1,043	1,066
2	HARRIS CO. M.U.D. 086	105	134	159	162	179	181
1	HARRIS CO. M.U.D. 115	0	38	73	76	111	115

TABLE 4 WHOLESALE CUSTOMERS AND NON-CUSTOMERS WITHIN THE NHCRWA – EXISTING AND PROJECTED ADF WATER DEMAND PER CONSTRUCTION PHASE *(CONTINUED)*

PLN REG	OWNER (1)	Year 2000 ADF (2) (gpm)	2010 ADF (gpm)	2019 ADF (gpm)	2020 ADF (gpm)	2029 ADF (gpm)	2030 ADF (gpm)
4	HARRIS CO. M.U.D. 168	840	929	929	929	929	929
4	HARRIS CO. M.U.D. 170	165	214	214	214	214	214
5	HARRIS CO. M.U.D. 222	345	386	448	454	483	486
5	HARRIS CO. M.U.D. 230	135	152	176	178	190	191
1	HARRIS CO. M.U.D. 231	0	76	145	153	221	229
5	HARRIS CO. M.U.D. 248 (SI HCFWSD 61)	NA	NA	NA	NA	NA	NA
1	HARRIS CO. M.U.D. 249	0	85	116	119	148	151
5	HARRIS CO. M.U.D. 280, now named NORTH POINTE WCID (SI NWHCMUD 15)	93	105	121	123	131	132
5	HARRIS CO. M.U.D. 360/PILGRIM	526	589	683	694	737	742
3	HARRIS CO. M.U.D. 367	214	270	340	348	384	388
3	HARRIS CO. M.U.D. 368	138	174	219	224	248	250
3	HARRIS CO. M.U.D. 383, Commercial Dev.	0	264	502	529	766	793
1	HARRIS CO. W.C.I.D. 092	538	730	835	847	847	847
1	HARRIS CO. W.C.I.D. 099	204	277	376	387	467	476
1	HARRIS CO. W.C.I.D. 136	204	277	376	387	408	410
1	HUNTERS GLEN M.U.D.	212	288	392	403	502	513
1	INVERNESS FOREST U.D. (partially w/in NHCRWA	230	312	424	436	543	555
4	Jersey Lake Homeowners Assoc aka Lakeside Club	65	65	65	65	65	65
5	LAKE FOREST U.D.	802	898	1,041	1,057	1,124	1,131
2	MEADOWHILL REGIONAL MUD aka DOVE MEADOWS M.U.D. (WP to SI NWM28)	276	352	419	427	471	476
1	MEMORIAL HILLS U.D.	228	310	421	433	540	551
5	MILLS ROAD M.U.D.	378	424	491	499	520	522
1	NORTH PARK P.U.D.	383	383	383	383	383	383
1	NORTHGATE CROSSING M.U.D. 1 (SI Northgate Crossing 2)	NA	NA	NA	NA	NA	NA
1	NORTHGATE CROSSING M.U.D. 2 (WP to SI Northgate Crossing 1)	95	129	175	180	224	229
5	NW HARRIS CO. M.U.D. 09	522	584	678	688	731	736
5	NW HARRIS CO. M.U.D. 15 (SI MUD 280)	210	235	273	277	294	296
3	NW HARRIS CO. M.U.D. 24	103	130	164	168	185	187
5	NW HARRIS CO. M.U.D. 27	0	34	64	67	97	101
2	NW HARRIS CO. M.U.D. 28 (SI to Meadowhill MUD)	0	117	221	233	338	350
4	NW HARRIS CO. M.U.D. 29	290	375	476	487	539	545
2	NW HARRIS CO. M.U.D. 30	0	312	592	623	904	935
2	NW HARRIS CO. M.U.D. 32	156	199	237	242	267	270

TABLE 4 WHOLESALE CUSTOMERS AND NON-CUSTOMERS WITHIN THE NHCRWA – EXISTING AND PROJECTED ADF WATER DEMAND PER CONSTRUCTION PHASE *(CONTINUED)*

PLN REG	OWNER (1)	Year 2000 ADF (2) (gpm)	2010 ADF (gpm)	2019 ADF (gpm)	2020 ADF (gpm)	2029 ADF (gpm)	2030 ADF (gpm)
1	Pilchers Oxford Group aka Splashtown	23	23	23	23	23	23
1	POST WOOD M.U.D.	210	285	388	399	407	408
4	REID ROAD M.U.D. 1	501	648	822	841	931	941
4	REID ROAD M.U.D. 2	267	345	438	449	497	502
1	RICHEY ROAD MUD	109	148	201	207	257	263
2	SHASLA P.U.D.	182	232	263	267	267	267
1	Six Flags Splashtown L.P.	102	102	102	102	102	102
2	SPRING WEST M.U.D.	66	84	100	102	112	114
1	TATTOR ROAD M.U.D.	364	495	616	630	630	630
1	TIMBER LANE U.D.	841	1,143	1,444	1,478	1,478	1,478
5	TIMBERLAKE I.D.	349	391	410	412	412	412
3	Undeveloped Area A	0	601	1,143	1,203	1,744	1,804
7	Undeveloped Area B	0	527	1,001	1,053	1,528	1,580
6	Undeveloped Area C	0	323	613	645	936	968
6	Undeveloped Area D	0	413	784	825	1,196	1,238
6	Undeveloped Area E	0	495	940	989	1,435	1,484
4	W. HARRIS CO. M U.D. 09	469	540	540	540	540	540
4	W. HARRIS CO. M.U.D. 10	676	874	885	886	886	886
4	W. HARRIS CO. M.U.D. 11	519	671	852	872	965	975
4	W. HARRIS CO. M.U.D. 21	67	86	110	112	124	126
4	WHITE OAK BEND M.U.D.	163	211	267	274	303	306
	Water Demand at ADF (gpm)	17,785	25,302	32,695	33,516	38,650	39,221
	Water Demand at ADF (mgd)	**25.61**	**36.44**	**47.08**	**48.26**	**55.66**	**56.48**
	120 WHOLESALE CUSTOMERS CUMULATIVE TOTALS FOR 2010 THROUGH 2029						
	Water Demand at ADF (gpm)	37,078	49,036	59,391	60,542	66,784	67,477
	Water Demand at ADF (mgd)	**53.39**	**70.61**	**85.52**	**87.18**	**96.17**	**97.17**
	16 WHOLESALE CUSTOMERS ADDED FOR 2030 SERVICE AREA						
1	Amberwood Utility Co.	12	16	21	22	27	28
7	CYPRESS HILL M.U.D. 1	240	249	259	260	270	271
7	CYPRESS HILL M.U.D. 2	0	212	402	424	614	635
1	HARRIS CO. M.U.D. 026	422	573	779	802	998	1,020
1	HARRIS CO. M.U.D. 085	0	56	107	113	163	169
7	HARRIS CO. M.U.D. 289	0	130	247	260	378	391
7	HARRIS CO. M.U.D. 322 (SI MUD 354 and 358)	NA	NA	NA	NA	NA	NA
7	HARRIS CO. M.U.D. 354 (SI MUDs 322 and 358)	NA	NA	NA	NA	NA	NA
7	HARRIS CO. M.U.D. 358 (WP to SI MUDs 322 and 354)	770	800	831	835	868	872
7	HARRIS CO. M.U.D. 364 (SI MUD 365)	NA	NA	NA	NA	NA	NA

TABLE 4 WHOLESALE CUSTOMERS AND NON-CUSTOMERS WITHIN THE NHCRWA – EXISTING AND PROJECTED ADF WATER DEMAND PER CONSTRUCTION PHASE *(CONTINUED)*

PLN REG	OWNER (1)	Year 2000 ADF (2) (gpm)	2010 ADF (gpm)	2019 ADF (gpm)	2020 ADF (gpm)	2029 ADF (gpm)	2030 ADF (gpm)
7	HARRIS CO. M.U.D. 365 (WP to SI MUD 364)	232	241	251	252	262	263
5	HARRIS CO. W.C.I.D. 113	147	164	190	193	206	207
5	NW HARRIS CO. M.U.D. 05	447	501	581	590	627	631
7	NW HARRIS CO. M.U.D. 10	223	231	240	241	251	252
1	Oak Hill Estates Water Co.	0	42	79	84	121	125
7	Suburban Utility Co.	0	140	266	280	406	420
	Water Demand at ADF (gpm)	2,492	3,355	4,254	4,354	5,191	5,284
	Water Demand at ADF (mgd)	**3.59**	**4.83**	**6.13**	**6.27**	**7.47**	**7.61**
	136 WHOLESALE CUSTOMERS CUMULATIVE TOTALS FOR 2010 THROUGH 2030						
	Water Demand at ADF (gpm)	39,570	52,391	63,646	64,896	71,975	72,761
	Water Demand at ADF (mgd)	**56.98**	**75.44**	**91.65**	**93.45**	**103.64**	**104.78**
	120 OWNERS NOT INCLUDED IN THE NHCRWA 2030 OVERALL SERVICE AREA						
6	Albury Manor Utility Co.	22	23	26	26	28	28
7	Allied Concrete Materials	12	13	13	13	14	14
5	Aquasource Development Co. aka Stable Gate Homeowners Assoc.	15	15	15	15	15	15
7	AquaSource Inc. aka Cypress Fields	28	29	30	30	32	32
5	AquaSource Inc. aka Marks Glen	23	26	30	31	33	33
6	AquaSource Inc. aka Rolling Oaks	27	29	32	32	35	35
4	AquaSource Utility, Inc. aka Creekside Estates	93	121	153	157	173	175
7	AquaSource Utility, Inc. aka Lakes of Rosehill	105	109	114	114	119	119
5	AquaSource Utility, Inc. aka Park Forest	45	50	58	59	62	63
3	Aquasource, Inc. aka Bammel Oaks 2	13	16	20	21	23	23
6	Aquasource, Inc. aka Oakwood Village	12	13	15	15	16	16
7	Ashton Houston Residence	20	52	54	54	56	57
6	Atascocita Management Corp.	75	81	89	90	98	99
6	Augusta Pines Golf Course aka Tour 18	15					
5	Beazer Homes	18	20	23	23	25	25
6	Bussell, Craig	15	16	17	17	19	19
4	C&P Utilities, Inc.	56	73	93	95	105	106
2	C&P Utilities, Inc.	60	76	91	92	102	103
7	C&P Utilities, Inc.	11	11	12	12	12	12
4	C&P Utilities, Inc.	11	14	18	19	21	21
7	C&P Utilities, Inc.	11	12	12	12	13	13
1	Castle Country Homes, Inc.	16	21	29	30	37	38
1	Cemex USA	10	10	10	10	10	10
3	Cemex USA	22	22	22	22	22	22

TABLE 4 WHOLESALE CUSTOMERS AND NON-CUSTOMERS WITHIN THE NHCRWA – EXISTING AND PROJECTED ADF WATER DEMAND PER CONSTRUCTION PHASE *(CONTINUED)*

PLN REG	OWNER (1)	Year 2000 ADF (2) (gpm)	2010 ADF (gpm)	2019 ADF (gpm)	2020 ADF (gpm)	2029 ADF (gpm)	2030 ADF (gpm)
7	Champions Glen, L.P.	12	12	13	13	13	13
3	Champions Golf Club	124	124	124	124	124	124
5	Chasewood Land Venture	28	31	36	37	39	39
4	City of Jersey Village for Jersey Meadows Golf Course	16	53	53	53	53	53
6	CITY OF TOMBALL	1,315	1,414	1,549	1,564	1,705	1,720
7	Compaq Computer Corp.	89	89	89	89	89	89
3	Compaq Computer Corp.	17	17	17	17	17	17
3	Compaq Computer Corporation	12	12	12	12	12	12
5	Cypress Forest Service Assoc.	41	46	54	55	58	58
7	Cypress Lakes Golf Course aka Middleton Properties	277	277	277	277	277	277
1	Cypresswood Golf Club aka Cypresswood LTD - US golf Corp	268	268	268	268	268	268
6	DOWDELL P.U.D.	144	155	169	171	186	188
6	Dubrook, Inc./Frontier Materials	10	11	12	12	13	13
7	EJDS Inc.	19	20	20	21	21	21
6	ENCANTO REAL U.D.	91	98	107	108	118	119
2	Enviro-Grow Nursery	11	14	17	17	19	19
4	Furlong LTD	42	54	69	70	78	79
1	Fussel Farm, Riley	22	30	41	43	53	54
2	Gilbert, Robert C	11	14	17	17	19	19
3	Gleannloch Farms Comm. Assoc. Inc. (aka Champions Glen LP)	110	110	110	110	110	110
3	Gleannloch Golf Club L.P.	291	291	291	291	291	291
7	Grand Northwest MUD	0	224	425	447	648	671
5	Grantwood Civic Club aka Grantwood Water Supply Corp.	34	34	34	34	34	34
6	HARRIS CO. M.U.D. 001	256	275	301	304	331	334
6	HARRIS CO. M.U.D. 009	0	129	245	258	374	387
6	HARRIS CO. M.U.D. 022	0	184	349	368	533	552
4	HARRIS CO. M.U.D 025 (WP to SI WHCMUD 1)	251	325	412	422	467	472
6	HARRIS CO. M.U.D. 109	727	782	856	865	942	951
6	HARRIS CO. M.U.D. 383 Golf Club (Proposed)	0	169	169	169	169	169
7	HARRIS CO. W.C.I.D. 155	0	192	365	384	556	576
3	Harris County	16	16	16	16	16	16
4	Harris County	17	17	17	17	17	17
2	Harris County	18	18	18	18	18	18
6	HMW Special Utility District	13	14	16	16	17	17
7	HMW Special Utility District aka 2920 West	35	36	37	38	39	39
7	HMW Special Utility District aka Alice Acres	18	19	20	20	21	21

TABLE 4 WHOLESALE CUSTOMERS AND NON-CUSTOMERS WITHIN THE NHCRWA – EXISTING AND PROJECTED ADF WATER DEMAND PER CONSTRUCTION PHASE *(CONTINUED)*

