

**ORDINANCE NO. 11-12-15-28**

**AN ORDINANCE OF THE CITY OF CORINTH, TEXAS AMENDING CHAPTER 36 OF THE CORINTH CODE OF ORDINANCES BY ADOPTING AMENDMENTS TO THE IMPACT FEES FOR WATER TREATMENT AND DISTRIBUTION FACILITIES AND FOR WASTEWATER COLLECTION AND IMPACT FEE AMOUNTS TO BE COLLECTED; PROVIDING A CREDIT EQUAL TO FIFTY PERCENT OF THE TOTAL PROJECTED COST OF IMPLEMENTING THE CAPITAL IMPROVEMENTS PLANS; ADOPTING UPDATED LAND USE ASSUMPTIONS AND UPDATED WATER AND WASTEWATER CAPITAL IMPROVEMENTS PLANS; PROVIDING FOR THE REPEAL OF ALL ORDINANCES IN CONFLICT; PROVIDING A SEVERABILITY CLAUSE; AND PROVIDING AN EFFECTIVE DATE.**

**WHEREAS**, Chapter 395 of the Texas Local Government Code sets forth certain procedures to be followed by municipalities in imposing, collecting, updating and expending impact fees; and

**WHEREAS**, the City Council has directed City staff to prepare updated land use assumptions to be used in preparation of updated capital improvements plans for water and wastewater facilities and impact fees based thereon; and

**WHEREAS**, the City Council of the City of Corinth, Texas, has given the notices and conducted the public hearings required by Chapter 395 of the Local Government Code for amendment of the land use assumptions, capital improvements plan, and impact fees; and

**WHEREAS**, the Capital Improvements Advisory Committee has filed its written comments on the proposed amendments to the land use assumptions, capital improvements plans, and impact fees as required by law; and

**WHEREAS**, the City Council finds that the facility improvements proposed in the updated water and wastewater capital improvements plans will best address the infrastructure requirements imposed upon the City by new development; and

**WHEREAS**, the City Council finds that the revised impact fees set forth below provide the appropriate level of cost recovery to the City attributable to new development; and

**WHEREAS**, the Water and Wastewater Capital Improvements Plans were developed by qualified professionals using generally accepted engineering and planning practices in accordance with Section 395.014 of the Texas Local Government Code; and

**WHEREAS**, the engineering professionals have recommended that the City adopt three service areas for wastewater impact fees and the City Council finds that

three service areas will more accurately allocate the cost of new facilities required to serve new development in the watershed in which the facilities are to be constructed;

**NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF CORINTH, TEXAS:**

**SECTION 1.**

That Section 36.55 (Definitions) of the Code of Ordinances of the City of Corinth is, and the same is hereby amended to include the following definition:

**“§36.55 DEFINITIONS.**

...  
*WASTEWATER IMPACT FEE SERVICE AREA.* A geographic area in which wastewater service is provided by the City. There are three wastewater impact fee service areas which are identified as the Denton Service Area, the Upper Trinity East Service Area and the Upper Trinity West Service Area, as identified in CIP Figure 4.2 in the 2011 Impact Fee Update Wastewater Capital Improvements Plan, a copy of which is on file with the City Secretary.”

**SECTION 2.**

Section 36.57 (Land Use Assumptions) of the Code of Ordinances of the City of Corinth is, and the same is amended to read as follows:

**“§36.57 LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLANS.**

The Land Use Assumptions, Roadway Impact Fee, Water and Wastewater Impact Fee Reports, Water Capital Improvements Plan and the Wastewater Capital Improvements Plan, dated September 2011 attached hereto as Exhibit “A”, are approved and incorporated herein by reference for all purposes.”

**SECTION 3.**

That Section 36.58 (C) of the Code of Ordinances of the City of Corinth is hereby repealed.

**SECTION 4.**

That Chapter 36 of the Code of Ordinances of the City of Corinth is hereby amended by the addition of Sections 36.61 through 36.62, which shall be and read as follows:

**“§36.61 FEES.**

(A) 1. A maximum impact fee of \$1441.00 per service unit equivalent for water supply, treatment and distribution facilities is assessed in accordance with Table 36.1 set forth below.

2. The current collected water impact fee is \$1,441.00 per service unit equivalent in accordance with the Table 36.1.

(B) Based on the adopted land use assumptions and capital improvements plan, the net growth-related capital costs required to provide wastewater service to a service unit equivalent is based upon three specific service areas set forth in Table 36.2. A maximum impact fee of \$1,094.00 per service unit equivalent for wastewater impact fees in the Upper Trinity East Basin is assessed in accordance with the SUE Table for meter sizes set forth below. A maximum impact fee of \$1,300.00 per service unit equivalent for wastewater impact fees in the Upper Trinity West Basin is assessed in accordance with the SUE Table for meter sizes set forth below. There is no cost for impact fees in the Denton Basin.

(C) The current collected wastewater impact fee is \$1,094.00 for the Upper Trinity East Basin and \$1,300.00 for the Upper Trinity West Basin per service unit equivalent in accordance with Table 36.2.

(D) The above fees have been calculated to provide a credit equal to 50 percent of the total projected cost of implementing the capital improvements plan.

[The remainder of this page is intentionally left blank.]

**TABLE 36.1  
SERVICE UNIT EQUIVALENCY TABLE FOR COMMONLY USED METERS  
AND IMPACT FEE RATES**

<b>Meter Size*</b>	<b>Service Unit Equivalent</b>	<b>Maximum Assessable Water Impact Fee (\$)</b>	<b>Water Impact Fee to be Collected</b>
5/8"x 3/4" PD	1	1,441	1,441
3/4" PD	1.5	2,162	2,162
1" PD	2.5	3,603	3,603
1 1/2" PD	5	7,205	7,205
2" PD	8	11,528	11,528
2" Compound	8	11,528	11,528
2" Turbine	10	14,410	14,410
3" Compound	16	23,056	23,056
3" Turbine	24	34,584	34,584
4" Compound	25	36,025	36,025
4" Turbine	42	60,522	60,522
6" Compound	50	72,050	72,050
6" Turbine	92	132,572	132,572
8" Compound	80	115,280	115,280
8" Turbine	160	230,560	230,560
10" Turbine	250	360,250	360,250

\*PD = Positive Displacement Meter (typical residential meters)

**TABLE 36.2  
SERVICE UNIT EQUIVALENCY TABLE FOR COMMONLY USED METERS  
AND IMPACT FEE RATES**

Meter Size*	Service Unit Equivalent	Maximum Assessable Wastewater Fee per Service Area (\$)			Waste Water Fee to be Collected	
		Denton	Upper Trinity East	Upper Trinity West	Upper Trinity East	Upper Trinity West
5/8"x 3/4" PD	1	\$0	1,094	1,300	1,094	1,300
3/4" PD	1.5	\$0	1,641	1,950	1,641	1,950
1" PD	2.5	\$0	2,735	3,250	2,735	3,250
1 1/2" PD	5	\$0	5,470	6,500	5,470	6,500
2" PD	8	\$0	8,752	10,400	8,752	10,400
2" Compound	8	\$0	8,752	10,400	8,752	10,400
2" Turbine	10	\$0	10,940	13,000	10,940	13,000
3" Compound	16	\$0	17,504	20,800	17,504	20,800
3" Turbine	24	\$0	26,256	31,200	26,256	31,200
4" Compound	25	\$0	27,350	32,500	27,350	32,500
4" Turbine	42	\$0	45,948	54,600	45,948	54,600
6" Compound	50	\$0	54,700	65,000	54,700	65,000
6" Turbine	92	\$0	100,648	119,600	100,648	119,600
8" Compound	80	\$0	87,520	104,000	87,520	104,000
8" Turbine	160	\$0	175,040	208,000	175,040	208,000
10" Turbine	250	\$0	273,500	325,000	273,500	325,000

\*PD = Positive Displacement Meter (typical residential meters)

**§ 36.62. CALCULATION OF FEES**

(A) The water and wastewater impact fees shall be based on the size of the water meter necessary to serve the development, and the number of service unit equivalents associated with the size of water meter necessary to serve the development. The amount of the impact fee due for water and wastewater shall be determined by multiplying the number of SUEs generated by the new development by the impact fee per SUE. If a new development's water or wastewater uses will exceed the SUEs set forth in the tables by more than 10% consumption or flow, the city engineer shall calculate the amount of impact fees for each category based on actual use.

(B) The city council may amend the current collected fees from time to time, provided they do not exceed the maximum assessable fees. The maximum assessable impact fees may be amended by the city council in accordance with the procedures set forth in Tex. Local Government Code, Chapter 395, as amended."

**SECTION 5.**

The water and wastewater impact fees to be collected from development on lots within a subdivision that has received final plat approval from the city before the effective date of this ordinance shall be assessed at the collected impact fee set forth in Impact Fee ordinance in effect at the time the lots were platted.

**SECTION 6.**

This ordinance shall be and is hereby declared to be cumulative of all other ordinances of the city and shall not operate to repeal or affect any such other ordinances, save the fees, except insofar as the provisions thereof are inconsistent or in conflict with the provisions hereof, and to the extent of such conflict, if any, such other ordinances are hereby repealed. Any other ordinance of the city requiring dedication of land for public parks, requiring dedication of right-of-way or easements, or construction or dedication of on-site water distribution, wastewater collection or drainage facilities, or streets, sidewalks, or curbs necessitated by and attributable to new development, or fees to be placed in trust for the purpose of reimbursing the city or developers for oversizing or constructing water or sewer mains or lines shall remain in full force and effect and not be repealed by the terms of this ordinance.

**SECTION 7.**

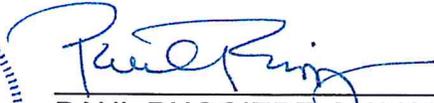
Should any paragraph, sentence, subdivision, clause, phrase or section of this ordinance be adjudged or held to be unconstitutional, illegal or invalid, the same shall not affect the validity of this ordinance as a whole or any part or provision thereof, other than the part so declared to be invalid, illegal or unconstitutional.

**SECTION 8.**

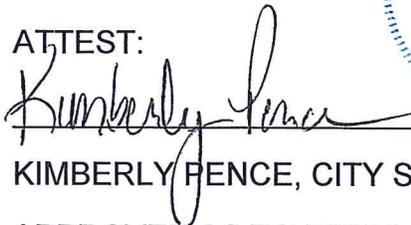
This ordinance shall be in full force and effect from and after its passage and publication as required by law, and it is so ordained.

**PASSED AND APPROVED ON THIS** 15 **DAY OF** December,  
**2011.**

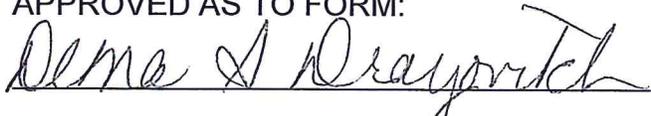


  
\_\_\_\_\_  
PAUL RUGGIERE, MAYOR

ATTEST:

  
\_\_\_\_\_  
KIMBERLY PENCE, CITY SECRETARY

APPROVED AS TO FORM:

  
\_\_\_\_\_  
DEBRA A. DRAYOVITCH, CITY ATTORNEY

**EXHIBIT "A"**  
**LAND USE ASSUMPTIONS AND CAPITAL IMPROVEMENTS PLANS**  
**FOR WATER AND WASTEWATER**

# **Land Use Assumptions for Impact Fees (2011 – 2021)**

**Prepared for:**

**City of Corinth, Texas**



**Prepared by:**

Kimley-Horn and Associates, Inc.  
801 Cherry Street, Unit 11, Suite 950  
Fort Worth, TX 76102  
817.335.6511  
Firm Registration No. F-928

**September 2011**



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## 1.1 INTRODUCTION

Chapter 395 of the Texas Local Government Code describes the procedure Texas cities must follow in order to create and implement impact fees. Senate Bill 243 (SB 243) amended Chapter 395 to define an Impact Fee as “a charge or assessment imposed by a political subdivision against new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development.”

Chapter 395 mandates that impact fees be reviewed and updated at least every five (5) years. Accordingly, the City of Corinth has initiated a review of its Land Use Assumptions, Capital Improvements Plan, and Impact Fees. The City has retained Kimley-Horn and Associates, Inc., to provide professional services for the update of their Land Use Assumptions. These Land Use Assumptions, which include both population and employment projections, form the basis for the development of the impact fee Capital Improvements Plans for water, wastewater, and roadway facilities.

In order to assess an impact fee, Land Use Assumptions must be developed to provide the basis for population and employment growth projections within a political subdivision. As defined by Chapter 395 of the Texas Local Government Code, these assumptions include a description of changes in land uses, densities, intensities, and population in the service area. In addition, these assumptions are useful in assisting the City of Corinth in determining the need and timing of capital improvements to serve future development.

In accordance with Chapter 395, information from the following sources was compiled: the City’s Comprehensive Plan, Existing Zoning Ordinances, and Future Land Use Plan, and consultation with City staff.

The components of the Land Use Assumptions include the following:

- **Methodology** – An overview of the general methodology used to generate the land use assumptions;
- **Impact Fee Service Areas** – Explanation of the division of Corinth into service areas for wastewater facilities;
- **Population and Employment**– Data on population and employment within the service area for the base year (2011), the completely developed (Build Out) scenario, and growth projections by service area over the next ten years (2011 – 2021); and
- **Land Use Assumptions Summary** – a synopsis of the land use assumptions.

## 1.2 METHODOLOGY

### A. OVERVIEW

The population and employment growth projections formulated in this report were done using reasonable and generally accepted planning principles. The following factors were considered in developing these projections:

- Comprehensive Plan
- Character, type, density, and quantity of existing development;
- Current zoning plans;
- Future Land Use Plan (as currently adopted);
- Growth trends;
- Location of vacant land;
- Physical holding capacity of Corinth; and
- Development projects, known or anticipated

The general methodology used in developing the land use assumptions include:

1. Establishing impact fee service areas for roadway, wastewater, and water facilities. (Exhibit 1.1 and 1.2)
2. Collection/determination of population and employment data for the base year 2011.
3. Projection of the ten year (2011-2021) population and employment by Service Area.

Demographics from the recent Comprehensive Plan served as the basis for establishing the year 2011 and ten year (2011-2021) demographic estimates and projections.

### B. IMPACT FEE SERVICE AREAS

#### *Water and Roadway Service Areas*

The geographic boundary of the proposed impact fee service areas for roadway and water facilities is shown in **Exhibit 1.1**. The roadway and water impact fee service area is one service area that covers the entire Corinth City limits.

#### *Wastewater Service Areas*

The geographic boundaries of the three (3) impact fee service areas for wastewater facilities are shown in **Exhibit 1.2**. The three (3) smaller wastewater service areas cover the same area as the roadway and water service area, but have been subdivided. This subdivision is to appropriately account for the three (3) basins that are within the City of Corinth: Upper Trinity East, Upper Trinity West, and Denton.

## C. POPULATION AND EMPLOYMENT

Population and employment estimates for the base year (2011) were performed based upon a survey of the existing land uses. Build out projections were prepared based upon combining the existing land uses within the service area with reasonable assumptions for undeveloped land based upon the currently adopted Future Land Use Plan. Ten year growth projections were prepared based upon consultation with City staff regarding the approximate portions of currently vacant property that will be developed by 2021. **Exhibit 1.3** presents the Future Land Use Plan that is part of the City of Corinth's Comprehensive Plan. **Table 1.1** summarizes the population and employment projections within the Roadway and Water Service Area for 2011 and 2021. **Table 1.2** summarizes the population and employment projections within the Wastewater Service Areas for 2011 and 2021.

