

**WATER & WASTEWATER IMPACT  
FEE UPDATE**

**2023 to 2033**

***Submitted To***



***"PRIDE IN OUR PAST . . . ENTHUSIASM FOR THE FUTURE"***

***Submitted By***

***BIRKHOFF, HENDRICKS & CARTER, L.L.P.  
PROFESSIONAL ENGINEERS  
DALLAS, TEXAS***

***April 2023***

**BIRKHOFF, HENDRICKS & CARTER, L.L.P.**  
**PROFESSIONAL ENGINEERS**

11910 Greenville Ave., Suite 600

Dallas, Texas 75243

Phone (214) 361-7900

www.bhellp.com

JOHN W. BIRKHOFF, P.E.  
GARY C. HENDRICKS, P.E., R.P.L.S.  
JOE R. CARTER, P.E.  
ANDREW MATA, JR., P.E.

DEREK B. CHANEY, P.E., R.P.L.S.  
CRAIG M. KERKHOFF, P.E., CFM  
JUSTIN R. IVY, P.E.  
COOPER E. REINBOLD, P.E.

Mr. David Henley  
City Manager  
City of Ovilla  
105 S. Cockrell Hill Road  
Ovilla, Texas 75154

Re: Water & Wastewater Impact Fee Update

Dear Mr. Henley:

This report presents the results of the City of Ovilla Water & Wastewater Impact Fee Update for the planning years 2023 through 2033. This report includes the updated land use assumptions (prepared by the City's Comprehensive Land Use Plan Review Committee), the updated impact fee Capital Improvements Plan, and the updated Maximum Impact Fees by meter size for water and wastewater. The maximum allowable fees per service unit (for a 5/8 x 3/4-inch water meter), adjusted to fifty percent (50%) of the calculated fees are the following:

**Maximum Allowable Water Impact Fee per Service Unit ..... \$3,355.31**

**Maximum Allowable Wastewater Impact Fee per Service Unit ..... \$5,314.75**

We have enjoyed working with the City on this important study and are available to discuss the findings and conclusions of this updated impact fee further at your convenience. We look forward to our continued working relationship with you and the City of Ovilla.

Sincerely yours,



Andrew Mata Jr., P.E.

**CITY OF OVILLA, TEXAS**  
**WATER & WASTEWATER IMPACT FEE UPDATE**  
*2023 To 2033*

**TABLE OF CONTENTS**

	<b><u>Page No.</u></b>
<b>A. Introduction .....</b>	<b>1</b>
<b>B. Glossary .....</b>	<b>2</b>
<b>C. Land Use Assumptions Summary .....</b>	<b>6</b>
Figure No. 1: Proposed Developments .....	7
C.1 Comprehensive Land Use Plan - Chapter 3 .....	8
C.2 Land Use & Population Summary Tables .....	15
<b>D. Definition of a Service Unit – Water and Wastewater .....</b>	<b>18</b>
<b>E. Calculation of Water &amp; Wastewater – Living Unit Equivalents 2016-2026 .....</b>	<b>19</b>
<b>F. Water Distribution System .....</b>	<b>20</b>
F.1 Existing Pump Stations, Ground Storage Reservoirs & Elevated Storage Tanks .....	20
F.2 Distribution Lines .....	21
F.3 Water Distribution System Capital Improvement Plan .....	21
Figure No. 2: Water Distribution System Capital Improvement Plan Map .....	22
F.4 Cost of Facilities .....	23
F.5 Utilized Capacity .....	24
<b>G. Wastewater Collection System .....</b>	<b>27</b>
G.1 General .....	27
G.2 Collection Lines .....	27
G.3 Treatment .....	28
G.4 Capital Improvement Program .....	28
Figure No. 3: Wastewater Capital Improvement Plan Map .....	30
G.5 Utilized Capacity .....	32

<b>H. Calculation of Maximum Impact Fees – Water &amp; Wastewater .....</b>	<b>33</b>
H.1 Maximum Allowable Water Impact Fee .....	33
H.2 Maximum Allowable Wastewater Impact Fee .....	33
H.3 Allowable Maximum Fee Per Living Unit and Meter Size .....	35

#### **Appendix "A": Water Distribution System - Impact Fee Data**

- (1) Existing Facilities – Pump Station, Ground Storage Reservoir, Elevated Storage Tanks
- (2) Existing Water Lines
- (3) Proposed Water Lines

#### **Appendix "B": Wastewater Collection System - Impact Fee Data**

- (1) Existing Facilities - Wastewater Treatment Plant, Trunk Lines
- (2) Proposed Treatment Facilities Improvements
- (3) Existing Collection Lines
- (4) Proposed Collection Lines

**CITY OF OVILLA, TEXAS**  
**WATER & WASTEWATER IMPACT FEE UPDATE**  
**2023 To 2033**

**A. INTRODUCTION**

Chapter 395, of the Local Government Code is an act that provides guidelines for financing capital improvements required by new development in municipalities, counties, and certain other local governments. Under Chapter 395, political subdivisions receive authorization to enact or impose impact fees on land that is located within their political subdivision's corporate boundaries or extraterritorial jurisdictions. No governmental entity or political subdivision can enact or impose an impact fee unless they receive specific authorization by state law or by Chapter 395.

An "Impact Fee" is a charge or assessment imposed by a political subdivision for new development within its service area in order to generate revenue for funding or recouping the costs of capital improvements of facility expansions necessitated by and attributable to the new development.<sup>1</sup> The City of Ovilla's current water Certificate of Convenient and Necessity (CCN) is CCN Numbers 11459 and 11589, and current sewer CCN is CCN No. 21041. The first step in determining an impact fee is preparation of land use and growth assumptions for the service area for the next ten years. That step has been completed and provided by the City. Next, a Capital Improvements Plan must be created to describe the water, wastewater and roadway infrastructure that will be necessary to serve the anticipated land uses and growth. The following section describes the Water and Wastewater Impact Fee.

**WATER AND WASTEWATER IMPACT FEES**

The following items can be included in the water and wastewater impact fee calculation:

- 1) The portion of the cost of the new infrastructure that is to be paid by the City, including engineering, property acquisition and construction cost.
- 2) Existing excess capacity in lines and facilities that will serve future growth and which were paid for in whole or part by the City and part by the Developer.
- 3) Interest and other finance charges on bonds issued by the City to cover its portion of the cost.

These items are summed and the utilized capacity is calculated over the impact fee period. The maximum allowable impact fee per service unit may not exceed fifty percent of the calculated

---

<sup>1</sup> P. 831, Texas Local Government Code, West's Texas Statutes and Codes, 1998 Edition.

maximum amount of the total utilized capital improvement cost divided by the total number of new standard service units. This maximum allowable impact fee recovers a portion of the City's costs to construct facilities to serve the new developments and growth. However, the City may recover the maximum fee by crediting the portion of utility service revenue generated by new service units during the 10-year program period.

Chapter 395 requires that an update of the land use assumptions, capital improvements plan, and impact fees be performed every five years, unless it is determined by the political subdivision after a review that such an update is not necessary.

This section of the report constitutes the City's 2023 water and wastewater portion of the Capital Improvements Plan, and the maximum allowable impact fees. As required by state law, the study period is a ten-year period with 2023 as the base year. The engineering analysis of the water and wastewater systems is based on established land use in the year 2023, projected land use patterns through the year 2033, and on proposed infrastructure.

## **B. GLOSSARY**

1. Advisory Committee means the capital improvements advisory committee established by the City for purposes of reviewing and making recommendations to the City Council on adoption and amendment of the City's impact fee program.
2. Area-related facility means a capital improvement or facility expansion which is designated in the impact fee capital improvements plan and which is not a site-related facility. Area-related facility may include a capital improvement which is located off-site, or within or on the perimeter of the development site.
3. Assessment means the determination of the amount of the maximum impact fee per service unit which can be imposed on new development.
4. Capital Improvement means either a water facility, wastewater facility or roadway with a life expectancy of three or more years, to be owned and operated by or on behalf of the City.
5. City means the City of Ovilla, Texas.
6. Credit means the amount of the reduction of an impact fee due, determined under this ordinance or pursuant to administrative guidelines that is equal to the value of area-related facilities provided by a property owner pursuant to the City's subdivision or zoning regulations or requirements, for the same type of facility.

7. Facility expansion means either a water facility expansion, sewer facility expansion or roadway expansion.
8. Final plat approval means the point at which the applicant has complied with all conditions of approval in accordance with the City's subdivision regulations, and the plat has been approved for filing with Ellis County.
9. Impact fee means either a fee for water facilities, wastewater facilities or roadway facilities, imposed on new development by the City pursuant to Chapter 395 of the Texas Local Government Code in order to generate revenue to fund or recoup the costs of capital improvements or facility expansion necessitated by and attributable to such new development. Impact fees do not include the dedication of rights-of-way or easements for such facilities, or the construction of such improvements, imposed pursuant to the City's zoning or subdivision regulations.
10. Impact fee capital improvements plan means either a water capital improvements plan, wastewater capital improvements plan or roadway capital improvements plan, adopted or revised pursuant to the impact fee regulations.
11. Land use assumptions means the projections of population and growth, and associated changes in land uses, densities and intensities over at least a ten-year period, as adopted by the City and as may be amended from time to time, upon which the capital improvements plans are based.
12. Land use equivalency table means a table converting the demands for capital improvements generated by various land uses to numbers of service units, as may be amended from time to time.
13. New development means the subdivision of land; the construction, reconstruction, redevelopment, conversion, structural alteration, relocation, or enlargement of any structure; or any use or extension of the use of land; any of which increases the number of service units.
14. Plat has the meaning given the term in the City's subdivision regulations. Plat includes replat.

15. Platting has the meaning given the term in the City's subdivision regulations. Platting includes replatting.
16. Property owner has the meaning given the term in the City's subdivision regulations. Property owner includes the developer for a new development.
17. Recoupment means the imposition of an impact fee to reimburse the City for capital improvements which the City had previously oversized to serve new development.
18. Service area means either a water service area or wastewater benefit area within the City, within which impact fees for capital improvements or facility expansion will be collected for new development occurring within such area, and within which fees so collected will be expended for those types of improvements or expansions identified in the type of capital improvements plan applicable to the service area. For roadways, it means a roadway service area within the city limits.
19. Service unit means the applicable standard units of measure shown on the land use equivalency table in the Impact Fees Capital Improvements Plan which can be converted to water meter equivalents, for water or for wastewater facilities, which serves as the standardized measure of consumption, use or generation attributable to the new unit of development. For roadway facilities, the service unit is converted vehicle miles.
20. Site-related facility means an improvement or facility which is for the primary use or benefit of a new development, and/or which is for the primary purpose of safe and adequate provision of water, wastewater or roadway facilities to serve the new development, and which is not included in the impact fees capital improvements plan and for which the property owner is solely responsible under subdivision or other applicable development regulations.
21. Utility connection means installation of a water meter for connecting a new development to the City's water system, or connection to the City's wastewater system.
22. Wastewater facility means a wastewater interceptor or main, lift station or other facility included within and comprising an integral component of the City's collection system for wastewater. Wastewater facility includes land, easements or structure associated with such facilities. Wastewater facility excludes site-related facilities.

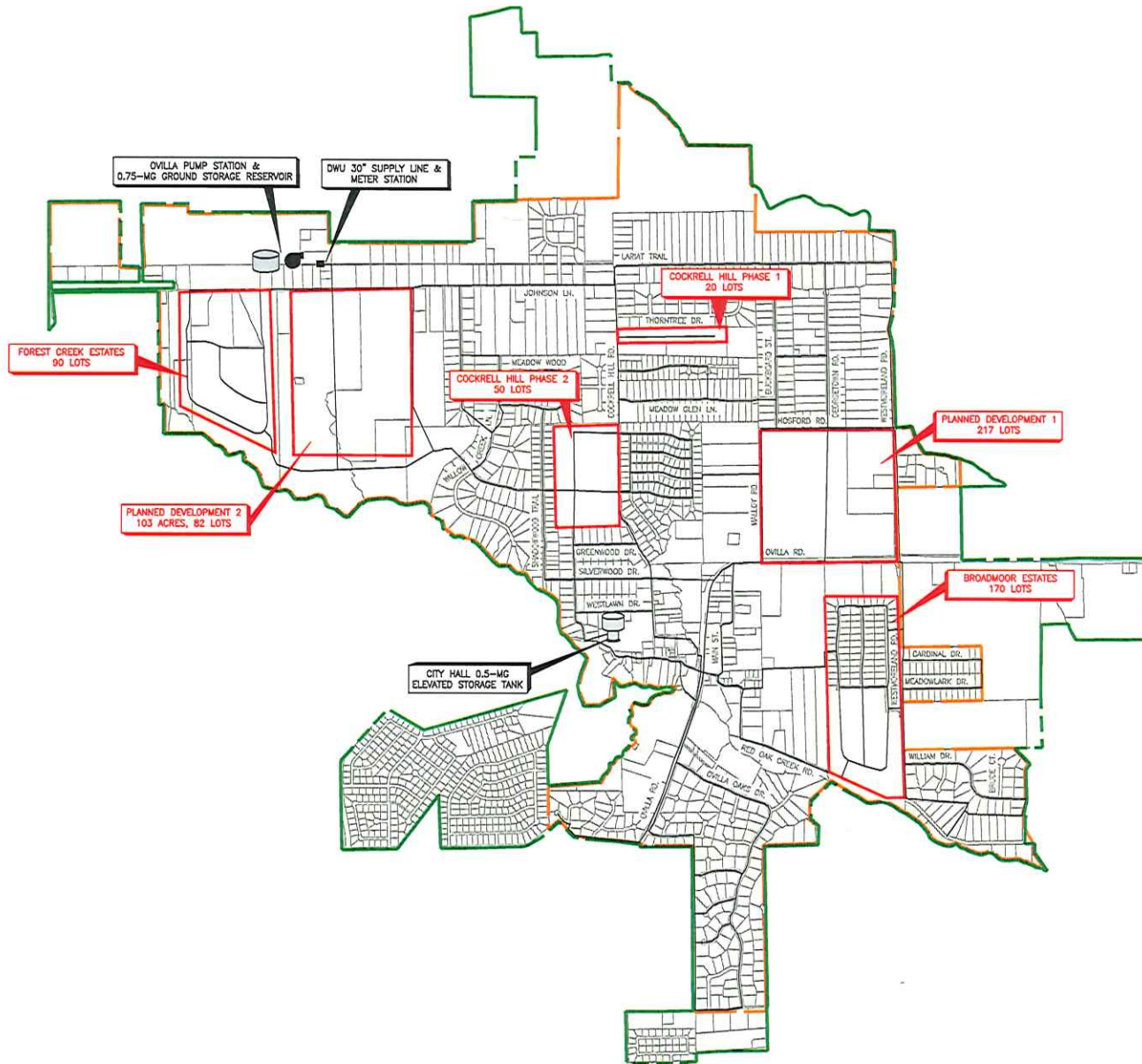


23. Wastewater facility expansion means the expansion of the capacity of any existing wastewater improvement for the purpose of serving new development, but does not include the repair, maintenance, modernization, or expansion of an existing sewer facility to serve existing development.
24. Wastewater capital improvements plan means the adopted plan, as may be amended from time to time, which identifies the wastewater facilities or wastewater expansions and their associated costs which are necessitated by and which are attributable to new development, for a period not to exceed 10 years.
25. Water facility means a water interceptor or main, pump station, storage tank or other facility included within and comprising an integral component of the City's water storage or distribution system. Water facility includes land, easements or structures associated with such facilities. Water facility excludes site-related facilities.
26. Water facility expansion means the expansion of the capacity of any existing water facility for the purpose of serving new development, but does not include the repair, maintenance, modernization, or expansion of an existing water improvement to serve existing development.
27. Water improvements plan means the adopted plan, as may be amended from time to time, which identifies the water facilities or water expansions and their associated costs which are necessitated by and which are attributable to new development, for a period not to exceed 10 years.
28. Water meter means a device for measuring the flow of water to a development, whether for domestic or for irrigation purposes.

### **C. LAND USE ASSUMPTIONS SUMMARY**

Under Chapter 395, of the Local Government Code, “Land Use Assumptions” includes a description of service area and projections of changes in land uses, densities, intensities, and population in the service area for a minimum of a 10-year period. In order to impose an impact fee, the City must adopt an order, ordinance, or resolution that establishes a public hearing date to consider the land use assumptions within the designated service area. After the public hearing on the land use assumptions, the City makes a determination of adoption or rejection of the ordinance, order or resolution approving the land use assumptions that will be utilized to develop the Capital Improvement Plan.

The Land Use Assumptions used in the impact fee study were prepared by the City of Ovilla’s Planning Department, presented in the following section, and titled “Comprehensive Land Use Plan”. The City’s Land Use Report assumes a range of growth rates from 2.37% per year to 5.05% per year. These growth rates were provided by the City in the Land Use Report and were calculated based on the historical growth rate of the City. Areas with known potential for development within the planning period were identified and lot counts provided by the City. The projected 2033 population was then calculated with the anticipated development. The projected growth in the 10-year planning period only accounts for the area within the City of Ovilla’s existing Water and Wastewater CCN. The average annual growth rate was calculated and applied annually to each year in the study period to buildout. These calculated populations are shown in Tables C-3 and C-4 (Pages 15 & 16) of this report. A summary of the City’s Land Use Report is shown in Tables C-1 through C-2. Figure 1 shows the developments included in the 10-year period of the impact fee study.



## CITY OF OVILLA, TEXAS

### 2023-2033 PROPOSED DEVELOPMENTS

#### LEGEND

- CITY LIMITS
- EXISTING WATER CCN LIMITS
- EXISTING WATER LINE (NO IMPACT FEE)
- PROPOSED DEVELOPMENTS
- EXISTING WATER FACILITIES

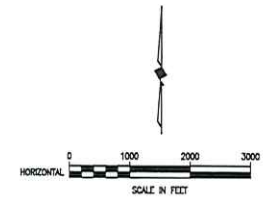
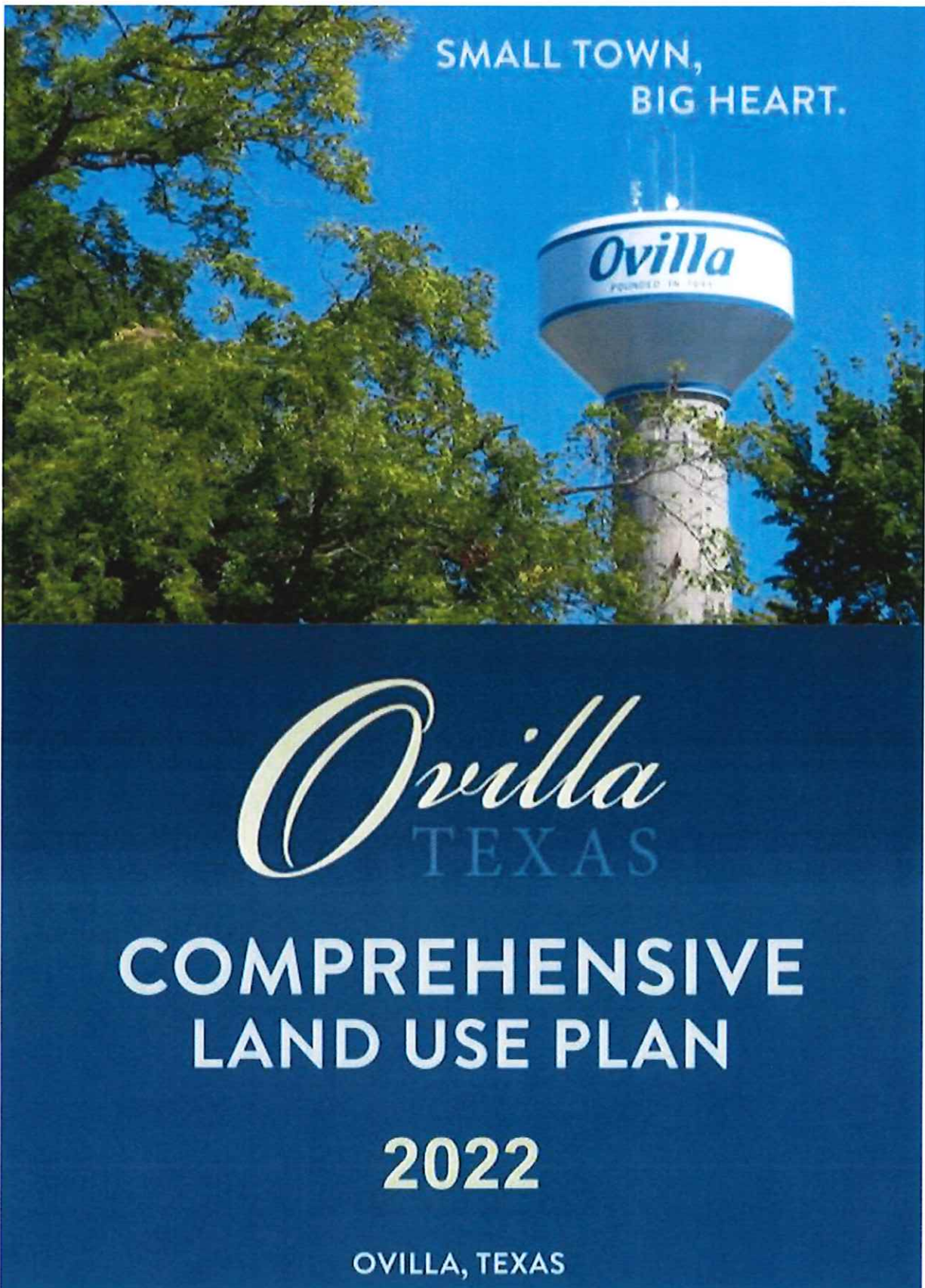


FIGURE NO. 1

BIRKHOFF, HENDRICKS & CARTER, L.L.P.  
PROFESSIONAL ENGINEERS  
DALLAS, TEXAS  
APRIL 2023

C.1 Comprehensive Land Use Plan





# City of Ovilla

## Comprehensive Land Use Plan

### April 2022

*Original Plan  
adopted 2000*

*2000 Plan Revised by:*

**MPRG inc.**   
Municipal Planning Resources Group, Inc.

*First Update  
adopted 2010*

*2010 Plan Revised by:*

**Kimley»Horn**  
Expect More. Experience Better.

*Second Update  
adopted 2016*

*2022 Plan Revised by:*

**Kimley»Horn**  
Expect More. Experience Better.

*Third Update  
adopted 2022*

# **City of Ovilla, Texas Comprehensive Land Use Plan**

## **City Council**

Richard Dormier, Mayor  
Doug Hunt, Place 4, Mayor Pro Tem  
Place 1, Rachel Huber      Place 2, Dean Oberg  
Place 3, David Griffen      Place 5, Michael Myers

## **Planning and Zoning Commission**

Carol Lynch, Chair (Place 3)  
Alan Whittaker, VP (Place 4)  
Place 1, Patrick Gray      Place 2, Josh Lewis  
Place 5, Dani Muckleroy      Place 6, Fred Hart  
Place 7, Vacant

## **Staff**

Pam Woodall, City Manager  
Bobbie Jo Taylor, City Secretary

## **Prepared by:**

City of Ovilla  
Comprehensive Land Use Plan Review Committee

**April 2022**

## **The Comprehensive Land Use Plan Review Committee**

**John Knight, Chair**

**Karl Kouns**

**Dani Muckleroy**

**Gary Jones**

**Michael Mohon**

**Kenneth Rarick**

**Alan Whittaker**

**Windy Zabojnik**

The Comprehensive Land Use Plan Review Committee is comprised of residents and representatives from the various City Council appointed Boards.

Over several months, the Comprehensive Land Use Update Committee conducted a series of open meetings to which the public was invited to attend and participate in the process of updating the Comprehensive Land Use Plan for the City of Ovilla.

## Chapter 3. Population

### Methodology

The population of a city plays a large role in long range planning exercises. In order to provide public facilities and services that will best serve the future needs of the citizenry, it is necessary to study the past and present size of the community, and finally to make projections that cover the planning period, in this case, 20 years. Population data for the Ovilla Comprehensive Land Use Plan was gathered from the U.S. Census Bureau and the North Central Texas Council of Governments (NCTCOG).

The current population for the City of Ovilla is 4,190. The City has shown a steady increase in population since its incorporation in 1963. The population of Ovilla has increased at an average rate of 5.05 percent per year, since 1970, the earliest available U.S. Census figures. The historic population trend for Ovilla is demonstrated in *Table 3.1, Historic Population of Ovilla, Texas*.

**Table 3.1**  
**Historic Population of Ovilla, Texas**

Year	Population	Change in Population per period	Average Change in Population per year
1970	339	--	--
1980	1,067	728	73 residents
1990	2,027	960	96 residents
2000	3,405	1,378	138 residents
2010	3,492	87	9 residents
2015	3,690	198	39 residents
2020	4,140	648	65 residents
2021	4,190	50	50 residents

Source: U.S. Census Bureau, NCTCOG

### Future Population

In order to project the future population of Ovilla, it is necessary to analyze past trends in the City's population. By studying the City's historic rate of growth, future population figures may be predicted, and ultimate build-out projections may be made. The average annual growth rate for the city of Ovilla was calculated using the following formula:

$$\left(1 + \frac{(P_x - P_0)}{x}\right)^x - 1 = \text{Average Annual Population Growth}$$

Where:

$P_x$  = New Population

$P_0$  = Old Population

$x$  = Number of years between  $P_x$  and  $P_0$

CITY OF OVILLA

POPULATION

COMPREHENSIVE LAND USE PLAN

PAGE 3-1



The population of the City of Ovilla grew at an average annual rate of 5.05 percent from 1970 until the present, and at a slower rate of 2.37 percent from 1990 until the present. With conditions remaining constant, it is reasonable to conclude that the City will continue to grow at a rate between these two figures, which would indicate an estimated total population of between 6,694 and 11,232 persons in the year 2041.

The key phrase in the previous statement is "conditions remaining constant." The addition of one or more large scale employers in Ovilla or the near vicinity could significantly change the population growth rate experienced by the City. Population projections obtained using 2.37 percent and 5.05 percent average growth rates appear in *Table 3.2. Historic and Future Populations for the City of Ovilla, Texas.*

**Table 3.2**  
**Historic and Future Populations for the City of Ovilla, Texas**

<b>Year</b>	<b>Historic Population</b>	<b>Lower Projection 2.37%</b>	<b>Higher Projection 5.05%</b>
1970	339		
1980	1,067		
1990	2,027		
2000	3,405		
2010	3,492		
2015	3,700		
2016	3,820		
2017	3,920		
2018	4,040		
2019	4,090		
2020	4,140		
2021	4,190		
2022		4,289	4,402
2023		4,391	4,624
2024		4,495	4,858
2025		4,602	5,103
2026		4,711	5,361
2027		4,822	5,632
2028		4,937	5,917
2029		5,054	6,216
2030		5,173	6,530
2031		5,296	6,860
2032		5,421	7,207
2033		5,550	7,571
2034		5,681	7,954
2035		5,816	8,356
2036		5,954	8,778
2037		6,095	9,222
2038		6,240	9,688
2039		6,387	10,177
2040		6,539	10,692
2041		6,694	11,232

*Source: U.S. Census Bureau, NCTCOG. Projections Estimated.*

### *Population at Build-out*

As discussed in the next chapter, over half of the property within the City of Ovilla's 5.7 square miles City limits is undeveloped land. This means that there is an abundance of land for residential development and future population growth. In addition to the property that is already in the City limits, the City of Ovilla has an extra-territorial jurisdiction (ETJ) of approximately 4.3 square miles. If all the ETJ is eventually annexed into the Ovilla City Limits, the ultimate size of the city will be ten square miles (10 sq. mi.). The build-out population occurs when all of the properties planned for residential uses in the entire planning area are completely developed. Based upon U.S. Census Bureau (2010) information, Kimley Horn and Associates, Inc. projects an estimated buildout population between 9,519 and 15,123 people.

With the projected future population for the next 20 years being 6,694 to 11,232, the City of Ovilla will reach 44 percent to 74 percent of the build-out population within the planning period for this plan. If the above trends continue, Ovilla will reach build-out sometime in the next 16 to 25 years.

In the near future, Ovilla can expect a steady continued growth, which will be managed most effectively by careful planning and citizen involvement in the governmental process.

*\*The Impact Fee Study buildout population only included the population within the City of Ovilla's existing Water and Wastewater CCN.*

## C.2 Land Use and Population Summary Tables

**TABLE C-1  
EXISTING LAND USE**

Land Use	Area (Ac.)	% Developed	% Undeveloped	% of Total
Residential (Single-Family)	1,843	95%	5%	52%
Residential - Vacant	87	0%	100%	2%
Commercial	62	3%	97%	2%
Commercial - Vacant	4	0%	100%	0%
Agriculture	1,425	0%	100%	41%
Public/Semi-Public	90	5.0%	95.0%	3%

*Total Developed:* 1,995 (Residential, Commercial, Institutional) 57%

*Total Undeveloped:* 1,516 (or Road, or Agriculture) 43%

*Total Land Area:* 3,511

*\* 44% to 74% of Buildout in next 20 years*

From 2023 City of Ovilla Land Use Report, Chapter 4, Page 4-1.

*\*The Impact Fee Study only included the areas of properties and developments within the City of Ovilla's existing Water and Wastewater CCN.*

**TABLE C-2  
HISTORICAL POPULATIONS & GROWTH RATES**

Year	Population
1970	339
1980	1,067
1990	2,027
2000	3,405
2010	3,492
2015	3,690
2020	4,140
2021	4,190
Growth	Years
5.05%	1970 - Present
2.37%	1990 - Present

From 2023 City of Ovilla Land Use Report, Chapter 3, Page 3-1 and 3-2

**TABLE C-3**  
**POPULATION PROJECTIONS**

**Historic & Future Populations for the City of Ovilla, Texas**

Year	Historic Population	* Lower Projection 2.37%	* Higher Projection 5.05	** Meter Count Projection 3.61%
1970	339	-----	-----	-----
1980	1,067	-----	-----	-----
1990	2,027	-----	-----	-----
2000	3,405	-----	-----	-----
2010	3,492	-----	-----	-----
2015	3,700	-----	-----	-----
2016	3,820	-----	-----	-----
2017	3,920	-----	-----	-----
2018	4,040	-----	-----	-----
2019	4,090	-----	-----	-----
2020	4,140	-----	-----	-----
2022	4,190	-----	-----	-----
2023	-----	4,289	4,402	4,341
2024	-----	4,391	4,624	4,498
2025	-----	4,495	4,857	4,660
2026	-----	4,602	5,103	4,828
2027	-----	4,711	5,360	5,002
2028	-----	4,822	5,631	5,183
2029	-----	4,937	5,915	5,370
2030	-----	5,054	6,214	5,564
2031	-----	5,173	6,528	5,765
2032	-----	5,296	6,858	5,864
2033	-----	5,421	7,204	5,972

\* City of Ovilla Land Use Report, Chapter 3, Page 3-3.

\*\* BHC Calculated Population Projection Based on City Provided Meter Count Projections.

The revised population projections were determined utilizing an average annual growth rate of 3.61% over the planning period. The average annual growth rate calculation and lot counts are shown in Table C-5 and are as follows:

$$\text{Average Annual Growth Rate (\%)} = \left[ 1 + \frac{2033 \text{ Population} - 2023 \text{ Population}}{2023 \text{ Population}} \right]^{1/\# \text{ yrs}} - 1$$

$$\begin{aligned} \text{Average Annual Growth Rate} &= \left[ 1 + \frac{(4,190 - 5,972)}{5,972} \right]^{1/10} - 1 \\ &= 3.61\% \end{aligned}$$

**TABLE C-4**  
**10 - YEAR POPULATION PROJECTIONS**  
**AND**  
**AVERAGE ANNUAL GROWTH RATE**

**10-Year Population Projection**

Development	Lots	Population
2023 Existing Population:	-----	4,190
1. Broadmoor Estates	170	522
2. Cockrell Hill Development 1	20	61
3. Cockrell Hill Development 2	50	154
4. Forest Creek Estates	90	276
5. Planned Development 1	217	517
6. Planned Development 2	82	252
<b>10-Year Population Growth:</b>	<b>629</b>	<b>1,782</b>
<b>2033 Population:</b>		<b>5,972</b>

Average Annual Growth Rate: 3.61%

**Densities Assumed**

Land Use	People per Unit
Senior Living	1.5
Single Family (R22)	3.07

**Planned Development**

Land Use	# Lots
R22	122
Senior Living	95
<b>Total:</b>	<b>217</b>

**10-Year Water Meter Projections**

Development	Lots	Meters
Existing 2023 Meters:	-----	1,314
1. Bradmoor Estates	170	170
2. Cockrell Hill Development 1	20	20
3. Cockrell Hill Development 2	50	50
4. Forest Creek Estates	90	90
5. Planned Development 1	217	217
6. Planned Development 2	82	82
<b>New Meters:</b>	<b>629</b>	<b>629</b>
<b>Total 2033 Meters (Exist.+New):</b>		<b>1,943</b>

Existing Water 2022 Meter Count Provided By City Staff (10/21/22)	
Size	# Meters
5/8x3/4	950
1"	353
1- 1/2"	2
2"	9
<b>Total:</b>	<b>1,314</b>

**10-Year Wastewater Meter Projections**

Development	Lots	Meters
Existing Meters:	-----	692
1. Bradmoor Estates	170	170
2. Cockrell Hill Development 1	20	20
3. Cockrell Hill Development 2	50	50
4. Forest Creek Estates	90	90
5. Planned Development 1	217	217
6. Planned Development 2	82	82
<b>New Meters:</b>	<b>629</b>	<b>629</b>
<b>Total 2033 Meters (Exist.+New):</b>		<b>1,321</b>

Existing 2022 WW Meter Count Provided By City Staff (02/20/17)	
Size	# Meters
5/8x3/4	692
1"	0
2"	0
<b>Total:</b>	<b>692</b>

#### **D. DEFINITION OF A SERVICE UNIT – WATER AND WASTEWATER**

Chapter 395 of the Local Government Code requires that impact fees be based on a defined service unit. A “service unit” means a standardized measure of consumption, use generation, or discharge attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards. The City of Ovilla has previously defined a water and wastewater service unit to be a 5/8” x 3/4” water meter. The service unit is based on the continuous duty capacity of a 5/8” x 3/4” water meter. This is the typical meter used for a single family detached dwelling, and therefore is considered to be equivalent to one “living unit”. Other meter sizes can be compared to the 5/8” x 3/4” meter through a ratio of water flows as published by the American Water Works Association as shown in Table D-1 below. This same ratio is then used to determine the proportional water and sewer impact fee amount for each water meter size.

**TABLE D-1  
LIVING UNIT EQUIVALENCIES  
FOR VARIOUS TYPES AND SIZES OF WATER METERS**

<b>Meter Type</b>	<b>Meter Size</b>	<b>Continuous Duty Maximum Rate <sup>(a)</sup></b>	<b>Living Unit Per Meter Size</b>
Simple	5/8” x 3/4”	10	1.0
Simple	1”	25	2.5
Simple	1½”	50	5.0
Simple	2”	80	8.0
Compound	2”	80	8.0
Turbine	2”	100	10.0
Compound	3”	160	16.0
Turbine	3”	240	24.0
Compound	4”	250	25.0
Turbine	4”	420	42.0
Compound	6”	500	50.0
Turbine	6”	920	92.0
Compound	8”	800	80.0
Turbine	8”	1,600	160.0
Turbine	10”	2,500	250.0
Turbine	12”	3,300	330.0

(a) Source: AWWA Standards: C700-02, Subsection 4.2, Table I, (2002)  
C701-02, Subsection 4.2, Table I, Class II, (2002)  
C702-01, Subsection 4.2, Table I, (2001)

**E. CALCULATION OF WATER & WASTEWATER - LIVING UNIT EQUIVALENTS**  
**2023-2033**

The City of Ovilla provided the existing water meter count by size category as of April 2023. In total, there are 1,314 water meters serving the existing population of 4,190 residents and businesses in the Water Service Area. Table E-1 shows the number of existing meters, the living unit equivalent factor, and the total number of living unit equivalents (LUE's) for water accounts. As shown in Table E-1, the new LUE's during the impact fee period total 629.

Similarly, the City has provided the number of wastewater accounts as of April 2023. Serving the 4,190 residents and businesses in the Sewer Service Area, there are 692 accounts. Table E-1 illustrates the existing Sewer accounts, their Living Unit Equivalency Factor and LUE's. As shown in Table E-1, the new LUE's during the impact fee period total 629.

**TABLE E-1**  
**WATER LIVING UNIT EQUIVALENTS BY METER SIZE**

Meter Size	2023			2033			New Living Units During Impact Fee Period
	Number of Water Meters	Living Unit Equivalent Ratio for 5/8" Used	Total Number of Equivalent Living Units	Number of Water Meters	Living Unit Equivalent Ratio for 5/8" Used	Total Number of Equivalent Living Units	
5/8"x3/4"	950	1.0	950	1,579	1.0	1,579	629
1"	355	2.5	888	355	2.5	888	0
2"	9	10.0	90	9	10.0	90	0
<b>Totals</b>	<b>1,314</b>		<b>1,928</b>	<b>1,943</b>		<b>2,557</b>	<b>629</b>

**TABLE E-2**  
**WASTEWATER LIVING UNIT EQUIVALENTS BY METER SIZE**

Meter Size	2023			2033			New Living Units During Impact Fee Period
	Number of Water Meters	Living Unit Equivalent Ratio for 5/8" Used	Total Number of Living Units	Number of Water Meters	Living Unit Equivalent Ratio for 5/8" Used	Total Number of Living Units	
5/8"x3/4"	692	1.0	692	1,321	1.0	1,321	629
<b>Totals</b>	<b>692</b>		<b>692</b>	<b>1,321</b>		<b>1,321</b>	<b>629</b>

## **F. WATER DISTRIBUTION SYSTEM**

Computer models for the years 2023 and 2033 were prepared based on the City's current Water Distribution System. The models were developed from residential population projections as provided in the Land Use Assumptions Report, prepared by the City of Ovilla's Planning Department. The residential population projection used for the water system analysis only accounts for the area within the City of Ovilla's existing Water CCN. The land areas follow closely to the construction of major facilities in the system as outlined in the Water Distribution Report. The additional growth within the next 10-years did not require improvements or additions to the existing pump station, ground storage reservoir or elevated storage. However, main distribution lines will need to be provided in order to support the anticipated growth.

All computer models were run for a 72-hour Extended Period Simulation to ensure proper sizing of the facilities to meet peak demand periods.

### **F.1 Existing Pump Stations, Ground Storage Reservoirs & Elevated Storage Tanks**

The existing water distribution system includes the facilities as shown below:

**TABLE F-1**  
**WATER DISTRIBUTION SYSTEM**  
**EXISTING PUMP STATIONS & GROUND STORAGE**

<b>Pump Station</b>	<b>Number Of Pumps</b>	<b>Rated Capacity (MGD)</b>	<b>Number of Ground Storage Reservoirs</b>	<b>Total Ground Storage Available (MG)</b>
Ovilla Pump Station	4	4.73	1	0.75
<b>Total:</b>	<b>4</b>	<b>4.73</b>	<b>1</b>	<b>0.75</b>

**TABLE F-2**  
**WATER DISTRIBUTION SYSTEM**  
**EXISTING ELEVATED STORAGE**

<b>Elevated Storage Tanks</b>	<b>Capacity in Million Gallons</b>
City Hall Elevated Storage Tank	0.5
<b>Total:</b>	<b>0.5</b>



The pump stations and ground storage facilities were analyzed on the maximum daily demand, while elevated storage acts dynamically and therefore was analyzed utilizing the difference between the Maximum Hourly Demand and the Maximum Daily Demand divided by four (6-hour drawdown time).

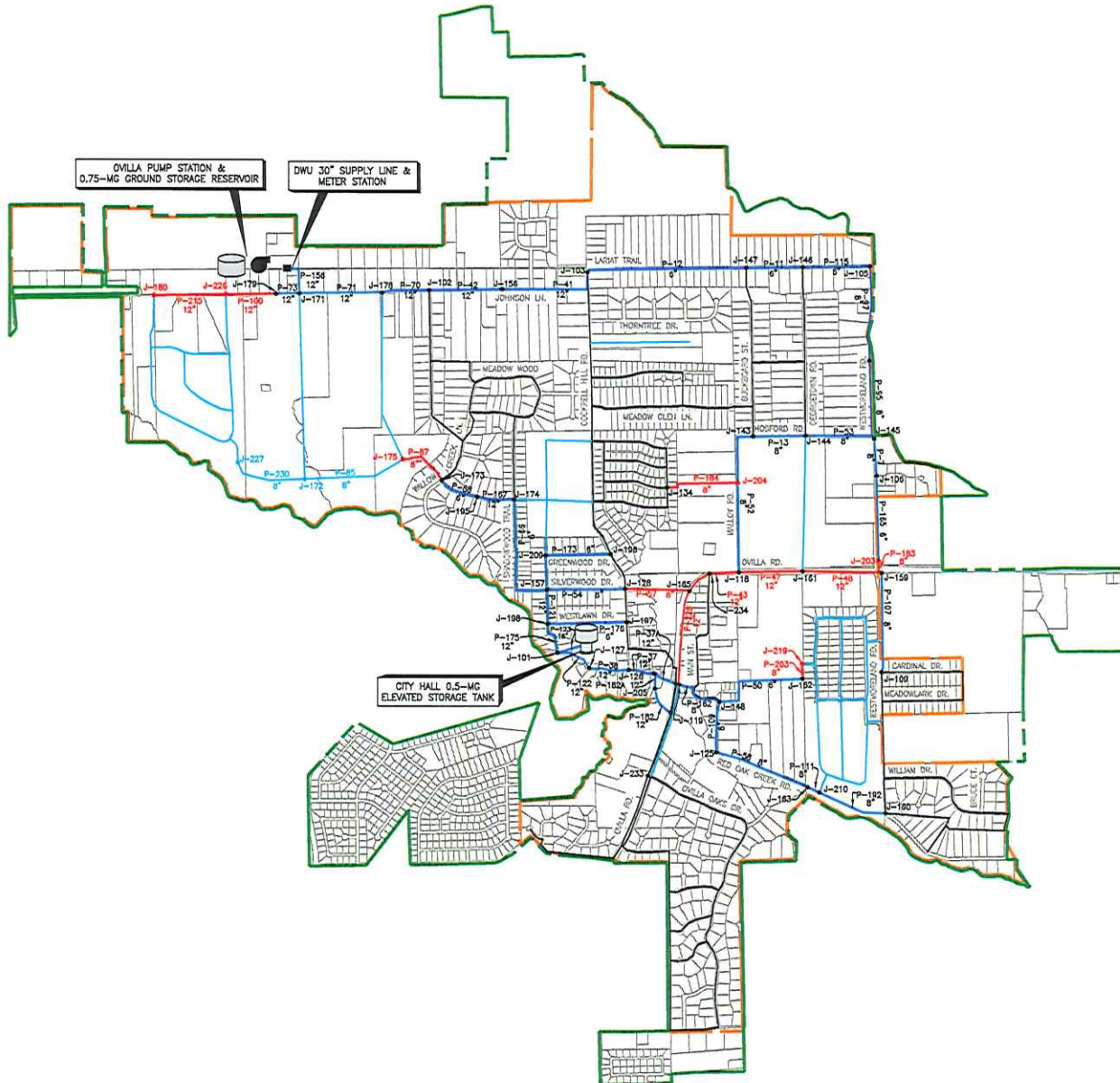
## **F.2 Distribution Lines**

The distribution lines consist of all lines within the service area planning boundary supplying water to customers in the City of Ovilla. Lines vary in size from 3/4-inch service lines to 12-inch transmission lines. