

**NP** **TEAGUE NALL AND PERKINS**  
CONSULTING ENGINEERS

March 17, 1997

City of Springtown  
102 East Second Street  
P. O. Box 444  
Springtown, Texas 76082  
Attn.: Mr. Bob Salinas

RE: FINAL REPORT  
Walnut Creek Basin  
Regional Wastewater Study  
Springtown, Texas  
Proj. No. SPR96219

Dear Mr. Salinas:

Attached is our final version of the report entitled "Walnut Creek Basin Regional Wastewater Study, Parker, Wise and Tarrant Counties of Texas", TWDB Number 97483198. We have forwarded nine (9) copies and one (1) camera-ready original to Gary Laneman of the Texas Water Development Board. Additional copies will be distributed to other participants based on your instruction.

Since the draft report, the treatment option to Fort Worth has been removed from serious consideration due to Fort Worth's desire to return the flows to Eagle Mountain Lake and the time delay before service to Fort Worth could be possible. Our current indication is that Azle supports a regional wastewater concept and use of Azle's plant(s) for treatment, but does not want to be a Member Entity of the regional district. Therefore, this report indicates that the most economical option will be to connect Springtown to Azle and serve Springtown, "downtown" Reno as quickly as possible. These entities, or a new district, would then contract with Azle for treatment. The trunk main would be sized for 20 year growth for the "population centers" and any addition service (i.e., unincorporated areas or greater Reno) would require upgrading or paralleling the original pipe.

This system would provide for Springtown's and "downtown" Reno's current needs at a cost which is less than the other studied options. Although a full regional system would not be available immediately, this arrangement would allow for future expansion to create a full regional system.

In short, it appears a "regional" approach is not only feasible but also recommended. Please note that costs shown in the report are somewhat generic since many of the actual sites are not defined. They are good for comparison purposes however.

If you have any questions, please call. We appreciate the opportunity to work with the City on this project and look forward to working with you on the most cost effective solutions to your engineering needs.



Sincerely,  
TEAGUE NALL AND PERKINS, INC.

*J. Kelly Carta*  
J. Kelly Carta, P.E.

Report Attached

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TWDB PROJECT NUMBER 97483198  
TNP PROJECT NUMBER SPR96219

**WALNUT CREEK BASIN**  
**REGIONAL WASTEWATER STUDY**  
**PARKER, WISE AND TARRANT COUNTIES OF TEXAS**

**FINAL REPORT  
TO THE  
TEXAS WATER DEVELOPMENT BOARD**

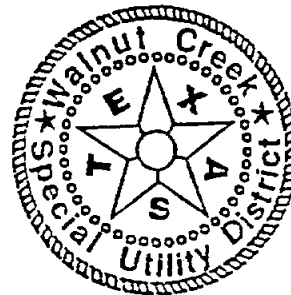
**MARCH 1997**

**FUNDED BY  
THE CITY OF SPRINGTOWN, TEXAS  
AND  
WALNUT CREEK SPECIAL UTILITY DISTRICT**

**WITH GRANT FUNDING BY THE  
TEXAS WATER DEVELOPMENT BOARD**



**PREPARED BY  
TEAGUE NALL AND PERKINS, INC.  
FORT WORTH, TEXAS**



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## ACKNOWLEDGMENTS

This study could not have been accomplished without a tremendous amount of support and cooperation from a number of entities. This particular report resulted from discussions during the spring of 1996 by the City of Springtown in an attempt to address local wastewater concerns and options. As the discussions grew, the need to consider a regional approach to the problem became evident. First and foremost, the City wishes to thank the Texas Water Development Board, who without their support and grant participation this study would not have been undertaken. Walnut Creek Special Utility District deserves special recognition for agreeing to participate in the funding of this endeavor. Also, Springtown wishes to thank all of the entities who played a part in supporting this project by providing interlocal agreements and information, attending meetings, contributing suggestions, and in other ways cooperating with, and facilitating, this study. These entities include the cities of Azle, Reno, Sanctuary, Pelican Bay, and Fort Worth; the communities of La Junta and Tanglewood; the counties of Parker and Wise; the districts of Walnut Creek Special Utility District (WCSUD), Wise County Water Control and Improvement District (WCWCID) and the Tarrant Regional Water District (TRWD) [formerly Tarrant County Water Control and Improvement District #1, or TCWCID#1]; the North Central Texas Council of Governments (NCTCOG); Save Eagle Mountain Lake, Inc (SEML); the Texas Water Development Board (TWDB); the Texas Natural Resource Conservation Commission (TNRCC); the Lewisville Aquatic Ecosystem Research Facility (LAERF); and the engineering consulting firms of Alan Plummer and Associates (APAI), Rady and Associates/Kimley Horn, and Cheatham and Associates; along with the staff and council members of the City of Springtown and a number of concerned citizens of the watershed. It is hoped that this study will provide the first step toward addressing and meeting the regional wastewater needs of the whole Walnut Creek basin.

## CHAPTER 1 - EXECUTIVE SUMMARY

This study concentrates on five basic scenarios for providing wastewater service (main trunk lines and treatment facilities only) to the Walnut Creek Watershed in northern Parker County during a 30 year planning period from 1997 to 2027. The watershed covers about 87.5 square miles and extends from near Agnes eastward to Eagle Mountain Lake. This is an area of potentially rapid growth. It borders Tarrant County (Fort Worth) and Eagle Mountain Lake (a major Fort Worth recreational area) to the east, and generally follows Highway 199 (a major 4 lane divided artery to Fort Worth). Not far on the other side of Eagle Mountain Lake is the Alliance Airport area, one of the fastest growing industrial areas in the metroplex. It appears that growth for the area is inevitable and that planning for the infrastructure to support such growth should take place now.

At present, only Springtown and Azle provide sewer collection and treatment. Springtown currently has a population of approximately 2800 served by a 0.26 mgd activated sludge (oxidation ditch) facility. Azle currently has a population of 11,800 people and is served by two activated sludge treatment plants (a 0.29 mgd facility on Walnut Creek and a 0.75 mgd facility on Ash Creek). Azle is currently in the process of upgrading the Ash Creek facility to 1.44 mgd and plans to provide service to Pelican Bay, and possibly Sanctuary, within the next year or so. All other portions of the watershed, including Reno, La Junta and portions of Parker and Wise Counties are not currently on wastewater service.

Due to much of the study area being rural, each scenario was divided into two options. One option serves the whole study area in the short term (30 year planning period) and the second option serves only the "population centers" now with growth to rural areas when warranted. In general, the "population center" options were least expensive during the study period due the use of fewer and smaller collection pipes.

### SCENARIO 1

The first scenario divides the watershed into three subareas with a plant to serve each subarea. One plant is to be located beyond the upstream edge of Reno to service Springtown and, possibly, the Parker/Wise County areas in the western portion of the watershed. This scenario assumes that the existing Springtown plant will be taken out of service once a new treatment plant is constructed. Two options were investigated for this plant, the first serving the whole area and the second option serving only Springtown and its ETJ (with a small portion of county area southeast of Springtown along SH 199) during the 30 year planning window. A second plant would be located at the east edge of Reno to serve Reno and portions of Parker County downstream of the proposed Springtown treatment plant. These areas are currently not served by a collection/treatment system. A third plant would be located in Azle to serve Azle, Sanctuary and Pelican Bay. One, or both, of Azle's existing wastewater treatment plants (WWTP's) could serve as the third WWTP.

### SCENARIO 2

The second scenario combines areas 1 and 2 from Scenario 1 and replaces the existing Springtown plant with a new plant in Reno. Springtown, Reno and areas of Parker and Wise Counties in the watershed would be served from this plant. The downstream service for Azle, Sanctuary and Pelican Bay would remain as shown in Scenario 1.



### SCENARIO 3

The third scenario combines all Walnut Creek subareas to form one regional area. This scenario assumes that the existing Azle facilities, in particular Ash Creek, would be expanded to accommodate regional flows. Collection trunk mains would be phased in to serve the region. All areas would be included in one "district" with costs spread across all customers of the district.

### SCENARIO 4

Scenario 4 incorporates the collection trunk main system of Scenario 3, however, instead of upgrading the treatment facilities in Azle, a continuation of the sewer was extended downstream to the Fort Worth Jenkins Lift Station near Lake Worth and treatment was assumed to be provided by the Fort Worth Village Creek Plant.

Although Scenario 4 yields the lowest apparent raw costs, other factors were brought out which discourages the use of this option. The most important of which is the need for water reuse in Eagle Mountain Lake which would not be accomplished with this option. Fort Worth can currently use 30 million gallons per day from the lake and is planning to expand this use to 60 MGD. Other smaller town draw water from the lake as well. During the recent drought conditions, the need to return wastewater to the lake for reuse as a water source became obvious.

Also, Azle currently uses 1 MGD of treated effluent for irrigation on their golf course facility. Even if raw sewage flows were sent to Fort Worth, at least 1 MGD would have to be treated locally to supply this demand.

### SCENARIO 5

Scenario 5 incorporates the same collection systems and treatment systems as Scenario 3. However, the collection systems in Scenario 5 are divided into one system to serve Azle, Pelican Bay and, possibly, Sanctuary, and a second collection system to handle Springtown, Reno, and the unincorporated areas of the Walnut Creek watershed. This scenario was added after the publication of the draft report due to additional input from the City of Fort Worth, Tarrant Regional Water District, and the City of Azle.

### CONCLUSIONS

A summary of the studied scenarios is given on the following page. It appears that the lowest cost option would be Scenario 4 for population centers only. However, this option would not serve most of Reno and the Parker County watershed within the 30 Year planning window. This option also assumes that Fort Worth can handle any additional flow from Walnut Creek regional facilities at the Jenkins Lift Station. At present, Fort Worth is not planning to serve Azle until sometime between 2006 and 2016, and even then, has not considered servicing the whole region. After publication of the draft report, both the City of Fort Worth and the Tarrant Regional Water District expressed desires to have wastewater flows treated and returned to Eagle Mountain Lake for reuse as a water supply. Fort Worth also indicated that in addition to connection at the Jenkin's Heights Lift Station, it would probably be necessary for the new customers (or district) to upgrade the collection facilities to the Village Creek Plant and upgrade the plant. Such demands could make any of the Scenario 4 options cost prohibitive and politically impractical.

If service by Fort Worth is not pursued, then a regional plant at Azle appears to be the most

beneficial for all members of the region collectively. It should be noted that a regional option under Scenario 3 utilizing treatment in Azle would cost the citizens of Azle slightly more than a non-regional system since Azle already has cost effective expansions planned and the Azle, Sanctuary, Pelican Bay area is almost to the assumed ultimate capacity of 2.5 persons per acre. However, a regional system in Azle is much less expensive for the bulk of the Walnut Creek watershed than is a series of smaller plants. In Scenario 5, regional treatment still takes place at the Azle plants but collection is broken down into an Azle-Pelican Bay-Sanctuary system and a Springtown-Reno-Unincorporated system. In this manner, Azle's cost structure remains "status quo" while the cost to Springtown and Reno increases slightly. This Scenario currently appears to be the most likely accepted plan for the region. However, to cut initial costs, construction of only the lines necessary to serve existing population centers (Springtown and "downtown" Reno) should be built initially.

Based on this analysis, it is recommended that the citizens and entities in the Walnut Creek watershed and adjacent municipal areas pursue a regionalized wastewater collection and treatment system. Depending on the actual rate of growth in the greater Reno and Parker County areas, it may be best to forgo service to some of these areas until after 2027.

**TABLE 1 - SUMMARY OF STUDIED SCENARIO OPTIONS**

Treatment Plant	Areas Served Population Centers	Current Plant Capacity (mgd)		Data at Initial Construction 2002		Averages over Planning Period 1987-2027		Year 2027		Total Present Value	
		Population Centers	Full Watershed	Population Centers	Full Watershed	Population Centers	Full Watershed	Population Centers	Full Watershed	Population Centers	Full Watershed
<b>SCENARIO 1</b>											
1-Springtown	Spr	0.26	3453	3453	\$68.20	\$147.14	5572	8695	2.50	\$11,244,808	\$22,078,221
2-Reno	DR	0.00	677	677	\$242.78	\$315.30	670	3053	0.25	\$2,794,843	\$5,380,133
3-Azle	Azi,PB,San	1.74	16885	16885	\$38.05	\$38.05	23917	3203	6.40	\$3,087,168	\$3,087,168
<b>TOTALS</b>		<b>2.00</b>	<b>20916</b>	<b>20916</b>	<b>\$48.11</b>	<b>\$83.68</b>	<b>30169</b>	<b>\$41.38</b>	<b>9.16</b>	<b>\$48,136,820</b>	<b>\$81,556,528</b>
<b>SCENARIO 2</b>											
1-Reno	Spr, DR	0.26	3520	3520	\$92.28	\$164.33	6222	11748	2.67	\$14,537,410	\$30,078,821
2-Azle	Azi,PB,San	1.74	16885	16885	\$38.05	\$38.05	23917	3203	6.40	\$3,087,168	\$3,087,168
<b>TOTALS</b>		<b>2.00</b>	<b>20977</b>	<b>20977</b>	<b>\$48.36</b>	<b>\$91.69</b>	<b>30169</b>	<b>\$40.82</b>	<b>9.07</b>	<b>\$48,634,678</b>	<b>\$64,172,990</b>
<b>SCENARIO 3</b>											
1-Azle	All Cities	2.00	20977	20977	\$39.47	\$51.38	30146	35981	8.78	\$48,734,158	\$63,588,188
<b>SCENARIO 4</b>											
Fort Worth Service	All Cities	2.00	20977	20977	\$31.39	\$44.53	30135	35773	0.00	\$34,329,586	\$48,300,011
<b>SCENARIO 5</b>											
Azle Service (50')	Spr, DR **	0.26	3520	4130	\$56.57	\$120.40	6222	11748	0.00	\$8,818,652	\$23,665,612
Azle Service (20')	Spr, DR **	0.26	3520	3520	\$31.83	\$37.41	5484	5484	0.00	\$4,408,417	\$4,408,417
Azle Service (20', PC only)	Spr, DR **	0.26	3520	3520	\$37.41	\$37.41	5484	5484	0.00	\$6,782,638	\$6,782,638

**LEGEND:**  
 Spr Springtown  
 DR Downtown Reno  
 AR All of Reno  
 WUW Western Unincorporated Watershed  
 CUW Central Unincorporated Watershed  
 AUW All Unincorporated Watershed  
 Azi Azle  
 PB Pelican Bay  
 San Sanctuary

- NOTES:**
- Quantities and Costs shown are opinions based on available data and to be used for comparison purposes only.
  - Actual values will vary depending on specific timing and actual implementation of any given scenario.
  - These figures only include capital costs for trunk main/interceptor and treatment plant or contract for disposal. Costs for minor lines and existing facilities are not included.
  - Initial population figures are generally the same for population centers and population centers-rural since lines to rural area are shown constructed after the year 2002 and therefore population for those lines are not counted.
  - Scenario 5 includes several piping arrangements and concentrates on the population center options. Piping includes 50 year design (as in the other scenarios), 20 year design sized for whole area, and 20 year design sized for population centers only. Azle, PB and Sanctuary are not included in this scenario, except that Azle will be contracted to treat flows.





1" = 8000'

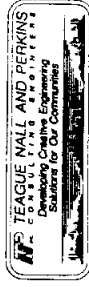
# WALNUT CREEK REGIONAL SEWER STUDY

## SCENARIO 1

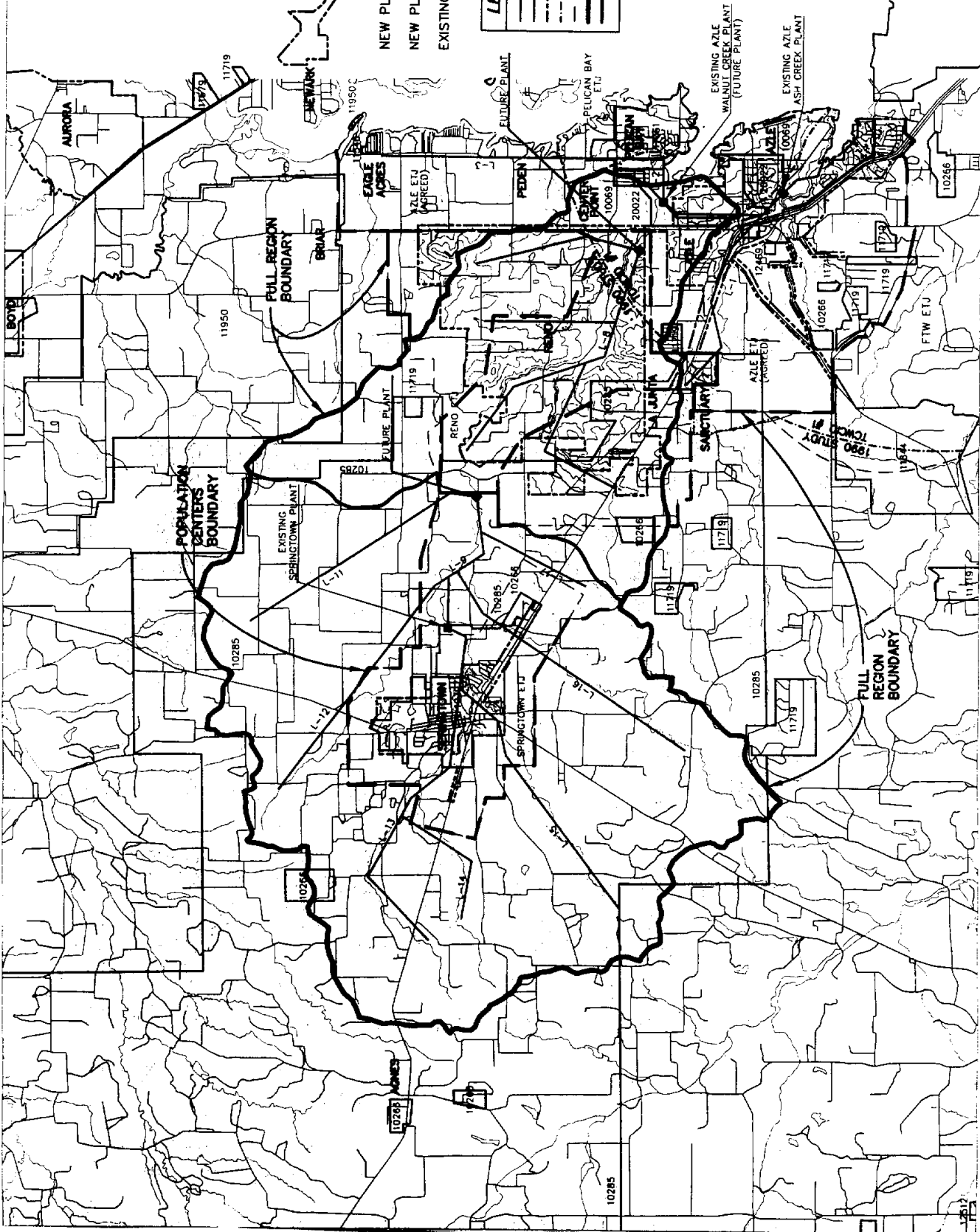
NEW PLANT AT WEST EDGE OF RENO FOR SPRINGTOWN & WESTERN COUNTY.  
 NEW PLANT AT EAST EDGE OF RENO FOR RENO & CENTRAL COUNTY.  
 EXISTING AZLE PLANTS & UPGRADE TO SERVE AZLE, PELICAN BAY, & SANCTUARY.

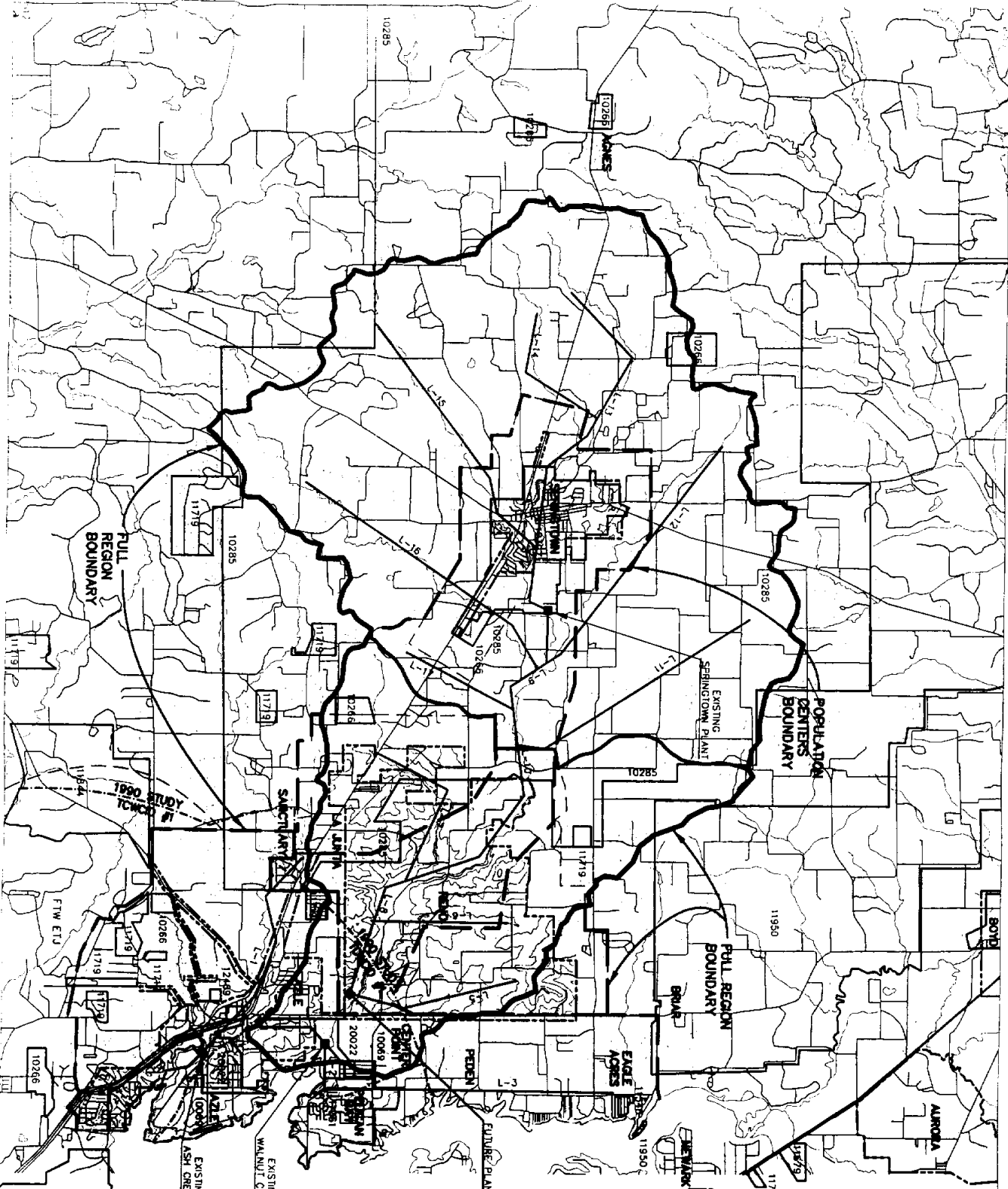
### LEGEND

	EXISTING WATER DISTRICT
	EXISTING SEWER DISTRICT
	APPROX. CITY LIMIT LINE
	1990 STUDY TOWNSHIP
	ETU
	WATERSHED BOUNDARY
	NON-WATERSHED SERVICE BOUNDARY



JANUARY 1997





# WALNUT CREEK REGIONAL SEWER STUDY

## SCENARIO 2

NEW PLANT AT EAST EDGE OF RENO FOR  
SPRINGTOWN, RENO, & COUNTY  
EXISTING AZLE PLANTS & UPGRADE TO SERVE  
AZLE, PELICAN BAY, & SANCTUARY.

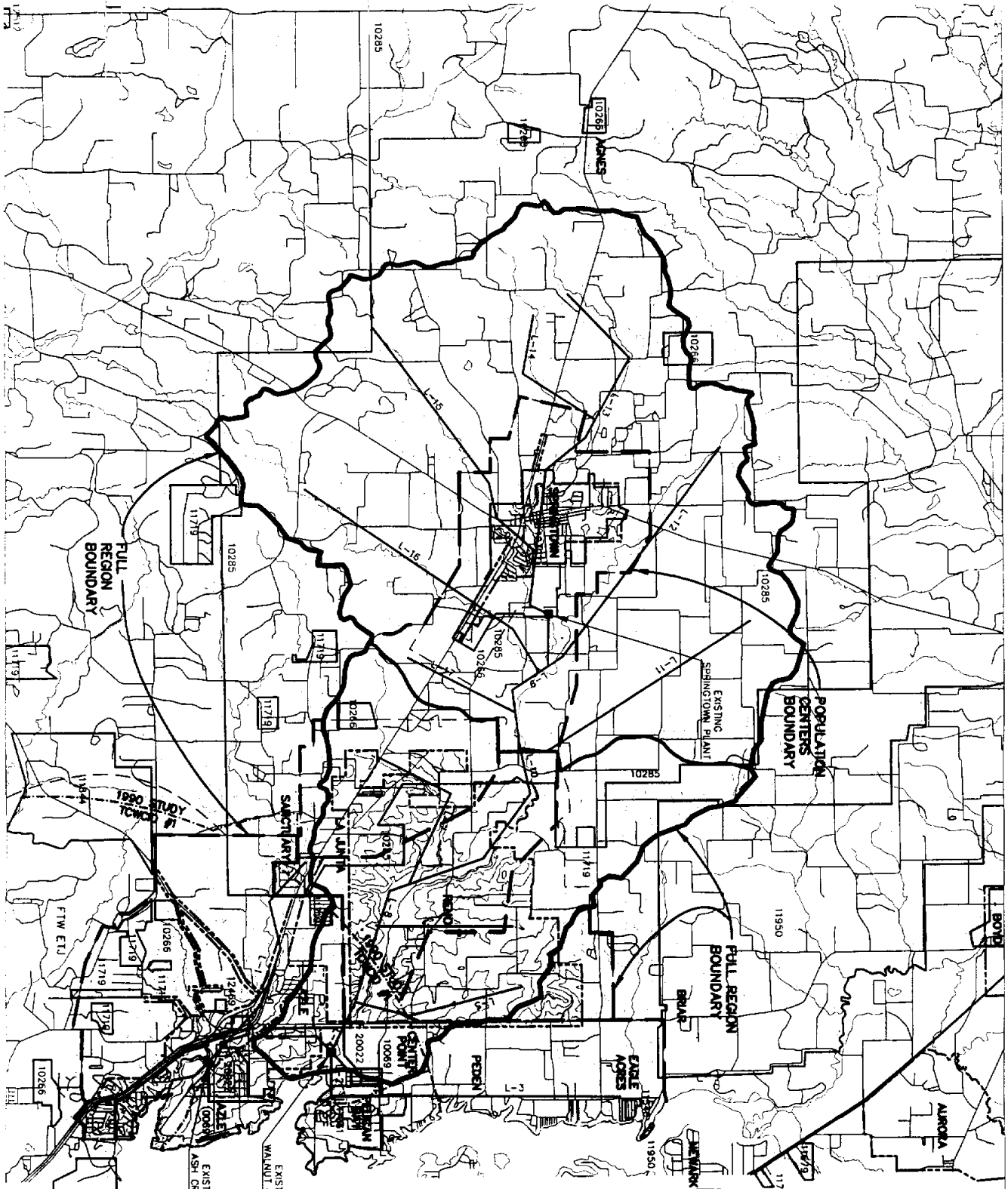
LEGEND	
	EXISTING WATER DISTRICT
	EXISTING SEWER DISTRICT
	APPROX. CITY LIMIT LINE
	1990 STUDY TOWARD FT.
	FTW
	WATERSHED BOUNDARY
	NON-WATERSHED SERVICE BOUNDARY

1" = 8000'



**TEAGUE HALL AND PERKINS**  
CONSULTING ENGINEERS  
1100 WEST 10TH STREET  
DALLAS, TEXAS 75201  
TELEPHONE 754-1111  
FACSIMILE 754-1112

JANUARY 1997



# WALNUT CREEK REGIONAL SEWER STUDY

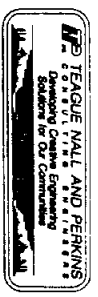
## SCENARIO 3

REGIONAL PLANT ON EAGLE MOUNTAIN  
LAKE TO SERVE ALL AREAS.

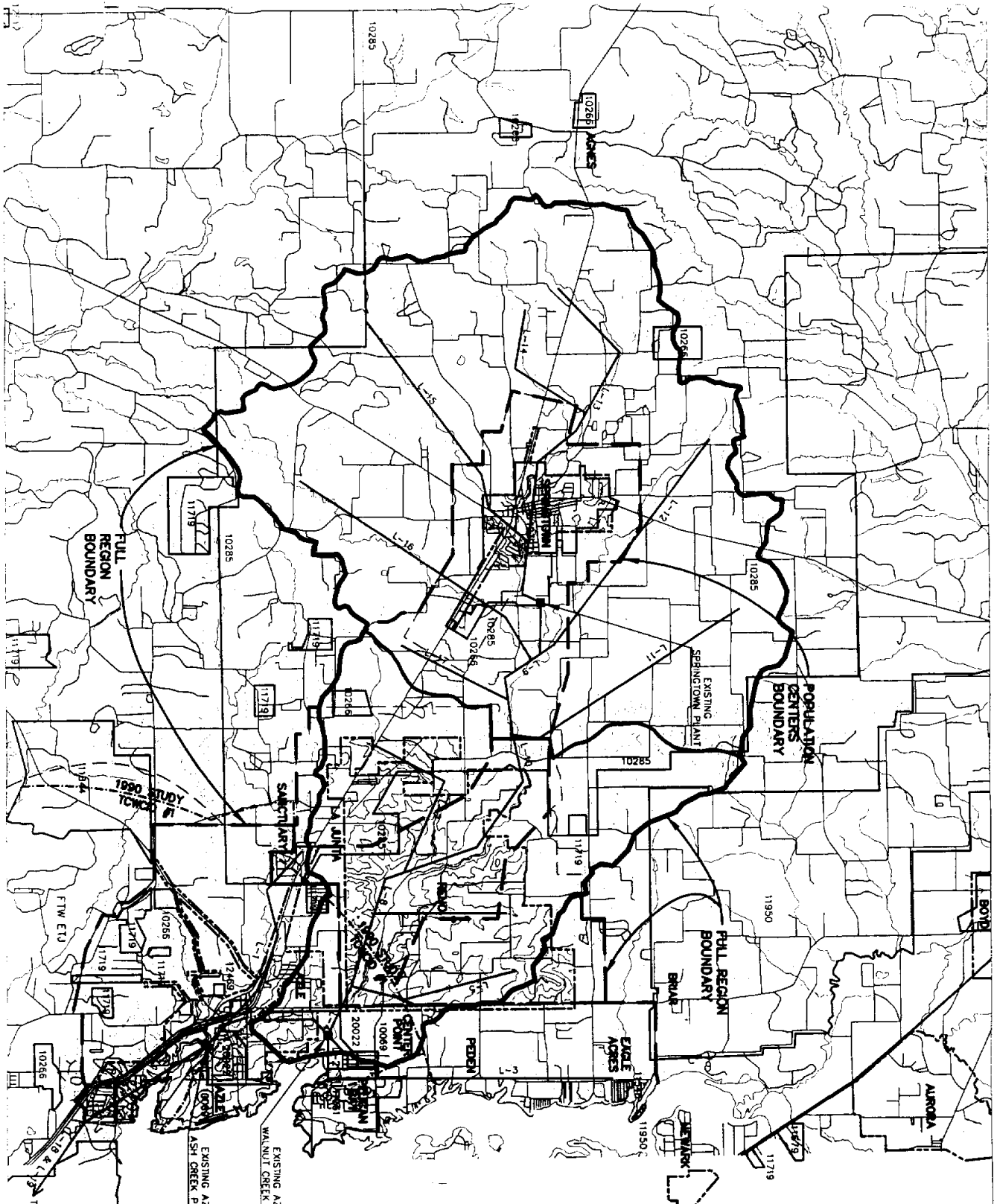
1" = 8000'



LEGEND	
	EXISTING WATER DISTRICT
	EXISTING SEWER DISTRICT
	APPROPRIATE CITY LIGHT LINE
	1980 STUDY TOWNCD #1
	ETJ
	WATERSHED BOUNDARY
	NON-WATERSHED SERVICE BOUNDARY



JANUARY 1997



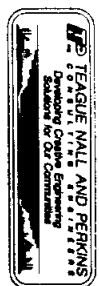
# WALNUT CREEK REGIONAL SEWER STUDY

SCENARIO 4

1" = 8000'



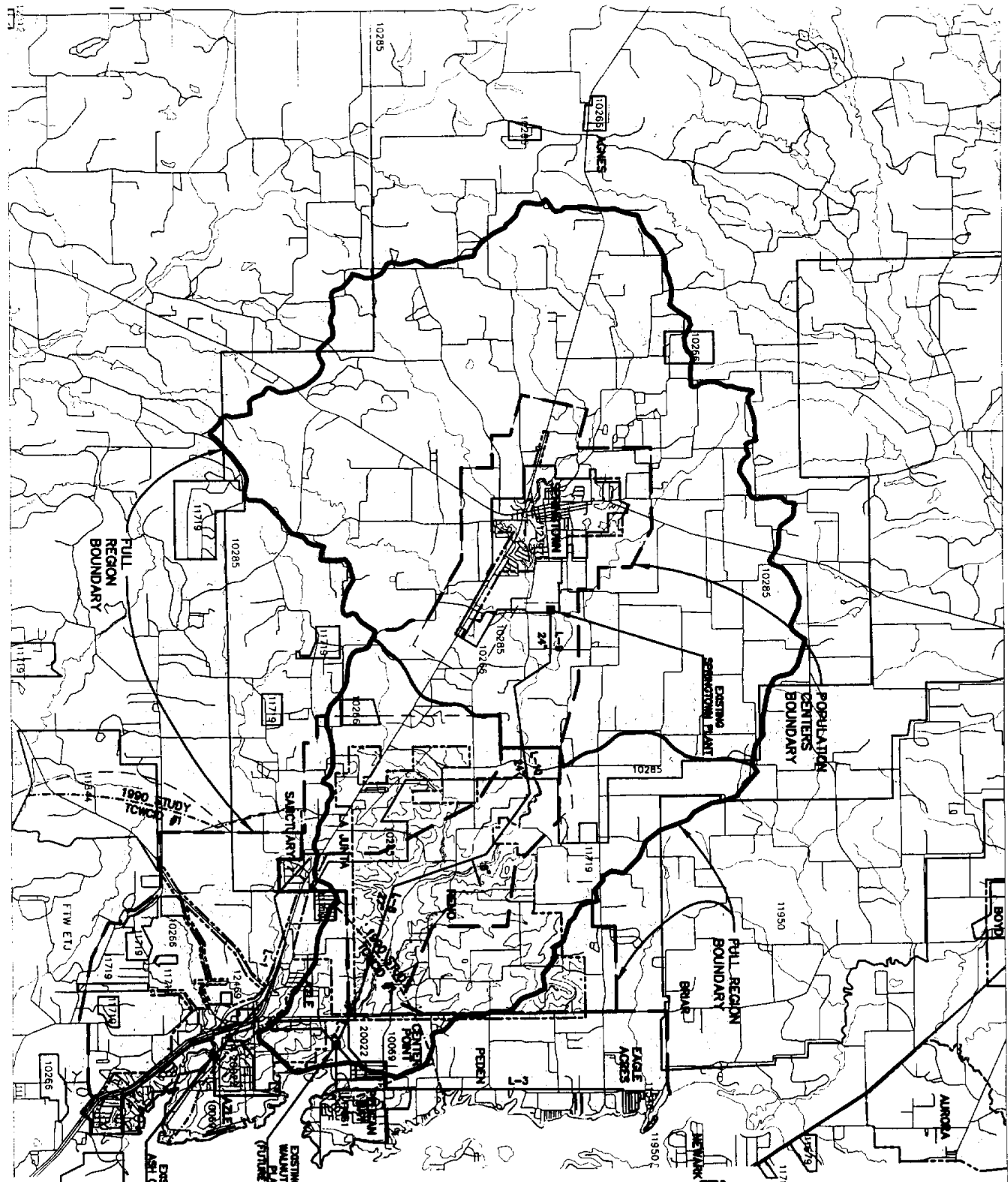
LEGEND	
	EXISTING WATER DISTRICT
	EXISTING SEWER DISTRICT
	APPENDIX CITY LIMIT LINE
	1980 STUDY TOWER #1
	ETJ
	WATERED BOUNDARY
	SEWER BOUNDARY
	SEWER BOUNDARY



JANUARY 1997

TO FW JENKINS LEFT STATION



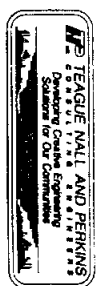


# WALNUT CREEK REGIONAL SEWER STUDY

## SCENARIO 5

SPRINGTOWN, RENO, & UNINCORPORATED  
AREAS TO DEVELOPE SYSTEM & CONTRACT  
WITH AZLE FOR TREATMENT.

LEGEND	
	EXISTING WATER DISTRICT
	EXISTING SEWER DISTRICT
	APPROX CITY LIMIT LINE
	1980 STUDY TOWNSHIP #1
	ETD
	WATERSHED BOUNDARY
	NON-WATERSHED SERVICE BOUNDARY



JANUARY 1997



1" = 8000'

**SCENARIO-5**

## CHAPTER II - INTRODUCTION

### REASON FOR STUDY

The City of Springtown is a small, but growing, rural town in Parker County, Texas. In the last few years, the City has been reviewing local wastewater options due to current concerns by the City and the Texas Natural Resource Conservation Commission (TNRCC) regarding the existing wastewater treatment facility. Should current growth trends continue, Springtown could soon be required to expand their wastewater facilities. To expand their service area, Springtown would need to construct additional facilities downstream of the existing treatment plant. In the course of considering whether a replacement treatment plant would be required, the City of Springtown began considering the feasibility of a regional approach to wastewater service in the area.

### BACKGROUND

In April and May of 1996, the City of Springtown began planning for the 1996-97 fiscal year. Of primary concern were short and long term solutions to the City's wastewater needs. The City has been under a TNRCC Enforcement Action since late 1993 for its existing wastewater treatment facility due to deficiencies and reported flows greater than 75% of its permitted capacity. A number of the problems have been corrected and more are currently being addressed. However, the City is resolved to correcting all problems and adequately preparing for the future needs of the community.

By the end of May, the City Council had decided to explore a regional approach as a potential long-term option and begin preparations for application to the Texas Water Development Board (TWDB) for grant funding of a regional study. During June, application documents were prepared for submittal to the TWDB for study consideration. An application to the Texas Natural Resource Conservation Commission (TNRCC) for a Certificate of Convenience and Necessity (CCN) to service unpermitted areas of the watershed was also submitted to facilitate the study application. Contacts were made to a number of entities in the watershed for support in the study application. The study application was submitted by the July 8, 1996, deadline.

Shortly after the submittal, TNRCC mailed notices of the CCN application to nearby entities. Walnut Creek Special Utility District opposed the CCN but was in favor of the study. The TWDB requested that Springtown obtain interlocal agreements with Parker and Wise Counties as a condition of the application. Ultimately, the CCN application was withdrawn, the Texas Water Development Board agreed to provide grant funding for the study and Walnut Creek SUD agreed to participate financially in the study. As other entities gained a full realization of the study objectives, support grew.

In October, the Springtown City Council selected Teague Nall and Perkins, Inc., a Fort Worth engineering consulting firm, to perform the study. On October 29, 1996, an organizational public meeting was held to discuss and define the scope of the project with interested entities. Subsequent meetings were held to tour the City of Fort Worth's Constructed Wetlands prototype, discuss interim study results, and to meet with specific groups of concern (SEML, WCSUD, etc.)

## PAST STUDIES

Several recent studies have been performed addressing wastewater planning around Eagle Mountain Lake. These studies were carried out by the Tarrant County Water Control and Improvement District #1 (now the Tarrant Regional Water District, TRWD) with grant assistance from the Texas Water Development Board (TWDB). Azle, Pelican Bay and Lakeside also participated in the studies. Both studies addressed only the extreme east end of the Walnut Creek Watershed and results were published in reports to the TWDB.

The first report entitled Upper West Fork and Clear Fork Trinity River Basin Water Quality and Regional Facility Planning Study was performed by Alan Plummer and Associates, Inc. in 1988. This study covered most of the TCWCID#1 administrative area and focused entirely on existing water quality and remediation of quality problems. As such, study of the Walnut Creek basin was very limited and focused on water quality and discharges from the existing Azle treatment plants.

However, the results for all discharges into Eagle Mountain Lake (the water body into which Walnut Creek drains), indicated that future discharges into the lake would need to be more adequately treated or diverted around Eagle Mountain Lake in order to reduce the amount of nutrients in the lake.

The second report entitled Regional Wastewater Facility Plan For a Portion of the Eagle Mountain Lake and Lake Worth Watersheds was generated by Alan Plummer and Associates, Inc., and Rady and Associates, Inc., in 1990. This report addressed a regional approach for areas along the edge of the two lakes but did not extend up the watersheds any great distance. On the Walnut Creek watershed, the study boundary included Azle but did not include Reno, La Junta and Springtown.

The report, as it pertains to Walnut Creek and Eagle Mountain Lake, focuses on the discharge of two existing treatment plants in Azle and the effect of septic systems in Pelican Bay. It also addresses the impetus by the Save Eagle Mountain Lake organization to prevent additional flows of effluent into Eagle Mountain Lake. As such, the alternatives listed by the report center around new facilities near Azle to collect all flows and treat to an acceptable level for discharge into Eagle Mountain Lake or to collect all flows and transport them to Fort Worth for treatment below the Eagle Mountain Lake watershed. The report references City of Fort Worth documents which indicate that Fort Worth wastewater service to Azle may be available by the year 2010.

The following items from the report should be noted:

1. The study area does not include Reno, La Junta, Springtown or the majority of the Walnut Creek watershed. (The study included 6.2 square miles of the 87.5 square mile Walnut Creek Watershed.)
2. The study focused on discharge of two existing treatment plants in Azle and problems with septic systems in Pelican Bay.
3. That Save Eagle Mountain Lake, Inc., is working to prevent additional flows of effluent into Eagle Mountain Lake.
4. The Azle wastewater plants (in 1990) were successfully operating under discharge permits allowing effluent limits of 10 mg/l BOD and 15 mg/l TSS. There were no permit limits on nitrogen or phosphorus.

5. To protect the Fort Worth water supply, Fort Worth's Wastewater System Plan and NCTCOG's Draft 1990 Annual Water Quality Management Plan advocated that Fort Worth provide wastewater service to the western side of Lake Worth and to Azle by the year 2010.
6. Pelican Bay has only septic systems and failures have been reported.
7. Several alternatives were proposed by the report:
  - (1). Enhance existing City of Azle plants and build a new plant to serve the area west of Lake Worth.
  - (2a). Build a trunk main to take all flows to Fort Worth's Village Creek Plant.
  - (2b). Build a new plant in Azle to service Azle and Pelican Bay and construct trunk mains to take all flows from west of Lake Worth to Fort Worth's Village Creek Plant.
  - (3). Replace the existing Azle plants with a new, high quality effluent plant near Azle to service Azle, Pelican Bay and the area west of Lake Worth.
  - (4). Replace the existing Azle plants with a new, high quality effluent plant on Lake Worth to service Azle, Pelican Bay and the area west of Lake Worth.
8. The study was structured for a 20 year time frame, ending in 2010.
9. Population projections showed a 20 year increase in population for the area west of Lake Worth, Azle and Pelican Bay to be 7,954. This is based on a 1990 population of 18,404 and a 2010 population of 26,358.
10. The most rapid population increase for the studied area was the Walnut Creek Watershed.
11. Low densities in the upstream reaches of the watersheds will make typical sewer collection non-cost effective for large areas of the watersheds prior to 2010.
12. The study indicates that the most cost effective solution would be to build a new regional plant near Azle to service Azle and Pelican Bay, with the area west of Lake Worth to be serviced by Fort Worth. However, the Fort Worth and NCTCOG reports do not predict availability of Fort Worth service prior to 2010. Fort Worth service to Azle would need to be reevaluated at a later date.
13. Consolidation of flows into a single plant might not be the most cost effective alternative during all of the 20 year planning cycle. Should population projections or permit requirements change from the projections used in the study, then the study will need to be reevaluated.
14. In the short term, Azle should consider combining its treatment facilities into only the Ash Creek Plant for economic reasons. However, ultimately, the Walnut Creek watershed should contribute the majority of Azle's flows.

15. Ultimately, interceptor and treatment facilities would be more appropriately managed by a "regional" entity such as the City of Fort Worth or Trinity River Authority (TRA).
16. Only a cursory review of effluent quality standards was presented. A full water quality review should be made in conjunction with further study to upgrade the Ash Creek Plant.

A third report was performed in 1995 dealing with the aquatic life in Walnut Creek. This report entitled "Habitat Assessment and Biological Survey of Walnut Creek, Parker County" was generated by Huther and Associates of Arlington, Texas for the Trinity River Authority of Texas and TNRCC under the Texas Clean Rivers Act. This report noted that:

"Conclusions based on visual observations, habitat assessment, and fish biosurvey are that Walnut Creek should be classified with a high aquatic life use designation."

### OBJECTIVES OF THIS STUDY

This study was undertaken to accomplish several objectives.

1. To determine the feasibility of a regional treatment system for the entire Walnut Creek watershed or the feasibility of a limited number of subregional systems which could provide better coverage with less cost than each entity supplying its own system.
2. The study has been viewed as a tool to bring all the entities in the watershed together to review joint approaches to individual and collective problems. (To this end this study has already been a resounding success).
3. Should a regional approach to wastewater be found feasible, then to lay the groundwork for a regional entity which would own and operate such a facility.

### STUDY PARTICIPANT ENTITIES

#### Primary Participants:

Texas Water Development Board (TWDB)  
City of Springtown  
Walnut Creek Special Utility District

#### Other Active Participants:

City of Azle  
City of Reno  
City of Sanctuary  
City of Fort Worth  
City of Pelican Bay  
Community of Tanglewood  
Tarrant Regional Water District  
(Formerly Tarrant County Water Control and Improvement District #1)  
Wise County Water Control and Improvement District #1  
Parker County Commissioner's Court and County Judge  
Wise County Commissioner's Court and County Judge

Save Eagle Mountain Lake, Inc. (SEML)  
Lewisville Aquatic Environment Research Facility (LAERF)  
Texas Natural Resource Conservation Commission (TNRCC)  
North Central Texas Council of Governments (NCTCOG)  
Teague Nall and Perkins, Inc.  
Alan Plummer and Associates, Inc. (APAI)  
Rady and Associates, Inc.  
Cheatham and Associates, Inc.  
Tanglewood Community

Also invited to Participate:

Community of La Junta  
D-Lux Utility Company  
Pelican Bay Utility Company, Inc.  
Community Water Supply Corp., Inc.  
Central Texas Utilities, Inc.  
Bradberry Water Supply Company

## CHAPTER III - STUDY AREA GEOGRAPHY AND EXISTING CONDITIONS

### STUDY AREA BOUNDARY

The study encompasses all of the Walnut Creek watershed located in northeastern Parker County and includes fringes of Wise and Tarrant County. The study area is shown on the following map page.

Starting at the creek's confluence with Eagle Mountain Lake near the existing Azle Walnut Creek Wastewater Plant, the drainage divide goes northwest between Azle and Pelican Bay, proceeds northwesterly along the northern half of Reno and just south of Briar into the southern portion of Wise County approximately 2.5 miles north of Springtown. The ridge then trends southwest to a point along Highway 199 approximately 4.2 miles west of Springtown, then southeast, crossing FM 51 to a vertex south of Veal Station, approximately 4.5 miles south of Springtown. From there, the boundary follows the divide between Walnut Creek and Ash Creek, generally eastward to Eagle Mountain Lake and passing through the northern portion of Azle.

In all, the watershed consists of approximately 87.5 sq. miles (55,989 acres) and encompasses Springtown, La Junta, the bulk of Reno and Sanctuary and a portion of Azle. A large portion of unincorporated northern Parker County is also included in the study area. The watershed extends a maximum of 14.4 miles east-west and 9.3 miles north to south. To facilitate the study, portions of Azle, Sanctuary and Pelican Bay (which are just outside of the watershed) were also included in the study.

### WATERSHED GEOLOGY AND TOPOGRAPHY

The normal pool elevation of Eagle Mountain Lake (at the downstream end of the watershed) is 649.1 feet MSL. The highest upstream ridge is 1275 feet MSL at Indian Knob on the western end of the watershed. The existing Springtown wastewater treatment plant is on Walnut Creek between Springtown and Reno at approximately elevation 800. This plant is some 50,000 feet (9.46 miles) upstream of the Walnut Creek outfall on Eagle Mountain Lake. The average slope along the creek downstream of Springtown is 0.29%.

According to the Soil Conservation Service, the predominant soils in the area are members of the Winthorst-Duffau-Weatherford association. These soils consist of gently sloping to sloping, deep loamy or sandy soils over weakly cemented sandstone or clay. In general, these soils are too pervious to function well for sewage lagoons but not pervious enough to function optimally for septic tanks. These soils tend to have low strengths causing them to erode easily and to allow piping failures in water impounding embankments.



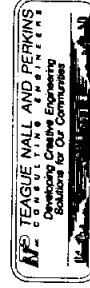
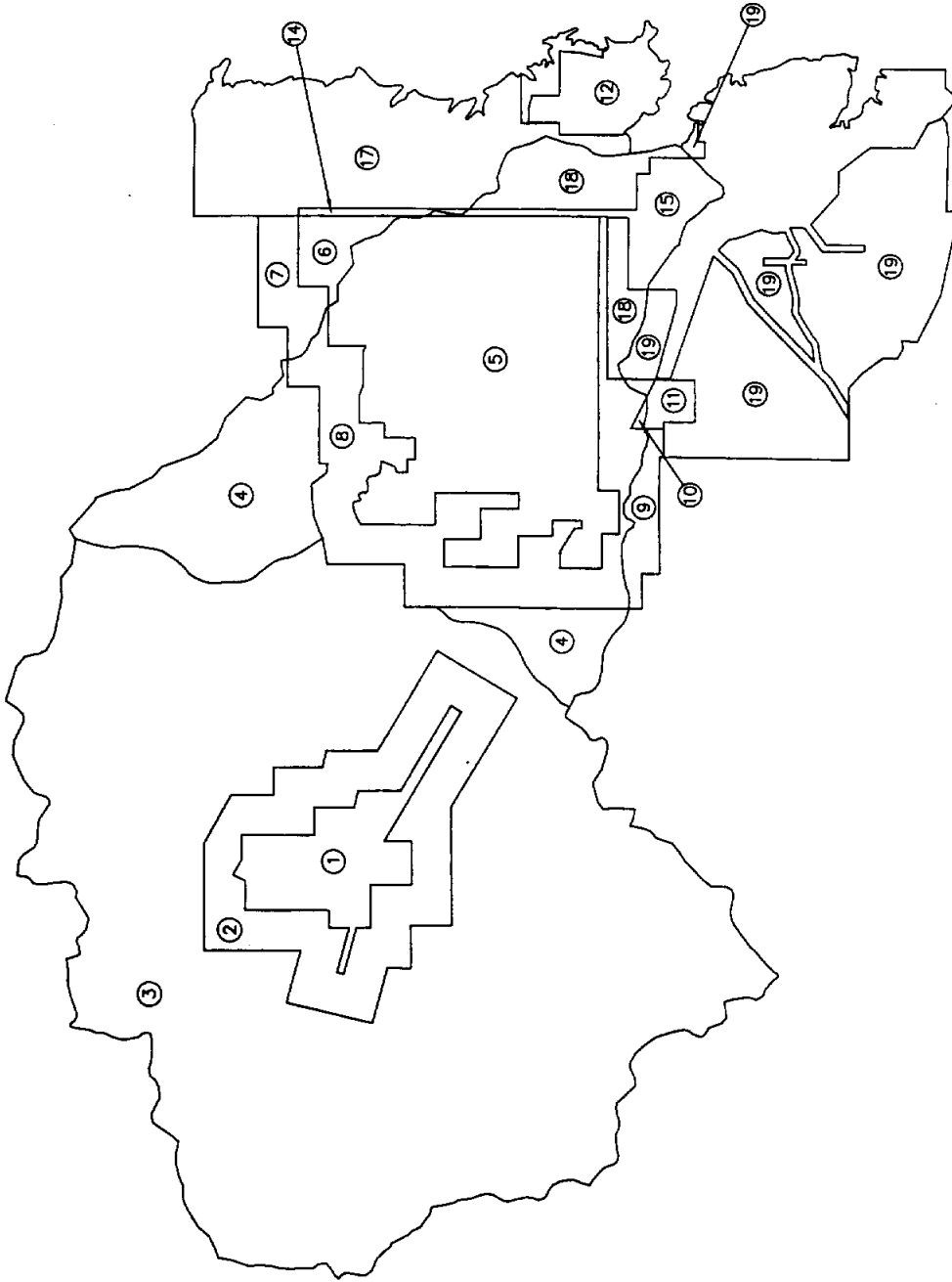


1" = 8000'

# WALNUT CREEK REGIONAL SEWER STUDY

## AREA LOCATION KEY

AREA #	ACRES
1	1669
2	4154
3	29299
4	3685
5	7491
6	46
7	617
8	7257
9	463
10	22
11	204
12	932
13	216
14	114
15	832
16	3550
17	4085
18	1558
19	5566
TOTAL	71762



JANUARY 1997

## LAND USES

The same soils characteristics which lead to problems for moderate urbanization also tend to be a benefit for agriculture. As such, most of the watershed is prime agricultural grazing land with some farming. In fact, the bulk of the watershed is currently used for agricultural uses. However, the impact of urban sprawl from the Dallas-Fort Worth metroplex is becoming more evident with an increase in the number of large lot, or "ranchette" developments in the unincorporated areas. As more of the unincorporated area becomes developed, the threat of various forms of pollution from failed septic systems becomes more of a concern.

The incorporated areas of Springtown, Sanctuary and Reno are primarily residential with some light commercial. The northern part of Azle, which lies in the Walnut Creek watershed, is mostly residential and commercial with some light industrial.

## ENVIRONMENTAL CONCERNS AND WATER USE

The lake was constructed in the 1920's as a water supply reservoir for Fort Worth and continues to be one of this city's major supply reservoirs. Eagle Mountain Lake provides the primary water source for the Walnut Creek basin. It is fed from the West Fork of the Trinity River which is now partially controlled upstream by Lake Bridgeport. Eagle Mountain Lake can store about 178,000 acre-feet of water supplying Fort Worth, Azle, Springtown, Reno and the Community Water System. Water allocation from the lake is controlled by the Tarrant Regional Water District. In 1987, the North Parker County Municipal Utility District looked at several locations for additional reservoirs including one on Walnut Creek. To date, none of these have seriously been pursued. The only other source of water in the watershed is well water, with the exception that Walnut Creek Special Utility District is now drawing water from Lake Bridgeport.

In addition, the lake is a prime residential and recreational attraction. As such, the shores of the lake have become populated with residents looking for a recreational retreat from the metroplex. Homes range from small houses to extravagant villas. However, many of the homes are on septic systems and this has led to concerns about water quality, especially during the summer when the lake level can drop and fresh upstream water is not abundant. Such concerns have precipitated in the formation of Save Eagle Mountain Lake, Inc., a non-profit corporation dedicated to preserving water quality and recreational aspects of the lake.

Tarrant Regional Water District has some jurisdiction for control of water quality in the lake. In the 1970's, the District began to regulate all on-site wastewater systems within 2000 feet of the lake for unincorporated areas. In 1989, the District established a "water quality area" extending 5 stream miles upstream of the normal pool elevation of Eagle Mountain Lake. This designation, sanctioned by the State of Texas, allows the District to establish discharge limits for wastewater discharges in the regulated area. Such limits are currently 10 mg/l BOD and 15 mg/l TSS for 30 day (monthly) average discharges. Oxidation pond limits are currently 30 mg/l BOD and 90 mg/l TSS for a thirty day average.

The District also performs research, training and assistance to assure the water quality of the lake and other lakes managed by the District. The two wastewater studies discussed earlier in this report were initiated and funded by the District with assistance from the Texas Water Development Board and others. The District is currently performing pilot projects (along with the City of Fort Worth) for constructed wetlands as a means to "polish" wastewater effluent from existing plants to meet, or exceed, acceptable discharge levels into the lake.

EXISTING CONDITIONS

Below are tables representing the existing service capabilities in the watershed.

<b>TABLE 2 - EXISTING TREATMENT PLANTS IN REGION</b>				
	<b>Springtown</b>	<b>Azle Walnut Creek</b>	<b>Azle Ash Creek Existing</b>	<b>Azle Ash Creek Complete</b>
Permit Capacity, mgd	0.260	0.294	0.750	1.443
75% Trigger Capacity, mgd	0.195	0.220	0.562	1.082
Treatment Method	Oxidation Ditch	Contact Stabilization	Extended Aeration	Extended Aeration
Age, Years	13	12	22	Under constr.
BOD5 Effluent Limit	10	10	10	10
TSS Effluent Limit	15	15	15	15
Nitrogen Effluent Limit	3	3	3	3
Phosphates Effluent Limit				
Current Population Served	2052		9000	9000
Current Avg Daily Flow	0.211		1.600	1.600
End Service by (30 yr)	2013	2014		2028

**TABLE 3 - EXISTING SERVICE FEES**

Existing Utility Rates (per month)	SPRINGTOWN			AZLE			Cost per 10000 Gallons
	Monthly Base Cost	Additional Cost per 1000 gal	Cost per 10000 Gallons	Monthly Base Cost	Additional Cost per 100 CF	Additional Cost per 1000 gal	
Residential	\$7.00	\$1.50	\$22.00	\$12.00	\$1.30	\$0.97	\$21.73
Apartment	\$7.00	\$1.50	\$22.00	\$12.00	\$1.30	\$0.97	\$21.73
Commercial	\$10.00	\$1.50	\$25.00	\$15.00	\$1.30	\$0.97	\$24.73
Industrial				\$1,335.00	\$1.30	\$0.97	\$1,344.73
Tap (one time charge)	\$350.00						

**TABLE 4 - EXISTING DEBT**

	Type	Maturity Date	Interest Rate	Remaining Principal	Annual Payment
<b>Springtown Existing Debt:</b>					
1962 Sewer Serial Bonds	Revenue	4/2000	3.625%	\$18,000	\$7,088
1983 Sewer Junior Lein	Revenue	4/2002	5.500%	\$85,000	\$15,686
1991 Tax and Utility C.O.	Mixed	8/2012	8.550%	\$430,000	\$42,801
1993 Tax and Utility C.O.	Mixed	8/2012	5.250%	\$440,000	\$43,025
<b>Azle Existing Debt:</b>					
1986 General Obligation Bonds	G.O.			\$235,000	\$127,037
1987 Refunding and Revenue Bonds	Revenue			\$335,000	\$344,631
1994 Refunding and Revenue Bonds	Revenue			\$8,916,905	\$655,745
1995 Waterworks and Revenue Bonds	Revenue			\$2,550,000	\$20,000

## SUBAREA PARAMETERS

To facilitate the study, the Walnut Creek watershed and parts of Azle, Pelican Bay and Sanctuary were delineated into subareas. Each area represents a portion of an entity (city, ETJ or unincorporated county) within each watershed (Walnut Creek, Ash Creek, or direct to Eagle Mountain Lake on the North End). For each subarea, a population percentage was calculated (see next chapter). These small areas were then grouped into service subareas for the treatment plants studied and linked by trunk mains for primary collection. Only main creek trunk lines were included in the collection system. Regular service mains and laterals were NOT included in this study. Such general collection systems must be addressed by each entity as development occurs. A map key to subareas and studies trunk lines is included herein. A tabular summary of the parameters for each area is shown on the following page.

**TABLE 6 - SUBAREA CALCULATIONS FOR REGION**

Area Number	Entity	Entity Segment	Watershed	Area SF	Area Acres	Area Sq. Mi.	Total Future Entity	Percent Future Entity	1997 Population (people)	1997 Population Density (per acre)	2027 Population (people)	2027 Population Density (per acre)
1	Springtown	City	Walnut	72711373	1669	2.6		28.66%	815	0.49	2606	1.56
2	Springtown	ETJ	Walnut	180953153	4154	6.5	5823	71.34%	2029	0.49	5237	1.26
3	County	West	Walnut	1276270599	29299	45.8		88.83%	2899	0.10	5570	0.19
4	County	Central	Walnut	160538770	3685	5.8	32985	11.17%	365	0.10	700	0.19
5	Reno	City	Walnut	326322342	7491	11.7		45.99%	1168	0.16	1716	0.23
6	Reno	City	North	20125985	462	0.7		2.84%	72	0.16	106	0.23
7	Reno	ETJ	North	26876718	617	1.0		3.79%	96	0.16	141	0.23
8	Reno	ETJ	Walnut	316126308	7257	11.3		44.55%	1132	0.16	1662	0.23
9	Reno	ETJ	Ash	20156397	463	0.7	16290	2.84%	72	0.16	106	0.23
10	Sanctuary	City	Walnut	970691	22	0.0		9.86%	28	1.27	69	3.09
11	Sanctuary	City	Ash	8874820	204	0.3	226	90.14%	259	1.27	630	3.09
12	Pelican Bay	City	North	40612810	932	1.5		81.22%	1553	1.67	4234	4.54
13	Pelican Bay	ETJ	North	9389188	216	0.3	1148	18.78%	359	1.67	979	4.54
14	Azle	City	North	4945538	114	0.2		0.72%	85	0.75	241	2.12
15	Azle	City	Walnut	36263315	832	1.3		5.30%	628	0.75	1774	2.13
16	Azle	City	Ash	154656259	3550	5.5		22.61%	2680	0.75	7566	2.13
17	Azle	ETJ	North	177932882	4085	6.4		26.01%	3083	0.75	8704	2.13
18	Azle	ETJ	Walnut	67873555	1558	2.4		9.92%	1176	0.75	3320	2.13
19	Azle	ETJ	Ash	242459684	5566	8.7	15705	35.44%	4201	0.75	11859	2.13
		<b>TOTAL</b>		<b>3144060386</b>	<b>72178</b>	<b>112.8</b>			<b>22702</b>	<b>0.31</b>	<b>57220</b>	<b>0.79</b>
	Parker County	All	Many	25146316800	577280	902.0						
	Walnut Creek	All	Walnut	2438030105	55969	87.5						
	Watershed TOTALS:											
			Walnut	2438030105	55969	87.5						
			Ash	426147161	9783	15.3						
			North	279883120	6425	10.0						
		<b>Total</b>		<b>3144060386</b>	<b>72178</b>	<b>112.8</b>						
	County PERCENTAGE:	Existing	2021918801	8.04%								
		Future Average	1436809369	5.71%								

## CHAPTER IV - STUDY AREA POPULATIONS

### POPULATION HISTORY

Since the mid 1800's, northern Parker County has been predominantly agricultural. Even today, about 16% of the total county's employment is agricultural. However, farming and ranching has now been eclipsed by manufacturing at 18%, government at 25% and wholesale/retail trade at 28%.

This diversity has brought industry and commerce to Azle and Springtown, especially along Highway 199, FM 730, FM 51 and in the commercial business districts. There has also been an increase in population in general. Azle and Springtown are both established communities offering the full scope of city services. Reno offers only water distribution.