PLN REG	OWNER (1)	Year 2000 ADF (2) (gpm)	2010 ADF (gpm)	2019 ADF (gpm)	2020 ADF (gpm)	2029 ADF (gpm)	2030 ADF (gpm)
2	HMW Special Utility District aka Brandywine Pines	18	23	28	28	31	31
5	HMW Special Utility District aka Cypress Pass	17	19	22	22	23	23
7	HMW Special Utility District aka Holly Lakes	17	17	18	18	19	19
7	HMW Special Utility District aka New Kentucky	84	87	90	91	94	95
4	HMW Special Utility District aka Red Oak Terrace	16	21	26	27	30	30
7	HMW Special Utility District aka Rosewood Hill	98	102	106	107	111	111
6	HMW Special Utility District aka Timberwilde	35	38	42	42	46	46
7	HMW Special Utility District aka Treichel Woods	12	13	13	13	14	14
6	HMW Special Utility District aka Willow Oaks	31	34	37	37	41	41
6	HOE Water Supply Corp.	25	27	29	30	32	33
6	Hometown Timbercrest, L.P.	116	125	137	138	150	152
4	Houston Race Park, Sam	72	72	72	72	72	72
3	I.Q. Products Company	10	13	16	16	18	18
6	Inline Development Corp. aka Sugarberry Place	51	55	61	61	67	67
1	Jaeger, Kenneth V.	18	24	33	34	42	43
7	Johnston Utilities Inc. aka Powder Mill Estates	72	75	78	78	81	81
2	Klein I.S.D.	12	16	19	19	21	21
6	Klein Memorial Park and Mausoleum	10	10	11	11	12	13
	KWIK KOPY CORP NORTHWEST FOREST	14					
7	Lake Owners Association	16	16	16	16	16	16
7	Lakes of Cypress Hill Homeowners	41	41	41	41	41	41
7	Lakes of Fairfield H.O.A.	106	106	106	106	106	106
5	Lakewood Grove Assoc Ltd.	9	9	9	9	9	9
3	Lodge at Cypresswood L.P.	15	15	15	15	15	15
5	National Golf Properties, Inc. aka Longwood Golf Club	169	169	169	169	169	169
3	Newman, Thomas C.	19	24	30	31	34	35
6	NORTHAMPTON M.U.D. (WP to SI Oakmont PUD)	838	901	986	996	1,086	1,096
2	Northgate Country Club	205	207	207	207	207	207
2	Northwest Airport MGMT., L.P.	20	20	20	20	20	20
7	NORTHWEST FREEWAY M.U.D.	168	175	182	182	190	190
7	Northwest Water Systems Inc.	36	37	38	39	40	40

TABLE 4 WHOLESALE CUSTOMERS AND NON-CUSTOMERS WITHIN THE NHCRWA – EXISTING AND PROJECTED ADF WATER DEMAND PER CONSTRUCTION PHASE *(CONTINUED)*

PLN REG	OWNER (1)	Year 2000 ADF (2) (gpm)	2010 ADF (gpm)	2019 ADF (gpm)	2020 ADF (gpm)	2029 ADF (gpm)	2030 ADF (gpm)
6	NW HARRIS CO. M.U.D. 19	60	65	71	72	78	79
6	OAKMONT PUD (SI to NORTHAMPTON M.U.D.)	0	174	332	349	506	523
2	Pinelakes LP now named Windrose Golf Club	190	190	190	190	190	190
6	Pinewood Place, Inc.	55	59	65	66	71	72
7	Pitcairn W.S.C.	17	18	18	18	19	19
7	Raub, Val	12	12	13	13	13	13
3	Raveneaux Country Club	106	106	106	106	106	106
4	Reliant Energy - T.H. Wharton Pwr Plant (Is not in NHCRWA's GRP)	NA	NA	NA	NA	NA	NA
5	Rock Creek LP	45	51	59	60	64	64
3	S C Utilities	24	24	24	24	24	24
1	Sasson, Eli aka Greens Rd Mobile Home Community	48	66	71	72	72	72
1	Southwest Utilities, Inc.	11	15	20	21	26	26
3	Sterling Gates Estates	10	13	16	16	18	18
5	Tall Pines Utility Inc.	21	23	27	27	29	29
4	Texas Arai, Inc.	11	14	17	18	20	20
6	Tom, John W. Sr.	10	10	11	11	12	12
6	Tomball Country Club	23	23	23	23	23	23
5	Tower Oak Bend Water Supply	42	47	55	56	59	60
5	Treeline Golf Club, INC	70	70	70	70	70	70
3	Trees & Plants Inc	10	12	16	16	18	18
6	Trunkline Gas Company	19	20	22	22	24	24
6	Undeveloped Area F (new Woodlds Area)	0	2,057	2,057	2,057	2,057	2,057
4	W. HARRIS CO. M.U.D. 01 (SI MUD 25)	0					
7	Waller I.S.D.	19	20	21	21	22	22
7	Waynewood Place Civic Club, INC	29	30	31	31	33	33
6	Willow Creek Golf Club	73	73	73	73	73	73

TABLE 4 WHOLESALE CUSTOMERS AND NON-CUSTOMERS WITHIN THE NHCRWA – EXISTING AND PROJECTED ADF WATER DEMAND PER CONSTRUCTION PHASE *(CONTINUED)*

PLN REG	OWNER (1)	Year 2000 ADF (2) (gpm)	2010 ADF (gpm)	2019 ADF (gpm)	2020 ADF (gpm)	2029 ADF (gpm)	2030 ADF (gpm)
4	Windermere Interests LTD	107	139	176	180	199	202
3	Woodwind Lakes Homeowners Assoc. aka Creekside U.C.	32	32	32	32	32	32
	Water Demand (gpy)	8,486	12,280	13,873	14,050	15,512	15,675
	Water Demand at ADF (mgd)	**12.22**	**17.68**	**19.98**	**20.23**	**22.34**	**22.57**
	TOTAL FLOWS WITHIN NHCRWA'S BOUNDARY >= 5.0 MGY						
	ADF (gpm)	**48,056**	**64,671**	**77,519**	**78,946**	**87,487**	**88,436**
	ADF (mgd)	**69.20**	**93.13**	**111.63**	**113.68**	**125.98**	**127.35**

Notes:

PLN REG: Planning Region Nos. 1 through 7 as shown in *Exhibit 4*; NA: Not applicable

(1) Some owners supply or receive their water from other owners through system interconnects (SI). Projected water demands for owners receiving water were combined into the projected water demands for the owner supplying their water.

(2) ADF: Annual average daily flow was calculated from HGCSD's Year 2000 pumpage.

(3) These water demands exclude the 750,000 gpd the City of Jersey Village receives from the City of Houston through its system interconnect.

TABLE 5 ESTIMATE OF PROBABLE COST FOR THE NHCRWA'S PROPOSED 2010 PRIMARY WATER TRANSMISSION

Item	Unit Cost	Quantity	Units	Costs ($)
Piping				
Open Cut Trench Construction	($/LF)			
Pipe @ 8"	$60	0	LF	$0
Pipe @ 12"	$90	0	LF	$0
Pipe @ 16"	$120	0	LF	$0
Pipe @ 24"	$210	0	LF	$0
Pipe @ 30"	$275	0	LF	$0
Pipe @ 36"	$340	0	LF	$0
Pipe @ 42"	$408	0	LF	$0
Pipe @ 48"	$475	0	LF	$0
Pipe @ 54"	$555	0	LF	$0
Pipe @ 60"	$635	71,450	LF	$45,370,750
Pipe @ 66"	$720	0	LF	$0
Pipe @ 84"	$955	0	LF	$0
Subtotal		**71,450**		**$45,370,750**
Trenchless Construction				
Pipe @ 12"	$600	0	LF	$0
Pipe @ 16"	$650	0	LF	$0
Pipe @ 24"	$845	0	LF	$0
Pipe @ 30"	$945	0	LF	$0
Pipe @ 36"	$1,045	0	LF	$0
Pipe @ 42"	$1,170	0	LF	$0
Pipe @ 48"	$1,295	0	LF	$0
Pipe @ 54"	$1,430	0	LF	$0
Pipe @ 60"	$1,565	1,768	LF	$2,766,920
Pipe @ 66"	$1,648	0	LF	$0
Pipe @ 84"	$1,850	0	LF	$0
Subtotal		**1,768**		**$2,766,920**
Total LF		**73,218**		
Total Capital Cost				**$48,137,670**
Engineering, Legal Costs and Contingencies				
Pipeline	30%	$48,137,670	$	$14,441,301
Other Facilities	35%	$0	$	$0
Environmental & Archaeology Studies and Mitigation				
Pipeline	$5,000	13.87	mile	$69,335
Other	$600	0	acres	$0
ESTIMATE OF PROBABLE TOTAL PROJECT COST				**$62,648,306**

TABLE 6 ESTIMATE OF PROBABLE COST FOR THE NHCRWA'S PROPOSED 2020 PRIMARY WATER TRANSMISSION

Item	Unit Cost	Quantity	Units	Costs ($)
Piping				
Open Cut Trench Construction	($/LF)			
Pipe @ 8"	$60	0	LF	$0
Pipe @ 12"	$90	0	LF	$0
Pipe @ 16"	$120	0	LF	$0
Pipe @ 24"	$210	0	LF	$0
Pipe @ 30"	$275	0	LF	$0
Pipe @ 36"	$340	0	LF	$0
Pipe @ 42"	$408	0	LF	$0
Pipe @ 48"	$475	0	LF	$0
Pipe @ 54"	$555	25,788	LF	$14,312,340
Pipe @ 60"	$635	19,470	LF	$12,363,450
Pipe @ 66"	$720	0	LF	$0
Pipe @ 72'	$805	22,038	LF	$17,740,590
Pipe @ 84"	$955	53,544	LF	$51,134,520
Subtotal		**120,840**		**$95,550,900**
Trenchless Construction				
Pipe @ 12"	$600	0	LF	$0
Pipe @ 16"	$650	0	LF	$0
Pipe @ 24"	$845	0	LF	$0
Pipe @ 30"	$945	0	LF	$0
Pipe @ 36"	$1,045	0	LF	$0
Pipe @ 42"	$1,170	0	LF	$0
Pipe @ 48"	$1,295	0	LF	$0
Pipe @ 54"	$1,430	332	LF	$474,760
Pipe @ 60"	$1,565	496	LF	$776,240
Pipe @ 66"	$1,648	0	LF	$0
Pipe @ 72'	$1,730	1,268	LF	$2,193,640
Pipe @ 84"	$1,850	2,146	LF	$3,970,100
Subtotal		**4,242**		**$7,414,740**
Total LF		**125,082**		
Total Capital Cost				**$102,965,640**
Engineering, Legal Costs and Contingencies				
Pipeline	30%	$102,965,640	$	$30,889,692
Other Facilities	35%	$0	$	$0
Environmental & Archacology Studies and Mitigation				
Pipeline	$5,000	23.69	mile	$118,449
Other	$600	0	acres	$0
ESTIMATE OF PROBABLE TOTAL PROJECT COST				**$133,973,781**

TABLE 7 ESTIMATE OF PROBABLE COST FOR THE NHCRWA'S PROPOSED 2010 WATER DISTRIBUTION SYSTEM

Item	Unit Cost	Quantity	Units	Costs ($)
Regional Water Facilities				
Pump Station No. 1 (T.C. Jester @ FM 1960)	$5,668,000	1	LS	$5,668,000
Regional Water Plant No. 1 (Louetta Rd)	$7,888,000	1	LS	$7,888,000
Regional Water Wells and Collection Lines	$1,000,000	8	EA	$8,000,000
Subtotal				**$21,556,000**
Piping				
Open Cut Trench Construction	($/LF)			
Pipe @ 8"	$60	0	LF	$0
Pipe @ 12"	$90	0	LF	$0
Pipe @ 16"	$120	0	LF	$0
Pipe @ 18"	$150	13,747	LF	$2,062,050
Pipe @ 20"	$175	7,064	LF	$1,236,200
Pipe @ 24"	$210	32,802	LF	$6,888,420
Pipe @ 30"	$275	30,748	LF	$8,455,700
Pipe @ 36"	$340	22,811	LF	$7,755,740
Pipe @ 42"	$408	26,590	LF	$10,848,720
Pipe @ 48"	$475	38,001	LF	$18,050,475
Pipe @ 54"	$555	9,518	LF	$5,282,490
Pipe @ 60"	$635	331	LF	$210,185
Pipe @ 66"	$720	0	LF	$0
Pipe @ 84"	$955	0	LF	$0
Subtotal		**181,612**		**$60,789,980**
Trenchless Construction				
Pipe @ 12"	$600	0	LF	$0
Pipe @ 16"	$650	0	LF	$0
Pipe @ 24"	$845	0	LF	$0
Pipe @ 30"	$945	340	LF	$321,300
Pipe @ 36"	$1,045	0	LF	$0
Pipe @ 42"	$1,170	318	LF	$372,060
Pipe @ 48"	$1,295	382	LF	$494,690
Pipe @ 54"	$1,430	161	LF	$230,230
Pipe @ 60"	$1,565	0	LF	$0
Pipe @ 66"	$1,648	0	LF	$0
Pipe @ 84"	$1,850	0	LF	$0
Subtotal		**1,201**		**$1,418,280**
Total LF		**182,813**		
District Interconnection	$100,000	47	EA	**$4,700,000**
Total Capital Cost				**$88,464,260**

TABLE 7 ESTIMATE OF PROBABLE COST FOR THE NHCRWA'S PROPOSED 2010 WATER DISTRIBUTION SYSTEM *(CONTINUED)*

Item	Unit Cost	Quantity	Units	Costs ($)
Engineering, Legal Costs and Contingencies				
Pipeline	30%	$66,908,260	$	$20,072,478
Other Facilities	35%	$21,556,000	$	$7,544,600
Land Acquisition				
Right of Way Pipeline (20% & 80% : 30 ft & 40 ft wide roads)	$109,000	0	acres	$0
Facilities Site Acquisition	$109,000	22	acres	$2,398,000
Property Surveying	10%	$2,398,000	$	$239,800
Environmental & Archaeology Studies and Mitigation				
Pipeline	$5,000	34.62	mile	$173,118
Other	$600	22	acres	$13,200
ESTIMATE OF PROBABLE TOTAL PROJECT COST				**$118,905,456**

TABLE 8 ESTIMATE OF PROBABLE COST FOR THE NHCRWA'S PROPOSED 2020 WATER DISTRIBUTION SYSTEM

Item	Unit Cost	Quantity	Units	Costs ($)
Regional Water Facilities				
Pump Station No. 2 (Hardy Rd @ FM 1960)	$5,004,000	1	LS	$5,004,000
Pump Station No. 3 (Beltway 8 @ SH 249)	$6,122,000	1	LS	$6,122,000
Regional Water Plant No. 2 (Telge Rd)	$5,405,000	1	LS	$5,405,000
Regional Water Plant No. 3 (Boudreaux Rd)	$6,558,000	1	LS	$6,558,000
Regional Water Plant No. 4 (Spring Cypress)	$8,607,000	1	LS	$8,607,000
Regional Water Wells and Collection Lines	$1,000,000	21	EA	$21,000,000
Subtotal				**$52,696,000**
Piping				
Open Cut Trench Construction	($/LF)			
Pipe @ 8"	$60	4,861	LF	$291,660
Pipe @ 12"	$90	18,506	LF	$1,665,540
Pipe @ 16"	$120	3,018	LF	$362,160
Pipe @ 18"	$150	22,112	LF	$3,316,800
Pipe @ 20"	$175	20,426	LF	$3,574,550
Pipe @ 24"	$210	96,696	LF	$20,306,160
Pipe @ 30"	$275	72,193	LF	$19.853,075
Pipe @ 36"	$340	22,119	LF	$7,520,460
Pipe @ 42"	$408	45,152	LF	$18,422,016
Pipe @ 48"	$475	44,765	LF	$21,263,375
Pipe @ 54"	$555	47,484	LF	$26,353,620
Pipe @ 60"	$635	5,473	LF	$3,475,355
Pipe @ 72'	$805	6,768	LF	$5,448,240
Subtotal		**409,573**		**$131,853,011**
Trenchless Construction				
Pipe @ 12"	$600	0	LF	$0
Pipe @ 16"	$650	182	LF	$118,300
Pipe @ 18"	$725	363	LF	$263,175
Pipe @ 24"	$845	1,296	LF	$1,095,120
Pipe @ 30"	$945	360	LF	$340,200
Pipe @ 36"	$1,045	1,172	LF	$1,224,740
Pipe @ 42"	$1,170	361	LF	$422,370
Pipe @ 48"	$1,295	2,052	LF	$2,657,340
Pipe @ 54"	$1,430	574	LF	$820,820
Pipe @ 60"	$1,565	0	LF	$0
Pipe @ 72'	$1,730	455	LF	$787,150
Subtotal		**6,815**		**$7,729,215**
Total LF		**416,388**		
District Interconnection	$100,000	73	EA	**$7,300,000**
Total Capital Cost				**$199,578,226**

TABLE 8 **ESTIMATE OF PROBABLE COST FOR THE NHCRWA'S PROPOSED 2020 WATER DISTRIBUTION SYSTEM** ***(CONTINUED)***

Item	Unit Cost	Quantity	Units	Costs ($)
Engineering, Legal Costs and Contingencies				
Pipeline	30%	$146,882,226	$	$44,064,668
Other Facilities	35%	$52,696,000	$	$18,443,600
Land Acquisition				
Right of Way Pipeline (20% & 80% : 30 ft & 40 ft wide roads)	$109,000	0	acres	$0
Facilities Site Acquisition	$109,000	46.5	acres	$5,068,500
Property Surveying	10%	$5,068,500	$	$506,850
Environmental & Archaeology Studies and Mitigation				
Pipeline	$5,000	78.86	mile	$394,307
Other	$600	46.5	acres	$27,900
ESTIMATE OF PROBABLE TOTAL PROJECT COST				**$268,084,051**

TABLE 9 ESTIMATE OF PROBABLE COST FOR THE NHCRWA'S PROPOSED 2030 WATER DISTRIBUTION SYSTEM

Item	Unit Cost	Quantity	Units	Costs ($)
Regional Water Facilities				
Pump Station No. 2 (Hardy Rd @ FM 1960)	$1,445,000	1	LS	$1,445,000
Pump Station No. 3 (Beltway 8 @ SH 249)	$1,378,000	1	LS	$1,378,000
Regional Water Plant No. 1 (Louetta Rd)	$1,371,000	1	LS	$1,371,000
Regional Water Plant No. 2 (Telge Rd)	$2,335,000	1	LS	$2,335,000
Regional Water Plant No. 3 (Boudreaux Rd)	$161,000	1	LS	$161,000
Regional Water Wells	$1,000,000	3	EA	$3,000,000
Subtotal				**$4,194,000**
Piping				
Open Cut Trench Construction	($/LF)			
Pipe @ 8"	$60	0	LF	$0
Pipe @ 12"	$90	10,768	LF	$969,120
Pipe @ 16"	$120	12,727	LF	$1,527,240
Pipe @ 18"	$150	0	LF	$0
Pipe @ 20"	$175	2,253	LF	$394,275
Pipe @ 24"	$210	10,917	LF	$2,292,570
Pipe @ 30"	$275	0	LF	$0
Pipe @ 36"	$340	23,632	LF	$8,034,880
Pipe @ 42"	$408	7,575	LF	$3,090,600
Pipe @ 48"	$475	0	LF	$0
Pipe @ 54"	$555	0	LF	$0
Pipe @ 60"	$635	0	LF	$0
Pipe @ 66"	$720	0	LF	$0
Pipe @ 72'	$805	0	LF	$0
Subtotal		**67,872**		**$16,308,685**
Trenchless Construction				
Pipe @ 12"	$600	0	LF	$0
Pipe @ 16"	$650	0	LF	$0
Pipe @ 24"	$845	0	LF	$0
Pipe @ 30"	$945	0	LF	$0
Pipe @ 36"	$1,045	0	LF	$0
Pipe @ 42"	$1,170	0	LF	$0
Pipe @ 48"	$1,295	0	LF	$0
Pipe @ 54"	$1,430	0	LF	$0
Pipe @ 60"	$1,565	0	LF	$0
Pipe @ 66"	$1,648	0	LF	$0
Pipe @ 72'	$1,730	0	LF	$0
Subtotal		**0**		**$0**
Total LF		**67,872**		
District Interconnection	$100,000	16	EA	**$1,600,000**
Total Capital Cost				**$22,102,685**

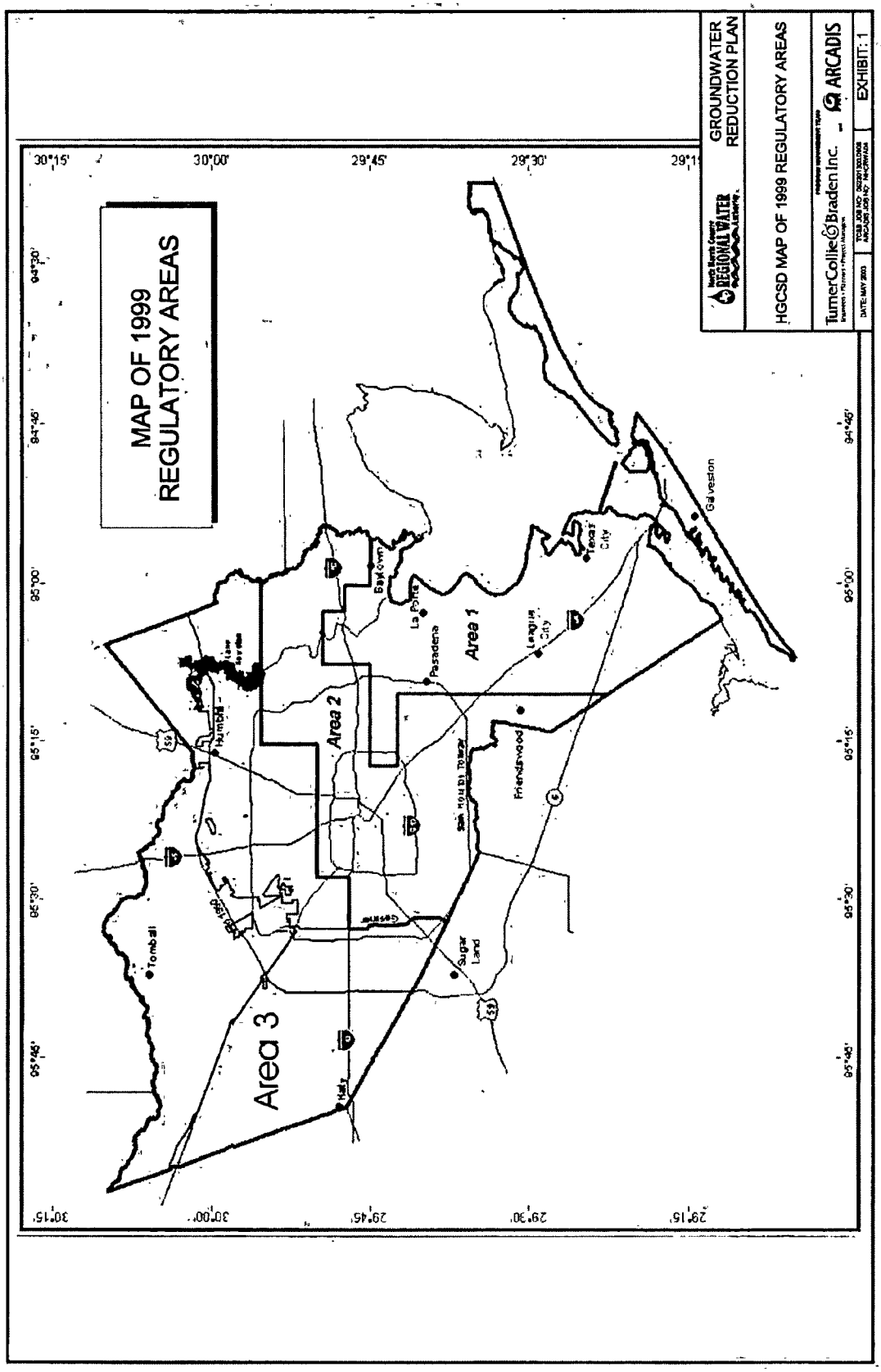
TABLE 9 ESTIMATE OF PROBABLE COST FOR THE NHCRWA'S PROPOSED 2030 WATER DISTRIBUTION SYSTEM *(CONTINUED)*

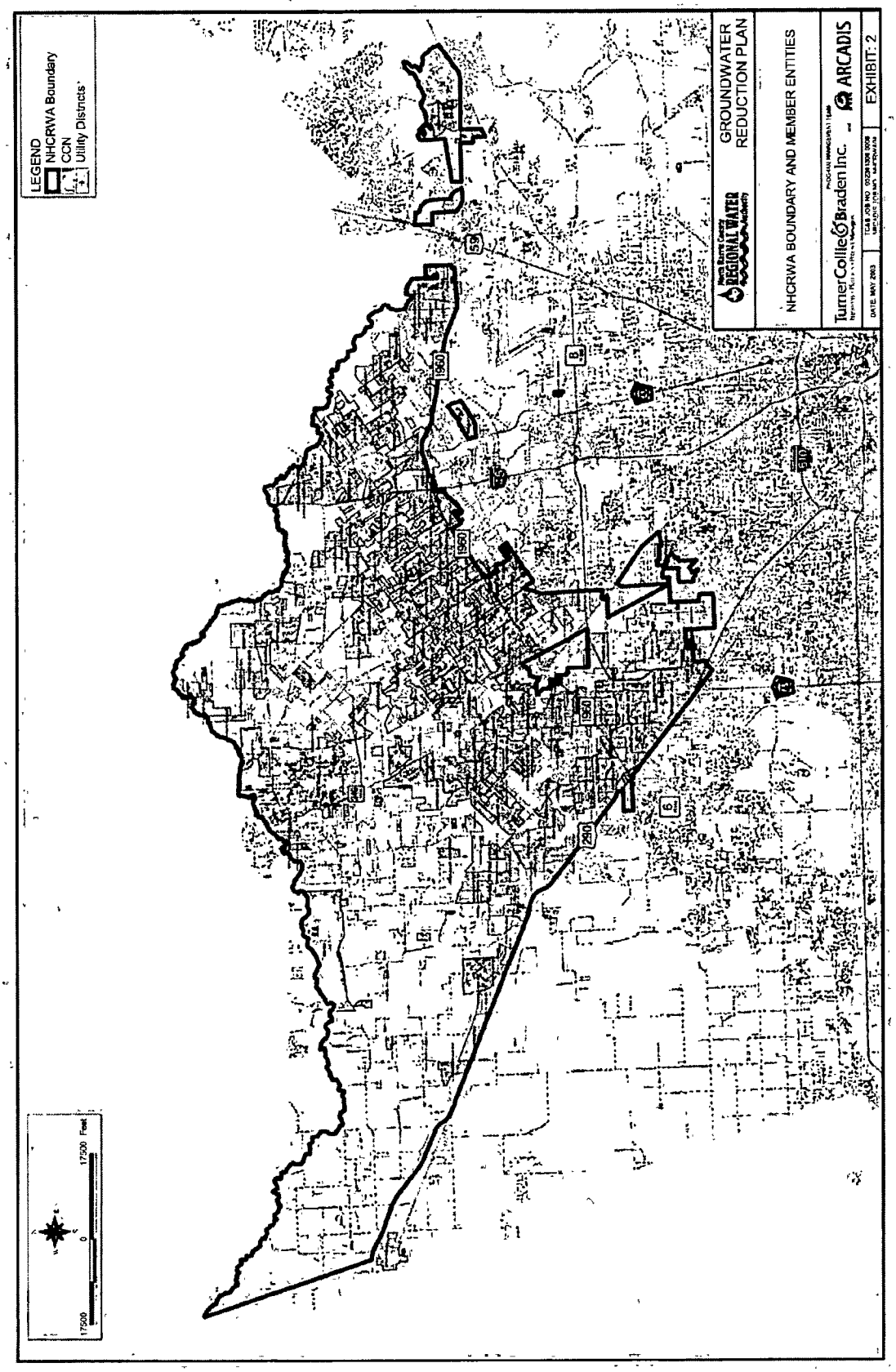
Item	Unit Cost	Quantity	Units	Costs ($)
Engineering, Legal Costs and Contingencies				
Pipeline	30%	$17,908,685	$	$5,372,606
Other Facilities	35%	$4,194,000	$	$1,467,900
Land Acquisition				
Right of Way Pipeline (20% & 80% : 30 ft & 40 ft wide roads)	$109,000	0	acres	$0
Facilities Site Acquisition	$109,000	0.5	acres	$54,500
Property Surveying	10%	$54,500	$	$5,450
Environmental & Archaeology Studies and Mitigation				
Pipeline	$5,000	12.85	mile	$64,273
Other	$600	0.5	acres	$300
TOTAL PROJECT COST				**$29,067,713**

TABLE 10 ESTIMATE OF PROBABLE COST SUMMARY FOR THE NHCRWA

Item	Cost by Phase		
	2010	2020	2030
Primary Water Transmission System	$62,648,000	$133,974,000	$0
Primary Water Distribution System	$118,905,000	$268,084,000	$29,068,000
Total Project Costs Each Phase	**$181,553,000**	**$402,058,000**	**$29,068,000**
ESTIMATE OF PROBABLE TOTAL PROJECT COST			**$612,679,000**

Note:
These estimates exclude interest and financing costs as well as the costs for acquiring surface water.


MAP OF 1999
REGULATORY AREAS
Area 1
Area 2
Area 3
Galveston
Texas City
La Porte
Pasadena
League City
Friendswood
Sugar Land
Tomball
Humble
Baytown
Katy
GROUNDWATER
REDUCTION PLAN
HGCSD MAP OF 1999 REGULATORY AREAS
TurnerCollie&Braden Inc.
ARCADIS
EXHIBIT: 1



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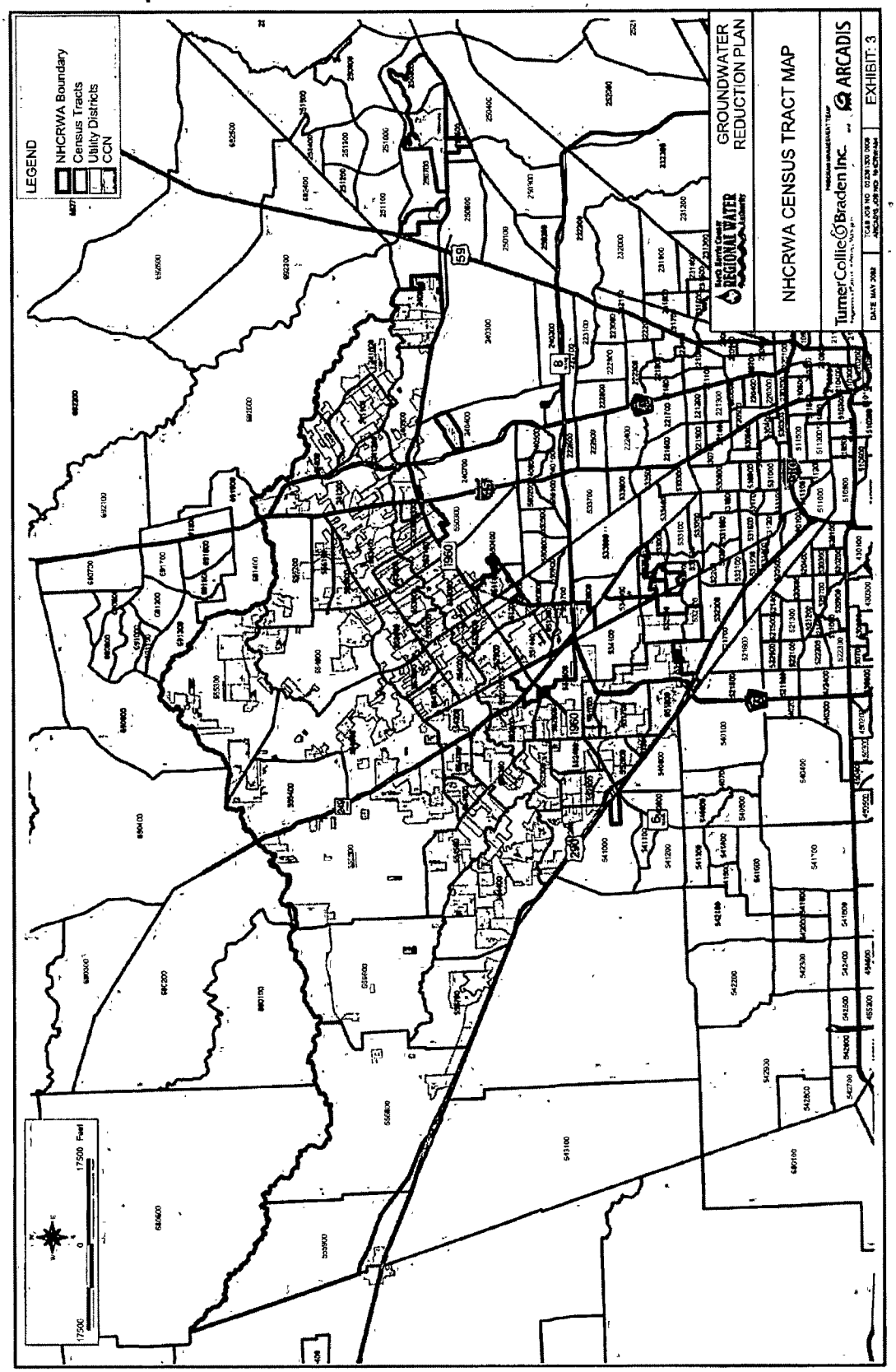
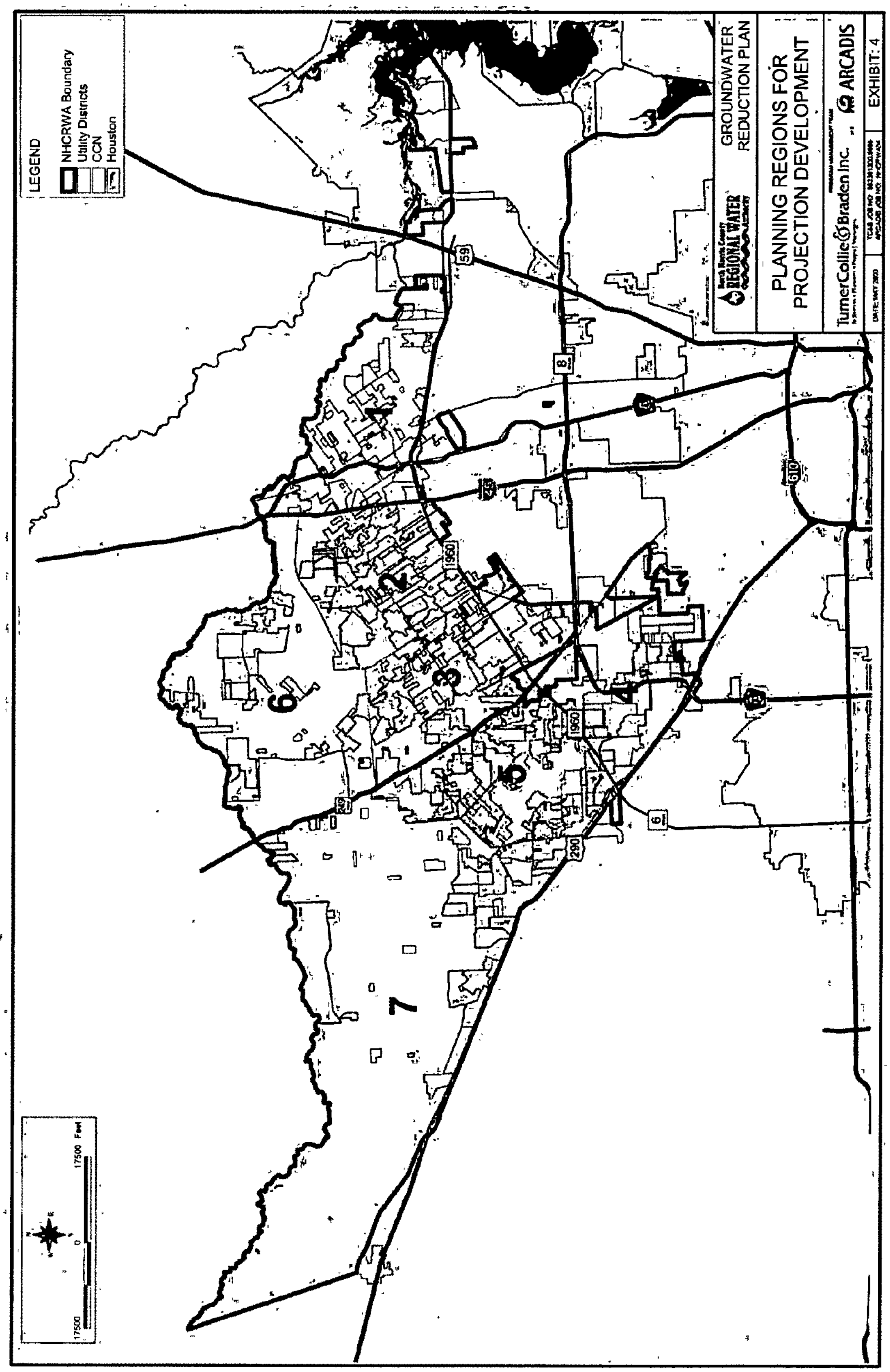
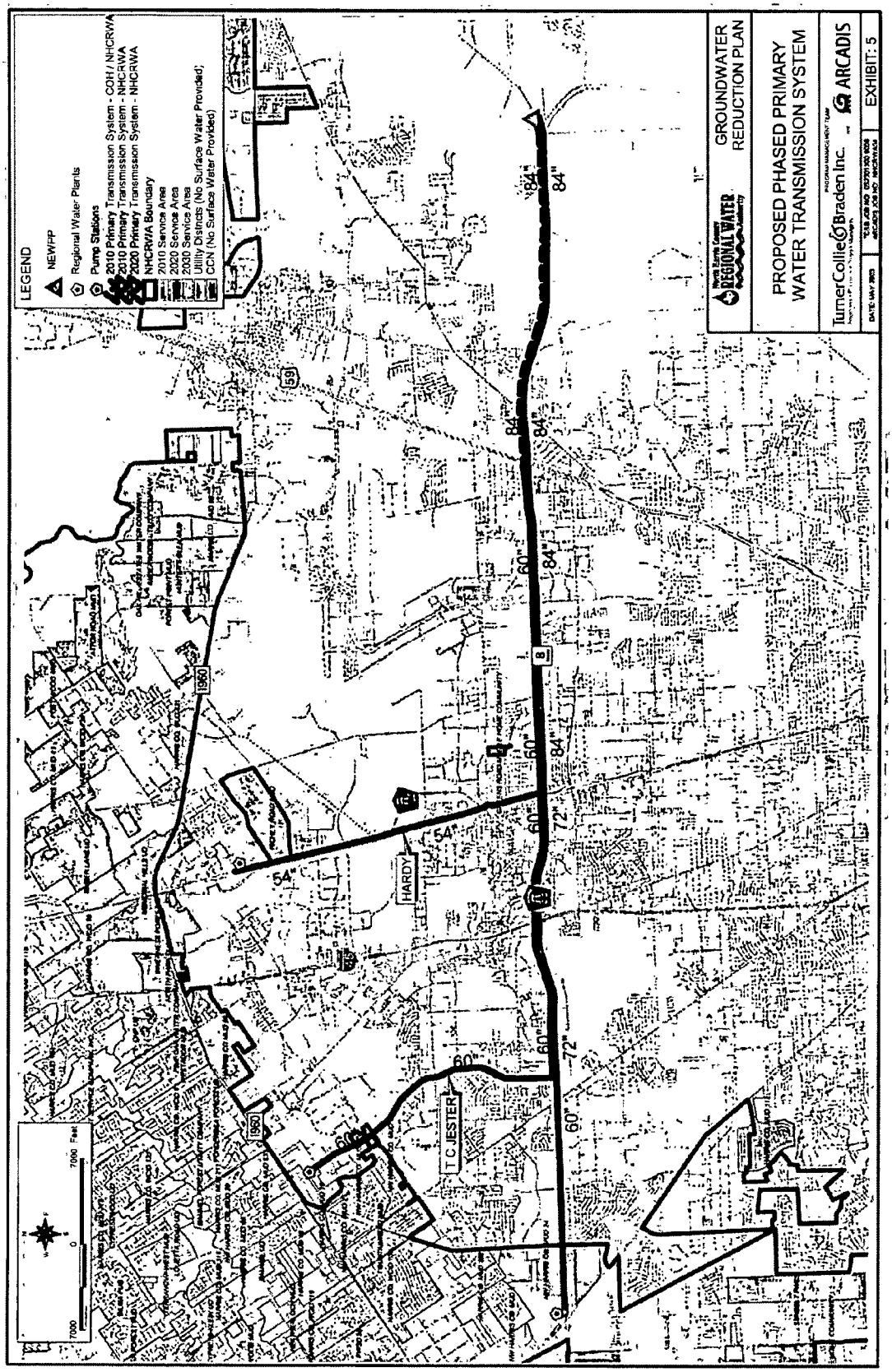
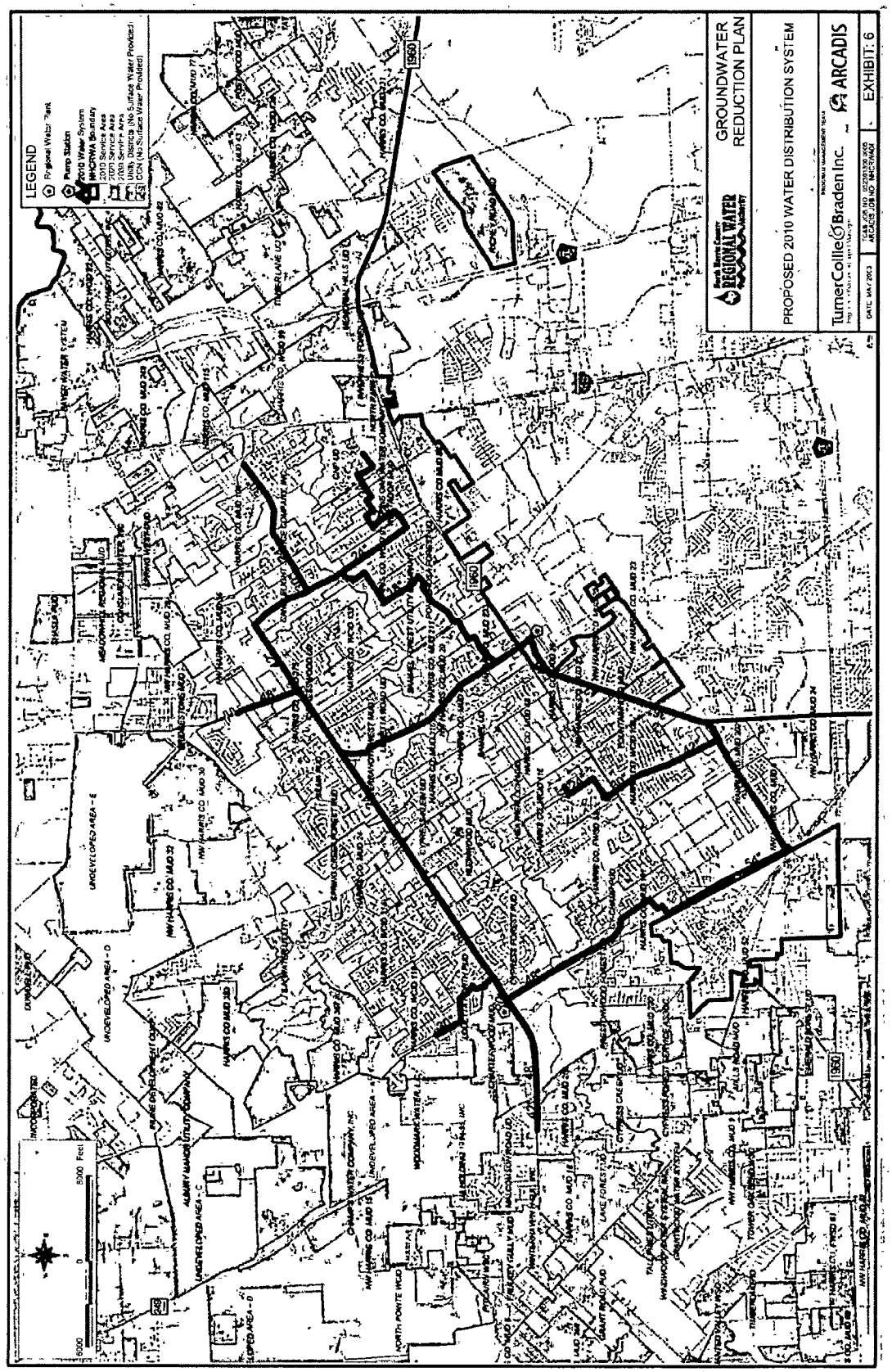

LEGEND
NHCRWA Boundary
Census Tracts
Utility Districts
CCN
GROUNDWATER REDUCTION PLAN
NHCRWA CENSUS TRACT MAP
Turner Collie & Braden Inc.
ARCADIS
EXHIBIT: 3
17500 Feet

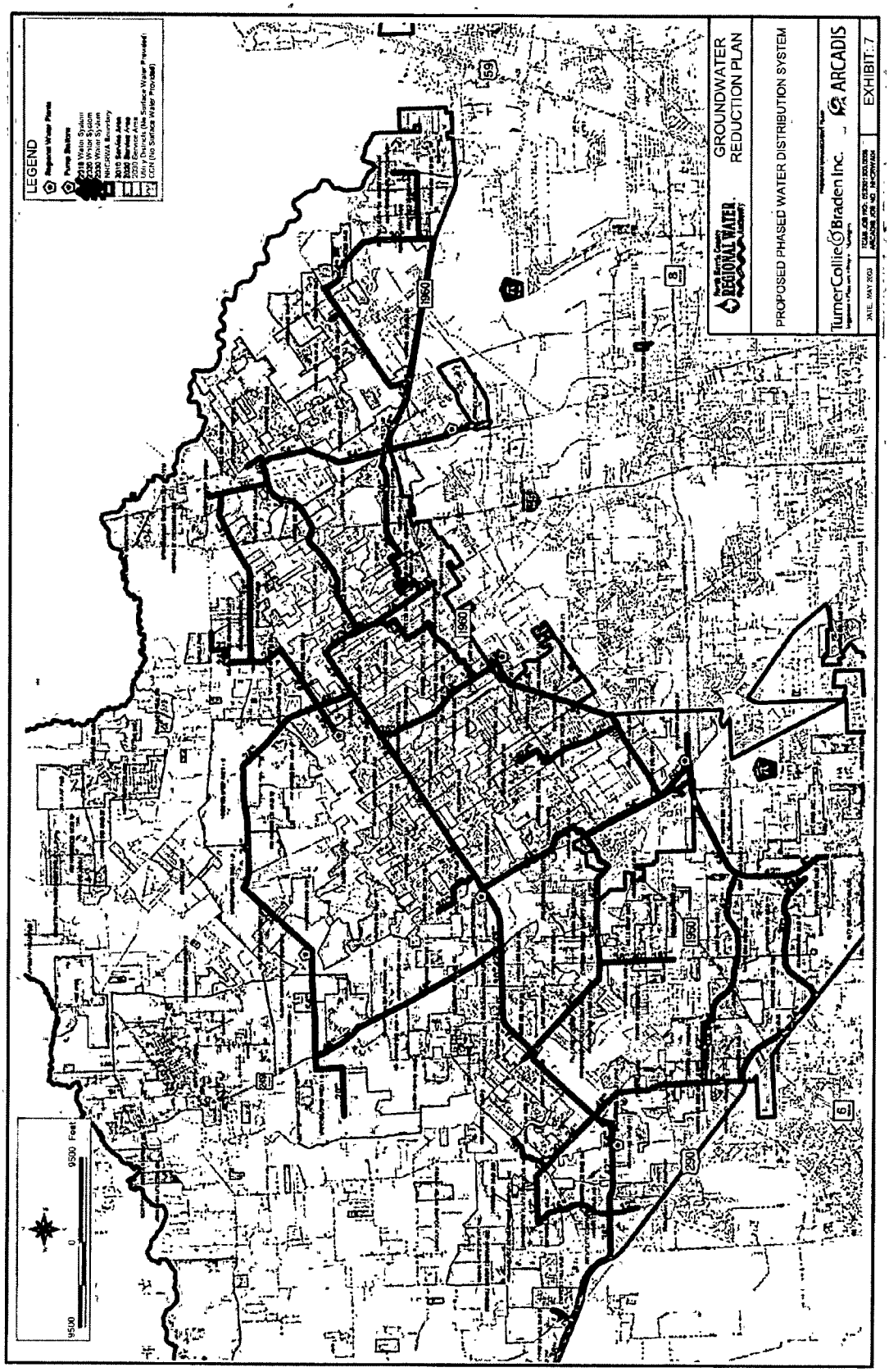

LEGEND
NHCRWA Boundary
Utility Districts
CCN
Houston
GROUNDWATER REDUCTION PLAN
PLANNING REGIONS FOR PROJECTION DEVELOPMENT
TurnerCollie&Braden Inc.
ARCADIS
EXHIBIT: 4
17500
0
17500 Feet



Direct Testimony of David Esquivel, P.E. **Ex. DME-6**



Direct Testimony of David Esquivel, P.E. **Ex. DME-6**



Direct Testimony of David Esquivel, P.E. **Ex. DME-6**

APPENDIX A . HOUSE BILL NOS. 2965 AND 1110

H.B. No. 2965 from the 76th Legislature, Regular Session, 1999

AN ACT

relating to the creation, administration, powers, duties, operation, and financing of the North Harris County Regional Water Authority; granting the power of eminent domain and the authority to issue bonds; providing a civil penalty.

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

ARTICLE 1. GENERAL PROVISIONS

SECTION 1.01. CREATION. (a) A regional water authority, to be known as the North Harris County Regional Water Authority, is created in Harris County, subject to a confirmation election held under Section 2.05 of this Act. The authority is a governmental agency and a body politic and corporate.

(b) The authority is created under and is essential to accomplish the purposes provided by Section 59, Article XVI, Texas Constitution.

SECTION 1.02. DEFINITIONS. In this Act:

(1) "Authority" means the North Harris County Regional Water Authority.

(2) "Board" means the board of directors of the authority.

(3) "Commission" means the Texas Natural Resource Conservation Commission.

(4) "Director" means a member of the board.

(5) "Local government" means a municipality, county, special district, or other political subdivision of this state or a combination of two or more of those entities.

(6) "Person" has the meaning assigned by Section 311.005, Government Code.

(7) "Subsidence district" means the Harris-Galveston Coastal Subsidence District.

(8) "System" means a network of pipelines, conduits, canals, pumping stations, force mains, treatment plants, and any other construction, device, or related appurtenance used to treat or transport water.

(9) "Water" includes:

(A) groundwater, percolating or otherwise;

(B) any surface water, natural or artificial, navigable or nonnavigable; and

(C) industrial and municipal wastewater.

(10) "Subsidence" means the lowering in elevation of the surface of land by the withdrawal of groundwater.

(11) "Agricultural crop" means food or fiber commodities grown for resale or commercial purposes that provide food, clothing, or animal feed.

SECTION 1.03. DESCRIPTION OF BOUNDARIES. (a) Except as provided by this section, the authority includes the territory that is contained in the following area, whether the territory contains noncontiguous parcels of land or whether the territory is located within the boundaries of any other governmental entity or political subdivision of the state, but only if also contained in one or more of the house districts described by this section:

BEGINNING at the intersection of the Harris and Waller County line with the north right-of-way line of U.S. Highway 290 (current alignment);

THENCE northwest along the Harris and Waller County line to the intersection with Spring Creek;

THENCE continuing southeasterly along said Harris and Waller County line, with the meanders of Spring Creek to the intersection of the Waller and Montgomery County line;

THENCE southeasterly along the Harris and Montgomery County line continuing with the meanders of said Spring Creek; to the intersection with the City of Houston, corporate limits;

THENCE along said City of Houston corporate limits, the following: south approximately one half mile; east approximately one half mile to the City of Humble corporate limits; north along said City of Humble corporate limits approximately one half mile to aforementioned Spring Creek; east along Spring Creek to its confluence with the San Jacinto River to the intersection of U.S. Highway 59; easterly and southerly along the take line for Lake Houston to the intersection with the southeasterly right-of-way of the Union Pacific Railroad; southwesterly along said Union Pacific Railroad for approximately two miles; south to the north end of Duessen Parkway; southeast along the east side of Duessen Parkway and along the north side of the access road to the intersection with North Lake Houston Parkway;

THENCE departing said City of Houston corporate limits, west along the north side of said North Lake Houston Parkway to the beginning of Mount Houston Road, and continuing west on Mount Houston Road to the 6900 block to the intersection of Suburban;

THENCE south along Suburban to the City of Houston corporate limits;

THENCE along said City of Houston corporate limits, the following: west to Hirsch Road; south along the west side of Hirsch Road to Langely; west along the south side of Langley to the southbound feeder road of US Highway 59; northeast along the west side of the feeder road of US Highway 59 to Little York; west along the south side of Little York to Bentley; north along the east side of Bentley to Sagebrush; west along the north side of Sagebrush to Halls Bayou; south along Halls Bayou to Little York; west along the south side of Little York to Aldine Westfield Road; north along the east sides of Aldine Westfield Road to its intersection with the easterly extension of the City of Houston corporate limits; west to the Hardy Toll Road; north along the Hardy Toll Road approximately 0.25 miles; east approximately 0.35 mile; north approximately 0.15 mile; west approximately 0.35 mile; northwest along the Hardy Toll Road approximately 1 mile; southwesterly along an irregular path generally west to Carby; west along Carby to Airline Drive; south along Airline Drive to Canino; west along Canino to Sweetwater; north along Sweetwater to West Road; west to Interstate 45/US 75; south along Interstate 45/US 75 to south of Bluebell Road; southerly along an irregular path generally south and west to West Mount Houston Road; west along Mount Houston Road to a line east of Ella Boulevard; south along a line generally parallel to Ella Boulevard to south of West Gulf Bank; west along the south side of West Gulf Bank to Tomball Parkway; northwest along Tomball Parkway approximately 1.5 mile; west along an irregular path to North Houston-Rosslyn Road; north along North Houston-Rosslyn Road to Vogel Creek; west along Vogel Creek to the FWD CRIP RR; south along the FWD CRIP RR to Logview; west along Logview to Hollister; south along Hollister to White Oak Bayou; east along White Oak Bayou to Twisting Vine; south along Twisting Vine to West Little York; west along West Little York to Fairbanks North Houston; south along Fairbanks North Houston to Cole Creek; west along Cole Creek to Hempstead Road; northwest along Hempstead Road to Brittmore Road, also being the intersection with U.S. Highway 290, Northwest Freeway;

THENCE departing said City of Houston corporate limits and continuing northwest along U.S. Highway 290, Northwest Freeway, at Spencer Road;

THENCE northwest along U.S. Highway 290, Northwest Freeway (current alignment), to the intersection of the Harris and Waller County line, the POINT OF BEGINNING.

(b) The authority includes only that territory described by Subsection (a) of this section that is also in the following state representative districts as described by Article II, Chapter 2, Acts of the 72nd Legislature, 3rd Called Session, 1992 (Article II, Article 195a-11, Vernon's Texas Civil

Statutes), as the districts existed on the effective date of this Act:

(1) District 127;
(2) District 126;
(3) District 130;
(4) District 135; and
(5) District 150.

(c) Notwithstanding Subsections (a) and (b) of this section, the authority does not include any area that, on the effective date of this Act, is inside the municipal limits of the city of Houston or inside the municipal limits of the city of Humble.

(d) On a municipality's annexation of any of the authority's territory, the annexed territory is excluded from the authority's territory. The authority shall continue to provide services to the annexed territory in accordance with contracts in effect at the time of the annexation unless a written agreement between the board and the governing body of the municipality provides otherwise.

SECTION 1.04. EXCLUSION OF CERTAIN TERRITORY. (a) A district organized under Section 52, Article III, or Section 59, Article XVI, Texas Constitution, that is located in the portion of the territory described by Section 1.03(a) of this Act that is south of Beltway 8 or east of U.S. Highway 59 may petition for exclusion of its territory from the authority's territory. Before the 61st day after the date the authority receives the petition, the board shall:

(1) grant the petition and order the territory excluded if the petition:

(A) includes an accurate legal description of the boundaries of the territory to be excluded; and

(B) the petition is filed with the authority before March 1, 2001; and

(2) if the board grants the petition, file for recording in the office of the county clerk of Harris County a copy of the order and a description of the authority's boundaries as they exist after the exclusion of the territory.

(b) The order excluding the territory is effective immediately after the order and description are recorded.

SECTION 1.05. APPLICABILITY OF OTHER LAW. (a) This Act prevails over any inconsistent provision of general law.

(b) This Act does not prevail over or preempt a provision of Chapter 151, Water Code, or Chapter 36, Water Code, that is being implemented by the subsidence district.

SECTION 1.06. FINDING OF BENEFIT. All the land and other property included within the boundaries of the authority will be benefited by the works and projects that are to be accomplished by the authority under powers conveyed by this Act. The authority is created to serve a public use and benefit.

ARTICLE 2. DIRECTORS

SECTION 2.01. BOARD OF DIRECTORS. (a) The authority is governed by a board of five directors.

(b) The board shall appoint a person to fill a vacancy in the office of director until the next election for directors. If the position is not scheduled to be filled at the election, the person elected to fill the position serves only for the remainder of the unexpired term.

(c) To be eligible to serve as director, a person must be a qualified voter in the voting district from which the person is elected or appointed.

SECTION 2.02. METHOD OF ELECTION OF DIRECTORS. (a) One director shall be

elected from each of five single-member voting districts by the qualified voters of the voting district.

(b) A person shall indicate on the person's application for a place on the ballot the voting district that the person seeks to represent.

(c) In the manner described by Section 49.103(d), Water Code, the board shall redraw the single-member voting districts as soon as practicable after:

(1) each federal decennial census; and

(2) any change in the boundaries of the authority.

(d) At the first election after each time the voting districts are redrawn:

(1) five new directors shall be elected to represent the single-member voting districts; and

(2) the directors elected shall draw lots to determine their terms so that:

(A) two directors serve two-year terms; and

(B) three directors serve four-year terms.

(e) Subchapter C, Chapter 146, Election Code, applies to the consideration of votes for a write-in candidate for the initial permanent director or permanent director as if the authority were a municipality.

SECTION 2.03. SERVICE OF DIRECTORS. (a) Temporary directors serve until the initial permanent directors are elected under Section 2.05 of this Act.

(b) The initial permanent directors serve until permanent directors are elected under Section 2.06 of this Act.

(c) Permanent directors serve staggered four-year terms.

(d) A director serves until the director's successor has qualified.

SECTION 2.04. TEMPORARY DIRECTORS. (a) The temporary board of directors is composed of three individuals appointed by the commission.

(b) If a temporary director fails to qualify for office, the temporary directors who have qualified shall appoint a person to fill the vacancy. If at any time there are fewer than two qualified temporary directors, or if the temporary directors cannot agree on the appointment, the commission shall appoint the necessary number of persons to fill all vacancies on the board.

(c) A temporary director is not eligible to be elected under Section 2.05 of this Act.

SECTION 2.05. CONFIRMATION AND INITIAL PERMANENT DIRECTORS ELECTION. (a) The temporary board of directors shall:

(1) establish five single-member voting districts in the manner described by Section 49.103(d), Water Code; and

(2) on the first uniform election date of the calendar year 2000 hold an election to confirm the establishment of the authority and to elect five initial permanent directors.

(b) A person who desires to be a candidate for the office of initial permanent director may file an application with the temporary board to have the candidate's name printed on the ballot.

(c) At the confirmation and initial permanent directors election, the temporary board of directors shall have placed on the ballot:

(1) the name of each candidate filing for the office of director; and

(2) blank spaces to write in the names of other persons.

(d) If the authority is created at the election, the temporary board of directors, at the time the vote is canvassed, shall:

(1) declare the qualified person who receives the most votes for each position to be

elected as the initial director for that position; and

(2) include the results of the initial directors election in the authority's election report to the commission.

(e) As soon as practicable after the initial permanent directors have qualified, the directors shall draw lots to determine their terms so that:

(1) two directors serve terms that expire when permanent directors are elected at the first election held under Section 2.06 of this Act; and

(2) three directors serve terms that expire when permanent directors are elected at the second election held under Section 2.06 of this Act.

(f) Section 41.001(a), Election Code, does not apply to the confirmation and initial permanent directors election held under this section.

(g) The temporary board of directors shall draft language for the ballot proposition used for the confirmation election. The ballot proposition must clearly and completely explain:

(1) the powers and duties of the authority;

(2) whether the authority has the power of eminent domain;

(3) whether the authority has the authority to issue bonds;

(4) whether the authority has the authority to impose taxes; and

(5) whether the authority has the authority to impose fees.

(h) The ballot language must explain the nature of any fees or taxes the authority has the authority to impose.

SECTION 2.06. ELECTION DATES. On the first uniform election date of the calendar year in each subsequent even-numbered year, the appropriate number of directors shall be elected to the board.

SECTION 2.07. COST OF ELECTION. (a) The temporary board of the authority shall fund the cost of the confirmation and initial permanent directors election if the temporary board is able to find a reasonable means of funding the election.

(b) If the temporary board is unable to fund the entire cost of the election, the temporary board of the authority and the board of directors of the subsidence district may execute an agreement by which:

(1) the subsidence district shall pay the portion of the costs that could not be funded by the district; and

(2) the authority shall repay the subsidence district for those costs within a reasonable period.

ARTICLE 3. ADMINISTRATIVE PROVISIONS

SECTION 3.01. MEETINGS AND ACTIONS OF BOARD. The board shall meet at least four times each year and may meet at any other time the board considers appropriate.

SECTION 3.02. GENERAL MANAGER. (a) The board shall employ a general manager as the chief administrative officer of the authority. The board may delegate to the general manager full authority to manage and operate the affairs of the authority subject only to the orders of the board.

(b) The duties of the general manager include:

(1) the administration of the orders of the board;

(2) coordination with state, federal, and local agencies;

(3) the oversight of development of authority plans and programs; and

(4) other duties assigned by the board.

(c) The board shall determine the terms of office and employment and the compensation to be paid the general manager. The general manager may be discharged by majority vote of the board.

SECTION 3.03. EMPLOYEES; BONDS. (a) The general manager of the authority shall employ all persons necessary for the proper handling of the business and operations of the authority and may employ attorneys, bookkeepers, engineers, and other expert and specialized personnel the board considers necessary. The general manager shall determine compensation to be paid by the authority.

(b) The general manager may discharge employees of the authority.

(c) The general manager of the authority and each employee or contractor of the authority who is charged with the collection, custody, or payment of any money of the authority shall execute a fidelity bond in an amount determined by the board and in a form and with a surety approved by the board. The authority shall pay for the bond.

ARTICLE 4. POWERS AND DUTIES

SECTION 4.01. GENERAL POWERS AND DUTIES. (a) The authority has all of the rights, powers, privileges, authority, functions, and duties necessary and convenient to accomplish the purposes of this Act, including those provided by Chapter 49, Water Code.

(b) The authority may:

(1) provide for the conservation, preservation, protection, recharge, and prevention of waste of groundwater, and for the reduction of groundwater withdrawals, in a manner consistent with the purposes of Section 59, Article XVI, Texas Constitution;

(2) for the purposes of reducing groundwater withdrawals and subsidence, acquire or develop surface water and groundwater supplies from sources inside of or outside of the boundaries of the authority and may conserve, store, transport, treat, purify, distribute, sell, and deliver water to persons, corporations, municipal corporations, political subdivisions of the state, and others, inside of and outside of the boundaries of the authority;

(3) enter into contracts with persons, including political subdivisions of the state, on terms and conditions the board considers desirable, fair, and advantageous for the performance of its rights, powers, and authority under this Act;

(4) coordinate water services provided inside of, outside of, or into the authority; and

(5) administer and enforce the provisions of the Act.

(c) The authority's rights, powers, privileges, authority, functions, and duties are subject to the continuing right of supervision of the state, to be exercised by and through the commission.

(d) The authority shall exercise its rights, powers, privileges, and authority in a manner that will promote regionalization of water treatment and distribution.

SECTION 4.02. AUTHORITY RULES. (a) The authority shall adopt and enforce rules reasonably required to implement this Act, including rules governing procedures before the board.

(b) The board shall compile its rules in a book and make them available for use and inspection at the authority's principal office.

SECTION 4.03. FEES AND CHARGES. (a) The authority may establish fees and charges as necessary to enable the authority to fulfill the authority's regulatory obligations provided by this Act.

(b) The authority may charge against the owner of a well located in the authority's boundaries

a fee on the amount of water pumped from the well. The board shall establish the rate of a fee under this subsection only after a special meeting on the fee. The board by rule may exempt classes of wells from the fee under this subsection. The board may not apply the fee to a well:

(1) with a casing diameter of less than five inches that serves a single-family dwelling;

(2) regulated under Chapter 27, Water Code;

(3) used for irrigation of agricultural crops;

(4) that produces 10 million gallons or less annually; or

(5) used solely for electric generation.

(c) Fees the board establishes must be sufficient to:

(1) achieve water conservation, prevent waste of water, serve as a disincentive to pumping groundwater, and accomplish the purposes of this Act, including making available alternative water supplies; and

(2) enable the authority to meet operation and maintenance expenses and pay the principal of and interest on debt issued in connection with the exercise of the authority's general powers and duties.

(d) The temporary board may set fees to pay for the initial operation of the authority and the election of the initial permanent board until the permanent board has been elected.

SECTION 4.04. CIVIL PENALTY; INJUNCTION. (a) A person who violates a rule or order of the authority is subject to a civil penalty of not less than $50 and not more than $5,000 for each violation or each day of a continuing violation.

(b) The authority may bring an action to recover the penalty in a district court in the county where the violation occurred. The penalty shall be paid to the authority.

(c) The authority may bring an action for injunctive relief in a district court in the county where a violation of an authority rule or order occurs or is threatened to occur. The court may grant to the authority, without bond or other undertaking, a prohibitory or mandatory injunction that the facts warrant, including a temporary restraining order, temporary injunction, or permanent injunction.

(d) The authority may bring an action for a civil penalty and injunctive relief in the same proceeding.

SECTION 4.05. WATER SUPPLY PLANS. The authority by rule shall, as needed but not less frequently than every five years, develop, prepare, revise, and adopt comprehensive water supply and drought contingency plans for various areas of the authority. The plans:

(1) must be consistent with regional planning; and

(2) must include 10-year, 20-year, and 50-year projections of water needs within the authority.

SECTION 4.06. ACQUISITION, CONSTRUCTION, AND OPERATION OF SYSTEMS. (a) The authority may:

(1) acquire and provide by purchase, gift, or lease a water treatment or supply system inside of or outside of the authority's boundaries;

(2) design, finance, or construct a water treatment or supply system and provide water services inside of or outside of the authority's boundaries;

(3) operate, lease, or sell a water treatment or supply system the authority constructs or acquires; and

(4) contract with any person to operate or maintain a water treatment or supply

system the person owns.

(b) The authority shall give persons outside the authority's boundaries, including the city of Houston, the option to contract for available excess capacity of the authority's water treatment or supply system or, before construction of a water treatment or supply system begins, for additional capacity of the system. The authority must offer a contract that would enable the person to pay for the excess capacity or additional capacity in accordance with the person's pro rata share of the capital investment and operational and maintenance costs for providing the excess capacity or additional capacity.

SECTION 4.07. SALE OR REUSE OF WATER OR BY-PRODUCT. The authority may store, sell, or reuse:

(1) water; or

(2) any by-product from the authority's operations.

SECTION 4.08. EMINENT DOMAIN. The authority may exercise the power of eminent domain in the manner provided in Chapter 21, Property Code, to acquire property of any kind to further authorized purposes of the authority. The authority may not exercise the power of eminent domain outside of the boundaries of the authority.

SECTION 4.09. CONTRACTS. (a) The authority may enter into a contract with any person or legal entity regarding the performance of any purpose or function of the authority, including a contract to jointly construct, finance, own, or operate works, improvements, facilities, plants, equipment, or appliances necessary to accomplish a purpose or function of the authority. A contract may be of unlimited duration.

(b) The authority may purchase an interest in a project used for a purpose or function of the authority.

(c) The authority may contract for:

(1) the purchase or sale of water or water rights;

(2) the performance of activities within the powers of the authority to promote the continuing and orderly development of land and property in the authority through the purchase, construction, or installation of works, improvements, facilities, plants, equipment, or appliances so that, to the greatest extent possible, considering sound engineering practices and economic feasibility, all the land and property in the authority may receive services of the works, improvements, facilities, plants, equipment, or appliances of the authority; or

(3) the construction, ownership, maintenance, or operation of any works, improvements, facilities, plants, equipment, or appliances of the authority or another person or legal entity.

(d) The authority may purchase surplus property from this state, the United States, or another public entity through a negotiated contract without bids.

(e) An officer, agent, or employee of the authority who is financially interested in the contract of the type described by Subsection (d) of this section shall disclose the interest to the board before the board votes on the acceptance of the contract.

SECTION 4.10. COOPERATION WITH AND ASSISTANCE OF OTHER GOVERNMENTAL ENTITIES. (a) In implementing this Act, the board may cooperate with and request the assistance of the Texas Water Development Board, the commission, the United States Geological Survey, the subsidence district, other local governments, and other agencies of the United States and this state.

(b) The subsidence district may enter into an interlocal contract with the authority to carry

out the authority's purposes and may carry out the governmental functions and services specified in the interlocal contract.

(c) The board shall coordinate with the city of Houston to develop an interregional plan for a system to distribute treated surface water in an economical and efficient manner.

SECTION 4.11. GIFTS AND GRANTS. The authority is authorized to accept a gift or grant from money collected by the subsidence district under Chapter 151, Water Code, to fund a water treatment or supply system. The authorization in this section is in addition to the authorization provided in Section 49.229, Water Code.

SECTION 4.12. EXPENDITURES. (a) The authority's money may be disbursed only by check, draft, order, or other instrument.

(b) Disbursements of the authority must be signed by at least two directors, except the board by resolution may allow the general manager, treasurer, bookkeeper, or other employee of the authority to sign disbursements.

(c) The board by resolution may allow disbursements to be transferred by federal reserve wire system to accounts in the name of the authority.

SECTION 4.13. TAXATION. The authority may not impose an ad valorem tax.

ARTICLE 5. NOTES AND BONDS

SECTION 5.01. REVENUE NOTES. (a) The board, without an election, may borrow money on negotiable notes of the authority to be paid solely from the revenue derived from any legal source, including:

(1) tolls, charges, and fees the authority imposes;

(2) the sale of water, water or sewer services, or any other service or product of the authority;

(3) grants or gifts;

(4) the ownership and operation of all or a designated part of the authority's works, improvements, facilities, plants, or equipment; and

(5) contracts between the authority and any person, including a local government.

(b) The notes may be first or subordinate lien notes at the board's discretion. An obligation may not be a charge on the property of the authority. An obligation may only be a charge on revenue pledged for the payment of the obligation.

SECTION 5.02. BONDS. (a) To carry out a power or authority conferred by this Act, the authority may issue bonds secured by all or part of the revenue derived from any source, including any source described by Section 5.01(a) of this Act.

(b) In issuing or securing a bond or note of the authority, the authority may exercise any power of an issuer under Chapter 656, Acts of the 68th Legislature, Regular Session, 1983 (Article 717q, Vernon's Texas Civil Statutes).

(c) The authority may conduct a public, private, or negotiated sale of the bonds.

(d) The authority's bonds must:

(1) be authorized by board resolution;

(2) be issued in the authority's name;

(3) be signed by the president or vice president of the board, which may be accomplished by facsimile signature;

(4) be attested by the secretary of the board, which may be accomplished by facsimile signature; and

(5) bear the authority's seal or facsimile seal.

(e) An authority bond may be secured by an indenture of trust with a corporate trustee.

(f) The authority may issue bonds in more than one series as required for carrying out the purposes of this Act. In issuing bonds secured by revenue of the authority, the authority may reserve the right to issue additional bonds secured by the authority's revenue that are on a parity with or are senior or subordinate to the bonds issued earlier.

(g) The resolution authorizing the bonds or the trust indenture securing the bonds may specify additional provisions that constitute a contract between the authority and its bondholders. The board may provide:

(1) for additional bond provisions; and

(2) for a corporate trustee or receiver to take possession of the authority's facilities if the authority defaults.

(h) Section 49.181, Water Code, does not apply to bonds or notes issued by the authority.

SECTION 5.03. REFUNDING BONDS. The provisions of this Act that apply to the authority's issuance of other bonds, their security, and the remedies of the holders apply to refunding bonds.

SECTION 5.04. APPROVAL AND REGISTRATION OF BONDS. After the authority authorizes bonds, the authority shall submit the bonds and the record relating to their issuance to the attorney general for approval. If the bonds are secured by a pledge of the proceeds of a contract between the authority and a municipality or other governmental agency, authority, or district, the authority shall submit to the attorney general a copy of the contract and the proceedings of the municipality or other governmental agency, authority, or district authorizing the contract. If the attorney general finds that the bonds have been authorized and each contract has been made in accordance with the constitution and laws of this state, the attorney general shall approve the bonds and contracts. On approval, the bonds shall be registered by the comptroller.

SECTION 5.05. FUNDING BY OTHER DISTRICTS. (a) The authority shall develop a procedure for cooperatively funding a project of the authority with money from other districts inside of the authority's boundaries if the authority project fulfills a governmental purpose of both the authority and other districts.

(b) Not later than the 90th day before the date the authority issues bonds, other than refunding bonds, to finance a project, the authority shall provide written notice of the authority's intention to issue the bonds to each district inside of the authority's boundaries that may be benefited or affected by the project. The notice must include the value of the bonds planned to be issued, a description of the project the bonds would finance, and a schedule of the portion of the project costs financed by the bonds that may be allocated to each district benefited or affected. The schedule must be prepared by means of a formula certified by the authority's engineer.

(c) A district may enter into a contract with the authority for the district to finance a portion of the proposed project with the district's resources instead of using proceeds from bonds of the authority for that purpose. The contract must be executed before the authority issues the bonds. As provided in the contract, the authority must:

(1) reduce the value of the bond issuance to the degree that the district provides project funding; and

(2) credit the district for its contribution to the project financing and adjust the allocation of revenue pledged to the payment of the bonds so that the authority avoids using, to a

degree commensurate with the contribution, revenue from the district to service the authority's bond debt or interest.

ARTICLE 6. MISCELLANEOUS PROVISIONS

SECTION 6.01. FINDINGS RELATED TO PROCEDURAL REQUIREMENTS. (a) The proper and legal notice of the intention to introduce this Act, setting out the general substance of this Act, has been published as provided by law, and the notice and a copy of this Act have been furnished to all persons, agencies, officials, or entities to which they are required to be furnished by the constitution and other laws of this state, including the governor, who has submitted the notice and the Act to the commission.

(b) The commission has filed its recommendations relating to this Act with the governor, lieutenant governor, and speaker of the house of representatives within the required time.

(c) All requirements of the constitution and laws of this state and the rules and procedures of the legislature with respect to notice, introduction, and passage of this Act are fulfilled and accomplished.

SECTION 6.02. EMERGENCY. The importance of this legislation and the crowded condition of the calendars in both houses create an emergency and an imperative public necessity that the constitutional rule requiring bills to be read on three several days in each house be suspended, and this rule is hereby suspended, and that this Act take effect and be in force from and after its passage, and it is so enacted.

H.B. No. 2965 from the 76th Legislature, Regular Session, 1999

President of the Senate Speaker of the House

I certify that H.B. No. 2965 was passed by the House on April 22, 1999, by a non-record vote; and that the House concurred in Senate amendments to H.B. No. 2965 on May 19, 1999, by the following vote: Yeas 143, Nays 0, 2 present, not voting.

Chief Clerk of the House

I certify that H.B. No. 2965 was passed by the Senate, with amendments, on May 17, 1999, by the following vote: Yeas 30, Nays 0.

Secretary of the Senate

APPROVED: _____
Date

_____
Governor

H.B. No. 1110 from the 77th Legislature, Regular Session, 2001

AN ACT

relating to the North Harris County Regional Water Authority.

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

SECTION 1. Section 1.02, Chapter 1029, Acts of the 76th Legislature, Regular Session, 1999, is amended by adding Subdivision (12) to read as follows:

(12) "Groundwater reduction plan" means a plan adopted or implemented to supply water, reduce reliance on groundwater, regulate groundwater pumping and water usage, or require and allocate water usage among persons in order to comply with or exceed the minimum requirements imposed by the subsidence district, including any applicable groundwater reduction requirements.

SECTION 2. Section 1.03, Chapter 1029, Acts of the 76th Legislature, Regular Session, 1999, is amended by adding Subsection (e) to read as follows:

(e) Notwithstanding Subsections (a) and (b) of this section, the authority does not include the territory of a district organized under Section 52, Article III, or Section 59, Article XVI, Texas Constitution, located within the area described by Subsections (a) and (b) of this section only if the territory meets both of the following criteria:

(1) any portion of the territory of the district was located outside the area described by Subsections (a) and (b) of this section on the effective date of this Act; and

(2) the district does not own, lease, or receive water for nonemergency purposes from a well located within the area described by Subsections (a) and (b) of this section.

SECTION 3. Chapter 1029, Acts of the 76th Legislature, Regular Session, 1999, is amended by adding Section 1.045 to read as follows:

Sec. 1.045. INCLUSION OF CERTAIN TERRITORY. (a) The board of directors of a district organized under Section 52, Article III, or Section 59, Article XVI, Texas Constitution, all or part of which is not included within the boundaries of the authority under Section 1.03 of this Act, may request by petition the inclusion of its territory in the authority's territory. The petition must:

(1) be filed with the authority; and

(2) include an accurate legal description of the boundaries of the territory to be included.

(b) If the authority has bonds, notes, or other obligations outstanding, the board shall require the petitioning district to assume its share of the outstanding bonds, notes, or other obligations.

(c) Before the 61st day after the date the authority receives the petition, the board shall hold a hearing to consider the petition. The board may grant the petition and order the territory described in the petition included in the authority's territory if:

(1) it is feasible, practicable, and to the advantage of the authority; and

(2) the authority's system and other improvements of the authority are sufficient or will be sufficient to supply the added territory without injuring the territory already included in the authority.

(d) If the board grants the petition, the board shall file for recording

in the office of the county clerk of Harris County:

(1) a copy of the order; and

(2) a description of the authority's boundaries as they exist after the inclusion of the territory.

(e) The order including the territory is effective immediately after the order and description are recorded.

(f) A district that petitions before January 1, 2002, for inclusion within the territory of the authority shall not be required to pay any fee to the authority for admission or reimbursement for activities the authority has undertaken since its creation in the furtherance of its duties and functions. A district that petitions for inclusion within the territory of the authority on or after January 1, 2002, shall be subject to such fees and reimbursements as are in effect at the time of such petition and are applicable to such petitioners.

SECTION 4. Section 4.01, Chapter 1029, Acts of the 76th Legislature, Regular Session, 1999, is amended by amending Subsection (b) and adding Subsections (e) through (h) to read as follows:

(b) The authority may:

(1) provide for the conservation, preservation, protection, recharge, and prevention of waste of groundwater[~~, and for the reduction of groundwater withdrawals,~~] in a manner consistent with the purposes of Section 59, Article XVI, Texas Constitution;

(2) for the purposes of reducing groundwater withdrawals and subsidence, acquire or develop surface water and groundwater supplies from sources inside of or outside of the boundaries of the authority and may conserve, store, transport, treat, purify, distribute, sell, and deliver water to persons, corporations, municipal corporations, political subdivisions of the state, and others, inside of and outside of the boundaries of the authority;

(3) enter into contracts with persons, including political subdivisions of the state, on terms and conditions the board considers desirable, fair, and advantageous for the performance of its rights, powers, and authority under this Act;

(4) coordinate water services provided inside of, outside of, or into the authority; [~~and~~]

(5) provide for the reduction of groundwater withdrawals by the development, implementation, or enforcement of a groundwater reduction plan as provided in Subsection (e) of this section;

(6) identify sources of water other than groundwater to be provided by the authority;

(7) specify the rates, terms, and conditions under which sources of water other than groundwater will be provided by the authority, which may be changed from time to time as deemed necessary by the authority;

(8) specify the dates and extent to which each person or district within the authority's boundaries shall accept water from the authority; and

(9) administer and enforce the provisions of the Act.

(e) The authority may develop, implement, participate in, and enforce a groundwater reduction plan. A groundwater reduction plan developed, implemented, participated in, or enforced by the authority shall be binding on persons, districts, entities, and wells within the authority's boundaries.

(f) The authority may contract on such terms as are mutually agreeable with any person or district located outside the authority to allow the person or district to be included in the authority's groundwater reduction plan. Such contracts shall have the same force and effect as if the person or district were located within the authority, except that the person or district shall not have the right to vote in elections for members of the board of the authority.

(g) The plan authorized by Subsection (c) of this section may be amended from time to time at the discretion of the authority subject to the requirements and procedures of the subsidence district applicable to the amendment of groundwater reduction plans.

(h) The groundwater reduction plan developed by the authority may exceed the minimum requirements imposed by the subsidence district, including without limitation any applicable groundwater reduction requirements.

SECTION 5. Section 4.08, Chapter 1029, Acts of the 76th Legislature, Regular Session, 1999, is amended to read as follows:

Sec. 4.08. EMINENT DOMAIN. (a) The authority may exercise the power of eminent domain inside the boundaries of the authority [~~in the manner provided in Chapter 21, Property Code,~~] to acquire property of any kind to further the authorized purposes of the authority[~~. The authority may not exercise the power of eminent domain outside of the boundaries of the authority~~].

(b)(1) The authority may exercise the power of eminent domain outside the boundaries of the authority to acquire any land, easements, or other property for purposes of pumping, treating, storing, and transporting water.

(2) The authority may not use the power of eminent domain granted by Subsection (b)(1) of this section for the condemnation of land for the purpose of acquiring rights to underground water or water or water rights.

(3) The authority may not use the power of eminent domain granted by Subsection (b)(1) of this section to acquire property of any kind that is:

(A) owned by a municipality with a population of 1.6 million or more or any instrumentality of a municipality with a population of 1.6 million or more, including any local government corporation created by the municipality; or

(B) located within the corporate boundaries of a municipality with a population of 1.6 million or more for limited or general purposes as of February 1, 2001.

(4) Notwithstanding Subsection (b)(3)(B) of this section, the authority may use the power of eminent domain granted by Subsection (b)(1) of this section to acquire property:

(A) within the corporate boundaries of a municipality with a population of 1.6 million or more if:

(i) the condemnation is to be used to provide facilities between two points that are within the authority; and

(ii) the area within the municipality is bounded by a line parallel to and 150 feet north of the north side of Greens Bayou and by a line parallel to and 150 feet south of the south side of Greens Bayou;

(B) that is within the corporate boundaries of a

municipality with a population of 1.6 million and annexation of the territory by the municipality was completed between January 1, 1962, and January 1, 1964; or

(C) that is within an area of the corporate boundaries of a municipality with a population of 1.6 million or more if the municipality grants permission for such condemnation.

(c) The power of eminent domain granted by Subsections (a) and (b) of this section shall be exercised in the manner provided in Chapter 21, Property Code, except that the authority shall not be required to give bond for appeal or bond for costs in any condemnation suit, or other suit to which it is a party, and shall not be required to deposit more than the amount of any award in any suit.

(d) When exercising the power of eminent domain granted by Subsections (a) and (b) of this section, the authority may elect to condemn either the fee simple or a lesser property interest.

(e) The authority may not exercise the power of eminent domain granted by Subsections (a) and (b) of this section to acquire property of any kind in a county that:

(1) has a population of more than 245,000;

(2) borders the Gulf of Mexico; and

(3) is adjacent to a county with a population of more than 1.6 million.

SECTION 6. Section 4.12(b), Chapter 1029, Acts of the 76th Legislature, Regular Session, 1999, is amended to read as follows:

(b) Disbursements of the authority must be signed by at least two directors, except, notwithstanding any other law, the board by resolution may allow the general manager, treasurer, bookkeeper, or other employee of the authority to sign disbursements.

SECTION 7. Article 4, Chapter 1029, Acts of the 76th Legislature, Regular Session, 1999, is amended by adding Section 4.14 to read as follows:

Sec. 4.14. INCLUDED DISTRICTS. A district inside of the authority's boundaries retains its separate identity, powers, and duties, except that the district is subject to the powers and duties of the authority, including those powers and duties of the authority necessary to develop, implement, and enforce a groundwater reduction plan.

SECTION 8. Section 1.04, Chapter 1029, Acts of the 76th Legislature, Regular Session, 1999, is repealed.

SECTION 9. This Act takes effect immediately if it receives a vote of two-thirds of all the members elected to each house, as provided by Section 39, Article III, Texas Constitution. If this Act does not receive the vote necessary for immediate effect, this Act takes effect September 1, 2001.

H.B. No. 1110 from the 77th Legislature, Regular Session, 2001

President of the Senate Speaker of the House

I certify that H.B. No. 1110 was passed by the House on March 21, 2001, by the following vote: Yeas 146, Nays 0,.1 present, not voting.

Chief Clerk of the House

I certify that H.B. No. 1110 was passed by the Senate on May 17, 2001, by the following vote: Yeas 30, Nays 0, 1 present, not voting.

Secretary of the Senate

APPROVED: _____
Date

_____
Governor

APPENDIX B NHCRWA WELL PUMPAGE

Notes:

1. The table format is shown as it is presented by the HGCSD.
2. Column title "AGG2000" is the aggregated number of wells with pumpage by the owner in Year 2000.
3. In "AGG2000." The number "999" signifies no pumpage in that particular well for the year.
4. Column title "PUMP2000 (GPY)" shows the total production from all wells assigned to the owner for a particular parcel of land. Duplicate entries for well owners are not included in the total pumpage.

<2 MGY - Water Well Permittees within NHCRWA per HGCSD 2000 Pumpage Report

WELL	OWNER	AGG2000	PUMP2000 (GPY)
5153	111011 JONES ROAD JOINT VENTURE		
5235	A & M AUTO PARTS, INC.	1	24,000
5978	A. G. GEOPHYSICAL	1	480,000
7699	A.R.C., LTD.	1	30,000
7926	A.R.C., LTD.	1	45,000
7704	A-1 ADVANCED MOVING & STORAGE	1	24,000
7052	A-1 DISCOUNT STORAGE	1	850
5579	AAA BOAT STORAGE	2	398,000
6833	AAA BOAT STORAGE	2	398,000
7403	AAA GRASS	1	21,120
7656	A-ACE STORAGE 1, LTD.	1	69,000
4890	ABERCROMBIE ACADEMY	1	800,000
5528	ABUZAID ENTERPRISES, INC.	999	
5752	ACCENT PACKAGING, INC.	1	59,892
4612	ADAMS RANCHES, INC., BUD	1	468,000
4611	ADAMS RANCHES, INC., BUD	1	828,000
3887	ADAMS, R.E.	999	
3888	ADAMS, R.E.	999	
5727	AERIFORM CORPORATION	1	15,000
5233	AHMED, MOHAMMED	1	49,000
3289	AHMED, MOHAMMED	1	200,000
7132	AKIN III, JESS W.	1	14,000
5283	AKSM INVESTMENTS INC.	1	35,000
7657	ALATTAR, FAROUK & RIMA	1	194,000
7617	ALETHA PROPERTIES INC.	1	600,000
6013	ALFANO, NICHOLAS	1	27,000
5338	ALI, KARIM	1	201,597
7361	ALL ASSETS, INC.	1	66,000
3317	ALLIED CYPRESS BANK	999	
3318	ALLIED CYPRESS BANK	999	
6483	ALLIED EXTERMINATORS	1	6,210
7990	ALLSEITZ, EDWIN	1	140,000
4750	ALPHABET SOUP EARLY LEARNING CTR	1	184,900
7147	ALSAY INCORPORATED	1	712,900
6073	ALSAY, INC.	999	
6127	ALSAY, INC.	999	
6384	ALSAY, INC.	999	
6965	AMB ENTERPRISE	1	500,000
5967	AMERICAN RODSMITH	1	1,082
6953	ANDERGAUGE, USA, INC.	2	12,000
6954	ANDERGAUGE, USA, INC.	2	12,000
2679	ANDERSON, IRA, TRUSTEE	999	
7090	ANDERSON, ROBERT L.	1	9,300
7660	ANGELIKA GOURMET FOODS	1	36,000
4881	ANTIQUE MALL, THE	1	999,997
7818	AQUASOURCE DEVELOPMENT COMPANY	1	570,000
7244	AQUASOURCE DEVELOPMENT INC.	1	
4986	ASH, BILLY H. - SHIPLEY DONUTS	1	69,600

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WELL	OWNER	AGG2000	PUMP2000 (GPY)
6145	ASH, JANICE L.	1	3,100
2503	ATASCOCITA MANAGEMENT CORP.	999	
2505	ATASCOCITA MANAGEMENT CORP.	999	
2960	ATASCOCITA MANAGEMENT CORP.	999	
7661	ATLAS PRIME REALTY CORP.	1	55,000
6710	ATLAS TRANSMISSION	1	10,000
6955	AUSTIN, RICK	1	12
7157	B&B TECHNOLOGY, INC.	1	73,000
4255	B.J.H. HOLDING INC.	1	
4254	B.J.H. HOLDING INC.	1	52,000
6712	BAHIA FARMS	1	100,000
3120	BAMMEL FOREST UTILITY COMPANY	999	
7056	BAMMEL TRUSTEE, ELIZABETH	1	1,000,000
1527	BAMMEL U.D.	999	
3862	BAMMEL U.D.	999	
7466	BAMSCH ENTERPRISES INC.	1	25,200
7153	BAMWOOD ACT CNTR/AMERICAN RAMALI		
7771	BANCROFT, EDDIE	1	39,000
5324	BANFF SCHOOL	1	44,000
4999	BARCUS, B.J.	1	893,600
6131	BARDWELL, JERRY	1	24,000
7095	BARRETT, GARY	1	290,660
7981	BARTASH CO., II LTD.	1	240,000
4884	BASHAM, CAREY E.	1	695,000
7563	BASIC OFFICE & SCHOOL SUPPLY	1	1,000,000
5440	BATES MOTOR HOMES	1	45,000
5129	BATES, BILL	1	1,610,000
6406	BAUMGARTNER, ALVIN	1	10,000
7890	BAYER, ALICE L.		
6968	BAYNE, ROY L.	1	12,000
6967	BAYNE, ROY L.	1	21,600
7059	BDB PARTNERSHIP	1	4,680
4862	BECK & MASTEN PONTIAC GMC, INC.	1	369,000
7303	BEDNAROWICZ, TOM	999	
5901	BELL, JAMES		
5871	BENFER, DARRIN W.	999	
4797	BENNETT, SAMUEL E., SR.	1	1,960,400
6959	BETHEL EVANGELICAL LUTHERAN	1	4,780
7383	BETHEL EVANGELICAL LUTHERAN CHUR		
6878	BETHESDA LUTHERAN HOMES & SERV.	2	799,000
7077	BEYER CONSTRUCTION, INC.	1	80,000
7553	BHAI, ISMAIL	1	50,000
5125	BHAI, ISMAIL		
6048	BHAI'S INVESTMENTS, INC.		
2494	BHUSHAN, SAMEET	2	585,600
6527	BIJJANI, CHARLIE	1	72,000
7291	BIRDWELL CONSTRUCTION INC., G.R.	1	96,000
7081	BISHOP, E.R.	1	1,200

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WELL	OWNER	AGG2000	PUMP2000 (GPY)
5310	BISMIL PROPERTIES, INC.		
6698	BLACKMAN, WILLIAM L.	1	322,900
6699	BLACKMAN, WILLIAM L.	1	403,300
7055	BLB, LTD.	1	348,000
7646	BLTF INC.	1	280,000
7647	BMB INVESTMENTS	1	
5801	BODY SHOP, THE	1	12,000
7191	BOKEMEYER, BURT	1	7,530
6931	BOLFING BROTHERS MARBLE, INC.	1	151,200
5742	BOND, GUY	1	230,000
7800	BONDS, JOHNNY	1	500,000
7160	BOUDREAUX, PAUL	1	100,000
6957	BOYD, JERRY B. & ELIZABETH M.	1	12,000
6998	BRABAND-STUTTS	1	144,000
7159	BRADLEY, JOHN & STACY D. BOWLIN	1	30,000
4153	BRAEWOOD DEVELOP CO/NORTHGATE	999	
5326	BRAUE, JOHN & JULIE	1	10,000
7071	BRENTWOOD LAKES HOMEOWNERS ASS	1	400
7247	BRIDGESTONE M.U.D.	1	2,200
3835	BROWN CONSTRUCTION, INC., GRANT	999	
7070	BROWN, ELENE BOUHOUTSOS	1	70,000
6773	BROWN, JOHN W.	1	7,677
7666	BROWN, JR., N.A.	1	100,000
4436	BSL GOLF CORP/JERSEY MEADOW G.C.		
4586	BSL GOLF CORP/JERSEY MEADOW G.C.		
7079	BURNS, JACK		
5311	BUSSEL & SONS, INC.	1	100,000
7365	BUTLER, DAROLYN	1	208,000
6782	C & C RESTAURANT	1	1,000,000
7636	C & L TIRE CO.		
4767	C & P UTILITIES, INC.	1	1,956,000
7292	C.W. OILFIELD SALES, INC.	1	2,400
7882	CALDWELL, VALERIE	1	140,000
6371	CALVARY HILL FUNERAL HOME	1	708,300
5169	CAMBRIDGE COURT MEDICAL CENTER	999	
1360	CAMERON IRON WORKS, INC.	999	
5815	CAMERON, COOPER	1	51,600
7937	CAMPOS, WALTER	1	493,987
3815	CAN-AM ASSOC. INC.	999	
3816	CAN-AM ASSOC. INC.	999	
1725	CANDLELIGHT SERVICE CO., INC.		
7432	CANTERRA CLASSICS		
5991	CAPITAL AIR & HEAT, INC.	1	24,000
7135	CARTER, JAMES	1	24,000
6401	CARTER'S COUNTRY	1	17,000
6400	CARTER'S COUNTRY	1	86,500
6935	CARTHEY, JOHN W.	1	8,304
7804	CASTRO, TIM	1	12,390

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WELL	OWNER	AGG2000	PUMP2000 (GPY)
2066	CBI NA-CON, INC.	999	
2859	CEMEX USA	2	-
2860	CEMEX USA	2	-
7606	CEPEDA, CARLOS A.	1	14,600
4799	CERES INVESTMENTS, INC.	1	724,000
7711	CHAMBERS, JUDY	1	490,000
7618	CHAMPION LAKES LIMITED	2	-
7619	CHAMPION LAKES LIMITED	2	-
5377	CHAMPION POINT AUTO CENTER	1	12,000
4853	CHAMPION SPRINGS HOMEOWNERS, INC	999	
6999	CHAMPION WINDOW, INC.	1	500,000
7000	CHAMPION WINDOW, INC.	1	500,000
3470	CHAMPIONS GLEN, L.P.	1	-
5212	CHAMPIONS GLEN, L.P.	1	-
5300	CHAMPIONS GLEN, L.P.	1	-
2414	CHAMPIONS GLEN, L.P.	1	160,000
2417	CHAMPIONS GLEN, L.P.	999	
5522	CHAMPIONS PEST CONTROL	1	3,450
7620	CHAMPIONS STONE COMPANY		
6511	CHAPELA, JOSE	1	10,335
7519	CHARLIE'S AUTO & TRUCK SALVAGE	1	78,000
7712	CHASEWOOD ENVIRONMENTAL	1	30
4034	CHASEWOOD LAND VENTURE	999	
6958	CHATAGNIER, JOHN M.	1	19,200
4630	CHENG'S FLEA MARKET		
3725	CHEVRON U.S.A., INC.	1	214,540
2766	CHEVRON U.S.A., INC.	999	
2770	CHEVRON U.S.A., INC.	999	
2772	CHEVRON U.S.A., INC.	999	
3421	CHEVRON U.S.A., INC.	999	
3536	CHEVRON U.S.A., INC.	999	
4001	CHEVRON U.S.A., INC.	999	
7968	CHIEH, FRANCISCO & SHU JANE	1	3,660
6300	CHRIST UNITED CHURCH	1	7,670
2058	CIRCLE K CORPORATION	999	
5220	CIRCLE S FOOD STORE	999	
5278	CJM TRUCKING & SOILS CO., INC.		
5547	CLA ENTERPRISES, INC.	1	95,000
6775	CLAIRMONTE, JAMES & JOYCELYN	1	500,000
5441	CLASSIC 3 GOLF COURSE	1	6,000
5442	CLASSIC 3 GOLF COURSE	1	1,955,000
7284	CLEM, R. TURNER	1	48,000
7670	CMH HOMES INC. DBA CLAYTON HOMES	1	10,000
7669	CMH HOMES INC. DBA LUV HOMES	1	10,000
7136	COCKAYNE, MIKE	1	75,500
3504	COE UTILITIES, INC.	999	
3506	COE UTILITIES, INC.	999	
3507	COE UTILITIES, INC.	999	

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WELL	OWNER	AGG2000	PUMP2000 (GPY)
3511	COE UTILITIES, INC.	999	
3666	COE UTILITIES, INC.	999	
3795	COE UTILITIES, INC.	999	
3961	COE UTILITIES, INC.	999	
4314	COE UTILITIES, INC.	999	
7745	COE, JR., E.W.	1	24,000
7932	COHEN, LARRY	1	379,400
7805	COLEMAN, RICHARD	1	5,400
7701	COLONY ASSOCIATES	1	150,000
7839	COLWELL ELECTRIC	1	10,400
1754	COMMUNITY UTILITY COMPANY	999	
3086	COMMUNITY UTILITY COMPANY	999	
3760	COMMUNITY UTILITY COMPANY	999	
2358	COMPAQ COMPUTER CORP.	999	
4134	COMPAQ COMPUTER CORP.	999	
4135	COMPAQ COMPUTER CORP.	999	
5495	COM-REAL PROPERTIES	999	
6254	CONCRETE SERVICES, INC.	1	3,000
5689	CON-EQUIP	1	880,000
6979	CONEY ISLAND L.P.	1	500,000
6376	CONNELL, JOE C. & SUSAN B.	1	15,600
1832	CONSUMERS WATER CORPORATION	999	
1840	CONSUMERS WATER CORPORATION	999	
6973	CONTINENTAL CASING CORP.	1	6,000
7411	CONTRINO, HERMAN	1	20,000
5403	CON-WAY SOUTHERN EXPRESS, INC.	1	163,800
6974	COPELAND, JIMMY	1	600,000
6975	CORB, ALVIN E.	1	100,000
5397	CORDER, J. MICHAEL	1	120,000
2740	CORNELIUS, INC.	999	
2742	CORNELIUS, INC.	999	
7697	COX, THOMAS P.	1	497,000
4929	CRAIN, HERBERT S.	999	
5910	CRC/MASTERCRAFT, INC.	1	20,250
7773	CRESS, BOBBY J.	1	42,000
4004	CSA LIMITED, INC.	999	
4278	CSA LIMITED, INC.	999	
2654	CULLEN ESTATE TRUST FBO HRM, LC	2	1,220,000
2655	CULLEN ESTATE TRUST FBO HRM, LC	2	1,220,000
6976	CUNNINGHAM, ROY M.	1	9,800
6977	CUNNINGHAM, ROY M.	1	340,000
4897	CURRIER, JR., JOHN D.	1	726,066
6090	CUSTOM PRECISION SHEETMETAL	1	59,000
7412	CY-FAIR AQUATIC CENTER	1	107,400
5128	CY-FAIR ASSEMBLY OF GOD CHURCH	1	450,000
5011	CY-FAIR LAWNMOWER, INC.	1	240,000
6103	CY-FAIR VOLUNTEER FIRE DEPT.	1	30,000
6897	CY-FAIR VOLUNTEER FIRE DEPT.	1	44,000

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WELL	OWNER	AGG2000	PUMP2000 (GPY)
3357	CY-FAIR, INC.	999	
3358	CY-FAIR, INC.	999	
2909	CY-FOREST SERVICE ASSOCIATION	999	
4940	CYPRESS CHILD CARE CENTER	1	342,390
7387	CYPRESS CREEK EMS	1	49,275
7388	CYPRESS CREEK EMS	1	49,275
7389	CYPRESS CREEK EMS	1	49,275
7386	CYPRESS CREEK EMS STATION 6		
5583	CYPRESS CREEK UTILITY SERVICE CO	1	108,000
5349	CYPRESS N. HOUSTON BUSINESS CTR.	1	396,000
5130	CYPRESS N. HOUSTON BUSINESS CTR.	999	
2677	CYPRESS-FAIRBANKS I.S.D.	999	
2678	CYPRESS-FAIRBANKS I.S.D.	999	
2951	CYPRESS-FAIRBANKS I.S.D.	999	
3598	CYPRESS-FAIRBANKS I.S.D.	999	
6173	CYPRESSWOOD LTD.	1	362,550
4173	CYPRESSWOOD LTD.	1	1,520,300
7009	D & S PROPERTIES LP	1	6,000
7873	D&S SERVICES	1	
7875	D&S SERVICES	1	
6084	D.B. TREE SERVICE	1	196,179
5136	DAIRY QUEEN 1960 WEST	1	20,400
7249	DANIEL, RONALD C.	1	16,000
6329	DAN'S HARDWARE COUNTRY, INC.	1	54,900
7074	DAVID'S CYCLES	1	5,475
7718	DAVIDSON, KENT	1	7,800
7752	DAVIDSON, LEA A.	1	150,300
5321	DAVIS BROTHERS CONSTRUCTION	1	133,500
6150	DDS AGGREGATES	1	12,000
5562	DENINA, RUSSELL	1	6,000
3985	DENNIS DEVELOPMENT INC.	999	
4743	DESAI, ARUN	1	38,750
7368	DEVINE, MILES DBA SEASON GROWERS	1	21,531
5954	DIA-DEN LTD.	1	966,600
7992	DIAMOND TRUCK AND EQUIPMENT	1	26,100
5035	DIAMONDS OF HOUSTON, INC.		
4805	DILLER, P.A., INC.	1	478,527
6790	DINCANS, KYLE B.	999	
6873	DIVERSE IRRIGATION GROUP, INC.	1	371,400
7253	DLT	1	44,200
5630	DOAN, TRUNG	1	2,924
1858	DOVE MEADOWS M.U.D.	1	
5586	DOVER, DANNY L.	1	500,000
5193	DR. PEPPER BOTTLING CO - HOUSTON	1	200,000
5624	DREYER, JEAN S.	1	156,000
7645	DRY CREEK HANGAR CONDOMINIUM	1	198,000
4047	DUBROOK, INC.		
7673	DUNN, WOODY	1	100,000

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WELL	OWNER	AGG2000	PUMP2000 (GPY)
5700	E & E REALTY CO	1	91,454
1774	EMERALD FOREST U.D.	999	
7061	ENGLAND, SADIE JO	1	600,000
5219	ENGLISH, ELLEN	1	28,800
6074	EOG RESOURCES, INC.	999	
5723	ESTATES AT WILLOW CREEK LLC, THE	1	48,000
6562	ESTES, DAVID	1	3,600
6980	EUBANKS, LARRY W.	1	
7213	EVENING STAR INVESTMENTS, LLC	1	324,000
6310	EVERETT SQUARE, INC.	1	734,059
6789	EXCALIBUR CONSTRUCTION, INC.	1	16,100
3006	EXXON COMPANY, U.S.A.	999	
5174	EXXON COMPANY, U.S.A.	999	
2403	EXXON CORPORATION	999	
3720	EXXON CORPORATION	999	
3997	EXXON CORPORATION	999	
4053	EXXON CORPORATION	999	
4067	EXXON CORPORATION	999	
4068	EXXON CORPORATION	999	
4387	EXXON LAND DEVELOPMENT INC.	1	500,000
4812	F L & H	1	480,000
7008	FAIRFIELD BAPTIST CHURCH	1	994,810
6010	FAIRFIELD CHRISTIAN CHURCH	1	58,400
6869	FAITH TEMPLE BAPTIST CHURCH	1	180,000
6663	FAMCOR OIL	999	
7214	FAMCOR OIL	999	
3609	FAUST PROPERTIES, INC.	999	
3817	FAUST PROPERTIES, INC.	999	
4026	FAUST PROPERTIES, INC.	999	
5345	FEINBERG, BARBIE	999	
6338	FELTS, MIKE	1	60
7350	FELTS, RON	1	26,000
7927	FERGUSEN GARRETT & ASSOCIATES		
7149	FERGUSON, ROBERT Y.	1	1,000,000
6981	FINCH, CINDY R.	1	100,000
7139	FIRST BAPTIST CHURCH ROSEHILL	1	11,400
2142	FIRST MADISON BANK, FSB	999	
2145	FIRST MADISON BANK, FSB	999	
2153	FIRST MADISON BANK, FSB	999	
7163	FISHER JR., WILLIAM K.	1	100,000
4814	FLINN, NADENE	1	360,000
5791	FLINTLOCK, LTD	999	
7047	FLORES, N.I., A PARTNERSHIP	1	203,390
4905	FONTANA TRUSTEE, FRANK P.	1	200,000
7700	FORD, RICHARD	1	36,000
6982	FORREST, GABRIEL	1	100,000
4066	FORUM PROPERTIES, INC.	999	
4815	FOUNDRY UNITED METHODIST CHURCH	999	