The population and employment estimates and projections were all compiled in accordance with the following categories:

*Units:* Number of dwelling units, both single and multi-family.

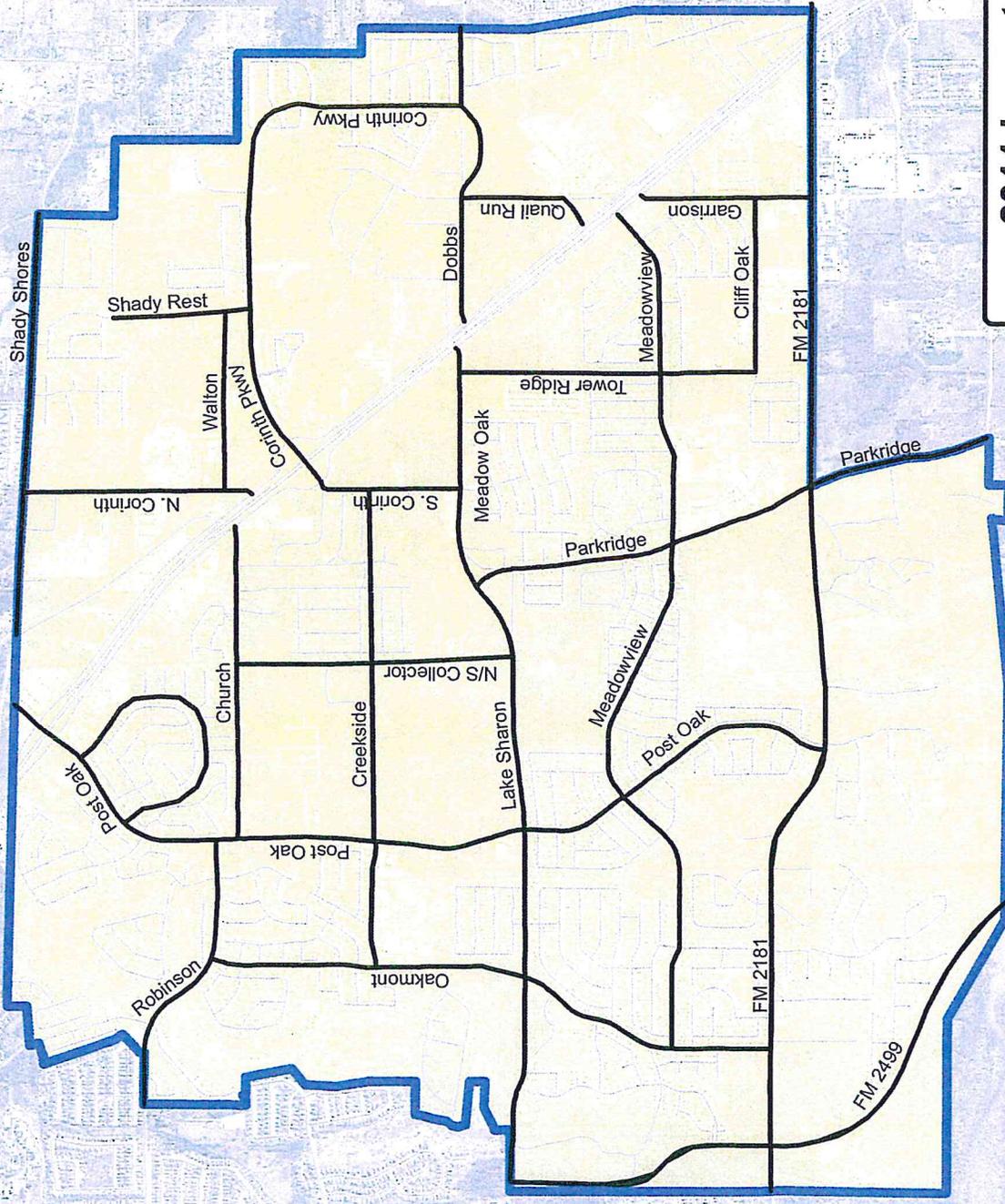
*Population:* Number of people, based on person per dwelling unit factors.

*Employment:* Square feet of building area based on three (3) different classifications. Each classification has unique trip making characteristics.

Retail: Land use activities which provide for the retail sale of goods that primarily serve households and whose locations choice is oriented toward the household sector, such as grocery stores and restaurants.

Service: Land use activities which provide personal and professional services such as government and other professional administrative offices.

Basic: Land use activities that produce goods and services such as those that export outside of the local economy, such as manufacturing, construction, transportation, wholesale, trade, warehousing, and other industrial uses.



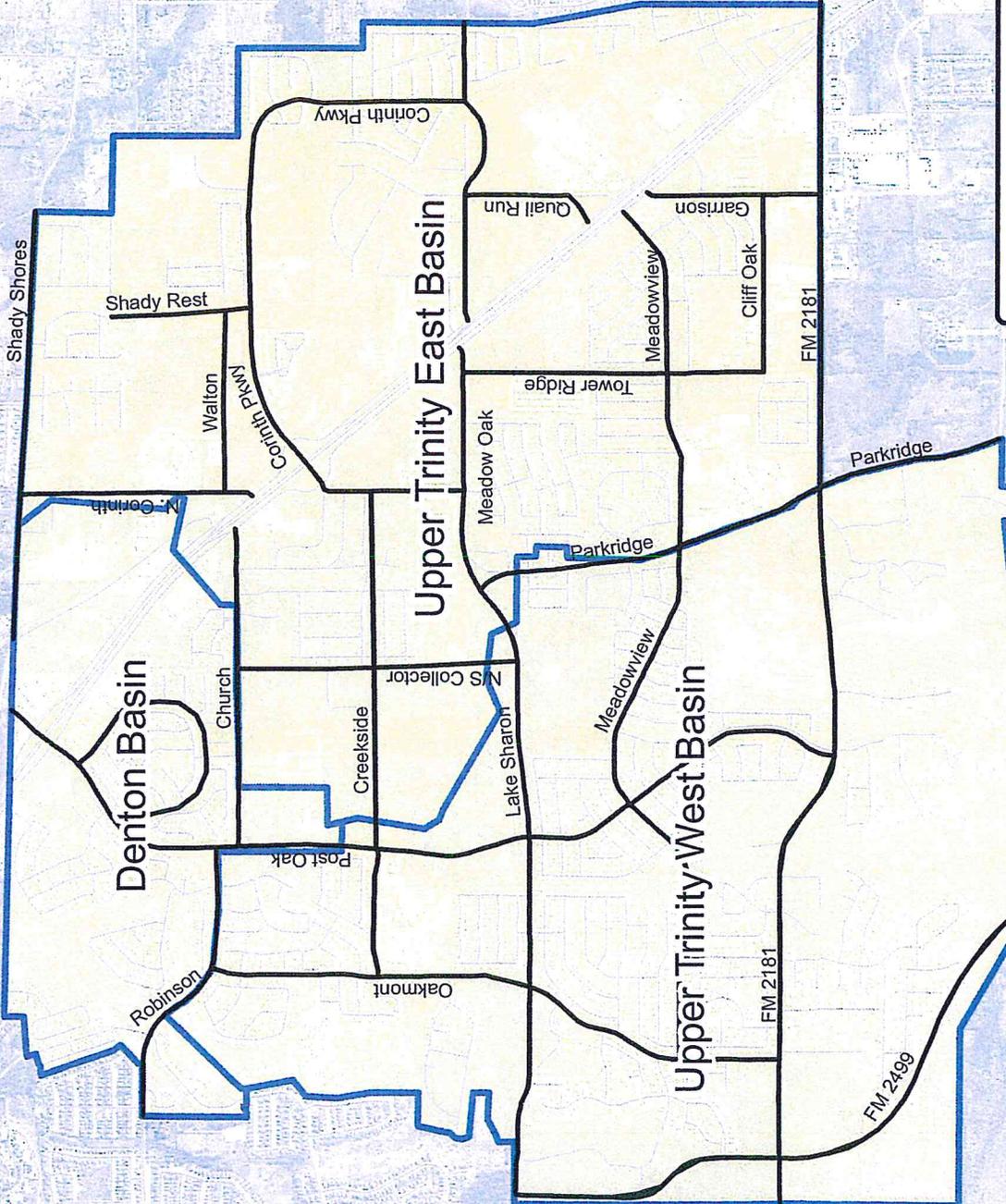
### 2011 Impact Fee Update Water and Roadway Service Area Exhibit 1.1

0 0.5 1 Miles

September 2011

#### Legend

- Water and Roadway Service Area
- Corinth City Limits
- Thoroughfare Facilities
- Local Roads



**2011 Impact Fee Update**  
**Wastewater Service Areas**  
**Exhibit 1.2**

Miles

Kimley-Horn and Associates, Inc.

**September 2011**

**Legend**

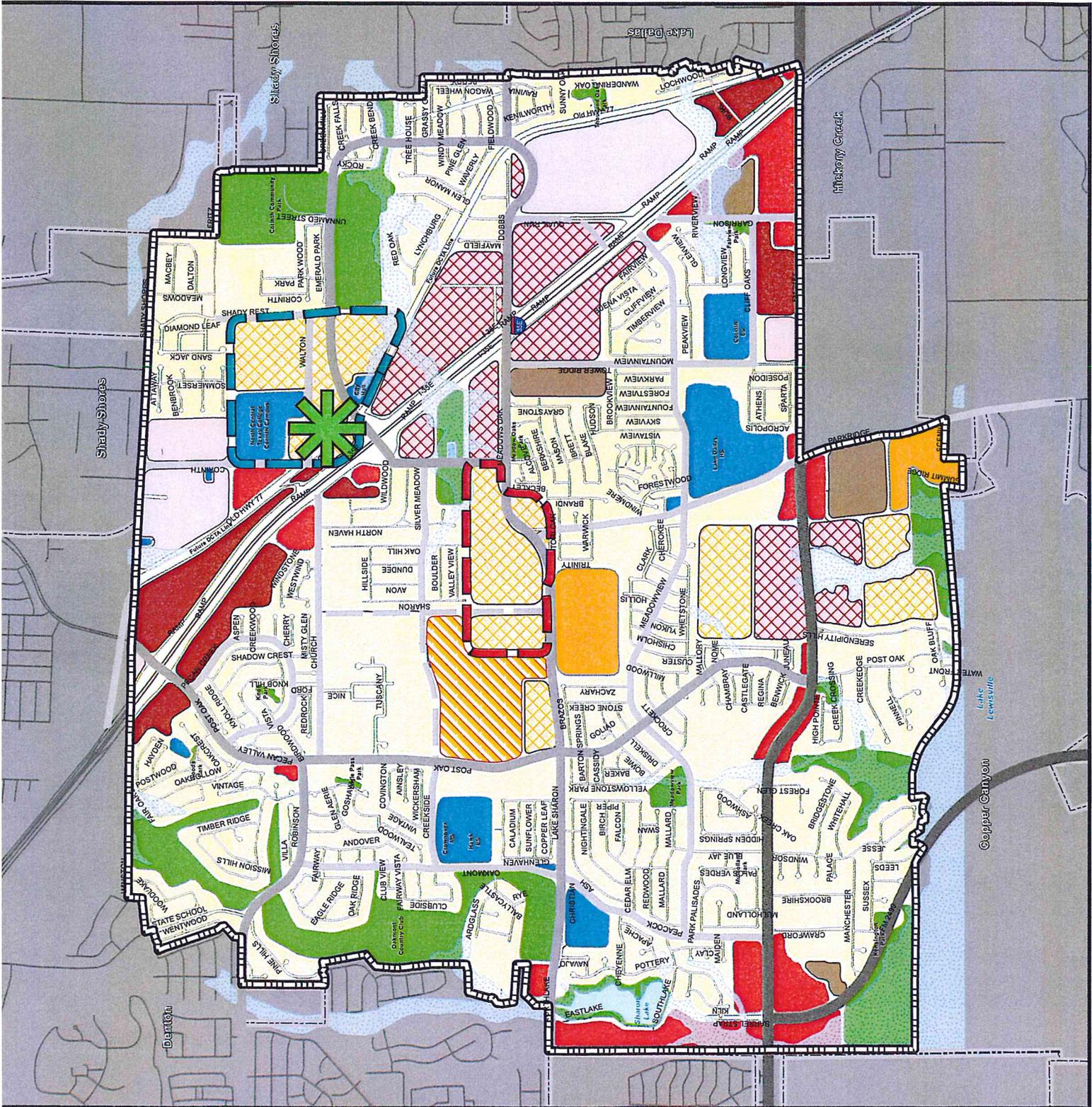
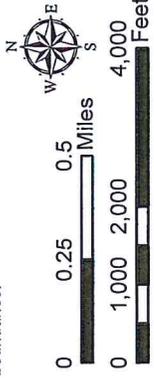
- Wastewater Service Areas
- Corinth City Limits
- Thoroughfare Facilities
- Local Roads

# Future Land Use Plan

- Future Land Use**
- Low Density Residential
  - Medium Density Residential
  - High Density Residential
  - Mixed Residential
  - Mixed Use with Residential
  - Parks and Open Space
  - Public/Semi-Public
  - Mixed Use Non-Residential
  - Office/Business Park
  - Retail
  - Commercial
  - Industrial
  - Multi-Modal Transit Center
  - Transit Oriented Development
  - Corinth City Center
- Road Types**
- Major Arterial
  - Minor Arterial
  - Collector
  - Corinth City Limits
  - FEMA 100 Year Floodplain

## Plate 4-1

Note:  
A Comprehensive Plan shall not constitute zoning district regulations or establish zoning district boundaries.



**Table 1.1. Population and Employment Projections  
for the Water and Roadway Service Area**

SA	Year	Population	Units	Employment (Square Feet)			
				Basic	Service	Retail	Total
Water and Roadway	2011	19,990	7,062	758,076	920,034	603,989	2,282,099
	2021	24,054	8,498	1,403,937	1,277,288	1,993,648	4,674,873

**Table 1.2. Population and Employment Projections  
for the Wastewater Service Areas**

SA	Year	Population	Units	Employment (Square Feet)* [Acres]			
				Basic	Service	Retail	Total
Upper Trinity West	2011	8,359	2,953	0	265,685	15,300	280,985
	2021	10,301	3,639	0	265,685	197,292	462,977
Upper Trinity East	2011	8,849	3,126	456,576	579,749	424,764	1,461,089
	2021	10,956	3,871	959,397	937,003	1,530,300	3,426,700
Denton	2011	2,782	983	301,500	74,600	163,925	540,025
	2021	2,797	988	444,540	74,600	266,056	785,196
<b>TOTALS</b>	<b>2011</b>	<b>19,990</b>	<b>7,062</b>	<b>758,076</b> <b>[87]</b>	<b>920,034</b> <b>[106]</b>	<b>603,989</b> <b>[70]</b>	<b>2,282,099</b> <b>[263]</b>
	<b>2021</b>	<b>24,054</b>	<b>8,498</b>	<b>1,403,937</b> <b>[161]</b>	<b>1,277,288</b> <b>[147]</b>	<b>1,993,648</b> <b>[229]</b>	<b>4,674,873</b> <b>[537]</b>

## D. SUMMARY

The City of Corinth is projected to experience a reasonable amount of growth in both population and employment over the next ten years. As a result of this analysis, the following summary statistics were compiled for the City of Corinth based on the ultimate City Limits:

- The existing (2011) population is approximately 19,990.
- The existing (2011) employment area is approximately 2,282,099 square feet (263 acres).
- The ten year (2021) population projection is approximately 24,054.
- The ten year (2021) employment area projection is approximately 4,674,873 square feet (537 acres).

# City of Corinth, Texas Water Impact Fee Report



## Prepared by:

Kimley-Horn and Associates, Inc.  
12700 Park Central Drive, Suite 1800  
Dallas, TX 75251  
972.770.1300  
Registration Number: F-928

**September 2011**

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- A. Conceptual Level Cost Projections

## 3.1 INTRODUCTION

The City of Corinth retained the services of Kimley-Horn and Associates, Inc. (Kimley-Horn) for the purpose of updating the impact fees for water system improvements required to serve new development. The impact fees were last updated in 2004 in accordance with Chapter 395 of the *Local Government Code* (impact fees), which requires a city imposing impact fees to update the land-use assumptions and capital improvements plan upon which the fees are calculated. .

The purpose of this report is to satisfy the requirements of the law and provide the City with projected land use assumptions, an impact fee capital improvements plan and associated impact fees.

For convenience and reference, the following is excerpted from Chapter 395 of the *Local Government Code*, “Financing Capital Improvements required by New Development in Municipalities, Counties, and certain other Local Governments.”

- (a) *The political subdivision shall use qualified professionals to prepare the capital improvements plan and to calculate the impact fee. The capital improvements plan must contain specific enumeration of the following items:*
- (1) *a description of the existing capital improvements within the service area and the costs to upgrade, update, improve, expand, or replace the improvements to meet existing needs and usage and stricter safety, efficiency, environmental, or regulatory standards, which shall be prepared by a qualified professional engineer licensed to perform such professional engineering services in this state;*
  - (2) *an analysis of the total capacity, the level of current usage, and commitments for usage of capacity of the existing capital improvements, which shall be prepared by a qualified professional engineer licensed to perform such professional engineering services in this state;*
  - (3) *a description of all or the parts of the capital improvements or facility expansions and their costs necessitated by and attributable to new development in the service area based on the approved land use assumptions, which shall be prepared by a qualified professional engineer licensed to perform such professional engineering services in this state;*
  - (4) *a definitive table establishing the specific level or quantity of use, consumption, generation, or discharge of a service unit for each category of capital improvements or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including but not limited to residential, commercial, and industrial;*
  - (5) *the total number of projected service units necessitated by and attributable to new development within the service area based on the approved land use assumptions and calculated in accordance with generally accepted engineering or planning criteria;*

- (6) *the projected demand for capital improvements or facility expansions required by new service units projected over a reasonable period of time, not to exceed 10 years; and*
- (7) *a plan for awarding:*
- (A) *a credit for the portion of ad valorem tax and utility service revenues generated by new service unit during the program period that is used for the payment of improvements, including the payment of debt, that are included in the capital improvements plan; or*
  - (B) *in the alternative, a credit equal to 50 percent of the total project cost of implementing the capital improvements plan.*

The impact fee study includes information from the *Water and Wastewater Master Plan Report* completed by Freese and Nichols, Inc. in September 2005. The impact fees are based on recommended capital improvements and the population growth projections outlined in the *Water and Wastewater Master Plan Report as well as the City's Comprehensive Master Plan*.

The study process was comprised of three (3) tasks:

#### **A. LAND USE ASSUMPTIONS**

In order to assess an impact fee, Land Use Assumptions must be developed to provide the basis for population and employment growth projections within a political subdivision. As defined by Chapter 395 of the Texas Local Government Code, these assumptions include a description of changes in land uses, densities, and population in the service area. In addition, these assumptions are useful in assisting the City of Corinth in determining the need and timing of capital improvements to serve future development.

In accordance with Chapter 395, information for the development of the Land Use Assumptions was determined from the City of Corinth Comprehensive Land Use Plan Categories – 2010, aerial photography, and consultation with City staff.

The residential and non-residential estimates and projections were all compiled in accordance with the following categories:

*Units:* Number of dwelling units, both single and multi-family.

*Population:* Number of people, based on person per dwelling unit factors.

*Employment:* Acreages based on retail, service, and basic land uses. Each classification has unique demand characteristics.

*Retail:* Land use activities which provide for the retail sale of goods that primarily serve households and whose location choice is oriented toward the household sector, such as grocery stores and restaurants.

Service: Land use activities which provide personal and professional services such as government and other professional administrative offices.

Basic: Land use activities that produce goods and services such as those that are exported outside of the local economy, such as manufacturing, construction, transportation, wholesale, trade, warehousing, and other industrial uses.

The geographic boundary of the impact fee service area for water facilities is shown in **Figure 3.1**. The City of Corinth contains only one (1) service area which is limited to the area within the current Water CCN. Per conversations with City staff, a single growth rate was assumed for the service area.

**Table 3.1** summarizes the residential and non-residential projections by service area within the City of Corinth for 2011, as well as the residential and non-residential projections by service area within the City of Corinth for 2021.

**Table 3.1 Residential and Non-Residential Projections for the City of Corinth**

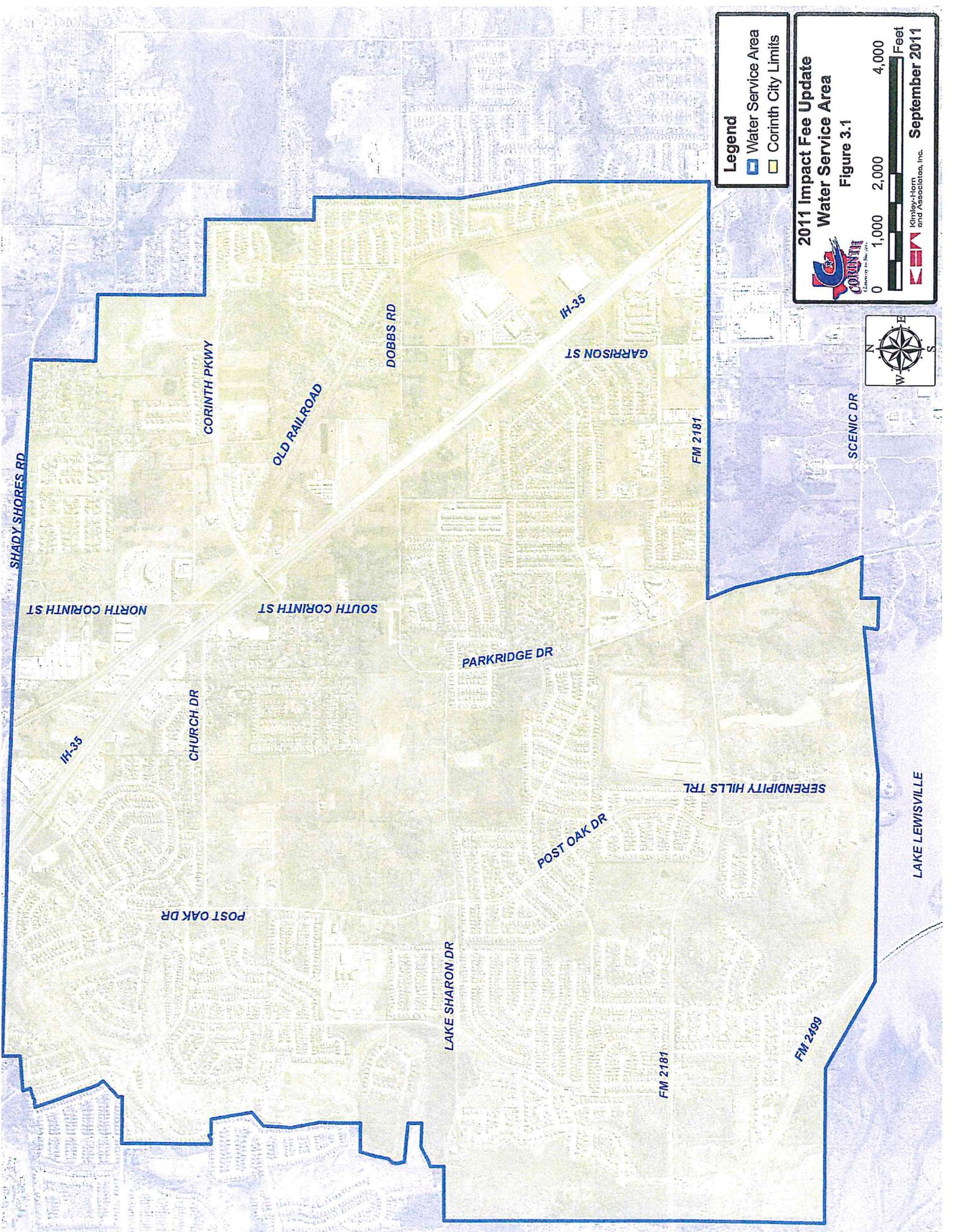
	Year	Population	Units	Employment (Acres)			
				Basic	Service	Retail	Total
<b>Corinth</b>	2011	19,990	7,062	87	106	70	263
	2021	24,054	8,498	161	147	229	537

## **B. IMPACT FEE CAPITAL IMPROVEMENTS PLAN**

This task involved evaluation of the water capital improvements plan outlined in the master plan and discussion with City staff to identify projects that will be built in the 10-year planning window and meet the design criteria.

## **C. IMPACT FEE ANALYSIS AND REPORT**

This task included calculating the additional service units, service unit equivalents, and credit reduction. These values were then used to determine the impact fee per service unit and the maximum assessable impact fee by meter size.



**Legend**

- Water Service Area
- Corinth City Limits

**2011 Impact Fee Update**  
**Water Service Area**  
**Figure 3.1**

0 1,000 2,000 4,000 Feet

Kimley-Horn and Associates, Inc. **September 2011**



SHADY SHORES RD

NORTH CORINTH ST

IH-35

CHURCH DR

POST OAK DR

CORINTH PKWY

SOUTH CORINTH ST

OLD RAILROAD

LAKE SHARON DR

DOBBS RD

PARKRIDGE DR

POST OAK DR

IH-35

GARRISON ST

FM 2181

FM 2181

SERENDIPITY HILLS TRL

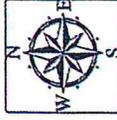
FM 2489

SCENIC DR

LAKE LEWISVILLE

**Corinth Water CIP Project List**

1. Lake Sharon Pump Station and 3 MG Ground Storage Tank
2. 24-inch and 20-inch water line along Lake Sharon Drive and Meadows Oak Drive
3. 16-inch Water Line Along Lake Sharon Drive and Meadows Oak Drive
4. 12-inch Water Lines Along South Corinth Street
5. 12-inch Water Line Along Lake Sharon Drive
6. 12-inch Water Line Along Lake Sharon Drive
7. 12-inch Water Line Along Shady Rest Lane and Shady Shores Road
8. 12-inch Water Line Along Shady Rest Lane, South of FM 2181
9. 12-inch Water Line Along Dobbs Road
10. Lake Sharon Pump Station Ground Storage Expansion (1.5 MG Ground Storage Tank)
11. Lake Sharon Pump Station Ground Storage Expansion (4,800 gpm Pump) - Phase I



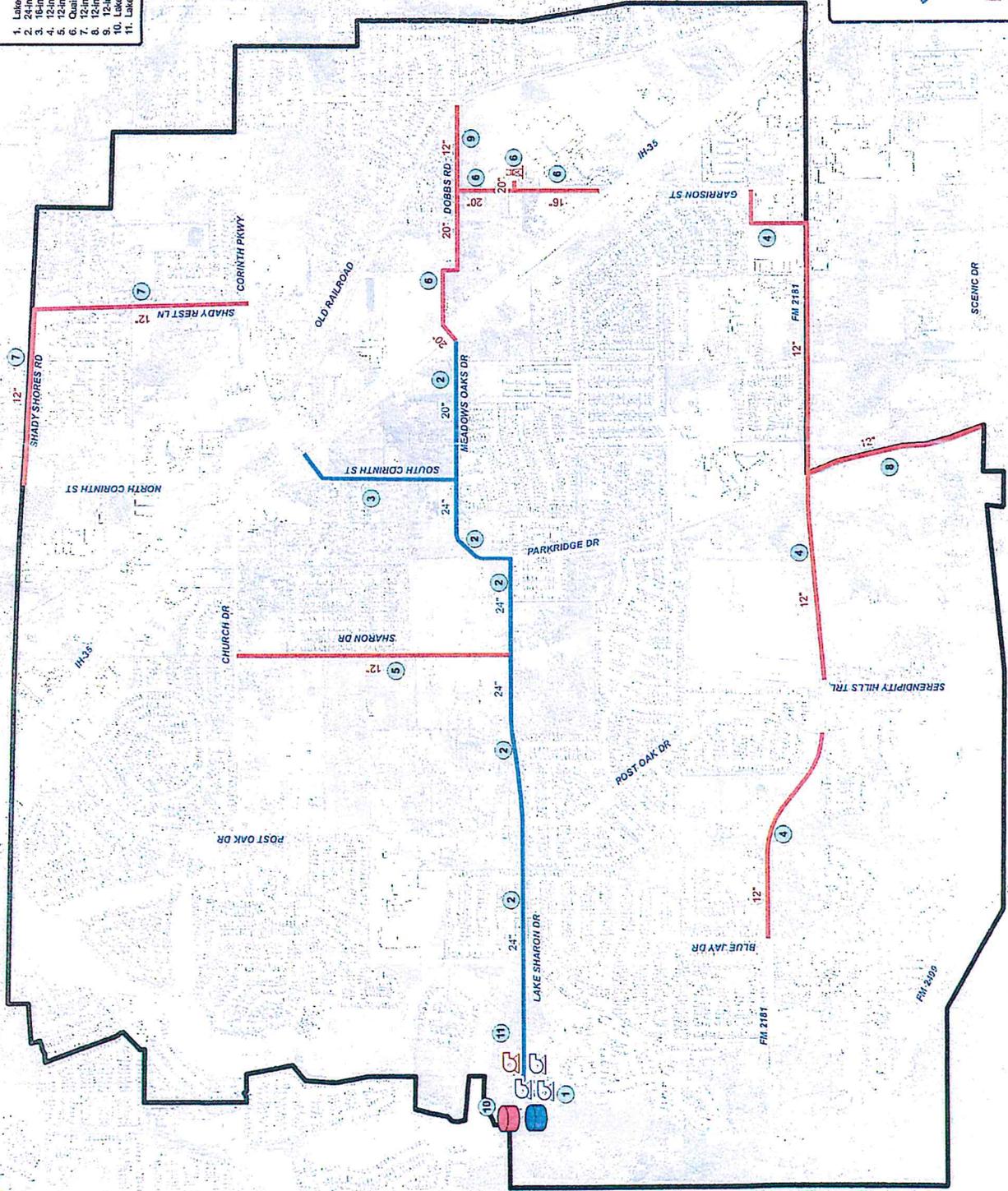
**Legend**

- Existing Elevated Tank
- Proposed Elevated Tank
- Existing Ground Tank
- Proposed Ground Tank
- Existing Pump Station
- Proposed Pump Station
- Existing Water Main
- Proposed Water Main
- Corinth City Limits

**2011 Impact Fee Update**  
**Water CIP**  
**Figure 3.2**

0 750 1,500 3,000 Feet

September 2011



## 3.2 EXECUTIVE SUMMARY

This study was performed to update the City of Corinth's Water System Impact Fees. Water system analysis and the Water System Master Plan are important tools for facilitating orderly growth of the water system and for providing adequate facilities that promote economic development in the City of Corinth. The implementation of an impact fee is a way to shift a portion of the burden of paying for new facilities onto new development.

Elements of the water system, including storage facilities, pumping facilities, and the distribution network itself, were evaluated against industry standards as outlined in the Design Criteria section of this report. Information related to the growth of the City was provided through the 2010 Comprehensive Plan.

Water system improvements necessary to serve 10-year (2021) and ultimate system needs were evaluated. Typically, infrastructure improvements are sized beyond the 10-year requirements; however, Texas' impact fee law (Chapter 395) only allows recovery of costs to serve the 10-year planning period. For example, the projected cost to construct the infrastructure needed through 2021 is \$17,608,084. Of this, \$5,322,845 is projected to be eligible for recovery through impact fees. After financing costs are added and the 50% credit is applied, \$3,705,232 is recoverable through impact fees serving the 10 year system needs. A portion of the remainder can be assessed as the planning window extends beyond 2021 and as the impact fees are updated in the future.

The impact fee law defines a service unit as follows: "Service Unit" means a standardized measure of consumption attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards and based on historical data and trends applicable to the political subdivision in which the individual unit of development is located during the previous 10 years." Therefore, the City of Corinth defines a *service unit* as unit of development that consumes the amount of water requiring a standard 5/8"x 3/4" meter. For a development that requires a different size meter, a service unit equivalent is established at a multiplier based on its capacity with respect to the 5/8"x 3/4" meter. The equivalency factor and associated impact fee by meter size is shown in **Table 3.2**.

Based on the City's 10-year growth projections and the associated demand (consumption) values, **2,572** additional service units will need water by the year 2021. Based on the additional service units and the recoverable capital improvements plans, the City may assess a maximum of **\$1,441** per service unit.

**Table 3.2 Maximum Assessable Water Impact Fee for Commonly Used Meters**

Meter Size*	Maximum Continuous Operating Capacity (GPM)**	Service Unit Equivalent	Maximum Assessable Fee (\$)
5/8"x 3/4" PD	10	1	1,441
3/4" PD	15	1.5	2,162
1" PD	25	2.5	3,603
1 1/2" PD	50	5	7,205
2" PD	80	8	11,528
2" Compound	80	8	11,528
2" Turbine	100	10	14,410
3" Compound	160	16	23,056
3" Turbine	240	24	34,584
4" Compound	250	25	36,025
4" Turbine	420	42	60,522
6" Compound	500	50	72,050
6" Turbine	920	92	132,572
8" Compound	800	80	115,280
8" Turbine	1,600	160	230,560
10" Turbine	2,500	250	360,250

\* PD = Positive Displacement Meter (Typical residential meter)

\*\*Operating capacities obtained from American Water Works Association (AWWA) C-700-02

### 3.3 DESIGN CRITERIA

#### A. WATER TRANSMISSION LINES

The function of the transmission system is to transfer water across the water system and fill the elevated storage tanks. There are three (3) conditions for which the transmission system is evaluated:

- **Peak hour demand** — This is the maximum demand that the system experiences. It is the condition under which the lowest operational pressures are experienced.
- **Tank filling (minimum hour demand)** — This is the period during which the elevated tank is replenished. This is the period of lowest demand during the maximum day. It normally occurs after midnight and is the condition under which the highest operational pressures are experienced.
- **Fire flow demand** — During the maximum day demand, the local transmission lines are tested to ensure that fire protection requirements are met. Pressures are allowed to fall below normal operating pressures, but should not drop below 20 psi.

The transmission system should be sized to maintain a minimum pressure of 40 psi during normal operating conditions and a minimum pressure of 20 psi during extreme operating conditions. The state requires a minimum operating pressure of 35 psi. In a current urban-type water system, operating pressures of 30-35 psi normally result in customer complaints. In addition, pressures above 80 psi are undesirable and should be avoided. The maximum pressure in extreme conditions should be limited to 120 psi because high operating pressure will result in increased system maintenance and increased operational cost. The transmission system should also be sized to limit maximum velocity in the pipe to five (5) feet per second.

#### B. STORAGE TANKS

The Texas Commission on Environmental Quality (TCEQ) and the State Board of Insurance (SBI) have established criteria for ground and elevated storage. These criteria address volume and height requirements only. The layout of the distribution system, location of the storage facilities, and the interaction with the high service and booster pumps affect the amount of storage necessary for the most efficient and reliable operation of the system.

##### 1. GROUND STORAGE

Ground storage serves two (2) functions:

- Equalization for differing feed rates between the water supply and pumping to the system; and
- Emergency capacity in the event of temporary loss of water supply.

Generally, ground storage facilities are located at water supply points or at each pump station within the water distribution system. Although ground and elevated storage facilities perform separate functions within the system, both are aimed at decreasing the impact of demand fluctuations. Their capacities are established based on knowledge of how demand varies seasonally and daily.

Due to inaccuracies in estimating growth, occasional extremes in usage exceed design values; ground storage must provide sufficient capacity to supply any differences. Sufficient ground storage should be provided to ensure that adequate supplies meet the maximum day demand. Kimley-Horn recommends that a minimum of fifty (50) percent of the maximum day demand should be held in ground storage.

## 2. ELEVATED STORAGE

Elevated storage serves three (3) purposes:

- Functionally, elevated storage equalizes the pumping rate to compensate for daily variations in demand and to maintain a fairly constant pumping rate (usually referred to as operational storage), or a pumping rate that conforms to the requirements of the electrical rate structure.
- Provides pressure maintenance and protection against surges created by instantaneous demand, such as fire flow and main breaks, and instantaneous change in supply, such as pumps turning on and off.
- Maintains a reserve capacity for fire protection and pressure maintenance in case of power failure to one or more pump stations. Sufficient storage should be maintained to provide two (2) hours of fire flow demand during a loss of power to the pump station.

Suggested storage capacities are established by the TCEQ. Adequate operational storage is established by determining the required volume to equalize the daily fluctuations in flow during the maximum day demand, plus the reserve volume required for fire protection.

The minimum requirements for storage, according to Chapter 290 of the Texas Administrative Code, are as follows:

- Total Storage - Equal to 200 gallons per connection.
- Elevated Storage - Equal to 100 gallons per connection; or
- Elevated Storage – Equal to 200 gallons per connection for a firm pumping capacity reduction from 2.0 gallons per connection to 0.6 gallons per connection.

Because elevated storage is approximately four (4) times more expensive than ground storage, an economical balance between elevated storage and pumping should be sought.

### C. PUMP STATIONS

Pumping capacities must provide the maximum demand or the peak hour demand required by the water system or the suggested capacities established by the TCEQ. Pumping capacity should supply the maximum demand with sufficient redundancy to allow for the largest pump at the pump station to be out of service. This is known as firm pumping capacity.

Each pump station or pressure plane must have two or more pumps that have a total capacity of 2.0 gallons per minute per connection, or have a total capacity of at least 1,000 gallons per minute and the ability to meet peak hour demand with the largest pump out of service, whichever is less. If the system provides elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection are required.

### D. WATER DEMAND

The criteria used for projecting the water demands for the water system were derived from the *Water and Wastewater Master Plan Report*, September 2005. **Table 3.3** shows the projected average day demand by land use type.

**Table 3.3 Demand by Land Use Type**

Land Use Type	Demand gpd/ac	Demand gpd/dwelling unit
Residential Units	N/A	500
Non-Residential	2,000	N/A

### 3.4 IMPACT FEE CAPITAL IMPROVEMENTS PLAN

The City of Corinth commissioned Freese and Nichols, Inc. to update the current Water Master Plan in 2005. The purpose of the water master plan is to provide the City with a logical strategy for upgrading and expanding its water distribution system to accommodate future growth and for addressing existing system deficiencies. Freese and Nichols, Inc. completed the *Water and Wastewater Master Plan Report*, September 2005 and recommended system improvements to accommodate growth through the City's build-out.

Fourteen (14) projects are determined eligible for recoverable cost through impact fees over the next 10 years. The total cost of these projects is \$19,262,718. The projected total CIP recoverable cost through impact fees is \$6,049,457. After a fifty (50) percent utility credit reduction due to waiving the financial analysis and the inclusion of financing costs, **\$4,211,027** is recoverable through impact fees serving the 10-year system needs. These impact fee capital improvements are shown in **Table 3.4** and illustrated in **Figure 3.2**.

**Table 3.4 Water Impact Fee Capital Improvements  
Project Cost and 10-Year Recoverable Cost**

Proj. #	Description	2011 Required Capacity (Percent Utilization)	2021 Required Capacity (Percent Utilization)	2011-2021 Required Capacity (Percent Utilization)	2021 Projected Recoverable Cost	Total Project Cost
1	Lake Sharon Pump Station and 3 MG Ground Storage Tank	77%	100%	23%	\$ 889,806	\$ 3,868,722
2	24-inch and 20-inch Water Line Along Lake Sharon Drive and Meadows Oak Drive	45%	65%	20%	\$ 390,878	\$ 1,954,388
3	16-inch Water Line Along South Corinth Street	45%	65%	20%	\$ 47,528	\$ 237,641
4	12-inch Water Lines Along FM 2181	0%	35%	35%	\$ 255,500	\$ 730,000
5	12-inch Water Line Along Lake Sharon Drive	0%	35%	35%	\$ 199,500	\$ 570,000
6	Quail Run 1.0 MG Elevated Tank and 20-inch and 16-inch Water Lines	4%	38%	34%	\$ 1,910,800	\$ 5,620,000
7	12-inch Water Line Along Shady Rest Lane and Shade Shores Road	0%	35%	35%	\$ 290,500	\$ 830,000
8	12-inch Water Line Along Parkridge Drive, South of FM 2181	0%	35%	35%	\$ 136,500	\$ 390,000
9	12-inch Water Line Along Dobbs Road	0%	35%	35%	\$ 70,000	\$ 200,000
10	Lake Sharon Pump Station Ground Storage Expansion	0%	13%	13%	\$ 266,500	\$ 2,050,000
11	Lake Sharon Pump Station Expansion Phase 1	0%	27%	27%	\$ 108,000	\$ 400,000
12	UTRWD System Contract Increase	0%	100%	100%	\$ 725,000	\$ 725,000
13	Water Impact Fee Report	0%	100%	100%	\$ 32,333	\$ 32,333
<b>Total</b>					<b>\$ 5,322,845</b>	<b>\$ 17,608,084</b>

## A. PROJECT DESCRIPTIONS

### 1. Lake Sharon Pump Station and 3 MG Ground Storage Tank

This project consists of a booster pump station, a 3 MG ground storage tank, and a 20-inch water line along future Lake Sharon Drive extension. The project involved installing 3 - 4,800 gpm pumps in a building sized for the ultimate capacity of 5 - 4,800 gpm pumps.

Project Cost	\$3,868,722
Recoverable Cost	\$889,806

### 2. 24-inch and 20-inch Water Line Along Lake Sharon Drive and Meadows Oak Drive

This project consists of a 24-inch and 20-inch water line extending into the water distribution system from the Lake Sharon Pump Station. The water line runs along Lake Sharon Drive and Meadows Oak Drive and extends to Interstate Highway 35E.

Project Cost	\$1,954,388
Recoverable Cost	\$390,878

### 3. 16-inch Water Lines Along South Corinth Street

This project consists of a 16-inch water line along South Corinth Street needed to provide looped connections with the existing 12-inch water lines. The limits for this project are between Blue Jay Drive and Post Oak Drive and Serendipity Hills Trail and Garrison Street. .

Project Cost	\$237,641
Recoverable Cost	\$47,528

### 4. 12-inch Water Lines Along FM 2181

This project consists of a 12-inch water line along FM 2181 needed to provide looped connections with the existing 12-inch water lines. The limits for this project are between Blue Jay Drive and Post Oak Drive and Serendipity Hills Trail and Garrison Street. This project is currently being designed.

Project Cost	\$730,000
Recoverable Cost	\$255,500

### 5. 12-inch Water Line Along Sharon Drive

This project consists of a 12-inch water line between Lake Sharon Drive and Church Drive.

Project Cost	\$570,000
Recoverable Cost	\$199,500



**6. Quail Run 1.0 MG Elevated Tank and 20-inch and 16-inch Water Lines**

This project consists of a 1.0 MG elevated storage tank along Quail Run and associated 20-inch and 16-inch water lines. The 20-inch water line runs along Dobbs Road from Interstate Highway 35E to Quail Run, then along Quail Run from Dobbs Road to the proposed elevated tank. The 16-inch water line runs along Quail run from the proposed elevated tank to Interstate Highway 35E

Project Cost	\$5,620,000
Recoverable Cost	\$1,910,800

**7. 12-inch Water Line Along Shady Rest Lane and Shade Shores Road**

This project consists of a 12-inch water line along Shady Rest Lane and Shade Shores Road. The water line connects the existing 16-inch water line along North Corinth Street with the existing 8-inch water line along Corinth Parkway.

Project Cost	\$830,000
Recoverable Cost	\$290,500

**8. 12-inch Water Line Along Parkridge Drive, South of FM 2181**

This project consists of a 12-inch water line along Parkridge Drive from FM 2181 to Scenic Drive.

Project Cost	\$390,000
Recoverable Cost	\$136,500

**9. 12-inch Water Line Along Dobbs Road**

This project consists of a 12-inch water line along Dobbs Road from Quail Run to the Old Railroad.

Project Cost	\$200,000
Recoverable Cost	\$70,000

**10. Lake Sharon Pump Station Ground Storage Expansion**

This project consists of constructing an additional 1.5 MG ground storage tank at the Lake Sharon Pump Station.

Project Cost	\$2,050,000
Recoverable Cost	\$266,500

**11. Lake Sharon Pump Station Expansion Phase 1**

This project consists of expanding the pump station capacity by adding a 4,800 gpm pump. The additional pump will increase the pump station capacity to 20.7 MGD (firm).

Project Cost	\$400,000
Recoverable Cost	\$108,000

**12. UTRWD System Contract Expansion**

As a wholesale customer to Upper Trinity Regional Water District (UTRWD) Corinth is required to share in costs for water capital improvements which are intended to meet increasing demand. Currently the City is contracted for 7.5 million gallons of water from UTRWD. In order to meet projected build out demands the City will have to increase their wholesale agreement with UTRWD.

Project Cost	\$725,000
Recoverable Cost	\$725,000

**13. Water Impact Fee Report**

Based on projected future infrastructure needs, the Water Impact Fees were updated to determine how much of the infrastructure costs may be recovered by the City.

Project Cost	\$32,333
Recoverable Cost	\$32,333

### 3.5 WATER IMPACT FEE CALCULATION

Chapter 395 of the Local Government Code defines a service unit as follows, “Service Unit” means a standardized measure of consumption attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards and based on historical data and trends applicable to the political subdivision in which the individual unit of development is located during the previous 10 years.” Therefore, the City of Corinth defines a *service unit* based on historical water usage over the past 10 years as compared to the estimated residential units. The residential unit is the development type that predominately uses a 5/8”x 3/4” meter. The measure of consumption per service unit is based on a 5/8”x 3/4” meter and the data shown in **Table 3.5**.

**Table 3.5 Service Unit Consumption Calculation**

Year	Population <sup>1</sup>	Residential Units (2.9 persons/unit) <sup>1</sup>	Water Usage Average Day Demand (MGD)	Consumption per Service Unit (GPD)
2001	13,051	4,500	2.26	502
2002	13,690	4,721	2.47	523
2003	14,991	5,169	2.86	553
2004	15,918	5,489	2.48	451
2005	16,303	5,622	3.20	569
2006	17,147	5,913	3.46	585
2007	18,755	6,467	2.47	382
2008	19,215	6,625	2.88	435
2009	19,650	6,776	2.66	393
2010	19,935	6,874	2.95	429
<b>Average Consumption per Service Unit</b>				<b>482</b>

Water Usage Source: City of Corinth  
(1) Source: 2011 Land Use Assumptions

#### Additional Service Units and Water Impact Fee Calculation

Based on the City’s 10-year growth projections and the resulting water demand projections, water service will be required for an additional 2,572 service units. The calculation is as follows:

- A service unit, which is a unit of development that consumes approximately 482 gallons per day (GPD), is a typical residential connection that uses a 5/8”x 3/4” meter. **Table 3.6** outlines the

future water demand projections and its relationship to the additional service units projected for the next 10-years.

**Table 3.6 10-year Additional Service Units Calculation**

Year	Average Day Demand (MGD)	Service Unit Demand (GPD)	Service Units
2011	3.92	482	8,133
2021	5.16	482	10,705
<b>10-year Additional Service Units</b>			<b>2,572</b>

\*Projected Water Usage Source: 2005 Water and Wastewater Master Plan and 2011 Land Use Assumptions

Impact fee law allows for a credit calculation to credit back the development community based on the utility revenues or ad valorem taxes that are allocated for paying a portion of future capital improvements. The intent of this credit is to prevent the City from double charging development for future capital improvements via impact fees and utility rates. If the City chooses to not do a financial analysis to determine the credit value they are required by law to reduce the recoverable cost by 50 percent. The city has chosen the latter; therefore, the maximum recoverable cost for impact fee shown below is 50 percent of the Pre Credit Recoverable Cost.

A breakdown of the 10-year recoverable costs and the associated impact fee per service unit is as follows:

**Table 3.7 10-year Recoverable Cost Breakdown**

<b>Pre Credit CIP Recoverable Cost for Impact Fee</b>	<b>\$5,322,845</b>
Financing Costs (5.5% Provided by City)	\$2,087,619
<b>Pre Credit Total</b>	<b>\$7,410,464</b>
Credit for Utility Revenues (50% credit)	(\$3,705,232)
<b>Maximum Recoverable Cost for Impact Fee</b>	<b>\$3,705,232</b>

$$\text{Impact fee per service unit} = \frac{\text{10-year recoverable costs}}{\text{10-year additional service units}}$$

$$\text{Impact fee per service unit} = \frac{\$3,705,232}{2,572}$$

$$\text{Impact fee per service unit} = \$1,441$$

Therefore, the maximum assessable impact fee per service unit is **\$1,441**.

For a development that requires a different size meter, a service unit equivalent is established at a multiplier based on its capacity with respect to the 5/8"x 3/4" meter. The maximum impact fee that could

be assessed for other meter sizes is based on the value shown on **Table 3.8, Service Unit Equivalency Table for Commonly Used Meters.**

**Table 3.8 Service Unit Equivalency Table for Commonly Used Meters**

<b>Meter Size*</b>	<b>Maximum Continuous Operating Capacity (GPM)**</b>	<b>Service Unit Equivalent</b>	<b>Maximum Assessable Fee (\$)</b>
5/8"x 3/4" PD	10	1	1,441
3/4" PD	15	1.5	2,162
1" PD	25	2.5	3,603
1 1/2" PD	50	5	7,205
2" PD	80	8	11,528
2" Compound	80	8	11,528
2" Turbine	100	10	14,410
3" Compound	160	16	23,056
3" Turbine	240	24	34,584
4" Compound	250	25	36,025
4" Turbine	420	42	60,522
6" Compound	500	50	72,050
6" Turbine	920	92	132,572
8" Compound	800	80	115,280
8" Turbine	1,600	160	230,560
10" Turbine	2,500	250	360,250

\* PD = Positive Displacement Meter (Typical residential meter)

\*\*Operating capacities obtained from American Water Works Association (AWWA) C-700-02

## Appendix A – Conceptual Level Project Cost Projections

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Water Impact Fee Analysis	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 61008044	<b>Checked By:</b> MAS

<b>Title:</b> Summary
-----------------------

Item No.	Item Description	Item Cost
4	12-inch Water Line Along FM 2181 (Halff and Associates, Inc.)	\$730,000
5	12-inch Water Line Along Lake Sharon Drive	\$570,000
6	Quail Run 1.0 MG Elevated Tank and 20-inch and 16-inch Water Lines	\$5,620,000
7	12-inch Water Line Along Shady Rest Lane and Shade Shores Road	\$830,000
8	12-inch Water Line Along Parkridge Drive, South of FM 2181	\$390,000
9	12-inch Water Line Along Dobbs Road	\$200,000
10	Lake Sharon Pump Station Ground Storage Expansion - 1.5 MG Ground Storage Tank	\$2,050,000
11	Lake Sharon Pump Station Ground Storage Expansion - Pump Addition Phase I	\$400,000
<b>TOTAL</b>		<b>\$10,060,000</b>

**Basis for Cost Projection:**

- No Design Completed
- Preliminary Design
- Final Design

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Water Impact Fee Analysis	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 61008044	<b>Checked By:</b> MAS

**Title:** 12-inch Water Line Along FM 2181 (Half and Associates, Inc.)

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (4% Per Half)	1	LS	\$24,000.00	\$24,000
2	12" Water Line	11,700	LF	\$40.00	\$468,000
3	12" Gate Valve	43	EA	\$1,600.00	\$68,800
4	Fire Hydrant Assembly	6	EA	\$3,500.00	\$21,000
5	Trench Safety	11,700	LF	\$1.00	\$11,700
6	Connect to Existing 12" Water Line	4	EA	\$1,400.00	\$5,600
7	Connect to Existing 8" Water Line	7	EA	\$1,250.00	\$8,750

**Basis for Cost Projection:**

- No Design Completed
- Preliminary Design
- Final Design

Subtotal:		\$607,850
Engineering/ Survey/ Testing (44%)*		
\$205,040	44	\$90,300
Contingency (%)	5	\$30,400
<b>Total:</b>		<b>\$730,000</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Water Impact Fee Analysis	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 61008044	<b>Checked By:</b> MAS

<b>Title:</b> 12-inch Water Line Along Lake Sharon Drive
----------------------------------------------------------

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$20,000.00	\$20,000
2	12" Water Line	4,200	LF	\$75.00	\$315,000
3	12" Gate Valve	5	EA	\$6,000.00	\$30,000
4	Fire Hydrant Assembly	5	EA	\$5,000.00	\$25,000
5	Trench Safety	4,200	LF	\$2.00	\$8,400
6	Connect to Existing Water Line	2	EA	\$5,000.00	\$10,000
<b>Basis for Cost Projection:</b>					
<input checked="" type="checkbox"/>	No Design Completed				
<input type="checkbox"/>	Preliminary Design				
<input type="checkbox"/>	Final Design				
Subtotal:					\$408,400
Engineering/ Survey/ Testing (%) 20					\$81,700
Contingency (%) 20					\$81,700
<b>Total:</b>					<b>\$570,000</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Water Impact Fee Analysis	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 61008044	<b>Checked By:</b> MAS

<b>Title:</b> Quail Run 1.0 MG Elevated Tank and 20-inch and 16-inch Water Lines
----------------------------------------------------------------------------------

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$192,000.00	\$192,000
2	Pollution Prevention and Control	1	LS	\$5,000.00	\$5,000
3	1.0 MG Composite Elevated Water Storage Tank	1	LS	\$2,000,000.00	\$2,000,000
4	20" Yard Piping	500	LF	\$175.00	\$87,500
5	20" Yard Gate Valve	1	EA	\$15,000.00	\$15,000
6	Concrete Sidewalk	150	SY	\$30.00	\$4,500
7	Driveway	150	SY	\$50.00	\$7,500
8	Site Grading	1	LS	\$40,000.00	\$40,000
9	8' Security Fene	1	LS	\$40,000.00	\$40,000
10	Landscaping	1	LS	\$20,000.00	\$20,000
11	Irrigation System	1	LS	\$10,000.00	\$10,000
12	20" Hydraulic Valve	1	LS	\$20,000.00	\$20,000
13	20" Water Line	3,280	LF	\$125.00	\$410,000
14	20" Gate Valve	4	EA	\$15,000.00	\$60,000
15	42" Bore with Steel Casing	320	LF	\$900.00	\$288,000
16	16" Water Line	1,300	LF	\$90.00	\$117,000
17	16" Gate Valve	2	EA	\$9,000.00	\$18,000
18	Fire Hydrant Assembly	6	EA	\$5,000.00	\$30,000
19	Trench Safety	4,580	LF	\$2.00	\$9,160
20	Connect to Existing Water Line	8	EA	\$5,000.00	\$40,000
21	Acquire Property	2	AC	\$300,000.00	\$600,000
<b>Pipe, Valves, Cathodic Protection and SCADA is included in the tank price</b>					

**Basis for Cost Projection:**

- No Design Completed
- Preliminary Design
- Final Design

Subtotal:		\$4,013,660
Engineering/ Survey/ Testing (%)	20	\$802,800
Contingency (%)	20	\$802,800
<b>Total:</b>		<b>\$5,620,000</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Water Impact Fee Analysis	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 61008044	<b>Checked By:</b> MAS

**Title:** 12-inch Water Line Along Shady Rest Lane and Shade Shores Road

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$29,000.00	\$29,000
2	12" Water Line	6,000	LF	\$75.00	\$450,000
3	12" Gate Valve	6	EA	\$6,000.00	\$36,000
4	Fire Hydrant Assembly	6	EA	\$5,000.00	\$30,000
5	Trench Safety	6,000	LF	\$2.00	\$12,000
6	Connect to Existing Water Line	7	EA	\$5,000.00	\$35,000
<b>Basis for Cost Projection:</b>					
<input checked="" type="checkbox"/>	No Design Completed				
<input type="checkbox"/>	Preliminary Design				
<input type="checkbox"/>	Final Design				
<b>Subtotal:</b>					\$592,000
Engineering/ Survey/ Testing (%) 20					\$118,400
Contingency (%) 20					\$118,400
<b>Total:</b>					<b>\$830,000</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Water Impact Fee Analysis	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 61008044	<b>Checked By:</b> MAS

<b>Title:</b> 12-inch Water Line Along Parkridge Drive, South of FM 2181
--------------------------------------------------------------------------

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$14,000.00	\$14,000
2	12" Water Line	2,800	LF	\$75.00	\$210,000
3	12" Gate Valve	3	EA	\$6,000.00	\$18,000
4	Fire Hydrant Assembly	3	EA	\$5,000.00	\$15,000
5	Trench Safety	2,800	LF	\$2.00	\$5,600
6	Connect to Existing Water Line	3	EA	\$5,000.00	\$15,000
<b>Basis for Cost Projection:</b>					
<input checked="" type="checkbox"/>	No Design Completed				
<input type="checkbox"/>	Preliminary Design				
<input type="checkbox"/>	Final Design				
<b>Subtotal:</b>					\$277,600
Engineering/ Survey/ Testing (%) 20					\$55,600
Contingency (%) 20					\$55,600
<b>Total:</b>					<b>\$390,000</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Water Impact Fee Analysis	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 61008044	<b>Checked By:</b> MAS

<b>Title:</b> 12-inch Water Line Along Dobbs Road
---------------------------------------------------

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$7,000.00	\$7,000
2	12" Water Line	1,300	LF	\$75.00	\$97,500
3	12" Gate Valve	2	EA	\$6,000.00	\$12,000
4	Fire Hydrant Assembly	2	EA	\$5,000.00	\$10,000
5	Trench Safety	1,300	LF	\$2.00	\$2,600
6	Connect to Existing Water Line	3	EA	\$5,000.00	\$15,000
<b>Basis for Cost Projection:</b>					
<input checked="" type="checkbox"/>	No Design Completed				
<input type="checkbox"/>	Preliminary Design				
<input type="checkbox"/>	Final Design				
Subtotal:					\$144,100
Engineering/ Survey/ Testing (%) 20					\$28,900
Contingency (%) 20					\$28,900
<b>Total:</b>					<b>\$200,000</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Water Impact Fee Analysis	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 61008044	<b>Checked By:</b> MAS

**Title: Lake Sharon Pump Station Ground Storage Expansion - 1.5 MG Ground Storage Tank**

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
<b>Site Work</b>					
1	Mobilization (5%)	1	LS	\$70,000.00	\$70,000
2	Site Grading	1	LS	\$40,000.00	\$40,000
3	Fence Removal/ Replacement	200	LF	\$20.00	\$4,000
4	Landscaping Repair	1	LS	\$15,000.00	\$15,000
5	Tree Removal/ Site Grubbing	1	LS	\$10,000.00	\$10,000
6	Drainage Improvements	1	LS	\$30,000.00	\$30,000
7	Erosion Control	1	LS	\$10,000.00	\$10,000
<b>Yard Piping</b>					
8	24" Tank Supply Line	100	LF	\$300.00	\$30,000
9	30" Outlet Piping to Suction Line	150	LF	\$375.00	\$56,250
10	8" Tank Drain Line	100	LF	\$125.00	\$12,500
11	Trench Safety for all Yard Piping	350	LF	\$2.00	\$700
12	Connect to Ex. Water Lines	2	EA	\$10,000.00	\$20,000
<b>Yard Valves &amp; Meters</b>					
13	Supply Meter Vault Modifications	1	EA	\$40,000.00	\$40,000
14	8" Gate Valve	1	EA	\$5,000.00	\$5,000
15	24" Gate Valve and Vault	2	EA	\$20,000.00	\$40,000
16	30" Gate Valve and Vault	2	EA	\$30,000.00	\$60,000
<b>GST</b>					
17	1.5 MG Ground Storage Tank	1	EA	\$800,000.00	\$800,000
18	Excavation	2,000	CY	\$30.00	\$60,000
19	Select Backfill	2,000	CY	\$30.00	\$60,000
<b>Electrical</b>					
20	Electrical/SCADA/Power	1	LS	\$100,000.00	\$100,000

<b>Basis for Cost Projection:</b>		Subtotal:	\$1,463,450
<input checked="" type="checkbox"/> No Design Completed		Engineering/ Survey/ Testing (%)	20
<input type="checkbox"/> Preliminary Design		Contingency (%)	20
<input type="checkbox"/> Final Design		<b>Total:</b>	<b>\$2,050,000</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Water Impact Fee Analysis	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 61008044	<b>Checked By:</b> MAS

<b>Title:</b> Lake Sharon Pump Station Ground Storage Expansion - Pump Addition Phase I
-----------------------------------------------------------------------------------------

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$14,000.00	\$14,000
2	4,800 GPM Pump and 400 HP Motor	1	EA	\$175,000.00	\$175,000
3	16" Pump Control Valve	1	EA	\$25,000.00	\$25,000
4	20" Spool Piping	5	LF	\$250.00	\$1,250
5	16" Spool Piping	5	LF	\$200.00	\$1,000
6	Electrical	1	LS	\$50,000.00	\$50,000
7	SCADA	1	LS	\$10,000.00	\$10,000
8	Concrete Pump Base	1	EA	\$2,500.00	\$2,500
9	2" Air Release Valve	1	EA	\$4,000.00	\$4,000

**Basis for Cost Projection:**

- No Design Completed
- Preliminary Design
- Final Design

<b>Subtotal:</b>		\$282,750
Engineering/ Survey/	20	
Testing (%)		\$56,600
Contingency (%)	20	\$56,600
<b>Total:</b>		<b>\$400,000</b>

# City of Corinth, Texas Wastewater Impact Fee Report



## Prepared by:

Kimley-Horn and Associates, Inc.  
12700 Park Central Drive, Suite 1800  
Dallas, TX 75251  
972.770.1300  
Registration Number: F-928

**September 2011**

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- A. Conceptual Level Project Cost Projections

## 4.1 INTRODUCTION

The City of Corinth retained the services of Kimley-Horn and Associates, Inc. (Kimley-Horn) for the purpose of updating the impact fees for the wastewater system improvements required to serve new development. The impact fees were last updated in 2004 in accordance with Chapter 395 of the *Local Government Code* (impact fees), which requires a city imposing impact fees to update the land-use assumptions and capital improvements plan upon which the fees are calculated.

The purpose of this report is to satisfy the requirements of the law and provide the City with proposed land use assumptions, an impact fee capital improvements plan and associated impact fees.

For convenience and reference, the following is excerpted from Chapter 395 of the *Local Government Code*, “Financing Capital Improvements required by New Development in Municipalities, Counties, and certain other Local Governments.”

- (a) *The political subdivision shall use qualified professionals to prepare the capital improvements plan and to calculate the impact fee. The capital improvements plan must contain specific enumeration of the following items:*
- (1) *a description of the existing capital improvements within the service area and the costs to upgrade, update, improve, expand, or replace the improvements to meet existing needs and usage and stricter safety, efficiency, environmental, or regulatory standards, which shall be prepared by a qualified professional engineer licensed to perform such professional engineering services in this state;*
  - (2) *an analysis of the total capacity, the level of current usage, and commitments for usage of capacity of the existing capital improvements, which shall be prepared by a qualified professional engineer licensed to perform such professional engineering services in this state;*
  - (3) *a description of all or the parts of the capital improvements or facility expansions and their costs necessitated by and attributable to new development in the service area based on the approved land use assumptions, which shall be prepared by a qualified professional engineer licensed to perform such professional engineering services in this state;*
  - (4) *a definitive table establishing the specific level or quantity of use, consumption, generation, or discharge of a service unit for each category of capital improvements or facility expansions and an equivalency or conversion table establishing the ratio of a service unit to various types of land uses, including but not limited to residential, commercial, and industrial;*
  - (5) *the total number of projected service units necessitated by and attributable to new development within the service area based on the approved land use assumptions and calculated in accordance with generally accepted engineering or planning criteria;*

- (6) *the projected demand for capital improvements or facility expansions required by new service units projected over a reasonable period of time, not to exceed 10 years; and*
- (7) *a plan for awarding:*
- (A) *a credit for the portion of ad valorem tax and utility service revenues generated by new service unit during the program period that is used for the payment of improvements, including the payment of debt, that are included in the capital improvements plan; or*
- (B) *in the alternative, a credit equal to 50 percent of the total project cost of implementing the capital improvements plan.*

The impact fee study includes information from the *Water and Wastewater Master Plan Report* completed by Freese and Nichols, Inc. in September 2005. The impact fees are based on recommended capital improvements and the population growth projections outlined in the *Water and Wastewater Master Plan Report as well as the City's Comprehensive Master Plan*.

The study process was comprised of three (3) tasks:

#### **A. LAND USE ASSUMPTIONS**

In order to assess an impact fee, Land Use Assumptions must be developed to provide the basis for population and employment growth projections within a political subdivision. As defined by Chapter 395 of the Texas Local Government Code, these assumptions include a description of changes in land uses, densities, and population in the service area. In addition, these assumptions are useful in assisting the City of Corinth in determining the need and timing of capital improvements to serve future development.

In accordance with Chapter 395, information for the development of the Land Use Assumptions was determined from the City of Corinth Comprehensive Land Use Plan Categories - 2010, aerial photography, and consultation with City staff.

The residential and non-residential estimates and projections were all compiled in accordance with the following categories:

*Units:* Number of dwelling units, both single and multi-family.

*Population:* Number of people, based on person per dwelling unit factors.

*Employment:* Acreages based on retail, service, and basic land uses. Each classification has unique demand characteristics.

**Retail:** Land use activities which provide for the retail sale of goods that primarily serve households and whose location choice is oriented toward the household sector, such as grocery stores and restaurants.

**Corinth Wastewater CIP Project List  
Upper Trinity East Service Area**

1. Lift Station 3A Upgrade, 18" Wastewater Line
2. Lift Station 3A Upgrade, 18" Force Main
3. Lift Station 3A Upgrade, 18" Wastewater Line
4. Lincoburg 15", 12" and 10" Wastewater Lines
5. Lift Station 2 Expansion and 6" Force Main
6. 15" Wastewater Line from Kensington Park Apartments to Burl Lift Station
7. Lift Station 3A Upgrade, 18" Wastewater Line
8. Lift Station 3A Upgrade, 18" Wastewater Line
9. 8" Wastewater Line Crossing IH 35E

**Corinth Wastewater CIP Project List  
Upper Trinity West Service Area**

1. Bryant Branch Lift Station, Force Main and Wastewater Line
2. Westside Lift Station Improvements
3. FM 2181 18" Force Main



**Legend**

- Existing Lift Station
- Proposed Lift Station
- Existing Force Main
- Proposed Force Main
- Existing Gravity Main
- Proposed Gravity Main
- Proposed Inverted Siphon
- Wastewater Service Areas

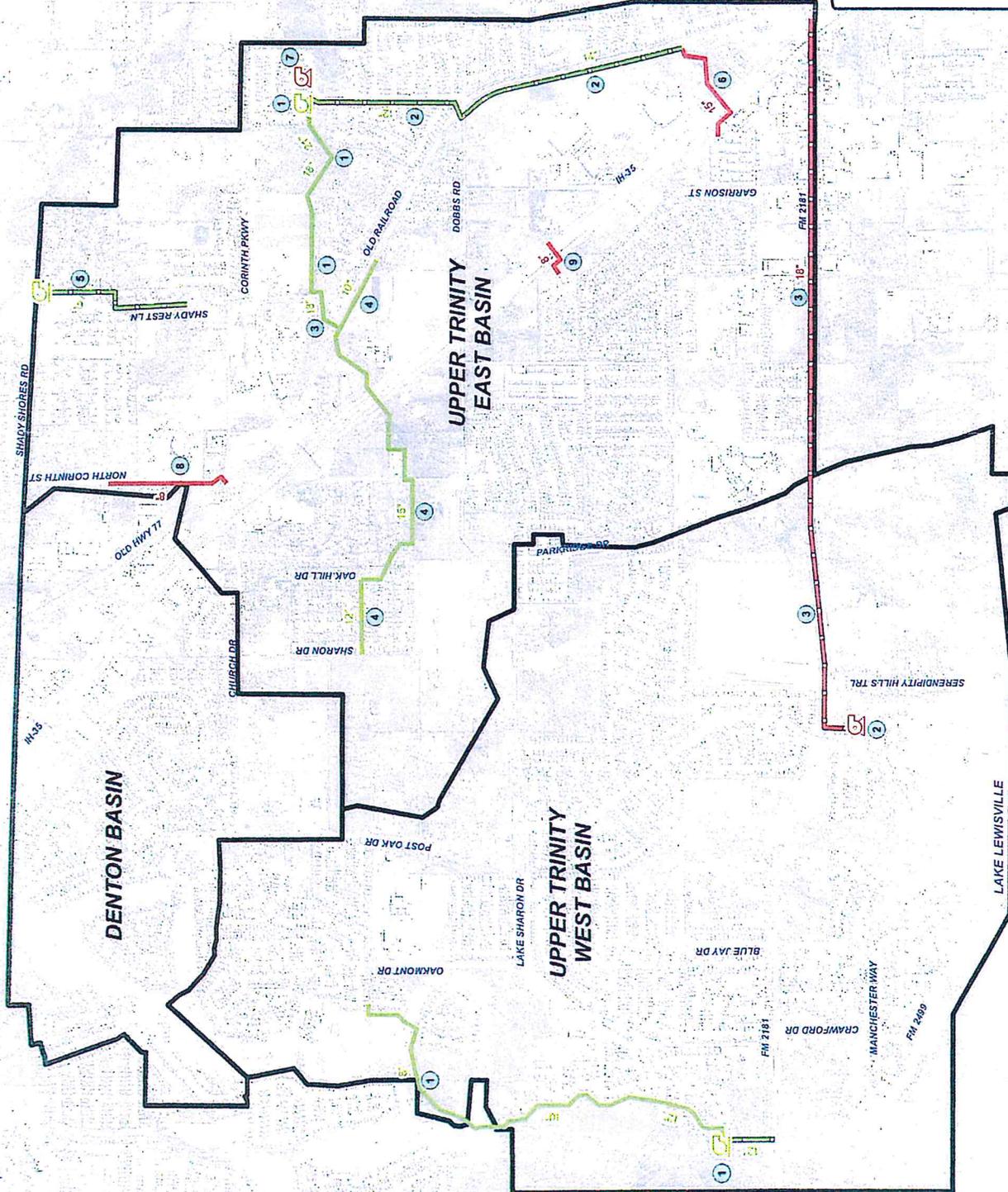
**2011 Impact Fee Update  
Wastewater CIP**

Figure 4.2



Kimley-Horn  
and Associates, Inc.

September 2011



Service: Land use activities which provide personal and professional services such as government and other professional administrative offices.

Basic: Land use activities that produce goods and services such as those that are exported outside of the local economy, such as manufacturing, construction, transportation, wholesale, trade, warehousing, and other industrial uses.

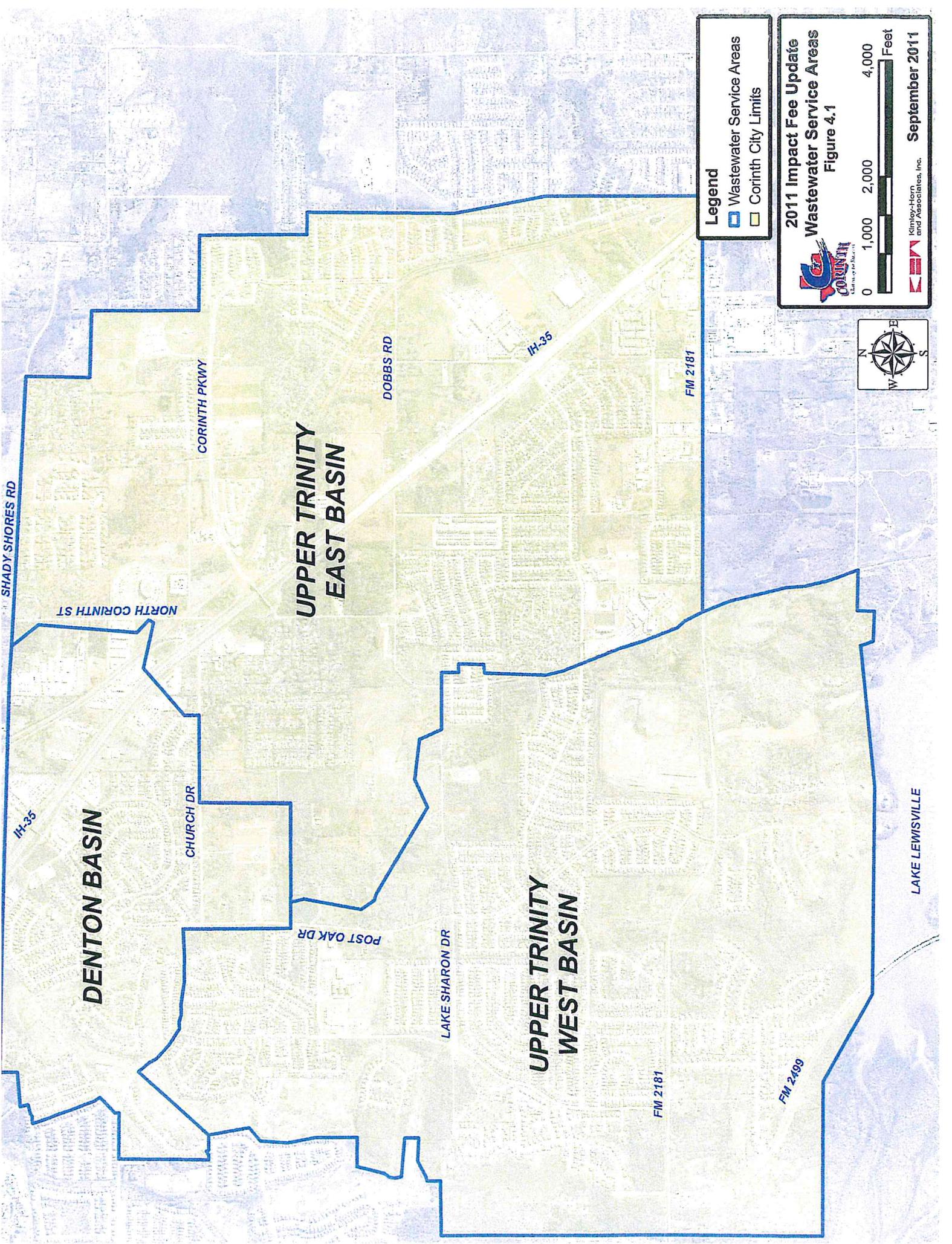
The proposed geographic boundaries for the impact fee service areas for wastewater facilities are shown in **Figure 4.1**. The City of Corinth current only contains only one (1) service area for wastewater. As part of this update the City has elected to divide the wastewater area into three (3) service areas. Per conversations with City staff, a single growth rate was utilized for all service areas.

## **B. IMPACT FEE CAPITAL IMPROVEMENTS PLAN**

This task involved evaluation of the wastewater capital improvements plan outlined in the master plan and discussion with City staff to identify projects that will be built in the 10-year planning window and meet the design criteria.

## **C. IMPACT FEE ANALYSIS AND REPORT**

This task included calculating the additional service units, service unit equivalents, and credit reduction. These values were then used to determine the impact fee per service unit and the maximum assessable impact fee by meter size.

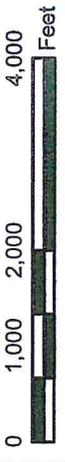


**Legend**

- Wastewater Service Areas
- Corinth City Limits



**2011 Impact Fee Update  
Wastewater Service Areas  
Figure 4.1**



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September 2011

**DENTON BASIN**

**UPPER TRINITY  
EAST BASIN**

**UPPER TRINITY  
WEST BASIN**

SHADY SHORES RD

NORTH CORINTH ST

CORINTH PKWY

DOBBS RD

IH-35

FM 2181

IH-35

CHURCH DR

POST OAK DR

LAKE SHARON DR

FM 2181

FM 2499

LAKE LEWISVILLE

## 4.2 EXECUTIVE SUMMARY

This study was performed to update the City of Corinth's Wastewater System Impact Fees. Wastewater system analysis and the Wastewater System Master Plan are important tools for facilitating orderly growth of the water system and for providing adequate facilities that promote economic development in the City of Corinth. The implementation of an impact fee is a way to shift a portion of the burden of paying for new facilities onto new development.

Elements of the water system, including storage facilities, pumping facilities, and the distribution network itself, were evaluated against industry standards as outlined in the Design Criteria section of this report. Information related to the growth of the City was provided through the City's 2010 Comprehensive Plan.

The City's Wastewater system is divided into three service areas, Denton, Upper Trinity East and Upper Trinity West. Each of these areas must be evaluated individually to determine the maximum impact fee allowable for each service area.

The Denton service area has zero (0) projects planned for the future and as a result there are no recoverable costs associated with this service area. The impact fee for the Denton service area is \$0. While the Denton service area has no City of Corinth Impact Fee residents in this service area may be subject to a charge associated with the City of Denton Impact Fees. The proposed future Wholesale Wastewater Treatment Contract between the City of Denton and the City of Corinth may require that Corinth residents in this service area pay the adopted City of Denton Impact Fee.

The Upper Trinity East service area has eleven (11) projects which are determined eligible for recoverable cost through impact fee over the next 10 years. The total cost of these projects is \$6,796,856. The projected total CIP recoverable cost through impact fees is \$2,641,806. After financing costs are added and the 50% credit is applied, \$1,838,961 is recoverable through impact fees serving the 10-year system needs. These impact fee capital improvements are shown in **Table 4.4.1** and illustrated in **Figure 4.2**.

The Upper Trinity West service area has five (5) projects which are determined eligible for recoverable cost through impact fee over the next 10 years. The total cost of these projects is \$4,038,602. The projected total CIP recoverable cost through impact fees is \$1,445,866. After financing costs are added and the 50% credit is applied, \$1,006,467 is recoverable through impact fees serving the 10-year system needs. These impact fee capital improvements are shown in **Table 4.4.2** and illustrated in **Figure 4.2**.



**Table 4.1 Maximum Assessable Wastewater Impact Fee for Commonly Used Meters**

Meter Size*	Maximum Continuous Operating Capacity (GPM)**	Service Unit Equivalent	Maximum Assessable Fee per Service Area (\$)		
			Denton	Upper Trinity East	Upper Trinity West
5/8"x 3/4" PD	10	1	\$0	1,094	1,300
3/4" PD	15	1.5	\$0	1,641	1,950
1" PD	25	2.5	\$0	2,735	3,250
1 1/2" PD	50	5	\$0	5,470	6,500
2" PD	80	8	\$0	8,752	10,400
2" Compound	80	8	\$0	8,752	10,400
2" Turbine	100	10	\$0	10,940	13,000
3" Compound	160	16	\$0	17,504	20,800
3" Turbine	240	24	\$0	26,256	31,200
4" Compound	250	25	\$0	27,350	32,500
4" Turbine	420	42	\$0	45,948	54,600
6" Compound	500	50	\$0	54,700	65,000
6" Turbine	920	92	\$0	100,648	119,600
8" Compound	800	80	\$0	87,520	104,000
8" Turbine	1,600	160	\$0	175,040	208,000
10" Turbine	2,500	250	\$0	273,500	325,000

\* PD = Positive Displacement Meter (Typical residential meter)

\*\*Operating capacities obtained from American Water Works Association (AWWA) C-700-02

**Table 4.2 Additional Service Units - 2021**

Service Area	2021 Additional Service Units
Denton	129
Upper Trinity East	1,681
Upper Trinity West	774
<b>TOTAL</b>	<b>2,584</b>

## 4.3 DESIGN CRITERIA

### A. SEWER TRUNK LINES (INTERCEPTORS)

The design criteria for sewer trunk lines or interceptors is based on the TCEQ requirements that meet peak wet weather design flows with no overflows while maintaining a minimum of 2 ft/sec cleaning velocity and a maximum of 8 ft/sec velocity.

### B. LIFT STATIONS PUMPING CAPACITY

The design criteria for lift station pumping shall be to provide firm pumping capacity to meet 125% of the peak wet weather design flows. The firm pumping capacity is defined as the available total pumping capacity with the largest pump out of service.

### C. LIFT STATION WET WELL CAPACITY

The design criteria for lift station wet wells are to provide adequate volumes to limit pump cycling to once every 10 minutes. Based on this criterion, the required operating volume for each pump can be calculated as

$$V = tQ/4 \quad \text{where,}$$

t = Maximum pump cycling time = 10 minutes  
 Q = Lead pump discharge rate in gallons per minute (gpm)  
 V = Required wet well volume between pump start and stop elevation

### D. FORCE MAINS

The design criteria recommended for force mains is to meet the required pumping capacity of the lift station at a velocity less than 8 feet per second and a maximum discharge pressure of 100 psi and to allow a minimum of 2 feet per second scouring velocity during a single pump operation.

### E. WASTEWATER DEMAND

The criteria used for projecting the water demands for the water system were derived from the *Water and Wastewater Master Plan Report*, September 2005. **Table 4.3** shows the projected average day demand by land use type.

**Table 4.3 Demand by Land Use Type**

Land Use Type	Demand gpd/ac	Demand gpd/dwelling unit
Residential Units	N/A	232
Non-Residential	1,000	N/A

## 4.4 IMPACT FEE CAPITAL IMPROVEMENTS PLAN

The City of Corinth commissioned Freese and Nichols, Inc. to update the current Wastewater Master Plan in 2005. The purpose of the wastewater master plan is to provide the City with a logical strategy for upgrading and expanding its wastewater system to accommodate future growth and for addressing existing system deficiencies. Freese and Nichols, Inc. completed the *Water and Wastewater Master Plan Report*, September 2005 and recommended system improvements to accommodate growth through the City's build-out.

The City's Wastewater system is divided into three service areas: Denton, Upper Trinity East and Upper Trinity West. Each of these areas must be evaluated individually to determine the maximum impact fee allowable for each service area.

The Denton service area has zero (0) projects planned for the future and as a result there are no recoverable costs associated with this service area. The impact fee for the Denton service area is \$0. While the Denton service area has no City of Corinth Impact Fee residents in this service area may be subject to a charge associated with the City of Denton Impact Fees. The proposed future Wholesale Wastewater Treatment Contract between the City of Denton and the City of Corinth may require that Corinth residents in this service area pay the adopted City of Denton Impact Fee.

The Upper Trinity East service area has eleven (11) projects which are determined eligible for recoverable cost through impact fee over the next 10 years. The total cost of these projects is \$6,796,856. The projected total CIP recoverable cost through impact fees is \$2,641,806. After financing costs are added and the 50% credit is applied, \$1,838,961 is recoverable through impact fees serving the 10-year system needs. These impact fee capital improvements are shown in **Table 4.4.1** and illustrated in **Figure 4.2**.

The Upper Trinity West service area has five (5) projects which are determined eligible for recoverable cost through impact fee over the next 10 years. The total cost of these projects is \$4,038,602. The projected total CIP recoverable cost through impact fees is \$1,445,866. After financing costs are added and the 50% credit is applied, \$1,006,467 is recoverable through impact fees serving the 10-year system needs. These impact fee capital improvements are shown in **Table 4.4.2** and illustrated in **Figure 4.2**.

**Table 4.4.1 Upper Trinity East  
Wastewater Impact Fee Capital Improvements  
Project Cost and 10-Year Recoverable Cost**

Proj. #	Description	2010 Required Capacity (Percent Utilization)	2020 Required Capacity (Percent Utilization)	2010-2020 Required Capacity (Percent Utilization)	2020 Projected Recoverable Cost	Total Project Cost
1	Lift Station 3A and 18-inch/21-inch Wastewater Line	50%	80%	30%	\$ 505,800	\$ 1,686,163
2	Lift Station 3A 12-inch/14-inch Force Main	47%	88%	41%	\$ 282,100	\$ 688,165
3	Lift Station 3A 18-inch Wastewater Line	32%	60%	28%	\$ 81,600	\$ 291,425
4	Lynchburg 15-inch, 12-inch and 10-inch Wastewater Lines	33%	65%	32%	\$ 407,100	\$ 1,272,325
5	Lift Station 2 Expansion and 6-inch Force Main	21%	30%	9%	\$ 57,200	\$ 635,572
6	15-inch Wastewater Line from Kensington Park Apartments to Burl Lift Station	0%	15%	15%	\$ 111,000	\$ 740,000
7	Lift Station 3A Upgrade	0%	64%	64%	\$ 108,800	\$ 170,000
8	North Corinth Street 8-inch Wastewater Line	37%	62%	25%	\$ 75,000	\$ 300,000
9	8-inch Wastewater Line Crossing IH 35E	0%	100%	100%	\$ 230,000	\$ 230,000
10	UTRWD System Contract	0%	100%	100%	\$ 767,040	\$ 767,040
11	Wastewater Impact Fee Update	0%	100%	100%	\$ 16,166	\$ 16,166
<b>Total</b>					<b>\$ 2,641,806</b>	<b>\$ 6,796,856</b>

**Table 4.4.2 Upper Trinity West  
Wastewater Impact Fee Capital Improvements  
Project Cost and 10-Year Recoverable Cost**

Proj. #	Description	2010 Required Capacity (Percent Utilization)	2020 Required Capacity (Percent Utilization)	2010-2020 Required Capacity (Percent Utilization)	2020 Projected Recoverable Cost	Total Project Cost
1	Bryant Branch Lift Station, Force Main and Wastewater Line	79%	96%	17%	\$ 148,300	\$ 872,526
2	Westside Lift Station Improvements	0%	33%	33%	\$ 609,000	\$ 1,845,450
3	FM 2181 18-inch Force Main	0%	33%	33%	\$ 311,300	\$ 943,400
4	UTRWD System Contract	0%	100%	100%	\$ 361,100	\$ 361,060
5	Wastewater Impact Fee Update	0%	100%	100%	\$ 16,166	\$ 16,166
<b>Total</b>					<b>\$ 1,445,866</b>	<b>\$ 4,038,602</b>

## A. PROJECT DESCRIPTIONS (BY SERVICE AREA)

### I. DENTON SERVICE AREA

#### 1. No Projects Planned

Project Cost	\$0
Recoverable Cost	\$0

### II. UPPER TRINITY EAST SERVICE AREA

#### 1. Lift Station 3A and 18-inch/21-inch Wastewater Line

This project involved the abandonment of Lift Stations 3 and 4 and the installation of three pumps along with the lift station structure. The project also involved an 18-inch/21-inch gravity wastewater line from Shady Rest Lane to the lift station site.

Project Cost	\$1,686,163
Recoverable Cost	\$505,800

#### 2. Lift Station 3A 12-inch/14-inch Force Main

This project involved the installation of a 12-inch/14-inch force main from the Lift Station 3A site to the Burl Street Lift Station.

Project Cost	\$688,165
Recoverable Cost	\$282,100

#### 3. Lift Station 3A 18-inch Wastewater Line

This project involved the installation of an 18-inch gravity wastewater line from Shady Rest Lane to the Old Railroad.

Project Cost	\$291,425
Recoverable Cost	\$98,600

#### 4. Lynchburg 15-inch, 12-inch and 10-inch Wastewater Lines

This project consisted of the installation of a 12-inch gravity wastewater line from Sharon Drive to Oak Hill Drive, a 15-inch gravity line from Oak Hill Drive to the east side of Interstate Highway 35E, and a 10-inch gravity wastewater line along the Old Railroad.

Project Cost	\$1,272,325
Recoverable Cost	\$407,100

#### 5. Lift Station 2 Expansion and 6-inch Force Main

This project consisted of the expansion of the existing Lift Station 2 and the installation of a 6-inch force main from the lift station to Corinth Bend.

Project Cost	\$635,572
Recoverable Cost	\$57,200

**6. 15-inch Wastewater Line from Kensington Park Apartments to Burl Lift Station**

This project consists of the installation of a 15-inch gravity wastewater line from the Kensington Park Apartments to the Burl Lift Station. This project will replace the existing 12-inch wastewater line.

Project Cost	\$740,000
Recoverable Cost	\$111,000

**7. Lift Station 3A Upgrade**

This project consists of the installation of a fourth pump at the existing lift station. The additional pump will increase the lift station firm capacity from 2.3 MGD to 3.4 MGD.

Project Cost	\$170,000
Recoverable Cost	\$108,800

**8. North Corinth Street 8-inch Wastewater Line**

This project consists of the installation of an 8-inch wastewater line along North Corinth Street. The project will replace an existing 6-inch wastewater line.

Project Cost	\$300,000
Recoverable Cost	\$75,000

**9. 8-inch Wastewater Line Crossing IH 35E**

This project consists of the installation of an 8-inch wastewater from the Destiny RV park to across Interstate Highway 35E.

Project Cost	\$230,000
Recoverable Cost	\$230,000

**10. UTRWD System Contract**

As a wholesale customer to Upper Trinity Regional Water District (UTRWD) Corinth is required to share in costs for wastewater capital improvements which are intended to meet increasing demand

Project Cost	\$767,040
Recoverable Cost	\$767,040

**11. Wastewater Impact Fee Update**

Based on the projected future infrastructure needs, a Wastewater Impact Fee Update was completed to determine how much of the infrastructure costs may be recovered by the City. The recoverable costs associated with the Wastewater Impact Fee Update have been divided among the Upper Trinity East and Upper Trinity West service areas.

Project Cost	\$16,166
Recoverable Cost	\$16,166

### III. UPPER TRINITY WEST SERVICE AREA

**1. Bryant Branch Lift Station, Force Main and Wastewater Line**

This project consisted of a lift station, 12-inch force main and gravity wastewater lines. The wastewater line sizes were 8-inch, 10-inch and 12-inch. The wastewater line was installed from Oakmont Country Club to the lift station.

Project Cost	\$872,526
Recoverable Cost	\$148,300

**2. Westside Lift Station Improvements**

This project involves the expansion of the exiting Westside Lift Station. The improvements will involve a new wet well and three new 2.8 MGD pumps, an associated electrical building and equipment upgrades. This project is currently under design.

Project Cost	\$1,845,450
Recoverable Cost	\$609,000

**3. FM 2181 18-inch Force Main**

This project involves the installation of an 18-inch force main from the Westside Lift Station to Interstate Highway 35E. This project is currently under design.

Project Cost	\$943,400
Recoverable Cost	\$311,300

**4. UTRWD System Contract**

As a wholesale customer to Upper Trinity Regional Water District (UTRWD) Corinth is required to share in costs for wastewater capital improvements which are intended to meet increasing demand

Project Cost	\$361,060
Recoverable Cost	\$361,060

**5. Wastewater Impact Fee Update**

Based on the projected future infrastructure needs, a Wastewater Impact Fee Update was completed to determine how much of the infrastructure costs may be recovered by the City. The recoverable costs associated with the Wastewater Impact Fee Update have been divided among the Upper Trinity East and Upper Trinity West service areas.

Project Cost	\$16,166
Recoverable Cost	\$16,166

## 4.5 WASTEWATER IMPACT FEE CALCULATION

Chapter 395 of the Local Government Code defines a service unit as follows, “Service Unit” means a standardized measure of consumption attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards and based on historical data and trends applicable to the political subdivision in which the individual unit of development is located during the previous 10 years.” Therefore, the City of Corinth defines a *service unit* based on historical wastewater usage over the past 10 years as compared to the estimated residential units. The City only has historical wastewater flow data for the Upper Trinity East and West service areas, the Denton service area wastewater flow is not metered. Since no data was available for the Denton area the table below only shows information related to the Upper Trinity East and West areas. The residential unit is the development type that predominately uses a 5/8”x 3/4” meter. The measure of consumption per service unit is based on a 5/8”x 3/4” meter and the data shown in **Table 4.5**.

**Table 4.5 Service Unit Consumption Calculation**

Year	Population <sup>1</sup>	Residential Units (2.9 persons/unit) <sup>1</sup>	Wastewater Flow Average Day Flow <sup>2</sup> (MGD)	Flow per Service Unit (GPD)
2001	10,503	3,622	0.57	157
2002	11,079	3,820	0.54	141
2003	12,335	4,253	0.53	125
2004	13,175	4,543	0.70	154
2005	13,557	4,675	0.69	148
2006	14,350	4,948	0.68	137
2007	15,958	5,503	1.28	232
2008	16,418	5,661	1.04	184
2009	17,120	5,903	1.19	202
2010	17,153	5,915	1.23	208
<b>Average Flow per Service Unit</b>				<b>169</b>

Wastewater Usage Source: City of Corinth

- (1) Source: 2011 Land Use Assumptions. Population shown represents Upper Trinity East and West areas only.
- (2) Historic Flow is for Upper Trinity East and West areas only. No meter data available for Denton area.

The City’s historic usage of 169 gallons per service unit is considerably less than the usage projected in the City’s Wastewater Master Plan. The master plan projects a usage of 232 gallons per day per service unit. There are numerous possible explanations for the variance in the historic data versus the master plan projections:



1. Inaccuracies associated with measuring wastewater flow
2. The historic data represents a large number of dry years which results in lower wastewater demands. The master plan focuses on projected demands for wet weather events.
3. No flow data available for the Denton Service Area
4. Master Plan over projecting demands

After evaluating the data available and weighing the possible explanations for the variations in the projected demands versus historic demands, it was decided to use the Master Plan demand projection of 232 gallons per day.

Based on the City’s 10-year growth projections and the resulting wastewater flow projections, wastewater service will be required for 2,584 additional service units. The calculation is as follows:

- A service unit, which is a unit of development that discharges approximately 232 gallons per day (GPD), is a typical residential connection that uses a 5/8”x 3/4” meter. Tables 4.6.1 – 4.6.3 outlines the future wastewater discharge projections and its relationship to the additional service units projected for the next 10-years.

**Table 4.6.1 Denton Service Area 10-year Additional Service Unit Calculation**

Year	Average Day Flow (MGD)	Service Unit Demand (GPD)	Service Units
2011	0.28	232	1,207
2021	0.31	232	1,336
<b>10-year Additional Service Units</b>			<b>129</b>

**Table 4.6.2 Upper Trinity East Service Area 10-year Additional Service Unit Calculation**

Year	Average Day Flow (MGD)	Service Unit Demand (GPD)	Service Units
2011	0.88	232	3,793
2021	1.27	232	5,474
<b>10-year Additional Service Units</b>			<b>1,681</b>

**Table 4.6.3 Upper Trinity West Service Area 10-year Additional Service Unit Calculation**

Year	Average Day Flow (MGD)	Service Unit Demand (GPD)	Service Units
2011	0.70	232	3,017
2021	0.88	232	3,791
<b>10-year Additional Service Units</b>			<b>774</b>

Impact fee law allows for a credit calculation to credit back the development community based on the utility revenues or ad valorem taxes that are allocated for paying a portion of future capital improvements. The intent of this credit is to prevent the City from double charging development for future capital improvements via impact fees and utility rates. If the City chooses not to do a financial analysis to determine the credit value, they are required by law to reduce the recoverable cost by 50 percent. The City has chosen the latter; therefore, the maximum recoverable cost for impact fee shown below is 50 percent of the Pre Credit Recoverable Cost.

A breakdown of the 10-year recoverable costs and the associated impact fee for each service area per service unit is as follows

**Table 4.7.1 Denton Service Area 10-year Recoverable Cost Breakdown**

<b>Pre Credit Recoverable Cost for Impact Fee</b>	<b>\$0</b>
<b>Credit for Utility Revenues</b>	<b>(\$0)</b>
<b>Maximum Recoverable Cost for Impact Fee</b>	<b>\$0</b>

$$\text{Impact fee per service unit} = \frac{\text{10-year recoverable costs}}{\text{10-year additional service units}}$$

$$\text{Impact fee per service unit} = \frac{\$0.00}{129}$$

$$\text{Impact fee per service unit} = \$0.00$$

Therefore, the maximum assessable impact fee for the Denton service area is **\$0.00**.

**Table 4.7.2 Upper Trinity East Service Area 10-year Recoverable Cost Breakdown**

<b>Pre Credit CIP Recoverable Cost for Impact Fee</b>	<b>\$2,641,806</b>
<b>Financing Cost (5.5% Provided by City)</b>	<b>\$1,036,116</b>
<b>Pre Credit Total</b>	<b>\$3,677,922</b>
<b>Credit for Utility Revenues</b>	<b>(\$1,838,961)</b>
<b>Maximum Recoverable Cost for Impact Fee</b>	<b>\$1,838,961</b>

$$\text{Impact fee per service unit} = \frac{\text{10-year recoverable costs}}{\text{10-year additional service units}}$$

$$\text{Impact fee per service unit} = \frac{\$1,838,961}{1,681}$$

$$\text{Impact fee per service unit} = \$1,094$$

Therefore, the maximum assessable impact fee for the Upper Trinity East service area is **\$1,094**.

**Table 4.7.3 Upper Trinity West Service Area 10-year Recoverable Cost Breakdown**

Pre Credit CIP Recoverable Cost for Impact Fee	\$1,445,866
Financing Cost (5.5% Provided by City)	\$567,069
<b>Pre Credit Total</b>	<b>\$2,012,935</b>
<b>Credit for Utility Revenues</b>	<b>(\$1,006,467)</b>
<b>Maximum Recoverable Cost for Impact Fee</b>	<b>\$1,006,467</b>

$$\text{Impact fee per service unit} = \frac{\text{10-year recoverable costs}}{\text{10-year additional service units}}$$

$$\text{Impact fee per service unit} = \frac{\$1,006,467}{774}$$

$$\text{Impact fee per service unit} = \$1,300$$

Therefore, the maximum assessable impact fee for the Upper Trinity West service area is **\$1,300**.

For a development that requires a different size meter, a service unit equivalent is established at a multiplier based on its capacity with respect to the 5/8" x 3/4" meter. The maximum impact fee that could be assessed for other meter sizes is based on the value shown on **Table 4.8, Service Unit Equivalency Table for Commonly Used Meters**.



**Table 4.8 Service Unit Equivalency Table for Commonly Used Meters**

Meter Size*	Maximum Continuous Operating Capacity (GPM)**	Service Unit Equivalent	Maximum Assessable Fee per Service Area (\$)		
			Denton	Upper Trinity East	Upper Trinity West
5/8"x 3/4" PD	10	1	\$0	1,094	1,300
3/4" PD	15	1.5	\$0	1,641	1,950
1" PD	25	2.5	\$0	2,735	3,250
1 1/2" PD	50	5	\$0	5,470	6,500
2" PD	80	8	\$0	8,752	10,400
2" Compound	80	8	\$0	8,752	10,400
2" Turbine	100	10	\$0	10,940	13,000
3" Compound	160	16	\$0	17,504	20,800
3" Turbine	240	24	\$0	26,256	31,200
4" Compound	250	25	\$0	27,350	32,500
4" Turbine	420	42	\$0	45,948	54,600
6" Compound	500	50	\$0	54,700	65,000
6" Turbine	920	92	\$0	100,648	119,600
8" Compound	800	80	\$0	87,520	104,000
8" Turbine	1,600	160	\$0	175,040	208,000
10" Turbine	2,500	250	\$0	273,500	325,000

\* PD = Positive Displacement Meter (Typical residential meter)

\*\*Operating capacities obtained from American Water Works Association (AWWA) C-700-02



Kimley-Horn  
and Associates, Inc.



## Appendix A – Conceptual Level Project Cost Projections

Client: City of Corinth	Date: 9/21/2011
Project: Wastewater CIP	Prepared By: CCC
KHA No.: 061008044	Checked By: MAS

Title: Summary
----------------

Item No.	Item Description	Item Cost
<b>Upper Trinity East Basin</b>		
6	15" Wastewater Line from Kensington Park Apartments to Burl Lift Station	\$740,000
7	Lift Station 3A Upgrade	\$170,000
8	North Corinth 8" Wastewater Line	\$300,000
9	8" Wastewater Line Crossing IH 35E	\$230,000
	<b>SUBTOTAL</b>	<b>\$1,440,000</b>
<b>Upper Trinity West Basin</b>		
2	Westside Lift Station Improvements (HDR)	\$1,845,450
3	FM 2181 18" Force Main (Halff and Associates, Inc.)	\$943,400
	<b>SUBTOTAL</b>	<b>\$2,788,850</b>
<b>TOTAL</b>		<b>\$4,228,850</b>

**Basis for Cost Projection:**

- No Design Completed
- Preliminary Design
- Final Design

The Engineer has no control over the cost of labor, materials, equipment, or over the Contractor's methods of determining prices or over competitive bidding or market conditions. Opinions of probable costs provided herein are based on the information known to Engineer at this time and represent only the Engineer's judgment as a design professional familiar with the construction industry. The Engineer cannot and does not guarantee that proposals, bids, or actual construction costs will not vary from its opinions of probable costs.

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Wastewater CIP	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 061008044	<b>Checked By:</b> MAS

**Title: 15" Wastewater Line from Kensington Park Apartments to Burl Lift Station**

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$26,000.00	\$26,000
2	15" PVC Wastewater Pipe	1,450	LF	\$120.00	\$174,000
3	27" Bore With Steel Casing	400	LF	\$700.00	\$280,000
4	48" Diameter Wastewater Manhole	4	EA	\$7,500.00	\$30,000
5	Trench Safety	1,450	LF	\$2.00	\$2,900
6	Connect to Existing Wastewater Manhole	4	EA	\$3,500.00	\$14,000

**Basis for Cost Projection:**

- No Design Completed
- Preliminary Design
- Final Design

Subtotal:		\$526,900
Engineering/ Survey/ Testing (%)	20	\$105,400
Contingency (%)	20	\$105,400
<b>Total:</b>		<b>\$740,000</b>
		\$950,800

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Wastewater CIP	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 061008044	<b>Checked By:</b> MAS

<b>Title:</b> Lift Station 3A Upgrade
---------------------------------------

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$6,000.00	\$6,000
2	Submersible Pump and Motor	1	EA	\$50,000.00	\$50,000
3	Piping	1	LS	\$20,000.00	\$20,000
4	Electrical	1	LS	\$15,000.00	\$15,000
5	SCADA	1	LS	\$10,000.00	\$10,000
6	Valves	1	LS	\$20,000.00	\$20,000

**Basis for Cost Projection:**

- No Design Completed
- Preliminary Design
- Final Design

<b>Subtotal:</b>		\$121,000
Engineering/ Survey/ Testing (%)	20	\$24,200
Contingency (%)	20	\$24,200
<b>Total:</b>		<b>\$170,000</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Wastewater CIP	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 061008044	<b>Checked By:</b> MAS

**Title:** North Corinth 8" Wastewater Line

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$11,000.00	\$11,000
2	8" PVC Wastewater Pipe	1,850	LF	\$85.00	\$157,250
3	48" Diameter Wastewater Manhole	4	EA	\$7,500.00	\$30,000
4	Trench Safety	1,850	LF	\$2.00	\$3,700
5	Connect to Existing Wastewater Manhole	3	EA	\$3,500.00	\$10,500
<b>Basis for Cost Projection:</b>					
<input checked="" type="checkbox"/>	No Design Completed				
<input type="checkbox"/>	Preliminary Design				
<input type="checkbox"/>	Final Design				
<b>Subtotal:</b>					\$212,450
Engineering/ Survey/					
Testing (%)					
Contingency (%)					
<b>Total:</b>					<b>\$300,000</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Wastewater CIP	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 061008044	<b>Checked By:</b> MAS

**Title:** 8" Wastewater Line Crossing IH 35E

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (5%)	1	LS	\$8,000.00	\$8,000
2	8" PVC Wastewater Pipe	200	LF	\$85.00	\$17,000
3	16" Bore and Steel Casing	400	LF	\$300.00	\$120,000
4	48" Diameter Wastewater Manhole	1	EA	\$7,500.00	\$7,500
5	Trench Safety	200	LF	\$2.00	\$400
6	Connect to Existing Wastewater Manhole	3	EA	\$3,500.00	\$10,500

**Basis for Cost Projection:**

- No Design Completed
- Preliminary Design
- Final Design

Subtotal:		\$163,400
Engineering/ Survey/ Testing (%)	20	\$32,700
Contingency (%)	20	\$32,700
<b>Total:</b>		<b>\$230,000</b>

\$295,400

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Wastewater CIP	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 061008044	<b>Checked By:</b> MAS

<b>Title:</b> Westside Lift Station Improvements (HDR)
--------------------------------------------------------

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Westside Lift Station Installation (HDR)	1	LS	\$1,503,650.00	\$1,503,650
<b>Basis for Cost Projection:</b>					
<input checked="" type="checkbox"/>	No Design Completed	Subtotal:			\$1,503,650
<input type="checkbox"/>	Preliminary Design	Engineering/			
<input type="checkbox"/>	Final Design	Survey/			\$341,800
			23	Testing (%)	
			0	Contingency (%)	\$0
<b>Total:</b>					<b>\$1,845,450</b>

<b>Client:</b> City of Corinth	<b>Date:</b> 9/21/2011
<b>Project:</b> Wastewater CIP	<b>Prepared By:</b> CCC
<b>KHA No.:</b> 061008044	<b>Checked By:</b> MAS

<b>Title:</b> FM 2181 18" Force Main (Half and Associates, Inc.)
------------------------------------------------------------------

Item No.	Item Description	Quantity	Unit	Unit Price	Item Cost
1	Mobilization (4% Per Half)	1	LS	\$30,000.00	\$30,000
2	18" Force Main Line	10,251	LF	\$55.00	\$563,805
3	18" Force Main BOTO	339	LF	\$52.00	\$17,628
4	Air Release Valve	11	EA	\$2,000.00	\$22,000
5	Meter Station for 18-inch Force Main	1	EA	\$115,000.00	\$115,000
6	Trench Safety	10,251	LF	\$1.00	\$10,251
7	Connect to Existing Forcemain	2	LS	\$1,500.00	\$3,000

**Basis for Cost Projection:**

- No Design Completed
- Preliminary Design
- Final Design

<b>Subtotal:</b>		\$761,684
Engineering/ Survey/ Testing (55%)	55	\$143,600
*\$260,960		
Contingency (%)	5	\$38,100
<b>Total:</b>		<b>\$943,400</b>