In the past, the main population growth appears to have been attributed to urban sprawl and recreation. People move further out of the metroplex to avoid crime and other urban problems. Eagle Mountain Lake and large tracts of available land have also been enticements.

In order to determine population projections, the present and past populations were required. Population data were gathered from a number of sources including the Bureau of Census, North Central Texas Council of Governments, Texas Water Development Board, previous studies and the various cities in the study area. A summary of this data, along with projections and graphs, are shown in the appendices.

The population data from all sources were analyzed to get historical population information. Long term data for Fort Worth and Weatherford were also analyzed due to the ready availability of a long history and the fact that both of these cities are major influences on the region in question. Different regression routines were investigated to obtain the closest fit to available data. Ultimately, it was decided to use a compound growth equation of the form:

$$\text{Population} = 1990 \text{ Population} \times (1 + \text{Compound Growth Rate})^{\text{Years from 1990}}$$

Although some other regression equations fit some particular existing curves better, this equation seemed to conform well to each curve group and the compound growth rates published by the North Central Texas Council of Governments (NCTCOG).

For Reno, Sanctuary, Pelican Bay and Parker County, curve factors were used consistent with NCTCOG and TWDB data. For Azle and Springtown, curve factors were used which approximated the population projections supplied by these cities. Where possible, a curve trending toward the higher existing projection was favored, due to an expected rapid growth in the region by a number of current influences. Such influences include the robust economy now being experienced in the metroplex, the recent widening of Hwy 199 facilitating access to the region, the influence of Alliance Airport currently generating jobs in northern Tarrant County and the Fort Worth master thoroughfare plan which is projecting a future "outer loop" linking the Alliance area with Azle, Reno and the surrounding region.

For the unincorporated areas, a proration was made to determine the initial density per square mile in the county. Parker County was used as the basis since only small portions of Wise and Tarrant Counties are in the study area.

Since the land area in question is fixed, a method was needed to determine an allocation of area

for each city at different times in the study. A decision was made to allow each city to expand to its extraterritorial jurisdiction (ETJ) boundary by the end of the 30 year study period. Therefore any population growth within a city was continually spread out to the limits of the current ETJ. All cities in the study have a one-half mile ETJ. (Fort Worth has a 5 mile ETJ which impacts the southeast end of the study. However, boundary agreements currently exist for the impacted areas, so ETJ growth by Fort Worth was not considered.) Azle's ETJ connects with the ETJ's of Sanctuary, Reno, Fort Worth and Pelican Bay. For this reason, Azle has entered into boundary agreements with these cities. These agreed boundaries were used to define the expansion in such areas.

Most of the historic population data was derived from the U.S. Census and reported by the various sources. However, the City of Springtown has contested the 1990 Census figures for their city. In this case, corrected figures, as reported by Springtown, were used.

The North Central Texas Council of Governments tracks population each year. NCTCOG publishes this information and also shows it as a compound growth rate since the last official census (1990). The Texas Water Development Board publishes projections for future growth for the low, high and most likely trends. Azle figures from NCTCOG are questionable since Azle crosses the Tarrant-Parker County Line and its total population is not explicitly referenced. However, Azle maintains a masterplan which provides for city derived projections.

In summary the following growth figures were used for population projections. The latest NCTCOG report shows Reno with a 1.29% compound growth rate, Springtown with a 0.59% growth rate and a general Parker County growth rate of 2.20%. Parker County's and Reno's rates were held as published by NCTCOG. In the case of Reno, this rate corresponds well to the TWDB "most likely" curve. A rate of 3.52% was established for Azle which corresponds well to the later years reported on Azle's projection. A 3.00% rate was derived for Sanctuary and 3.40% for Pelican Bay. These cities are not published in NCTCOG's review but growth values were determined by fitting curves to recent historic populations. A rate of 3.95% was calculated for Springtown based on information supplied by the City.

Population tables and graphs are included in the appendices. A summary of the population projections for each entity and the population percentage for each map area (as defined in the previous chapter) is as follows:

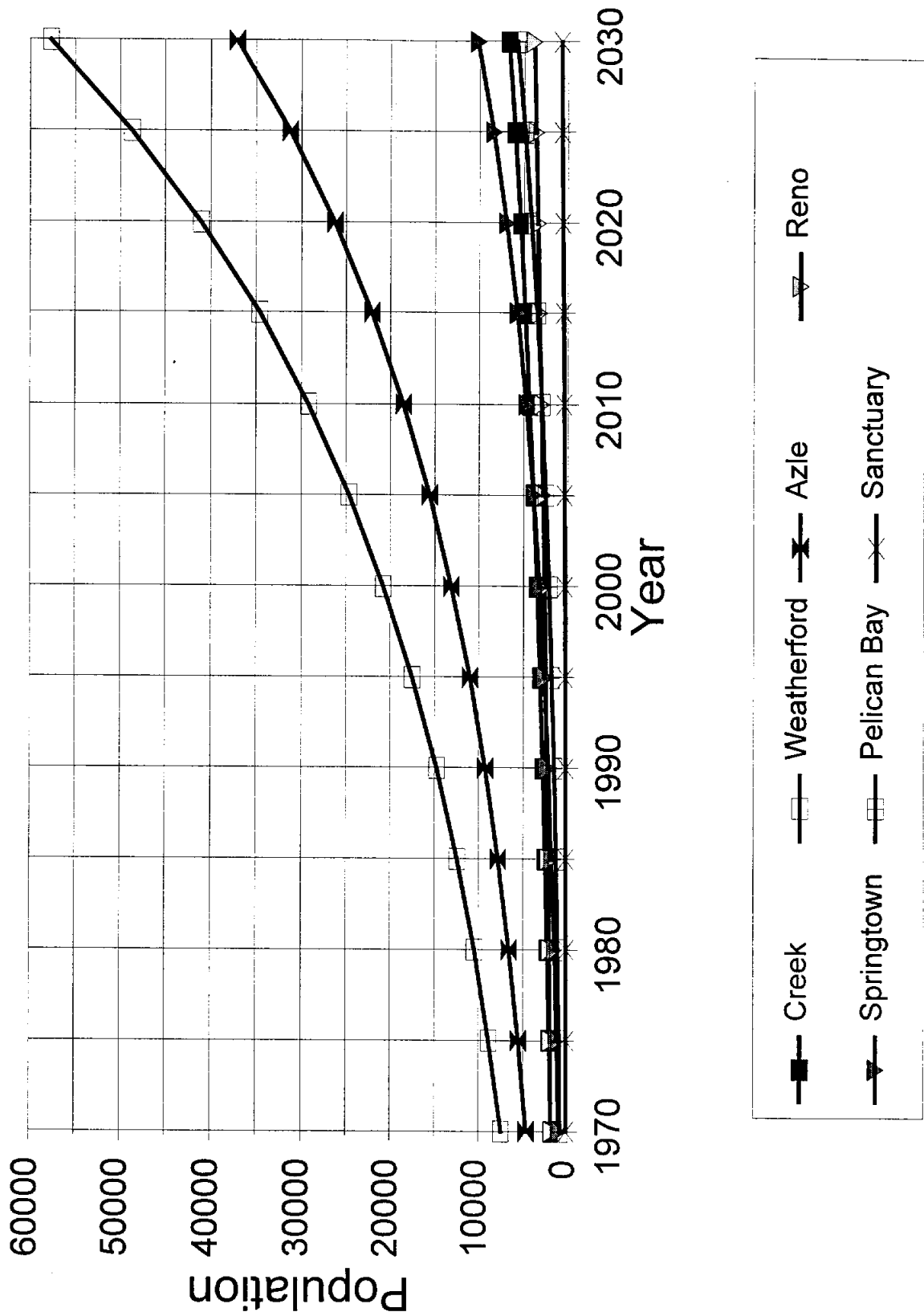
<b>TABLE 6 - FUTURE EXPECTED POPULATIONS</b>									
	Year Ultimate Reached								
	2.5/acre	1997	2000	2005	2010	2015	2020	2025	2027
Azle	2032	11853	13150	15633	18585	22094	26266	31226	33463
Springtown	2040	2845	3195	3878	4707	5713	6934	8416	9094
Parker/Wise County	2100+	3264	3484	3885	4332	4829	5385	6003	6271
Reno	2100+	2540	2640	2814	3001	3199	3411	3637	3731
Sanctuary	2021	288	314	365	423	490	3411	565	565
Pelican Bay	2010	1912	2114	2498	2870	2870	2870	2870	2870
<b>TOTAL</b>		<b>22702</b>	<b>24897</b>	<b>29073</b>	<b>33916</b>	<b>39196</b>	<b>48277</b>	<b>52717</b>	<b>55994</b>



**TABLE 7 - POPULATION GROWTH RATES**

Area	% of Entity	Entity 1990 Population	Compound Growth Factor	Population Equation In the form of $y = \% * 1990 \text{ Population} * GF^{\text{Number of Years}}$
1	0.2866	2169	1.0395	$= .2866 * (2169 * (1.0395)^{\text{Year}-1990})$
2	0.7134	2169	1.0395	$= .7134 * (2169 * (1.0395)^{\text{Year}-1990})$
3	0.8883	2803	1.0220	$= .8883 * (2803 * (1.022)^{\text{Year}-1990})$
4	0.1117	2803	1.0220	$= .1117 * (2803 * (1.022)^{\text{Year}-1990})$
5	0.4599	2322	1.0129	$= .4599 * (2322 * (1.0129)^{\text{Year}-1990})$
6	0.0284	2322	1.0129	$= .0284 * (2322 * (1.0129)^{\text{Year}-1990})$
7	0.0379	2322	1.0129	$= .0379 * (2322 * (1.0129)^{\text{Year}-1990})$
8	0.4455	2322	1.0129	$= .4455 * (2322 * (1.0129)^{\text{Year}-1990})$
9	0.0284	2322	1.0129	$= .0284 * (2322 * (1.0129)^{\text{Year}-1990})$
10	0.0986	234	1.0300	$= .0986 * (234 * (1.030)^{\text{Year}-1990})$
11	0.9014	234	1.0300	$= .9014 * (234 * (1.030)^{\text{Year}-1990})$
12	0.8122	1513	1.0340	$= .8122 * (1513 * (1.034)^{\text{Year}-1990})$
13	0.1878	1513	1.0340	$= .1878 * (1513 * (1.034)^{\text{Year}-1990})$
14	0.0072	9304	1.0352	$= .0072 * (9304 * (1.0352)^{\text{Year}-1990})$
15	0.0530	9304	1.0352	$= .0530 * (9304 * (1.0352)^{\text{Year}-1990})$
16	0.2261	9304	1.0352	$= .2261 * (9304 * (1.0352)^{\text{Year}-1990})$
17	0.2601	9304	1.0352	$= .2601 * (9304 * (1.0352)^{\text{Year}-1990})$
18	0.0992	9304	1.0352	$= .0992 * (9304 * (1.0352)^{\text{Year}-1990})$
19	0.3544	9304	1.0352	$= .3544 * (9304 * (1.0352)^{\text{Year}-1990})$

# Population Projection Comparisons



## CHAPTER V - WASTEWATER PROJECTIONS

### METHODOLOGY FOR WASTEWATER PROJECTIONS

Once population projections were established, these projections were converted to anticipated wastewater flows using standard TNRCC criteria. Flows were determined for the dry weather 30 day average, the wet weather maximum 30 day average, peak daily flow and peak 2-hour flow. Flow and waste load projections were calculated based on per capita contributions for the anticipated service populations.

### FLOW PROJECTIONS

The Texas Natural Resource Conservation Commission's "TAC Chapter 317, Design Criteria for Sewerage Systems", (hereinafter referred to as "TNRCC rules"), requires that treatment plant facilities be designed to process the wet weather, maximum 30 day average flow. The TNRCC also establishes a 100 gallon per capita flow rate for daily average flows, and an average per capita wastewater strength of 200 mg/l BOD5 (5 day biological oxygen demand) to be used in the absence of site specific field gathered data.

The 1990 Tarrant Regional Water District study showed actual field data resulting in somewhat less flows than the state recommendations, so the 1990 report was based on the State recommendations. Data submitted by Azle and Springtown show these numbers to still be reasonable for the purpose of this report.

Analysis in the 1990 report showed that flow factors of 1.5, 2 and 4 were reasonable for the City of Azle based on historical data. These numbers are consistent with national averages. Therefore the following per capita flows have been used in this study.

Dry Weather 30 day average =	100 gallons per capita day
Wet Weather Maximum 30 day average=	150 gallons per capita day
Peak Daily Flow=	200 gallons per capita day
Peak 2 Hour Flow=	400 gallons per capita day

### WASTELOAD PROJECTIONS

Wasteload projections were based on an incoming flow of 200 mg/l of 5 day biological oxygen demand (BOD5), 200 mg/l of Total Suspended Solids (TSS), 30 mg/l of nitrogen and 10 mg/l of phosphorus. The waste stream was then routed through a sequence of treatment processes based on the curves found in "Water Supply and Sewerage, Fifth Edition" by E.W. Steel and Terence J. McGhee, published by McGraw Hill, 1979. These curves were originally from the EPA's "Guide to the Selection of Cost Effective Wastewater Treatment Systems". In all, these curves describe cost data for various processes making up 228 of the most common treatment strings. A percentage of removal for BOD5, TSS, nitrogen and phosphorus was assigned to each process component base on the literature. In addition, one of two optional tertiary treatments, constructed wetlands or additional filters were added, if needed.

Currently the most stringent effluent requirements for the Eagle Mountain Lake as (5 streamflow miles above the lake) as dictated by the TNRCC and Tarrant Regional Water District (TRWD) are 10 mg/l BOD5 and 15 mg/l TSS. Due to the existing possible concern regarding these requirements (by Save Eagle Mountain Lake, Inc.) and the potential for more stringent federal requirements

during the next 30 years, the costs generated by this report are based on using constructed wetlands to achieve discharge compliance with 5 mg/l BOD5, 5 mg/l TSS, 2 mg/l nitrogen and 1 mg/l phosphorus in the permit requirements. Such action should produce conservative results for all studied combinations.

Computer analysis of the possible treatment sequences indicated that for the plant size ranges in question, either an activated sludge or a trickling filter system (each with constructed wetlands) would be the most cost effective means for achieving the desired effluent conditions. Since activated sludge processes are currently in use by both Azle and Springtown, standard activated sludge systems with constructed wetland tertiary polishing were used for this study.

## **CHAPTER VI - TREATMENT PLANT AND TRUNK MAIN PROJECTIONS**

### METHODOLOGY FOR WASTEWATER TREATMENT PLANT PROJECTIONS

For this report, initial plant constructions were set for the year 2002. This date was assumed to be the earliest new wastewater facilities could be located, designed, permitted and constructed. To maintain consistency for cost comparisons, all initial upgrades of existing plants were also set for the year 2002. Other upgrades during the 30 year planning window were included if population design flows were projected to exceed 75% of plant capacity within the 30 year planning window. In general, plant construction was based on a 20 year life to coincide with the financial analysis. In a few cases, plants were "paid off" prior to new construction being required.

### TREATMENT PLANT NEEDS

Once projected populations and design flows were established for each plant, the plant cost for capital expense and annual operation and maintenance was determined based on the Steel/McGhee curves (see Chapter V) and corrected for 1996 dollars. The results of each cost projection were then compared with the curves published by Alan Plummer and Associates in their 1990 report. An estimated cost for each plant scenario was calculated by the methods discussed in Chapter VII.

**TABLE 8 - TREATMENT PLANT COSTS**

Treatment Plant	Areas Served		Initial Added Plant Capacity (mgd)		Capital Cost 1996 \$'s		O&M Costs 1996 \$'s	
	Population Centers	Full Watershed	Population Centers	Full Watershed	Population Centers	Full Watershed	Population Centers	Full Watershed
<b>SCENARIO 1</b>								
1-Springtown	Spr	Spr, WUW	1.15	1.87	\$4,838,521	\$6,296,154	\$1.68	\$1.47
2-Reno	DR	AR, CUW	0.25	0.66	\$3,824,693	\$3,918,312	\$2.30	\$2.03
3-Azle	Azi,PB,Sa	Azi, PB, San	4.66	4.66	\$11,562,493	\$11,562,493	\$1.22	\$1.22
<b>TOTALS</b>			<b>4.91</b>	<b>5.32</b>	<b>\$20,225,707</b>	<b>\$21,776,959</b>		
<b>SCENARIO 2</b>								
1-Reno	Spr, DR	Spr, AR, AUW	1.29	2.49	\$5,121,121	\$7,525,948	\$1.62	\$1.38
2-Azle	Azi,PB,Sa	Azi,PB,San	4.66	4.66	\$11,562,493	\$11,562,493	\$1.22	\$1.22
<b>TOTALS</b>			<b>5.95</b>	<b>7.15</b>	<b>\$16,683,614</b>	<b>\$19,088,441</b>		
<b>SCENARIO 3</b>								
1-Azle	All Cities	All Areas	5.48	5.79	\$12,996,371	\$13,527,265	\$1.19	\$1.18
<b>SCENARIO 4</b>								
Fort Worth Service	All Cities	All Areas	0.00	0.00	\$0	\$0	\$0.62	\$0.62
<b>SCENARIO 5</b>								
Azle Service (50*)	Spr, DR *	Spr, AR, AUW **	0.00	0.00	\$0	\$0	\$1.65	\$1.65
Azle Service (20*)	Spr, DR *	Spr, AR, AUW **	0.00	0.00	\$0	\$0	\$1.65	\$1.65
Azle Service (20*,PC only)	Spr, DR *	Spr, AR, AUW **	0.00	0.00	\$0	\$0	\$1.65	\$1.65

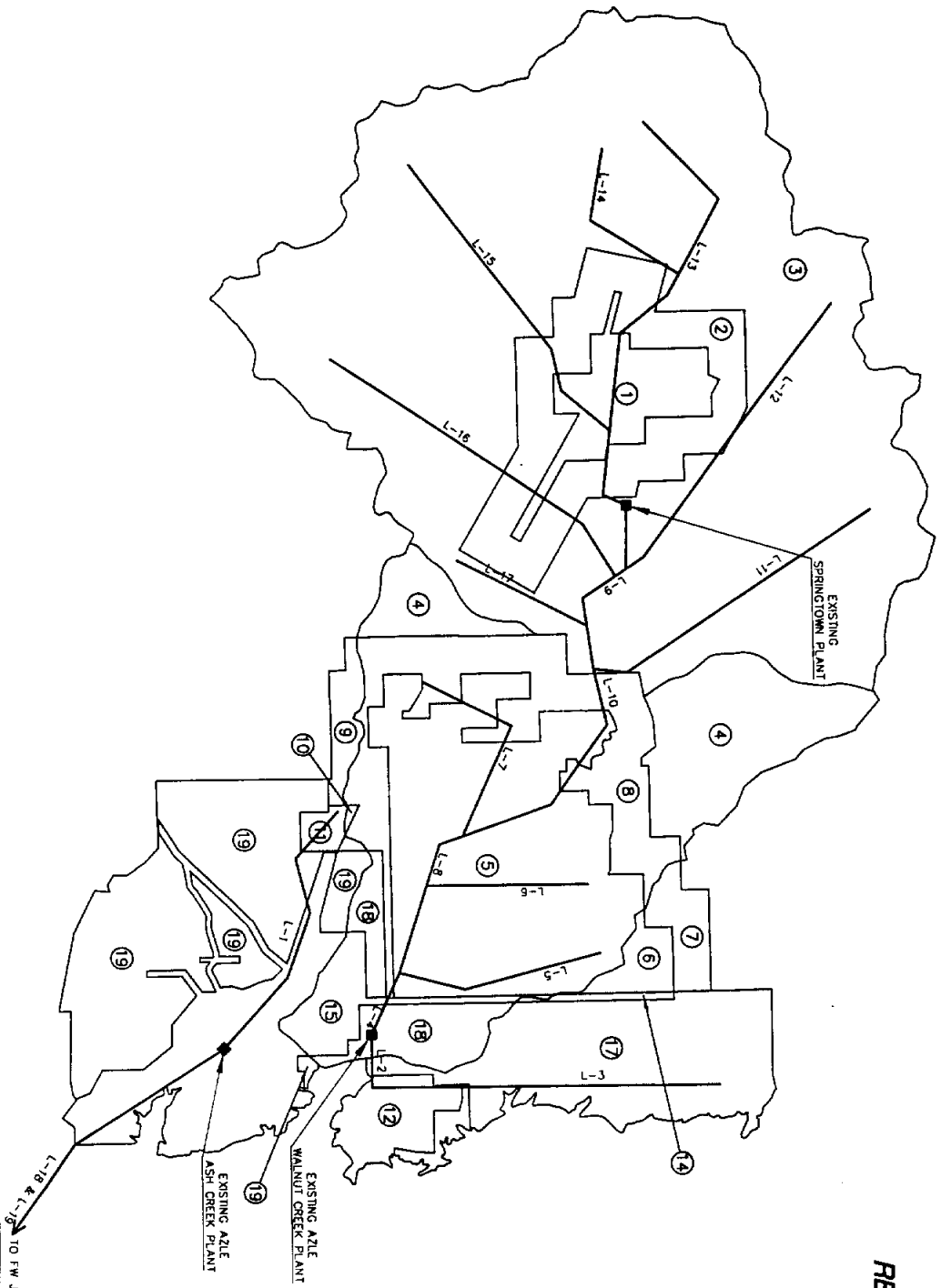
NOTES:  
 1.) Total initial added capacity varies among scenarios depending on 75% for next upgrade.  
 2.) For Scenarios 4 and 5, O&M cost reflects contract treatment price.



1" = 8000'

# WALNUT CREEK REGIONAL SEWER STUDY

## PIPE LOCATION KEY



**M.P. TEAGUE NALL AND PERKINS**  
ENGINEERS ARCHITECTS  
PLANNERS  
CONSULTANTS

JANUARY 1997

L-18 & L-17 TO FW JENKINS LIFT STATION

**COLLECTION SYSTEM**

For each plant scenario, trunk mains were sized to extend up Walnut Creek and, in some cases, some or all, of each of the major tributaries. An ultimate population density of 2.5 persons per acre was used to size pipes in areas for which ultimate density was expected during the 30 year planning time frame. For other, more sparsely populated areas, it was assumed that trunk systems would have a 50 year life and, therefore, a 50 year population projection was used for pipe sizing. To reduce costs, a 20 year life/size was also studied for Scenario 5. All pipes were assumed to be installed on minimum grade. If actual field conditions permit steeper grades, some runs may be able to utilize smaller pipes by actual design.

**TABLE 9 - PIPE FACTORS**  
(Total Cost includes Manholes, etc.)

Pipe Size (in dia)	Min Grade (ft/ft)	Capacity (cfs)	TOTAL Cost per L.F. @12' (1996 \$'s)
6	0.0050	0.40	38.00
8	0.0033	0.69	41.00
10	0.0025	1.10	44.00
12	0.0020	1.59	47.00
15	0.0015	2.50	52.00
18	0.0011	3.48	57.00
21	0.0009	4.75	62.00
24	0.0008	6.40	67.00
27	0.0006	7.59	72.00
30	0.0006	9.62	77.00
33	0.0005	11.83	82.00
36	0.0005	14.15	87.00
39	0.0004	16.51	92.00
42	0.0004	20.12	97.00
45	0.0004	24.19	102.00
48	0.0004	28.73	107.00
56	0.0004	43.33	112.00
60	0.0004	52.09	117.00
72	0.0004	84.70	125.00
84	0.0004	127.76	145.00
30P	N/A		60.00



## CHAPTER VII - COST PROJECTIONS

### ECONOMIC METHODOLOGIES

To compare capital, operation/maintenance, finance, and miscellaneous costs of the various scenarios, cost were determined based on 1996 dollars. These costs were then projected to the time of construction using a 4% annual inflation rate. Any project financing was assumed to be based on a 20 year financing at an 8% annual interest rate and with the first payment to occur in the year of initial construction.

To determine a method for anticipating the inflated value of money, historic data from the Federal Consumer Price Index (CPI) and the Engineering News Record (ENR) were reviewed and compared. Each one of these curves utilizes its own base year for comparison. For the CPI, a base value of 100 is used for 1982. The ENR index utilizes a base of 100 in 1913. After review, it was decided to use the historic CPI data and associated annual factors for standardizing all costs to 1996 dollars. The cost factors used are published in the appendices.

### PROJECTIONS FOR CAPITAL COSTS

Plant construction costs were determined from several sources. In the APAI study, a set of graphs was included which contained curves for capital plant, capital filters, O&M plant and O&M filters, and overhead (land, engineering, permitting, etc.). These curves appear to be based on 1990 dollars and were used to get rough estimates during the early phase of the project. However, it was noted by representatives from Alan Plummer and Rady/Kimley Horn in one of the joint meetings (December 1996) that the values generated for small plants (less than 1 mgd) using these curves appear to be exaggerated from actual small plant costs.

For the final calculations, curves from Water Supply and Sewerage, Fifth Edition, 1979, by E. W. Steel and Tarence J. McGhee (McGraw-Hill Publications) were used. These curves give cost figures (in 1970 dollars) for a wide variety of plant components and the available plant sequences for each component. Values for constructed wetlands, a more recent tertiary treatment, were added from available literature, particularly Use of Constructed Wetlands for Protection of Water Quality in Water Supply Reservoirs, 1996, published by the American Water Works Association Research Foundation. This document was prepared by Tarrant Regional Water District (TRWD) and Alan Plummer and Associates (APAI) and is highly relevant to the Walnut Creek watershed.

### PROJECTIONS FOR OPERATION AND MAINTENANCE COSTS

The annual operation and maintenance costs (O&M) for each plant scenario was projected based on the flow anticipated for each plant and cost factors published by APAI and Steel/McGhee. Again, costs from Steel/McGhee were used for the final calculations.

### ENVIRONMENTAL COSTS

Environmental costs were calculated indirectly while calculating capital costs. This was accomplished by assigning average removal percentages for BOD5, TSS, nitrogen, and phosphorus for each of the plant components used in the estimate. In this way, not only the flow was utilized but also an estimation of the initial and final effluent parameters. The plant type used for new construction was the lowest cost alternative which would meet the anticipated effluent limits for the plant.

## ENTITY PARTICIPATION

Obviously, for a regional approach to be cost effective and have any validity, a large amount of participation is required from all entities in the region. Initial response for all entities has been favorable. A final response from Springtown, Azle, Reno, Sanctuary, Pelican Bay and Parker County (with Walnut Creek SUD) is expected once regionalization options are explored and this report reviewed in detail.

## REGIONAL ADMINISTRATION CONSIDERATIONS

The study resulted in five scenarios for wastewater service in the Walnut Creek Basin. In Scenario 1, each major city would provide its own service or a regional entity would operate all plants. In Scenario 2, a regional entity would most likely own and operate the plant serving Springtown and Reno, with the Azle plant(s) either operated by Azle or a regional entity. For Scenario 3, a regional entity would most likely own and operate all facilities. For Scenario 4, a regional entity would provide the collection system and contract treatment from the City of Fort Worth. For Scenario 5, a regional entity would provide the collection system for the Walnut Creek Basin (Springtown, Reno, and unincorporated area) and contract with Azle for treatment.

## CHAPTER VIII - RECOMMENDATIONS

Based on the findings of this study, it is recommended that the Walnut Creek basin institute some form of regional wastewater collection and/or treatment. It appears that such action would not only have cost benefits for sewer but a regional system would also allow growth and control of wastewater in the area and help prevent pollution of the local water supply by the use of septic tanks.

It would appear that the best course of action would be to connect all existing cities with the treatment facilities in Azle and then pursue contracting with Fort Worth for sewage treatment prior to any required large expansion of the Azle facilities. However, it has been shown that the connection to Fort Worth would probably not be possible until the later part of the planning period and that additional downstream upgrades to Fort Worth's existing system could make this option cost prohibitive. Even more important, treatment by Fort Worth would mean that a water resource ( 32 ac-ft per day by year 2047) which is needed by the local area, could not be recycled and reused locally, but would be lost downstream. This fact has been demonstrated by the drought conditions of the past year in which the level of Eagle Mountain Lake dropped significantly and the threat of low water supplies, in part, spurred the City of Fort Worth and Tarrant Regional Water District to lobby the state legislature for stronger water control in drought periods.

All of the scenarios, except Scenario 4, would treat wastewater upstream of Eagle Mountain Lake and release the effluent either back into the lake or for beneficial surface uses upstream of the lake. However, returning flows to the lake could also mean increasing the effectiveness of treatment in order to prevent degradation of the water supply by pollution and nutrients. Therefore, the remaining scenarios studied have incorporated the costs of using constructed wetlands to polish wastewater plant effluents to anticipated acceptable limits.

It has also been shown that much of the area in Walnut Creek is sparsely populated and may not be cost effective to sewer with a collection system at this time. Therefore, each scenario was studied both as servicing the whole region within the 30 year planning period and as limiting service to the more urban "population centers" of Azle, Pelican Bay, Sanctuary, Springtown and "downtown" Reno. In all cases, service to only the population centers reduced overall customer costs.

At this point, the City of Springtown and the Walnut Creek Special Utility District are working toward a special law district to serve the Walnut Creek watershed. Although many other entities have voiced support for such a district, most are not willing to commit membership until the details have been more fully addressed. At this time, it appears that Azle would have little to benefit (from a customer rate standpoint) by being a member of the district. Azle does appear to be willing to contract with a district to use Azle's treatment facilities to treat the district's flows.

The results of this report indicate a cost savings by increased regionization. Therefore, a district west of Azle which contracted with Azle for treatment would be preferable to separate entities trying to own, operate and maintain two or more treatment facilities upstream. The overall findings of this report indicate that the best course of action at this time would be the creation of a single wastewater entity to collect flows from the Walnut Creek watershed and treat these flows at Azle's treatment facilities, whether or not Azle is a member of this entity. It is also shown that currently it is impractical to serve the more rural areas at this time. However, it is anticipated that the availability of wastewater service in this area could change both the land uses and growth rates such that service could be feasible quicker than currently anticipated.

COLLECTION SYSTEM

For each plant scenario, trunk mains were sized to extend up Walnut Creek and, in some cases, some or all, of each of the major tributaries. An ultimate population density of 2.5 persons per acre was used to size pipes in areas for which ultimate density was expected during the 30 year planning time frame. For other, more sparsely populated areas, it was assumed that trunk systems would have a 50 year life and, therefore, a 50 year population projection was used for pipe sizing. To reduce costs, a 20 year life/size was also studied for Scenario 5. All pipes were assumed to be installed on minimum grade. If actual field conditions permit steeper grades, some runs may be able to utilize smaller pipes by actual design.

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(Total Cost includes Manholes, etc.)

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56	0.0004	43.33	112.00
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Plant construction costs were determined from several sources. In the APAI study, a set of graphs was included which contained curves for capital plant, capital filters, O&M plant and O&M filters, and overhead (land, engineering, permitting, etc.). These curves appear to be based on 1990 dollars and were used to get rough estimates during the early phase of the project. However, it was noted by representatives from Alan Plummer and Rady/Kimley Horn in one of the joint meetings (December 1996) that the values generated for small plants (less than 1 mgd) using these curves appear to be exaggerated from actual small plant costs.

For the final calculations, curves from Water Supply and Sewerage, Fifth Edition, 1979, by E. W. Steel and Tarence J. McGhee (McGraw-Hill Publications) were used. These curves give cost figures (in 1970 dollars) for a wide variety of plant components and the available plant sequences for each component. Values for constructed wetlands, a more recent tertiary treatment, were added from available literature, particularly Use of Constructed Wetlands for Protection of Water Quality in Water Supply Reservoirs, 1996, published by the American Water Works Association Research Foundation. This document was prepared by Tarrant Regional Water District (TRWD) and Alan Plummer and Associates (APAI) and is highly relevant to the Walnut Creek watershed.

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The annual operation and maintenance costs (O&M) for each plant scenario was projected based on the flow anticipated for each plant and cost factors published by APAI and Steel/McGhee. Again, costs from Steel/McGhee were used for the final calculations.

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## TOTAL ANNUAL COSTS

During each year and for each scenario option, a total annual cost was generated. This cost includes the annualized cost of all financed capital construction (plants and collection system) as well as the anticipated annual operation and maintenance cost adjusted for inflation. These values were then divided by the service population for each year to yield a cost per person. A monthly cost per person and monthly cost per residential customer (based on 2.54 people per household to be consistent with the prior study) was also calculated. The initial and average monthly costs for each option were compared in making a recommendation. For this report, all customers were considered residential. No allowance has been made for commercial or industrial customers.

## PRESENT VALUE COMPARISONS

The present value (1996 dollars) of the total annual cost for each option was calculated. The sum of the present values for the years 1997 to 2027 are shown for comparing the various options.

## LONG-TERM COST ANALYSIS SUMMARY

Below is a summary of the cost analysis along with the cost analysis for each option of each scenario.

## COST PER CONNECTION

The monthly connection cost for residential users has been calculated for comparison. These costs are in addition to any existing monthly sewer charges.

## FINANCING COSTS

In all cases, financing was assumed for all capital items based on 20 year financing at 8% beginning in the first year of construction for a given financed time frame.

## RE-USE/ EXPANSION OF EXISTING FACILITIES OPTIONS

For all options, use of existing facilities has been continued until system expansions can be performed. In most cases, new facilities are shown to start operation in 2002. In such cases, the existing Springtown plant and the Azle Walnut Creek plant are assumed to cease operation shortly afterward (1-2 years). In cases using Azle as a treatment facility, the existing capacity of Ash Creek had been utilized and all expansions are assumed to be to the Ash Creek plant. It may be possible to continue to use the Walnut Creek facility as a secondary plant to Ash Creek.

## ENTITY PARTICIPATION

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The study resulted in five scenarios for wastewater service in the Walnut Creek Basin. In Scenario 1, each major city would provide its own service or a regional entity would operate all plants. In Scenario 2, a regional entity would most likely own and operate the plant serving Springtown and Reno, with the Azle plant(s) either operated by Azle or a regional entity. For Scenario 3, a regional entity would most likely own and operate all facilities. For Scenario 4, a regional entity would provide the collection system and contract treatment from the City of Fort Worth. For Scenario 5, a regional entity would provide the collection system for the Walnut Creek Basin (Springtown, Reno, and unincorporated area) and contract with Azle for treatment.

## CHAPTER VIII - RECOMMENDATIONS

Based on the findings of this study, it is recommended that the Walnut Creek basin institute some form of regional wastewater collection and/or treatment. It appears that such action would not only have cost benefits for sewer but a regional system would also allow growth and control of wastewater in the area and help prevent pollution of the local water supply by the use of septic tanks.

It would appear that the best course of action would be to connect all existing cities with the treatment facilities in Azle and then pursue contracting with Fort Worth for sewage treatment prior to any required large expansion of the Azle facilities. However, it has been shown that the connection to Fort Worth would probably not be possible until the later part of the planning period and that additional downstream upgrades to Fort Worth's existing system could make this option cost prohibitive. Even more important, treatment by Fort Worth would mean that a water resource ( 32 ac-ft per day by year 2047) which is needed by the local area, could not be recycled and reused locally, but would be lost downstream. This fact has been demonstrated by the drought conditions of the past year in which the level of Eagle Mountain Lake dropped significantly and the threat of low water supplies, in part, spurred the City of Fort Worth and Tarrant Regional Water District to lobby the state legislature for stronger water control in drought periods.

All of the scenarios, except Scenario 4, would treat wastewater upstream of Eagle Mountain Lake and release the effluent either back into the lake or for beneficial surface uses upstream of the lake. However, returning flows to the lake could also mean increasing the effectiveness of treatment in order to prevent degradation of the water supply by pollution and nutrients. Therefore, the remaining scenarios studied have incorporated the costs of using constructed wetlands to polish wastewater plant effluents to anticipated acceptable limits.

It has also been shown that much of the area in Walnut Creek is sparsely populated and may not be cost effective to sewer with a collection system at this time. Therefore, each scenario was studied both as servicing the whole region within the 30 year planning period and as limiting service to the more urban "population centers" of Azle, Pelican Bay, Sanctuary, Springtown and "downtown" Reno. In all cases, service to only the population centers reduced overall customer costs.

At this point, the City of Springtown and the Walnut Creek Special Utility District are working toward a special law district to serve the Walnut Creek watershed. Although many other entities have voiced support for such a district, most are not willing to commit membership until the details have been more fully addressed. At this time, it appears that Azle would have little to benefit (from a customer rate standpoint) by being a member of the district. Azle does appear to be willing to contract with a district to use Azle's treatment facilities to treat the district's flows.

The results of this report indicate a cost savings by increased regionization. Therefore, a district west of Azle which contracted with Azle for treatment would be preferable to separate entities trying to own, operate and maintain two or more treatment facilities upstream. The overall findings of this report indicate that the best course of action at this time would be the creation of a single wastewater entity to collect flows from the Walnut Creek watershed and treat these flows at Azle's treatment facilities, whether or not Azle is a member of this entity. It is also shown that currently it is impractical to serve the more rural areas at this time. However, it is anticipated that the availability of wastewater service in this area could change both the land uses and growth rates such that service could be feasible quicker than currently anticipated.



## **APPENDICES**

APPENDIX A - DOCUMENTS OF SUPPORT AND COMMENT

APPENDIX B - MAJOR CHANGES SINCE DRAFT REPORT

APPENDIX C - MEETINGS, NOTES AND HANDOUTS

APPENDIX D - PRESS COVERAGE

APPENDIX E - SCENARIO COST PROJECTIONS

APPENDIX F - PARTICIPATING INDIVIDUALS

APPENDIX G - POPULATION TRENDS

APPENDIX H - WATER CONSERVATION PLAN  
(To be sent under separate cover.)

APPENDIX I - TREATMENT METHODS AND SEQUENCES

APPENDIX J - INFLATION COST FACTORS

APPENDIX K - PIPE COSTS USED FOR ANALYSIS

## **APPENDIX A - DOCUMENTS OF SUPPORT AND COMMENT**

TEXAS WATER DEVELOPMENT BOARD DRAFT REVIEW COMMENTS

WALNUT CREEK SPECIAL UTILITY DISTRICT SUPPORT RESOLUTION

PARKER COUNTY COMMISSIONERS COURT SUPPORT RESOLUTION

CITY OF RENO SUPPORT RESOLUTION

TARRANT REGIONAL WATER DISTRICT SUPPORT LETTER AND EXTENSION REQUEST

CITY OF FORT WORTH SUPPORT LETTER AND COMMENTS

U.S. ARMY CORPS OF ENGINEERS, L.A.E.R.F. SUPPORT LETTER

SAVE EAGLE MOUNTAIN LAKE, INC. (SEML) SUPPORT LETTER AND CONCERNS

TNRCC RESPONSE TO SEML CONCERNS

KZEE RADIO SUPPORT COMMENTS

ALAN PLUMMER AND ASSOCIATES MARKUP COMMENTS

(Only cover note included herein, actual comments were 10 excerpted pages from the draft report showing mostly grammatical corrections, which have been incorporated into the actual final report.)

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS SUPPORT RESOLUTION

CITY OF SANCTUARY SUPPORT RESOLUTION

WISE COUNTY COMMISSIONERS COURT SUPPORT RESOLUTION

(To be voted on March 28, 1997 and forwarded later)

CITY OF AZLE SUPPORT RESOLUTION

(To be voted on after review of the final report.)



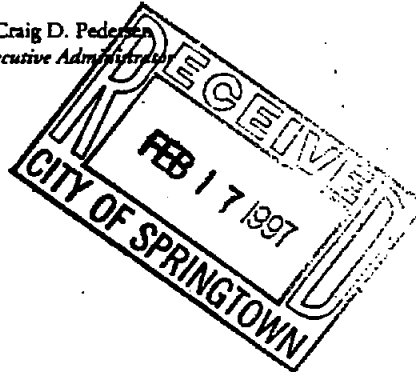
# TEXAS WATER DEVELOPMENT BOARD

William B. Madden, *Chairman*  
Charles W. Jenness, *Member*  
Lynwood Sanders, *Member*

Craig D. Pedersen  
*Executive Administrator*

Noé Fernández, *Vice-Chairman*  
Elaine M. Barrón, M.D., *Member*  
Charles L. Geren, *Member*

February 11, 1997



Mr. Bob Salinas  
City Administrator  
City of Springtown  
P.O. Box 444  
102 East Street  
Springtown, Texas 76082

Re: Review of the Draft Final Report for the Walnut Creek Regional Wastewater Study with the City of Springtown(City) Walnut Creek S.U.D. and the Texas Water Development Board (TWDB), TWDB Contract No. 97-483-198.

Dear Mr. Salinas:

Texas Water Development Board staff have completed a review of the draft final report submitted under TWDB Contract No. 97-483-198. As stated in the above referenced contract, the City will consider incorporating comments on the draft final report from the TWDB, shown in Attachment 1, and other commentors into a final report. The City must include a copy of the TWDB's comments in the final report.

The Board looks forward to receiving one (1) unbound camera-ready original and nine (9) bound double-sided copies of the Final Report on this planning project. Please contact Mr. Gary Laneman, the Board's Contract Manager, at (512) 463-8062, if you have any questions about the Board's comments.

Sincerely,

Tommy Knowles  
Deputy Executive Administrator  
for Planning

cc: Gary Laneman, TWDB

Our Mission

Exercise leadership in the conservation and responsible development of water resources for the benefit of the citizens, economy, and environment of Texas.

P.O. Box 13231 • 1700 N. Congress Avenue • Austin, Texas 78711-3231

WALNUT CREEK REGIONAL WASTEWATER STUDY - FINAL REPORT - MARCH 1997  
URL Address: <http://www.twdb.state.tx.us> • E-Mail Address: [info@twdb.state.tx.us](mailto:info@twdb.state.tx.us)

♻️ Printed on Recycled Paper ♻️

## **ATTACHMENT 1**

### **TEXAS WATER DEVELOPMENT BOARD**

#### **COMMENTS ON THE WALNUT CREEK REGIONAL WASTEWATER STUDY PARKER, WISE AND TARRANT COUNTIES OF TEXAS Contract No. 97-483-198**

- 1) In using Scenario 4, the need for reuse by the City of Ft. Worth will be an important and determining factor. The future water supply needs for the region should be detailed using the Texas Water Plan water demand projections. This will document the need for wastewater reuse as an important component in the feasibility study.
- 2) All scenarios will incorporate the use of return flows within the subbasins. This has not been detailed or accounted for in the design flow tables for each year. Correct the tables to reflect intended subbasin use of return flows.
- 3) All future water demand and, therefore, wastewater generation calculations will require expanded and ever increasing emphasis on water conservation and efficient management practices. More detail must be incorporated into the report to emphasize a commitment to reducing per capita water demands.
- 4) The Eagle Mountain Lake area (page 25, paragraph 6) is referenced but not delineated in the report. This makes review difficult and clarity lacking. Please detail which portion of the Walnut Creek Regional Sewer Study area has been defined as the Eagle Mountain Lake Area.
- 5) In paragraph 6, page 25, the permit limits of 5,5,2,1, is referenced. This needs to be clarified. Please reference their constituents (BOD, TSS etc.) and if this pertains to all scenarios or just those for the Eagle Mountain Lake area.
- 6) In paragraph 7, page 25, activated sludge processes were integrated into the considerations of the study. It is not clear if activated sludge processes were part of the constructed wetlands considerations. Please clarify and expand on whether activated sludge processes were used for all scenarios developed.
- 7) Please define the scenarios in the table on page 26 and explain why it differs from the table on page 7.

**A RESOLUTION SUPPORTING  
A REGIONAL WASTEWATER SYSTEM  
FOR THE WALNUT CREEK WATERSHED  
OF PARKER, WISE AND TARRANT COUNTIES  
OF TEXAS**

WHEREAS, the Walnut Creek watershed flows into Eagle Mountain Lake and drains approximately 87.5 square miles of Parker, Wise and Tarrant Counties of Texas; and

WHEREAS, most of the watershed, save the Cities of Azle and Springtown, is not served by a collective wastewater collection and treatment system; and

WHEREAS, many septic systems within the watershed do not operate in a consistent and reliable manner; and

WHEREAS, a centralized system is necessary to serve increased growth in the area; and

WHEREAS, water quality and quantity in Eagle Mountain Lake is a concern to the local area; and

WHEREAS, the City of Springtown and Walnut Creek Special Utility District have matched funds from the Texas Water Development Board to study the feasibility of a regional wastewater system for the watershed and contiguous populated areas; and

WHEREAS, the draft report for such study has indicated a feasibility for wastewater regionalization in the watershed; and

WHEREAS, the undersigned entity has a vested interest in the water quality and quantity of the Walnut Creek watershed;

NOW, THEREFORE BE IT RESOLVED, by Board of Directors  
(governing body of entity)  
of Walnut Creek Special Utility District  
(supporting entity);

THAT we support the concept of wastewater regionalization for the Walnut Creek watershed and that this resolution of support shall be forwarded to the Texas Water Development Board, prior to or concurrent with, the final study report being submitted to the TWDB due March 19, 1997. We also understand that this resolution is not supporting a particular method of regionalization but only supports the concept of regionalization itself.

This resolution was (approved)(disapproved) this 11th day of February, 1997  
by the following vote of its governing members.

**AYES**

(In favor of resolution)

James Johnson

Lloyd Sisk

Ray Smith

Jerry DeWeese

Michael Gilley

**NAYS**

(Opposed to resolution)

This vote is recorded as made this day.

ATTEST:

Michael Gilley  
Secretary/Treasurer  
Secretary/Treasurer  
(TITLE)

James Johnson  
(Mayor or Authorized Agent)  
President



**PARKER COUNTY**  
Weatherford, Texas 76086

March 10, 1997

**TO:** Texas Legislature  
**FROM:** The Parker County Commissioners Court  
**RE:** The Parker County Utility District # 1

---

Parker County is one of the fastest growing counties in Texas. Subdivisions are rapidly covering major areas of Parker County, especially the undeveloped land.

We have an urgent need to develop a Parker County Regional Utility District to provide wastewater.


The creation of a Regional Utility District in Parker County would make possible the building, operating and maintaining facilities necessary for the treatment and transportation of wastewater. This would also protect, preserve and restore purity and sanitary conditions to both surface and groundwater in the County.

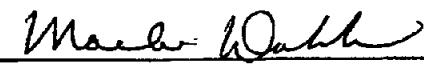
With the creation of the Parker County Utility District, we will have a mechanism that will provide an orderly basis for the treatment of wastewater, and solid waste, as well as the utility needs of its service area.

The Parker County Commissioners Court recognizes the need for such a district to be created at this time. The creation of this district would benefit all the citizens of Parker County, therefore we add our support to this effort.

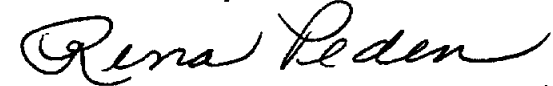
**IT IS THEREFORE ADOPTED, ORDERED and ENTERED** into the minutes of  
Commissioners Court this 10th day of **MARCH, 1997.**

  
\_\_\_\_\_  
**BEN LONG**  
**PARKER COUNTY JUDGE**

  
\_\_\_\_\_  
**DANNY CHOATE**  
**COMMISSIONER, PRECINCT # 1**

  
\_\_\_\_\_  
**MACK DOBBS**  
**COMMISSIONER, PRECINCT # 2**

  
\_\_\_\_\_  
**CHARLIE HORTON**  
**COMMISSIONER, PRECINCT # 3**

  
\_\_\_\_\_  
**RENA PEDEN**  
**COMMISSIONER, PRECINCT # 4**  
*VOTED "AYE" but left meeting before  
LETTER WAS signed.*

**ATTEST:**

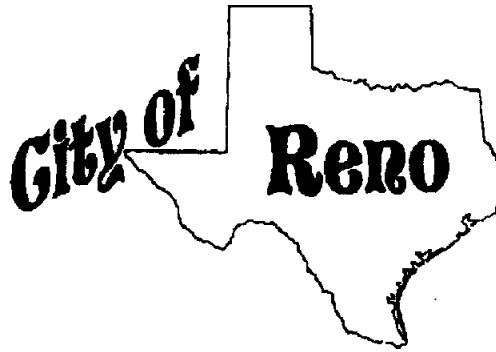
  
\_\_\_\_\_  
**JEANE BRUNSON**  
**COUNTY CLERK**



Mayor: Lloyd Bailey

Mayor Pro-Tem: Matt Sisk

Secretary: Regena Meeks



Council Members:

- Ed Braun
- Dale Carroll
- Kim McCann
- Ned Pugh

DATE: 2-24-97

TO: Lisa

FAX # 523-7139

NUMBER OF PAGES INCLUDING COVER SHEET: 3

FROM: REGENA

REMARKS Sorry - hope its not late

IF THERE ARE ANY QUESTIONS OR PROBLEMS WITH THIS TRANSMISSION  
PLEASE CALL: (817)221-2500 FAX # (817)221-3650

THANK YOU AND HAVE A NICE DAY!!!

---

174 W. Reno Rd. — Azle, Texas 76020 ♦ Phone (817) 221-2500 — Fax (817) 221-3650  
Office Hours: Monday through Friday — 8:00 a.m. to 5:00 p.m.

**A RESOLUTION SUPPORTING  
A REGIONAL WASTEWATER SYSTEM  
FOR THE WALNUT CREEK WATERSHED  
OF PARKER, WISE AND TARRANT COUNTIES  
OF TEXAS**

**WHEREAS, the Walnut Creek watershed flows into Eagle Mountain Lake and drains approximately 87.5 square miles of Parker, Wise and Tarrant Counties of Texas; and**

**WHEREAS, most of the watershed, save the Cities of Azle and Springtown, is not served by a collective wastewater collection and treatment system; and**

**WHEREAS, many septic systems within the watershed do not operate in a consistent and reliable manner; and**

**WHEREAS, a centralized system is necessary to serve increased growth in the area; and**

**WHEREAS, water quality and quantity in Eagle Mountain Lake is a concern to the local area; and**

**WHEREAS, the City of Springtown and Walnut Creek Special Utility District have matched funds from the Texas Water Development Board to study the feasibility of a regional wastewater system for the watershed and contiguous populated areas; and**

**WHEREAS, the draft report for such study has indicated a feasibility for wastewater regionalization in the watershed; and**

**WHEREAS, the undersigned entity has a vested interest in the water quality and quantity of the Walnut Creek watershed;**

NOW, THEREFORE BE IT RESOLVED, by City Council  
(governing body of entity)  
of City of Reno  
(supporting entity)

THAT we support the concept of wastewater regionalization for the Walnut Creek watershed and that this resolution of support shall be forwarded to the Texas Water Development Board, prior to or concurrent with, the final study report being submitted to the TWDB due March 19, 1997. We also understand that this resolution is not supporting a particular method of regionalization but only supports the concept of regionalization itself.

This resolution was (approved)(disapproved) this 3 day of February, 1997 by the following vote of its governing members.

AYES

(In favor of resolution)

Matt Sisk  
Ed Braun  
F.E. Pugh  
Dale Carroll  
\_\_\_\_\_  
\_\_\_\_\_  
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NAYS

(Opposed to resolution)

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This vote is recorded as made this day.

D.L. Bailey  
(Mayor or Authorized Agent)

ATTEST:

Regina Meeks  
City Secretary  
(TITLE)

TARRANT COUNTY WATER CONTROL AND IMPROVEMENT  
DISTRICT NUMBER ONE

800 East North Side Drive  
Fort Worth, Texas 76102-1097



James M. Oliver  
General Manager

BOARD OF DIRECTORS  
George W. Shannon, President  
Victor W. Henderson, Vice President  
Charles B. Campbell Jr., Secretary  
Hal S. Sparks III  
Brian C. Newby

Route 1, Box 1660  
Streetman, Texas 75859-9630  
Telephone 903-389-3928  
FAX 903-389-7587

RECEIVED FEB 24 1997

February 21, 1997

Teague Nall and Perkins  
Consulting Engineers  
915 Florence Street  
Fort Worth, Texas 76102  
Attn: J. Kelly Carta, P.E.

Re: Walnut Creek Regional Wastewater Study  
Springtown, Texas  
Project Number SPR96219

Dear Mr. Carta:

The Tarrant Regional Water District is in receipt of the draft report referenced above. We understand that the review period is short and a final report is due in the Texas Water Development Board office on March 19, 1997. Due to this short review time for the different alternatives, the District is requesting a 60 day extension to the review period to provide ample time for us to evaluate the impact of the various proposed scenarios on the water quality of Eagle Mountain Lake.

The District is fundamentally supportive of regionalization and has participated in several studies with the Texas Water Development Board near both Eagle Mountain and Cedar Creek Reservoirs in an attempt to develop plans for guiding regionalization of wastewater systems around those reservoirs. However, with the water quality modeling tools now available to the District, we would like to fully examine the potential impacts of each proposed scenario before a final report is issued.

The District hopes the 60 day review period extension can be granted. We look forward to hearing from you. Should you have any questions, please feel free to contact me at 903-389-3928.

Sincerely,

A handwritten signature in black ink, appearing to read "Woody Frossard". The signature is fluid and cursive, with a large loop at the end.

Woody Frossard  
Manager Environmental Services

cc: Bob Salinas, City of Springtown  
Mack Wood, Save Eagle Mountain Lake  
Gary Laneman, TWDB  
Carolyn Brittin, TWDB



RECEIVED FEB 25 1997

February 18, 1997

FEB 25 1997

J. Kelley Carta, P. E.  
Teague Nall and Perkins Consulting Engineers  
915 Florence Street  
Fort Worth, Texas 76102

**RE: Walnut Creek Regional Wastewater Study  
Springtown, Texas**

Dear Mr. Carta:

The subject draft report has been reviewed by staff of the Fort Worth Water Department. Following are our concerns and comments.

Fort Worth is not currently planning to provide wastewater service to Azle by 2006 or 2016, but service plans indicate that this is a possibility if mutually beneficial. Future plans did not include wastewater service to entities beyond Azle. A recent study by Alan Plummer Associates indicated that service to Azle would not be cost-effective in the immediate future. Also, when service to the Azle area is considered, prior facility plans recommended evaluating the use of a satellite treatment plant with high quality treatment and discharge into Lake Worth or Eagle Mountain Lake.

The report indicates that the proposed regional system would only be responsible for costs to get flow to the Fort Worth system at the Jenkins Heights lift station, and any improvements to downstream facilities would be considered a system cost. This is not necessarily a correct assumption. System improvements, including additional capacity at the treatment plant, would be included in negotiations for a new wholesale wastewater contract. System improvements, assuming pumping to the main Fort Worth system, could be substantial including upgrades to the lift station, parallel relief mains for wet weather flows and additional treatment units at the plant.

When considering all of the above factors, it is projected that a decision on providing wastewater service to Azle and areas beyond, as proposed in the study, could take some time. Before a recommendation could be made, several additional studies would be required.

**WATER DEPARTMENT  
ADMINISTRATION DIVISION**

THE CITY OF FORT WORTH ★ 1000 THROCKMORTON STREET ★ FORT WORTH, TEXAS 76102  
WALNUT CREEK BASIN REGIONAL WASTEWATER STUDY (PHASE 2) REPORT-MARCH 1997 - PAGE A13

Page 2

J. Kelley Carta, P. E.

February 18, 1997

Fort Worth agrees that regionalization would be beneficial for service to the area if shown to be cost-effective and environmentally sound. Timing has to be considered in the recommendation. Another factor that needs to be considered is the value of water as an additional raw water source. For purposes of the subject study, it would appear practical not to consider utilization of the Fort Worth system as a short-term solution. It may be appropriate to include service by Fort Worth as a possible long-term solution, and also a regional system that serves the Springtown/Azle area with discharge to Eagle Mountain Lake.

Please use this letter as our support for some type of regionalization to solve wastewater problems in the Springtown/Azle area.

Sincerely,



Lee C. Bradley, Jr.  
Director

JWS/sa

cc: James W. Scanlan, Regulatory/Environmental Coordinator  
Frank Crumb, Engineering Coordinator/Engineering Services

*Fort Worth  
Frank Crumb*

SPRINGTOWN/AZLE

REVIEW OF WALNUT CREEK REGIONAL WW STUDY

1. FORT WORTH IS NOT PLANNING TO SERVE AZLE BY 2006 OR 2016, BUT HAS A PLAN TO PROVIDE SERVICE IF NECESSARY OR MUTUALLY BENEFICIAL.
2. THE REPORT INDICATES THAT THE REGIONAL SYSTEM WOULD ONLY BE RESPONSIBLE FOR COSTS TO GET FLOW TO THE FORT WORTH SYSTEM AT JENKINS HEIGHTS LS. ONCE A WHOLESALE CONTRACT IS SIGNED, ANY IMPROVEMENTS TO DOWNSTREAM FACILITIES WILL BE CONSIDERED A SYSTEM COST, HOWEVER, IMPROVEMENTS DOWNSTREAM OF THE POINT OF ENTRY TO FW SYSTEM AND TO THE LIFT STATION WOULD PROBABLY BE PART OF THE NEGOTIATIONS OF A NEW WHOLESALE WASTEWATER CONTRACT.

-FW MASTER PLAN INDICATES THAT THE COLLECTION SYSTEM DOWNSTREAM OF THE JENKINS HEIGHTS LIFT STATION WILL REQUIRE A RELIEF MAIN BY 2010 TO CONVEY WET WEATHER FLOWS. A CURRENT UPDATE OF THE MASTER PLAN MAY REVISE THIS DATE.

JENKINS HEIGHTS CAPACITY HAS A CURRENT FIRM CAPACITY OF 1.8 MGD IS NOT SUFFICIENT FOR ADDITIONAL FLOW FROM WALNUT CREEK AT THE RATES INDICATED IN SCENARIO 4A-3.11 MGD DESIGN FLOW IN 2002 WHEN WALNUT CREEK IS MOTHBALLED.

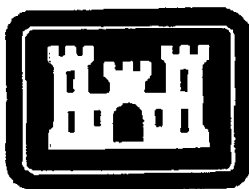
ACCORDING TO THE REPORT, FORT WORTH STAFF INDICATED THAT DOWNSTREAM SYSTEM IMPROVEMENTS TO ACCOMMODATE WALNUT CREEK FLOW WOULD BE PERFORMED IN A TIMELY MANNER ON PAGE 6.

BASED ON THE CURRENT LEVEL OF WORK AND EXPENSE DEDICATED TO THE WET WEATHER PROGRAM UNDER THE EPA ADMINISTRATIVE ORDER, FORT WORTH DOES NOT AGREE THAT THESE IMPROVEMENTS WOULD BE COMPLETED IN A TIMELY MANNER. ISSUES WOULD BE COST AND ULTIMATELY TREATMENT PLANT CAPACITY. VILLAGE CREEK HAS A LIMITED AREA TO EXPAND AND THE LAST PLANNED EXPANSION IS 17 MGD AND WE ARE CURRENTLY DOING A UPDATING STUDY TO GO TO 166 MGD. THEREFORE WE ARE LOOKING AT BUILDOUT OF 183MGD . CAPACITY UNTIL SOMETIME PAST 2020.

FORT WORTH PREFERS EFFLUENT TO BE UTILIZED AS WATER SUPPLY IF PROPER TREATMENT LIMITS AND OPERATIONS ARE PROVIDED. TO DISCHARGE THE EFFLUENT 40-50 MILES DOWNSTREAM WHERE REUSE IS LESS FEASIBLE MAKES NO SENSE WHEN FORT WORTH MAY BE CONSIDERING UPSTREAM TREATMENT FACILITIES TO RELIEVE VILLAGE CREEK IN THE FUTURE.

BEFORE THIS RECOMMENDATION COULD BE ADOPTED SEVERAL ADDITIONAL STUDIES WOULD BE REQUIRED AND BASED ON THE POLITICS OF THE SITUATION, IMPLEMENTATION SHOULD BE CONSIDERED ONLY AS A LONG TERM SOLUTION.





**US Army Engineer Waterways Experiment Station  
Lewisville Aquatic Ecosystem Research Facility  
RR#3 Box 446 #1 Fish Hatchery Road  
Lewisville, Texas 75056-9720  
ph. (972) 436-2215 FAX (972) 436-1402**

---

## **FAX COVER PAGE**

**DATE:** 6 Mar 97

**SEND TO:** Kelly Carta  
**FAX #:** (817) 336-2813  
**VOICE #:**

**FROM:** Chetta S. Owens  
Lewisville Aquatic Ecosystem Research Facility  
RR#3 Box 446 #1 Fish Hatchery Road  
Lewisville, TX 75056-9720  
(972) 436-2215 FAX (972) 436-1402

**# OF PAGES TO FOLLOW:**

**Memo:**



**Lewisville Aquatic Ecosystem Research  
Facility  
RR3, Box 446  
Lewisville, Texas 75056  
(972) 436-2215**

---

Mr. Gary Laneman  
Texas Water Development Board  
1700 North Congress Avenue  
Austin, Texas  
78711-3231

Feb. 21, 1997

RE: Walnut Creek Regional  
Wastewater Study  
Springtown, Texas  
Proj. No. SPR96219

Dear Mr. Laneman,

This letter is in support of the wastewater regionalization for the Walnut Creek watershed to be submitted to the TWDB on March 19, 1997. TNRCC and the EPA, Region 6 are currently developing a statewide watershed approach to managing the aquatic systems of Texas. The regionalization of the Walnut Creek watershed would conform to the current ideas being considered for the state of Texas.

Thank you for your time.

Sincerely,

A handwritten signature in cursive script that reads "Chetta Owens".

Chetta Owens  
Research Biologist  
LAERF  
RR 3, Box 446  
Lewisville, Texas  
75056  
(972)436-2215



## SAVE EAGLE MOUNTAIN LAKE, INC.

316 BAILEY AVENUE, SUITE 103 • FORT WORTH, TEXAS 76107 • (817) 332-7283

RECEIVED FEB 25 1997

February 24, 1997

J. Kelly Carta, P.E.  
Teague Nall & Perkins  
915 Florence Street  
Fort Worth, TX 76102

RE: Walnut Creek Wastewater Study  
Springtown, TX  
Proj. No. SPR96219

Dear Mr. Carta:

Save Eagle Mountain Lake, Inc. endorses the regional wastewater treatment system concept as long as it does not conflict with the Resolution adopted by the Texas Water Commission on January 22, 1986 (See attached).

However, proposals in the draft of the Walnut Creek Regional Wastewater Study have not addressed water quality impacts to Eagle Mountain Lake, both short and long term. These studies must be done before we can make an educated judgement about which scenario is best for the Lake.

We request that any wastewater treatment plan developed will ensure compliance with 5 mg/l BOD5, 5 mg/l TSS, 2mg/l total N, 1 mg/l total P permit requirements, as specified in the draft report.

THIS LETTER WAS APPROVED BY THE SAVE EAGLE MOUNTAIN LAKE, INC. BOARD OF DIRECTORS BY A VOTE OF 16 TO 0 IN A TELEPHONE VOTE CONDUCTED ON FEBRUARY 21 AND 24, 1997.

Sincerely,

Mack W. Wood  
President, Save Eagle Mountain Lake, Inc.

cc: Texas Water Development Board

**President**

Mack W. Wood

**1st Vice President**

Betsy Schaffer

**2nd Vice President**

Carl C. Wilson

**Secretary**

Cheryl Anderson

**Treasurer**

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Betsy Schaffer  
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Mack W. Wood  
Penny H. Yost

**Legal Counsel**

Wynette Parchman

**Executive Director**

Izzy D. Knesnik

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Gilmore Lauderdale - 1987  
Guy Rogers, Jr. - 1988  
Carl C. Wilson - 1989-1990  
Robert G. Bonham - 1991  
Wynette Parchman - 1992-1993  
Reed Pigman, Jr. - 1994-1995

02/05/87 11:58 TTS12 338 4444  
02/05/87 10:00 0122380806

TNRCC-Watershed  
TNRCC LEGAL

0004  
002

# TEXAS WATER COMMISSION



## RESOLUTION

WHEREAS, Eagle Mountain Lake serves as a primary source of drinking water and valuable recreational resource for numerous residents of the Tarrant County area; and

WHEREAS, increasing urban development in the Eagle Mountain Lake watershed has resulted in an increasing number of applications for permits to discharge waste into Eagle Mountain Lake; and

WHEREAS, the Texas Water Commission has received numerous letters from individual residents, citizen groups, governmental bodies, and elected officials regarding their concern for protecting the water quality of Eagle Mountain Lake; and

WHEREAS, Speaker Gid Lewis, Senator Hugh Parnier, the City Council of Fort Worth, the Commissioners Court of Tarrant County, the Save Eagle Mountain Lake citizen's association, and the lake authority, Tarrant County Water Control and Improvement District No. 1, have all requested a halt to the approval of permit requests to discharge wastewater effluent into Eagle Mountain Lake until a water quality study has been performed on the lake; and

WHEREAS, the Tarrant County Water Control and Improvement District No. 1 and the Save Eagle Mountain Lake Association have committed to participate with the Commission in a short-term water quality study of Eagle Mountain Lake; and

WHEREAS, the Texas Water Commission is fully committed to protecting the quality of Eagle Mountain Lake and all of our State's water resources.

NOW, THEREFORE, BE IT RESOLVED BY THE TEXAS WATER COMMISSION that the Commission immediately suspend the processing of new applications for new permits for waste discharge into Eagle Mountain Lake and its tributaries within one mile of the lake, pending completion of appropriate water quality studies, in order to assist the Commission in its water quality permitting responsibilities. It is the intention of the Commission that this suspension not apply to pending applications or applications for amendment or renewal of existing waste discharge permits.

Signed this 22nd day of January, 1986.

TEXAS WATER COMMISSION

*Paul H. Roberts*  
PAUL ROBERTS, Chairman

*Ralph Downing*  
Ralph Downing, Commissioner

*John D. Houchins*  
John D. Houchins, Commissioner

ATTEST:

*Mary Kay Harman*  
Mary Kay Harman, Chief Clerk



**TNRCC**

Protecting Texas  
by Reducing and  
Preventing Pollution

# FAX TRANSMITTAL

DATE: February 5, 1997 NUMBER OF PAGES (including this cover sheet): 3

TO: Name Kelly Carta  
 Organization Teague, Nall, Perkins  
 FAX Number 817 336-2813

FROM: TEXAS NATURAL RESOURCE CONSERVATION COMMISSION  
 Name Clyde E. Bohmfalk  
 Division/Region WPA  
 Telephone Number 512 239-1315  
 FAX Number 512 239-4410

**NOTES:**  
Kelly:

I am concerned that I may have given you some erroneous information recently. When we talked about the moratorium for wastewater discharges to Eagle Mountain Lake, I told you I could not find anything about it. As it turns out, I should have looked a little harder. Please accept my apology for giving you the wrong information. I hope this does not create a significant nor long lasting inconvenience for you. I know it can be frustrating trying to get information from us and it does not help matters when you are given the wrong information. This has also been sent to Woody Frousard at Tarrant Regional Water District. He and I have discussed this on the phone.

To follow up on our recent telephone conversation, I am sending you copies of the letter I received from Save Eagle Mountain and the resolution adopted by the Texas Water Commission in 1986. As far as I have been able to determine so far, no one can say that the "studies" were ever finalized nor is there any evidence that this resolution has been rescinded or repealed or whatever is needed to get it off the books. Soooooo, apparently it is still in effect. I do not know the procedure, but I assume it could be repealed by petitioning the TNRCC commissioners.

The resolution was provided to me by our Legal Division and you may want to contact Ms. Margaret Hoffman, an attorney in that division at (512)239-0600 or Mr. Tom Weber, Acting Director of the Agriculture and Watershed Management Division at (512) 239-1072.

Post-it® Fax Note	7671	Date	<u>2/5/97</u>	# of pages	<u>3</u>
To	<u>Bob Salinas</u>	From	<u>Kelly Carta</u>	Co.	
Co./Dept.	<u>City of Springtown</u>	Phone #		Fax #	
Phone #		Fax #	<u>817-523-3179</u>		



## SAVE EAGLE MOUNTAIN LAKE, INC.

316 BAILEY AVENUE, SUITE 103 · FORT WORTH, TEXAS 76107 · (817) 332-7283

January 20, 1997

**President**

Mack W. Wood

**1st Vice President**

Neil Kretzer

**2nd Vice President**

Carl C. Wilson

**Secretary**

Jamie McNeill

**Treasurer**

Steven B. McKeever

**Directors**

- Cheryl Anderson
- Dorcas E. Boerner
- Mark Bronson
- Dee Cvetko
- Sharon Davis
- Sue Horvison
- Randall Kressler
- Neil Kretzer
- Steven B. McKeever
- Jamie McNeill
- Duke Palmer
- Reed Piggman, Jr.
- Betsy Schaffer
- Carl C. Wilson
- Mack W. Wood
- Penny H. Yost

**Legal Counsel**

Wynette Parchman

**Executive Director**

Ilze D. Knesnik

**Past Presidents**

- Hal Sparks - 1985-1986
- Gilmore Lauderdale - 1987
- Guy Rogers, Jr. - 1988
- Carl C. Wilson - 1989-1990
- Robert G. Bonham - 1991
- Wynette Parchman - 1992-1993
- Reed Piggman, Jr. - 1994-1995

Mr. Clyde Baumfauk  
TNRCC  
P.O. Box 13087  
Austin, TX 78711

Dear Mr. Baumfauk:

One of our Board members, Betsy Schaffer, has asked that I write to you regarding the status of the moratorium for no further sewage treatment plants on Eagle Mountain Lake in Fort Worth, Texas. It is my understanding that this moratorium was established in 1986.

Any information that you could provide regarding this matter would be most appreciated. Thank you for your assistance.

Sincerely,

Ilze D. Knesnik  
Executive Director

# TEXAS WATER COMMISSION



## RESOLUTION

WHEREAS, Eagle Mountain Lake serves as a primary source of drinking water and valuable recreational resource for numerous residents of the Tarrant County area; and

WHEREAS, increasing urban development in the Eagle Mountain Lake watershed has resulted in an increasing number of applications for permits to discharge waste into Eagle Mountain Lake; and

WHEREAS, the Texas Water Commission has received numerous letters from individual residents, citizen groups, governmental bodies, and elected officials regarding their concern for protecting the water quality of Eagle Mountain Lake; and

WHEREAS, Speaker Gib Lewis, Senator Hugh Parnor, the City Council of Fort Worth, the Commissioners Court of Tarrant County, the Save Eagle Mountain Lake citizen's association, and the lake authority, Tarrant County Water Control and Improvement District No. 1, have all requested a halt to the approval of permit requests to discharge wastewater effluent into Eagle Mountain Lake until a water quality study has been performed on the lake; and

WHEREAS, the Tarrant County Water Control and Improvement District No. 1 and the Save Eagle Mountain Lake Association have committed to participate with the Commission in a short-term water quality study of Eagle Mountain Lake; and

WHEREAS, the Texas Water Commission is fully committed to protecting the quality of Eagle Mountain Lake and all of our State's water resources.

NOW, THEREFORE, BE IT RESOLVED BY THE TEXAS WATER COMMISSION that the Commission immediately suspend the processing of new applications for new permits for waste discharge into Eagle Mountain Lake and its tributaries within one mile of the lake, pending completion of appropriate water quality studies, in order to assist the Commission in its water quality permitting responsibilities. It is the intention of the Commission that this suspension not apply to pending applications or applications for amendment or renewal of existing waste discharge permits.

Signed this 22nd day of January, 1986.

TEXAS WATER COMMISSION

*Paul Hopkins*  
Paul Hopkins, Chairman

*Ralph Downing*  
Ralph Downing, Commissioner

*Julia D. Hutchins*  
Julia D. Hutchins, Commissioner

ATTEST:

*May Ann Meyer*  
May Ann Meyer, Chief Clerk

Barry R. McBee, *Chairman*  
R. B. "Ralph" Marquez, *Commissioner*  
John M. Baker, *Commissioner*  
Dan Pearson, *Executive Director*



## TEXAS NATURAL RESOURCE CONSERVATION COMMISSION

*Protecting Texas by Reducing and Preventing Pollution*

February 10, 1997

Ms. Ilze D. Knesnik  
Executive Director  
Save Eagle Mountain Lake, Inc.  
316 Bailey Avenue, Suite 103  
Fort Worth, Texas 76107

Re: Eagle Mountain Lake

Dear Ms. Knesnik:

Enclosed please find a copy of a resolution adopted by the Texas Water Commission on January 22, 1986 which "suspends the processing of new applications for new permits for waste discharge into Eagle Mountain Lake and its tributaries within one mile of the lake...." This document was provided to me by Ms. Margaret Hoffman, an attorney in the Texas Natural Resource Conservation Commission Legal Division. It is my understanding that studies have been undertaken, but it is not clear that all of the issues which prompted this resolution have been resolved. It does not appear that any action has ever been taken by the Texas Water Commission or the Texas Natural Resource Conservation Commission to rescind this resolution.

Additional questions on this issue may be directed to Ms. Hoffman at (512) 239-0600 or to Mr. Tom Weber, Acting Director of the Agriculture and Watershed Management Division, at (512) 239-1072.

Sincerely,

A handwritten signature in black ink, appearing to read "Randall B. Wilburn".

Randall B. Wilburn, Director  
Water Planning and Assessment Division

cc: Woody Frousard  
Tarrent Regional Water District

RBW/cb



FRED CAUBLE OF CAUBLE HOSKINS ARCHITECTS MET WITH THE PARKER COUNTY COMMISSIONERS COURT DURING THEIR REGULAR MEETING MONDAY MORNING TO DISCUSS RENOVATION OF THE OLD POST OFFICE BUILDING FOR USE AS A COURTS BUILDING. ALSO PRESENT WERE 43RD DISTRICT JUDGE JIM MULLIN, DISTRICT ATTORNEY DON SCHNEBLEY AND DISTRICT CLERK LANA TIBBITS. CAUBLE PRESENTED A FEASIBILITY STUDY ON THE PROJECT AND SAID THAT THE COURT NOW NEEDS TO DECIDE WHAT - AND HOW MANY - COURTS WILL BE LOCATED IN THE FACILITY. MULLIN SUGGESTED THAT THERE BE ONLY ONE ENTRANCE FOR SECURITY REASONS. CAUBLE SAID, HOWEVER, THAT TWO ENTRANCES WOULD BE NECESSARY DUE TO FIRE REGULATIONS. OTHER CONCERNS DISCUSSED WERE HANDICAP ACCESS INTO AND THROUGHOUT THE BUILDING, EXTRA ROOM NEEDED FOR JURY SELECTION IN CASE OF CAPITAL TRIALS, LOCATION OF BATHROOMS, AND HOW TO ELIMINATE CONTACT BETWEEN PRISONERS AND THE PUBLIC. CAUBLE SAID THAT BEFORE HE CAN SHOW DETAILED PLANS, A DECISION WILL HAVE TO BE MADE ABOUT HOW MANY AND WHAT KIND OF COURTS WILL BE NEEDED. THE COURT THEN WENT INTO EXECUTIVE SESSION FOR MORE THAN AN HOUR TO DISCUSS CONTEMPLATED LITIGATION WITH THE PARKER COUNTY HOSPITAL DISTRICT OVER THE PAYMENT OF MEDICAL BILLS FOR INMATES OF THE COUNTY JAIL. AFTER THE SESSION, THE COURT VOTED TO HAVE ATTORNEY ROBERT T. BASS SEEK AN EARLY RESOLUTION TO THE PROBLEM AND REPORT BACK TO THE COURT IN THREE WEEKS. BROOKES WORTHINGTON PRESENTED THE COURT WITH A REQUEST TO PLACE A LIFE-SIZED STATUE OF A HORSE AND RIDER ON CITY OR COUNTY PROPERTY TO RECOGNIZE THE ROLL OF THE CUTTING HORSE INDUSTRY IN THIS AREA. HE SAID THE NATIONAL CUTTING HORSE ASSOCIATION HAS NAMED PARKER COUNTY THE CUTTING HORSE CAPITAL OF THE U.S. WORTHINGTON SAID THE FIRST PRESIDENT OF THE NCHA WAS RAY SMITH FROM PARKER COUNTY. POSSIBLE LOCATIONS DISCUSSED WERE THE COURTHOUSE SQUARE, THE COURTHOUSE ANNEX AND THE CHAMBER OF COMMERCE. THE COURT VOTED TO TABLE THE REQUEST FOR TWO WEEKS. THE COURT ALSO EXPRESSED SUPPORT FOR THE CREATION OF THE PARKER COUNTY UTILITY DISTRICT NUMBER ONE AS REQUESTED BY TOM GENTRY AND BOB SALINIS OF SPRINGTOWN. A RESOLUTION APPROVED BY THE COURT STATED "THE CREATION OF THIS DISTRICT WOULD BENEFIT ALL THE CITIZENS OF PARKER COUNTY, THEREFORE WE ADD OUR SUPPORT TO THIS EFFORT."

# TEXAS WATER COMMISSION



## RESOLUTION

WHEREAS, Eagle Mountain Lake serves as a primary source of drinking water and valuable recreational resource for numerous residents of the Tarrant County area; and

WHEREAS, increasing urban development in the Eagle Mountain Lake watershed has resulted in an increasing number of applications for permits to discharge waste into Eagle Mountain Lake; and

WHEREAS, the Texas Water Commission has received numerous letters from individual residents, citizen groups, governmental bodies, and elected officials regarding their concern for protecting the water quality of Eagle Mountain Lake; and

WHEREAS, Speaker Gib Lewis, Senator Hugh Parmer, the City Council of Fort Worth, the Commissioners Court of Tarrant County, the Save Eagle Mountain Lake citizen's association, and the lake authority, Tarrant County Water Control and Improvement District No. 1, have all requested a halt to the approval of permit requests to discharge wastewater effluent into Eagle Mountain Lake until a water quality study has been performed on the lake; and

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Signed this 22nd day of January, 1986.

TEXAS WATER COMMISSION

*Paul Hopkins*  
Paul Hopkins, Chairman

*Ralph Downing*  
Ralph Downing, Commissioner

*John D. Touchins*  
John D. Touchins, Commissioner

ATTEST:

*May Ann Skye*



## SAVE EAGLE MOUNTAIN LAKE, INC.

316 BAILEY AVENUE, SUITE 103 • FORT WORTH, TEXAS 76107 • (817) 332-7283

**President**

Mack W. Wood

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Wynette Parchman

**Executive Director**

Ilze D. Knesnik

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Guy Rogers, Jr. - 1988  
Carl C. Wilson - 1989-1990  
Robert G. Bonham - 1991  
Wynette Parchman - 1992-1993  
Reed Pigman, Jr. - 1994-1995

January 20, 1997

Mr. Clyde Baumfauk  
TNRCC  
P.O. Box 13087  
Austin, TX 78711

Dear Mr. Baumfauk:

One of our Board members, Betsy Schaffer, has asked that I write to you regarding the status of the moratorium for no further sewage treatment plants on Eagle Mountain Lake in Fort Worth, Texas. It is my understanding that this moratorium was established in 1986.

Any information that you could provide regarding this matter would be most appreciated. Thank you for your assistance.

Sincerely,

Ilze D. Knesnik  
Executive Director



**TRANSMISSION FORM**

DATE: 3/13/97  
 TIME: 8:30  
 JOB NO.: 96-162

TO: Kelly Carter  
 COMPANY: Trague, Hall and Perkins  
 ADDRESS: \_\_\_\_\_  
 CITY: FW STATE: \_\_\_\_\_ PHONE: 336-5773  
 FAX: 536-2313

FROM: Louetta Mckay  
 841 WEST MITCHELL STREET • ARLINGTON, TEXAS 76013-2506  
 PHONE 817-461-1491 • FAX 817-860-3339

**COMMENTS:**

NO. PGS. 11  
 (INCLUDING COVER)

*Here are my comments re: City of Springtown draft report. Hope they are some help.*

*Sorry for the delay. I just got the report back from Mark late yesterday.*

and particulars of this special district on behalf of the study participants. Mr. Salinas noted that the district could eventually serve a total of 25,000-30,000 people. Kelly Carda, Consulting Engineer was also present and explained different scenarios of ways to look at wastewater treatment.

The group discussed what cities were in favor of the special district and contracting arrangements. Regionalization of wastewater treatment was also discussed. The new authority will continue to talk with other entities concerning further regionalization. An alternate is to have each entity enter into contracts and agreements. Clyde Bohmfalk, TNRCC, was asked for an opinion. Mr. Bohmfalk indicated the best and most preferable way is for the TNRCC to deal with one entity. It was requested that the WRC give a non-binding letter of support that the regional approach is the preferred method for wastewater treatment.

Chuck Owen made a motion to prepare a letter of support indicating that the regional approach is a desirable arrangement for wastewater service in this area. The motion was seconded by Ken Reneau and unanimously voted.

4. **Senate Bill 1 Discussion.** It was noted by staff the Senate Bill 1 is still being changed. Sam Brush will check on the newest bill and report to the committee.

#### REVIEW ITEMS

5. **Texas Review and Comment System.** One item was considered by the Council. The City of Lipan has submitted a preapplication for funding from the USDA Rural Development program to upgrade its water system. Lipan gets its drinking water from wells, and until recently had an agreement with Santo WSC to furnish water when the Lipan system was inadequate. Cancellation of the Santo WSC agreement left the Lipan system with insufficient capacity, and there are also other system elements that require upgrading to meet state requirements. Lipan proposes to construct a new well, and make the necessary improvements to its storage system and distribution lines. Sam Brush spoke with the consultant about surface water options, and the consultant indicated that a line to the Brazos River Authority plant had been considered. Even with estimated costs of \$10.00 per foot of line, that option was considered infeasible because of cost. Lipan would also have to negotiate a contract for the water with the Authority.

Upon motion by Tom Taylor, seconded by Greg Dickens, the WRC unanimously voted to move forward with a favorable comment.

#### INFORMATION ITEMS

6. **Status Report on Regional Storm Water Program Progress.** Due to time constraints, other topics will be discussed at a future meeting.
7. **NCTCOG External Survey.** The Water Resources Committee members were reminded to return the survey if they had not already done so.
8. **NCTCOG Programs and Environmental Activities.** Due to time constraints, other topics will be discussed at a future meeting.

- 03/13/97 10:23 10:23 10:23 10:23
9. **Schedule for Next Meeting of the Water Resources Council.** The next meeting of the WRC is scheduled for 10:00 a.m., Thursday, March 13, 1997 at the NCTCOG offices.

This meeting summary was approved by the Water Resources Council on Thursday, March 13, 1997.



Samuel W. Brush  
Manager, Environmental Systems

r:\adcom\wiggins\wrc\wmin9702.doc

---

Phone (817) 677-3008  
Fax (817) 677-3008


January 27, 1997

Mayor Tom Gentry  
City of Springtown

Dear Tom,

After attending the Walnut Creek Wastewater Study discussion last week, I've talked over the subject with various members of the City Council. To go to the point, we wholeheartedly support the concept of a regional approach to the problem as outlined in the recommendation contained in the study draft. It is obvious that such an approach constitutes the most effective method of dealing with the problem itself as well as ensuring that our environment is properly protected and the area population is properly served. From what was said at the meeting, it appears that the best approach is to pursue the idea of a regional plant at Azle.

If we can help in the next step of establishing a district, please let me know.  
Also thanks for the hospitality we always receive in your city.

  
Floyd E. Galloway, Mayor

*Faxed 27 Jan 1710  
A*

## **APPENDIX B - MAJOR CHANGES SINCE DRAFT REPORT**

The following are a list of main changes in this document since the submittal of the draft report. Most of these changes are due to comments received during the review period.

1. The City of Fort Worth has indicated that they will not be able to serve the area in a timely manner and would likely require upgrades all the way to, and including, the Village Creek Treatment Plant east of Fort Worth. The City would prefer that flow be allowed to return to Eagle Mountain Lake in order to be reused for water supply sources. Tarrant Regional Water District also expressed a desire to have flows returned to the lake
2. It appears that the City of Azle is in favor of regionalization and use of their plants for a regional treatment, but probably do not want to be a member of a new district. An additional scenario was added to allow for the district contracting with Azle for treatment. This is essentially the same as scenario 3 from a collection standpoint, but the cost per customer changes since Azle would not be a part of the district and costs would not be leveled across the Azle, Pelican Bay and (possibly) Sanctuary populations.
3. All scenarios were divided into two options. One based on serving the the whole watershed and one for sizing facilities to serve current "population centers" only.
4. Some minor changes were made in population distributions for some subareas.
5. Additional appendices have been added to reflect the history of the study to date.



## APPENDIX C - MEETINGS, NOTES AND HANDOUTS

Below is a list of the major meetings associated with this study. These meetings were either open public meetings or major update meetings for governing bodies of some study participants. Many other smaller meetings and contacts took place among individual or small groups of players which are not recorded here.

### MEETING (10/29/96) - FIRST PUBLIC MEETING (ORGANIZATION AND SCOPE)

- PUBLIC NOTICE
- NOTIFICATION LETTER
- AGENDA
- MEETING HANDOUT
- MEETING MINUTES/NOTES

### MEETING (11/21/96) - CONSTRUCTED WETLANDS FIELD TRIP

(Sponsored by Tarrant Regional Water District and APAI)

- NOTIFICATION LETTER

### MEETING (12/19/96) - SECOND PUBLIC MEETING, PRELIMINARY FINDINGS

- NOTIFICATION LETTER AND PRELIMINARY FINDINGS

(Technical data not included due to bulk and being superceded by final report.)

- MEETING MINUTES/NOTES

### MEETING (1/9/97) - SAVE EAGLE MOUNTAIN LAKE UPDATE MEETING

- MEETING MINUTES/NOTES

### MEETING (1/23/97) - THIRD PUBLIC MEETING, DRAFT FINAL REPORT

- NOTIFICATION LETTER
- MEETING HANDOUTS
- MEETING MINUTES/NOTES

### MEETING (1/11/97) - WALNUT CREEK S.U.D. UPDATE MEETING

- MEETING HANDOUTS

### MEETING (2/13/97) - NCTCOG WATER RESOURCES COUNCIL

- AGENDA



# CITY OF SPRINGTOWN

Thomas Gentry, Mayor  
Don McBryde, Place 1  
Al Swan, Place 2

Bob Salinas  
City Administrator

Clarage "Doc" Dockery, Place 3  
Robert Wilson, Place 4  
Carl Moore, Place 5

## NOTICE OF PUBLIC MEETING

Notice is hereby given that on October 29, 1996 at 7:00 P.M. the City of Springtown will hold a Public Meeting, to be located at 102 E. Second Street, Springtown, Texas.

The purpose of this meeting is to receive input to develop a Scope of Service for the Engineering Study from the Texas Water Development Board for a Regional Wastewater Study of the Walnut Creek Basin. The study is from the Research and Planning Funds, not to exceed \$30,000.00.

I, Cindy Hall, City Secretary, do hereby certify that said notice of the above named meeting was posted on the bulletin board of the City Hall of the City of Springtown, Texas, a place readily accessible to the public at all times, on this the 25th day of October, 1996 at ~~10:35 AM~~ and remained continuously posted for at least 72 hours immediately preceding said meeting and that said meeting was posted in accordance with Chapter 551, Texas Government Code.



Cindy Hall, City Secretary

This facility is wheelchair accessible. Handicapped parking spaces are available. Request for sign interpretative services must be made 48 hours ahead of meeting. To make arrangements, call 817-523-4834.



# CITY OF SPRINGTOWN

Thomas Gentry, Mayor  
Don McBryde, Place 1  
Al Swan, Place 2

Bob Salinas  
City Administrator

Clarage "Doc" Dockery, Place 3  
Robert Wilson, Place 4  
Carl Moore, Place 5

Date 10 / 28 / 1996

Number of Pages 4 INCLUDING COVER

**TO:**  
KELLY CARTA  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**FROM:**  
CINDY HALL  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## REMARKS:

THIS LETTER WAS SENT TO THE FOLLOWING PERSON(S).

1. SAVE EAGLE MT. LAKE, INC.
2. DON SANDS, COMMUNITY LEADER, AZLE
3. CHEYTA OWENS, LEWSVILLE AQUATIC ECOSYSTEM
4. LES KEEBLE, COMMUNITY LEADER, TANGLEWOOD ADD.
5. WISE CO. WATER IMP. #1
6. TARRANT CO. WATER #1
7. CITY OF AZLE
8. HARRELL WALKER, CITY OF LAJUNTA
9. CITY OF SANITARY
10. CITY OF RENO
11. WISE CO. JUDGE
12. PARKER CO. JUDGE
13. WALNUT CREEK (SUD)
14. LORETTA MORKY
15. TNRCC
16. TX. WATER DEV. BOARD

**CITY OF SPRINGTOWN**

Thomas Gentry, *Mayor*  
Don McBryde, *Place 1*  
Al Swan, *Place 2*

Bob Salinas  
*City Administrator*

Clarage "Doc" Dockery, *Place 3*  
Robert Wilson, *Place 4*  
Carl Moore, *Place 5*

October 14, 1996

Save Eagle Mountain Lake, Inc.  
Ms. Ilse Knesnik  
316 Bailey Avenue, Suite 103  
Fort Worth, Texas 76107

RE: Regional Wastewater Study - Scope of Service Meeting

Dear Ms. Knesnik:

On September 19, 1996, the Texas Water Development Board approved funding for a regional wastewater study for the Walnut Creek Drainage Basin.

The study is from the Research and Planning Funds, not exceeding \$30,000.00. Throughout this application process your City or organization has demonstrated an interest in this study.

A meeting has been scheduled for Tuesday, October 29, 1996 at 7:00 P.M. in Springtown, City Hall, located at 102 E. Second Street. The purpose is to receive input to develop a Scope of Service for this engineering study.

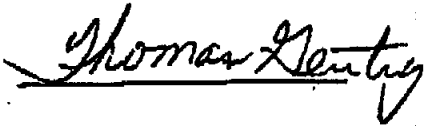
Your input is essential for this study. If you or your representative cannot attend this meeting, your written comments are welcomed. Either way, please contact Cindy Hall, City Secretary at metro (817) 220-2006 to confirm your intentions.

**CADY**

Scope of Service...Cont..Page 2

I look forward to meeting with you on this vital study.

Sincerely,



Thomas Gentry  
Mayor

TG/ch

**REGIONAL SEWER STUDY  
WALNUT CREEK WATERSHED  
PARKER, WISE AND TARRANT COUNTIES  
OF TEXAS**

**SPONSORED BY THE  
CITY OF SPRINGTOWN  
AND THE  
WALNUT CREEK SPECIAL UTILITY DISTRICT  
WITH GRANT FUNDING FROM THE  
TEXAS WATER DEVELOPMENT BOARD (TWDB)**

## **I. WHY ARE WE HERE TONIGHT?**

- 1.) Learn more about the study effort.
- 2.) Learn more about the watershed.
- 3.) Learn more about each other.
- 4.) Encourage cooperation and unity in the study effort.

A great deal of information is already known about the watershed. Elements of topographic information, demographics, water use projections, prior studies, known problems, etc. have already been identified and collected. However, each group maintains its own data on population, useage, land use, future plans and projections which may be more accurate or better suited than the information gathered. The collection of all this information at the beginning of the study will help increase the accuracy of the results and will benefit all those involved in the future construction and collection efforts which may result from this study.

## **II. PURPOSE**

This study was originated by the City of Springtown due to:

- 1.) Past and Current Concerns with existing sewer treatment facilities.
- 2.) Recent Growth in the Area
- 3.) Expectation of even greater development in the area over the next few years.

## **III. SPRINGTOWN**

Springtown is located in northern Parker County at the crossroads of Highway 199 and F.M. 51. The city currently has a population of between 1800 and 2200 residents. Springtown is an established general law city responsible for both water and sewer to its citizens. For years, it has been a farming and ranching community, but due to its proximity to the Metroplex, is starting to become a bedroom community for Tarrant County industry.

## **IV. CITY SERVICES**

Springtown is located within the upper third of the Walnut Creek watershed and is the most upstream major community in the watershed. Once dependent on wells, most of Springtown's water is now purchased from the Tarrant County Water Control and Improvement District Number 1, pumped from Eagle Mountain Lake and treated at city owned facilities. Likewise, the city sewer collection system takes sewer to a city owned plant on Walnut Creek, treats it and releases it into the creek.

## **V. EXISTING SPRINGTOWN SEWER TREATMENT**

Springtown moved and upgraded their sewer treatment plant in the early 1980's. At the

time, it was anticipated that the new plant would be able to serve the city's needs and expansion for the foreseeable future. (Increased federal environmental regulation and problems with the plant caused the treatment to less than satisfactory in the early 1990's). By the end of 1993, Springtown's plant was reported to be operating at 75% of its design capacity. Since that time, efforts have been underway to upgrade the plant, reduce infiltration and inflow and look at the need toward expansion or replacement.

## **VI. SEWER EXPANSION LOCATIONS**

When Springtown began to look at the possibility of having to build a new plant, the question was asked as to where would be the optimum location to provide for expansion of services during the next 20-30 years. The main options were to build a larger plant on the existing site, or to build further downstream to serve more customers.

## **VII. SPRINGTOWN'S NEIGHBORS**

Only about two potential sites exist downstream of the present site before encountering Springtown's neighbors to the east. First encountered is Reno, a city covering a large land area which purchases its water from Springtown and depends on septic tanks for sewerage. Small communities like La Junta, Sanctuary and Briar adjoin Reno. Likewise, these communities do not offer sewer service, and depend on purchased treated water or private wells for water supply. To the east of Reno is Azle. Azle is located along the western shores of Eagle Mountain Lake and provides its citizens with both water and sewer service.

## **VIII. AREA GROWTH**

During the past few years, the Walnut Creek watershed has experienced steady, and fairly rapid, growth. Past population spikes have been attributed to oil and gas production in the area and the recreational aspects of Eagle Mountain Lake. However, urban sprawl is starting to push Fort Worth against Azle and improvement of Highway 199 to a four lane divided roadway is starting to entice industry and residences westward. Active growth in the northern part of Fort Worth due to Alliance Airport and associated industries is also impacting the area.

## **IX. REGIONAL APPROACH**

As Springtown began to look at their sewer situation in preparation for the 1996-1997 fiscal year, it became evident that a regional approach to sewer might be more cost effective for Springtown and its neighbors than for each to continue pursuing their own solution to the problem. Of course the regional approach is only one possibility, but one worthy of study. The Texas Water Development Board (TWDB) published a notice in May 1996 for requests of funding for regional water and/or sewer studies. Springtown applied for such a grant and was approved. The grant is a 50-50 matching grant totaling \$30,000 to look at possible regional sewer solutions in the Walnut Creek watershed.



Other entities in the watershed were approached for their support and cooperation in the study.

**X. CCN's**

In order to apply for and be considered for the regional grant, Springtown had to show authority for sewer in the study area. Normally, this is by possession of a Certificate of Convenience and Necessity (CCN) from the Texas Natural Resource Conservation Commission (TNRCC), but can also be by interlocal agreement. (A CCN is essentially a license by the state to provide a specified type of utility service in a specified area.) Springtown applied for a CCN for the portion of the watershed not currently covered by sewer CCN's or municipal service (western half) and began to work with Reno and other eastern cities for interlocal agreements to allow study of the eastern half. Due to a number of concerns, Springtown was finally allowed to enter into interlocal agreements with the three counties involved to show eligibility and the CCN application dropped.

**XI. EXISTING WATER CCN'S**

In most rural areas, the availability of water has generally been a greater concern than the disposal of sewer. This is evident when looking at the exhibits generated for this meeting. Preliminary investigation has shown that the number of water CCN's in the Walnut Creek Watershed greatly outnumber the sewer CCN's. These CCN's cover about two-thirds of the watershed area. The following water CCN's for the watershed appear on the exhibit (as reported by TNRCC).

10069	City of Azle
10266	D-LUX Utility Company
10285	Walnut Creek Special Utility District
11061	Pelican Bay Utility Company, Inc.
11546	Community Water Supply Corp. Company
11719	Central Texas Utilities, Inc.
11950	Bradberry Water Supply Company
12397	City of Springtown

**XII. EXISTING SEWER CCN'S**

In contrast to water CCN's, less than 5% of the Walnut Creek watershed is covered by sewer CCN's. The remaining area is serviced by septic tanks. Septic systems do not often work well unless there is appropriate soils and flows are low. In reality, this generally

restricts use to residential dwellings, adequately spaced and near sandy soils. Hardly the conditions to promote commercial, industrial and typical subdivision residential in the area. The existing sewer CCN's are held by:

20022	City of Azle
-------	--------------

### **XIII. PRIOR STUDIES**

A number of studies have been made in the area relating to water supply and distribution since the late 1920's. These have included studies by the Tarrant County Water Control and Improvement District Number 1, which resulted in the creation of Eagle Mountain Lake controlled by TCWCID#1, studies by Azle and Springtown yeilding the transition of these towns from well water to lake water, and the recent studies by Walnut Creek Special Utility District resulting in the transition of much of the rural area from well water to lake water.

The amount of sewer studies, as expected, appears to be far fewer. Such studies traditionally have been in advance of collection and treatment plant improvements for Azle and Springtown. In 1990, environmental pressures on Eagle Mountain Lake resulted in a study by Alan Plummer and Associates, Inc., and Rady and Associates, Inc., for TCWCID#1 (funded by Azle, Fort Worth and the Texas Water Development Board) on sewer and septic tank impacts on Eagle Mountain Lake's and Lake Worth's western shores. Although the study included Walnut Creek, only the very downstream end was studied, primarily in relation to Azle. (See exhibit)

### **XIV. PLAYERS IN THIS STUDY**

Springtown, as recipient of the grant, will administer the study. Since May, a number of entities have been contacted for support and input to make this study a reality. These groups consist of governments, utility agencies, planning agencies, special interest groups and private citizens interested in achieving the optimum sewage treatment solution for the citizens, taxpayers and businesses in the Walnut Creek Watershed. Those primarily involved thusfar are listed below, and others are encouraged to join.

Texas Water Development Board	City of Springtown	Walnut Creek Special Utility District
Texas Natural Resource Conservation Commission	City of Reno	Wise County Water Control and Improvement District
Parker County Commissioners Court	City of Azle	Tarrant County Water Control and Improvement District Number 1

Wise County Commissioners Court	City of Sanctuary	Save Eagle Mountain Lake, Inc.
North Central Texas Council of Governments	Community of La Junta	A Number of Concerned Individuals

**XV. ENGINEER FOR THE STUDY**

The City of Springtown, with the concurrence of the Texas Water Development Board, has retained the engineering firm of Teague, Nall and Perkins, Inc. of Fort Worth to perform the study. The firm has been working with Springtown for over a year and the firm and/or its current employees have participated in a number of projects in Parker, Wise and Tarrant counties including a number of projects in the Walnut Creek watershed.

**XVI. SCOPE OF WORK**

Meet with entities to gather information to determine feasibility of three potential sewer options. Each option will include service areas, plant general locations, anticipated flows, and anticipated phasing and construction for a 30 year service life. The options to be studied are:

- 1.) Multiple individual plants,
- 2.) Two or three subregional plants
- 3.) Single regional plant or collection system

The primary goals are to explore ways to

- 1.) Maximize the communities benefitted
- 2.) Minimize the cost of sewer service to customers
- 3.) Minimize the number of treatment plants in the watershed
- 4.) Minimize the enviromental impact to the watershed (i.e. the use of beneficial wetlands for terciary sewer treatment, (polishing))

**XVII. PURPOSE OF THESE MEETINGS**

This meeting is the first of three planned meetings to bring together the players and public during the course of this study. This study will be 'Fast Tracked' meaning that data will be collected and results generated rapidly in order to achieve a final report the Texas Water Development Board in March of 1997. This meeting will be to discuss the overall intent of the project and the scope of work to be performed. Input from all players will be solicited. A second meeting is planned for late December or early January to discuss preliminary results. A final meeting is planned for late February or early March to review the final report which will be sent to the TWDB in Austin.

**XVIII. WALNUT CREEK WATERSHED FACTS**

- 1.) Watershed encompasses approximately 58 square miles.

- 2.) Watershed contains all or part of four incorporated cities with the remainder made up of rural and unincorporated areas.
- 3.) Watershed empties in to environmentally sensitive Eagle Mountain Lake.

#### **XIX. SPRINGTOWN FACTS**

- 1.) 1990 Census Population=1740
- 2.) Current Estimate = 2200
- 3.) Current Land Area = Approx 2 square miles
- 4.) TWDB Most Likely Projected 2020 Population (TWDB) = 4638
- 5.) 1990 Water Usage = 263 acre-ft (234,775 gallons per day)
- 6.) Current Sewer Plant Capacity (260,000 gallons per day)
- 7.) Current Plant under TNRCC enforcement order
- 8.) TWDB Projected 2030 Water Usage = 582 acre-ft (519,540 gallons per day)

#### **XX. AZLE FACTS**

- 1.) 1990 Census Population= 7665
- 2.) TWDB Most Likely Projected 2020 Population (TWDB) = 14704
- 3.) 1990 Water Usage = 989 acre-ft (882,862 gallons per day)
- 4.) TWDB Projected 2030 Water Usage = 1845 acre-ft (1.647 MGD)
- 5.) Azle has existing plant which may be converted to a regional facility

#### **XI. HOW YOU CAN HELP !**

During the next few weeks, TNP will continue to gather information on the watershed. We will be asking for:

- 1.) Population figures and projections
- 2.) Land Uses and Projections
- 3.) Existing Planned Facilities
- 4.) Existing Problems and Concerns
- 5.) Water Use and Projections
- 6.) Wastewater Use and Projections
- 7.) Past Know Studies
- 8.) Utility Facility and Service Maps
- 9.) Existing Topo or Aerial Maps of Entities
- 10.) Subdivision Maps
- 11.) Other Information



**TEAGUE NALL AND PERKINS**  
CONSULTING ENGINEERS

City of Sanctuary  
Texas Natural Resource Conservation Commission

These groups, along with others noted at the meeting, will also receive a copy of these meeting notes.

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The following are notes from the above referenced meeting. Please review and advise the note taker of any corrections or clarifications that you think are needed.

1. Passed out sign-up sheet. (See above.)
2. Passed out agenda and handout notes. (See attached.)
3. Bob Salinas, Springtown City Administrator, gave a welcome and introduction on behalf of the City of Springtown.
4. Went around the room and allowed everyone to introduce themselves.
5. Welcome by Tom Gentry, Springtown Mayor, and introduction by Bob of Mark Berry, P.E. from Teague, Nall and Perkins for the presentation.
6. Overhead presentation by Mark Berry explaining the history of the project and the need for the study. In short, the City of Springtown is starting to experience growing pains and is looking at the need to expand their existing wastewater treatment plant. In looking at how to address the treatment issues, a regional approach seemed to be a good option. Springtown then applied on July 8, 1996, to the Texas Water Development Board for funding participation in a regional study. Springtown also began to approach other entities in the Walnut Creek Watershed for cooperation in a regional approach. Ultimately, the TWDB approved support for a regional study with the City of Springtown and Walnut Creek SUD providing matching funds. This organizational meeting was the first of three public meetings for the study. This meeting was to explain the need for the study, discuss the scope of work to be performed and to solicit input from all of the players in the basin. (See handout notes.) Mark noted that two recent previous studies had been performed by Alan Plummer and Rady and Associates for the Tarrant County W.C.I.D. #1, but these only reached the far eastern edge of the watershed. Also, Azle has a Walnut Creek wastewater treatment plant at the downstream end of the watershed which might be incorporated into a regional approach. A pair of map exhibits were also presented to show the watershed and existing entity boundaries within it. Mark noted that the current approach will be to look at three general options in the study; each entity providing its own service (status quo), 2-4 subregional plants, or a single regional system. Mark noted that environmental concerns would be a focus of the study due to effluent limitations into Eagle Mountain Lake. After the presentation, Mark opened the floor for discussion.
7. Bill Pembroke, Rady and Associates -
  - Q. What is the typical TWDB collection service life?
  - A. 30 Years for the study, normally 50 Years for facility design

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915 FLORENCE STREET  
FORT WORTH, TEXAS 76102  
817/336-5773

220 W. IRVING BLVD., SUITE 2  
IRVING, TEXAS 75060  
214/254-1765

**TEAGUE NALL AND PERKINS**  
**CONSULTING ENGINEERS**

- Q. Have preliminary treatment plant locations been identified?  
A. Somewhat. Various tributary boundaries are shown on the map and logical sites would be at the confluence of tributaries. As discussed, the study will look at each entity having its own plant, several subregional plants, or a single regional plant. Obviously, the existing Azle plant at the downstream end of the watershed will be looked at as an option for a single regional plant.
- Q. What measures will be used to evaluate the study?  
A. Several possible measures are available based on the economy and number of people served. Of critical importance is what can be financed and paid for. Alan Plummer used number of households served and cost per household as a basis in their reports.
- Q. Will only the portion of Azle in the Walnut Creek watershed be included?  
A. Probably. The grant only covers the Walnut Creek watershed. Portions of Ash Creek might be included if any recommendation is studied utilizing Azle's Ash Creek plant. Azle needs to make it known if they wish the Ash Creek plant service area to be included.
- Q. What is the level of study?  
A. The main Walnut Creek channel and some major tributaries servicing community areas. Minor service tributaries will not be studied individually or sized.  
C. Azle currently has plans to upgrade their second plant.
8. Dick Smith, Alan Plummer -  
Q. What would include multiple plants?  
A. Probably 2-4 plants at the confluence of major tributaries to service subregional areas.  
Q. What about a regional entity managing several such plants as a method of phasing in regional service?  
A. Such an approach might be practical.
9. Mark Ernst, TCWCID #1  
Q. Was Fort Worth invited to this meeting?  
A. Not explicitly. Tarrant County WCID #1 controls the water supply in the Fort Worth area and the City of Fort Worth could not provide sewer collection until at least halfway through the study period. One of the prior Alan Plummer studies indicated that collection of Azle's wastewater by Fort Worth was not currently practical, but might become practical in the future.
10. Tom Gentry, Mayor of Springtown -  
C. It has been Springtown's dream to have one regional entity which is managed by a regional board. This study will help to focus on the best future approach and how such an approach can be implemented.
11. Bob Salinas, Springtown City Administrator -  
C. Bob noted that for a regional approach to work, all entities in the basin would eventually have to participate. He asked for input from all meeting participants.  
C. Bob also noted the use of innovative technologies to reduce costs and reduce environmental impacts. One such approach is the use of created wetlands to polish effluent so as not to adversely impact Eagle Mountain Lake as the watershed develops.

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CONSULTING ENGINEERS

12. Carl Wilson(?), Save Eagle Mountain Lake  
Q. Are the tight study deadlines driven by the grant provisions?  
A. Yes
13. Mark Berry, Teague Nall and Perkins  
Q. To what extent did the Alan Plummer study address Azle wastewater collection by Fort Worth?  
A. Dick Smith recalled that one of the options was to collect the wastewater in an interceptor sewer and flow it to the Jenkins Lift Station. This option was costly at the time of the study. It may be more feasible now.
14. Bob Salinas, Springtown City Administrator -  
C. The growth is already coming to the area. The sewer problem will only get worse.  
C. Bob again solicited everyone's input.
15. Paul Bounds, Springtown Public Works Director  
Q. How will the potential for eventual collection by Fort Worth be addressed in this study?  
A. An eventual plan to collect all, or part, of the sewer in the watershed and send it to Fort Worth will need to be addressed but it cannot be presented as a single option due to the long lead time to accomplish. Data from the prior studies which address service from Fort Worth will be looked at in this study for the whole watershed.
16. Dick Smith, Alan Plummer Associates  
Q. Will water reuse be considered?  
A. Azle is currently reusing effluent on their golf course. Using effluent for agricultural irrigation is also possible. In a more abstract since the water used in Springtown is flowing to Eagle Mountain Lake and cycled back to Springtown as raw water.
17. Loretta Mokry, Alan Plummer Associates  
Q. Alan Plummer has been working on water reclamation projects for TCWCID #1. Would anyone be interested in a field trip to the Azle created wetlands project?  
A. Most participants expressed an interest and encouraged Loretta to schedule a field trip.
18. Lou Bridges, Wise County WCID #1  
C. Lou and the Wise County WCID #1 desire to remain involved in the study project and wishes to cooperate with the study wherever possible. They want to be kept informed.
19. Les Kuble, Tanglewood  
Q. Where will population projections come from?  
A. Several sources. The Texas Water Development Board has a set of population projections for Springtown, Reno and Azle. The North Central Texas Council of Governments also has projections. Each city and county has their own records and projections. All will be reviewed and reasonable projections drawn from these sources. Al Swan noted recent problems and inconsistencies with Springtown's official Census and COG populations.

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**TEAGUE NALL AND PERKINS**  
CONSULTING ENGINEERS

20. Reed Pigman, Save Eagle Mountain Lake  
C. Would like to see link to Fort Worth studied as an option.
21. Mark Ernst, Tarrant County WCID #1  
C. Study will need to show BOD, TSS, Nitrogen and Phosphorus loadings for each option.
22. Mark recessed the meeting for a short break.
23. Mark Berry, Teague Nall and Perkins  
C. It seems to be the general consensus that the study should include a Fort Worth Option, water reuse and loadings for BOD, TSS, Nitrogen and Phosphorus for each option.  
C. There will need to be two more general meetings, one in late December to early January and another in March. Tuesday seemed to work well this time. Azle representatives noted that Azle has Council meetings on the 1st and 3rd Tuesdays of each month.  
C. TNRCC is now strongly advocating the beneficial reuse of wastewater and sludge.
24. Unrecorded Participant  
Q. How long after study results before construction will start?  
A. Depends on the outcome of the study.  
A. Gary Laneman of the Texas Water Development Board noted that the environmental assessment can start about 3 months after the applications are approved when State Revolving Funds are used.
25. Bob Salinas, Springtown City Administrator  
C. Bob stressed the difference between the Walnut Creek basin (the geographic area of the study) and the Walnut Creek Special Utility District (a water district serving the western portion of the basin and extending west and north to Lake Bridgeport.)
26. \_\_\_\_\_, Save Eagle Mountain Lake  
Q. How long does Springtown have to correct its current wastewater problems.  
A. Springtown is under an Enforcement Order and is currently upgrading its existing facilities to comply with the order.
27. Al Swan, Springtown City Council  
C. The North Central Texas Council of Government's Metro planning area does not go west of the Tarrant County Line. Springtown is trying to get Wise and Parker County added to the COG Metro planning region for infrastructure planning.
28. Meeting adjourned.



# CITY OF SPRINGTOWN

Thomas Gentry, Mayor  
Don McBryde, Place 1  
Al Swan, Place 2

Bob Salinas  
City Administrator

Clarage "Doc" Dockery, Place 3  
Robert Willson, Place 4  
Carl Moore, Place 5

November 13, 1996

Dear Committee Member:

As promised, Alan Plummer is sponsoring a tour of the City of Fort Worth Wetlands Demonstration Project on Thursday, November 21, 1996 at 9:00 a.m.

The group will meet at the Tarrant Regional Water District's Eagle Mountain Lake Office (west side of dam - see attached map) located at 10201 North Shore Drive.

The Walnut Creek Regional Sewer Study will be considering the feasibility of a similar program as part of the wastewater treatment system.

If you would like to learn more about the use of constructed Wetlands, I would encourage you to attend this meeting. If you have any questions, please contact me at your convenience at metro 220-2006. Hope to see you on November 21st.

Sincerely,

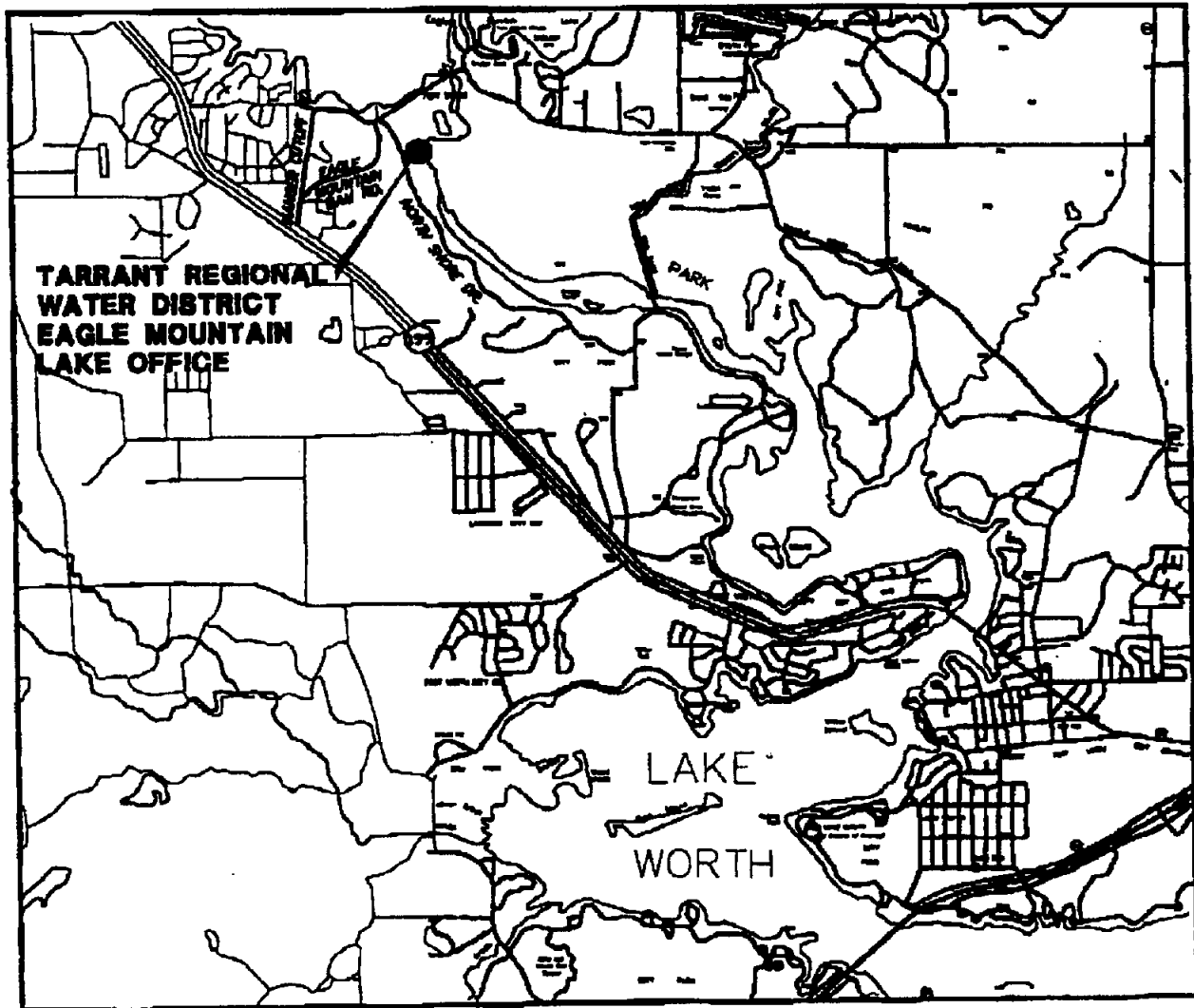
Bob Salinas  
City Manager

Attachment

BS.lpm

**CITY OF FORT WORTH  
WETLANDS DEMONSTRATION PROJECT TOUR**

Alan Plummer Associates, Inc. is pleased to invite the City of Springtown and other parties interested in constructed wetlands to a guided tour of the City of Fort Worth's Wetlands Demonstration Project at the Fort Worth Nature Center and Refuge in northwest Tarrant County. The tour will be conducted on **Thursday, November 21, 1996**, starting at 9 a.m. from the Tarrant Regional Water District's Eagle Mountain Lake Office at 10201 North Shore Drive (see map).



**TEAGUE NALL AND PERKINS**  
CONSULTING ENGINEERS

December 5, 1996

Teague Nall and Perkins, Inc.  
915 Florence Street  
Fort Worth, Texas 76102  
Attn: Kelly Carta, Project Manager

RE: Walnut Creek Regional  
Wastewater Study  
Springtown, Texas  
Proj. No. SPR96219

Dear Mr. Carta:

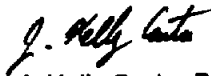
The City of Springtown, along with Walnut Creek Special Utility District and the Texas Water Development Board, is performing a regional wastewater study for the Walnut Creek drainage basin. Enclosed is a copy of the notes from the first meeting of interested parties held on October 29. Also enclosed are copies of the handout from the meeting, a contact sheet of all known interested entities and a questionnaire. All interested parties are encouraged to attend our next meeting to be held at Springtown City Hall, 7:30 p.m., Thursday, December 19, 1996. We will use this meeting to review findings before completing the draft report. If you attended the first meeting, we again thank you for your interest and participation. If you did not attend, then we especially ask for your attendance at the next meeting.

As you probably know by now, Springtown is seeking input and cooperation to determine the feasibility and viability of a regional wastewater system for the Walnut Creek watershed. Such a system has the potential to not only benefit Springtown, but also Azle, Reno, Sanctuary, La Junta, and other small communities and rural areas of the watershed. Of prime concern in the current study is the determination of cost effective options which can be implemented according to need and which will be complementary to the environmental concerns of Eagle Mountain Lake.

The study is planned to conclude its initial draft phase by the end of December. Therefore, we are asking that you review the attached questionnaire and, if possible, respond in a timely fashion. The information which you supply will help increase the accuracy of our conclusions and will enhance the likelihood of a solution which will meet the needs of the population in the watershed. Also, some of the questions/requests may not pertain to your entity. If you have other information which is not asked for, but which you think might be of assistance, please include it.

Should you need additional information, please call me.

Sincerely,



J. Kelly Carta, P.E.

Enclosures: Meeting notes and handouts  
Contact sheet  
Questionnaire

**Current Cost Factors:**

Please list your current utility (water and wastewater) rates and charges. Include a fee schedule, if available, with tap fees, volume and service charges: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Please list any outstanding debt on your wastewater facilities and general payment schedule: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**3. CURRENT PLANNING:**

Based on your projections, provide the following:

	Population	Customers	Average Daily Water Use	Average Daily Sewer Flow	% Residential Development
1997	_____	_____	_____	_____	_____
2000	_____	_____	_____	_____	_____
2010	_____	_____	_____	_____	_____
2020	_____	_____	_____	_____	_____
2030	_____	_____	_____	_____	_____

What are you currently doing to promote economic development? \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

In general, have your economic development efforts been successful? \_\_\_\_\_

\_\_\_\_\_

What is your target land use mix for your jurisdiction (in percent by land area)

Agricultural	_____
Parks/Open Spaces	_____
Schools/Churches	_____
Ranchette Lot Residential (2+ Acres)	_____
Large Lot Residential (1-2 Acres)	_____
Single Family Residential (<1 Acre)	_____
Multi- Family Residential	_____
Commercial	_____
Industrial	_____
Other	_____

Who should we contact for additional questions about your current wastewater operations or

**Current Cost Factors:**

Please list your current utility (water and wastewater) rates and charges. Include a fee schedule, if available, with tap fees, volume and service charges: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Please list any outstanding debt on your wastewater facilities and general payment schedule: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**3. CURRENT PLANNING:**

Based on your projections, provide the following:

	Population	Customers	Average Daily Water Use	Average Daily Sewer Flow	% Residential Development
1997	_____	_____	_____	_____	_____
2000	_____	_____	_____	_____	_____
2010	_____	_____	_____	_____	_____
2020	_____	_____	_____	_____	_____
2030	_____	_____	_____	_____	_____

What are you currently doing to promote economic development? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

In general, have your economic development efforts been successful? \_\_\_\_\_

\_\_\_\_\_

What is your target land use mix for your jurisdiction (in percent by land area)

- Agricultural \_\_\_\_\_
- Parks/Open Spaces \_\_\_\_\_
- Schools/Churches \_\_\_\_\_
- Ranchette Lot Residential (2+ Acres) \_\_\_\_\_
- Large Lot Residential (1-2 Acres) \_\_\_\_\_
- Single Family Residential (<1 Acre) \_\_\_\_\_
- Multi-Family Residential \_\_\_\_\_
- Commercial \_\_\_\_\_
- Industrial \_\_\_\_\_
- Other \_\_\_\_\_

Who should we contact for additional questions about your current wastewater operations or

CONTACT LIST FOR WALNUT CREEK REGIONAL WASTEWATER STUDY (DRAFT)

Member	First Name	Last Name	Suffix	Title	Organization	Addr1	Addr2	City	State	Zip	Phone	Fax
Yes	Lorela	Moby			Alan Plummer and Associates, Inc.	841 West Michael Street		Arlington	Texas	76013	817-461-1491	817-860-3339
Yes	Richard	Smith		Owner	Alan Plummer and Associates, Inc.	7824 Mosler View Court		Fort Worth	Texas	76116	817-284-2724	817-589-0072
	Mr.	Ernsberry		Owner	Bradbury Water Supply Company	P. O. Box 296		Boyd	Texas	76233		
Yes	Billy	Green		President	Central Texas Utilities, Inc.	P. O. Box 136659		Fort Worth	Texas	76107	817-237-6217	817-237-6217
Yes	Dick	Allen			City of Azle	613 Southeast Parkway		Azle	Texas	76020	817-444-2541	817-444-7068
Yes	Darrell	Ridgely		Director of Public Works	City of Azle	613 Southeast Parkway		Azle	Texas	76020	817-444-2541	817-444-7068
Yes	Shirley	Bradley		Mayor	City of Azle	613 Southeast Parkway		Azle	Texas	76020	817-444-2541	817-444-7068
Yes	Jeffrey	Gully		Acting City Manager	City of Azle	613 Southeast Parkway		Azle	Texas	76020	817-444-2541	817-444-7068
Yes	Jim	Scantlin			City of Fort Worth	1000 Throckmorton Street		Fort Worth	Texas	76110	817-871-6203	817-871-8185
Yes	Billy	Heaton		Mayor	City of Palican Bay	1800 Pelican Circle		Azle	Texas	76021	817-444-1234	817-444-1234
Yes	Ned	Pugh		Mayor	City of Reno	174 West Reno Road		Azle	Texas	76020	817-221-2500	817-221-3850
Yes	Lloyd	Bailey		Mayor	City of Reno	174 West Reno Road		Azle	Texas	76020	817-221-2500	817-221-3850
Yes	Ed	Braun		Mayor	City of Reno	174 West Reno Road		Azle	Texas	76020	817-221-2500	817-221-3850
Yes	Floyd	Galloway		Mayor	City of Sanctuary	2017 Dorothy Lane		Azle	Texas	76020	817-677-3008	817-677-3008-51
Yes	Don	McByde		Council Member	City of Springtown	P.O. Box 444	102 East Second	Springtown	Texas	76082-0444	817-523-4834	817-523-3179
Yes	Paul	Bounds		Director of Public Works	City of Springtown	P.O. Box 444	102 East Second	Springtown	Texas	76082-0444	817-523-4834	817-523-3179
Yes	Bob	Sallinas		City Administrator	City of Springtown	P.O. Box 444	102 East Second	Springtown	Texas	76082-0444	817-523-4834	817-523-3179
Yes	Tom	Gentry		Mayor	City of Springtown	P.O. Box 444	102 East Second	Springtown	Texas	76082-0444	817-523-4834	817-523-3179
Yes	Robert	Wilson		Council Member	City of Springtown	P.O. Box 444	102 East Second	Springtown	Texas	76082-0444	817-523-4834	817-523-3179
Yes	Carl	Moore		Council Member	City of Springtown	P.O. Box 444	102 East Second	Springtown	Texas	76082-0444	817-523-4834	817-523-3179
Yes	Al	Swan		Mayor Pro-Tem	City of Springtown	P.O. Box 444	102 East Second	Springtown	Texas	76082-0444	817-523-4834	817-523-3179
Yes	Doc	Dodson		Council Member	City of Springtown	P.O. Box 444	102 East Second	Springtown	Texas	76082-0444	817-523-4834	817-523-3179
	Doris	Hoyfield			Community Water Supply Corp. Company	12190 Liberty School Road		Azle	Texas	76021	817-444-1112	
	Walker	Harrill		Community Leader	Community of La Junta			Fort Worth	Texas	76116-5600	817-731-4300	
	Michael	Eastland		Owner	D-LUX Utility Company	3309 Whithrop, Suite 97		Fort Worth	Texas	76011	817-640-3300	817-640-7806
Yes	Roy	Morris		Executive Director	Paradise	616 Six Flags Drive		Arlington	Texas	76011		
Yes	Ben	Lony		County Judge	Parmer County Commissioners Court	1 Courthouse Square		Weatherford	Texas	76086	817-599-6591	817-599-6189
Yes	Ren	Pedin		Commissioner Precinct 4	Parmer County Commissioners Court	1 Courthouse Square		Weatherford	Texas	76086	817-599-6591	817-599-6189
Yes	Gane	Thompson		Owner	Pelican Bay Utility Company, Inc.	1713 Pelican Oval		Azle	Texas	76020	817-444-2982	817-444-2982
Yes	Bill	Pembroke	P.E.	Project Manager	Rady and Assoc / Kinley Horn	910 Cailler Street		Fort Worth	Texas	76102-3542	817-338-6511	817-338-6070
Yes	Carl	Wilson		Director	Saw Eagle Mountain Lake, Inc.	316 Bailey Avenue, Suite 103		Fort Worth	Texas	76107	817-332-7283	
Yes	Mark	Wood		President	Saw Eagle Mountain Lake, Inc.	316 Bailey Avenue, Suite 103		Fort Worth	Texas	76107	817-332-7283	
Yes	Wynette	Parchman		Legal Council	Saw Eagle Mountain Lake, Inc.	316 Bailey Avenue, Suite 103		Fort Worth	Texas	76107	817-332-7283	
Yes	Reed	Pigman, Jr.		Director	Saw Eagle Mountain Lake, Inc.	317 Hickorywood		Fort Worth	Texas	76107	817-332-7283	
Yes	Les	Keable		Community Leader	Tanglewood Addition			Azle	Texas	76020	817-221-1332	
Yes	Mark	Ernst	M.S., R.S.	Water Quality Manager	Tarrant Regional Water District	10201 North Shore Drive		Fort Worth	Texas	76135-9379	817-237-8580	817-237-8583
Yes	Kelly	Canta	P.E.	Project Manager	Teague Hill and Perkins, Inc.	915 Florence Street		Fort Worth	Texas	76102	817-338-6778	817-338-2813
Yes	Mark	Berry	P.E.	Principal	Teague Hill and Perkins, Inc.	915 Florence Street		Fort Worth	Texas	76102	817-338-6778	817-338-2813
Yes	Lin	Zhang		Manager, Enforcement Section	Texas Natural Resource Conservation Commission	P.O. Box 13087, Mail Code 149		Fort Worth	Texas	76102	817-338-6778	817-338-2813
Yes	Albert	Hock		Water Utility Rates and Services	Texas Natural Resource Conservation Commission	P.O. Box 13087		Fort Worth	Texas	76102	817-338-6778	817-338-2813
Yes	Candyn L.	Britlin		Chief, Regional Planning and P	Texas Natural Resource Conservation Commission	P.O. Box 13231, Capital Station		Austin	Texas	78711-3231	512-239-6960	512-239-6972
Yes	Gary	Laneman	P.E.	Planning Division	Texas Water Development Board	P.O. Box 13231, Capital Station		Austin	Texas	78711-3231	512-483-7847	512-475-2053
Yes	Chaita	Owens		General Manager	U.S. Army Corps of Engineers, L.A.E.R.F.	1700 North Congress Avenue		Austin	Texas	78704	512-483-7847	512-475-2053
Yes	Jerri	Helmbeck		County Judge	Walnut Creek Special Utility District	P.O. Box 657		Lewisville	Texas	76082	972-438-2216	972-438-1402
Yes	L.D.	McDonald		County Judge	Wise County Commissioners Court	P.O. Box 657		Springtown	Texas	76082	817-220-7707	817-220-7707
Yes	Carl	Cox		Board Member	Wise County Commissioners Court	P.O. Box 303		Bridgeport	Texas	76426	817-687-5743	817-687-6404
Yes	Bob	Pruden		Board Member	Wise County Water Control and Improvement District	1203 Halsell Street		Bridgeport	Texas	76426	817-683-2820	
Yes	Toad	Duitend		Board Member	Wise County Water Control and Improvement District	1203 Halsell Street		Bridgeport	Texas	76426	817-683-2820	
Yes	Lou	Bridges		President	Wise County Water Control and Improvement District	1203 Halsell Street		Bridgeport	Texas	76426	817-683-2820	
Yes	Eddie	Chatham	P.E.	Principal	Wise County Water Control and Improvement District	1203 Halsell Street		Bridgeport	Texas	76426	817-683-2820	
					Cheatham & Associates, Inc.	1601 E. Lemar Blvd		Arlington	Texas	76011	817-598-0598	817-268-6532

## **TEAGUE NALL AND PERKINS**

**CONSULTING ENGINEERS**

### **MEETING NOTES**

TO: All Attendees PROJECT: Walnut Creek Regional Sewer Study  
Springtown, Texas  
NOTES BY: Kelly Carta, P.E. PROJECT #: SPR 96219

### **MEETING INFORMATION:**

DATE: December 19, 1996  
TIME: 7:30 p.m.  
PLACE: Council Chambers, Springtown City Hall  
PURPOSE: Posted Public Meeting to Discuss Initial Preliminary Findings

<b><u>ATTENDEES:</u></b>	<b><u>REPRESENTING:</u></b>	<b><u>PHONE #:</u></b>
Loretta Mokry	Alan Plummer Assoc.	817-461-1491
Darrell Riding	City of Azle	817-444-2541
Jim Scanlan	City of Fort Worth	817-871-8203
Bill Pembroke	Rady and Assoc./Kimley-Horn	817-335-6511
Tom Gentry	City of Springtown	817-220-2006
Al Swan	City of Springtown	817-220-2006
Bob Salinas	City of Springtown	817-220-2006
Robert Wilson	City of Springtown	817-220-2006
Clarage Dockery	City of Springtown	817-220-2006
Mark Ernst	Tarrant Regional Water District	817-237-8585
Kelly Carta	Teague, Nail and Perkins	817-336-5773
Chetta Owens	U.S. Corps of Engineers/L.A.E.R.F.	972-436-2215

### **Meeting Notes:**

1. Second formal public meeting. Purpose of this meeting to discuss preliminary input and findings to be used for draft report.
2. Had participants sign the sign-up sheet. (See above)
3. Kelly Carta distributed preliminary inputs, calculations, and population data for all to review.
4. Only Springtown and Azle have returned the questionnaires for existing systems and city plans.
5. Azle plans to serve Pelican Bay by next year.
6. It was noted that the Fort Worth extraterritorial jurisdiction (ETJ) extends to Sanctuary.
7. Teague Nail and Perkins requested ETJ maps from Azle and Fort Worth. Azle has "agreed to" boundaries for most of their ETJ.



8. Bill Pembroke noted that the curves used in the Alan Plummer study of 1990 tend to have excess costs for small plants (less than 1 mgd). Suggested Kelly talk to Mark Perkins of Alan Plummer to verify curves.
9. Meeting Adjourned.



2. Questions and Responses:

a.) Why is Springtown trying to promote growth?

Springtown realizes that the factors are in place which will cause growth to continue to happen. It is not a matter of promoting growth but accommodating it. It would be better to have some control of sewage in the region than to have no control.

b.) Why does Springtown want someone else to pay for their problem?

The problem is not Springtown's. Effluent problems and septic tanks will effect the whole area. It just so happens that Springtown's problems have caused them to take the pro-active lead in investigating a regional approach.

c.) Why is a regional approach needed to control effluent and septic tanks? Can't it (they) be controlled now?

The individual cities (Azle and Springtown) can control septic tanks and effluent within their city limits. Reno is all septic tanks and depends on Parker County for control. Likewise for the unincorporated areas. Parker County, as a county, cannot initiate zoning. They can only set minimum lot sizes to comply with state criteria. This is currently 1.5 acres per lot minimum, up from 1.0 acres per lot in past years. Unfortunately, a number of areas are already denser and will not be easily changed. The county only has one sanitarian to regulate new and failed septic systems for the whole county. As such, the problem is larger than the enforcement.

Tarrant Regional Water District can control septic systems within 2000 feet of the lake and effluents within 5 miles of the lake. However, a regional wastewater district could regulate the whole Walnut Creek Watershed.

d.) Mark Ernst, Tarrant Regional Water District, was asked about the effect of effluent on the water quality in the lake. Mark stated that once flows were determined, he could run some quality analysis. Mark also mentioned that it could be beneficial to have the effluent quantity of water returned to the lake, especially in drought times like occurred this past year.

e.) Bill Pembroke, Rady/Kimley Horn, was asked about Azle's plant and water reuse. He noted that Azle is planning to upgrade its Ash Creek plant and service Pelican Bay. All of the effluent from the plant is being pumped to the golf course but not all is being used directly on the golf course.

f.) Could the effluent from a regional plant be pumped back up Walnut Creek for release so that it could be "cleansed" by the creek?

Yes, but not without great expense. This approach would not be practical.

g.) Frank Crumb, City of Fort Worth, was asked about Fort Worth's plans for the region. Frank noted that Fort Worth addresses service to the Azle area as a contingency in their master plan. Service to the area is shown in the plan to potentially occur sometime between 2006 and 2016, however such service is not now actively being planned.

3.) The presentation portion of the meeting ended and all non-SEML participants were dismissed.

 **TEAGUE NALL AND PERKINS**  
CONSULTING ENGINEERS

January 15, 1997

Teague Nall and Perkins, Inc.  
915 Florence Street  
Fort Worth, Texas 76102  
Attn: Mark Berry

RE: Walnut Creek Regional  
Wastewater Study  
Springtown, Texas  
Proj. No. SPR96219

Dear Mr. Berry:

This letter is to inform all participants of the next scheduled meeting regarding the Walnut Creek Regional Wastewater Study. This meeting will be held on Thursday, January 23, at 7:00 p.m. in the Council Chambers of Springtown City Hall. We will be discussing the draft report.

Copies of the draft report will be sent to the Texas Water Development Board at the end of this week. Due to the bulk of the report and the expanded number on our mailing list (we now have 68), we have decided not to distribute individual copies at this time. Instead, we are sending advance copies to the representatives listed below. Other individuals are asked to share these copies. If this causes a major inconvenience, please call me to discuss additional copies. Copies will be sent out, or hand delivered, either late this week or Monday.

Draft Distribution:

Loreta Mokry, Alan Plummer and Associates, Inc.  
Darrell Riding, City of Azle  
Frank Crumb, City of Fort Worth  
Billy Heaton, City of Pelican Bay  
Lloyd Bailey, City of Reno  
Floyd Galloway, City of Sanctuary  
Bob Salinas, City of Springtown  
Michael Eastland, North Central Texas Council of Governments  
Danny Choate, Parker County Precinct 1  
Bill Pembroke, Rady/Kimley-Horn  
Mack Wood, Save Eagle Mountain Lake, Inc.  
Mark Ernst, Tarrant Regional Water District  
Kelly Carta, Teague Nall and Perkins  
Lin Zhang, Texas Natural Resource Conservation Commission  
Gary Laneman (7), Texas Water Development Board  
Chetta Owens, U. S. Army Corps of Engineers LAERF  
Jerry Holsomback, Walnut Creek Special Utility District  
L. D. McDonald, Wise County Judge  
Lou Bridges, Wise County Water Control and Improvement District  
Eddie Cheatham, Cheatham and Associates

Should you need additional information, please call me.

Sincerely,



J. Kelly Carta, P.E.

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**HANDOUT FOR DRAFT REVIEW MEETING  
WALNUT CREEK REGIONAL WASTEWATER STUDY  
PARKER, WISE AND TARRANT COUNTIES OF TEXAS  
TWDB # 97483198 TNP # SPR96219**

**January 23, 1997**

This is a public meeting to review the findings of the draft report submitted to the Texas Water Development Board regarding the current Walnut Creek Regional Wastewater Study. All of the entities which have been involved in this report, as well as the general public, are invited to review the report and submit comments. Due to delays in completion, some entities have not received a copy of the report prior to the meeting. Copies of the report will be available to these entities following tonight's presentation.

Some items in the report have already been amended. These will be discussed herein and during the meeting. Please keep this handout with any copies of the report for reference to these changes.

In summary, four general service methods (which we have called 'scenarios'), were studied for a 30 year planning period from 1997 to 2027. The first scenario was for three wastewater treatment plants (WWTP's); a replacement plant in Springtown, a new plant in Reno, and an upgraded plant in Azle. In this scenario, each major city in the region would service its own area plus portions of the surrounding county and smaller cities. The second scenario was for two WWTP's, one in Reno to serve Reno, Springtown and unincorporated areas and another in Azle to serve Azle, Sanctuary and Pelican Bay. The third scenario was for an upgraded WWTP in Azle to serve the whole region. The fourth and last scenario was for the region to be serviced by the City of Fort Worth.

In the draft report, some scenarios had options to only serve a part of their allotted scenario service area. This caused some confusion and also made comparison difficult since some results were not based on identical areas. To correct this problem, the calculations have been redone to allow for two 'options' to each scenario. One option would be service to only existing population centers during the 30 year planning period, and one option to serve the whole region during the same period. In addition, the timing of pipe system implementation was synchronized to allow easier comparison. The amended results to the original draft report are contained herein. Note that it may not be beneficial to serve some of the sparsely populated outer areas of Reno and unincorporated areas prior to 2027.

Also since the publishing of the draft report, the City of Fort Worth has contacted TNP to express that they feel they were misquoted in the report when it state that Fort Worth could provide service in a timely manner if wastewater was delivered to the Jenkins Lift Station in Fort Worth. Fort Worth may not be able to upgrade their system from the Jenkins Lift Station to their Village Creek Plant without cost being assessed to the requesting

customer. If this is verified, then the results for costs to Fort Worth could be increase substantially.

You may have also noticed the pair of articles in the Fort Worth Star-Telegram yesterday regarding the Tarrant Regional Water District. In short, TRWD has agreed to perform quality studies pertaining to scenario effluent. TRWD also appears to be concerned with the amount of water that would not be recycled to Eagle Mountain Lake should treatment by Fort Worth take place.

Attached is a table summarizing the revised report findings. This report, and these findings, are still in draft phase. This report only addresses treatment plant cost, cost of trunk mains for main creek tributaries (not minor collectors) and operation/maintenance costs. Based on these findings, it appears that some form of regionalization would be most beneficial the study area as a whole. It also appears the service to Fort Worth would be most cost effective provided upgrades downstream of Jenkins Lift Station can be excluded.

Although the present value of capital and O&M costs for the total of all treatment plant systems for each of the three scenarios does not change dramatically, it should be noted that the average cost per customer for the total of all customers reduces as the number of plants are reduced.

Thank you for your attendance at tonights meeting. We will look forward to your continued comments and suggestions as we strive to improve life for the citizens of our area.

## Report Summary of Studied Service Options

	Total Present Value		Monthly Cost				2027 Treatment	
	Partial	Full	Per Customer Partial	Per Customer Full	Average Population Partial	Average Population Full	Plant Capacity, (mgd) Partial	Plant Capacity, (mgd) Full
<b>Scenario 1</b>								
Springtown	\$11,244,808	\$22,078,221	\$63.70	\$77.21	5572	8695	2.50	3.60
Reno	\$2,794,843	\$5,380,133	\$188.76	\$86.09	670	3053	0.25	0.66
Azle	\$34,097,169	\$34,097,169	\$32.03	\$32.03	23917	23917	6.40	6.40
<b>TOTAL</b>	<b>\$48,136,820</b>	<b>\$61,555,523</b>	<b>\$41.36</b>	<b>\$47.67</b>	<b>30159</b>	<b>35665</b>	<b>9.15</b>	<b>10.66</b>
<b>Scenario 2</b>								
Reno	\$14,537,410	\$30,075,821	\$70.73	\$75.19	6222	11748	2.67	4.42
Azle	\$34,097,169	\$34,097,169	\$32.03	\$32.03	23917	23917	6.40	6.40
<b>TOTAL</b>	<b>\$48,634,579</b>	<b>\$64,172,990</b>	<b>\$40.02</b>	<b>\$46.25</b>	<b>30139</b>	<b>35665</b>	<b>9.07</b>	<b>10.82</b>
<b>Scenario 3</b>								
Azle	\$48,734,158	\$63,589,188	\$37.80	\$39.82	30146	35981	8.78	10.57
<b>Scenario 4</b>								
Fort Worth	\$34,329,556	\$48,300,011	\$22.94	\$26.38	30135	35573	0.00	0.00

**Scenario 1 - Plant 1 - Partial Option - Springtown Only**

Plant at western edge of Reno to serve Springtown, Springtown ETJ, and SE Pipe Area

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Pop/Infls Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1989)	Capital Costs Collection System (\$ 1989)	Total Capital Costs (\$ 1989)	Interest Rate	Term (Years)	Loan Factor	Capital Recovery Factor	OBM Cost Per 1000 Gallons	Total Annual Cost (\$/Year)	Annual OBM Cost (\$/Year)	Annual Capital Cost (\$/Year)	Monthly Household Cost (\$/Month)	Persons Per Household
1987	Start Program	0.26	0.26	2645	0.26	0.43	\$0	\$0	\$0	8.00%	20	0.1018	1.88	\$297,839	\$1,112,419	\$322	\$316	2.54	
1988		0.26	0.26	2837	0.30	0.44	\$0	\$0	\$0					\$202,841	\$1,147,471	\$306	\$278		
1989		0.26	0.26	3074	0.31	0.46	\$0	\$0	\$0					\$227,260	\$1,171,750	\$300	\$263		
2000		0.26	0.26	3185	0.32	0.48	\$0	\$0	\$0					\$353,037	\$1,184,087	\$286	\$260		
2001		0.28	0.28	3321	0.33	0.50	\$0	\$0	\$0					\$31,027	\$1,228,487	\$281	\$248		
2002	New 1.15 mgd Plant, SS Line 9	1.42	1.07	3453	0.35	0.52	\$1,270,864	\$6,109,415	\$7,380,269					\$412,805	\$1,257,133	\$288	\$222		
2003	Add SS Line 17	1.42	1.07	3764	0.38	0.56	\$428,588	\$381,561	\$844,350					\$441,958	\$1,290,277	\$284	\$222		
2004	Take Existing Plant Off-Line	1.18	0.87	4051	0.41	0.61	\$0	\$0	\$0					\$344,530	\$1,384,784	\$279	\$214		
2005		1.18	0.87	4205	0.42	0.63	\$0	\$0	\$0					\$344,530	\$1,466,564	\$278	\$202		
2006		1.18	0.87	4371	0.44	0.66	\$0	\$0	\$0					\$344,530	\$1,551,771	\$275	\$187		
2007		1.18	0.87	4540	0.45	0.68	\$0	\$0	\$0					\$344,530	\$1,639,587	\$273	\$164		
2008		1.18	0.87	4718	0.47	0.71	\$0	\$0	\$0					\$344,530	\$1,730,333	\$272	\$141		
2009		1.18	0.87	4896	0.48	0.73	\$0	\$0	\$0					\$344,530	\$1,823,808	\$272	\$118		
2010		1.18	0.87	5080	0.51	0.76	\$0	\$0	\$0					\$344,530	\$1,919,816	\$272	\$95		
2011		1.18	0.87	5271	0.53	0.82	\$0	\$0	\$0					\$344,530	\$2,018,533	\$272	\$72		
2012		1.18	0.87	5468	0.55	0.86	\$0	\$0	\$0					\$344,530	\$2,119,883	\$272	\$49		
2013		1.18	0.87	5672	0.59	0.89	\$0	\$0	\$0					\$344,530	\$2,223,874	\$272	\$26		
2014		1.18	0.87	5883	0.62	0.92	\$0	\$0	\$0					\$344,530	\$2,331,403	\$272	\$3		
2015		1.18	0.87	6099	0.64	0.96	\$0	\$0	\$0					\$344,530	\$2,442,628	\$272	\$0		
2016		1.18	0.87	6327	0.66	1.00	\$0	\$0	\$0					\$344,530	\$2,557,658	\$272	\$0		
2017		1.18	0.87	6566	0.69	1.04	\$0	\$0	\$0					\$344,530	\$2,676,493	\$272	\$0		
2018		1.18	0.87	6816	0.72	1.08	\$0	\$0	\$0					\$344,530	\$2,800,043	\$272	\$0		
2019		1.18	0.87	7077	0.75	1.12	\$0	\$0	\$0					\$344,530	\$2,928,308	\$272	\$0		
2020		1.18	0.87	7349	0.77	1.16	\$0	\$0	\$0					\$344,530	\$3,061,288	\$272	\$0		
2021		1.18	0.87	7633	0.80	1.21	\$0	\$0	\$0					\$344,530	\$3,200,083	\$272	\$0		
2022	Add 1.34 mgd to Plant	2.50	1.88	8044	0.84	1.25	\$3,222,827	\$14,178,268	\$17,401,095					\$1,474,748	\$2,807,061	\$360	\$416		
2023		2.50	1.88	8357	0.87	1.30	\$0	\$0	\$0					\$1,474,748	\$2,967,001	\$360	\$416		
2024		2.50	1.88	8683	0.87	1.35	\$0	\$0	\$0					\$1,474,748	\$3,132,221	\$361	\$417		
2025		2.50	1.88	9021	0.90	1.35	\$0	\$0	\$0					\$1,474,748	\$3,284,828	\$352	\$420		
2026		2.50	1.88	9373	0.94	1.41	\$0	\$0	\$0					\$1,474,748	\$3,454,410	\$354	\$425		
2027	TOTALS for Planning Period (1987 - 2027)	Avg =	Avg =	5572	0.94	1.41	\$10,091,848	\$1,887,462	\$11,979,310					\$1,474,748	\$22,638,788	Average	\$254	\$425	
2028		2.50	1.88	9846	1.00	1.50	\$11,244,808	\$22,771,818	\$34,016,626					\$1,474,748	\$24,511,416	Average	\$254	\$425	

Present Value (in 1989 dollars) of all costs during planning period (1987-2027) = \$11,244,808  
Calculations represent new expenditures only.

JAN 23 1997



**Scenario 1 - Plant 1 - Full Option - Springtown/County**

Plant at western edge of Rose to serve Springtown and Western County/Watershed

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1986)	Capital Costs Collection System (\$ 1986)	Total Capital Costs (\$ 1986)	Interest Rate	Loan Term (Years)	Capital Recovery Factor	CIAM Cost Per 1000 Gallons	Total Annual Cost (\$/Share)	Annual Cost Per Capita (\$/Share)	Annual Cost Per Household	Month Household Cost (\$/Share)
1997	Start Program	0.26	0.20	2845	0.26	0.43	\$0	\$0	\$0	8.00%	20	0.1018	1.47	\$2,400,141	\$905	\$1,768	\$147.14
1998		0.26	0.20	2907	0.30	0.44	\$0	\$0	\$0					\$2,420,811	\$947	\$1,646	\$137.05
1999		0.26	0.20	3074	0.31	0.46	\$0	\$0	\$0					\$2,452,080	\$929	\$1,587	\$133.10
2000		0.26	0.20	3165	0.32	0.48	\$0	\$0	\$0					\$2,725,451	\$172	\$945	\$78.71
2001		0.29	0.20	3321	0.33	0.50	\$0	\$0	\$0					\$2,785,056	\$358	\$930	\$77.46
2002	New 1.87 Plant, Line 9, County	2.13	1.60	3453	0.35	0.52	\$1,270,864	\$1,967,048	\$9,574,739					\$2,809,296	\$380	\$915	\$76.29
2003	Add Line 17	1.87	1.40	3754	0.38	0.58	\$428,588	\$0	\$961,881					\$2,850,656	\$356	\$902	\$74.19
2004	Take Existing Plant Off-Line	1.87	1.40	3800	0.39	0.58	\$0	\$0	\$11,271,440					\$2,808,638	\$350	\$890	\$73.26
2005	Add Lines 11-16	1.87	1.40	7329	0.73	1.10	\$0	\$0	\$0					\$2,900,569	\$348	\$879	\$72.40
2006		1.87	1.40	7558	0.78	1.17	\$0	\$0	\$0					\$3,018,038	\$342	\$859	\$71.82
2007		1.87	1.40	7785	0.80	1.21	\$0	\$0	\$0					\$3,147,593	\$339	\$851	\$70.82
2008		1.87	1.40	8040	0.83	1.24	\$0	\$0	\$0					\$3,218,390	\$332	\$844	\$70.30
2009		1.87	1.40	8255	0.86	1.28	\$0	\$0	\$0					\$3,296,816	\$330	\$837	\$69.78
2010		1.87	1.40	8484	0.94	1.37	\$0	\$0	\$0					\$3,378,373	\$327	\$831	\$69.28
2011		1.87	1.40	8694	0.97	1.46	\$0	\$0	\$0					\$3,464,383	\$326	\$827	\$68.81
2012		1.87	1.40	8903	1.00	1.55	\$0	\$0	\$0					\$3,554,042	\$324	\$823	\$68.60
2013		1.87	1.40	9103	1.03	1.63	\$0	\$0	\$0					\$3,646,818	\$323	\$821	\$68.38
2014		1.87	1.40	9294	1.07	1.70	\$0	\$0	\$0					\$3,741,262	\$322	\$818	\$68.17
2015		1.87	1.40	9484	1.11	1.76	\$0	\$0	\$0					\$3,837,774	\$322	\$816	\$67.97
2016		1.87	1.40	9674	1.15	1.81	\$0	\$0	\$0					\$3,935,951	\$321	\$815	\$67.77
2017		1.87	1.40	9864	1.19	1.87	\$0	\$0	\$18,873,215					\$4,035,876	\$320	\$815	\$67.62
2018		1.87	1.40	10053	1.22	1.93	\$0	\$0	\$0					\$4,137,245	\$318	\$814	\$67.50
2019		1.87	1.40	10243	1.25	2.00	\$0	\$0	\$0					\$4,240,448	\$318	\$814	\$67.39
2020		1.87	1.40	10433	1.29	2.06	\$0	\$0	\$0					\$4,348,862	\$318	\$814	\$67.28
2021		1.87	1.40	10624	1.33	2.13	\$0	\$0	\$0					\$4,462,168	\$318	\$814	\$67.18
2022	Add 1.73 mgd to Plant	3.60	2.70	12868	1.42	2.20	\$8,013,848	\$0	\$18,873,215					\$4,571,654	\$317	\$814	\$67.04
2023		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$4,684,037	\$317	\$814	\$66.92
2024		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$4,796,284	\$317	\$814	\$66.82
2025		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$4,908,441	\$317	\$814	\$66.72
2026		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$5,020,600	\$317	\$814	\$66.62
2027		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$5,132,761	\$317	\$814	\$66.52
2028		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$5,244,922	\$317	\$814	\$66.42
2029		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$5,357,083	\$317	\$814	\$66.32
2030		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$5,469,244	\$317	\$814	\$66.22
2031		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$5,581,405	\$317	\$814	\$66.12
2032		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$5,693,566	\$317	\$814	\$66.02
2033		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$5,805,727	\$317	\$814	\$65.92
2034		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$5,917,888	\$317	\$814	\$65.82
2035		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$6,030,049	\$317	\$814	\$65.72
2036		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$6,142,210	\$317	\$814	\$65.62
2037		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$6,254,371	\$317	\$814	\$65.52
2038		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$6,366,532	\$317	\$814	\$65.42
2039		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$6,478,693	\$317	\$814	\$65.32
2040		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$6,590,854	\$317	\$814	\$65.22
2041		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$6,703,015	\$317	\$814	\$65.12
2042		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$6,815,176	\$317	\$814	\$65.02
2043		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$6,927,337	\$317	\$814	\$64.92
2044		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$7,039,498	\$317	\$814	\$64.82
2045		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$7,151,659	\$317	\$814	\$64.72
2046		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$7,263,820	\$317	\$814	\$64.62
2047		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$7,375,981	\$317	\$814	\$64.52
2048		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$7,488,142	\$317	\$814	\$64.42
2049		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$7,600,303	\$317	\$814	\$64.32
2050		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$7,712,464	\$317	\$814	\$64.22
2051		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$7,824,625	\$317	\$814	\$64.12
2052		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$7,936,786	\$317	\$814	\$64.02
2053		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$8,048,947	\$317	\$814	\$63.92
2054		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$8,161,108	\$317	\$814	\$63.82
2055		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$8,273,269	\$317	\$814	\$63.72
2056		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$8,385,430	\$317	\$814	\$63.62
2057		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$8,497,591	\$317	\$814	\$63.52
2058		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$8,609,752	\$317	\$814	\$63.42
2059		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$8,721,913	\$317	\$814	\$63.32
2060		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$8,834,074	\$317	\$814	\$63.22
2061		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$8,946,235	\$317	\$814	\$63.12
2062		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$9,058,396	\$317	\$814	\$63.02
2063		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$9,170,557	\$317	\$814	\$62.92
2064		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$9,282,718	\$317	\$814	\$62.82
2065		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$9,394,879	\$317	\$814	\$62.72
2066		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$9,507,040	\$317	\$814	\$62.62
2067		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$9,619,201	\$317	\$814	\$62.52
2068		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$9,731,362	\$317	\$814	\$62.42
2069		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$9,843,523	\$317	\$814	\$62.32
2070		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$9,955,684	\$317	\$814	\$62.22
2071		3.60	2.70	12868	1.47	2.20	\$0	\$0	\$0					\$10,067,845	\$317	\$814	\$62.12
2072		3.60	2.70														

**Scenario 1 - Plant 2 - Partial Option - Reno Downtown**

Plant at eastern edge of Reno to serve "Downtown" Reno and portions of Reno along Walker Creek

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1986)	Capital Costs Collection System (\$ 1986)	Total Capital Costs (\$ 1986)	Interest Rate	Loan Term (Years)	Capital Recovery Factor	OSM Cost Per 1000 Gallons	Total Annual Cost (\$/Share)	Annual Cost Per Capita (\$/Share)	Monthly Household Cost (\$/Share)	Persons Per Household
1987	Start Program	0	0.00	0	0.00	0.00	\$0	\$0	\$0	8.00%	20	0.1018	2.30	\$0	\$0	\$0	2.54
1988		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$0	\$0	\$0	
1989		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$0	\$0	\$0	
2000		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$0	\$0	\$0	
2001		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$0	\$0	\$0	
2002	Build 25 mgd Plant + Lines 5, 8b	0.25	0.18	877	0.07	0.10	\$3,824,683	\$1,842,844	\$5,467,337					\$74,808	\$74,808	\$74,808	
2003		0.25	0.18	886	0.07	0.10	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2004		0.25	0.18	895	0.07	0.11	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2005		0.25	0.18	713	0.07	0.11	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2006		0.25	0.18	722	0.07	0.11	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2007		0.25	0.18	731	0.07	0.11	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2008		0.25	0.18	741	0.07	0.11	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2009		0.25	0.18	750	0.08	0.11	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2010		0.25	0.18	760	0.08	0.11	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2011		0.25	0.18	770	0.08	0.12	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2012		0.25	0.18	780	0.08	0.12	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2013		0.25	0.18	790	0.08	0.12	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2014		0.25	0.18	800	0.08	0.12	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2015		0.25	0.18	810	0.08	0.12	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2016		0.25	0.18	821	0.08	0.12	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2017		0.25	0.18	831	0.08	0.12	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2018		0.25	0.18	842	0.08	0.13	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2019		0.25	0.18	853	0.09	0.13	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2020		0.25	0.18	864	0.09	0.13	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2021		0.25	0.18	875	0.09	0.13	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2022		0.25	0.18	886	0.09	0.13	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2023		0.25	0.18	896	0.09	0.13	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2024		0.25	0.18	909	0.09	0.14	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2025		0.25	0.18	921	0.09	0.14	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2026		0.25	0.18	933	0.09	0.14	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
2027		0.25	0.18	945	0.09	0.14	\$0	\$0	\$0					\$704,808	\$704,808	\$704,808	
<b>TOTALS for Planning Period (1987 - 2027)</b>			<b>Avg</b>	<b>878</b>	<b>0.08</b>	<b>0.14</b>	<b>\$3,824,683</b>	<b>\$1,842,844</b>	<b>\$5,467,337</b>					<b>\$14,884,728</b>	<b>\$14,884,728</b>	<b>\$14,884,728</b>	<b>Average</b>
2042		0.25	0.18	1130	0.11	0.17											

Present Value (in 1986 dollars) of all costs during planning period (1987-1927) = \$9,794,445  
Calculations represent new expenditures only.

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### Scenario 1 - Plant 2 - Full Option - Reno and Mid County

Plant at eastern edge of Reno to serve Reno and portions of the County downstream of the Spingtown Plant

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Populatio Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Treatment Plant (\$ 1999)	Capital Costs Collection System (\$ 1999)	Interest Rate 4.00%	Interest Rate 8.00%	Lean Term (Years)	Capital Recovery Factor 0.1018	Annual O&M Cost Per 1000 Gallons	Total Annual Cost (\$/Share)	Annual O&M Cost (\$/Share)	Annual Cost Per Capita (\$/Share)	Persons Per Household 2.54	Monthly Household Cost (\$/Share)
1987	Start Program	0	0.00	0	0.00	0.00	\$0	\$0	\$0	\$0	20	0.1018	\$0	\$0	\$0	\$0	2.54	\$0
1988		0	0.00	0	0.00	0.00	\$0	\$0	\$0	\$0			\$0	\$0	\$0	\$0		\$0
1989		0	0.00	0	0.00	0.00	\$0	\$0	\$0	\$0			\$0	\$0	\$0	\$0		\$0
2000		0	0.00	0	0.00	0.00	\$0	\$0	\$0	\$0			\$0	\$0	\$0	\$0		\$0
2001		0	0.00	0	0.00	0.00	\$0	\$0	\$0	\$0			\$0	\$0	\$0	\$0		\$0
2002	Build 86 mgd Plant + Lines 4, 5b	86	0.50	877	0.07	0.07	\$1,642,844	\$3,860,956	\$3,860,956	\$7,036,353			\$63,473	\$1,008,481	\$1,490	\$3,784		\$316.30
2003	Add Lines 5-7	86	0.50	3158	0.22	0.22	\$1,703,614	\$1,703,614	\$1,703,614	\$2,241,440			\$307,964	\$1,252,972	\$397	\$1,008		\$83.87
2004		86	0.50	3203	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,259,806	\$390	\$1,007		\$83.81
2005		86	0.50	3248	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,257,502	\$387	\$1,007		\$83.80
2006		86	0.50	3294	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,258,293	\$387	\$1,007		\$83.84
2007		86	0.50	3341	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,259,084	\$387	\$1,008		\$84.02
2008		86	0.50	3388	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,259,875	\$388	\$1,010		\$84.15
2009		86	0.50	3439	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,260,666	\$388	\$1,012		\$84.33
2010		86	0.50	3484	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,261,457	\$389	\$1,014		\$84.51
2011		86	0.50	3534	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,262,248	\$389	\$1,016		\$84.69
2012		86	0.50	3584	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,263,039	\$390	\$1,018		\$84.87
2013		86	0.50	3635	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,263,830	\$390	\$1,020		\$85.05
2014		86	0.50	3686	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,264,621	\$391	\$1,022		\$85.23
2015		86	0.50	3738	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,265,412	\$391	\$1,024		\$85.41
2016		86	0.50	3792	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,266,203	\$392	\$1,026		\$85.59
2017		86	0.50	3846	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,267,000	\$392	\$1,028		\$85.77
2018		86	0.50	3900	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,267,800	\$393	\$1,030		\$85.95
2019		86	0.50	3955	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,268,600	\$393	\$1,032		\$86.13
2020		86	0.50	4012	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,269,400	\$394	\$1,034		\$86.31
2021		86	0.50	4070	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,270,200	\$394	\$1,036		\$86.49
2022		86	0.50	4128	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,271,000	\$395	\$1,038		\$86.67
2023		86	0.50	4187	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,271,800	\$395	\$1,040		\$86.85
2024		86	0.50	4246	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,272,600	\$396	\$1,042		\$87.03
2025		86	0.50	4307	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,273,400	\$396	\$1,044		\$87.21
2026		86	0.50	4369	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,274,200	\$397	\$1,046		\$87.39
2027		86	0.50	4431	0.22	0.22	\$0	\$0	\$0	\$0			\$346,008	\$1,275,000	\$397	\$1,048		\$87.57
	<b>TOTALS for Planning Period (1987 - 2027)</b>		<b>Avg</b>	<b>3953</b>	<b>0.22</b>	<b>0.22</b>	<b>\$5,819,312</b>	<b>\$5,819,312</b>	<b>\$7,264,679</b>	<b>\$9,276,523</b>			<b>\$16,794,581</b>	<b>\$18,908,151</b>	<b>\$250</b>	<b>\$635</b>	<b>Average</b>	<b>\$88.89</b>
2042		86	0.50	6463	0.55	0.55												

Present Value (in 1999 dollars) of all costs during planning period (1987-1927) = \$6,399,193  
 Calculations represent new expenditures only.

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### Scenario 1 - Plant 3 - Azle

Plant at Azle Ash Creek to serve Azle, Pellen Bay and Samsbury

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1986)	Capital Costs Collection System (\$ 1986)	Total Capital Costs (\$ 1986)	Interest Rate	Loan Term (Years)	Capital Recovery Factor	O&M Cost Per 1000 Gallons	Total Annual Cost (\$/Year)	Annual Capital Cost (\$/Year)	Annual Cost Per Household (\$/Year)	Persons Per Household	
1987	Start Program	1.74	1.31	11853	1.19	1.78	\$0	\$0	\$0	8.00%	20	0.1019	\$700,490	\$2,602,138	\$179	\$454	2.54	
1988	Add Lines 1,2,6,3 (Sanc., P.B. ETJ)	1.74	1.31	14544	1.43	2.18	\$3,735,600	\$1,735,600	\$5,471,200	8.00%	20	0.1019	\$753,957	\$2,655,698	\$176	\$446	2.54	
1989		1.74	1.31	15042	1.51	2.26	\$0	\$0	\$0	8.00%	20	0.1019	\$811,505	\$2,713,164	\$174	\$442	2.54	
2000		1.74	1.31	15578	1.56	2.34	\$0	\$0	\$0	8.00%	20	0.1019	\$873,447	\$2,775,098	\$172	\$437	2.54	
2001		1.74	1.31	16122	1.61	2.42	\$0	\$0	\$0	8.00%	20	0.1019	\$940,118	\$2,841,768	\$170	\$433	2.54	
2002	Add 4.68 mgd, Mottball W.C.	6.40	4.80	18655	1.87	2.50	\$11,562,493	\$14,630,242	\$26,192,735	8.00%	20	0.1019	\$1,011,678	\$2,813,528	\$186	\$428	2.54	
2003		6.40	4.80	19258	1.73	2.58	\$0	\$0	\$0	8.00%	20	0.1019	\$1,088,116	\$2,890,784	\$187	\$425	2.54	
2004		6.40	4.80	19771	1.78	2.66	\$0	\$0	\$0	8.00%	20	0.1019	\$1,172,260	\$2,973,699	\$189	\$422	2.54	
2005		6.40	4.80	18496	1.85	2.77	\$0	\$0	\$0	8.00%	20	0.1019	\$1,261,332	\$3,063,308	\$185	\$420	2.54	
2006		6.40	4.80	19142	1.91	2.87	\$0	\$0	\$0	8.00%	20	0.1019	\$1,354,044	\$3,159,603	\$185	\$418	2.54	
2007		6.40	4.80	19810	1.98	2.97	\$0	\$0	\$0	8.00%	20	0.1019	\$1,451,789	\$3,263,358	\$184	\$417	2.54	
2008		6.40	4.80	20503	2.05	3.08	\$0	\$0	\$0	8.00%	20	0.1019	\$1,553,288	\$3,374,037	\$184	\$416	2.54	
2009		6.40	4.80	21219	2.12	3.18	\$0	\$0	\$0	8.00%	20	0.1019	\$1,659,388	\$3,492,001	\$185	\$416	2.54	
2010		6.40	4.80	21960	2.20	3.29	\$0	\$0	\$0	8.00%	20	0.1019	\$1,770,862	\$3,617,001	\$186	\$416	2.54	
2011		6.40	4.80	22844	2.25	3.38	\$0	\$0	\$0	8.00%	20	0.1019	\$1,887,841	\$3,749,789	\$187	\$422	2.54	
2012		6.40	4.80	23294	2.32	3.48	\$0	\$0	\$0	8.00%	20	0.1019	\$2,010,549	\$3,888,979	\$186	\$422	2.54	
2013		6.40	4.80	23848	2.39	3.59	\$0	\$0	\$0	8.00%	20	0.1019	\$2,139,849	\$4,034,980	\$186	\$422	2.54	
2014		6.40	4.80	24600	2.47	3.70	\$0	\$0	\$0	8.00%	20	0.1019	\$2,275,140	\$4,188,789	\$187	\$425	2.54	
2015		6.40	4.80	25454	2.55	3.82	\$0	\$0	\$0	8.00%	20	0.1019	\$2,416,047	\$4,349,688	\$186	\$422	2.54	
2016		6.40	4.80	26246	2.62	3.94	\$0	\$0	\$0	8.00%	20	0.1019	\$2,562,054	\$4,518,034	\$170	\$432	2.54	
2017		6.40	4.80	27087	2.71	4.06	\$0	\$0	\$0	8.00%	20	0.1019	\$2,713,855	\$4,694,201	\$172	\$439	2.54	
2018		6.40	4.80	27918	2.79	4.19	\$0	\$0	\$0	8.00%	20	0.1019	\$2,871,013	\$4,876,013	\$168	\$439	2.54	
2019		6.40	4.80	28785	2.88	4.32	\$0	\$0	\$0	8.00%	20	0.1019	\$3,034,208	\$5,062,328	\$110	\$278	2.54	
2020		6.40	4.80	29704	2.97	4.46	\$0	\$0	\$0	8.00%	20	0.1019	\$3,203,654	\$5,252,554	\$114	\$290	2.54	
2021		6.40	4.80	30648	3.06	4.60	\$0	\$0	\$0	8.00%	20	0.1019	\$3,389,654	\$5,447,054	\$118	\$302	2.54	
2022		6.40	4.80	31563	3.16	4.74	\$0	\$0	\$0	8.00%	20	0.1019	\$3,582,655	\$5,645,655	\$123	\$314	2.54	
2023		6.40	4.80	32574	3.26	4.89	\$0	\$0	\$0	8.00%	20	0.1019	\$3,783,195	\$5,848,195	\$128	\$328	2.54	
2024		6.40	4.80	33568	3.36	5.04	\$0	\$0	\$0	8.00%	20	0.1019	\$4,000,603	\$6,065,603	\$134	\$338	2.54	
2025		6.40	4.80	34601	3.47	5.20	\$0	\$0	\$0	8.00%	20	0.1019	\$4,234,813	\$6,299,813	\$139	\$353	2.54	
2026		6.40	4.80	35700	3.58	5.36	\$0	\$0	\$0	8.00%	20	0.1019	\$4,486,813	\$6,542,813	\$144	\$367	2.54	
2027		6.40	4.80	36895	3.69	5.53	\$0	\$0	\$0	8.00%	20	0.1019	\$4,757,317	\$6,794,317	\$150	\$382	2.54	
TOTALS for Planning Period (1987 - 2027)			Average	28917	3.09	5.53	\$11,562,493	\$14,735,600	\$26,298,093					\$71,978,290	\$38,332,974	\$150	Average	
2042		6.40	4.80	42688	4.27	8.40	\$84,067,100	\$0	\$84,067,100									

Present Value (in 1986 dollars) of all costs during planning period (1987-1927) =  
Calculations represent new expenditures only.

JAN 23 1997

### Scenario 2 - Plant 1 - Partial Option - Downtown Reno/Springtown

Plant at eastern edge of Reno to serve Downtown Reno and Springtown

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1988)	Capital Costs Collection System (\$ 1988)	Total Capital Costs (\$ 1988)	Interest Rate 8.00%	Loan Term (Years) 20	Capital Recovery Factor 0.1018	O&M Cost Per 1000 Gallons 1.62	Total Annual Cost (\$Millions)	Annual Cost Per Capita (\$Million)	Annual Cost Per Household (\$Million)	Persons Per Household 2.54
1987	Start Program	0.28	0.20	2845	0.28	0.43	\$0	\$0	\$0					\$253,387	\$438	\$1,107	922.28
1988		0.28	0.20	2957	0.30	0.44	\$0	\$0	\$0					\$345,480	\$284	\$225	\$77.88
1989		0.28	0.20	3074	0.31	0.46	\$0	\$0	\$0					\$371,782	\$358	\$268	\$75.70
2000		0.28	0.20	3185	0.32	0.48	\$0	\$0	\$0					\$400,122	\$352	\$283	\$74.42
2001		0.28	0.20	3321	0.33	0.50	\$0	\$0	\$0					\$430,662	\$348	\$279	\$73.22
2002	New 1.29 Plant, Add Lines to, 8.9, 10	1.55	1.18	4448	0.44	0.53	\$5,121,121	\$4,300,018	\$9,421,139	8%	\$11,820,746	\$1,271,330	\$253,387	\$1,534,718	\$341	\$265	\$72.11
2003	Add SS Line 17	1.26	0.97	4584	0.46	0.69	\$0	\$0	\$0					\$483,574	\$341	\$265	\$72.11
2004	Take Existing Springtown Plant Off-Line	1.26	0.97	4764	0.48	0.71	\$0	\$0	\$0					\$488,044	\$338	\$265	\$71.06
2005		1.26	0.97	4820	0.48	0.74	\$0	\$0	\$0					\$498,044	\$331	\$265	\$70.15
2006		1.26	0.97	5093	0.51	0.76	\$0	\$0	\$0					\$537,274	\$327	\$265	\$69.31
2007		1.26	0.97	5271	0.53	0.79	\$0	\$0	\$0					\$578,482	\$324	\$265	\$68.54
2008		1.26	0.97	5437	0.55	0.82	\$0	\$0	\$0					\$622,892	\$321	\$265	\$67.87
2009		1.26	0.97	5619	0.58	0.88	\$0	\$0	\$0					\$670,787	\$318	\$265	\$67.28
2010		1.26	0.97	5819	0.61	0.91	\$0	\$0	\$0					\$724,412	\$316	\$265	\$66.78
2011		1.26	0.97	6037	0.63	0.94	\$0	\$0	\$0					\$784,071	\$314	\$265	\$66.31
2012		1.26	0.97	6272	0.66	0.97	\$0	\$0	\$0					\$850,083	\$312	\$265	\$65.84
2013		1.26	0.97	6495	0.68	1.01	\$0	\$0	\$0					\$924,576	\$311	\$265	\$65.40
2014		1.26	0.97	6727	0.67	1.05	\$0	\$0	\$0					\$1,007,818	\$310	\$265	\$65.00
2015		1.26	0.97	6998	0.70	1.08	\$0	\$0	\$0					\$1,100,000	\$310	\$265	\$64.65
2016		1.26	0.97	7218	0.72	1.12	\$0	\$0	\$0					\$1,202,289	\$310	\$265	\$64.31
2017		1.26	0.97	7477	0.75	1.16	\$0	\$0	\$0					\$1,315,681	\$311	\$265	\$64.01
2018		1.26	0.97	7767	0.77	1.18	\$0	\$0	\$0					\$1,440,219	\$311	\$265	\$63.72
2019		1.26	0.97	8028	0.80	1.20	\$0	\$0	\$0					\$1,577,000	\$311	\$265	\$63.46
2020		1.26	0.97	8316	0.83	1.25	\$0	\$0	\$0					\$1,726,219	\$311	\$265	\$63.21
2021		1.26	0.97	8617	0.86	1.29	\$0	\$0	\$0					\$1,888,000	\$311	\$265	\$62.96
2022	Add 1.38 mgd to plant	2.67	2.00	8830	0.88	1.34	\$5,305,762	\$0	\$5,305,762	8%	\$14,704,464	\$1,497,882	\$24,408,898	\$342	\$265	\$72.48	
2023		2.67	2.00	9255	0.93	1.39	\$0	\$0	\$0					\$2,686,822	\$341	\$265	\$72.18
2024		2.67	2.00	9692	0.96	1.44	\$0	\$0	\$0					\$3,000,705	\$342	\$265	\$71.93
2025		2.67	2.00	9942	0.98	1.48	\$0	\$0	\$0					\$3,344,387	\$342	\$265	\$71.68
2026		2.67	2.00	10305	1.03	1.55	\$0	\$0	\$0					\$3,720,484	\$345	\$265	\$71.43
2027		2.67	2.00	10702	1.03	1.55	\$0	\$0	\$0					\$4,134,887	\$345	\$265	\$71.18
TOTALS for Planning Period (1987 - 2027)																	
2042		2.67	2.00	17777	1.78	2.87	\$10,424,888	\$4,726,898	\$15,151,488	8%	\$27,189,871	\$3,412,887	\$24,408,898	\$345	\$265	\$70.93	\$78.23

Present Value (in 1988 dollars) of all costs during planning period (1987-2027) = \$14,597,418  
 Calculations represent new expenditures only.

JAN 23 1997

### Scenario 2 - Plant 1 - Full Option - Reno/Springtown

Plant at western edge of Reno to serve Reno, Springtown and County

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1988)	Capital Costs Collection System (\$ 1988)	Inflation Rate 4.00%	Interest Rate 8.00%	Loan Term (Years) 20	Capital Recovery Factor 0.1019	O&M Cost Per 1000 Gallons 1.38	Total Annual Cost (\$/Share)	Annual Cost Per Capita (\$/Share)	Annual Cost Per Household (\$/Share)	Persons Per Household 2.54
1987	Start Program	0.26	0.20	2645	0.28	0.43	\$0	\$0						\$3,298,148	\$776	\$1,972	\$164.33
1988		0.26	0.20	2957	0.30	0.44	\$0	\$0						\$3,401,143	\$482	\$1,250	\$104.14
1989		0.26	0.20	3074	0.31	0.46	\$0	\$0						\$3,432,864	\$483	\$1,228	\$102.29
1990		0.26	0.20	3195	0.32	0.46	\$0	\$0						\$3,501,258	\$350	\$689	\$74.07
2001		0.26	0.20	3321	0.33	0.50	\$0	\$0						\$3,752,983	\$346	\$378	\$73.18
2002	New 2.48 Plant, Add Lines to, 8, 9, 10	2.75	2.06	6913	0.69	1.04	\$7,253,948	\$4,300,018	4.00%	8.00%	20	0.1019	1.38	\$3,806,431	\$342	\$888	\$72.39
2003	Add Lines 6-7, 17	2.48	1.87	7103	0.71	1.07	\$0	\$0						\$3,883,889	\$335	\$830	\$70.89
2004	Take Existing Springtown Plant Off-Line	2.48	1.87	10677	1.06	1.50	\$0	\$0						\$3,883,889	\$335	\$830	\$70.89
2005	Add Lines 11-16	2.48	1.87	11358	1.11	1.67	\$0	\$0						\$4,054,074	\$329	\$835	\$69.90
2006		2.48	1.87	11428	1.14	1.71	\$0	\$0						\$4,121,150	\$324	\$823	\$68.65
2007		2.48	1.87	11729	1.17	1.76	\$0	\$0						\$4,221,288	\$324	\$818	\$68.16
2008		2.48	1.87	12039	1.20	1.81	\$0	\$0						\$4,308,228	\$322	\$814	\$67.70
2009		2.48	1.87	12389	1.24	1.85	\$0	\$0						\$4,401,232	\$320	\$810	\$67.48
2010		2.48	1.87	12809	1.27	1.90	\$0	\$0						\$4,500,781	\$318	\$807	\$67.28
2011		2.48	1.87	13029	1.29	1.95	\$0	\$0						\$4,607,250	\$316	\$805	\$67.08
2012		2.48	1.87	13360	1.31	2.01	\$0	\$0						\$4,721,232	\$316	\$804	\$66.97
2013		2.48	1.87	13742	1.37	2.06	\$0	\$0						\$4,843,237	\$316	\$803	\$66.86
2014		2.48	1.87	14115	1.41	2.12	\$0	\$0						\$4,973,843	\$317	\$805	\$67.05
2015		2.48	1.87	14500	1.46	2.23	\$0	\$0						\$5,113,073	\$318	\$807	\$67.21
2016		2.48	1.87	14887	1.48	2.29	\$0	\$0						\$5,263,384	\$317	\$805	\$67.05
2017		2.48	1.87	15307	1.53	2.36	\$0	\$0						\$5,423,722	\$318	\$809	\$67.44
2018		2.48	1.87	15750	1.57	2.42	\$0	\$0						\$5,595,429	\$320	\$813	\$67.75
2019		2.48	1.87	16198	1.62	2.48	\$0	\$0						\$5,779,343	\$320	\$818	\$68.13
2020		2.48	1.87	16616	1.66	2.56	\$0	\$0						\$5,970,251	\$322	\$818	\$68.13
2021	Add 1.74 mgd to plant	4.42	3.32	17681	1.71	2.65	\$8,034,669	\$0						\$6,167,409	\$324	\$823	\$68.58
2022		4.42	3.32	18081	1.76	2.71	\$0	\$0						\$6,324,465	\$324	\$823	\$68.58
2023		4.42	3.32	18506	1.81	2.78	\$0	\$0						\$6,490,927	\$324	\$823	\$68.58
2024		4.42	3.32	18956	1.86	2.85	\$0	\$0						\$6,667,702	\$324	\$823	\$68.58
2025		4.42	3.32	19438	1.91	2.92	\$0	\$0						\$6,855,211	\$324	\$823	\$68.58
2026		4.42	3.32	19948	1.96	2.99	\$0	\$0						\$7,054,081	\$324	\$823	\$68.58
2027		4.42	3.32	20488	2.01	3.06	\$0	\$0						\$7,264,821	\$324	\$823	\$68.58
2028		4.42	3.32	21068	2.06	3.13	\$0	\$0						\$7,487,021	\$324	\$823	\$68.58
2029		4.42	3.32	21688	2.11	3.20	\$0	\$0						\$7,721,221	\$324	\$823	\$68.58
2030		4.42	3.32	22348	2.16	3.27	\$0	\$0						\$7,967,021	\$324	\$823	\$68.58
2031		4.42	3.32	23048	2.21	3.34	\$0	\$0						\$8,224,821	\$324	\$823	\$68.58
2032		4.42	3.32	23788	2.26	3.41	\$0	\$0						\$8,494,021	\$324	\$823	\$68.58
2033		4.42	3.32	24568	2.31	3.48	\$0	\$0						\$8,774,821	\$324	\$823	\$68.58
2034		4.42	3.32	25388	2.36	3.55	\$0	\$0						\$9,067,021	\$324	\$823	\$68.58
2035		4.42	3.32	26248	2.41	3.62	\$0	\$0						\$9,371,221	\$324	\$823	\$68.58
2036		4.42	3.32	27148	2.46	3.69	\$0	\$0						\$9,687,021	\$324	\$823	\$68.58
2037		4.42	3.32	28088	2.51	3.76	\$0	\$0						\$10,014,021	\$324	\$823	\$68.58
2038		4.42	3.32	29068	2.56	3.83	\$0	\$0						\$10,352,021	\$324	\$823	\$68.58
2039		4.42	3.32	30088	2.61	3.90	\$0	\$0						\$10,701,021	\$324	\$823	\$68.58
2040		4.42	3.32	31148	2.66	3.97	\$0	\$0						\$11,061,021	\$324	\$823	\$68.58
2041		4.42	3.32	32248	2.71	4.04	\$0	\$0						\$11,432,021	\$324	\$823	\$68.58
2042		4.42	3.32	33388	2.76	4.11	\$0	\$0						\$11,814,021	\$324	\$823	\$68.58
2043		4.42	3.32	34568	2.81	4.18	\$0	\$0						\$12,207,021	\$324	\$823	\$68.58
2044		4.42	3.32	35788	2.86	4.25	\$0	\$0						\$12,611,021	\$324	\$823	\$68.58
2045		4.42	3.32	37048	2.91	4.32	\$0	\$0						\$13,026,021	\$324	\$823	\$68.58
2046		4.42	3.32	38348	2.96	4.39	\$0	\$0						\$13,452,021	\$324	\$823	\$68.58
2047		4.42	3.32	39688	3.01	4.46	\$0	\$0						\$13,889,021	\$324	\$823	\$68.58
2048		4.42	3.32	41068	3.06	4.53	\$0	\$0						\$14,337,021	\$324	\$823	\$68.58
2049		4.42	3.32	42488	3.11	4.60	\$0	\$0						\$14,796,021	\$324	\$823	\$68.58
2050		4.42	3.32	43948	3.16	4.67	\$0	\$0						\$15,266,021	\$324	\$823	\$68.58
2051		4.42	3.32	45448	3.21	4.74	\$0	\$0						\$15,747,021	\$324	\$823	\$68.58
2052		4.42	3.32	46988	3.26	4.81	\$0	\$0						\$16,239,021	\$324	\$823	\$68.58
2053		4.42	3.32	48568	3.31	4.88	\$0	\$0						\$16,742,021	\$324	\$823	\$68.58
2054		4.42	3.32	50188	3.36	4.95	\$0	\$0						\$17,256,021	\$324	\$823	\$68.58
2055		4.42	3.32	51848	3.41	5.02	\$0	\$0						\$17,781,021	\$324	\$823	\$68.58
2056		4.42	3.32	53548	3.46	5.09	\$0	\$0						\$18,317,021	\$324	\$823	\$68.58
2057		4.42	3.32	55288	3.51	5.16	\$0	\$0						\$18,864,021	\$324	\$823	\$68.58
2058		4.42	3.32	57068	3.56	5.23	\$0	\$0						\$19,422,021	\$324	\$823	\$68.58
2059		4.42	3.32	58888	3.61	5.30	\$0	\$0						\$19,991,021	\$324	\$823	\$68.58
2060		4.42	3.32	60748	3.66	5.37	\$0	\$0						\$20,571,021	\$324	\$823	\$68.58
2061		4.42	3.32	62648	3.71	5.44	\$0	\$0						\$21,162,021	\$324	\$823	\$68.58
2062		4.42	3.32	64588	3.76	5.51	\$0	\$0						\$21,764,021	\$324	\$823	\$68.58
2063		4.42	3.32	66568	3.81	5.58	\$0	\$0						\$22,377,021	\$324	\$823	\$68.58
2064		4.42	3.32	68588	3.86	5.65	\$0	\$0						\$22,991,021	\$324	\$823	\$68.58
2065		4.42	3.32	70648	3.91	5.72	\$0	\$0						\$23,616,021	\$324	\$823	\$68.58
2066		4.42	3.32	72748	3.96	5.79	\$0	\$0						\$24,252,021	\$324	\$823	\$68.58
2067		4.42	3.32	74888	4.01	5.86	\$0	\$0						\$24,899,021	\$324	\$823	\$68.58
2068		4.42	3.32	77068	4.06	5.93	\$0	\$0						\$25,557,021	\$324	\$823	\$68.58
2069		4.42	3.32	79288	4.11	6.00	\$0	\$0						\$26,226,021	\$324	\$823	\$68.58
2070		4.42	3.32	81548	4.16	6.07	\$0	\$0						\$26,906,021	\$324	\$823	\$68.58
2071		4.42	3.32	83848	4.21	6.14	\$0	\$0						\$27,597,021	\$324	\$823	\$68.58
2072		4.42	3.32	86188	4.26	6.21	\$0	\$0						\$28,299,021	\$324	\$823	

### Scenario 2 - Plant 2 - Azle

Plant at Azle Fish Creek to serve Azle, Pelican Bay and Reservoir  
Assumes Walnut Creek Plant Taken Out of Service or used by Reno/Springtown (option)

Year	Acuity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Populatio Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1999)	Capital Costs Collection System (\$ 1999)	Interest Rate 4.00%	Loan Term (Years) 20	Capital Recovery Factor 6.1019	D&M Cost Per 1000 Gallons 1.22	Total Annual D&M Cost (\$/Year)	Annualized Capital Costs	1997-2027 Annualized Capital Costs	Total Annual D&M Cost (\$/Year)	Total Annual D&M Cost (\$/Year)	Annual Cost Per Capita (\$/Year)	Annual Cost Per Household (\$/Year)	Persons Per Household 2.54	Monthly Household Cost (\$/Month)	
1997	Start Program	1.74	1.31	11853	1.19	1.76	\$0	\$0	8.00%			\$700,490	\$700,490	\$1,901,648	\$1,901,648	\$2,602,139	\$2,602,139	\$179	\$454	2.54	\$37.87	
1998	Add Lines 1,2,6,3 (Sanct., P.B., ETI)	1.74	1.31	14544	1.45	2.16	\$0	\$3,735,800	8.00%			\$753,957	\$753,957	\$1,901,648	\$1,901,648	\$2,486,900	\$2,486,900	\$179	\$448	2.54	\$37.34	
2000		1.74	1.31	15578	1.51	2.26	\$0	\$0	8.00%			\$811,508	\$811,508	\$1,901,648	\$1,901,648	\$2,715,154	\$2,715,154	\$174	\$442	2.54	\$38.37	
2001		1.74	1.31	16122	1.58	2.34	\$0	\$0	8.00%			\$840,116	\$840,116	\$1,901,648	\$1,901,648	\$2,775,068	\$2,775,068	\$172	\$437	2.54	\$38.45	
2002	Add 4.00 mgd, Methball W.C.	8.40	4.80	16885	1.67	2.42	\$11,562,483	\$0	8.00%			\$1,011,578	\$1,011,578	\$1,901,648	\$1,901,648	\$2,441,768	\$2,441,768	\$170	\$433	2.54	\$38.05	
2003		8.40	4.80	17288	1.73	2.69	\$0	\$0	8.00%			\$1,068,116	\$1,068,116	\$1,901,648	\$1,901,648	\$2,813,328	\$2,813,328	\$169	\$429	2.54	\$35.71	
2004		8.40	4.80	17871	1.79	2.88	\$0	\$0	8.00%			\$1,122,259	\$1,122,259	\$1,901,648	\$1,901,648	\$2,890,784	\$2,890,784	\$167	\$423	2.54	\$35.42	
2005		8.40	4.80	18496	1.85	2.77	\$0	\$0	8.00%			\$1,251,732	\$1,251,732	\$1,901,648	\$1,901,648	\$3,073,189	\$3,073,189	\$168	\$420	2.54	\$34.98	
2006		8.40	4.80	19142	1.81	2.87	\$0	\$0	8.00%			\$1,358,044	\$1,358,044	\$1,901,648	\$1,901,648	\$3,163,389	\$3,163,389	\$165	\$418	2.54	\$34.88	
2007		8.40	4.80	18810	1.88	2.87	\$0	\$0	8.00%			\$1,461,709	\$1,461,709	\$1,901,648	\$1,901,648	\$3,289,583	\$3,289,583	\$165	\$418	2.54	\$34.85	
2008		8.40	4.80	20593	2.05	3.08	\$0	\$0	8.00%			\$1,573,238	\$1,573,238	\$1,901,648	\$1,901,648	\$3,474,937	\$3,474,937	\$164	\$418	2.54	\$34.88	
2009		8.40	4.80	21219	2.12	3.29	\$0	\$0	8.00%			\$1,693,309	\$1,693,309	\$1,901,648	\$1,901,648	\$3,665,035	\$3,665,035	\$164	\$418	2.54	\$34.85	
2010		8.40	4.80	21960	2.20	3.38	\$0	\$0	8.00%			\$1,807,802	\$1,807,802	\$1,901,648	\$1,901,648	\$3,708,901	\$3,708,901	\$165	\$418	2.54	\$34.83	
2011		8.40	4.80	22544	2.25	3.38	\$0	\$0	8.00%			\$1,837,841	\$1,837,841	\$1,901,648	\$1,901,648	\$3,838,490	\$3,838,490	\$165	\$420	2.54	\$34.96	
2012		8.40	4.80	23224	2.32	3.49	\$0	\$0	8.00%			\$2,077,339	\$2,077,339	\$1,901,648	\$1,901,648	\$3,978,078	\$3,978,078	\$169	\$422	2.54	\$35.17	
2013		8.40	4.80	23848	2.39	3.59	\$0	\$0	8.00%			\$2,227,140	\$2,227,140	\$1,901,648	\$1,901,648	\$4,128,763	\$4,128,763	\$167	\$425	2.54	\$35.40	
2014		8.40	4.80	24689	2.47	3.70	\$0	\$0	8.00%			\$2,388,817	\$2,388,817	\$1,901,648	\$1,901,648	\$4,298,698	\$4,298,698	\$168	\$428	2.54	\$35.67	
2015		8.40	4.80	25454	2.55	3.82	\$0	\$0	8.00%			\$2,560,885	\$2,560,885	\$1,901,648	\$1,901,648	\$4,468,834	\$4,468,834	\$170	\$432	2.54	\$35.99	
2016		8.40	4.80	26248	2.62	3.84	\$0	\$0	8.00%			\$2,746,952	\$2,746,952	\$1,901,648	\$1,901,648	\$4,648,201	\$4,648,201	\$172	\$438	2.54	\$36.39	
2017		8.40	4.80	27057	2.71	4.09	\$0	\$0	8.00%			\$2,946,013	\$2,946,013	\$1,901,648	\$1,901,648	\$4,838,554	\$4,838,554	\$176	\$448	2.54	\$37.23	
2018		8.40	4.80	27818	2.79	4.19	\$0	\$0	8.00%			\$3,160,308	\$3,160,308	\$1,901,648	\$1,901,648	\$5,039,954	\$5,039,954	\$114	\$290	2.54	\$24.18	
2019		8.40	4.80	28765	2.88	4.32	\$0	\$0	8.00%			\$3,399,554	\$3,399,554	\$1,901,648	\$1,901,648	\$5,257,855	\$5,257,855	\$119	\$302	2.54	\$26.13	
2020		8.40	4.80	29704	2.97	4.48	\$0	\$0	8.00%			\$3,699,185	\$3,699,185	\$1,901,648	\$1,901,648	\$5,499,465	\$5,499,465	\$123	\$314	2.54	\$28.13	
2021		8.40	4.80	30646	3.06	4.74	\$0	\$0	8.00%			\$4,182,348	\$4,182,348	\$1,901,648	\$1,901,648	\$5,768,003	\$5,768,003	\$134	\$338	2.54	\$29.28	
2022		8.40	4.80	31583	3.18	4.80	\$0	\$0	8.00%			\$4,813,522	\$4,813,522	\$1,901,648	\$1,901,648	\$6,068,803	\$6,068,803	\$139	\$353	2.54	\$30.39	
2023		8.40	4.80	32574	3.28	5.04	\$0	\$0	8.00%			\$5,164,813	\$5,164,813	\$1,901,648	\$1,901,648	\$6,404,813	\$6,404,813	\$144	\$367	2.54	\$30.79	
2024		8.40	4.80	33599	3.38	5.20	\$0	\$0	8.00%			\$5,542,317	\$5,542,317	\$1,901,648	\$1,901,648	\$6,728,000	\$6,728,000	\$150	\$382	2.54	\$31.79	
2025		8.40	4.80	34681	3.47	5.35	\$0	\$0	8.00%			\$6,970,266	\$6,970,266	\$1,901,648	\$1,901,648	\$7,179,266	\$7,179,266	Average	Average		Average	
2026		8.40	4.80	35769	3.56		\$0	\$0	8.00%													
2027		8.40	4.80	36968	3.69		\$0	\$0	8.00%													
		TOTALS for Planning Period (1997 - 2027)		Avg=	28817	3.59	\$11,882,493	\$1,738,908	\$18,298,883		\$18,970,667	\$38,932,974	\$71,979,266									
2042		8.40	4.80	42689	4.27	5.40																

Present Value (n 1998 dollars) of all costs during planning period (1997-1027) = \$84,897,188  
Calculations represent new expenditures only.

JAN 23 1997

### Scenario 3 - Plant 1 - Partial - Regional Eagle Mountain Lake - Without County and Greater Reno

Plant at Eagle Mountain Lake to initially serve Ash, Springtown, "downtown" Reno, Pelican Bay and Serranoy. Parker County watershed and the rest of Reno to be phased in at a later date.  
Existing plants in Springtown and Ash to be incorporated and/or phased out.

Year	Activity	Plant Capacity (mgd)	75% Trough Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1988)	Capital Costs Collection System (\$ 1988)	Interest Rate (\$ 1988)	Total Capital Costs (\$ 1988)	Loan Term (Years)	Capital Recovery Factor	OSM Cost Per 1000 Gallons	Total Annual OSM Cost (\$/Year)	Annual Cost Per Capita (\$/Year)	Annual Cost Per Household (\$/Year)	Monthly Household Cost (\$/Month)	Persons Per Household
1987	Start Program (Springtown/Ash)	2.00	1.50	14888	1.47	2.20	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$3,945,984	\$204	\$204	\$204	2.54
1988	Add Lines 1,2,3 (P.B., SanctiEJ)	2.00	1.50	17565	1.76	2.84	\$0	\$3,735,600	8.00%	\$3,735,600	20	0.1019	1.18	\$690,938	\$200	\$200	\$200	2.54
1989		2.00	1.50	18235	1.82	2.74	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$3,719,317	\$187	\$187	\$187	2.54
2000		2.00	1.50	18389	1.89	2.83	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$890,308	\$184	\$184	\$184	2.54
2001		2.00	1.50	18537	1.89	2.84	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$1,035,063	\$184	\$184	\$184	2.54
2002	Add 5.48 mgd Plant, Add Lines 4, 5a, 8b, 8, 10	7.48	6.81	20977	2.10	3.15	\$12,868,371	\$4,775,068	8.00%	\$17,771,499	20	0.1019	1.18	\$3,911,993	\$188	\$188	\$188	2.54
2003	Monthly Springtown and MC Plants, Add Line 1	8.03	4.52	21891	2.18	3.28	\$0	\$428,938	8.00%	\$428,938	20	0.1019	1.18	\$4,010,217	\$183	\$183	\$183	2.54
2004		8.03	4.52	22889	2.27	3.40	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$1,347,852	\$181	\$181	\$181	2.54
2005		8.03	4.52	23478	2.35	3.52	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$1,451,345	\$178	\$178	\$178	2.54
2006		8.03	4.52	24313	2.43	3.59	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$1,593,188	\$176	\$176	\$176	2.54
2007		8.03	4.52	25176	2.52	3.78	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$1,843,838	\$175	\$175	\$175	2.54
2008		8.03	4.52	26077	2.61	3.91	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$1,953,288	\$174	\$174	\$174	2.54
2009		8.03	4.52	27008	2.70	4.05	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$1,813,228	\$174	\$174	\$174	2.54
2010		8.03	4.52	28094	2.80	4.20	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$1,953,288	\$174	\$174	\$174	2.54
2011		8.03	4.52	29291	2.83	4.38	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$2,109,827	\$174	\$174	\$174	2.54
2012		8.03	4.52	30621	3.02	4.53	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$2,221,058	\$175	\$175	\$175	2.54
2013		8.03	4.52	32021	3.02	4.58	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$2,354,628	\$178	\$178	\$178	2.54
2014		8.03	4.52	31184	3.12	4.88	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$2,515,919	\$178	\$178	\$178	2.54
2015		8.03	4.52	32181	3.22	4.88	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$2,699,909	\$177	\$177	\$177	2.54
2016		8.03	4.52	33215	3.32	4.88	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$2,844,832	\$178	\$178	\$178	2.54
2017		8.03	4.52	34285	3.43	5.14	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$3,063,432	\$178	\$178	\$178	2.54
2018		8.03	4.52	35393	3.54	5.48	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$3,363,283	\$181	\$181	\$181	2.54
2019		8.03	4.52	36541	3.65	5.48	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$3,843,283	\$181	\$181	\$181	2.54
2020		8.03	4.52	37730	3.77	5.69	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$4,207,760	\$181	\$181	\$181	2.54
2021		8.03	4.52	38962	3.89	5.84	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$4,811,044	\$181	\$181	\$181	2.54
2022	Add 2.75 to Plant	8.78	8.58	40200	4.02	6.03	\$8,030,081	\$0	8.00%	\$8,030,081	20	0.1019	1.18	\$6,178,214	\$174	\$174	\$174	2.54
2023		8.78	8.58	40894	4.09	6.13	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$6,841,914	\$177	\$177	\$177	2.54
2024		8.78	8.58	43623	4.22	6.34	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$7,108,784	\$181	\$181	\$181	2.54
2025		8.78	8.58	45052	4.30	6.54	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$7,580,867	\$181	\$181	\$181	2.54
2026		8.78	8.58	45552	4.51	6.76	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$8,069,066	\$187	\$187	\$187	2.54
2027		8.78	8.58	46552	4.68	6.88	\$0	\$0	8.00%	\$0	20	0.1019	1.18	\$8,576,877	\$187	\$187	\$187	2.54
2027	TOTALS for Planning Period (1987-2027)		Avg	38148	4.68	6.88	\$21,827,242	\$9,347,258		\$31,174,500		0.1019	1.18	\$88,246,175	\$185	\$185	\$185	Average
2042		8.78	8.58	85553	5.88	8.78				\$48,724,188								

Present Value (in 1988 dollars) of all costs during planning period (1987-1927) =  
Calculations represent new expenditures only.

JAN 23 1997



### Scenario 3 - Plant 1 - Full Option - Regional Eagle Mountain Lake

Plant at Eagle Mountain Lake to serve all of Walnut Creek Watershed plus parts of Azale, Polkman Bay and Bonbrary  
 Extending plants in Springtown and Azale to be incorporated and/or phased out.

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Treatment Plant (\$ 1986)	Capital Costs Collection System (\$ 1986)	Total Capital Costs (\$ 1986)	Interest Rate (1986)	Total Capital Costs (\$ Future)	Loan Term (Years)	Capital Recovery Factor	DAM Cost Per 1000 Gallons	Total Annual Cost (\$ Future)	Annual Cost Per Capita (\$ Future)	Annual Cost Per Household (\$ Future)	Monthly Household Cost (\$ Future)	Persons Per Household
1987	Start Program (Springtown/Azale)	2.00	1.50	14886	1.47	2.20	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$16,638	\$4,761,080	\$271	\$689	\$57.35	2.54
1988	Add Lines 1,2,3 (P.B., Sancti LEU)	2.00	1.50	17595	1.70	2.84	\$0	\$3,735,000	\$3,735,000	8.00%	\$4,040,425	20	0.1016	\$853,461	\$4,884,481	\$259	\$673	\$59.09	2.54
1989		2.00	1.50	18235	1.82	2.74	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$4,884,481	\$259	\$673	\$59.09	2.54
2000	Add New 5.79 Plant	7.76	5.84	18599	1.86	2.83	\$13,827,295	\$4,775,000	\$18,602,295	8.00%	\$19,824,987	20	0.1016	\$1,261,409	\$5,806,480	\$247	\$628	\$54.89	2.54
2001	Add Lines 4,5a,5b,9,10	7.76	5.84	20977	2.10	3.16	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$5,806,480	\$247	\$628	\$54.89	2.54
2002	Abolish Springtown and WC Plants	7.23	5.42	27562	2.75	4.13	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2003	Add Lines 5-7 and 11-17	7.23	5.42	25385	2.54	4.26	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2004		7.23	5.42	25696	2.54	4.26	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2005		7.23	5.42	26216	3.02	4.54	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2006		7.23	5.42	31222	3.12	4.86	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2007		7.23	5.42	32233	3.22	4.84	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2008		7.23	5.42	33279	3.33	4.86	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2009		7.23	5.42	34392	3.44	5.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2010		7.23	5.42	34923	3.59	5.39	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2011		7.23	5.42	35978	3.70	6.05	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2012		7.23	5.42	36988	3.81	6.58	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2013		7.23	5.42	38186	3.92	6.88	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2014		7.23	5.42	40381	4.04	6.00	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2015		7.23	5.42	41366	4.16	6.23	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2016		7.23	5.42	42613	4.28	6.42	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2017		7.23	5.42	44101	4.41	6.52	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2018		7.23	5.42	45434	4.54	6.82	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2019		7.23	5.42	46812	4.68	7.02	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2020		7.23	5.42	48189	4.82	7.23	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2021		10.57	7.93	48585	4.87	7.45	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2022	Add 3.34 to Plant	10.57	7.93	51180	5.12	7.87	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2023		10.57	7.93	52717	5.27	7.91	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2024		10.57	7.93	54328	5.43	8.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2025		10.57	7.93	55904	5.60	8.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2026		10.57	7.93	58881	5.88	8.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2027		10.57	7.93	60881	6.08	8.90	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2028		10.57	7.93	62904	6.29	9.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2029		10.57	7.93	64951	6.49	9.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2030		10.57	7.93	67022	6.70	9.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2031		10.57	7.93	69117	6.91	9.90	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2032		10.57	7.93	71236	7.12	10.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2033		10.57	7.93	73379	7.34	10.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2034		10.57	7.93	75546	7.55	10.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2035		10.57	7.93	77737	7.77	10.90	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2036		10.57	7.93	79952	7.99	11.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2037		10.57	7.93	82191	8.21	11.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2038		10.57	7.93	84454	8.44	11.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2039		10.57	7.93	86741	8.67	11.90	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2040		10.57	7.93	89052	8.90	12.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2041		10.57	7.93	91387	9.13	12.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2042		10.57	7.93	93746	9.37	12.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2043		10.57	7.93	96129	9.60	12.90	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2044		10.57	7.93	98536	9.83	13.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2045		10.57	7.93	100967	10.06	13.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2046		10.57	7.93	103422	10.29	13.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2047		10.57	7.93	105891	10.52	13.90	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2048		10.57	7.93	108374	10.75	14.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2049		10.57	7.93	110871	10.98	14.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2050		10.57	7.93	113382	11.21	14.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2051		10.57	7.93	115907	11.44	14.90	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2052		10.57	7.93	118446	11.67	15.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2053		10.57	7.93	120999	11.90	15.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2054		10.57	7.93	123566	12.13	15.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2055		10.57	7.93	126147	12.36	15.90	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2056		10.57	7.93	128742	12.59	16.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2057		10.57	7.93	131351	12.82	16.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2058		10.57	7.93	133974	13.05	16.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2059		10.57	7.93	136611	13.28	16.90	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2060		10.57	7.93	139262	13.51	17.15	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2061		10.57	7.93	141927	13.74	17.40	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54
2062		10.57	7.93	144606	13.97	17.65	\$0	\$0	\$0	8.00%	\$0	20	0.1016	\$0	\$0	\$0	\$0	\$0	2.54

**Scenario 4 - No Plants - Partial Option - Fort Worth Service - Without County and Greater Reno**

Build regional collection infrastructure, pipe to Fort Worth and phase out existing plants.

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Populatio Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Treatment Plant (\$ 1999)	Capital Costs Collection System (\$ 1999)	Total Capital Costs (\$ 1999)	Interest Rate (8.00%)	Loan Term (Years) 20	Capital Recovery Factor 0.1819	FW Charge Per 1000 Gallons 0.82	Persons Per Household 2.54	Annual Cost Per Capita Household (\$/Share)	Annual Cost Per Household (\$/Share)	Monthly Household Cost (\$/Share)
1987	Start Program (Springtown/Arlis)	2.00	1.50	14938	1.47	2.20	\$0	\$0	\$0	4.00%	20	0.1819	\$430,657	\$437	\$172	\$39,39	
1988	Add Lines 1,2,3 (P.B., SanctiEti)	2.00	1.50	17595	1.76	2.84	\$0	\$3,735,800	\$3,735,800	8.00%	20	0.1819	\$484,186	\$429	\$168	\$39,50	
1989		2.00	1.50	18225	1.82	2.74	\$0	\$0	\$0	8.00%	20	0.1819	\$500,328	\$416	\$164	\$31,69	
2000		2.00	1.50	18996	1.88	2.83	\$0	\$0	\$0	8.00%	20	0.1819	\$530,237	\$408	\$160	\$31,80	
2001	Add Lines 18, 19 and LR Stations to F.VL	2.00	1.50	20977	2.10	3.15	\$12,187,898	\$0	\$12,187,898	8.00%	20	0.1819	\$600,987	\$387	\$152	\$32,24	
2002	Add Lines 4,5a, 8b, 9, 10	2.00	1.50	21891	2.19	3.28	\$4,775,068	\$0	\$4,775,068	8.00%	20	0.1819	\$631,869	\$377	\$148	\$31,39	
2003	Northball Springtown and VAC Plants, Add Line 1	2.00	1.50	22966	2.27	3.40	\$4,020,368	\$361,561	\$4,381,929	8.00%	20	0.1819	\$670,968	\$369	\$146	\$30,78	
2004		2.00	1.50	23478	2.35	3.52	\$0	\$0	\$0	8.00%	20	0.1819	\$702,968	\$363	\$145	\$30,21	
2005		2.00	1.50	24313	2.43	3.65	\$0	\$0	\$0	8.00%	20	0.1819	\$750,163	\$358	\$143	\$29,86	
2006		2.00	1.50	25161	2.52	3.77	\$0	\$0	\$0	8.00%	20	0.1819	\$814,422	\$350	\$140	\$29,20	
2007		2.00	1.50	26058	2.61	3.91	\$0	\$0	\$0	8.00%	20	0.1819	\$894,124	\$340	\$136	\$28,74	
2008		2.00	1.50	26988	2.70	4.05	\$0	\$0	\$0	8.00%	20	0.1819	\$1,005,337	\$332	\$132	\$28,32	
2009		2.00	1.50	27932	2.80	4.19	\$0	\$0	\$0	8.00%	20	0.1819	\$1,150,384	\$326	\$128	\$27,84	
2010		2.00	1.50	28932	2.84	4.28	\$0	\$0	\$0	8.00%	20	0.1819	\$1,320,769	\$322	\$125	\$27,37	
2011		2.00	1.50	29971	2.89	4.38	\$0	\$0	\$0	8.00%	20	0.1819	\$1,516,364	\$319	\$122	\$26,91	
2012		2.00	1.50	30200	3.02	4.53	\$0	\$0	\$0	8.00%	20	0.1819	\$1,730,816	\$318	\$120	\$26,43	
2013		2.00	1.50	31162	3.12	4.67	\$0	\$0	\$0	8.00%	20	0.1819	\$1,974,281	\$318	\$119	\$25,93	
2014		2.00	1.50	32169	3.22	4.82	\$0	\$0	\$0	8.00%	20	0.1819	\$2,240,251	\$318	\$118	\$25,41	
2015		2.00	1.50	33162	3.32	4.98	\$0	\$0	\$0	8.00%	20	0.1819	\$2,536,529	\$318	\$117	\$24,84	
2016		2.00	1.50	34262	3.43	5.14	\$0	\$0	\$0	8.00%	20	0.1819	\$2,864,486	\$318	\$117	\$24,28	
2017		2.00	1.50	35398	3.54	5.48	\$0	\$0	\$0	8.00%	20	0.1819	\$3,230,965	\$318	\$117	\$23,68	
2018		2.00	1.50	36517	3.65	5.48	\$0	\$0	\$0	8.00%	20	0.1819	\$3,640,903	\$318	\$117	\$23,08	
2019		2.00	1.50	37766	3.77	5.69	\$0	\$0	\$0	8.00%	20	0.1819	\$4,100,787	\$318	\$117	\$22,48	
2020		2.00	1.50	39037	3.89	6.04	\$0	\$0	\$0	8.00%	20	0.1819	\$4,612,221	\$318	\$117	\$21,88	
2021		2.00	1.50	40375	4.02	6.33	\$0	\$0	\$0	8.00%	20	0.1819	\$5,179,787	\$318	\$117	\$21,28	
2022		2.00	1.50	41775	4.02	6.33	\$0	\$0	\$0	8.00%	20	0.1819	\$5,800,973	\$318	\$117	\$20,68	
2023		2.00	1.50	43234	4.22	6.34	\$0	\$0	\$0	8.00%	20	0.1819	\$6,480,399	\$318	\$117	\$20,08	
2024		2.00	1.50	44823	4.36	6.34	\$0	\$0	\$0	8.00%	20	0.1819	\$7,220,050	\$318	\$117	\$19,48	
2025		2.00	1.50	46552	4.51	6.78	\$0	\$0	\$0	8.00%	20	0.1819	\$8,020,909	\$318	\$117	\$18,88	
2026		2.00	1.50	48452	4.69	6.89	\$0	\$0	\$0	8.00%	20	0.1819	\$8,890,430	\$318	\$117	\$18,28	
2027		2.00	1.50	50515	4.89	6.89	\$0	\$0	\$0	8.00%	20	0.1819	\$9,830,507	\$318	\$117	\$17,68	
	<b>TOTALS for Planning Period (1987 - 2027)</b>		<b>AVG</b>	<b>38115</b>	<b>4.89</b>	<b>6.89</b>	<b>\$12,187,898</b>	<b>\$4,381,929</b>	<b>\$16,569,827</b>	<b>8.00%</b>	<b>20</b>	<b>0.1819</b>	<b>\$46,969,932</b>	<b>318</b>	<b>\$117</b>	<b>\$18,16</b>	<b>\$21,84</b>
2028		2.00	1.50	52635	5.79	8.89	\$0	\$0	\$0	8.00%	20	0.1819	\$53,008,104	\$318	\$117	\$18,16	\$21,84
2029		2.00	1.50	54815	6.79	10.89	\$0	\$0	\$0	8.00%	20	0.1819	\$60,008,104	\$318	\$117	\$18,16	\$21,84
2030		2.00	1.50	57065	7.79	12.89	\$0	\$0	\$0	8.00%	20	0.1819	\$68,008,104	\$318	\$117	\$18,16	\$21,84
2031		2.00	1.50	59485	8.79	14.89	\$0	\$0	\$0	8.00%	20	0.1819	\$77,008,104	\$318	\$117	\$18,16	\$21,84
2032		2.00	1.50	62085	9.79	16.89	\$0	\$0	\$0	8.00%	20	0.1819	\$87,008,104	\$318	\$117	\$18,16	\$21,84
2033		2.00	1.50	64865	10.79	18.89	\$0	\$0	\$0	8.00%	20	0.1819	\$98,008,104	\$318	\$117	\$18,16	\$21,84
2034		2.00	1.50	67825	11.79	20.89	\$0	\$0	\$0	8.00%	20	0.1819	\$110,008,104	\$318	\$117	\$18,16	\$21,84
2035		2.00	1.50	70965	12.79	22.89	\$0	\$0	\$0	8.00%	20	0.1819	\$123,008,104	\$318	\$117	\$18,16	\$21,84
2036		2.00	1.50	74285	13.79	24.89	\$0	\$0	\$0	8.00%	20	0.1819	\$137,008,104	\$318	\$117	\$18,16	\$21,84
2037		2.00	1.50	77795	14.79	26.89	\$0	\$0	\$0	8.00%	20	0.1819	\$152,008,104	\$318	\$117	\$18,16	\$21,84
2038		2.00	1.50	81495	15.79	28.89	\$0	\$0	\$0	8.00%	20	0.1819	\$168,008,104	\$318	\$117	\$18,16	\$21,84
2039		2.00	1.50	85385	16.79	30.89	\$0	\$0	\$0	8.00%	20	0.1819	\$185,008,104	\$318	\$117	\$18,16	\$21,84
2040		2.00	1.50	89465	17.79	32.89	\$0	\$0	\$0	8.00%	20	0.1819	\$203,008,104	\$318	\$117	\$18,16	\$21,84
2041		2.00	1.50	93735	18.79	34.89	\$0	\$0	\$0	8.00%	20	0.1819	\$222,008,104	\$318	\$117	\$18,16	\$21,84
2042		2.00	1.50	98195	19.79	36.89	\$0	\$0	\$0	8.00%	20	0.1819	\$242,008,104	\$318	\$117	\$18,16	\$21,84
2043		2.00	1.50	102845	20.79	38.89	\$0	\$0	\$0	8.00%	20	0.1819	\$263,008,104	\$318	\$117	\$18,16	\$21,84
2044		2.00	1.50	107685	21.79	40.89	\$0	\$0	\$0	8.00%	20	0.1819	\$285,008,104	\$318	\$117	\$18,16	\$21,84
2045		2.00	1.50	112715	22.79	42.89	\$0	\$0	\$0	8.00%	20	0.1819	\$308,008,104	\$318	\$117	\$18,16	\$21,84
2046		2.00	1.50	117935	23.79	44.89	\$0	\$0	\$0	8.00%	20	0.1819	\$332,008,104	\$318	\$117	\$18,16	\$21,84
2047		2.00	1.50	123345	24.79	46.89	\$0	\$0	\$0	8.00%	20	0.1819	\$357,008,104	\$318	\$117	\$18,16	\$21,84
2048		2.00	1.50	128945	25.79	48.89	\$0	\$0	\$0	8.00%	20	0.1819	\$383,008,104	\$318	\$117	\$18,16	\$21,84
2049		2.00	1.50	134735	26.79	50.89	\$0	\$0	\$0	8.00%	20	0.1819	\$410,008,104	\$318	\$117	\$18,16	\$21,84
2050		2.00	1.50	140715	27.79	52.89	\$0	\$0	\$0	8.00%	20	0.1819	\$438,008,104	\$318	\$117	\$18,16	\$21,84
2051		2.00	1.50	146885	28.79	54.89	\$0	\$0	\$0	8.00%	20	0.1819	\$467,008,104	\$318	\$117	\$18,16	\$21,84
2052		2.00	1.50	153245	29.79	56.89	\$0	\$0	\$0	8.00%	20	0.1819	\$497,008,104	\$318	\$117	\$18,16	\$21,84
2053		2.00	1.50	159895	30.79	58.89	\$0	\$0	\$0	8.00%	20	0.1819	\$528,008,104	\$318	\$117	\$18,16	\$21,84
2054		2.00	1.50	166835	31.79	60.89	\$0	\$0	\$0	8.00%	20	0.1819	\$560,008,104	\$318	\$117	\$18,16	\$21,84
2055		2.00	1.50	174065	32.79	62.89	\$0	\$0	\$0	8.00%	20	0.1819	\$593,008,104	\$318	\$117	\$18,16	\$21,84
2056		2.00	1.50	181585	33.79	64.89	\$0	\$0	\$0	8.00%	20	0.1819	\$627,008,104	\$318	\$117	\$18,16	\$21,84
2057		2.00	1.50	189395	34.79	66.89	\$0	\$0	\$0	8.00%	20	0.1819	\$662,008,104	\$318	\$117	\$18,16	\$21,84
2058		2.00	1.50	197495	35.79	68.89	\$0	\$0	\$0	8.00%	20	0.1819	\$708,008,104	\$318	\$117	\$18,16	\$21,84
2059		2.00	1.50	205885	36.79	70.89	\$0	\$0	\$0	8.00%	20	0.1819	\$755,008,104	\$318	\$117	\$18,16	\$21,84
2060		2.00	1.50	214565	37.79	72.89	\$0	\$0	\$0	8.00%	20	0.1819	\$803,008,104	\$318	\$117	\$18,16	\$21,84
2061		2.00	1.50	223535	38.79	74.89	\$0	\$0	\$0	8.00%	20	0.1819	\$852,008,104	\$318	\$117	\$18,16	\$21,84
2062		2.00	1.50	232795	39.79	76.89	\$0	\$0	\$0	8.00%	20	0.1819	\$902,008,104	\$3			

### Scenario 4 - No Plants - Full Option - Fort Worth Service - Full Region

Build regional collection infrastructure, pipe to Fort Worth and phase out existing plants.

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Fort Worth Connection (\$ 1980)	Capital Costs Collection System (\$ 1985)	Initiation Rate (4.00%)	Interest Rate (8.00%)	Total Capital Costs (\$ Future)	Low Term (Years) 20	Capital Recovery Factor Annualized Capital Costs 0.1018	FW Charge Per 1000 Gallons 0.62	Total Annual Cost (\$/Share)	Annual Cost Per Household (\$/Share)	Monthly Cost Per Household (\$/Share)	Persons Per Household 2.54	
1987	Start Program (Springtown/Ashe)	2.00	1.50	14988	1.47	2.20	\$0	\$0			\$0		\$3,823,828	\$430,077	\$4,354,583	\$247	\$629	\$82.39	
1988	Add Lines L2,3 (P.B., Stone,ETD)	2.00	1.50	17685	1.76	2.84	\$0	\$3,733,800			\$4,040,426		\$3,823,828	\$484,188	\$4,388,112	\$241	\$611	\$80.84	
1989		2.00	1.50	18238	1.82	2.74	\$0	\$0			\$0		\$3,823,828	\$508,328	\$4,424,254	\$234	\$595	\$80.55	
2000		2.00	1.50	18689	1.86	2.83	\$0	\$0			\$0		\$3,823,828	\$539,287	\$4,463,212	\$228	\$579	\$80.23	
2001	Add Lines 18, 19 and LR Stations to F.W.	2.00	1.50	19687	1.96	2.84	\$12,187,868	\$0			\$14,822,443		\$3,823,828	\$600,887	\$4,584,663	\$216	\$548	\$80.88	
2002	Add Lines 4,6a,8b,9,10	0.00	0.00	21723	2.10	3.15	\$0	\$4,775,088			\$6,942,022		\$3,823,828	\$468,979	\$4,370,896	\$210	\$534	\$84.63	
2003	Northall Springtown and WC Plants	0.00	0.00	28388	2.84	4.28	\$0	\$0			\$13,814,780		\$3,823,828	\$879,123	\$4,803,948	\$199	\$490	\$88.82	
2004	Add Lines 5-7 and 11-17	0.00	0.00	29269	2.80	4.39	\$0	\$8,948,164			\$18,762,944		\$3,823,828	\$943,722	\$4,867,848	\$188	\$462	\$86.37	
2006		0.00	0.00	30246	3.02	4.54	\$0	\$0			\$0		\$3,823,828	\$1,013,132	\$4,807,057	\$183	\$458	\$84.69	
2007		0.00	0.00	31223	3.12	4.68	\$0	\$0			\$0		\$3,823,828	\$1,087,715	\$5,011,841	\$181	\$408	\$83.98	
2008		0.00	0.00	32233	3.22	4.84	\$0	\$0			\$0		\$3,823,828	\$1,167,862	\$5,091,785	\$168	\$401	\$83.44	
2009		0.00	0.00	33278	3.33	4.99	\$0	\$0			\$0		\$3,823,828	\$1,253,881	\$5,177,917	\$168	\$388	\$82.83	
2010		0.00	0.00	34382	3.44	5.15	\$0	\$0			\$0		\$3,823,828	\$1,348,595	\$5,270,491	\$163	\$380	\$82.47	
2011		0.00	0.00	34983	3.48	5.24	\$0	\$0			\$0		\$3,823,828	\$1,422,491	\$5,346,417	\$152	\$380	\$82.42	
2012		0.00	0.00	35923	3.58	5.39	\$0	\$0			\$0		\$3,823,828	\$1,502,630	\$5,446,858	\$150	\$365	\$82.08	
2013		0.00	0.00	36928	3.70	5.55	\$0	\$0			\$0		\$3,823,828	\$1,590,026	\$5,553,951	\$148	\$351	\$81.76	
2014		0.00	0.00	38008	3.81	5.71	\$0	\$0			\$0		\$3,823,828	\$1,745,213	\$5,688,139	\$146	\$339	\$81.28	
2015		0.00	0.00	39188	3.92	5.88	\$0	\$0			\$0		\$3,823,828	\$1,886,171	\$5,782,688	\$147	\$329	\$81.28	
2016		0.00	0.00	40381	4.04	6.05	\$0	\$0			\$0		\$3,823,828	\$2,001,317	\$5,825,243	\$147	\$319	\$81.07	
2017		0.00	0.00	41588	4.16	6.23	\$0	\$0			\$0		\$3,823,828	\$2,143,620	\$5,887,448	\$146	\$311	\$80.80	
2018		0.00	0.00	42813	4.28	6.42	\$0	\$0			\$0		\$3,823,828	\$2,296,066	\$5,966,913	\$142	\$306	\$81.38	
2019		0.00	0.00	44041	4.41	6.62	\$0	\$0			\$0		\$3,823,828	\$2,459,813	\$6,007,726	\$138	\$300	\$81.81	
2020		0.00	0.00	45434	4.54	6.82	\$0	\$0			\$0		\$3,823,828	\$2,635,502	\$6,055,502	\$135	\$295	\$82.28	
2021		0.00	0.00	46812	4.66	7.02	\$0	\$0			\$0		\$3,823,828	\$2,824,052	\$6,084,052	\$133	\$288	\$82.77	
2022		0.00	0.00	48188	4.82	7.23	\$0	\$0			\$0		\$3,823,828	\$3,024,084	\$6,084,084	\$133	\$280	\$83.23	
2023		0.00	0.00	49665	4.97	7.45	\$0	\$0			\$0		\$3,823,828	\$3,240,008	\$6,040,008	\$128	\$272	\$83.81	
2024		0.00	0.00	51160	5.12	7.67	\$0	\$0			\$0		\$3,823,828	\$3,471,773	\$6,041,773	\$128	\$265	\$84.38	
2025		0.00	0.00	52717	5.27	7.91	\$0	\$0			\$0		\$3,823,828	\$3,720,540	\$6,040,540	\$127	\$258	\$85.04	
2026		0.00	0.00	54328	5.43	8.15	\$0	\$0			\$0		\$3,823,828	\$3,987,576	\$6,040,576	\$127	\$251	\$85.84	
2027		0.00	0.00	55984	5.60	8.40	\$0	\$0			\$0		\$3,823,828	\$4,274,246	\$6,040,246	\$126	\$244	\$86.81	
	<b>TOTALS for Planning Period (1987 - 2027)</b>		<b>Average</b>	<b>36778</b>	<b>5.60</b>	<b>8.40</b>	<b>\$15,187,898</b>	<b>\$18,488,882</b>			<b>\$18,646,791</b>	<b>\$18,628,888</b>	<b>\$78,478,819</b>	<b>\$66,141,881</b>	<b>\$4,274,246</b>	<b>\$70</b>	<b>\$184</b>	<b>\$18.16</b>	<b>Average</b>
2042		0.00	0.00	70470	7.05	10.57													

Present Value (in 1000 dollars) of all costs during planning period (1987-2027) = \$48,300,811

Calculations represent new expenditures only.

JAN 28 1997



5. Kelly Carta, of Teague Nall and Perkins, presented handout which included updates since completion of the draft report. Noted desire of Tarrant Regional Water Board to keep effluent flowing into Eagle Mountain Lake and response by City of Fort Worth that connection to City could be more costly and time consuming than originally reported (See handout). The handout also included some updated cost figures to more accurately distinguish between "full region" and "population center only" costs.
6. Questions and Responses:
  - a.) What about the need to keep 1 mgd of effluent going to the golf course in Azle?  
This has not been addressed in the current draft but will need to be added.
  - b.) What about costs included for Fort Worth infrastructure improvements?  
The draft report addressed costs to Fort Worth's Jenkin Heights lift station in Lake Worth. The cost of upgrading the system to the Village Creek Treatment Plant was considered to be a part of the Fort Worth system costs and included in the normal Fort Worth connection fees. Frank Crumb, of the Fort Worth Water Department, noted that this would probably not be the case. He submitted a fact sheet to the engineers noting that Fort Worth only had plans to serve the Azle area should a need arise and it was mutually beneficial. He also noted that existing upgrades, potential future upgrades would probably require pass through cost to the regional client and would probably not facilitate connection in a "timely manner". In addition, Fort Worth would prefer the effluent to be discharged back into Eagle Mountain Lake to be available for water reuse to Fort Worth.
  - c.) What about the total cost to Reno since they do not have an existing infrastructure?  
The costs shown in the report are for costs associated with treatment facilities and trunk mains only. They do not include existing debts or minor lines. In the case of Reno (and unincorporated areas of the county), no minor lines exist and such costs would have to be added to the amounts shown. The scope of determining the size and extent of minor lines depends on a number of unknown variables and is beyond the scope of this study. However, the study has been divided into service to the whole region and service to "population centers" so that a cost could be generated to serve denser populated areas now and address the more sparsely populated areas as they develop.
  - d.) Gary Laneman of the Texas Water Development Board noted that Senate Bill 1 had already been introduced into the Texas Senate. This bill concerns drought problems in Texas and water conservation issues. Water reuse and drought provisions will be critical to any water/wastewater projects. Gary also noted that state funds through the TWDB are continuing to decrease.
  - e.) Frank Crumb noted that Fort Worth is currently estimating they will need to expand the transmission system from the Jenkins Heights lift station to the Village Creek Wastewater Treatment plant around 2010 at a cost of \$7 Million to \$10 Million. This does not include expansion to the plant itself.
  - f.) Bob Salinas, Springtown City Administrator, reminded everyone that water recycling will be critical. Based on the newspaper article about their last meeting the Tarrant Regional Water District is also concerned about wastewater recycling issues.
  - g.) Frank Crumb went on to explain that Village Creek is currently permitted to treat 166 mgd and the next expansion should take it to over 180 mgd. Fort Worth is looking at satellite plants upstream of Village Creek to allow for water reuse. Frank was asked if he would be in favor of a regional plant in Azle and what were Fort Worth's interests in water reuse. After some

discussion, Frank summarized that they would be in favor of a regional plant discharging into Eagle Mountain Lake to make water reuse available, but that Fort Worth is not currently interested in treating the water from the region or in financially participating in a regional plant.

h.) Tom Gentry made a request of all participants to express any support for regionalization which they might have in a resolution form and submit it to the City of Springtown. He stressed that the time for such action is short since the final report is due to the Texas Water Development Board on March 19, 1997.

**A RESOLUTION SUPPORTING  
A REGIONAL WASTEWATER SYSTEM  
FOR THE WALNUT CREEK WATERSHED  
OF PARKER, WISE AND TARRANT COUNTIES  
OF TEXAS**

WHEREAS, the Walnut Creek watershed flows into Eagle Mountain Lake and drains approximately 87.5 square miles of Parker, Wise and Tarrant Counties of Texas; and

WHEREAS, most of the watershed, save the Cities of Azle and Springtown, is not served by a collective wastewater collection and treatment system; and

WHEREAS, many septic systems within the watershed do not operate in a consistent and reliable manner; and

WHEREAS, a centralized system is necessary to serve increased growth in the area; and

WHEREAS, water quality and quantity in Eagle Mountain Lake is a concern to the local area; and

WHEREAS, the City of Springtown and Walnut Creek Special Utility District have matched funds from the Texas Water Development Board to study the feasibility of a regional wastewater system for the watershed and contiguous populated areas; and

WHEREAS, the draft report for such study has indicated a feasibility for wastewater regionalization in the watershed; and

WHEREAS, the undersigned entity has a vested interest in the water quality and quantity of the Walnut Creek watershed;

NOW, THEREFORE BE IT RESOLVED, by \_\_\_\_\_  
(governing body of entity)

of \_\_\_\_\_  
(supporting entity)

THAT we support the concept of wastewater regionalization for the Walnut Creek watershed and that this resolution of support shall be forwarded to the Texas Water Development Board, prior to or concurrent with, the final study report being submitted to the TWDB due March 19, 1997. We also understand that this resolution is not supporting a particular method of regionalization but only supports the concept of regionalization itself.

This resolution was (approved)(disapproved) this \_\_\_\_\_ day of \_\_\_\_\_, 1997  
by the following vote of its governing members.

**AYES**

(In favor of resolution)

**NAYS**

(Opposed to resolution)

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This vote is recorded as made this day.

\_\_\_\_\_  
(Mayor or Authorized Agent)

ATTEST:

\_\_\_\_\_  
\_\_\_\_\_  
(TITLE)



# Walnut Creek S.U.D. Presentation on Regional Wastewater Study February 11, 1997

1. **SPRINGTOWN'S ORIGINAL NEED:** The City of Springtown must currently take action regarding wastewater planning and service due to area growth and a TNRCC Enforcement Order.
2. **SPRINGTOWN SEARCHES FOR A SOLUTION:** The City of Springtown decided in May 1996, at the suggestion of the TNRCC, to investigate the need for a regional system that could benefit Springtown, Reno, and other incorporated and non-incorporated areas of the Walnut Creek watershed.
3. **GRANT REQUEST FOR REGIONAL STUDY:** Springtown applied to the Texas Water Development Board for funding support for a regional wastewater study. This study was funded by the TWDB on the condition that Walnut Creek S.U.D. participate. Walnut Creek S.U.D. agreed to participate in the study.
4. **REGIONAL STUDY:** Teague Nall and Perkins began the study in late November. The study is now in the draft report and comment stage. The final study report is due to the TWDB by March 19, 1997.
5. **STUDY GROUP:** The study has included the input and cooperation of Walnut Creek S.U.D., Texas Water Development Board, Texas Natural Resource Conservation Commission, Tarrant Regional Water District, Wise County Water Control and Improvement District, Wise County Commissioner's Court, Parker County Commissioner's Court, City of Azle, City of Reno, City of Fort Worth, City of Sanctuary, City of Pelican Bay, Save Eagle Mountain Lake Inc., Community of La Junta, the Community of Tanglewood, the engineering firm of Alan Plummer and Associates, the engineering firm of Rady and Associates/Kimley Horn, and the firm of Teague Nall and Perkins..
6. **STUDY MEETINGS:** To date, three meetings have been held with the representatives of the groups listed above. A kickoff meeting was held in November, a meeting was held in December about midway through the study process and a meeting was held in January to present the draft findings. A separate meeting was held with, and at the request of, Save Eagle Mountain Lake in January to brief their board of directors.
7. **DRAFT REPORT RESULTS:** The regional wastewater draft report indicates that wastewater collection and treatment for the Walnut Creek Watershed needs to be handled on a regional basis. The City of Springtown and Walnut Creek S.U.D. have a high level of interest in achieving a regional wastewater collection and treatment solution and have been willing to incur expense in exploring a mechanism to solve the problem.
8. **PUSH FOR REGIONALIZATION:** The State of Texas (TNRCC and TWDB) is currently encouraging regionalization of facilities. A 1990 report by Tarrant Regional Water District indicated that Azle should be the regional entity for the lake area, but did not treat the watershed as a whole. For this reason, Azle has since started a staged upgrade of their treatment facilities and plans to supply wastewater treatment to Pelican Bay within the next year. The regional sewer draft report supports the use of Azle's facilities for regional wastewater service.

9. **REGIONAL SOLUTION:** The most readily apparent solution currently is the creation of a new regional wastewater district under general or special law to own and operate the regional collection facility. (The treatment will be handled by either the City of Azle being a part of the regional district or by contracting on an interlocal basis for Azle to treat the district's collected wastewater.)
10. **ENVIRONMENTAL CONCERNS:** Save Eagle Mountain Lake, Inc., is concerned about water quality in Eagle Mountain Lake.
11. **DROUGHT CONCERNS:** Tarrant Regional Water District and the City of Fort Worth are both worried about depletion of lake water during a drought and would like to see effluents returned to the lake. This desire has, in part, led to Senate Bill 1 now before the Texas Senate.
12. **FORT WORTH TREATMENT OPTION:** The draft report indicated that the expenditure of funds for wastewater in the region would be best spent by concentrating on a collection system and connecting to the Fort Worth System at the Jenkin's Heights lift station. The City of Fort Worth has since indicated that they would NOT be able to accept such flows in a timely manner and would probably charge the regional system for upgrades up to, and including, the Village Creek Treatment Plant near Arlington. This would, therefore, make the Fort Worth service option impractical. For this reason, the Fort Worth option has been dropped from consideration.
13. **SOMETHING NEW:** A number of the entities in the study group have expressed interest and support for a new regional entity to provide wastewater service for the region. The establishment of a new regional entity is a new problem for all of the people in the region, including the officials of Springtown. Because it is new, misunderstandings and miscommunications could take place. It is our purpose to explain the current situation and proposed solutions in a way which addresses the interests of governmental entities in the affected area.
14. **SUPPORT RESOLUTION:** Copies of a resolution supporting a regional wastewater entity have been provided for all participants in the study. It currently appears that the cities of Fort Worth and Azle support the need for a regional entity but do not want to be a member of the entity (i.e., district). Likewise, Tarrant Regional Water District appears to support the concept of a regional district but does not want to be a voting member. They do want to have an advisory role. Also, Azle would like to contract with any created district to treat their wastewater flows.
15. **LEGAL ADVICE:** Based on a preliminary review and preliminary consultation with legal counsel, it appears that the most advantageous solution for the creation of a regional wastewater authority would be to establish a new special law district by act of the legislature. Initially, other possible solutions were reviewed and analyzed (including municipal utility districts), but for various reasons, all of these other options have been rejected or relegated to second and third choices.
16. **PUBLIC UTILITY AGENCY vs. SPECIAL LAW DISTRICT:** Walnut Creek S.U.D. has suggested the use of a Public Utility Agency in lieu of a Special Law District. Public Utility Agencies are interlocal group agencies in which member entities retain ownership of assets but collectively allow the PUA to operate, maintain, and improve the facilities through user fees and revenue bonds. A PUA is created by joint ordinance or resolution of the participating entities. However, each member entity retains ownership liabilities. A Special

Law District is an entity created by the legislature and could acquire ownership of certain assets from the member entities. Provisions are flexible during the creation and the District is bound by the final enacting legislation. Member entities would have a guiding voice but would be further shielded from day to day operations and liability.

17. **SPRINGTOWN UNDER PRESSURE:** Springtown is currently "under the gun" for a wastewater solution. Should Springtown decide not to pursue a regional entity, and upgrade their current treatment plant, it will most likely be 20 years or more before it would be feasible to start placing infrastructure in areas of the county and incorporated areas where collection systems do not now exist.
18. **FASTEST COURSE OF ACTION:** Due to the timeframes and procedures required for legislative action, it has been deemed necessary to publish a notice regarding the legislative requests for a special law district. The notice has already been sent for publication.
19. **DESIRE TO HAVE WALNUT CREEK S.U.D. AS A MEMBER:** The City of Springtown and other participants in this proposal recognize that the cooperation of Walnut Creek Special Utility District is highly desirable, mainly because of the desire of the City of Springtown and other entities in the area to maintain a beneficial and positive working relationship with Walnut Creek S.U.D. For these reasons, The City of Springtown wishes to incorporate input from Walnut Creek S.U.D. regarding the structure and powers of the proposed district. Attached are some of the more important provisions which are proposed for inclusion in the District. Please note that both the publication notice and the proposed language make it clear that the District should NOT have the power to levy property taxes.
20. **NO CONFLICT WITH WALNUT CREEK S.U.D.:** Specifically, it is the desire of the City of Springtown and other entities involved to create a new district which does not conflict directly with the current powers and purpose of the Walnut Creek Special Utility District. Most importantly it is desired that the new District not be involved in the drinking water business or in competing with other services which are provided by the Walnut Creek Special Utility District.
21. **ACCOMPLISHING GOALS:** In these regards, we desire positive and meaningful input from your District in accomplishing the wastewater service goals.
22. **CRITICAL ISSUES:** Important: Can your support be counted on in creating a regional wastewater authority? MORE IMPORTANT: If not, can you be counted on not to oppose a new regional wastewater authority?
23. **IMPLEMENTATION:** The regional wastewater study clearly determines that the projected needs of the region, as well as existing needs, require the creation of a regional system for wastewater. As you are aware, no wastewater system can be provided without incurring expense. However, the most economical and effective mechanism is to have a regional system. True leadership requires the implementation of an immediate solution for a number of reasons.
  - A. If we do not implement the regional system, then someone else will do it or force it to be done in a manner not of our choice (e.g., Aledo middle school). It is better to have a solution implemented without pressure from the outside to be operated by citizens who live in the area and who use the facilities.
  - B. Historical comparisons show that delays in implementing solutions allow problems



North Central Texas Council

Post-it® Fax Note	7671	Date	2/12	# of pages	2
To	A.G. SWAN	From	SAM BRUSH		
Co./Dest		Co.	NCTCOG		
Phone #	817-523-4834	Phone #	817/645-9213		
Fax #	817-523-3179	Fax #	817/640-7806		

**TO:** Water Resources Council                      **DATE:** February 7, 1997

**FROM:** Warren Brewer, Chairman

**SUBJECT:** Notice and Agenda for February 13, 1997  
Water Resources Council Meeting

The next meeting of the Water Resources Council will be held:

**on:** Thursday, February 13, 1997

**at:** 10:00 a.m.

**in:** NCTCOG Offices

**ACTION/DISCUSSION ITEMS**

- 1. Summary of the December 12, 1996 Meeting.** The summary (tan) is included in your packet.
- 1997 Annual Water Quality Management Plan.** The staff will present additional watershed information and review a prototype of the format to be used in the Annual Plan. According to this format each city will have a data sheet for each watershed in which it falls. The data will include the results of the decision tree analysis using the AWWA watershed management procedure outlined at the last meeting, as well as additional information on annual pollutant loadings, constituents of concern, selected pollution sources and a menu of potential Best Management Practices.
- Walnut Creek Regional Wastewater Study – Parker, Wise and Tarrant Counties of Texas.** The City of Springtown and the Walnut Creek Special Utility District have undertaken the above study with Texas Water Development Board funding. The study is nearing completion, and recommendations have been outlined. The enclosed materials (blue) represent key excerpts from the study. The study group is seeking support for the concept of formally establishing a regional entity that can continue to explore appropriate wastewater service arrangements within the basin. The WRC is being asked to consider expressing support in writing to the Texas Water Development Board. The staff will provide an additional overview on this project and seek comment and direction regarding any actions to be taken. A representative from the consulting engineering firm for the project will be invited to attend and respond to questions about the study recommendations and service alternatives.

WALNUT CREEK BASIN REGIONAL WASTEWATER STUDY FINAL REPORT MARCH 1997 PAGE C51  
*Please see reverse side for balance of agenda*

4. **Senate Bill 1 Discussion.** The statewide drought conditions over the past year have resulted in heightened attention by the legislature to planning for water resources. One outcome has been the proposed Senate Bill No. 1, which covers an array of water resource development and management topics. Several WRC members have expressed interest in discussing this bill and the potential regional impacts. Copies of the bill will be available at the meeting, and the staff will provide an overview and note any key impacts that can be determined.

#### REVIEW ITEMS

5. **Texas Review and Comment System.** There is one item for review by the WRC this month. Description of the project and accompanying documentation are included (green). The staff will be presenting this item and seeking direction from WRC members on their preferred recommendation for the project.

#### INFORMATION ITEMS

6. **Status Report on Regional Storm Water Activities.** WRC members will be briefed on the current activities underway through NCTCOG's regional storm water management program as well as the status of the 319(h) funded Texas Nonpoint SourceBOOK project, which has recently experienced some changes to the grant arrangements.
7. **NCTCOG External Survey.** Recently you were mailed a survey document asking for your opinions on the services provided to you by NCTCOG. If you have not yet returned the survey to University of North Texas, please consider doing so. The February 14th cut off date for UNT is tomorrow. If you did not receive a survey or need another copy, please see Susan Wiggins for an additional copy of the survey and a postage paid envelope.
8. **NCTCOG Programs and Environmental Activities.** The staff will report on other environmental or water resource activities of interest to WRC members if there is available time.
9. **Schedule for Next Meeting of the Water Resources Council.** The next regularly scheduled meeting of the WRC is tentatively set for March 13, 1997.

I look forward to seeing you at the upcoming meeting.



Warren Brewer

## **APPENDIX D - PRESS COVERAGE**

FORT WORTH STAR-TELEGRAM (1/22/97) - WATER SHORTAGE/GIB LEWIS LOBBY

AZLE NEWS 1/30/97 - DRAFT WATERSHED STUDY, REGIONAL SYSTEM NEEDED

SPRINGTOWN EPIGRAPH - 1/30/97 - STUDY SHOWS SEWER PLAN

SPRINGTOWN EPIGRAPH - 1/30/97 - BANK EXPANSION, CITY LOOKS AT MUD

AZLE NEWS 2/6/97 - STUDY SUPPORTS REGIONAL WASTEWATER

AZLE NEWS 2/6/97 - COUNCIL ACCEPTS BIDS FOR WASTEWATER PLANT EXPANSION

AZLE NEWS 2/13/97 - GLASGOW TO LOBBY FOR DISTRICT

SPRINGTOWN EPIGRAPH 2/13/97 - CITY TO PURSUE SPECIAL LAW DISTRICT

SPRINGTOWN EPIGRAPH 2/20/97 - WALNUT CREEK AGREES TO PURSUE DISTRICT

SPRINGTOWN EPIGRAPH 2/20/97 - CITY TO APPROACH COUNTY FOR AGREEMENT

SPRINGTOWN EPIGRAPH 2/20/97 - WINN-DIXIE SHOPPING CENTER UNDER CONSTRUCTION

SPRINGTOWN EPIGRAPH 3/6/97 - CITY MEETS WITH PARKER COUNTY

SPRINGTOWN EPIGRAPH 3/6/97 - EAGLE MOUNTAIN LAKE FULL

WEATHERFORD DEMOCRAT 3/13/97 - COUNTY COMMISSIONERS SUPPORT DISTRICT

SPRINGTOWN EPIGRAPH 3/6/97 - COUNTY COMMISSIONERS SUPPORT DISTRICT

## Texas expected to run short on water by 2010

### Tarrant water district hires Gib Lewis as lobbyist for likely legislative battles

BY ANITA BAKER  
Star-Telegram Staff Writer

FORT WORTH — The Tarrant Regional Water District board yesterday hired former Texas House Speaker Gib Lewis as a lobbyist to represent the agency on major state water legislation.

"We have never had one before," said James Oliver, district general manager. But several water

issues expected to arise during the legislative session could affect the district's water supply planning, he said.

In another issue, the board was told about a water district study to determine whether proposed expansion of waste-water treatment for the Springtown area will affect water quality at Eagle Mountain Lake.



A public meeting on the expansion proposals is scheduled for 7 p.m. tomorrow in Springtown City Hall, 102 E. Second St.

The board hired Lewis, whose clients range from Dallas/Fort Worth Airport to Laidlaw Waste Systems, for two years at \$3,000 a month. (More on LOBBY on Page 13)

### Recycling waste water proposed in report to be introduced as bill

BY JAY ROOT  
Star-Telegram Austin Bureau

AUSTIN — In less than 15 years, Texas will not be able to supply enough water to meet its urban needs unless policy makers make adjustments now, according to a state report released yesterday.

A summary of the State Water Plan, crafted by the Texas Water Development Board, concluded

that a do-nothing scenario would leave 15 percent of the state's urban water needs unmet by 2010.

The cost to the Texas economy: up to \$40 billion a year.

"The era of plentiful water, when an area's need could be readily met with development of new supplies, [is] past," the report said. "The state's rapidly growing population

(More on WATER on Page 13)

## Water

From Page 1

aid economy will require additional water development."

The report, which lists recommendations such as recycling water and crafting a drought response plan, will serve as the "general framework" for legislation currently being prepared by lawmakers, said the bill's chief sponsor, Sen. J.E. "Buster" Brown, R-Lake Jackson.

Brown, expected to file the legislation today, said he expects a heated debate over any changes to water rights.

"Somebody said that whiskey is made for drinking and water is made for fighting," Brown said. "There's going to be real strong feelings [for] leaving things like they are in certain areas."

Among the most contentious issues is the "rule of capture," which essentially gives landowners absolute ownership of ground water.

Brown said the legislation could indirectly address that longstanding legal principle, but he cast doubt on any wholesale changes.

"It's a recognized rule of law, one that has a great tradition in Texas and one that I think probably would not be changed unless there were extreme emergency needs in the state," he said.

The report addressed an issue of major concern to Tarrant County by suggesting that the Legislature amend the Water Code to define the parameters for reusing treated waste water.

The Tarrant Regional Water District is studying the feasibility of recycling some of the treated sewage that is pumped into the Trinity River from waste water plants.

The water would be picked up in lakes downstream after being filtered through wetlands.

A potential snag is that the Texas Natural Resource Conservation Commission has an "interim policy" saying that once the waste water goes into the river, its ownership returns to the state.

Without the reuse option, Tarrant County may have no choice but to compete with Dallas and other municipalities that are seeking surface water in Northeast Texas, said Tony Bagwell, director of Water Resources Planning for the development board.

"And they [Tarrant County] may be the last ones through the door," he said.

Asked about the prospect of Tarrant County residents drinking what started out as treated sewer, Bagwell said: "It's mainly consumer perception. . . . It's going to be pretty darn clean water once it ends up in those lakes. The water in those lakes will be cleaner than the water in the river."

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# Lobby

From Page 1

month, plus expenses not to exceed \$500 a month. Fees before expenses will total \$72,000, Oliver said.

Lewis said yesterday that water rights issues may lead to major fights this session.

"We need to have a drought plan in place that would get us into and beyond the next century since the population will double in the next 50 years," he said.

The Tarrant water board has done an "absolutely wonderful job in this region," Lewis said. Unfortunately, other parts of the state have not done as well and efforts must be made to protect Tarrant County water resources, he said.

Oliver said the district has spent more than \$1 million on pilot projects involving reuse of Trinity River water downstream near the district's Richland-Chambers Reservoir.

The district is involved in a project that, if successful, may lead to pulling water from the Trinity River, running it through wetlands to improve water quality, then directing it into the Richland-Chambers Reservoir.

One of the battles expected in the Legislature is who has rights to river water.

Additional legislation is expected to deal with interbasin transfers — the movement of water from one river watershed to another. Tarrant and other area water

districts are eyeing the Sulfur River in Northeast Texas as a potential water source.

In other action, district officials said they have been asked by Save Eagle Mountain Lake Inc. to study how plans for expanding wastewater treatment for Springtown area residents might affect Eagle Mountain Lake.

At question is the Walnut Creek drainage basin, which flows through portions of Tarrant, Parker and Wise counties, said Bob Salinas, Springtown city manager.

The city and the Walnut Creek Special Utility District are considering expanding sewage facilities to many communities that now rely on septic tanks. The proposal may call for expansion of waste-water facilities in Springtown or construction of a new plant.

Treated water from the Springtown plant flows into Walnut Creek and eventually into Eagle Mountain Lake.

"Anytime you are looking at building a waste-water treatment plant or redoing one or going to Austin to upgrade your permit, we get concerned about how it will affect overall water quality in the lake," said Mac Wood, president of Save Eagle Mountain Lake.

Salinas said his city is also concerned about lake water quality.

"Eagle Mountain Lake is our drinking water source and we don't want to mess it up," he said.

Other options might involve directing waste water to an Azle plant or to Fort Worth facilities, said Woody Frossard, water district manager of environmental services.



# Study shows regional waste water system needed

BY CHARLES HODGES

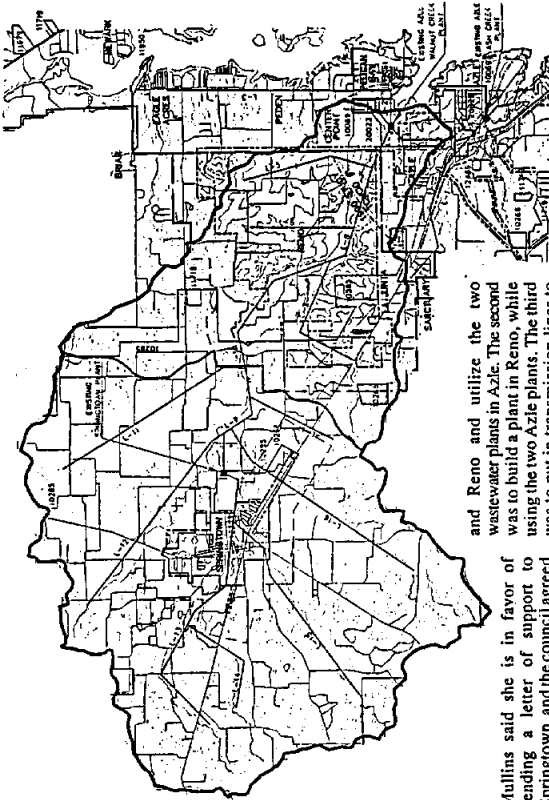
Would a regional wastewater authority be good for the Walnut Creek watershed? The initial draft of a study commissioned by the city of Springtown, Walnut Creek Special Utility District and the Texas Water Development Board says yes.

The findings of the study were released in draft form last Thursday night during a meeting of groups involved in the study area, and the Azle city council gave a consensus agreement during a workshop Tuesday night.

The purpose of the study was to determine if regional wastewater in the watershed was feasible, and then developed four scenarios to show how it can be done. The study did not go into the business side of how to get the job done.

Springtown city administrator Bob Salinas said that is going to be up to experts in cooperative utility districts to work with cities and communities in the area to determine how to make the concept of a regional wastewater authority become a reality.

He said getting support for the regional concept is what is important. That is why he asked those in attendance who represented Azle, Lajunta, Sanctuary, Tanglewood, Parker County, Fort Worth and Save Eagle Mountain Lake to look at the report's findings and send a letter of support to starting to look ahead to improve-



and Reno and utilize the two wastewater plants in Azle. The second was to build a plant in Reno, while using the two Azle plants. The third was to put in transmission lines to let the Azle plants serve the entire watershed area. A fourth plan called

Mullins said she is in favor of sending a letter of support to Springtown, and the council agreed by consensus since a formal vote was not allowed because it met in a workshop.

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The first two plans were cost prohibitive, Bery said. The only two that had any financial merit were using the Azle plants or Fort Worth. But the Fort Worth water department informed Springtown officials the plan to contract with Fort Worth was not possible because the city could not handle the flows expected.

That leaves Azle as the only viable option.

Riding told the council another reason Azle is the only option is so water can be recycled into Eagle Mountain Lake. If the wastewater was sent to Fort Worth, he said, the depletion from the lake would do a great deal of harm.

He told his council there are

recycling methods where water from wastewater plants can be recycled in ways that would be cost effective and help the lake. Recycling of wastewater is included in Senate Bill 1, which is rewriting state water control laws.

Even though the study is in its first draft, Gary Laneman, Texas Water Development Board engineer in the facility needs section of the planning division, told those at last Thursday's meeting there is enough from the preliminary draft for Springtown officials to meet with State Rep. Ric Williamson and State Sen. David Sibley to see if any funds can be made available to help establish a regional authority.

for all of the region's wastewater to be sent to Fort Worth.

Lake to look at the report's findings and send a letter of support to Springtown to attach to the final report that will be sent to the Texas Water Development Board.

By showing a united front behind the concept, state officials can work to get money allocated to establish the authority and let work proceed on getting the infrastructure in place to get the system working.

Azle public works director Darrell Riding told his council Tuesday he agrees with the concept of regional wastewater. Azle is a key piece in the puzzle because out of the four scenarios outlined in the study, the one that calls for Azle to handle the treatment of the wastewater is the best option available.

Riding said that scenario would be good for Azle because it would help development between Azle and Springtown. Because there is no wastewater treatment in the area now, large scale development is virtually impossible.

Since he has no problem with the concept of a regional wastewater authority, he recommended the council write a letter to Springtown supporting the idea so officials with the Texas Water Development Board and Texas Natural Resources Conservation Commission can move forward with helping to establish the authority.

However, Riding did say that a Monday meeting between Springtown city administrator Bob Salinas and mayor pro-tem Al Swan brought up an area of disagreement.

was the result of Springtown starting to look ahead to improvements to its own wastewater plant. The TNRCC told the city that if it was going to look at its own needs, why not start looking at a regional level. The TNRCC is the regulatory arm overseeing the state's wastewater plants.

After getting a grant from the Texas Water Development Board and getting the Walnut Creek SUD to cover one-quarter of the cost of the study, and talking to every governmental agency involved in the area, Teague, Nall and Perkins, the city's engineering firm, was hired to conduct the study.

The mandate of the study was to determine whether it was economically feasible to collect and treat wastewater in the Walnut Creek watershed and determine the best ways to physically do it.

Teague, Nall and Perkins engineers Mark Berry and Kelly Carta came up with four plans. The first was to build regional plants in Springtown

Swan brought up the idea of developing a Municipal Utility District (MUD) to be the wastewater authority. Riding told the council he disagreed with the MUD concept because that could be used to develop a taxing district, which would take taxing control away from the city council.

He said the letter to Springtown will be sent only after the final draft of the study is complete. The target date for completion is March 19.

But Riding said there are a number of ways a regional authority could be made up that would satisfy Azle's concerns, including the establishment of a MUD that does not include the city of Azle, interlocal agreements between the different entities in the watershed could join an authority together while Azle handles the treatment of the wastewater, and Azle handling treatment and Springtown putting in the collection system for the watershed.

Azle's Mayor pro-tem June

# The Springtown Epigraph

Volume 33, Number 44

Thursday, January 30, 1997

50 cents

18 pages plus supplements

Springtown, Texas

## Study shows sewer plan

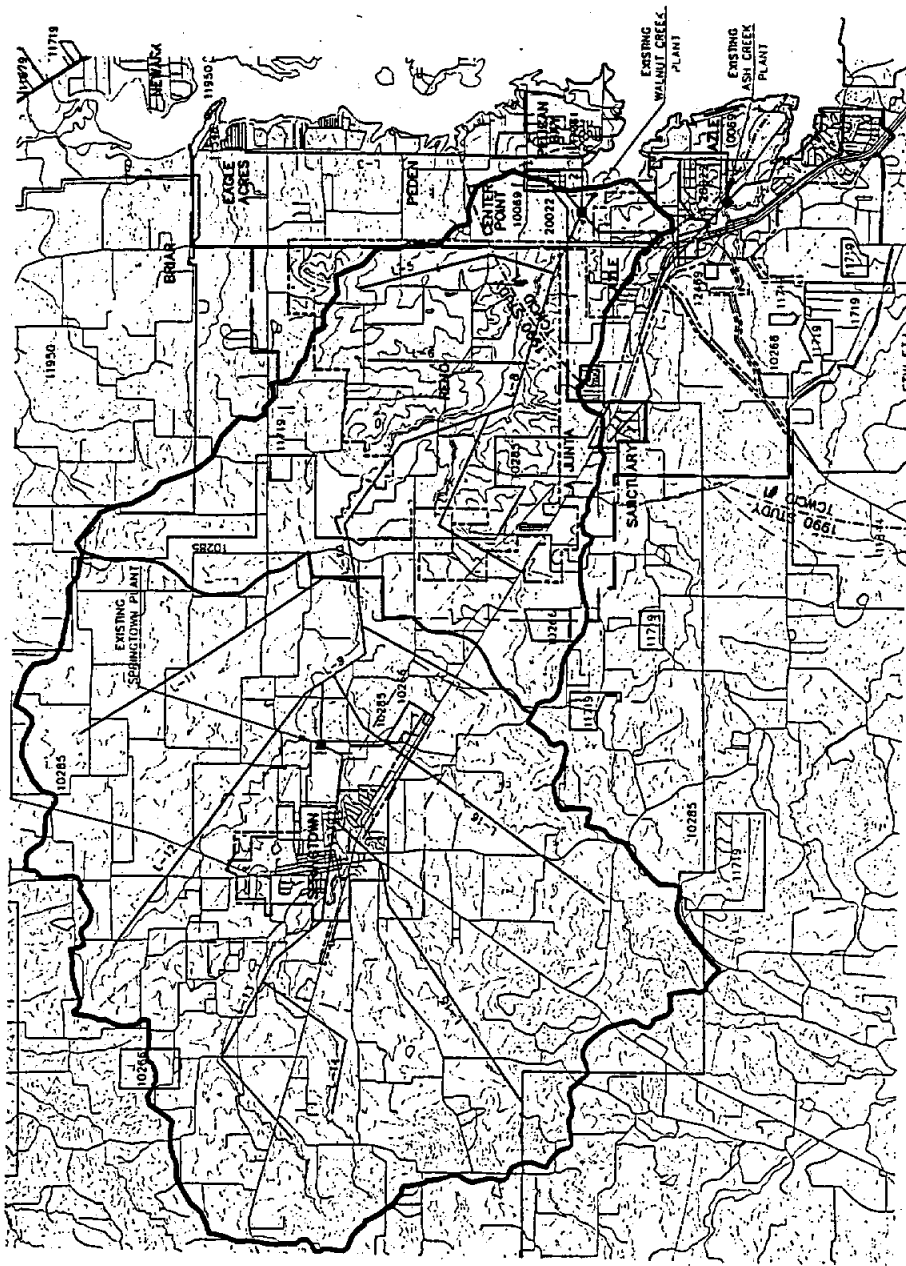
by Charles Hodges  
The Springtown Epigraph

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See Sewer, page 17



The area in the dark lines is the watershed for Walnut Creek and covers most of the area of the proposed regional wastewater authority area. The dashed line coming from south of Azle to include Sanctuary and from Eagle Acres west to just north of Reno outline the rest of the proposed area.

## Sewer: Plan shows need for regional wastewater program

From the front page

the watershed was feasible, and then developed four scenarios to show how it can be done. The study did not go into the business side of how to get the job done.

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Azle's Mayor pro-tem June Mullins said she is in favor of sending a letter of support to Springtown, and the council agreed by consensus since a formal vote was not allowed because it met in a workshop.

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# The Springtown Epigraph

Volume 33, Number 45

Thursday, February 6, 1997

50 cents

20 pages plus supplements

Springtown, Texas

## Bank builds branch First Bank starts construction

After five years working out of the old Mutual Building and Loan office on Ave C, First Bank is starting construction on a new home.

Tuesday, the Azle-based bank broke ground on a new 4,000 square foot building located on the south side of Hwy. 199, just east of Springtown, near Gieb Veterinary Clinic.

"We came out here five years ago, it was a commitment to the people in this community," bank president Scott Allred said.

That commitment paid off with a new building that doubles the amount of customers that can be served and adds services such as safe deposit boxes.

Vice president and branch manager Craig Doyle said the bank is just answering the growth that has come to the Springtown area.

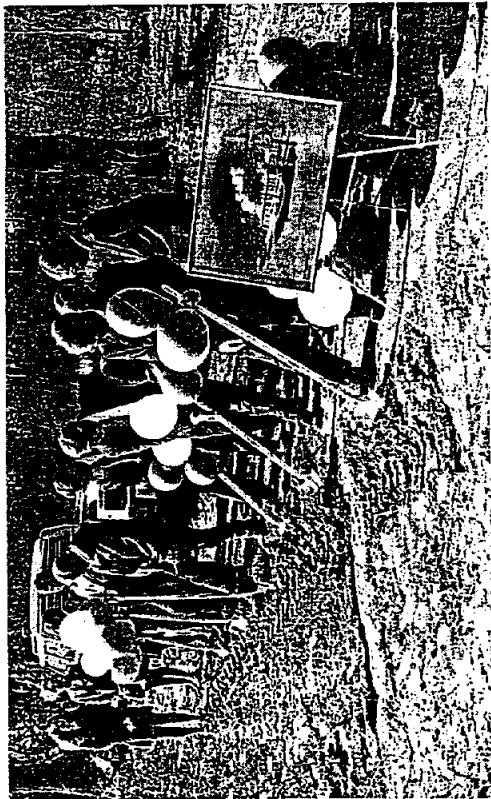


Photo by Charles Hodges  
Officials from the Springtown Chamber of Commerce, city of Springtown and First Bank break ground for the bank's new Springtown offices on Hwy. 199 just east of the city. Vice president and branch manager Craig Doyle said the new building is needed for the facility to keep up with growth in the area.

He pointed to the development of the Winn Dixie shopping center and other business ventures that came to the area and the influx of people moving here.

"We have seen growth, too," he said.

The new facility will have four teller windows inside and a four-car drive through system. Both can be expanded, Doyle said, to six inside lanes.

Construction on the stone building will begin in the next 10 days. It is hoped it will be ready for business in six months. He said it will cost \$750,000.

Aside from the safe deposit

# Sewer request may go to Austin

by Charles Hodges  
The Springtown Epigraph.

The initial draft of a feasibility study released last week shows that the Walnut Creek watershed, stretching out west from Eagle Mountain Lake, is a candidate for a regional wastewater authority.

The study, funded by the city of Springtown, Walnut Creek Special Utility District (SUD) and the Texas Water Development Board, indicates a need for regional

wastewater treatment capability as the rural population grows and cities struggle to meet increasingly stringent state mandates on treating effluent.

Springtown city officials have announced plans to seek legislation creating such an authority in the current session. The city council had scheduled a meeting Tuesday to vote on a resolution asking the Texas legislature to pass such a bill, and hiring former State Sen. Bob Glasgow of Stephenville to see it

through the House and Senate.

But the meeting was called off when the council failed to achieve a quorum.

Currently, the city of Springtown is working with a \$250,000 state grant to bring its sewer plant up to state standards and out from under an enforcement order issued by the Texas Natural Resource Conservation Commission (TNRCC).

"This is a window of opportunity," mayor Thomas Gentry said. "We have to pass a resolution and

have a notice published in the paper for 30 days before there can be a vote in Austin."

Mayor pro-tem Al Swan said the city is not trying to force a regional authority, but having it created by the legislature would save 18 months to three years, as well as a cost of about \$200,000.

The city does not have the time or the money to waste, Swan added.

City councilman Doc Dockery

See Sewer, page 18.

# Sewer: City, Walnut Creek disagree over type of authority

From the front page

to do is get the ball rolling so everything will be in place for final passage by the time the legislature adjourns in early June.

Once it adjourns, the bill cannot be considered for at least two years unless it is put on the agenda for a special session — and those are usually called only for major statewide issues.

Salinas said discussions among the different groups which have been part of the study process may point out changes that will be needed even after the initial legislation is filed. Swans said it will be up to Glasgow to work with Sen. David Sibley and Rep. Ric Williamson to get the bill through the Legislature and onto Gov. George W. Bush's desk for his signature.

While there has been much discussion on what the authority should or would look like, Salinas said nothing is written in stone and the make up of the authority may change up to the day of final passage by the House or Senate.

"I don't know what the authority will look like. Everything is up for discussion so everyone can be sensitive of the needs of the entities involved," Salinas said.

Springtown started working on a regional wastewater plan at the request of the TNRCC, which regulates wastewater issues. The city expressed interest in doing a

study to see what it will need to do to rebuild its current wastewater plant for future use.

The city is proposing the establishment of a Municipal Utility District (MUD). Mark Berry, an engineer for Teague, Hall and Perkins who worked on the feasibility study, said a MUD is a special district that would provide a specific service to a specific area — much like a municipality would provide a service to its residents. The MUD is an independent body that could own assets, oversee and maintain equipment, and receive loans, grants and other seed money from state and federal sources.

According to Swann, only a MUD will give a regional wastewater authority the ability to effectively get grants and loans, while at the same time being able to own the transmission lines and other equipment needed to make a sewer service work for the entire area.

There are other ways to create an authority, however. A Special Utility District (SUD) such as Walnut Creek, which provides water service to a large area around Springtown, could not tap into federal resources. Swann said having the ability to go after federal dollars would reduce the cost of the system to those who tap into the lines.

Walnut Creek SUD director Jerry

Holsomback supports another option, a Public Utility Authority or PUA, for organizing the authority. Legislation allowing PUAs was passed in the late 1970's. Holsomback said it would allow the authority to have the benefits of a MUD without having the ability to tax.

The ability to tax sent a red flag up for Azle public works director Darrell Riding when he talked to the Azle city council last Tuesday. Riding said he would oppose Azle becoming part of a MUD because it could take taxing control away from the council.

Holsomback said Springtown was "premature" in going to the legislature and hiring Glasgow to see it through.

"I, myself or Walnut Creek, will not agree or sponsor any kind of district that has a taxing authority," he said. "There are ways of doing this where everyone is represented. I think it should be Springtown, Walnut Creek, Reno and Azle."

Holsomback said he does not feel an authority with the ability to tax would be good for the area. And, he added, a MUD might have to hold bond elections to get capital needed for major construction projects. Those taxes would have to be approved by voters within the authority's boundaries.

"I don't think anything you have right now that would allow any kind of taxing would be beneficial or

acceptable to the people," Holsomback said. "As I have told people on the Springtown council, we can have a public utility agency for wastewater and sewer only. It has the ability to do anything except tax. The Attorney General's office said it is a good piece of legislation. Our attorneys in Austin have said it would work. We had them review it. We can support something in that direction."

Springtown officials stressed they are not proposing a district that would tax for the sake of taxing, or that people who are not getting services would pay a tax.

"This council would not vote for anything that would tax people for something they are not getting," Swann said. "In fact, it can't tax. It is in the codes."

Swann and Gentry said the initial proposal the city is considering for the makeup of the authority contains a provision that only those who are receiving services will pay for the use of those services.

Any extra charges would not be a tax, Swann said. Customers of the services provided by the authority would pay a surcharge to have lines installed coming off the main transmission lines that would provide the sewer service to the individual home.

The exact cost of providing that service is not known, Berry said.

More engineering will need to be done to determine the final cost. Another big unknown is how much state money will be available to start the authority. That "seed money" from Austin is a major reason Springtown wants to get the authority established now, so it can take advantage of current grant polls. State officials have told the city the total amount grant money offered to local governments by the state may be reduced by the legislature in its current session.

"The timing may not be right," Salinas said. "We have talked to everyone we can, but there are others we have not talked to like I would have liked. The fact is, we are facing a deadline. We know an authority has to be created and details still need to be ironed out."

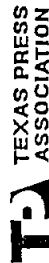
"We are sensitive to the needs of the different communities," he added. "We have to be flexible to do it."

Since the Walnut Creek SUD put up \$7,500 to help pay for the study, Salinas asked Holsomback if there could be a meeting between the engineers who conducted the study and the Walnut Creek board to go over the findings.

Holsomback said such a meeting will take place in the next couple of weeks.

## The Springtown Epigraph

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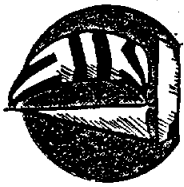
Letters from Readers must be signed and include an address and the writer's phone number. Anonymous letters will not be published, although the name of a letter writer may be withheld under certain circumstances at the editor's discretion. Letters should be as brief as possible, typewritten and double spaced.

Letters endorsing political candidates will be published only as paid advertising. The deadline for letters from readers is 5 p.m. Monday.

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# Azle News

50¢

Friday, February 6, 1997

Volume 45, Number 32

Azle, Texas 76020

## Study supports regional wastewater

BY CHARLES HODGES

A feasibility study released last week shows that the Walnut Creek watershed, stretching out west from Eagle Mountain Lake, is a prime candidate for a regional wastewater authority.

The study, funded by the city of Springtown, Walnut Creek Special Utility District and the Texas Water Development Board, indicates a need for regional wastewater treatment capability as the rural population grows and cities struggle to meet increasingly stringent state mandates on treating effluent.

The city of Azle participated in

the study by providing information. Azle, which three years ago began using its treated effluent to irrigate Cross Timbers Golf Course, has two wastewater plants on Eagle Mountain Lake — one of which is currently idle. The city expects to reopen that plant later this year when it begins to accept and process sewage from Pelican Bay.

The city of Springtown has been the driving force thus far behind efforts to create some sort of regional authority. City officials announced plans last week to seek legislation creating an authority in the current session.



I don't think anything that would allow any kind of taxing would be acceptable to the people.

Jerry Holsomback  
Walnut Creek SUD director

In fact, Springtown's city council had scheduled a meeting Tuesday to vote on a resolution asking the Texas legislature to pass such a bill, and hiring former State Sen. Bob Glasgow of Stephenville to see it through the House and Senate. The meeting was called off when the council failed to achieve a quorum.

Currently, Springtown is working with a \$250,000 state grant to bring its sewer plant up to state standards and out from under an enforcement order issued by the Texas Natural Resource Conservation Commission

PLEASE SEE STUDY, PAGE 4A.



# Study: Wastewater entity needed

■STUDY, FROM PAGE ONE.

(TNRCC).

"This is a window of opportunity," mayor Thomas Gentry said. "We have to pass a resolution and have a notice published in the paper for 30 days before there can be a vote in Austin."

Mayor pro-tem Al Swan said the city is not trying to force a regional authority, but having it created by the legislature would save 18 months to three years, as well as a cost of about \$200,000.

The city does not have the time or the money to waste, Swan added.

City councilman Doc Dockery said even with improvements to Springtown's wastewater facilities, it will likely be back under an enforcement order in two years, because of growth and expected tougher state standards.

The area is also looking at tougher restrictions on septic systems coming out of Austin in the next few years, and water issues are on the front burner in the legislature this session.

"We are running out of time," Parker County judge Ben Long said about getting sewer service for the entire area.

Even if the legislature approves an authority for this area, it will be several years before service would become available.

The city of Azle joined several other entities on an advisory committee for the study. Included were Parker County, Save Eagle Mountain Lake, Inc., the city of Reno, the Tanglewood subdivision west of Azle, the city of Fort Worth and the Tarrant County Regional Water Board.

While Springtown is taking the lead in trying to have the authority established, it is not known what the authority will look like in its final form. According to city administrator Bob Salinas, all Springtown wants to do is get the ball rolling so everything will be in place for final passage by the time the legislature adjourns in early June.

Once it adjourns, the bill cannot be considered for at least two years unless it is put on the agenda for a special session — and those are usually called only for major statewide issues.

Salinas said discussions among the different groups which have been part of the study process may point out changes that will be needed even after the initial legislation is filed. Swan said it will be up to Glasgow to work with Sen. David Sibley and Rep. Ric Williamson to get the bill through the Legislature and onto Gov. George W. Bush's desk for his signature.

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Among the options for organizing



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an entity are a Municipal Utility District (MUD), a Special Utility District (SUD) and a Public Utility Authority (PUA).

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A SUD, such as Walnut Creek,

which provides water service to a large area around Springtown, could not tax and would be unable to go after federal dollars which might reduce the cost of the system to those who tap into the lines.

A PUA — the option favored by Walnut Creek SUD director Jerry Holsomback — would offer the benefits of a MUD without the ability to tax.

The "T-word" sent a red flag up for Azle public works director Darrell Riding when he talked to the Azle city council last Tuesday. Riding said he would oppose Azle becoming part of a MUD because it could take taxing control away from the council.

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Springtown officials stressed they are not proposing a district that would tax for the sake of taxing, or that people who are not getting services would pay a tax.

Swan and Gentry said the initial proposal the city is considering for the makeup of the authority contains a provision that only those who are receiving services will pay for the use of those services.

The possibility of obtaining "seed money" from the state to start the authority is a major reason Springtown wants to get things going quickly. State officials have told the city the total amount grant money offered to local governments by the state may be reduced by the legislature in its current session.

"The timing may not be right," Salinas said. "We have talked to everyone we can, but there are others we have not talked to like I would have liked. The fact is, we are facing a deadline. We know an authority has to be created and details still need to be ironed out."

"We are sensitive to the needs of the different communities," he added. "We have to be flexible to do it."

Holsomback said the engineers who conducted the study and the Walnut Creek board will meet in the next few weeks to go over the findings.

# Council sets forum, election

## BY ROBYN ADAMS SCHMIDT

The Azle city council set the date Tuesday night for its May election of the mayor's position as well as city council places 3, 4 and 6.

If they choose to run again, Mayor Shirley Bradley and council members Van Harrmitt, Dick Gann and Leck Heilin will be up for reelection May 3.

The first day to file for a place on the ballot will be Feb. 17. Filing will close March 19 at 5 p.m.

Early voting in person will be held from April 14 to April 29 between 8 a.m. and 5 p.m. at Azle City Hall. Citizens can apply for mail ballots starting March 4 and must be received in the city secretary's office by 5 p.m. April 25. Applications for mail ballot should be mailed to: Kim Shelton, City Secretary, 613 SE Parkway, Azle, TX 76020.

Council members also confirmed the location of the city-wide public forum that the council will sponsor Tuesday, Feb. 25 starting at 7 p.m. at Azle Elementary.

### Nuisance ordinance

The council unanimously approved a revised version of the nuisance ordinances of the Azle Municipal Code following a brief discussion about issues that were raised at the council's work session last week on the ordinance.

Interim city manager Jerry Guillery explained to council members that state law sets out

much of the requirements for the city's junk vehicle portion of the nuisance ordinance.

The new junk vehicle ordinance states that a vehicle may be cited as a junk vehicle if it is self-propelled and inoperable and one of the following:

- Has an expired license plate or invalid motor vehicle inspection certificate;
- Is wrecked, dismantled or discarded;
- Has remained inoperable for more than 45 consecutive days.

### Waste water plant expansion

The council accepted a bid contract from Control Specialists, Inc. to complete the expansion construction of the city's waste water treatment plant.

The lowest bid the city received (from Control Specialists, Inc.) for more than the city budgeted for the project, City engineer Bill Pembroke explained to the council that if they accepted the company's alternate bid of \$2.3 million for the project, the city's public works department could negotiate with the company to alter the company's plans to include the construction needs that the city deems most important for the plan.

### Other action items

The council approved an amendment to the Building Board of Adjustment's by-laws that would allow the board to meet when they

**City note: Laidlaw has moved its Friday recycling pickup in Azle to Tuesdays**

have agenda items or when a meeting is called by committee chairperson or two committee members, instead of having to hold monthly meetings.

The council also unanimously approved a contract with First Southwest Company to provide the documentation necessary to comply with the Securities and Exchange Commission (SEC) requirements for continuing disclosure of municipal bond information to investors. The company's services were estimated to cost about \$1,500 annually.

### Discussion items

Council members took a consensus to have interim city

manager Jerry Guillery to begin the hiring process for the economic development director position that was approved in the 1996-1997 city budget, but has not been filled because the council was waiting to hire a permanent city manager first. Council member B.J. Clark remained opposed to starting the hiring process until the new city manager is in place.

Council members expressed concerns that waiting any longer to hire the economic development director would delay Azle's full participation in the development that is rapidly in the northwest sector of the Metroplex.

"We waited for a good reason, but the wait has been a whole lot longer than we thought," Harrmitt said.

Council members also directed members Gann and Harrmitt to continue recruiting people to serve on a Citizen Golf Committee. Gann reported that Tom Brace had expressed interest in the committee.



# Azle News

Thursday, February 13, 1997

Volume 45, Number 33

30 pages plus supplements

## *Glasgow to lobby for water district*

BY CHARLES HODGES

The ball is rolling on getting a regional wastewater authority designed to serve the Walnut Creek watershed established by June.

Monday, the Springtown city council voted to start preparing legislation to be introduced in the current session of the Texas Legislature — and to hire former State Sen. Bob Glasgow to push it through the Senate and House.

The vote came just a few days after city officials found an alternative means of organizing the authority that gives it the powers needed to get grants and other funding without creating another taxing entity.

The Special Law District was discovered by attorney John Lynch, who has been working as a consultant to the city to determine the best organizational structure for a regional wastewater system.

Springtown is taking the lead on establishing a wastewater district to cover the Walnut Creek watershed, but the city of Azle has been involved through providing information for the study. Azle's wastewater plants are a potential

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PLEASE SEE WATER, PAGE 2A.

# Water effort gains lobbyist

■WATER, FROM PAGE ONE.

source of treatment capacity for the district, should it be created.

Springtown and the Walnut Creek Special Utility District (SUD) joined forces with the Texas Water Development Board to study whether it is feasible to have a regional sewer authority to serve the area. An initial draft of the study shows it is — now the question is how the regional authority should be established.

Springtown city officials originally proposed a Municipal Utility District (MUD). But that plan drew fire from the city of Azle and Walnut Creek SUD because MUDs have the ability to levy property taxes.

The city council was scheduled to meet Feb. 3 to approve drafting legislation and hiring Glasgow, but the lack of a quorum canceled the meeting. Last Wednesday, city administrator Bob Salinas, mayor Thomas Gentry and mayor pro-tem Al Swan met with Lynch in his office and discussed the idea of a Special Law District.

Swan said the city is backing off the MUD because of the tax issue. Springtown's council would not be in favor of establishing another taxing authority, just as Azle's council informally said two weeks ago during a budget workshop, and Walnut Creek's director Jerry Holsomback said last Tuesday.

Salinas said Springtown has had staff contacts with Azle city staff to inform them of the SLD possibility. Walnut Creek's board of directors had a meeting with Salinas and Springtown city engineers Tuesday night.

According to information provided by the city, the SLD can only be created by the Legislature.

“

After research and consultation with an attorney, the Special Law District fit our needs while working a compromise with the different entities involved.

Bob Salinas  
Springtown city manager

Because state lawmakers are currently in session, Salinas said it is vital the city get a bill drawn up and approved by the first week of June — or the area will have to wait two years before the SLD issue can be addressed again.

“We just don't have the time to wait,” Salinas said.

Even if the legislature approves an authority this session, Springtown's city engineering firm, Teague, Nall and Perkins, said it would be 2002 before it could begin operations. With growth in the area accelerating, Salinas said waiting two years could be a costly delay.

A Special Law District is run by a board of directors and a manager. The board would be appointed by various cities and other entities within the region or affected by the region. Participating entities would have designated positions on the board for appointment.

How many board members and how they would be selected still has

to be worked out, Salinas said.

The authority would not have the ability to tax, but it would be able to issue bonds. Those bonds could be financed by special user fees that would pay for installing a collection system for a particular area, with fees collected in that area paying for the work.

That scenario is one Swan said he wanted to see in a MUD, but Lynch said last Wednesday that a

MUD would have taxing authority, which is unacceptable to some of the entities involved in the study area.

“After research and consultation with an attorney, the Special Law District fit our needs while working a compromise with the different entities involved,” Salinas said.

Meanwhile, work is continuing on getting letters of support for the need for developing a regional wastewater authority. The letters Springtown is receiving are not binding on any governmental body or state agency to establish the district, just recognizing there is a need in the watershed for a regional wastewater collection system as small cities become unable to meet increasingly strict state mandates on their wastewater systems, and a growing rural population and smaller lot sizes makes septic tanks less effective.

The Reno city council voted last Monday to write a letter of support. Azle city staff is preparing a letter that will be proposed to the council when the final draft of the feasibility study is released in March.

# The Springtown Spin

Volume 33, Number 46

Thursday, February 13, 1997

50 cents

20 pages plus supplements

## City to take authority to Austin

By Charles Hodges  
The Springtown Epigraph

The ball is rolling on getting a regional wastewater authority assigned to serve the Walnut Creek watershed established by June.

Monday, the Springtown city council voted to start preparing legislation to be introduced in the current session of the Texas Legislature — and to hire former state Sen. Bob Glasgow to push it through the Senate and House. The vote came just a few days after city officials found an

alternative means of organizing the authority that gives it the powers needed to get grants and other funding without creating another taxing entity.

The Special Law District was discovered by attorney John Lynch, who has been working as a consultant to the city to determine the best organizational structure for a regional wastewater system.

Springtown is taking the lead on establishing a wastewater district to cover the Walnut Creek watershed, but the city of Azle has been involved through providing

information for the study. Azle's wastewater plants are a potential source of treatment capacity for the district, should it be created.

Springtown and the Walnut Creek Special Utility District (SUD) joined forces with the Texas Water Development Board to study whether it is feasible to have a regional sewer authority to serve the area. An initial draft of the study shows it is — now the question is how the regional authority should be established.

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See SLD, page 3

# SLD: District plans sack taxes

## From the front page

### Special Law District.

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Salinas said Springtown has had staff contacts with Azle city staff to inform them of the SLD possibility. Walnut Creek's board of directors had a meeting with Salinas and Springtown city engineers Tuesday night.

According to information provided by the city, the SLD can only be created by the Legislature. Because state lawmakers are currently in session, Salinas said it is vital the city get a bill drawn up and approved by the first week of June — or the area will have to wait two years before the SLD issue can be addressed again.

"We just don't have the time to wait," Salinas said.

Even if the legislature approves an authority this session, Springtown's city engineering firm,

Teague, Nall and Perkins, said it would be 2002 before it could begin operations. With growth in the area accelerating, Salinas said waiting two years could be a costly delay.

A Special Law District is run by a board of directors and a manager. The board would be appointed by various cities and other entities within the region or affected by the region. Participating entities would have designated positions on the board for appointment.

How many board members and how they would be selected still has to be worked out, Salinas said.

The authority would not have the ability to tax, but it would be able to issue bonds. Those bonds could be financed by special user fees that would pay for installing a collection system for a particular area, with fees collected in that area paying for the work.

That scenario is one Swan said he wanted to see in a MUD, but Lynch said last Wednesday that a MUD would have taxing authority, which is unacceptable to some of the entities involved in the study area.

"After research and consultation with an attorney, the Special Law District fitted our needs while

working a compromise with the different entities involved," Salinas said.

Meanwhile, work is continuing on getting letters of support for the need for developing a regional wastewater authority. The letters Springtown is receiving are not binding on any governmental body or state agency to establish the district, just recognizing there is a need in the watershed for a regional wastewater collection system as small cities become unable to meet increasingly strict state mandates on their wastewater systems, and a growing rural population and smaller lot sizes makes septic tanks less effective.

The Reno city council voted last Monday to write a letter of support. Azle city staff is preparing a letter that will be proposed to the council when the final draft of the feasibility study is released in March.

## Walnut Creek approves plan

by Charles Hodges  
The Springtown Epigraph

"It is a better plan."  
That is the opinion of Walnut Creek Special Utility District Board member Mike Gilley after hearing the last half of a proposal from Springtown city officials on the proposed regional wastewater authority.

City engineers Mark Berry and Kelly Carra along with city administrator Bob Salinas met with Walnut Creek director Jerry Holsomback and the board last Tuesday to discuss the regional wastewater study, which was sponsored by Walnut Creek, Springtown and the Texas Water Development Board.



If we keep going the way we are now everybody will benefit from it.

Jerry Holsomback  
Walnut Creek Special Utility District

After expressing reservations over having a taxing authority run a wastewater district, Holsomback said he is encouraged by having the district established by a Special Law District (SLD), an authority that does not have taxing powers.

"What was presented to our board was what we were looking for and what we wanted to happen," Holsomback said. "Going with the Special Law District is a good way to do it. Everyone will be represented with it."

but it drew fire from the city of Azle and the Walnut Creek because MUDs have the ability to levy property taxes.

"The big hang up we had was that it shouldn't have the taxing power," Holsomback said. "I think we can accomplish the same purpose just as well [with the SLD]."

According to information provided by the city, a SLD can only be approved by the legislature. Because it is in the middle of its current session, city officials are working to have the legislature pass a bill establishing the authority before the end of the session in the first week of June or else the area

See Sewer, page 17

## Council to vote on pacts

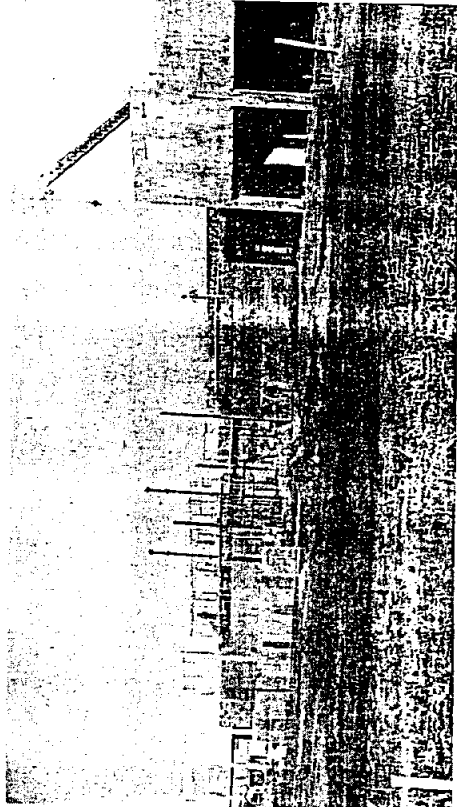
by Charles Hodges  
The Springtown Epigraph

Two interlocal governmental agreements helping to pave the way for the establishment of a regional wastewater authority will be considered Thursday night by the Springtown city council.

The agreements are with Parker County and the Wise County Water Improvement District No. 1, allowing the city to "plan, develop and operate" facilities through a regional wastewater authority.

Mayor pro-tem Al Swan said that

See Council, page 18



The front wall is starting to go up on the new Winn Dixie. Construction continues on the supermarket and shopping center on Hwy. 199.

# Council: City fathers face full meeting

Thursday, February 20, 1997/Page 17

## From the front page

despite the fact the agreements have language allowing the city to operate the wastewater system, Springtown has no intention of operating a regional wastewater authority.

"Not until the authority is created and the board decides what to do. Besides where would [the city] get the money from to operate it in the first place?" Swan said.

The agreements are needed to proceed with the development of the authority.

In other action, the council is scheduled to approve an ordinance establishing late water bill payment policies. Based on a citizen request, the council decided to have county attorney George Staples review the late payment policy that originally gave customers until 10 a.m. the day after the 15th of the month when that day falls on a weekend or holiday to pay a utility bill before

it is considered late and a late fee is charged.

The new ordinance will give customers the entire business day after the weekend or holiday to make the payment.

The council is also scheduled to consider a plat review, set May 3 for the city council election and declare some equipment, furniture and other items belonging to the city and police department as surplus so it can be sold at public auction.

A work session has also been planned so the council can hear a presentation from St. Environmental Services. It is the same company who talked to the council before about possibly contracting to operate the wastewater system.

The current system will have to be used even if a regional wastewater authority is established because the authority will not provide service for the next five to seven years.

# Sewer: Gets a boost

## From the front page

will need to wait for two years before the SLD issue can be addressed again.

A SLD is run by a board of directors and a manager. The board will be appointed by various cities and other entities within the region or affected by the region. Participating entities will have designated positions on the board for appointment.

How many board members and how they will be selected still has to be worked out, Salinas said.

The authority will not have the ability to set property taxes, but it can have the ability to issue bonds. The bonds can be financed by special user fees that will pay, for example, for installing a special collection system for a particular area with the fees for that one area being paid for by those effected.

That is the scenario Swan said he wanted to see in a MUD, but attorneys told Springtown officials a MUD will have to be a taxing authority, which is unacceptable to some of the entities involved in the study area.

Salinas said he was pleased that Walnut Creek came on board to support the SLD after last Tuesday's meeting.

"I am well pleased with the way things are turning around and the direction we are going now," Holsomback said. "If we keep going the way we are now everybody will benefit from it."

There is still a lot of work ahead to make the district become a reality. Reno city officials have not been formally told of the SLD and what impact it would have in that city, and Azle city officials have only been informally briefed on the SLD.



# The Springtown Epigraph

Volume 33, Number 49

Thursday, March 6, 1997

50 cents

20 pages plus supplements

Springtown, Texas

## County sets new limits on two roads

There are new speed limits on two area county roads.

The Parker County Commissioners Court Monday voted to set a speed limit of 40 miles per hour on Knob Road from F.M. 2257 to Dobbs Trail. A 45 mile per hour limit was also placed on Veal Station Road from Old Springtown Road to Hwy. 51.

The recommendations were made by Parker County commissioner Prec. 1 Danny Choate.

The court also heard a presentation from Springtown mayor Thomas Gentry asking for an

interlocal governmental agreement concerning the proposed Walnut Creek watershed regional wastewater authority.

"We got the cart before the horse," Gentry told the commissioners over the agreement.

All the city needs from the county is a letter supporting the concept of a regional authority to go in the final draft of a feasibility study on the project, which will be completed on March 19.

The city has started work to have

See Court, page 20



Photo by Robyn Adams Schmidt  
After being closed for a week due to high water and debris, Eagle Mountain Lake reopened to recreational boaters last Saturday. As of Tuesday, the lake was just above its normal level of 649 feet above sea level. Reservoir manager David Geary said Monday that there are no plans to close the lake this week, since the lake is continuing to return to its normal level. Here, a man watches as water is still being let out of the lake through the dam.

## Court: SLD district

From the front page  
the Texas Legislature approve the authority under a Special Law District, a non-taxing authority that would govern the wastewater district.

The court will vote during its meeting on Monday, March 10, whether it will approve the recommendation letter, which is non-binding and does not commit the county to the regional authority.

# The Democrat

Weatherford

A quick visit to

Austin

See Knockin' About, page 5A

Weatherford, a great place to live  
Home of Sherry Young

192ND YEAR, NO. 61, 16 PAGES, 2 SECTIONS, 50 CENTS

THURSDAY, MARCH 13, 1997

WEATHERFORD, TEXAS

## County commissioners express support for creation of proposed utility district

By BRAD MICHAEL MOORE

**Democrat Reporter**  
WEATHERFORD — In a show of support, Parker County Commissioners Court Monday passed a motion made by Precinct 4 Commissioner Rena Peden and seconded by Precinct 3 Commissioner Charlie Horton to write a letter backing the proposed creation of a utility district. The Parker County Utility District No. 1 (a regional wastewater district) would focus on wastewater issues. Springtown Mayor Thomas Gentry and

City of Springtown Administrator Bob Salinas brought forth information on the proposed project to Parker County Commissioners. The letter of support they requested will be included as support material in their proposal to be presented to the Texas Water Development Board March 17.

"We've got to stop this poisoning of our ground," Gentry said while discussing Springtown's own need to address its wastewater issues.

Salinas said that past and ongoing eco-

nomic studies covering Parker County point out a need for concentrated efforts to improve the county's infrastructure including roads, water and wastewater treatment.

"This (regional wastewater district) could be a great benefit, enhancing the health and quality of life for the people of Northeast Parker County," Salinas said.

Initial groundwork for a study to get this inter-local agreement underway was kicked started by a \$30,000 grant, \$15,000 of which came from the Texas Water Develop-

ment Board to match \$15,000 raised by the City of Springtown and the Walnut Creek Special Utility District.

The proposed utility district would provide wastewater services to public and private end-users serving portions of both Parker and Wise Counties. Revenue for district services would be funded by user fees only and the district would have no property taxing powers. Participation in the district's services would be voluntary for citizens.

See Court, page 2A

# Court

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**Continued from page 1A**  
gible property owners who presently use septic systems.

If the Texas State Legislature approves creation of the district upon recommendation of the Texas Water Development Board, a board of directors would be created and the utility district authority would be governed under the rules of a Special Law District. Members of the director's board would not receive compensation for their service and would have a four year board term.

Board members will be appointed by a governing body of member entities made up of public and private utility providers which furnish retail service and contracting with the district. Entities having interests or contracting with the district, but not having member entity status, would be eligible for Advisory Entity status.

The utility district would not begin providing service to potential customers until after the year 2000 if the district plans come along according to its present timetables.

Present boundaries for the proposed Parker County Utility District No. 1 starts at Agnes (on Highway 199) going east to a line near the communities of Eagle Acres, Center Point and Azle, coming south of Sanctuary in Parker County and going north of Springtown to a line parallel with Aurora in Wise County (Aurora is being used as a reference and is not included).

Thirty groups in the two-county area now support the proposed utility district including county governing entities, special interest groups and individuals including

Parker County Commissioners Court, Wise County Commissioners Court, Wise County Water Improvement and Control District No. 1, Walnut Creek Special Utility District, the cities of Springtown, Reno, La Junta and Sanctuary, Save Eagle Mountain Lake, Inc., and Tarrant County Regional Water District.

The letter Gentry and Salinas requested was signed by all sitting Parker County Commissioners Court members and reads:

"Parker County is one of the fastest growing counties in Texas. Subdivisions are rapidly covering major areas of Parker County, especially the undeveloped land.

We have an urgent need to develop a Parker County Regional Utility District to provide wastewater in an efficient and environmentally safe manner.

The creation of a Regional Utility District in Parker County would make possible the building, operating and maintaining facilities necessary for the treatment and transportation of wastewater. This would also protect, preserve and restore purity and sanitary conditions to both surface and groundwater in the County.

With the creation of the Parker County Utility District, we will have a mechanism that will provide an orderly basis for the treatment of wastewater, and solid waste, as well as the utility needs of its service area.

The Parker County Commissioners Court recognizes the need for such a district to be created at this time. The creation of this district would benefit all the citizens of Parker County; therefore, we add our support to this effort."

# District: County

## From the front page

for passage of the bill.  
"Ric Williamson was going to hand-deliver it to [State Senator David] Sibley and have it introduced by caption," Salinas said. "There are still some changes that need to be made before it goes to committee."

The wastewater district would be funded through grants as well as loans that would be repaid through revenues. No taxing authority is proposed for the district, which would collect wastewater from a wide rural area as well as from cities.

Increasingly stringent state and federal standards make it difficult for small cities like Springtown to operate wastewater systems. Because of the cost, the Springtown council has for several years been looking at participating in a regional system which might be able to handle wastewater from a wide area more efficiently.

The city of Azle, which currently has excess capacity in its wastewater treatment facilities, was one of several entities involved in a recently-completed study to determine the feasibility of a wastewater district in the area.

TO: KELLY  
CARTA  
  
FROM: Bob  
SALINAS

# Commissioners support district

Parker County commissioners Monday put their signatures to a letter supporting the formation of Parker County Utility District #1, an entity that would collect and treat wastewater from the rapidly-growing rural population.

County Judge Ben Long said the letter was requested by the city of Springtown, the driving force behind the utility district.

"We formed up a letter in support of it, and we all signed it," the judge said. "It was unanimous."

The text of the letter says:

"Parker County is one of the fastest growing counties in Texas. Subdivisions are rapidly covering major areas of Parker County, especially the undeveloped land.

"We have an urgent need to develop a Parker County Regional Utility District to provide wastewater.

"The creation of a Regional Utility District in Parker County would make possible the building, operating and maintaining facilities

The creation of a Regional Utility District in Parker County would... protect, preserve and restore purity and sanitary conditions to both surface and groundwater in the County.

Letter from Commissioners' Court  
In support of Wastewater District

necessary for the treatment and transportation of wastewater. This would also protect, preserve and restore purity and sanitary conditions to both surface and groundwater in the County.

"With the creation of the Parker County Utility District, we will have a mechanism that will provide an orderly basis for the treatment of wastewater, and solid waste, as well

as the utility needs of its service area.

"The Parker County Commissioners Court recognizes the need for such a district to be created at this time. The creation of this district would benefit all the citizens of Parker County, therefore we add our support to this effort.

"It is therefore adopted, ordered and entered into the minutes of

Commissioners Court this 10th day of March, 1997."

Jerry Holsomback, manager of Walnut Creek Special Utility District, said elected officials throughout the area were asked to endorse the concept of a wastewater district. "Their support will lend credence to efforts underway in Austin to get the district created in this session by an act of the State Legislature.

"As the study was progressing we asked everybody concerned to endorse it if they thought it would be a good thing," he said. "So far, they've all done that."

Springtown city manager Bob Salinas said the bill to create the district has not gone to committee yet, but a draft copy was delivered Friday to State Rep. Ric Williamson by lobbyist Bob Glasgow. Glasgow, a former State Senator and an attorney in Stephenville, was hired by the city of Springtown to work

Please see DISTRICT, page 5

## **APPENDIX E - SCENARIO COST PROJECTIONS**

SCENARIO 1 - PLANT 1 (SPRINGTOWN) - POPULATION CENTERS

SCENARIO 1 - PLANT 1 (SPRINGTOWN) - POPULATION CENTERS AND RURAL

SCENARIO 1 - PLANT 2 (RENO) - POPULATION CENTERS

SCENARIO 1 - PLANT 2 (RENO) - POPULATION CENTERS AND RURAL

SCENARIO 1 - PLANT 3 (AZLE) - AZLE AREA

SCENARIO 2 - PLANT 1 (RENO) - POPULATION CENTERS

SCENARIO 2 - PLANT 1 (RENO) - POPULATION CENTERS AND RURAL

SCENARIO 2 - PLANT 2 (AZLE) - AZLE AREA

SCENARIO 3 - PLANT 1 (AZLE) - POPULATION CENTERS AND AZLE AREA

SCENARIO 3 - PLANT 1 (AZLE) - POPULATION CENTERS, AZLE AREA AND RURAL

SCENARIO 4 - NO PLANTS (FORT WORTH SERVICE) - POPULATION CENTERS AND AZLE

SCENARIO 4 - NO PLANTS (FORT WORTH SERVICE) - POPULATION CENTERS, AZLE AREA  
AND RURAL

SCENARIO 5 - AZLE SERVICE - POPULATION CENTERS (50 YEAR PIPES, RURAL EXPANSION)

SCENARIO 5 - AZLE SERVICE - POPULATION CENTERS AND RURAL

SCENARIO 5 - AZLE SERVICE - POPULATION CENTERS (20 YEAR PIPES, RURAL SIZED)

SCENARIO 5 - AZLE SERVICE - POPULATION CENTERS (20 YEAR PIPES, SIZED ONLY FOR  
POPULATION CENTERS)

### Scenario 1 - Plant 1 (Springtown) - Population Centers

Plant at western edge of Reno to serve Springtown, Springtown ETJ, and SE Pipe Area

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Inflation Rate 4.00%	Interest Rate 8.00%	Loan Term (Years) 20	Capital Recovery Factor 0.1019	O&M Cost Per 1000 Gallons 1.68	Total Annual Cost (\$future)	Annual O&M Cost (\$future)	Annual Per Capita Cost (\$future)	Annual Cost Per Household (\$future)	Persons Per Household 2.54
1997	Start Program	0.26	0.20	2845	0.28	0.43	\$0	\$0						\$1,112,419	\$267,889	\$322	\$818	\$66.20
1998		0.26	0.20	2957	0.30	0.44	\$0	\$0						\$1,147,471	\$302,941	\$306	\$776	\$64.70
1999		0.26	0.20	3074	0.31	0.48	\$0	\$0						\$1,171,790	\$327,260	\$300	\$763	\$63.80
2000		0.26	0.20	3195	0.32	0.48	\$0	\$0						\$1,198,067	\$353,537	\$296	\$751	\$62.80
2001		0.26	0.20	3321	0.33	0.50	\$0	\$0						\$1,226,457	\$381,927	\$291	\$740	\$61.70
2002	New 1.15 mgd Plant, SS Line 9	1.42	1.07	3453	0.35	0.52	\$4,838,521	\$1,270,894						\$1,257,133	\$412,603	\$288	\$731	\$60.88
2003	Add SS Line 17	1.42	1.07	3754	0.38	0.56	\$0	\$426,588						\$1,290,277	\$445,747	\$284	\$722	\$60.15
2004	Take Existing Plant Off-Line	1.16	0.87	3900	0.39	0.58	\$0	\$0						\$1,326,089	\$481,559	\$281	\$714	\$59.51
2005		1.16	0.87	4051	0.41	0.61	\$0	\$0						\$1,364,784	\$520,254	\$279	\$708	\$58.96
2006		1.16	0.87	4208	0.42	0.63	\$0	\$0						\$1,406,594	\$562,064	\$276	\$702	\$58.50
2007		1.16	0.87	4371	0.44	0.66	\$0	\$0						\$1,451,771	\$607,241	\$275	\$697	\$58.12
2008		1.16	0.87	4540	0.45	0.68	\$0	\$0						\$1,500,587	\$656,057	\$273	\$694	\$57.83
2009		1.16	0.87	4716	0.47	0.71	\$0	\$0						\$1,553,333	\$706,803	\$272	\$691	\$57.62
2010		1.16	0.87	4899	0.49	0.73	\$0	\$0						\$1,610,328	\$765,798	\$272	\$690	\$57.50
2011		1.16	0.87	5090	0.51	0.76	\$0	\$0						\$1,671,915	\$827,385	\$272	\$690	\$57.47
2012		1.16	0.87	5287	0.53	0.79	\$0	\$0						\$1,738,463	\$893,833	\$272	\$690	\$57.52
2013		1.16	0.87	5493	0.55	0.82	\$0	\$0						\$1,810,374	\$965,844	\$272	\$692	\$57.86
2014		1.16	0.87	5706	0.57	0.86	\$0	\$0						\$1,888,079	\$1,043,549	\$273	\$695	\$57.88
2015		1.16	0.87	5928	0.59	0.89	\$0	\$0						\$1,972,046	\$1,127,516	\$275	\$698	\$58.19
2016		1.16	0.87	6158	0.62	0.92	\$0	\$0						\$2,062,781	\$1,218,251	\$277	\$703	\$58.59
2017		1.16	0.87	6397	0.64	0.96	\$0	\$0						\$2,162,252	\$1,316,299	\$277	\$703	\$58.59
2018		1.16	0.87	6646	0.66	1.00	\$0	\$0						\$2,271,048	\$1,422,252	\$277	\$703	\$58.59
2019		1.16	0.87	6905	0.69	1.04	\$0	\$0						\$2,389,001	\$1,536,747	\$277	\$703	\$58.59
2020		1.16	0.87	7173	0.72	1.08	\$0	\$0						\$2,511,495	\$1,660,473	\$277	\$703	\$58.59
2021		1.16	0.87	7452	0.75	1.12	\$0	\$0						\$2,646,925	\$1,794,176	\$277	\$703	\$58.59
2022	Add 1.34 mgd to Plant	2.50	1.88	7743	0.77	1.16	\$5,222,527	\$0						\$3,413,410	\$1,938,661	\$364	\$925	\$77.09
2023		2.50	1.88	8044	0.80	1.21	\$0	\$0						\$3,600,000	\$2,127,516	\$360	\$915	\$76.30
2024		2.50	1.88	8357	0.84	1.25	\$0	\$0						\$3,800,000	\$2,336,747	\$360	\$915	\$76.23
2025		2.50	1.88	8683	0.87	1.30	\$0	\$0						\$4,011,495	\$2,567,473	\$361	\$915	\$76.43
2026		2.50	1.88	9021	0.90	1.35	\$0	\$0						\$4,246,925	\$2,822,252	\$362	\$920	\$76.70
2027		2.50	1.88	9373	0.94	1.41	\$0	\$0						\$4,513,410	\$3,113,410	\$364	\$925	\$77.09
			Avg=	5572	0.94	1.41	\$10,061,048	\$1,697,482						\$25,739,090	\$12,538,768	\$364	\$925	\$77.09
2042		2.50	1.88	16646	1.66	2.50	\$0	\$0						\$114,479,298	\$52,222,527	\$360	\$915	\$76.30
							\$11,758,530	\$22,771,018						\$25,739,090	\$12,538,768	\$364	\$925	\$77.09

Present Value (in 1986 dollars) of all costs during planning period (1997-1927) = \$11,244,808

Calculations represent new expenditures only.

## Scenario 1 - Plant 1 (Springtown) - Population Centers and Rural

Plant at western edge of Reno to serve Springtown and Western County Watershed

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Inflation Rate 4.00%	Interest Rate 8.00%	Loan Term (Years) 20	Capital Recovery Factor 0.1019	O&M Cost Per 1000 Gallons 1.47	Annual O&M Cost (\$/future)	Total Annual Cost (\$/future)	Annual Cost Per Capita (\$/future)	Annual Cost Per Household (\$/future)	Persons Per Household 2.54	Monthly Household Cost (\$/future)
1997	Start Program																		
1998		0.26	0.20	2845	0.28	0.43	\$0	\$0							\$2,165,738	\$695	\$1,766		\$147.14
1999		0.26	0.20	2957	0.30	0.44	\$0	\$0							\$2,165,738	\$647	\$1,645		\$137.05
2000		0.26	0.20	3074	0.31	0.46	\$0	\$0							\$2,165,738	\$629	\$1,597		\$133.10
2001		0.26	0.20	3195	0.32	0.48	\$0	\$0							\$2,165,738	\$629	\$1,597		\$133.10
2002		0.26	0.20	3321	0.33	0.50	\$0	\$0							\$2,165,738	\$629	\$1,597		\$133.10
2002	New 1.87 Plant, Line 9, County	2.13	1.60	3453	0.35	0.52	\$6,296,154	\$1,270,894						\$234,403	\$2,400,141	\$695	\$1,766		\$147.14
2003	Add Line 17	2.13	1.60	3754	0.38	0.56	\$0	\$428,588						\$265,073	\$2,430,811	\$647	\$1,645		\$137.05
2004	Take Existing Plant Off-Line	1.87	1.40	3900	0.39	0.58	\$0	\$0						\$286,353	\$2,452,090	\$629	\$1,597		\$133.10
2005	Add Lines 11-16	1.87	1.40	7329	0.73	1.10	\$0	\$7,817,992						\$559,713	\$2,725,451	\$372	\$945		\$78.71
2006		1.87	1.40	7558	0.76	1.13	\$0	\$0						\$600,298	\$2,766,036	\$366	\$930		\$77.46
2007		1.87	1.40	7795	0.78	1.17	\$0	\$0						\$643,872	\$2,809,610	\$360	\$915		\$76.29
2008		1.87	1.40	8040	0.80	1.21	\$0	\$0						\$690,659	\$2,856,397	\$355	\$902		\$75.20
2009		1.87	1.40	8293	0.83	1.24	\$0	\$0						\$740,898	\$2,906,636	\$350	\$890		\$74.19
2010		1.87	1.40	8555	0.86	1.28	\$0	\$0						\$794,849	\$2,960,586	\$346	\$879		\$73.25
2011		1.87	1.40	8825	0.88	1.32	\$0	\$0						\$852,788	\$3,018,526	\$342	\$868		\$72.40
2012		1.87	1.40	9105	0.91	1.37	\$0	\$0						\$915,017	\$3,080,754	\$338	\$859		\$71.62
2013		1.87	1.40	9394	0.94	1.41	\$0	\$0						\$981,856	\$3,147,593	\$335	\$851		\$70.92
2014		1.87	1.40	9694	0.97	1.45	\$0	\$0						\$1,053,652	\$3,219,390	\$332	\$844		\$70.30
2015		1.87	1.40	10003	1.00	1.50	\$0	\$0						\$1,130,778	\$3,296,516	\$330	\$837		\$69.75
2016		1.87	1.40	10323	1.03	1.55	\$0	\$0						\$1,213,635	\$3,379,373	\$327	\$831		\$69.29
2017		1.87	1.40	10654	1.07	1.60	\$0	\$0						\$1,302,656	\$3,468,393	\$326	\$827		\$68.91
2018		1.87	1.40	10997	1.10	1.65	\$0	\$0						\$1,398,304	\$3,564,042	\$324	\$824		\$68.38
2019		1.87	1.40	11351	1.14	1.70	\$0	\$0						\$1,501,081	\$3,666,818	\$323	\$821		\$68.38
2020		1.87	1.40	11717	1.17	1.76	\$0	\$0						\$1,611,524	\$3,777,262	\$322	\$819		\$68.23
2021		1.87	1.40	12096	1.21	1.81	\$0	\$0						\$1,730,214	\$3,895,951	\$322	\$818		\$68.17
2022	Add 1.73 mgd to Plant	3.60	2.70	12489	1.25	1.87	\$6,013,849	\$16,873,215						\$1,857,774	\$3,555,978	\$285	\$723		\$60.27
2023		3.60	2.70	12895	1.29	1.93	\$0	\$0						\$1,994,876	\$3,693,080	\$286	\$727		\$60.62
2024		3.60	2.70	13315	1.33	2.00	\$0	\$0						\$2,142,245	\$3,840,449	\$288	\$733		\$61.05
2025		3.60	2.70	13749	1.37	2.06	\$0	\$0						\$2,300,658	\$3,998,862	\$291	\$739		\$61.56
2026		3.60	2.70	14199	1.42	2.13	\$0	\$0						\$2,470,954	\$4,169,158	\$294	\$746		\$62.15
2027		3.60	2.70	14664	1.47	2.20	\$0	\$0						\$2,654,037	\$4,352,241	\$297	\$754		\$62.82
			<b>Avg=</b>	<b>8695</b>	<b>1.47</b>	<b>2.20</b>	<b>\$12,310,003</b>	<b>\$9,515,474</b>						<b>\$31,928,168</b>	<b>\$4,352,241</b>	<b>\$297</b>	<b>\$754</b>		<b>\$62.82</b>
2042		3.60	2.70	23981	2.40	3.60	\$21,825,477	\$37,936,745						\$53,503,974	\$53,503,974	Average =	\$77.21		\$77.21

Present Value (in 1996 dollars) of all costs during planning period (1997-2027) = \$22,076,221

Calculations represent new expenditures only.

## Scenario 1 - Plant 2 (Reno) - Population Centers

Plant at eastern edge of Reno to serve "Downtown" Reno and portions of Reno along Walnut Creek

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Total Capital Costs (\$ 1996)	Interest Rate	Loan Term (Years)	Capital Recovery Factor	O&M Cost Per 1000 Gallons	Total Annual Cost (\$/future)	Annual Cost Per Capita (\$/future)	Annual Cost Per Household (\$/future)	Monthly Household Cost (\$/future)	Persons Per Household	
1997	Start Program																		
1998		0	0.00	0	0.00	0.00	\$0	\$0	\$0	8.00%	20	0.1019		\$71,915	\$1,147	\$2,913	\$242.76	2.54	
1999		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$75,757	\$1,138	\$2,690	\$240.87		
2000		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$79,803	\$1,129	\$2,668	\$239.03		
2001		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$84,066	\$1,121	\$2,847	\$237.27		
2002	Build .25 mgd Plant + Lines 8, 8b	0.25	0.19	677	0.07	0.10	\$3,824,693	\$1,642,644	\$5,467,337					\$98,287	\$1,105	\$2,808	\$233.97		
2003		0.25	0.19	686	0.07	0.10	\$0	\$0	\$0					\$98,270	\$1,098	\$2,789	\$232.43		
2004		0.25	0.19	695	0.07	0.10	\$0	\$0	\$0					\$109,049	\$1,091	\$2,772	\$230.97		
2005		0.25	0.19	704	0.07	0.11	\$0	\$0	\$0					\$114,874	\$1,085	\$2,755	\$229.59		
2006		0.25	0.19	713	0.07	0.11	\$0	\$0	\$0					\$121,010	\$1,079	\$2,740	\$228.29		
2007		0.25	0.19	722	0.07	0.11	\$0	\$0	\$0					\$127,474	\$1,073	\$2,725	\$227.07		
2008		0.25	0.19	731	0.07	0.11	\$0	\$0	\$0					\$134,283	\$1,067	\$2,711	\$225.94		
2009		0.25	0.19	741	0.07	0.11	\$0	\$0	\$0					\$141,456	\$1,062	\$2,699	\$224.88		
2010		0.25	0.19	750	0.08	0.11	\$0	\$0	\$0					\$149,012	\$1,058	\$2,687	\$223.92		
2011		0.25	0.19	760	0.08	0.12	\$0	\$0	\$0					\$156,971	\$1,054	\$2,676	\$223.04		
2012		0.25	0.19	770	0.08	0.12	\$0	\$0	\$0					\$165,356	\$1,050	\$2,665	\$222.25		
2013		0.25	0.19	780	0.08	0.12	\$0	\$0	\$0					\$174,189	\$1,044	\$2,651	\$221.56		
2014		0.25	0.19	790	0.08	0.12	\$0	\$0	\$0					\$183,493	\$1,042	\$2,645	\$220.96		
2015		0.25	0.19	800	0.08	0.12	\$0	\$0	\$0					\$193,295	\$1,040	\$2,641	\$220.45		
2016		0.25	0.19	810	0.08	0.12	\$0	\$0	\$0					\$203,620	\$233	\$591	\$49.27		
2017		0.25	0.19	821	0.08	0.12	\$0	\$0	\$0					\$214,496	\$242	\$615	\$51.24		
2018		0.25	0.19	831	0.08	0.12	\$0	\$0	\$0					\$225,954	\$252	\$639	\$53.29		
2019		0.25	0.19	842	0.08	0.13	\$0	\$0	\$0					\$238,023	\$262	\$665	\$55.42		
2020		0.25	0.19	853	0.09	0.13	\$0	\$0	\$0					\$250,738	\$272	\$692	\$57.63		
2021		0.25	0.19	864	0.09	0.13	\$0	\$0	\$0					\$264,131	\$283	\$719	\$59.94		
2022		0.25	0.19	875	0.09	0.13	\$0	\$0	\$0					\$279,901	\$293	\$746	\$62.24		
2023		0.25	0.19	886	0.09	0.13	\$0	\$0	\$0					\$296,177	\$303	\$773	\$64.54		
2024		0.25	0.19	898	0.09	0.13	\$0	\$0	\$0					\$313,062	\$313	\$800	\$66.84		
2025		0.25	0.19	909	0.09	0.14	\$0	\$0	\$0					\$330,566	\$323	\$827	\$69.14		
2026		0.25	0.19	921	0.09	0.14	\$0	\$0	\$0					\$348,695	\$333	\$854	\$71.44		
2027		0.25	0.19	933	0.09	0.14	\$0	\$0	\$0					\$367,457	\$343	\$881	\$73.74		
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>Avg=</b>	<b>670</b>	<b>0.09</b>	<b>0.14</b>	<b>\$3,824,693</b>	<b>\$1,642,644</b>	<b>\$5,467,337</b>					<b>\$14,092,120</b>	<b>\$283</b>	<b>\$719</b>	<b>\$59.94</b>	<b>Average =</b>	
2042		0.25	0.19	1130	0.11	0.17			<b>\$6,917,925</b>					<b>\$3,862,599</b>					

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) = \$2,794,843  
 Calculations represent new expenditures only.



## Scenario 1 - Plant 2 (Reno) - Population Centers and Rural

Plant at eastern edge of Reno to serve Reno and portions of the County downstream of the Springtown Plant

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Total Capital Costs (\$ 1996)	Interest Rate	Loan Term (Years)	Capital Recovery Factor	O&M Cost Per 1000 Gallons	Total Annual Cost (\$/future)	Annual Cost Per Capita (\$/future)	Annual Cost Per Household (\$/future)	Persons Per Household
1997	Start Program	0	0.00	0	0.00	0.00	\$0	\$0	\$0	8.00%	20	0.1019	2.03	\$0	\$0	\$0	2.54
1998		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$0	\$0	\$0	
1999		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$0	\$0	\$0	
2000		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$0	\$0	\$0	
2001		0	0.00	0	0.00	0.00	\$0	\$0	\$0					\$0	\$0	\$0	
2002	Build 66 mgd Plant + Lines 8, 8b	0.66	0.50	677	0.07	0.10	\$3,916,312	\$1,642,644	\$5,560,956					\$63,473	\$1,008,481	\$3,784	
2003	Add Lines 5-7	0.66	0.50	3158	0.32	0.47	\$0	\$1,703,614	\$1,703,614					\$307,964	\$1,252,972	\$1,008	
2004		0.66	0.50	3203	0.48	0.48	\$0	\$0	\$0					\$324,798	\$1,269,805	\$396	
2005		0.66	0.50	3248	0.32	0.49	\$0	\$0	\$0					\$342,555	\$1,287,562	\$396	
2006		0.66	0.50	3294	0.33	0.49	\$0	\$0	\$0					\$361,286	\$1,306,293	\$397	
2007		0.66	0.50	3341	0.33	0.50	\$0	\$0	\$0					\$381,045	\$1,326,052	\$397	
2008		0.66	0.50	3388	0.34	0.51	\$0	\$0	\$0					\$401,888	\$1,346,895	\$398	
2009		0.66	0.50	3436	0.34	0.52	\$0	\$0	\$0					\$423,875	\$1,368,883	\$398	
2010		0.66	0.50	3484	0.35	0.52	\$0	\$0	\$0					\$447,070	\$1,392,077	\$400	
2011		0.66	0.50	3534	0.35	0.53	\$0	\$0	\$0					\$471,538	\$1,416,545	\$401	
2012		0.66	0.50	3584	0.36	0.54	\$0	\$0	\$0					\$497,350	\$1,442,357	\$402	
2013		0.66	0.50	3635	0.36	0.55	\$0	\$0	\$0					\$524,580	\$1,469,588	\$404	
2014		0.66	0.50	3686	0.37	0.55	\$0	\$0	\$0					\$553,307	\$1,498,314	\$406	
2015		0.66	0.50	3739	0.37	0.56	\$0	\$0	\$0					\$583,612	\$1,528,619	\$409	
2016		0.66	0.50	3792	0.38	0.57	\$0	\$0	\$0					\$615,583	\$1,560,590	\$412	
2017		0.66	0.50	3846	0.38	0.58	\$0	\$0	\$0					\$649,312	\$1,594,320	\$415	
2018		0.66	0.50	3900	0.39	0.59	\$0	\$0	\$0					\$684,896	\$1,629,904	\$418	
2019		0.66	0.50	3956	0.40	0.59	\$0	\$0	\$0					\$722,437	\$1,667,445	\$422	
2020		0.66	0.50	4012	0.40	0.60	\$0	\$0	\$0					\$762,044	\$1,707,052	\$425	
2021		0.66	0.50	4070	0.41	0.61	\$0	\$0	\$0					\$803,831	\$1,748,838	\$430	
2022		0.66	0.50	4128	0.41	0.62	\$0	\$0	\$0					\$847,917	\$1,794,917	\$430	
2023		0.66	0.50	4187	0.42	0.63	\$0	\$0	\$0					\$894,431	\$1,844,431	\$430	
2024		0.66	0.50	4246	0.42	0.64	\$0	\$0	\$0					\$943,506	\$1,899,506	\$430	
2025		0.66	0.50	4307	0.43	0.65	\$0	\$0	\$0					\$995,284	\$1,960,284	\$430	
2026		0.66	0.50	4369	0.44	0.66	\$0	\$0	\$0					\$1,049,915	\$2,021,915	\$430	
2027		0.66	0.50	4431	0.44	0.66	\$0	\$0	\$0					\$1,107,556	\$2,084,556	\$430	
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>Avg=</b>	<b>3053</b>			<b>\$3,918,312</b>	<b>\$3,346,258</b>	<b>\$7,264,570</b>					<b>\$15,761,051</b>	<b>\$18,900,151</b>	<b>\$250</b>	<b>Average =</b>
2042		0.66	0.50	5493	0.55	0.82											

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) = **\$5,380,133**  
 Calculations represent new expenditures only.

### Scenario 1 - Plant 3 (Azle)

Plant at Azle Ash Creek to serve Azle, Pelican Bay and Sanctuary

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Total Capital Costs (\$ 1996)	Interest Rate 8.00%	Loan Term (Years) 20	Capital Recovery Factor 0.1019	O&M Cost Per 1000 Gallons 1.22	Total Annual Cost (\$/future)	Annual Cost Per Capita (\$/future)	Persons Per Household 2.54	Monthly Household Cost (\$/future)
1997	Start Program	1.74	1.31	11853	1.19	1.78	\$0	\$0	\$0					\$2,602,139	\$179	\$454	\$37.87
1998	Add Lines 1,2,&3 (Sanct., P.B. ETJ)	1.74	1.31	14544	1.45	2.18	\$0	\$3,735,600	\$3,735,600					\$2,655,606	\$176	\$448	\$37.34
1999		1.74	1.31	15052	1.51	2.26	\$0	\$0	\$0					\$2,713,154	\$174	\$442	\$36.87
2000		1.74	1.31	15578	1.56	2.34	\$0	\$0	\$0					\$2,775,096	\$172	\$437	\$36.43
2001		1.74	1.31	16122	1.61	2.42	\$0	\$0	\$0					\$2,841,766	\$170	\$433	\$36.05
2002	Add 4.66 mgd, Mothball W.C.	6.40	4.80	16885	1.67	2.50	\$11,562,493	\$0	\$11,562,493					\$2,913,526	\$169	\$429	\$35.71
2003		6.40	4.80	17268	1.73	2.59	\$0	\$0	\$0					\$2,990,764	\$167	\$425	\$35.42
2004		6.40	4.80	17871	1.79	2.68	\$0	\$0	\$0					\$3,073,899	\$166	\$422	\$35.18
2005		6.40	4.80	18496	1.85	2.77	\$0	\$0	\$0					\$3,163,380	\$165	\$420	\$34.98
2006		6.40	4.80	19142	1.91	2.87	\$0	\$0	\$0					\$3,259,693	\$165	\$418	\$34.83
2007		6.40	4.80	19810	1.98	2.97	\$0	\$0	\$0					\$3,363,358	\$164	\$417	\$34.72
2008		6.40	4.80	20503	2.05	3.08	\$0	\$0	\$0					\$3,474,937	\$164	\$416	\$34.66
2009		6.40	4.80	21219	2.12	3.18	\$0	\$0	\$0					\$3,595,035	\$164	\$416	\$34.65
2010		6.40	4.80	21960	2.20	3.29	\$0	\$0	\$0					\$3,708,601	\$165	\$418	\$34.83
2011		6.40	4.80	22544	2.25	3.38	\$0	\$0	\$0					\$3,839,490	\$165	\$420	\$34.98
2012		6.40	4.80	23234	2.32	3.49	\$0	\$0	\$0					\$3,978,979	\$166	\$422	\$35.17
2013		6.40	4.80	23949	2.39	3.59	\$0	\$0	\$0					\$4,128,789	\$167	\$425	\$35.40
2014		6.40	4.80	24689	2.47	3.70	\$0	\$0	\$0					\$4,289,696	\$169	\$428	\$35.67
2015		6.40	4.80	25454	2.55	3.82	\$0	\$0	\$0					\$4,462,534	\$170	\$432	\$35.99
2016		6.40	4.80	26246	2.62	3.94	\$0	\$0	\$0					\$4,648,201	\$172	\$436	\$36.35
2017		6.40	4.80	27067	2.71	4.06	\$0	\$0	\$0					\$4,846,013	\$177	\$446	\$37.34
2018		6.40	4.80	27916	2.79	4.19	\$0	\$0	\$0					\$5,056,085	\$180	\$454	\$38.55
2019		6.40	4.80	28795	2.88	4.32	\$0	\$0	\$0					\$5,279,554	\$184	\$468	\$39.95
2020		6.40	4.80	29704	2.97	4.46	\$0	\$0	\$0					\$5,519,554	\$189	\$482	\$41.66
2021		6.40	4.80	30646	3.06	4.60	\$0	\$0	\$0					\$5,776,955	\$196	\$502	\$43.63
2022		6.40	4.80	31583	3.16	4.74	\$0	\$0	\$0					\$6,052,348	\$203	\$526	\$45.95
2023		6.40	4.80	32574	3.26	4.89	\$0	\$0	\$0					\$6,348,603	\$212	\$553	\$48.48
2024		6.40	4.80	33599	3.36	5.04	\$0	\$0	\$0					\$6,666,003	\$223	\$582	\$51.26
2025		6.40	4.80	34661	3.47	5.20	\$0	\$0	\$0					\$7,007,522	\$236	\$617	\$54.26
2026		6.40	4.80	35760	3.58	5.36	\$0	\$0	\$0					\$7,374,813	\$251	\$661	\$57.99
2027		6.40	4.80	36898	3.69	5.53	\$0	\$0	\$0					\$7,778,317	\$268	\$707	\$61.97
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>Avg=</b>	<b>23917</b>			<b>\$11,562,493</b>	<b>\$3,735,600</b>	<b>\$15,298,093</b>					<b>\$38,032,974</b>	<b>\$150</b>	<b>\$382</b>	<b>\$31.79</b>
2042		6.40	4.80	42698	4.27	6.40			<b>\$18,870,667</b>					<b>\$71,670,266</b>	<b>\$150</b>	<b>\$382</b>	<b>\$32.03</b>

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) = **\$34,097,169**  
 Calculations represent new expenditures only.

## Scenario 2 - Plant 1 (Reno) - Population Centers

Plant at eastern edge of Reno to serve Downtown Reno and Springtown

Inflation Rate  
4.00%

Interest Rate  
8.00%

Loan Term (Years)  
20

Capital Recovery Factor  
0.1019

O&M Cost Per 1000 Gallons  
1.52

Persons Per Household  
2.54

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Populatio Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Total Capital Costs (\$ 1996)	Total Capital Costs (\$ Future)	1997-2027 Annualized Capital Costs	Annual O&M Cost (\$future)	Total Annual Cost (\$future)	Annual Cost Per Capita (\$future)	Annual Cost Per Household (\$future)	Monthly Household Cost (\$future)	
1987	Start Program	0.26	0.20	2845	0.28	0.43	\$0	\$0	\$0	\$0	\$1,271,330	\$263,387	\$1,534,718	\$436	\$1,107	\$32.28	
1988		0.26	0.20	2957	0.30	0.44	\$0	\$0	\$0	\$0	\$1,271,330	\$345,480	\$1,616,811	\$364	\$925	\$77.08	
1989		0.26	0.20	3074	0.31	0.46	\$0	\$0	\$0	\$0	\$1,271,330	\$371,782	\$1,643,112	\$358	\$908	\$75.70	
1990		0.26	0.20	3195	0.32	0.48	\$0	\$0	\$0	\$0	\$1,271,330	\$400,122	\$1,671,452	\$352	\$893	\$74.42	
2001		0.26	0.20	3321	0.33	0.50	\$0	\$0	\$0	\$0	\$1,271,330	\$430,662	\$1,701,992	\$346	\$879	\$73.22	
2002	New 1.29 Plant, Add Lines 8a 8b, 9, 10	1.55	1.16	3520	0.35	0.53	\$5,121,121	\$4,300,018	\$9,421,139	\$11,920,746	\$1,271,330	\$463,574	\$11,734,904	\$341	\$865	\$72.11	
2003	Add SS Line 17	1.55	1.16	4440	0.44	0.67	\$0	\$426,588	\$426,588	\$561,361	\$1,271,330	\$469,044	\$1,770,374	\$336	\$853	\$71.09	
2004	Take Existing Springtown Plant Off-Line	1.29	0.97	4594	0.46	0.69	\$0	\$0	\$0	\$0	\$1,271,330	\$537,274	\$1,808,604	\$331	\$842	\$70.15	
2005		1.29	0.97	4754	0.48	0.71	\$0	\$0	\$0	\$0	\$1,271,330	\$576,482	\$1,849,812	\$327	\$832	\$69.31	
2006		1.29	0.97	4920	0.49	0.74	\$0	\$0	\$0	\$0	\$1,271,330	\$622,902	\$1,894,232	\$324	\$823	\$68.54	
2007		1.29	0.97	5093	0.51	0.76	\$0	\$0	\$0	\$0	\$1,271,330	\$670,787	\$1,942,117	\$321	\$814	\$67.87	
2008		1.29	0.97	5271	0.53	0.79	\$0	\$0	\$0	\$0	\$1,271,330	\$722,412	\$1,993,742	\$318	\$807	\$67.28	
2009		1.29	0.97	5457	0.55	0.82	\$0	\$0	\$0	\$0	\$1,271,330	\$778,071	\$2,049,401	\$316	\$801	\$66.78	
2010		1.29	0.97	5650	0.56	0.85	\$0	\$0	\$0	\$0	\$1,271,330	\$838,083	\$2,109,413	\$314	\$796	\$66.37	
2011		1.29	0.97	5849	0.58	0.88	\$0	\$0	\$0	\$0	\$1,271,330	\$902,792	\$2,174,122	\$312	\$793	\$66.04	
2012		1.29	0.97	6057	0.61	0.91	\$0	\$0	\$0	\$0	\$1,271,330	\$972,570	\$2,243,900	\$311	\$790	\$65.80	
2013		1.29	0.97	6272	0.63	0.94	\$0	\$0	\$0	\$0	\$1,271,330	\$1,047,818	\$2,319,148	\$310	\$788	\$65.65	
2014		1.29	0.97	6495	0.65	0.97	\$0	\$0	\$0	\$0	\$1,271,330	\$1,126,969	\$2,400,299	\$310	\$787	\$65.59	
2015		1.29	0.97	6727	0.67	1.01	\$0	\$0	\$0	\$0	\$1,271,330	\$1,216,491	\$2,487,821	\$310	\$787	\$65.61	
2016		1.29	0.97	6968	0.70	1.05	\$0	\$0	\$0	\$0	\$1,271,330	\$1,310,889	\$2,582,219	\$311	\$789	\$65.72	
2017		1.29	0.97	7218	0.72	1.08	\$0	\$0	\$0	\$0	\$1,271,330	\$1,412,708	\$2,682,220	\$311	\$789	\$65.72	
2018		1.29	0.97	7477	0.75	1.12	\$0	\$0	\$0	\$0	\$1,271,330	\$1,522,537	\$2,787,220	\$310	\$788	\$65.65	
2019		1.29	0.97	7747	0.77	1.16	\$0	\$0	\$0	\$0	\$1,271,330	\$1,641,013	\$2,900,220	\$308	\$785	\$65.59	
2020		1.29	0.97	8026	0.80	1.20	\$0	\$0	\$0	\$0	\$1,271,330	\$1,768,822	\$3,020,220	\$308	\$785	\$65.59	
2021		1.29	0.97	8316	0.83	1.25	\$0	\$0	\$0	\$0	\$1,271,330	\$1,906,705	\$3,148,695	\$308	\$785	\$65.59	
2022	Add 1.38 mgd to plant	2.67	2.00	8617	0.86	1.29	\$5,303,742	\$0	\$5,303,742	\$14,704,464	\$1,497,682	\$1,412,708	\$3,020,390	\$338	\$856	\$71.49	
2023		2.67	2.00	8930	0.89	1.34	\$0	\$0	\$0	\$0	\$1,497,682	\$1,522,537	\$3,138,695	\$339	\$861	\$71.78	
2024		2.67	2.00	9255	0.93	1.39	\$0	\$0	\$0	\$0	\$1,497,682	\$1,641,013	\$3,266,504	\$341	\$865	\$72.08	
2025		2.67	2.00	9592	0.96	1.44	\$0	\$0	\$0	\$0	\$1,497,682	\$1,768,822	\$3,404,387	\$342	\$870	\$72.48	
2026		2.67	2.00	9942	0.99	1.49	\$0	\$0	\$0	\$0	\$1,497,682	\$2,065,464	\$3,553,146	\$345	\$876	\$72.98	
2027		2.67	2.00	10305	1.03	1.55	\$0	\$0	\$0	\$0	\$1,497,682	\$2,408,836	\$3,707,982	\$348	\$881	\$73.48	
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>Avg=</b>	<b>6222</b>	<b>1.03</b>	<b>1.55</b>	<b>\$10,424,863</b>	<b>\$4,726,806</b>	<b>\$15,151,469</b>	<b>\$27,186,571</b>	<b>\$34,412,697</b>	<b>\$24,408,836</b>	<b>\$3,553,146</b>	<b>\$345</b>	<b>\$876</b>	<b>\$73.48</b>	
2042		2.67	2.00	17777	1.78	2.67											<b>Average =</b>

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) = **\$14,537,410**  
 Calculations represent new expenditures only.

## Scenario 2 - Plant 1 (Reno) - Population Centers and Rural

Plant at eastern edge of Reno to serve Reno, Springtown and County

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Total Capital Costs (\$ 1996)	Interest Rate	Loan Term (Years)	Capital Recovery Factor	O&M Cost Per 1000 Gallons	Total Annual Cost (\$/future)	Annual Cost Per Capita (\$/future)	Annual Cost Per Household (\$/future)	Persons Per Household
1987	Start Program																
1986		0.26	0.20	2845	0.28	0.43	\$0	\$0	\$0	8.00%	20	0.1019	1.38	\$3,206,146	\$776	\$1,972	2.54
1989		0.26	0.20	2957	0.30	0.44	\$0	\$0	\$0					\$458,199	\$492	\$1,250	
1999		0.26	0.20	3074	0.31	0.46	\$0	\$0	\$0					\$469,620	\$483	\$1,228	
2000		0.26	0.20	3195	0.32	0.48	\$0	\$0	\$0					\$758,315	\$350	\$889	
2001		0.26	0.20	3321	0.33	0.50	\$0	\$0	\$0					\$809,149	\$346	\$878	
2002	New 2.49 Plant, Add Lines 8a,8b,9,10	2.75	2.06	4130	0.41	0.62	\$7,525,948	\$4,300,018	\$11,825,966					\$3,206,146	\$342	\$868	
2003	Add Lines 5-7,17	2.75	2.06	6913	0.69	1.04	\$0	\$2,130,202	\$2,130,202					\$3,401,143	\$483	\$1,228	
2004	Take Existing Springtown Plant Off-Line	2.49	1.87	7103	0.71	1.07	\$0	\$0	\$0					\$3,701,259	\$350	\$889	
2005	Add Lines 11-16	2.49	1.87	10577	1.06	1.59	\$0	\$7,817,992	\$7,817,992					\$3,701,259	\$346	\$878	
2006		2.49	1.87	10852	1.09	1.63	\$0	\$0	\$0					\$3,806,431	\$342	\$868	
2007		2.49	1.87	11136	1.11	1.67	\$0	\$0	\$0					\$3,864,522	\$338	\$859	
2008		2.49	1.87	11428	1.14	1.71	\$0	\$0	\$0					\$3,926,633	\$335	\$850	
2009		2.49	1.87	11729	1.17	1.76	\$0	\$0	\$0					\$3,993,048	\$332	\$842	
2010		2.49	1.87	12039	1.20	1.81	\$0	\$0	\$0					\$4,064,074	\$329	\$835	
2011		2.49	1.87	12359	1.24	1.85	\$0	\$0	\$0					\$4,140,040	\$326	\$829	
2012		2.49	1.87	12689	1.27	1.90	\$0	\$0	\$0					\$4,221,298	\$324	\$823	
2013		2.49	1.87	13029	1.30	1.95	\$0	\$0	\$0					\$4,308,226	\$322	\$818	
2014		2.49	1.87	13380	1.34	2.01	\$0	\$0	\$0					\$4,401,232	\$320	\$814	
2015		2.49	1.87	13742	1.37	2.06	\$0	\$0	\$0					\$4,500,751	\$319	\$810	
2016		2.49	1.87	14115	1.41	2.12	\$0	\$0	\$0					\$4,607,250	\$318	\$807	
2017		2.49	1.87	14500	1.45	2.17	\$0	\$0	\$0					\$4,721,232	\$317	\$805	
2018		2.49	1.87	14897	1.49	2.23	\$0	\$0	\$0					\$4,843,237	\$316	\$804	
2019		2.49	1.87	15307	1.53	2.30	\$0	\$0	\$0					\$4,973,843	\$316	\$803	
2020		2.49	1.87	15730	1.57	2.36	\$0	\$0	\$0					\$5,113,673	\$316	\$803	
2021		2.49	1.87	16166	1.62	2.42	\$0	\$0	\$0					\$5,263,394	\$317	\$805	
2022	Add 1.74 mgd to plant	4.42	3.32	16616	1.66	2.49	\$6,034,060	\$0	\$6,034,060					\$5,423,722	\$318	\$807	
2023		4.42	3.32	17081	1.71	2.56	\$0	\$0	\$0					\$5,595,429	\$319	\$809	
2024		4.42	3.32	17561	1.76	2.63	\$0	\$0	\$0					\$5,779,343	\$320	\$813	
2025		4.42	3.32	18056	1.81	2.71	\$0	\$0	\$0					\$5,976,351	\$322	\$818	
2026		4.42	3.32	18568	1.86	2.79	\$0	\$0	\$0					\$6,187,409	\$324	\$823	
2027		4.42	3.32	19096	1.91	2.86	\$0	\$0	\$0					\$6,408,751	\$326	\$829	
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>Avg=</b>	<b>11746</b>			<b>\$13,560,008</b>	<b>\$14,248,212</b>	<b>\$27,808,220</b>					<b>\$40,687,792</b>	<b>Average =</b>	<b>\$75.19</b>	
2042		4.42	3.32	29473	2.95	4.42											

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) = **\$30,075,821**

Calculations represent new expenditures only.

### Scenario 2 - Plant 2 (Azle) - Azle Area

Plant at Azle Ash Creek to serve Azle, Pelican Bay and Sanctuary  
Assumes Walnut Creek Plant Taken Out of Service or used by Reno/Springtown (Option)

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Total Capital Costs (\$ 1996)	Interest Rate	Inflation Rate	Loan Term (Years)	Capital Recovery Factor	O&M Cost Per 1000 Gallons	Total Annual Cost (\$ Future)	Annual Cost Per Capita (\$ Future)	Annual Cost Per Household (\$ Future)	Persons Per Household
1997	Start Program	1.74	1.31	11853	1.19	1.78	\$0	\$0	\$0	8.00%	4.00%	20	0.1019	\$700,490	\$2,602,139	\$179	\$454	2.54
1998	Add Lines 1,2,&3 (Sand., P. B. ETJ)	1.74	1.31	14544	1.45	2.18	\$0	\$3,735,600	\$3,735,600					\$753,957	\$2,655,606	\$176	\$448	
1999		1.74	1.31	15052	1.51	2.26	\$0	\$0	\$0					\$811,506	\$2,713,154	\$174	\$442	
2000		1.74	1.31	15578	1.56	2.34	\$0	\$0	\$0					\$873,447	\$2,775,096	\$172	\$437	
2001		1.74	1.31	16122	1.61	2.42	\$0	\$0	\$0					\$940,118	\$2,841,766	\$170	\$433	
2002	Add 4.66 mgd, Moothall W.C.	6.40	4.80	16685	1.67	2.50	\$11,562,493	\$0	\$11,562,493					\$1,011,878	\$2,913,526	\$169	\$429	
2003		6.40	4.80	17288	1.73	2.58	\$0	\$0	\$0					\$1,089,116	\$2,990,764	\$167	\$425	
2004		6.40	4.80	17871	1.79	2.69	\$0	\$0	\$0					\$1,172,250	\$3,073,899	\$166	\$422	
2005		6.40	4.80	18496	1.85	2.77	\$0	\$0	\$0					\$1,261,732	\$3,163,380	\$165	\$420	
2006		6.40	4.80	19142	1.91	2.87	\$0	\$0	\$0					\$1,358,044	\$3,259,693	\$165	\$418	
2007		6.40	4.80	19810	1.98	2.97	\$0	\$0	\$0					\$1,461,709	\$3,363,358	\$164	\$417	
2008		6.40	4.80	20503	2.05	3.08	\$0	\$0	\$0					\$1,573,288	\$3,474,937	\$164	\$416	
2009		6.40	4.80	21219	2.12	3.18	\$0	\$0	\$0					\$1,693,386	\$3,595,035	\$164	\$416	
2010		6.40	4.80	21960	2.20	3.29	\$0	\$0	\$0					\$1,807,952	\$3,709,601	\$165	\$418	
2011		6.40	4.80	22544	2.25	3.38	\$0	\$0	\$0					\$1,937,841	\$3,839,490	\$165	\$420	
2012		6.40	4.80	23234	2.32	3.49	\$0	\$0	\$0					\$2,077,330	\$3,978,979	\$166	\$422	
2013		6.40	4.80	23949	2.39	3.59	\$0	\$0	\$0					\$2,227,140	\$4,128,789	\$167	\$425	
2014		6.40	4.80	24689	2.47	3.70	\$0	\$0	\$0					\$2,388,047	\$4,289,686	\$169	\$428	
2015		6.40	4.80	25454	2.55	3.82	\$0	\$0	\$0					\$2,560,885	\$4,462,534	\$170	\$432	
2016		6.40	4.80	26246	2.62	3.94	\$0	\$0	\$0					\$2,746,552	\$4,648,201	\$172	\$436	
2017		6.40	4.80	27067	2.71	4.06	\$0	\$0	\$0					\$2,946,013	\$4,846,013	\$106	\$268	
2018		6.40	4.80	27916	2.79	4.19	\$0	\$0	\$0					\$3,160,308	\$5,054,308	\$110	\$279	
2019		6.40	4.80	28795	2.88	4.32	\$0	\$0	\$0					\$3,390,554	\$5,279,554	\$114	\$290	
2020		6.40	4.80	29704	2.97	4.46	\$0	\$0	\$0					\$3,637,955	\$5,523,955	\$119	\$302	
2021		6.40	4.80	30645	3.06	4.60	\$0	\$0	\$0					\$3,899,165	\$5,799,165	\$123	\$314	
2022		6.40	4.80	31583	3.16	4.74	\$0	\$0	\$0					\$4,182,348	\$6,082,348	\$128	\$326	
2023		6.40	4.80	32574	3.26	4.89	\$0	\$0	\$0					\$4,486,603	\$6,386,603	\$134	\$339	
2024		6.40	4.80	33599	3.36	5.04	\$0	\$0	\$0					\$4,813,522	\$6,713,522	\$139	\$353	
2025		6.40	4.80	34661	3.47	5.20	\$0	\$0	\$0					\$5,164,813	\$7,064,813	\$144	\$367	
2026		6.40	4.80	35760	3.58	5.36	\$0	\$0	\$0					\$5,542,317	\$7,427,317	\$150	\$382	
2027		6.40	4.80	36898	3.69	5.53	\$11,562,493	\$3,735,600	\$15,298,093					\$5,942,317	\$7,810,317	\$150	\$382	
			Avg=	23917					\$18,670,667					\$71,670,266	\$38,032,974	Average	\$32.03	
2042		6.40	4.80	42699	4.27	6.40			\$34,097,169									

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) =  
Calculations represent new expenditures only.

### Scenario 3 - Plant 1 (Azle) - Population Centers and Azle Area

Plant at Eagle Mountain Lake to initially serve Azle, Springtown, "downtown" Reno, Pelican Bay and Sanctuary, Parker County watershed and the rest of Reno to be phased in at a later date.  
Existing plants in Springtown and Azle to be incorporated and/or phased out.

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Total Capital Costs (\$ 1996)	Interest Rate 8.00%	Loan Term (Years) 20	Capital Recovery Factor 0.1019	O&M Cost Per 1000 Gallons 1.19	Annual Total Annual Cost (\$future)	Annual Cost Per Capita (\$future)	Annual Cost Per Household (\$future)	Persons Per Household 2.54
1997	Start Program (Springtown/Azle)	2.00	1.50	14698	1.47	2.20	\$0	\$0	\$0					\$3,585,594	\$204	\$518	\$43.14
1998	Add Lines 1,2,3 (P.B., Sanct,ETU)	2.00	1.50	17595	1.76	2.64	\$0	\$3,735,600	\$3,735,600	8.00%	20	0.1019	1.19	\$3,649,948	\$200	\$508	\$42.37
1999		2.00	1.50	18235	1.82	2.74	\$0	\$0	\$0					\$3,719,317	\$197	\$500	\$41.66
2000		2.00	1.50	18899	1.89	2.83	\$0	\$0	\$0					\$3,794,082	\$194	\$492	\$41.00
2001		2.00	1.50	19587	1.96	2.94	\$0	\$0	\$0					\$3,871,903	\$188	\$474	\$39.47
2002	Add 5.48 mgd Plant, Add Lines 4,8a,8b,9,10	7.48	5.61	20977	2.10	3.15	\$12,996,371	\$4,775,098	\$17,771,469					\$4,010,217	\$183	\$465	\$36.78
2003	Moithball Springtown and WC Plants, Add Line 1	6.03	4.52	21891	2.19	3.28	\$0	\$426,588	\$426,588					\$4,106,561	\$181	\$460	\$36.34
2004		6.03	4.52	22869	2.27	3.40	\$0	\$0	\$0					\$4,210,355	\$179	\$456	\$37.96
2005		6.03	4.52	23476	2.35	3.52	\$0	\$0	\$0					\$4,322,175	\$178	\$452	\$37.63
2006		6.03	4.52	24313	2.43	3.65	\$0	\$0	\$0					\$4,442,646	\$176	\$448	\$37.35
2007		6.03	4.52	25179	2.52	3.78	\$0	\$0	\$0					\$4,572,438	\$175	\$445	\$37.11
2008		6.03	4.52	26077	2.61	3.91	\$0	\$0	\$0					\$4,712,275	\$174	\$443	\$36.93
2009		6.03	4.52	27008	2.70	4.05	\$0	\$0	\$0					\$4,862,937	\$174	\$442	\$36.80
2010		6.03	4.52	27972	2.80	4.20	\$0	\$0	\$0					\$4,980,068	\$175	\$446	\$37.13
2011		6.03	4.52	28394	2.84	4.26	\$0	\$0	\$0					\$5,141,938	\$176	\$446	\$37.16
2012		6.03	4.52	29291	2.93	4.39	\$0	\$0	\$0					\$5,315,919	\$176	\$447	\$37.23
2013		6.03	4.52	30221	3.02	4.53	\$0	\$0	\$0					\$5,502,930	\$177	\$448	\$37.35
2014		6.03	4.52	31184	3.12	4.68	\$0	\$0	\$0					\$5,703,963	\$177	\$450	\$37.52
2015		6.03	4.52	32181	3.22	4.83	\$0	\$0	\$0					\$5,920,084	\$178	\$453	\$37.73
2016		6.03	4.52	33215	3.32	4.98	\$0	\$0	\$0					\$6,152,442	\$179	\$456	\$37.98
2017		6.03	4.52	34285	3.43	5.14	\$0	\$0	\$0					\$6,391,044	\$181	\$462	\$38.29
2018		6.03	4.52	35393	3.54	5.31	\$0	\$0	\$0					\$6,648,555	\$181	\$463	\$38.29
2019		6.03	4.52	36541	3.65	5.48	\$0	\$0	\$0					\$6,919,680	\$181	\$469	\$38.80
2020		6.03	4.52	37730	3.77	5.66	\$0	\$0	\$0					\$7,198,794	\$181	\$474	\$39.43
2021		6.03	4.52	38962	3.90	5.84	\$0	\$0	\$0					\$7,498,327	\$181	\$479	\$39.83
2022	Add 2.75 to Plant	8.78	6.58	40200	4.02	6.03	\$8,030,891	\$0	\$8,030,891					\$7,808,794	\$181	\$489	\$40.47
2023		8.78	6.58	40894	4.09	6.13	\$0	\$0	\$0					\$8,121,547	\$181	\$499	\$41.32
2024		8.78	6.58	42234	4.22	6.34	\$0	\$0	\$0					\$8,468,555	\$184	\$509	\$42.37
2025		8.78	6.58	43623	4.36	6.54	\$0	\$0	\$0					\$8,829,911	\$187	\$526	\$43.68
2026		8.78	6.58	45062	4.51	6.78	\$0	\$0	\$0					\$9,204,440	\$191	\$551	\$45.19
2027		8.78	6.58	46552	4.66	6.98	\$0	\$0	\$0					\$9,608,220	\$195	\$586	\$47.32
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>Avg=</b>	<b>30146</b>			<b>\$21,027,262</b>	<b>\$8,937,286</b>	<b>\$29,964,548</b>					<b>\$77,857,997</b>	<b>\$195</b>	<b>\$496</b>	<b>\$41.32</b>
2042		8.78	6.58	58553	5.86	8.78			<b>\$48,734,158</b>								<b>Average =</b>

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) =  
Calculations represent new expenditures only.

### Scenario 3 - Plant 1 (Azle) - Population Centers, Azle Area and Rural

Plant at Eagle Mountain Lake to serve all of Walnut Creek Watershed plus parts of Azle, Pelican Bay and Sanctuary  
Existing plants in Springtown and Azle to be incorporated and/or phased out.

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Treatment Plant (\$ 1996)	Capital Costs (\$ 1996)	Inflation Rate (1996)	Interest Rate (1996)	Loan Term (Years)	Capital Recovery Factor	O&M Cost Per 1000 Gallons	Annual O&M Cost (\$/future)	Total Annual Cost (\$/future)	Annual Cost Per Capita (\$/future)	Annual Cost Per Household (\$/future)	Persons Per Household
1997	Start Program (Springtown/Azle)	2.00	1.50	14698	1.47	2.20	\$0	\$0	4.00%	8.00%	20	0.1019	1.18	\$0	\$0	\$0	\$0	2.54
1998	Add Lines 1,2,3 (P.B., Sanct,ETJ)	2.00	1.50	17565	1.76	2.64	\$0	\$3,735,600						\$3,948,422	\$4,768,060	\$271	\$688	
1999		2.00	1.50	18235	1.82	2.74	\$0	\$0						\$3,948,422	\$4,831,874	\$265	\$673	
2000	Add New 5.79 Plant	7.78	5.84	18899	1.89	2.83	\$13,527,265	\$15,824,967						\$3,948,422	\$4,900,660	\$259	\$659	
2001	Add Lines 4,8a,8b,9,10	7.78	5.84	20255	2.03	3.04	\$0	\$4,775,098						\$3,948,422	\$5,009,832	\$247	\$628	
2002	Mothball Springtown and WC Plants	7.23	5.42	20977	2.10	3.15	\$0	\$0						\$3,948,422	\$5,081,628	\$243	\$617	
2003	Add Lines 5-7 and 11-17	7.23	5.42	27502	2.75	4.13	\$0	\$9,948,194						\$3,948,422	\$5,507,163	\$200	\$509	
2004		7.23	5.42	28386	2.84	4.26	\$0	\$0						\$3,948,422	\$5,621,593	\$198	\$503	
2005		7.23	5.42	29299	2.93	4.39	\$0	\$0						\$3,948,422	\$5,744,538	\$196	\$498	
2006		7.23	5.42	30245	3.02	4.54	\$0	\$0						\$3,948,422	\$5,876,641	\$194	\$494	
2007		7.23	5.42	31222	3.12	4.68	\$0	\$0						\$3,948,422	\$6,018,590	\$193	\$490	
2008		7.23	5.42	32233	3.22	4.84	\$0	\$0						\$3,948,422	\$6,171,127	\$191	\$486	
2009		7.23	5.42	33279	3.33	4.99	\$0	\$0						\$3,948,422	\$6,335,051	\$190	\$484	
2010		7.23	5.42	34362	3.44	5.15	\$0	\$0						\$3,948,422	\$6,511,221	\$189	\$481	
2011		7.23	5.42	34903	3.49	5.24	\$0	\$0						\$3,948,422	\$6,655,744	\$191	\$484	
2012		7.23	5.42	35923	3.59	5.39	\$0	\$0						\$3,948,422	\$6,846,331	\$191	\$484	
2013		7.23	5.42	36978	3.70	5.55	\$0	\$0						\$3,948,422	\$7,050,728	\$191	\$484	
2014		7.23	5.42	38068	3.81	5.71	\$0	\$0						\$3,948,422	\$7,269,957	\$191	\$485	
2015		7.23	5.42	39196	3.92	5.88	\$0	\$0						\$3,948,422	\$7,505,115	\$191	\$486	
2016		7.23	5.42	40361	4.04	6.05	\$0	\$0						\$3,948,422	\$7,757,381	\$192	\$488	
2017		7.23	5.42	41566	4.16	6.23	\$0	\$0						\$3,948,422	\$8,028,025	\$193	\$491	
2018		7.23	5.42	42813	4.28	6.42	\$0	\$0						\$2,584,845	\$8,348,833	\$162	\$413	
2019		7.23	5.42	44101	4.41	6.62	\$0	\$0						\$2,584,845	\$8,726,425	\$165	\$419	
2020		7.23	5.42	45434	4.54	6.82	\$0	\$0						\$2,584,845	\$9,159,800	\$167	\$425	
2021		7.23	5.42	46812	4.68	7.02	\$0	\$0						\$2,584,845	\$9,600,800	\$170	\$432	
2022	Add 3.34 to Plant	10.57	7.93	48199	4.82	7.23	\$9,153,713	\$25,378,393						\$2,584,845	\$10,179,699	\$173	\$440	
2023		10.57	7.93	49655	4.97	7.45	\$0	\$0						\$2,584,845	\$10,719,699	\$176	\$448	
2024		10.57	7.93	51160	5.12	7.67	\$0	\$0						\$2,584,845	\$11,284,114	\$180	\$456	
2025		10.57	7.93	52717	5.27	7.91	\$0	\$0						\$2,584,845	\$11,885,873	\$183	\$466	
2026		10.57	7.93	54328	5.43	8.15	\$0	\$0						\$2,584,845	\$12,529,257	\$187	\$476	
2027		10.57	7.93	55994	5.60	8.40	\$0	\$0						\$2,584,845	\$13,214,854	\$191	\$486	
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>Avg=</b>	<b>35981</b>		<b>8.40</b>	<b>\$22,680,978</b>	<b>\$18,458,992</b>						<b>\$104,816,902</b>	<b>\$10,719,699</b>	<b>\$191</b>	<b>\$486</b>	<b>Average =</b>
2042		10.57	7.93	70470	7.05	10.57	\$0	\$0						\$63,589,188	\$10,719,699	\$176	\$448	

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) = \$63,589,188  
Calculations represent new expenditures only.





### Scenario 4 - No Plants (Fort Worth Service) - Population Centers, Azle Area and Rural

Build regional collection infrastructure, pipe to Fort Worth and phase out existing plants.

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Fort Worth Connection (\$ 1996)	Capital Costs Collection System (\$ 1996)	Inflation Rate 4.00%	Interest Rate 8.00%	Loan Term (Years) 20	Capital Recovery Factor 0.1019	FW Charge Per 1000 Gallons 0.62	Annual Cost Per Household (\$/future)	Annual Cost Per Household (\$/future)	Persons Per Household 2.54	
1997	Start Program (Springtown/Azle)	2.00	1.50	14698	1.47	2.20	\$0	\$0		\$0	\$0	\$3,923,926	\$430,657	\$247	\$629	\$52.39	
1998	Add Lines 1,2,3 (P.B., SandLETJ)	2.00	1.50	17595	1.76	2.64	\$0	\$3,735,600		\$3,735,600	\$4,040,425	\$3,923,926	\$464,186	\$241	\$611	\$60.94	
1999		2.00	1.50	18235	1.82	2.74	\$0	\$0		\$0	\$0	\$3,923,926	\$500,328	\$234	\$595	\$49.55	
2000		2.00	1.50	18699	1.89	2.83	\$0	\$0		\$0	\$0	\$3,923,926	\$539,287	\$228	\$579	\$48.23	
2001	Add Lines 18, 19 and Lift Stations to F.W.	2.00	1.50	19587	1.96	2.94	\$12,187,899	\$4,775,098		\$12,187,899	\$14,828,443	\$3,923,926	\$600,667	\$226	\$548	\$45.65	
2002	Add Lines 4,8a,8b,9,10	0.00	0.00	20977	2.10	3.15	\$0	\$0		\$4,775,098	\$6,042,022	\$3,923,926	\$646,970	\$210	\$534	\$44.53	
2003	Mothersball Springtown and WVC Plants	0.00	0.00	21725	2.17	3.26	\$0	\$0		\$0	\$0	\$3,923,926	\$679,123	\$189	\$430	\$35.82	
2004	Add Lines 5-7 and 11-17	0.00	0.00	28386	2.84	4.26	\$0	\$9,948,194		\$9,948,194	\$13,614,790	\$3,923,926	\$943,722	\$166	\$422	\$35.17	
2005		0.00	0.00	29299	2.93	4.39	\$0	\$0		\$0	\$0	\$3,923,926	\$943,722	\$166	\$422	\$35.17	
2006		0.00	0.00	30245	3.02	4.54	\$0	\$0		\$0	\$0	\$3,923,926	\$1,013,132	\$163	\$415	\$34.55	
2007		0.00	0.00	31222	3.12	4.68	\$0	\$0		\$0	\$0	\$3,923,926	\$1,087,715	\$161	\$408	\$33.98	
2008		0.00	0.00	32233	3.22	4.84	\$0	\$0		\$0	\$0	\$3,923,926	\$1,167,862	\$158	\$401	\$33.44	
2009		0.00	0.00	33279	3.33	4.99	\$0	\$0		\$0	\$0	\$3,923,926	\$1,253,991	\$156	\$395	\$32.93	
2010		0.00	0.00	34362	3.44	5.15	\$0	\$0		\$0	\$0	\$3,923,926	\$1,348,555	\$153	\$390	\$32.47	
2011		0.00	0.00	34903	3.49	5.24	\$0	\$0		\$0	\$0	\$3,923,926	\$1,422,491	\$153	\$389	\$32.42	
2012		0.00	0.00	35923	3.59	5.39	\$0	\$0		\$0	\$0	\$3,923,926	\$1,522,630	\$152	\$385	\$32.09	
2013		0.00	0.00	36978	3.70	5.55	\$0	\$0		\$0	\$0	\$3,923,926	\$1,630,025	\$150	\$381	\$31.79	
2014		0.00	0.00	38068	3.81	5.71	\$0	\$0		\$0	\$0	\$3,923,926	\$1,745,213	\$149	\$378	\$31.52	
2015		0.00	0.00	39196	3.92	5.88	\$0	\$0		\$0	\$0	\$3,923,926	\$1,868,771	\$148	\$375	\$31.28	
2016		0.00	0.00	40361	4.04	6.05	\$0	\$0		\$0	\$0	\$3,923,926	\$1,999,243	\$147	\$373	\$31.07	
2017		0.00	0.00	41566	4.16	6.23	\$0	\$0		\$0	\$0	\$3,923,926	\$2,143,520	\$146	\$371	\$30.90	
2018		0.00	0.00	42813	4.28	6.42	\$0	\$0		\$0	\$0	\$3,923,926	\$2,296,095	\$146	\$371	\$31.35	
2019		0.00	0.00	44101	4.41	6.62	\$0	\$0		\$0	\$0	\$3,923,926	\$2,459,813	\$147	\$373	\$11.81	
2020		0.00	0.00	45434	4.54	6.82	\$0	\$0		\$0	\$0	\$3,923,926	\$2,635,502	\$147	\$373	\$12.28	
2021		0.00	0.00	46812	4.68	7.02	\$0	\$0		\$0	\$0	\$3,923,926	\$2,824,052	\$147	\$373	\$12.77	
2022		0.00	0.00	48199	4.82	7.23	\$0	\$0		\$0	\$0	\$3,923,926	\$3,024,064	\$147	\$373	\$13.28	
2023		0.00	0.00	49655	4.97	7.45	\$0	\$0		\$0	\$0	\$3,923,926	\$3,240,008	\$147	\$373	\$13.81	
2024		0.00	0.00	51160	5.12	7.67	\$0	\$0		\$0	\$0	\$3,923,926	\$3,471,773	\$147	\$373	\$14.36	
2025		0.00	0.00	52717	5.27	7.91	\$0	\$0		\$0	\$0	\$3,923,926	\$3,720,540	\$147	\$373	\$14.94	
2026		0.00	0.00	54328	5.43	8.15	\$0	\$0		\$0	\$0	\$3,923,926	\$3,987,576	\$147	\$373	\$15.54	
2027		0.00	0.00	55994	5.60	8.40	\$0	\$0		\$0	\$0	\$3,923,926	\$4,274,245	\$147	\$373	\$16.16	
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>Avg=</b>	<b>35773</b>	<b>7.05</b>	<b>10.57</b>	<b>\$12,187,899</b>	<b>\$18,459,892</b>		<b>\$30,646,791</b>	<b>\$38,525,680</b>	<b>\$78,478,513</b>	<b>\$55,141,831</b>	<b>\$78</b>	<b>Average =</b>	<b>\$194</b>	<b>\$26.38</b>
2042		0.00	0.00	70470	7.05	10.57											

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) = \$48,300,011  
 Calculations represent new expenditures only.



### Scenario 5 - Azle Service - Main Watershed

Reno, Springtown and Unincorporated Areas to Install Main Collection System and Contract with Azle for Treatment

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1998)	Capital Costs Collection System (\$ 1998)	Total Capital Costs (\$ 1998)	Interest Rate	Loan Term (Years)	Capital Recovery Factor	Contract Cost Per 1000 Gallons	Total Annual Cost (\$ Future)	Annual O&M Cost (\$ Future)	Annual Cost Per Capita (\$ Future)	Annual Cost Per Household (\$ Future)	Monthly Household Cost (\$ Future)	Persons Per Household
1997	Start Program																		
1998		0.26	0.20	2845	0.28	0.43	\$0	\$0	\$0	8.00%	20	0.1019	1.65	\$314,897	\$1,032,430	\$589	\$1,445	\$120.40	2.54
1999		0.26	0.20	2957	0.30	0.44	\$0	\$0	\$0					\$547,847	\$1,101,887	\$374	\$949	\$79.06	
2000		0.26	0.20	3074	0.31	0.46	\$0	\$0	\$0					\$806,631	\$1,176,149	\$369	\$937	\$78.07	
2001		0.26	0.20	3195	0.32	0.48	\$0	\$0	\$0					\$906,681	\$1,255,559	\$278	\$706	\$58.85	
2002		0.26	0.20	3321	0.33	0.50	\$0	\$0	\$0					\$967,460	\$1,340,481	\$277	\$703	\$58.55	
2003	Add Lines 4,8a,8b,9,10	0.26	0.20	4130	0.41	0.62	\$0	\$4,775,098	\$4,775,098					\$1,011,887	\$1,431,310	\$275	\$689	\$58.29	
2004	Add Lines 5-7,17	0.26	0.20	6913	0.69	1.04	\$0	\$2,130,202	\$2,130,202					\$1,176,149	\$1,528,466	\$274	\$695	\$57.84	
2005	Take Existing Springtown Plant Off-Line	0.26	0.20	7103	0.71	1.07	\$0	\$7,817,992	\$7,817,992					\$1,340,481	\$1,831,310	\$273	\$694	\$57.80	
2006	Add Lines 11-16	0.00	0.00	10852	1.09	1.63	\$0	\$0	\$7,817,992					\$1,032,430	\$1,431,310	\$273	\$695	\$57.88	
2007		0.00	0.00	11136	1.11	1.67	\$0	\$0	\$0					\$1,101,887	\$1,528,466	\$274	\$698	\$58.01	
2008		0.00	0.00	11428	1.14	1.71	\$0	\$0	\$0					\$1,176,149	\$1,632,402	\$274	\$698	\$58.19	
2009		0.00	0.00	11729	1.17	1.76	\$0	\$0	\$0					\$1,255,559	\$1,743,605	\$276	\$701	\$58.44	
2010		0.00	0.00	12039	1.20	1.81	\$0	\$0	\$0					\$1,340,481	\$1,862,595	\$276	\$701	\$58.74	
2011		0.00	0.00	12359	1.24	1.85	\$0	\$0	\$0					\$1,431,310	\$1,989,931	\$276	\$705	\$59.12	
2012		0.00	0.00	12689	1.27	1.90	\$0	\$0	\$0					\$1,528,466	\$2,126,214	\$278	\$709	\$59.55	
2013		0.00	0.00	13029	1.30	1.95	\$0	\$0	\$0					\$1,632,402	\$2,272,089	\$281	\$715	\$60.05	
2014		0.00	0.00	13380	1.34	2.01	\$0	\$0	\$0					\$1,743,605	\$2,428,249	\$284	\$721	\$60.62	
2015		0.00	0.00	13742	1.37	2.06	\$0	\$0	\$0					\$1,862,595	\$2,595,437	\$286	\$727	\$61.29	
2016		0.00	0.00	14115	1.41	2.12	\$0	\$0	\$0					\$1,989,931	\$2,774,450	\$286	\$727	\$62.00	
2017		0.00	0.00	14500	1.45	2.17	\$0	\$0	\$0					\$2,126,214	\$2,966,148	\$286	\$727	\$62.76	
2018		0.00	0.00	14897	1.49	2.23	\$0	\$0	\$0					\$2,272,089	\$3,171,450	\$281	\$715	\$63.54	
2019		0.00	0.00	15307	1.53	2.30	\$0	\$0	\$0					\$2,428,249	\$3,391,346	\$284	\$721	\$64.41	
2020		0.00	0.00	15730	1.57	2.36	\$0	\$0	\$0					\$2,595,437	\$3,626,599	\$286	\$727	\$65.34	
2021		0.00	0.00	16166	1.62	2.42	\$0	\$0	\$0					\$2,774,450	\$3,879,251	\$286	\$727	\$66.34	
2022		0.00	0.00	16616	1.66	2.48	\$0	\$0	\$0					\$2,966,148	\$4,141,450	\$286	\$727	\$67.44	
2023		0.00	0.00	17081	1.71	2.56	\$0	\$0	\$0					\$3,171,450	\$4,411,450	\$281	\$715	\$68.62	
2024		0.00	0.00	17581	1.78	2.63	\$0	\$0	\$0					\$3,391,346	\$4,698,882	\$275	\$698	\$70.00	
2025		0.00	0.00	18058	1.81	2.71	\$0	\$0	\$0					\$3,626,599	\$4,998,882	\$276	\$701	\$71.44	
2026		0.00	0.00	18568	1.86	2.79	\$0	\$0	\$0					\$3,879,251	\$5,311,450	\$276	\$701	\$72.88	
2027		0.00	0.00	19086	1.91	2.86	\$0	\$0	\$0					\$4,141,450	\$5,648,882	\$276	\$701	\$74.44	
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>AVG=</b>	<b>11748</b>	<b>1.91</b>	<b>2.86</b>	<b>\$0</b>	<b>\$14,725,292</b>	<b>\$14,725,292</b>					<b>\$48,648,447</b>	<b>\$40,685,187</b>	<b>\$203</b>	<b>\$516</b>	<b>\$67.99</b>	<b>Average =</b>
2042		0.00	0.00	29473	2.95	4.42													

Present Value (in 1998 dollars) of all costs during planning period (1997-1927) = \$23,685,612  
 Calculations represent new expenditures only.



### Scenario 5 - 1 Plant (Azle Service) - Population Centers ONLY (20 Year Pipes)

Collection system for Springtown and downtown Reno with pipes sized for 20 year growth in only the population centers. Contract with Azle for treatment.

Year	Activity	Plant Capacity (mgd)	75% Trigger Capacity (mgd)	Population Served (people)	Avg Daily Flow (mgd)	Design Flow (mgd)	Capital Costs Treatment Plant (\$ 1996)	Capital Costs Collection System (\$ 1996)	Total Capital Costs (\$ 1996)	Interest Rate 8.00%	Loan Term (Years) 20	Capital Recovery Factor 0.1019	Contract Cost Per 1000 Gallons 1.65	Persons Per Household 2.54			
												1997-2027 Annualized Capital Costs	Annual Contract Cost (\$/future)	Total Annual Cost (\$/future)	Annual Cost Per Capita (\$/future)	Monthly Household Cost (\$/future)	
1997	Start Program	0.26	0.20	2845	0.28	0.43	\$0	\$0	\$0					\$622,122	\$177	\$37.41	
1998		0.26	0.20	2957	0.30	0.44	\$0	\$0	\$0					\$643,730	\$178	\$37.25	
1999		0.26	0.20	3074	0.31	0.46	\$0	\$0	\$0					\$667,063	\$178	\$37.16	
2000		0.26	0.20	3195	0.32	0.48	\$0	\$0	\$0					\$692,321	\$175	\$37.13	
2001		0.26	0.20	3321	0.33	0.50	\$0	\$0	\$0					\$719,597	\$175	\$37.20	
2002		0.26	0.20	3520	0.35	0.53	\$0	\$2,745,728	\$2,745,728					\$749,075	\$176	\$37.32	
2003	Add Lines 4. 8a, 8b, 9, 10	0.28	0.20	3658	0.37	0.55	\$0	\$0	\$0					\$780,934	\$177	\$37.50	
2004	Take Existing Springtown Plant Off-Line	0.00	0.00	3900	0.36	0.57	\$0	\$0	\$0					\$815,368	\$178	\$38.03	
2005		0.00	0.00	3949	0.39	0.59	\$0	\$0	\$0					\$832,600	\$180	\$38.38	
2006		0.00	0.00	4103	0.41	0.62	\$0	\$0	\$0					\$852,580	\$177	\$38.74	
2007		0.00	0.00	4283	0.43	0.64	\$0	\$0	\$0					\$882,270	\$181	\$39.28	
2008		0.00	0.00	4429	0.44	0.66	\$0	\$0	\$0					\$903,252	\$183	\$39.79	
2009		0.00	0.00	4602	0.46	0.69	\$0	\$0	\$0					\$1,034,030	\$185	\$40.37	
2010		0.00	0.00	4782	0.48	0.72	\$0	\$0	\$0					\$1,088,912	\$188	\$41.02	
2011		0.00	0.00	4989	0.50	0.75	\$0	\$0	\$0					\$1,148,229	\$191	\$41.73	
2012		0.00	0.00	5163	0.52	0.77	\$0	\$0	\$0					\$1,212,341	\$194	\$42.51	
2013		0.00	0.00	5365	0.54	0.80	\$0	\$0	\$0					\$1,281,636	\$197	\$43.35	
2014		0.00	0.00	5575	0.56	0.84	\$0	\$0	\$0					\$1,356,532	\$201	\$44.25	
2015		0.00	0.00	5793	0.58	0.87	\$0	\$0	\$0					\$1,437,483	\$205	\$45.34	
2016		0.00	0.00	6020	0.60	0.90	\$0	\$0	\$0					\$1,524,979	\$209	\$46.78	
2017		0.00	0.00	6255	0.63	0.94	\$0	\$0	\$0					\$1,617,911	\$214	\$48.23	
2018		0.00	0.00	6500	0.65	0.98	\$0	\$0	\$0					\$1,717,122	\$219	\$49.76	
2019		0.00	0.00	6755	0.68	1.01	\$0	\$0	\$0					\$1,817,911	\$224	\$51.35	
2020		0.00	0.00	7019	0.70	1.05	\$0	\$0	\$0					\$1,925,693	\$229	\$53.00	
2021		0.00	0.00	7294	0.73	1.09	\$0	\$0	\$0					\$2,037,911	\$234	\$54.78	
2022		0.00	0.00	7580	0.76	1.14	\$0	\$0	\$0					\$2,154,979	\$239	\$56.66	
2023		0.00	0.00	7877	0.79	1.18	\$0	\$0	\$0					\$2,281,636	\$244	\$58.66	
2024		0.00	0.00	8186	0.82	1.23	\$0	\$0	\$0					\$2,417,911	\$249	\$60.78	
2025		0.00	0.00	8507	0.85	1.28	\$0	\$0	\$0					\$2,564,979	\$254	\$63.00	
2026		0.00	0.00	8841	0.88	1.33	\$0	\$0	\$0					\$2,722,694	\$259	\$65.34	
2027		0.00	0.00	9188	0.92	1.38	\$0	\$0	\$0					\$2,891,636	\$264	\$67.78	
	<b>TOTALS for Planning Period (1997 - 2027)</b>		<b>Avg=</b>	<b>6484</b>			<b>\$3,474,222</b>	<b>\$2,745,728</b>	<b>\$2,745,728</b>			<b>\$7,077,143</b>	<b>\$21,865,262</b>	<b>\$1,866,413</b>	<b>\$203</b>	<b>\$43.00</b>	<b>Average =</b>
2042				17777	1.78	2.67											

Present Value (in 1996 dollars) of all costs during planning period (1997-1927) = \$6,792,638  
 Calculations represent new expenditures only.

## APPENDIX F - PARTICIPATING INDIVIDUALS

The following individuals were active participants in this study and associated meetings:

**Alan Plummer and Associates, Inc.:**

Loretta Mokry  
Richard Smith

**City of Azle:**

Shirley Bradley, Mayor  
Jerry Guillory, Acting City Manager  
Darrell Riding, Director of Public Works  
Dick Allen, Water and Wastewater

**City of Fort Worth, Water Department:**

Lee C. Bradley, Jr., Director  
Jim Scanlin, P.E., Regulatory/Environmental Coordinator  
Frank Crumb, P.E., Engineering Services Coordinator

**City of Reno:**

Loyd Bailey, Mayor  
Ned Pugh, City Council  
Ed Braun, City Council  
Matt Sisk, City Council  
Dale Carroll, City Council

**City of Sanctuary:**

Floyd Galloway, Mayor

**City of Springtown:**

Tom Gentry, Mayor  
Al Swan, Mayor Pro-Tem  
Claredge "Doc" Dockery, City Council  
Don McBryde, City Council  
Robert Wilson, City Council  
Carl Moore, City Council  
Bob Salinas, City Administrator  
Cindy Hall, City Secretary  
Paul Bounds, Public Works Director

**Community Water Supply Corp. Company**

Doris Holyfield

**North Central Texas Council of Governments:**

Michael Eastland, Executive Director  
Sam Brush

**Parker County Commissioners Court:**

Honorable Ben Long, County Judge  
Danny Choate, Commissioner Precinct 1

Mack Dobbs, Commissioner Precinct 2  
Charlie Horton, Commissioner Precinct 3  
Rena Peden, Commissioner Precinct 4

Save Eagle Mountain Lake, Incorporated  
Mack Wood, President  
Betsy Schaffer, First Vice President  
Carl Wilson, Second Vice President  
Cheryl Anderson, Secretary  
Steven McKeever, Treasurer  
Wynette Parchman, Legal Council  
Ilze Knesnik, Executive Director  
Reed Pigman, Jr., Director  
Dorcas Boerner, Director  
Mark Bronson, Director  
Dee Cvetko, Director  
Sharon Davis, Director  
Carol Godbey, Director  
Sue Harvison, Director  
Randy Kressler, Director  
Neil Kretzer, Director  
Mike Muncy, Director  
Duke Palmer, Director  
Penny Yost, Director

Tanglewood Addition:  
Les Keeble, Community Leader

Rady and Associates (Kimley Horn)  
Bill Pembroke, P.E., Project Manager

Tarrant Regional Water District  
James Oliver, General Manager  
Mike Williams, Community and Customer Relations Managers  
Woody Frossard, Manager Environmental Services  
Mark Ernst, M.S., R.S., Water Quality Manager - Environmental Services

Teague Nall and Perkins, Inc.  
Mark Berry, P. E., Principal  
J. Kelly Carta, P.E., Project Manager

Texas Natural Resources Conservation Commission  
Lin Zhang, Manager of Enforcement Section  
Albert Holck, Water Utility Rates and Services  
Clyde E. Bohmfalk, Program Specialist, Watershed Assessment and Planning

Texas Water Development Board:  
Tommy Knowles, Deputy Executive Administrator for Planning  
Carolyn L. Brittin, Chief of Regional Planning and Projects  
Gary Laneman, P.E., Planning Division

U. S. Army Corps of Engineers, Lewisville Aquatic Environmental Research Facility  
Chetta Owens, Research Biologist

Walnut Creek Special Utility District:  
Jerry Holsomback, General Manager  
Ron Freeman, Attorney  
James Johnson, President  
Michael Gilley, Secretary/Treasurer  
Lloyd Sisk, Director  
Ray Smith, Director  
Jerry DeWeese, Director

Wise County Commissioners Court:  
Honorable L.D. McDonald, County Judge

Wise County Water Control and Improvement District:  
Lou Bridges, Chairman  
Carl Cox, Board Member  
Todd Durden, Board Member

Cheatham and Associates, Inc.:  
Eddie Cheatham, P.E., Principal



## **APPENDIX G - POPULATION TRENDS**

FORT WORTH HISTORICAL AND PROJECTED POPULATION

WEATHERFORD HISTORICAL AND PROJECTED POPULATION

UNINCORPORATED PARKER COUNTY HISTORICAL AND PROJECTED POPULATION

SPRINGTOWN HISTORICAL AND PROJECTED POPULATION

AZLE HISTORICAL AND PROJECTED POPULATION

SANCTUARY HISTORICAL AND PROJECTED POPULATION

PELICAN BAY HISTORICAL AND PROJECTED POPULATION

RENO HISTORICAL AND PROJECTED POPULATION

FORT WORTH POPULATION GRAPH

WEATHERFORD POPULATION GRAPH

UNINCORPORATED PARKER COUNTY POPULATION GRAPH

SPRINGTOWN POPULATION GRAPH

AZLE POPULATION GRAPH

SANCTUARY POPULATION GRAPH

PELICAN BAY POPULATION GRAPH

RENO POPULATION GRAPH

**FORT WORTH  
POPULATION HISTORY  
AND PROJECTIONS**

Year	Fort Worth Census	Fort Worth 1.57% Growth
1850		
1860		
1870	500	
1880	6663	
1890	23076	
1900	26688	
1910	73312	
1920	106482	
1930	163447	
1940	177662	
1950	278778	
1960	356268	
1970	393476	
1980	385164	
1990	447619	447619
1993	461650	469035
1995	473600	483878
1996	477850	491475
1997		499191
2000		523074
2005		565445
2010		611248
2020		714286
2030		834693
2040		975396
2050		1139818

**WEATHERFORD  
POPULATION HISTORY  
AND PROJECTIONS**

Year	Weatherford Census	Weatherford 3.46% Growth
1850	175	
1860	1823	
1870	1935	
1880	2046	
1890	3369	
1900	4786	
1910	5074	
1920	6203	
1930	4912	
1940	5924	
1950	8093	
1960	9759	
1970	11750	
1980	12049	
1990	14804	14804
1993	15350	16394
1995	16550	17549
1996	18000	18156
1997		18784
2000		20802
2005		24658
2010		29230
2020		41073
2030		57714
2040		81097
2050		113953

**UNINCORPORATED PARKER COUNTY  
POPULATION HISTORY  
AND PROJECTIONS**

Year	Unincorporated	Unincorporated	Unincorporated	Unincorporated	Unincorporated
	Parker Co. NCTCOG	Parker Co. TWDB Low	Parker Co. TWDB High	Parker Co. TWCB M.L.	Parker Co. 2.20% Growth
1970	18617				
1980	26658	26223	26223	26223	
1990	40737	40149	40149	40149	40737
1993	41500				43485
1995	44050				45420
1996	45500				46419
1997					47440
2000		40438	56091	48105	50641
2005					56462
2010		42029	77455	58945	62952
2020		42656	107630	70206	78256
2030		42673	136658	82490	97280
2040		42506	170553	92664	120930
2050		42438	205266	100246	150329

**CITY OF SPRINGTOWN  
POPULATION HISTORY  
AND PROJECTIONS**

Year	Springtown	Springtown	Springtown	Springtown	Springtown	Springtown	Springtown	Springtown
	NCTCOG	TWDB Low	TWDB High	TWDB M.L.	Questionnaire	0.59% Growth	2.08% Growth	3.95% Growth
1970	1194	1194	1194	1194				
1980	1658	1658	1658	1658				
1990	1740	1740	1740	1740	2169	2169	2169	2169
1993	1750	1750	1750	1750		2208	2307	2436
1995	1800	1800	1800	1800		2234	2404	2633
1996	1800	1800	1800	1800	2588	2247	2454	2737
1997					2588	2260	2505	2845
2000		2060	2856	2432	3557	2300	2665	3195
2005						2369	2954	3878
2010		2277	4197	3149	5835	2440	3274	4707
2020		2403	6065	3873	7760	2588	4022	6934
2030		2469	7907	4638	10321	2744	4942	10215
2040		2492	9997	5262		2911	6071	15048
2050		2515	12639	5970		3087	7459	22168

**CITY OF AZLE  
POPULATION HISTORY  
AND PROJECTIONS**

Year	Azle Census	Azle 1990 TWDB Low	Azle 1990 TWDB High	Azle 1988 Masterplan	Azle NCTCOG	Azle TWCB Low	Azle TWDB High	Azle TWDB M.L.	Azle Questionnaire	Azle 1.35% Growth	Azle 3.52% Growth
1960	2969	2969	2969	2969	2969	2969	2969	2969			
1970	4493	4493	4493	4493	4493	4493	4493	4493			
1980	5822	5822	5822	5822	5822	5822	5822	5822			
1990		9272	9335	9304	9240	8868	8868	8868		9240	9304
1993										9619	10321
1995		10286	10357	9800	9910					9881	11061
1996										10014	11450
1997									9450	10149	11853
2000		11300	11379	10750	10580	11790	14509	11790	10750	10566	13150
2005		11733	11878	12000	11325					11299	15633
2010		12165	12376	14000	12070					12082	18585
2020						12978	19433	13816	14000	13816	26266
2030						13731	24990	15871	22800	15799	37123
2040						14046	30867	17346	37200	18066	52467
2050						13794	38876	19092		20658	74152
						13546	48969	21053			

**CITY OF SANCTUARY  
POPULATION HISTORY  
AND PROJECTIONS**

Year	Sanctuary TWDB	Sanctuary 3.00% Growth
1980		
1990	234	234
1993		256
1995	276	271
1996	280	279
1997		288
2000		314
2005		365
2010		423
2020		568
2030		763
2040		1026
2050		1379

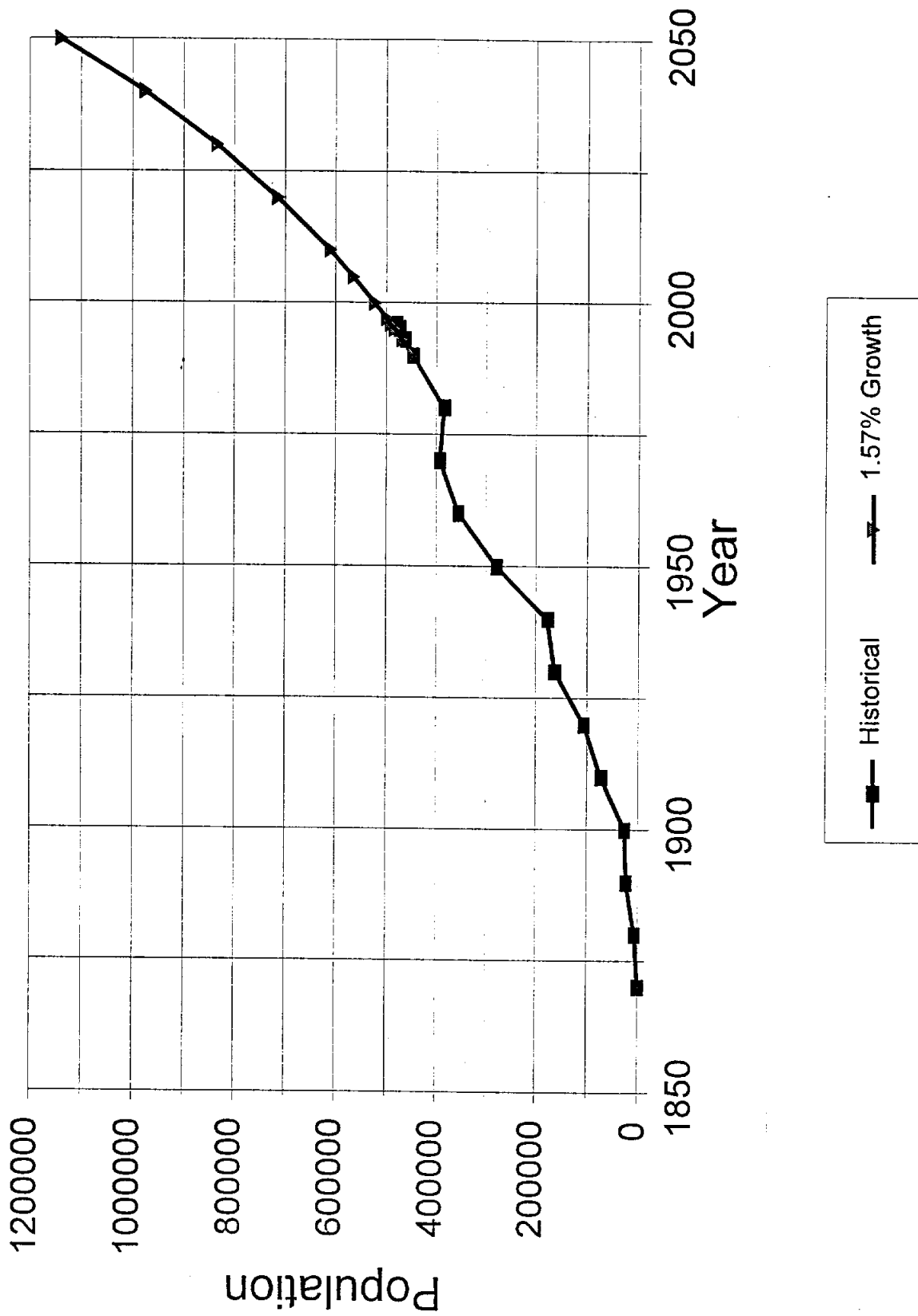
**CITY OF PELICAN BAY  
POPULATION HISTORY  
AND PROJECTIONS**

Year	Pelican Bay APAI Total	Pelican Bay APAI Sewered	Pelican Bay 3.40% Growth
1980			
1990	1513		1513
1993			1673
1995	1886	1583	1788
1996			1849
1997			1912
2000	2141	1895	2114
2005	2549	2300	2498
2010	2958	2705	2953
2020			4125
2030			5763
2040			8051
2050			11248

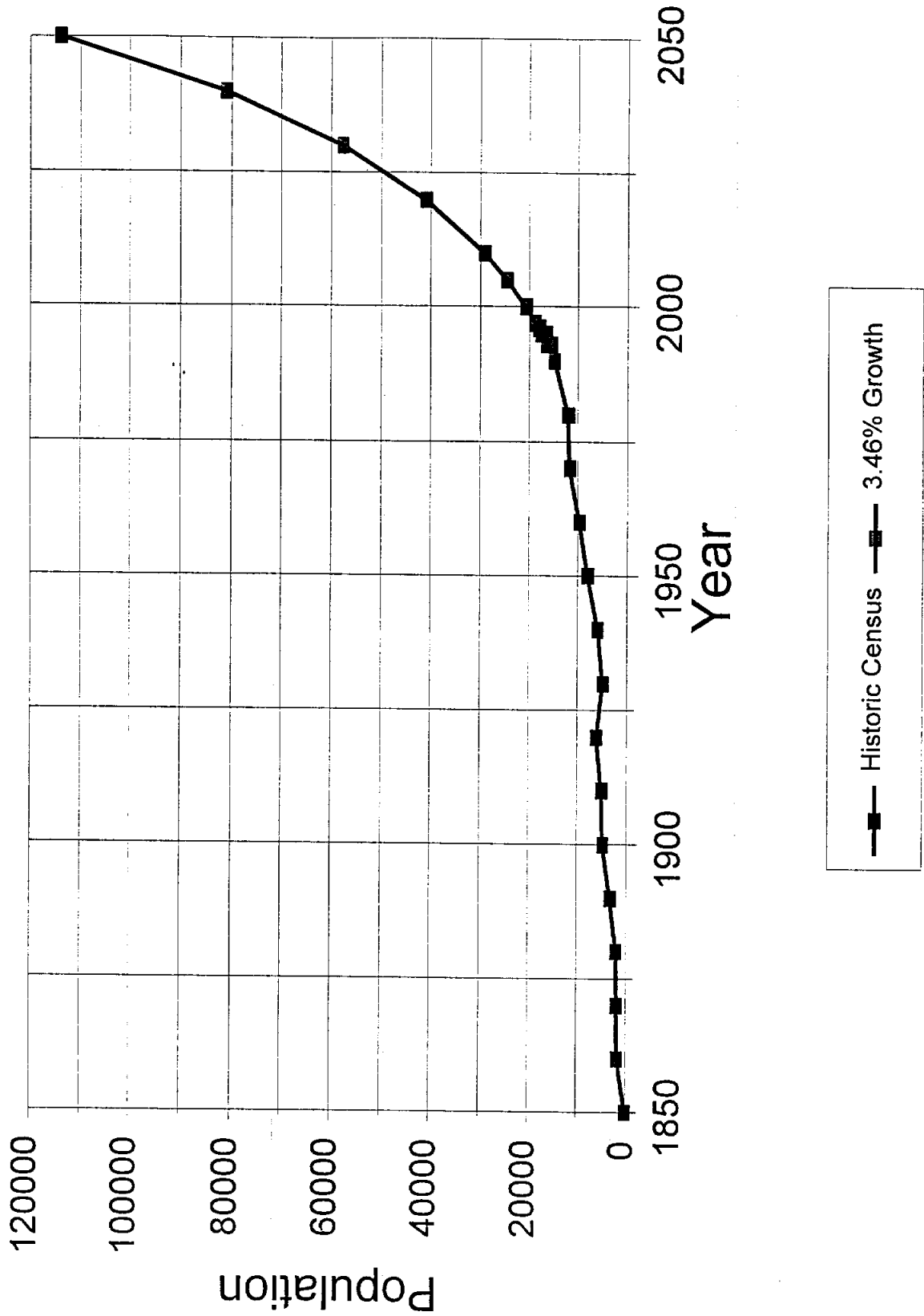
**CITY OF RENO  
POPULATION HISTORY  
AND PROJECTIONS**

<b>Year</b>	<b>Reno NCTCOG</b>	<b>Reno TWDB Low</b>	<b>Reno TWDB High</b>	<b>Reno TWDB M.L.</b>	<b>Reno 1.29% Growth</b>
1970	688	688	688	688	
1980	1174	1174	1174	1174	
1990	2322	2322	2322	2322	2322
1993	2300	2300	2300	2300	2413
1995	2450	2450	2450	2450	2476
1996	2500	2500	2500	2500	2508
1997					2540
2000		2296	3184	2712	2640
2005					2814
2010		2235	4120	3091	3001
2020		2200	5552	3546	3411
2030		2155	6902	4049	3877
2040		2131	8550	4500	4407
2050		2107	10591	5001	5010

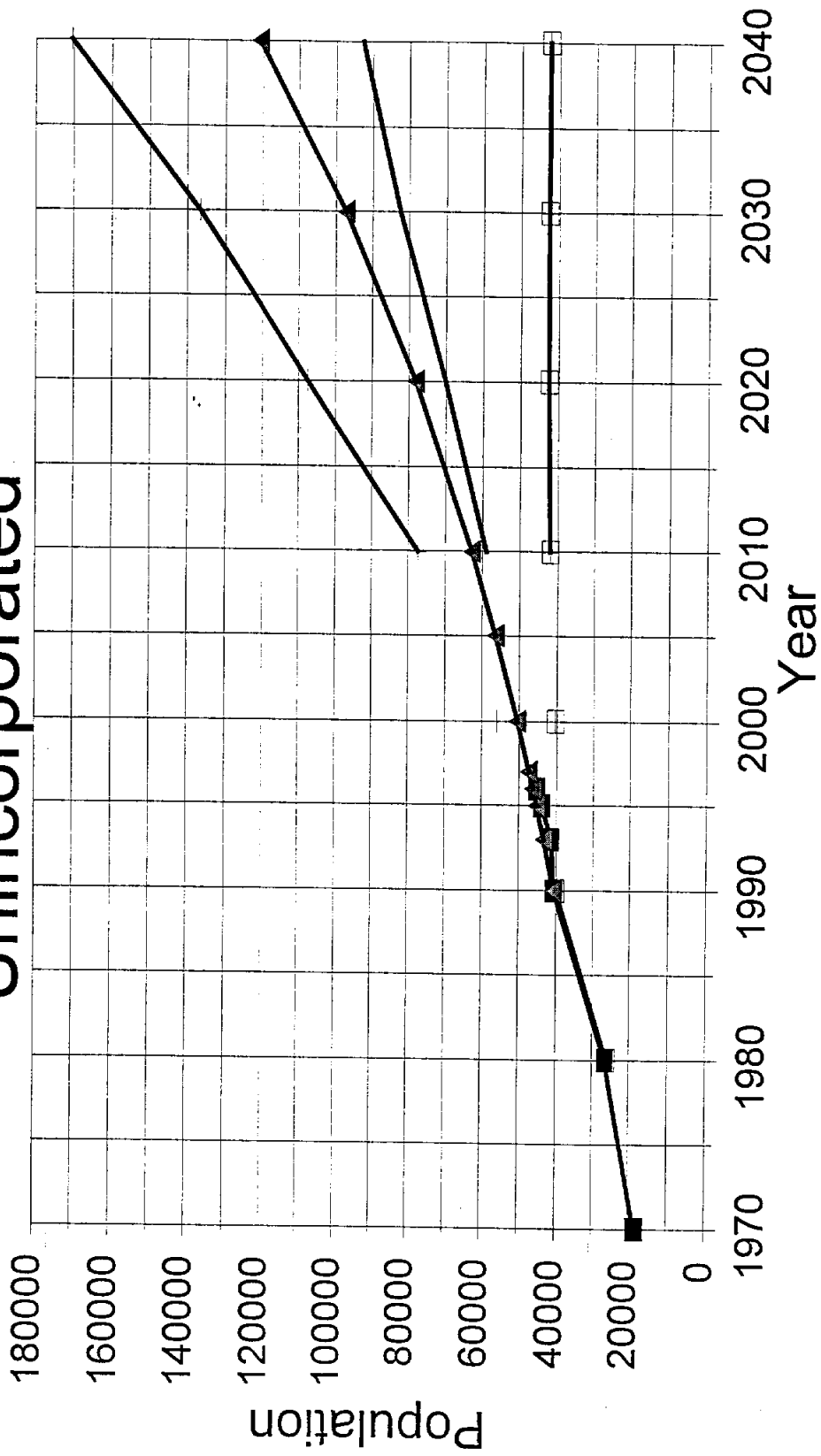
# Fort Worth Population



# Weatherford Population

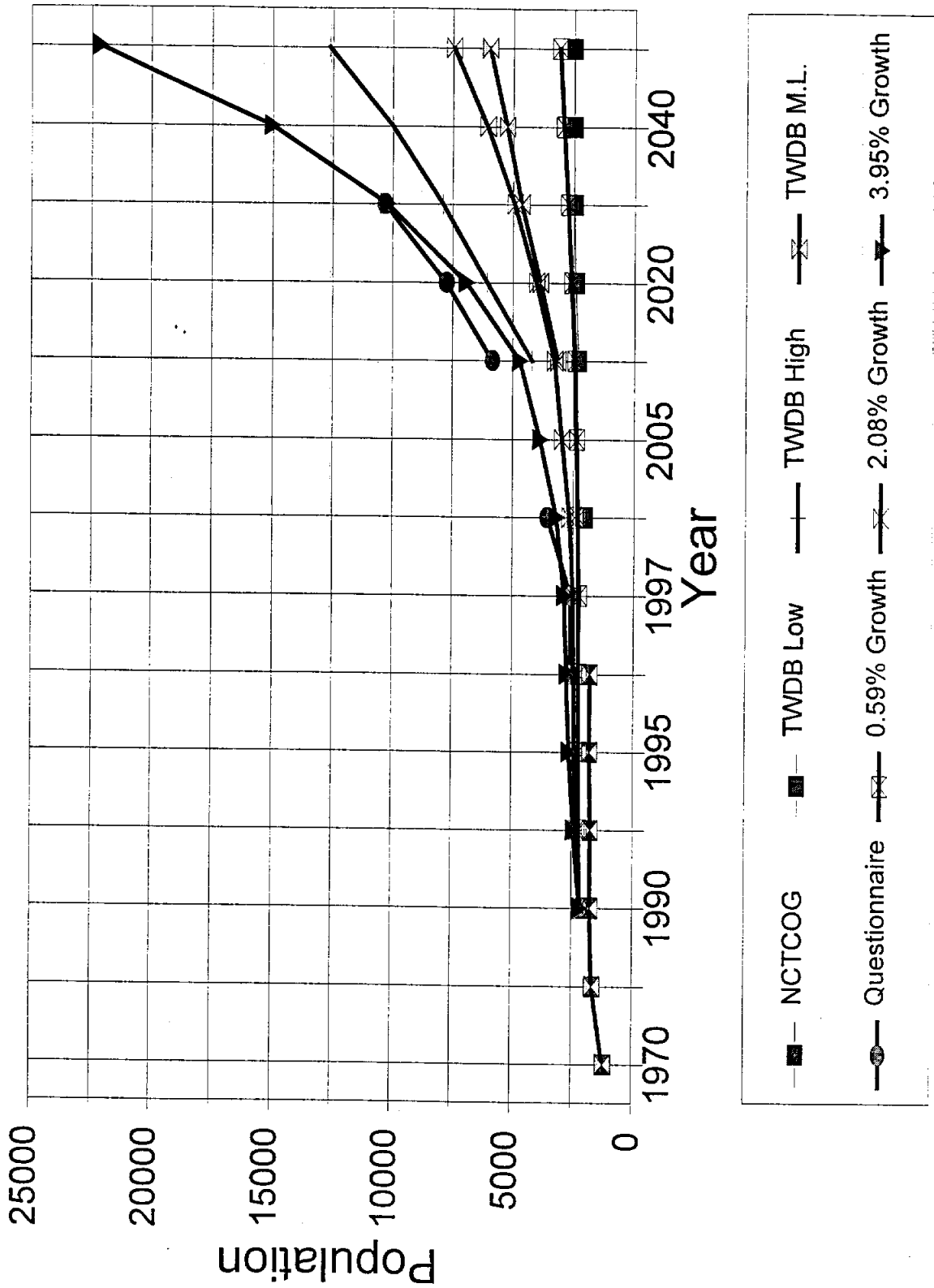


# Parker County Population Unincorporated

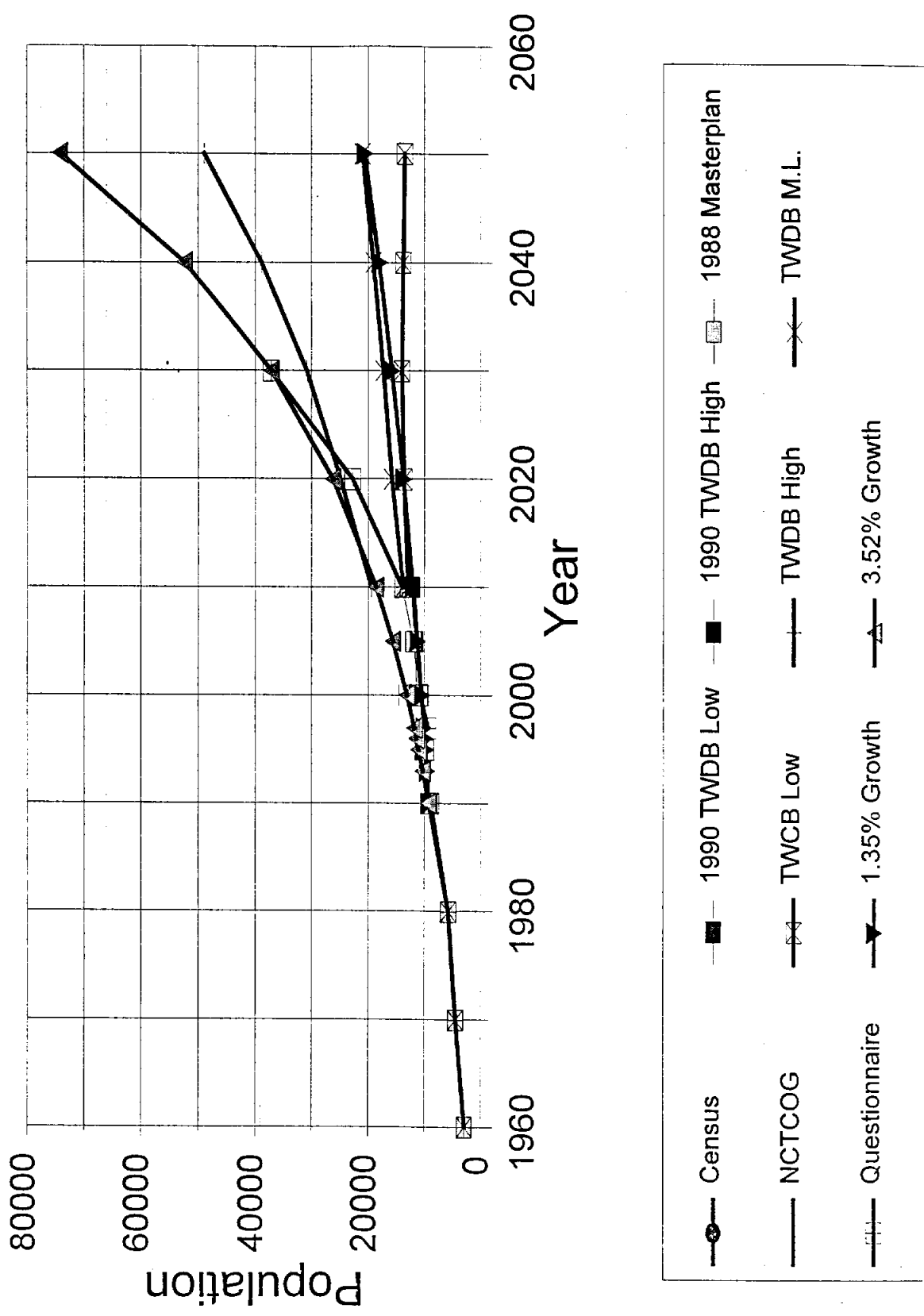




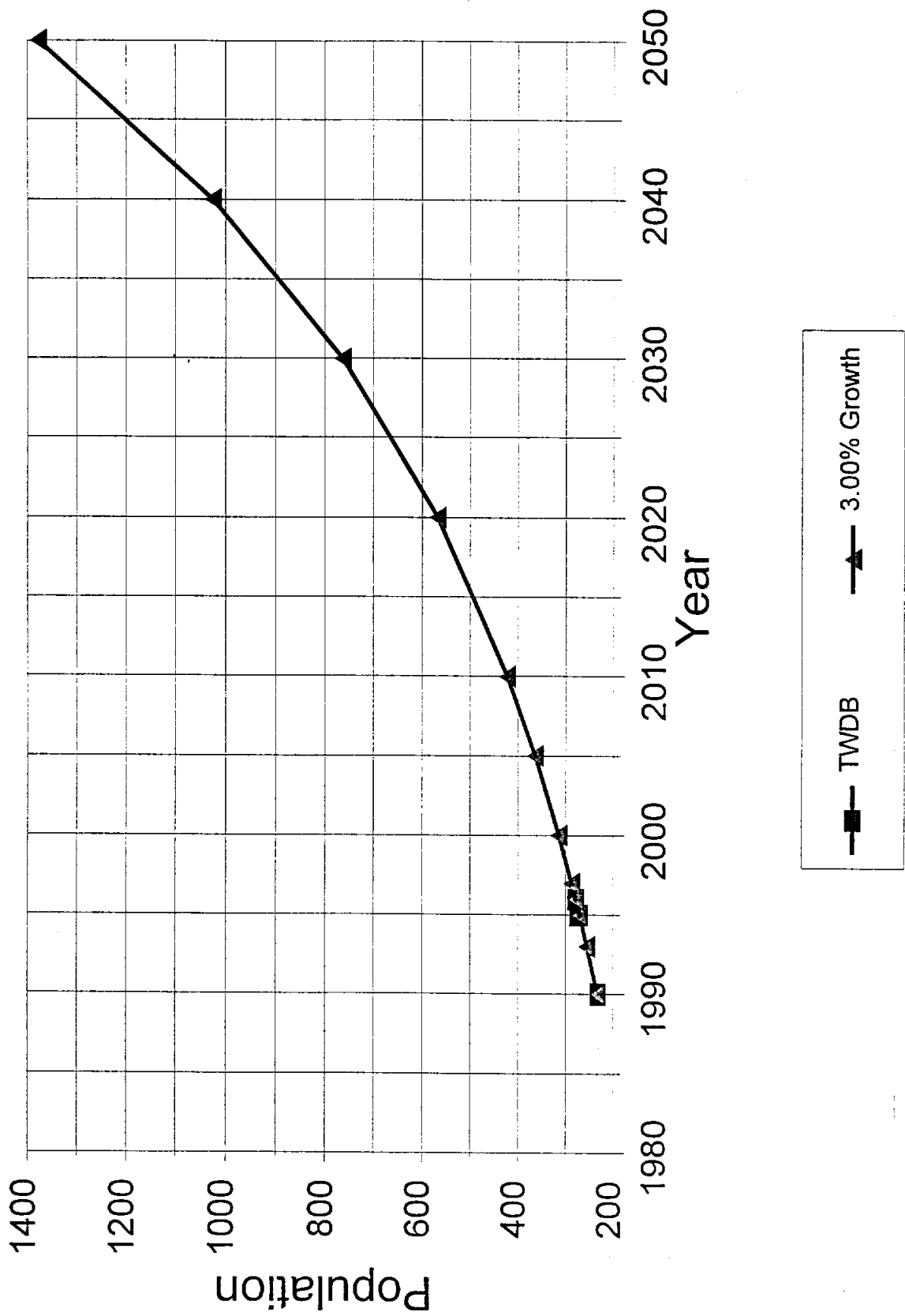
# Springtown Population



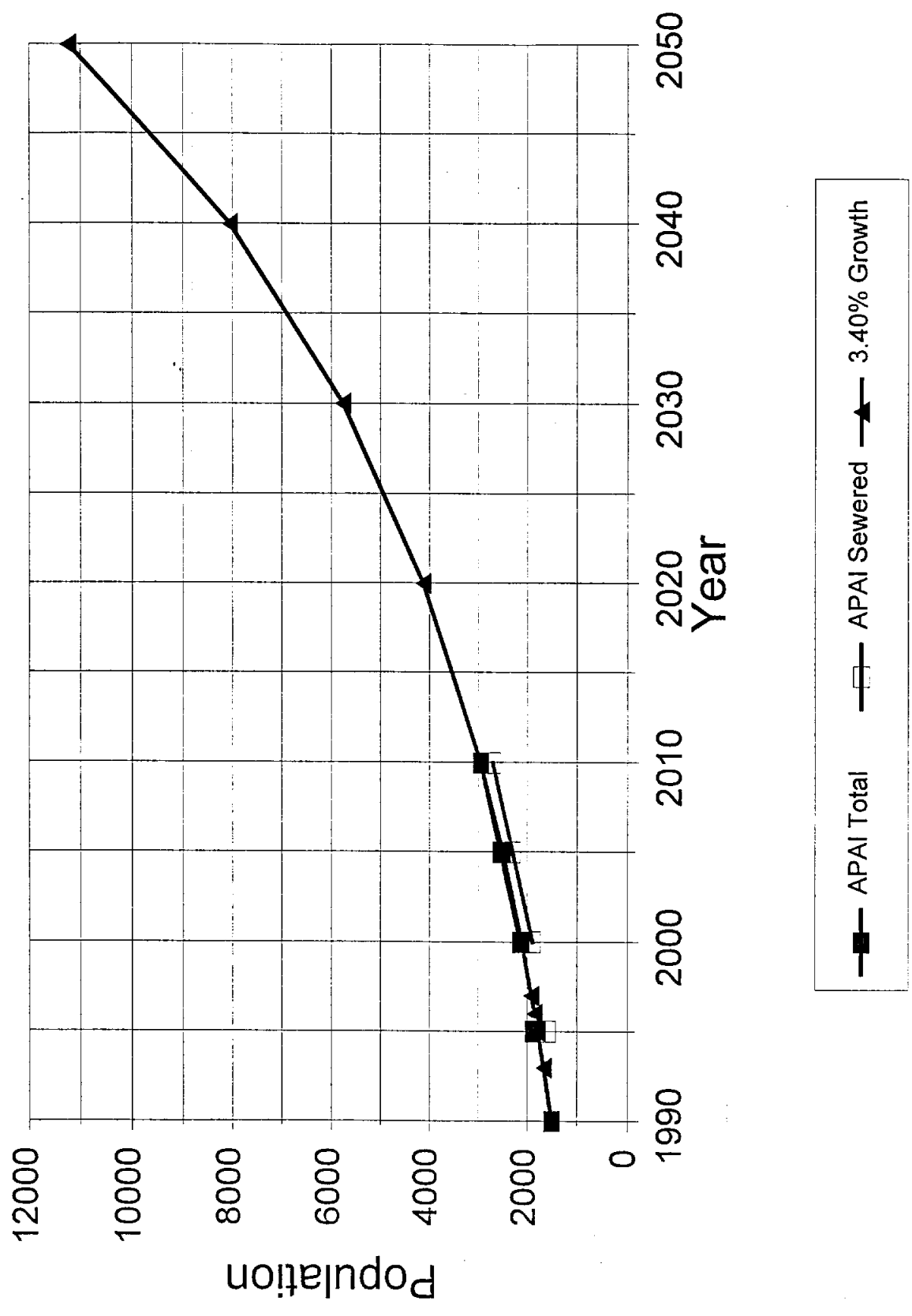
# Azle Population



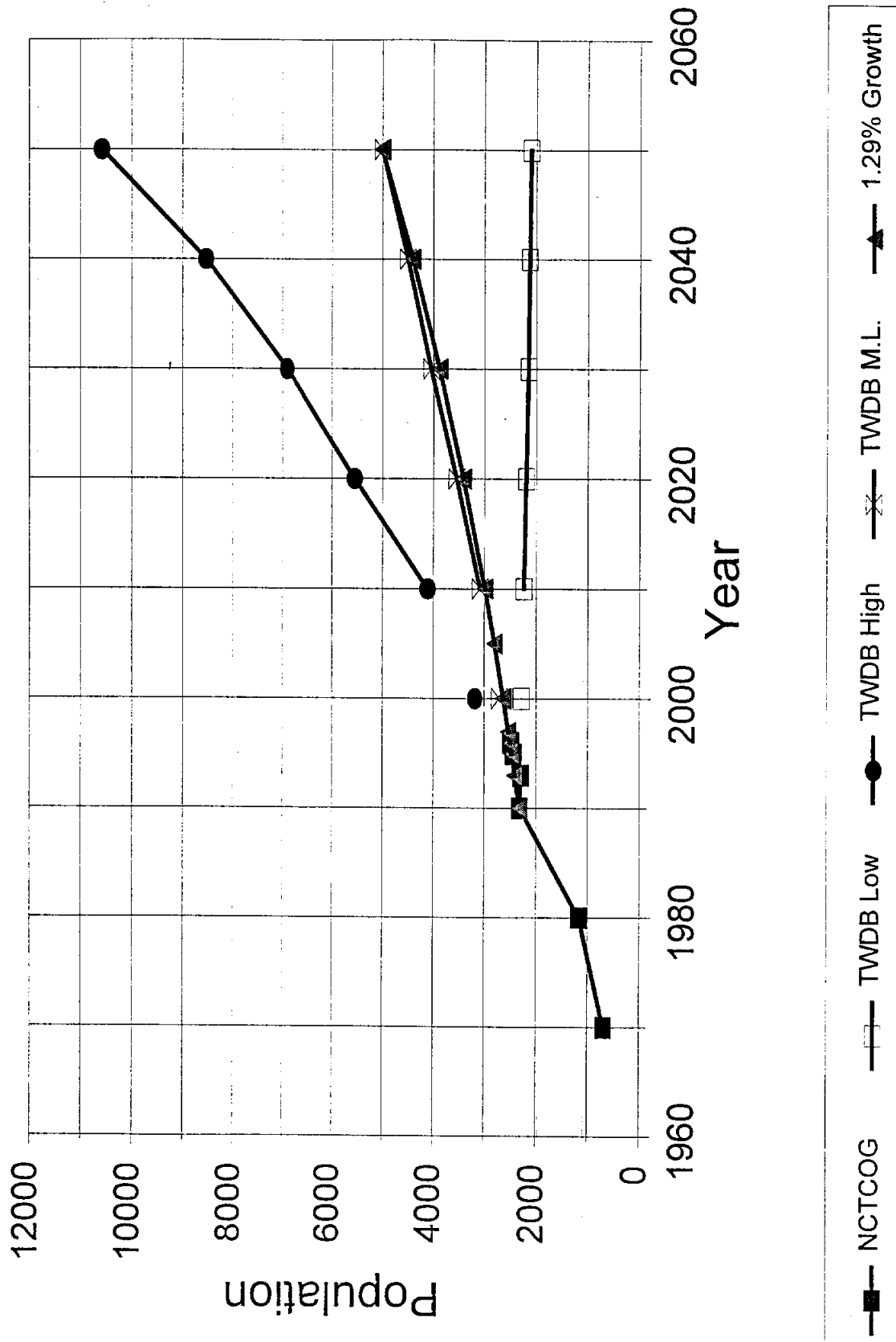
# Sanctuary Population



# Pelican Bay Population



# Reno Population



## **APPENDIX H - WATER CONSERVATION PLAN**

(Not currently reviewed and approved, to be submitted under separate cover.)

## **APPENDIX I - TREATMENT METHODS AND SEQUENCES**

PROCESSES USED FOR PLANT COSTS

TREATMENT SEQUENCES REVIEWED FOR COST ANALYSIS

**PROCESSES USED FOR PLANT COSTS**  
(COSTS BASED ON STEEL/McGHEE CURVES)

Process	Stage	Process Name	Process Influent Comes From	Removals			
				% BOD5	% TSS	% N	% P
AA	Liquid	Preliminary Treatment	Raw	27	27	2	0
AB	Liquid	Raw Sewer Pumping	AA	0	0	0	0
A1	Liquid	Primary Sedimentation - Conventional	AA,AB	30	55	15	0
A2	Liquid	Primary Sedimentation - 2 Stage Lime	AA,AB	55	90	15	80
A3	Liquid	Primary Sedimentation - 1 Stage Lime	AA,AB	55	90	15	75
A4	Liquid	Primary Sedimentation - Alum	AA,AB	55	90	25	75
A5	Liquid	Primary Sedimentation - FeCl3	AA,AB	55	90	25	75
B1	Liquid	Trickling Filter	A1	90	75	25	80
B2	Liquid	Trickling Filter	A3	90	75	25	80
B3	Liquid	Trickling Filter	A4	90	75	25	80
C1	Liquid	Activated Sludge	A1	90	90	55	15
C2	Liquid	Activated Sludge	A3	90	90	55	15
C3	Liquid	Activated Sludge	A5	90	90	55	15
C4	Liquid	Activated Sludge + Alum	A1	95	95	65	20
C5	Liquid	Activated Sludge + FeCl3	A1	95	95	65	20
C6	Liquid	Activated Sludge, High Rate	A1	85	85	45	15
C7	Liquid	Activated Sludge, High Rate + Alum	A1	90	90	55	20
C8	Liquid	Activated Sludge, High Rate + FeCl3	A1	90	90	55	20
D	Liquid	Filtration	A2,C4,C5,F1,F2,B2,B3,C2,C3,G1,G2,G3,G4,H,J,K	90	75	0	80
E	Liquid	Activated Carbon	D	88	70	15	0
F1	Liquid	Two Stage Lime	B1	0	0	0	70
F2	Liquid	Two Stage Lime	C1	0	0	0	0
G1	Liquid	Biological Nitrofication	C6	0	0	5	0
G2	Liquid	Biological Nitrofication	B1	0	0	5	0
G3	Liquid	Biological Nitrofication	A3,A4,A5	0	0	5	0
G4	Liquid	Biological Nitrofication	A2,C7,C8	0	0	80	0
H	Liquid	Biological Denitrofication	G1,G2,G3,G4	0	0	85	0
I	Liquid	Ion Exchange	D,E	0	0	95	0
J	Liquid	Breakpoint Chlorination	A2,B1,B2,B3,C1,C2,C3,C4,C5,F1,F2	0	0	70	0
K	Liquid	Ammonia Stripping	F1,F2	0	0	0	0
R	Liquid	Disinfection	ANY PROCESS	0	0	0	0
L1	Sludge	Anaerobic Digestion	A1+B1,A1+C1,A1+C6	0	0	0	0
L2	Sludge	Anaerobic Digestion	A1+C4,A1+C5,A1+C7,A1+C8,A4+B3,A4+C3,A5+B3,A5+C5	0	0	0	0
M1	Sludge	Heat Treatment	A1+B1,A1+C1,A1+C6	0	0	0	0
M2	Sludge	Heat Treatment	A1+C4,A1+C5,A1+C7,A1+C8,A4+B3,A4+C3,A5+B3,A5+C5	0	0	0	0
N1	Sludge	Air Drying	L1	0	0	0	0
N2	Sludge	Air Drying	L2	0	0	0	0
O1	Sludge	Dewatering	A1+B1,A1+C1,A1+C6	0	0	0	0
O2	Sludge	Dewatering	A1+C4,A1+C5,A1+C7,A1+C8,A4+B3,A4+C3,A5+B3,A5+C5	0	0	0	0
O3	Sludge	Dewatering	A2	0	0	0	0
O4	Sludge	Dewatering	A3+B2,A3+C2	0	0	0	0
O5	Sludge	Dewatering	L1	0	0	0	0
O6	Sludge	Dewatering	L2	0	0	0	0
O7	Sludge	Dewatering	F1,F2	0	0	0	0
O8	Sludge	Dewatering	M1	0	0	0	0
O9	Sludge	Dewatering	M2	0	0	0	0
P1	Sludge	Incineration	O1	0	0	0	0
P2	Sludge	Incineration	O2	0	0	0	0
P3	Sludge	Incineration	O3	0	0	0	0
P4	Sludge	Incineration	O4	0	0	0	0
P5	Sludge	Incineration	O7+O1	0	0	0	0
P6	Sludge	Incineration	O8	0	0	0	0
P7	Sludge	Incineration	O9	0	0	0	0
Q1	Sludge	Recalcination	O3	0	0	0	0
Q2	Sludge	Recalcination	O4	0	0	0	0
Q3	Sludge	Recalcination	O7	0	0	0	0
W	Wetland	Advanced Tertiary Treatment	R	0	99	82	72
DPLUS	Sewer	Additional Filtration	F1,F2,G1,G2,G3,G4,H,J,K	75	75	30	0
ETC	All	Land, Engr, Permits, etc.	All				



## TREATMENT SEQUENCES REVIEWED FOR COST ANALYSIS

NO.	LIQUID				SLUDGE				OPTIONAL		
1	AA	AB	A1	B1	F1	J	R	L1	N1	WL	DPLUS
2	AA		A1	B1	F1	J	R	L1	N1	WL	DPLUS
3	AA	AB	A1	B1	F1		K R	L1	N1	WL	DPLUS
4	AA		A1	B1	F1		K R	L1	N1	WL	DPLUS
5	AA	AB	A1	B1			G2 H R	L1	N1	WL	DPLUS
6	AA		A1	B1			G2 H R	L1	N1	WL	DPLUS
7	AA	AB	A1	B1		J	R	L1	N1	WL	DPLUS
8	AA		A1	B1		J	R	L1	N1	WL	DPLUS
9	AA	AB	A1	B1	F1	J	R		O7 P5	WL	DPLUS
10	AA		A1	B1	F1	J	R		O7 P5	WL	DPLUS
11	AA	AB	A1	B1	F1		K R		O7 P5	WL	DPLUS
12	AA		A1	B1	F1		K R		O7 P5	WL	DPLUS
13		AB	A1	B1	F1	J	R		O7	Q3	WL DPLUS
14			A1	B1	F1	J	R		O7	Q3	WL DPLUS
15		AB	A1	B1	F1		K R		O7	Q3	WL DPLUS
16			A1	B1	F1		K R		O7	Q3	WL DPLUS
17	AA	AB	A1	B1	F1	J	R	L1	O5	WL	DPLUS
18	AA		A1	B1	F1	J	R	L1	O5	WL	DPLUS
19	AA	AB	A1	B1	F1		K R	L1	O5	WL	DPLUS
20	AA		A1	B1	F1		K R	L1	O5	WL	DPLUS
21	AA	AB	A1	B1			G2 H R	L1	O5	WL	DPLUS
22	AA		A1	B1			G2 H R	L1	O5	WL	DPLUS
23	AA	AB	A1	B1		J	R	L1	O5	WL	DPLUS
24	AA		A1	B1		J	R	L1	O5	WL	DPLUS
25	AA	AB	A1	B1	F1	J	R	M1	O8 P6	WL	DPLUS
26	AA		A1	B1	F1	J	R	M1	O8 P6	WL	DPLUS
27	AA	AB	A1	B1	F1		K R	M1	O8 P6	WL	DPLUS
28	AA		A1	B1	F1		K R	M1	O8 P6	WL	DPLUS
29	AA	AB	A1	B1			G2 H R	M1	O8 P6	WL	DPLUS
30	AA		A1	B1			G2 H R	M1	O8 P6	WL	DPLUS
31	AA	AB	A1	B1		J	R	M1	O8 P6	WL	DPLUS
32	AA		A1	B1		J	R	M1	O8 P6	WL	DPLUS
33	AA	AB	A1	B1	F1	J	R		O1 P1	WL	DPLUS
34	AA		A1	B1	F1	J	R		O1 P1	WL	DPLUS
35	AA	AB	A1	B1	F1		K R		O1 P1	WL	DPLUS
36	AA		A1	B1	F1		K R		O1 P1	WL	DPLUS
37	AA	AB	A1	B1			G2 H R		O1 P1	WL	DPLUS
38	AA		A1	B1			G2 H R		O1 P1	WL	DPLUS
39	AA	AB	A1	B1		J	R		O1 P1	WL	DPLUS
40	AA		A1	B1		J	R		O1 P1	WL	DPLUS
41	AA	AB	A1	C1	F2	J	R	L1	N1	WL	DPLUS

42	AA	A1	C1	F2	J	R	L1	N1	WL	DPLUS			
43	AA	AB	A1	C1	F2	K	R	L1	N1	WL	DPLUS		
44	AA	A1	C1	F2		K	R	L1	N1	WL	DPLUS		
45	AA	AB	A1	C1		J	R	L1	N1	WL	DPLUS		
46	AA	A1	C1		J	R	L1	N1		WL	DPLUS		
47	AA	AB	A1	C1	F2	J	R		O7	P5	WL	DPLUS	
48	AA	A1	C1	F2	J	R			O7	P5	WL	DPLUS	
49	AA	AB	A1	C1	F2	K	R		O7	P5	WL	DPLUS	
50	AA	A1	C1	F2		K	R		O7	P5	WL	DPLUS	
51	AA	AB	A1	C1	F2	J	R		O7	Q3	WL	DPLUS	
52	AA	A1	C1	F2	J	R			O7	Q3	WL	DPLUS	
53	AA	AB	A1	C1	F2	K	R		O7	Q3	WL	DPLUS	
54	AA	A1	C1	F2		K	R		O7	Q3	WL	DPLUS	
55	AA	AB	A1	C1	F2	J	R	L1	O5		WL	DPLUS	
56	AA	A1	C1	F2	J	R	L1		O5		WL	DPLUS	
57	AA	AB	A1	C1	F2	K	R	L1	O5		WL	DPLUS	
58	AA	A1	C1	F2		K	R	L1	O5		WL	DPLUS	
59	AA	AB	A1	C1		J	R	L1	O5		WL	DPLUS	
60	AA	A1	C1		J	R	L1		O5		WL	DPLUS	
61	AA	AB	A1	C1	F2	J	R	M1	O8	P6	WL	DPLUS	
62	AA	A1	C1	F2	J	R		M1	O8	P6	WL	DPLUS	
63	AA	AB	A1	C1	F2	K	R	M1	O8	P6	WL	DPLUS	
64	AA	A1	C1	F2		K	R	M1	O8	P6	WL	DPLUS	
65	AA	AB	A1	C1		J	R	M1	O8	P6	WL	DPLUS	
66	AA	A1	C1		J	R		M1	O8	P6	WL	DPLUS	
67	AA	AB	A1	C1	F2	J	R		O1	P1	WL	DPLUS	
68	AA	A1	C1	F2	J	R			O1	P1	WL	DPLUS	
69	AA	AB	A1	C1	F2	K	R		O1	P1	WL	DPLUS	
70	AA	A1	C1	F2		K	R		O1	P1	WL	DPLUS	
71	AA	AB	A1	C1		J	R		O1	P1	WL	DPLUS	
72	AA	A1	C1		J	R			O1	P1	WL	DPLUS	
73	AA	AB	A1	C4	D	E	I	R	L2	N2	WL	DPLUS	
74	AA	A1	C4	D	E		I	R	L2	N2	WL	DPLUS	
75	AA	AB	A1	C4			J	R	L2	N2	WL	DPLUS	
76	AA	A1	C4				J	R	L2	N2	WL	DPLUS	
77	AA	AB	A1	C4	D	E	I	R	L2	O6	WL	DPLUS	
78	AA	A1	C4	D	E		I	R	L2	O6	WL	DPLUS	
79	AA	AB	A1	C4			J	R	L2	O6	WL	DPLUS	
80	AA	A1	C4				J	R	L2	O6	WL	DPLUS	
81	AA	AB	A1	C4	D	E	I	R	M2	O9	P7	WL	DPLUS
82	AA	A1	C4	D	E		I	R	M2	O9	P7	WL	DPLUS
83	AA	AB	A1	C4			J	R	M2	O9	P7	WL	DPLUS
84	AA	A1	C4				J	R	M2	O9	P7	WL	DPLUS
85	AA	AB	A1	C4	D	E	I	R		O2	P2	WL	DPLUS
86	AA	A1	C4	D	E		I	R		O2	P2	WL	DPLUS
87	AA	AB	A1	C4			J	R		O2	P2	WL	DPLUS
88	AA	A1	C4				J	R		O2	P2	WL	DPLUS
89	AA	AB	A1	C5	D	E	I	R	L2	N2	WL	DPLUS	
90	AA	A1	C5	D	E		I	R	L2	N2	WL	DPLUS	
91	AA	AB	A1	C5			J	R	L2	N2	WL	DPLUS	
92	AA	A1	C5				J	R	L2	N2	WL	DPLUS	
93	AA	AB	A1	C5	D	E	I	R	L2	O6	WL	DPLUS	
94	AA	A1	C5	D	E		I	R	L2	O6	WL	DPLUS	
95	AA	AB	A1	C5			J	R	L2	O6	WL	DPLUS	
96	AA	A1	C5				J	R	L2	O6	WL	DPLUS	
97	AA	AB	A1	C5	D	E	I	R	M2	O9	P7	WL	DPLUS
98	AA	A1	C5	D	E		I	R	M2	O9	P7	WL	DPLUS
99	AA	AB	A1	C5			J	R	M2	O9	P7	WL	DPLUS
100	AA	A1	C5				J	R	M2	O9	P7	WL	DPLUS

101	AA	AB	A1	C5	D	E		I	R			O2	P2	WL	DPLUS
102	AA		A1	C5	D	E		I	R			O2	P2	WL	DPLUS
103	AA	AB	A1	C5				J	R			O2	P2	WL	DPLUS
104	AA		A1	C5				J	R			O2	P2	WL	DPLUS
105	AA	AB	A1	C6			G1	H	R	L1		N1		WL	DPLUS
106	AA		A1	C6			G1	H	R	L1		N1		WL	DPLUS
107	AA	AB	A1	C6			G1	H	R	L1		O5		WL	DPLUS
108	AA		A1	C6			G1	H	R	L1		O5		WL	DPLUS
109	AA	AB	A1	C6			G1	H	R		M1	O8	P6	WL	DPLUS
110	AA		A1	C6			G1	H	R		M1	O8	P6	WL	DPLUS
111	AA	AB	A1	C6			G1	H	R			O1	P1	WL	DPLUS
112	AA		A1	C6			G1	H	R			O1	P1	WL	DPLUS
113	AA	AB	A1	C6			G1	H	R			O1	P1	WL	DPLUS
114	AA		A1	C6			G1	H	R			O1	P1	WL	DPLUS
115	AA	AB	A1	C7			G4	H	R	L2		N2		WL	DPLUS
116	AA		A1	C7			G4	H	R	L2		N2		WL	DPLUS
117	AA	AB	A1	C7			G4	H	R	L2		O6		WL	DPLUS
118	AA		A1	C7			G4	H	R	L2		O6		WL	DPLUS
119	AA	AB	A1	C7			G4	H	R		M2	O9	P7	WL	DPLUS
120	AA		A1	C7			G4	H	R		M2	O9	P7	WL	DPLUS
121	AA	AB	A1	C7			G4	H	R			O2	P2	WL	DPLUS
122	AA		A1	C7			G4	H	R			O2	P2	WL	DPLUS
123	AA	AB	A1	C8			G4	H	R	L2		N2		WL	DPLUS
124	AA		A1	C8			G4	H	R	L2		N2		WL	DPLUS
125	AA	AB	A1	C8			G4	H	R	L2		O6		WL	DPLUS
126	AA		A1	C8			G4	H	R	L2		O6		WL	DPLUS
127	AA	AB	A1	C8			G4	H	R		M2	O9	P7	WL	DPLUS
128	AA		A1	C8			G4	H	R		M2	O9	P7	WL	DPLUS
129	AA	AB	A1	C8			G4	H	R			O2	P2	WL	DPLUS
130	AA		A1	C8			G4	H	R			O2	P2	WL	DPLUS
131	AA	AB	A2		D	E			R			O3	P3	WL	DPLUS
132	AA		A2		D	E			R			O3	P3	WL	DPLUS
133	AA	AB	A2				G4	H	R			O3	P3	WL	DPLUS
134	AA		A2				G4	H	R			O3	P3	WL	DPLUS
135	AA	AB	A2						R	J		O3	P3	WL	DPLUS
136	AA		A2						R	J		O3	P3	WL	DPLUS
137	AA	AB	A2		D	E			R			O3	Q1	WL	DPLUS
138	AA		A2		D	E			R			O3	Q1	WL	DPLUS
139	AA	AB	A2				G4	H	R			O3	Q1	WL	DPLUS
140	AA		A2				G4	H	R			O3	Q1	WL	DPLUS
141	AA	AB	A2						R	J		O3	Q1	WL	DPLUS
142	AA		A2						R	J		O3	Q1	WL	DPLUS
143	AA	AB	A3	B2		D	E		R			O4	P4	WL	DPLUS
144	AA		A3	B2		D	E		R			O4	P4	WL	DPLUS
145	AA	AB	A3	B2					R	J		O4	P4	WL	DPLUS
146	AA		A3	B2					R	J		O4	P4	WL	DPLUS
147	AA	AB	A3		C2	D	E		R			O4	P4	WL	DPLUS
148	AA		A3		C2	D	E		R			O4	P4	WL	DPLUS
149	AA	AB	A3		C2				R	J		O4	P4	WL	DPLUS
150	AA		A3		C2				R	J		O4	P4	WL	DPLUS
151	AA	AB	A3	B2		D	E		R			O4	Q2	WL	DPLUS
152	AA		A3	B2		D	E		R			O4	Q2	WL	DPLUS
153	AA	AB	A3	B2					R	J		O4	Q2	WL	DPLUS
154	AA		A3	B2					R	J		O4	Q2	WL	DPLUS
155	AA	AB	A3		C2	D	E		R			O4	Q2	WL	DPLUS
156	AA		A3		C2	D	E		R			O4	Q2	WL	DPLUS
157	AA	AB	A3		C2				R	J		O4	Q2	WL	DPLUS
158	AA		A3		C2				R	J		O4	Q2	WL	DPLUS
159	AA	AB	A3				G3	H	R					WL	DPLUS
160	AA		A3				G3	H	R					WL	DPLUS

161	AA	AB	A4	B3		D	E		I		R	L2	N2	WL	DPLUS
162	AA		A4	B3		D	E		I		R	L2	N2	WL	DPLUS
163	AA	AB	A4	B3					J		R	L2	N2	WL	DPLUS
164	AA		A4	B3					J		R	L2	N2	WL	DPLUS
165	AA	AB	A4	B3		D	E		I		R	L2	O6	WL	DPLUS
166	AA		A4	B3		D	E		I		R	L2	O6	WL	DPLUS
167	AA	AB	A4	B3					J		R	L2	O6	WL	DPLUS
168	AA		A4	B3					J		R	L2	O6	WL	DPLUS
169	AA	AB	A4	B3		D	E		I		R	M2	O9 P7	WL	DPLUS
170	AA		A4	B3		D	E		I		R	M2	O9 P7	WL	DPLUS
171	AA	AB	A4	B3					J		R	M2	O9 P7	WL	DPLUS
172	AA		A4	B3					J		R	M2	O9 P7	WL	DPLUS
173	AA	AB	A4	B3		D	E		I		R		O2 P2	WL	DPLUS
174	AA		A4	B3		D	E		I		R		O2 P2	WL	DPLUS
175	AA	AB	A4	B3					J		R		O2 P2	WL	DPLUS
176	AA		A4	B3					J		R		O2 P2	WL	DPLUS
177	AA	AB	A4		C3	D	E		I		R	L2	N2	WL	DPLUS
178	AA		A4		C3	D	E		I		R	L2	N2	WL	DPLUS
179	AA	AB	A4		C3				J		R	L2	N2	WL	DPLUS
180	AA		A4		C3				J		R	L2	N2	WL	DPLUS
181	AA	AB	A4		C3	D	E		I		R	L2	O6	WL	DPLUS
182	AA		A4		C3	D	E		I		R	L2	O6	WL	DPLUS
183	AA	AB	A4		C3				J		R	L2	O6	WL	DPLUS
184	AA		A4		C3				J		R	L2	O6	WL	DPLUS
185	AA	AB	A4		C3	D	E		I		R	M2	O9 P7	WL	DPLUS
186	AA		A4		C3	D	E		I		R	M2	O9 P7	WL	DPLUS
187	AA	AB	A4		C3				J		R	M2	O9 P7	WL	DPLUS
188	AA		A4		C3				J		R	M2	O9 P7	WL	DPLUS
189	AA	AB	A4		C3	D	E		I		R		O2 P2	WL	DPLUS
190	AA		A4		C3	D	E		I		R		O2 P2	WL	DPLUS
191	AA	AB	A4		C3				J		R		O2 P2	WL	DPLUS
192	AA		A4		C3				J		R		O2 P2	WL	DPLUS
193	AA	AB	A4					G3 H			R			WL	DPLUS
194	AA		A4					G3 H			R			WL	DPLUS
195	AA	AB	A5	B3		D	E		I		R	L2	N2	WL	DPLUS
196	AA		A5	B3		D	E		I		R	L2	N2	WL	DPLUS
197	AA	AB	A5	B3					J		R	L2	N2	WL	DPLUS
198	AA		A5	B3					J		R	L2	N2	WL	DPLUS
199	AA	AB	A5	B3		D	E		I		R	L2	O6	WL	DPLUS
200	AA		A5	B3		D	E		I		R	L2	O6	WL	DPLUS
201	AA	AB	A5	B3					J		R	L2	O6	WL	DPLUS
202	AA		A5	B3					J		R	L2	O6	WL	DPLUS
203	AA	AB	A5	B3		D	E		I		R	M2	O9 P7	WL	DPLUS
204	AA		A5	B3		D	E		I		R	M2	O9 P7	WL	DPLUS
205	AA	AB	A5	B3					J		R	M2	O9 P7	WL	DPLUS
206	AA		A5	B3					J		R	M2	O9 P7	WL	DPLUS
207	AA	AB	A5	B3		D	E		I		R		O2 P2	WL	DPLUS
208	AA		A5	B3		D	E		I		R		O2 P2	WL	DPLUS
209	AA	AB	A5	B3					J		R		O2 P2	WL	DPLUS
210	AA		A5	B3					J		R		O2 P2	WL	DPLUS

211	AA	AB	A5	C3	D	E	I	R	L2	N2	WL	DPLUS
212	AA		A5	C3	D	E	I	R	L2	N2	WL	DPLUS
213	AA	AB	A5	C3			J	R	L2	N2	WL	DPLUS
214	AA		A5	C3			J	R	L2	N2	WL	DPLUS
215	AA	AB	A5	C3	D	E	I	R	L2	O6	WL	DPLUS
216	AA		A5	C3	D	E	I	R	L2	O6	WL	DPLUS
217	AA	AB	A5	C3			J	R	L2	O6	WL	DPLUS
218	AA		A5	C3			J	R	L2	O6	WL	DPLUS
219	AA	AB	A5	C3	D	E	I	R	M2	O9 P7	WL	DPLUS
220	AA		A5	C3	D	E	I	R	M2	O9 P7	WL	DPLUS
221	AA	AB	A5	C3			J	R	M2	O9 P7	WL	DPLUS
222	AA		A5	C3			J	R	M2	O9 P7	WL	DPLUS
223	AA	AB	A5	C3	D	E	I	R		O2 P2	WL	DPLUS
224	AA		A5	C3	D	E	I	R		O2 P2	WL	DPLUS
225	AA	AB	A5	C3			J	R		O2 P2	WL	DPLUS
226	AA		A5	C3			J	R		O2 P2	WL	DPLUS
227	AA	AB	A5				G3 H	R			WL	DPLUS
228	AA		A5				G3 H	R			WL	DPLUS

## APPENDIX J - INFLATION COST FACTORS

<b>COST (PRICE) INDICES</b>			
Year	Consumer Price Index	ENR Index	1996 Adjusted CPI
1950	23.8	510	0.154
1951	25.9		0.166
1952	26.5		0.169
1953	26.8		0.170
1954	26.9		0.171
1955	26.7	660	0.171
1956	27.2		0.173
1957	28.1		0.179
1958	28.9		0.184
1959	29.1		0.185
1960	29.6	824	0.189
1961	29.8		0.190
1962	30.2		0.192
1963	30.6		0.195
1964	31.0		0.197
1965	31.6	971	0.201
1966	32.4		0.206
1967	33.3		0.213
1968	34.7		0.222
1969	36.6		0.234
1970	38.8	1311	0.247
1971	40.6		0.258
1972	41.7		0.266
1973	44.2		0.283
1974	49.0		0.314
1975	53.6	2125	0.343
1976	56.8		0.362
1977	60.7	2540	0.386
1978	65.2		0.415
1979	72.3		0.462
1980	82.7		0.525
1981	90.6		0.579
1982	97.0		0.615
1983	99.5		0.634
1984	103.7		0.662
1985	107.6		0.685
1986	109.5		0.698
1987	113.5		0.724
1988	118.0		0.754
1989	124.1		0.790
1990	129.9		0.832
1991	136.0		0.868
1992	140.2		0.894
1993	144.4		0.920
1994	148.0	5407	0.944
1995	152.5	5511	0.971
1996	156.7		1.000
1970	1995 to 1970 Ratio		
Ratios	CPI	ENR	CPI Adj.
1995	3.93	4.20	3.93
1996	4.04		

## **APPENDIX K - PIPE COSTS USED FOR ANALYSIS**

PIPE FACTORS

TRUNK MAIN IMPLEMENTATION - 50 YEAR LINES

TRUNK MAIN IMPLEMENTATION - 20 YEAR LINES

TRUNK MAIN IMPLEMENTATION - 20 YEAR LINES (POPULATION CENTERS ONLY)

## PIPE FACTORS

(Total Cost includes  
manholes, etc.)

Pipe Size (in dia)	Min Grade (ft/ft)	Capacity (cfs)	TOTAL Cost per L.F. @12' (1996 \$'s)
6	0.0050	0.40	38.00
8	0.0033	0.69	41.00
10	0.0025	1.10	44.00
12	0.0020	1.59	47.00
15	0.0015	2.50	52.00
18	0.0011	3.48	57.00
21	0.0009	4.75	62.00
24	0.0008	6.40	67.00
27	0.0006	7.59	72.00
30	0.0006	9.62	77.00
33	0.0005	11.83	82.00
36	0.0005	14.15	87.00
39	0.0004	16.51	92.00
42	0.0004	20.12	97.00
45	0.0004	24.19	102.00
48	0.0004	28.73	107.00
56	0.0004	43.33	112.00
60	0.0004	52.09	117.00
72	0.0004	84.70	125.00
84	0.0004	127.76	145.00
30P	N/A		60.00





## TRUNK MAIN IMPLEMENTATION - 20 YEAR LINES

Pipe Line Number	Function	Linear Feet	Areas Served	Acreage Served	Ultimate Population at 2.5 per acre	Projected 20 Year Population (2017)	Design Population (Lesser of Ult or 20)	Design Flow (gpm)	Design Flow (cfs)	Pipe Size (in dia)	Design Flow (mgd)	Cost per Foot (1996 \$'s)	Total Cost (1996 \$'s)	20 Year Annualized Monthly Family Cost
Existing														
1	Ash Creek Trunk To Sanctuary	21600	1,14,15,16	5792	14480	8860	8860	2461	5.48	21	5.79	62.00	\$1,339,200	\$3.26
2	Trunk to Pelican Bay	11600	10,11,19	5233	13083	9890	9890	2747	6.12	21	5.23	62.00	\$719,200	\$1.57
3	Trunk to Azle North	17600	17	4085	10213	6158	6158	1711	3.81	18	4.09	57.00	\$1,003,200	\$3.51
4	Azle Trunk to Reno	4440	1 thru 9	54681	136703	14551	14551	4042	9.01	27	54.68	72.00	\$319,680	\$0.47
5	Reno NE Feeder	14625	6,7	1079	2698	218	218	60	0.13	6	1.08	38.00	\$55,750	\$55.06
6	Reno North Feeder	11340	5(,3)	2247	5618	453	453	126	0.28	6	2.25	38.00	\$430,920	\$20.51
7	Reno SW Feeder	15521	4(,5),5(,3)	4090	10225	735	735	204	0.45	6	4.09	38.00	\$589,798	\$17.31
8	Reno Main Trunk	24962	4 thru 9	19975	49938	3846	3846	1068	2.38	12	19.98	47.00	\$1,173,214	\$6.58
8a	Reno Main Trunk (with Springtown)	24962	1 thru 9	54681	136703	14551	14551	4042	9.01	27	54.68	72.00	\$1,797,264	\$2.66
8b	Reno Feeder to Pick up "Downtown	2500	5(,15)	200	500	757	500	139	0.31	6	0.20	38.00	\$95,000	\$4.10
9	Springtown Trunk to New Plant	13102	1 thru 3	35122	87805	10654	10654	2959	6.59	24	35.12	67.00	\$877,834	\$1.78
10	Springtown Tie to Reno Trunk	4000	1 thru 3	35122	87805	10654	10654	2959	6.59	24	35.12	67.00	\$268,000	\$0.54
11	Springtown NE Feeder	22831	3(,15)	4395	10987	672	672	187	0.42	6	4.39	38.00	\$867,578	\$27.83
12	Springtown North Feeder	23789	3(,15)	4395	10987	672	672	187	0.42	6	4.39	38.00	\$903,982	\$29.00
13	Springtown Western Trunk	32909	1,2(,70),3(,40)	16296	40741	6644	6644	1846	4.11	18	16.30	57.00	\$1,875,813	\$6.09
14	Springtown Western Feeder	12315	3(,10)	2930	7325	448	448	124	0.28	6	2.93	38.00	\$467,970	\$22.52
15	Springtown SW Feeder	23643	2(,20),3(,20)	6691	16727	1777	1777	494	1.10	10	6.69	44.00	\$1,040,292	\$12.62
16	Springtown South Feeder	25864	2(,10)3(,10)	3345	8363	888	888	247	0.55	6	3.35	38.00	\$982,832	\$23.85
17	Springtown SE Feeder	11226	3(,05)	1465	3662	224	224	62	0.14	6	1.46	38.00	\$426,588	\$41.05
18	Azle to Fort Worth Jenkins	22400	1-17	72178	180445	42428	42428	11786	26.26	45	72.18	102.00	\$2,284,800	\$1.16
19	Azle to Fort Worth Jenkins (Force)	27200	1-17	72178	180445	42428	42428	11786	26.26	45	72.18	102.00	\$2,774,400	\$1.41
	Lift Stations	3	1-17	72178	180445	42428	42428	50124	111.68	72	72.18	\$1,996,966	\$5,987,999	\$3.04
<b>TOTAL =</b>													<b>\$26,781,214</b>	<b>\$13.61</b>

## TRUNK MAIN IMPLEMENTATION - 20 YEAR LINES - POPULATION CENTERS ONLY

Pipe Line Number	Function	Linear Feet	Areas Served	Acreage Served	Ultimate Population at 2.5 per acre	Projected 20 Year Population (2017)	Design Population (Lesser of Ult or 20)	Design Flow (gpm)	Design Flow (cfs)	Pipe Size (in dia)	Design Flow (mgd)	Cost per Foot (1996 \$'s)	Total Cost (1996 \$'s)	20 Year Annualized Monthly Family Cost
Existing														
1	Ash Creek Trunk To Sanctuary	21600		5792	14480	0	0	0.00	0.00		5.79	\$0	\$0	
2	Trunk to Pelican Bay	11600		5233	13083	0	0	0.00	0.00		5.23	\$0	\$0	
3	Trunk to Azle North	17600		4085	10213	0	0	0.00	0.00		4.09	\$0	\$0	
4	Azle Trunk to Reno	4440		54681	136703	6666	1852	4.13	18	18	54.68	57.00	\$253,080	\$0.82
5	Reno NE Feeder	14625		1079	2698	0	0	0.00	0.00		1.08	\$0	\$0	
6	Reno North Feeder	11340		2247	5618	0	0	0.00	0.00		2.25	\$0	\$0	
7	Reno SW Feeder	15521		4090	10225	0	0	0.00	0.00		4.09	\$0	\$0	
8	Reno Main Trunk	24962		19975	49938	0	0	0.00	0.00		19.98	\$0	\$0	
8a	Reno Main Trunk (with Springtown)	24962		54681	136703	6666	1852	4.13	18	18	54.68	57.00	\$1,422,834	\$4.60
8b	Reno Feeder to Pick up "Downtown"	2500		200	500	492	137	0.30	6	6	0.20	38.00	\$95,000	\$4.16
9	Springtown Trunk to New Plant	13102		35122	87805	6173	1715	3.82	18	18	35.12	57.00	\$746,814	\$2.61
10	Springtown Tie to Reno Trunk	4000		35122	87805	6173	1715	3.82	18	18	35.12	57.00	\$228,000	\$0.80
11	Springtown NE Feeder	22831		4395	10987	0	0	0.00	0.00		4.39	\$0	\$0	
12	Springtown North Feeder	23789		4395	10987	0	0	0.00	0.00		4.39	\$0	\$0	
13	Springtown Western Trunk	32909		16296	40741	0	0	0.00	0.00		16.30	\$0	\$0	
14	Springtown Western Feeder	12315		2930	7325	0	0	0.00	0.00		2.93	\$0	\$0	
15	Springtown SW Feeder	23643		6691	16727	0	0	0.00	0.00		6.69	\$0	\$0	
16	Springtown South Feeder	25864		3345	8363	0	0	0.00	0.00		3.35	\$0	\$0	
17	Springtown SE Feeder	11226		1465	3662	0	0	0.00	0.00		1.46	\$0	\$0	
18	Azle to Fort Worth Jenkins	22400		72178	180445	0	0	0.00	0.00		72.18	\$0	\$0	
19	Azle to Fort Worth Jenkins (Force)	27200		72178	180445	0	0	0.00	0.00		72.18	\$0	\$0	
	Lift Stations	0		72178	180445	0	50124	111.68			72.18	\$1,995,966	\$0	\$0
<b>TOTAL =</b>													<b>\$2,745,728</b>	<b>\$8.88</b>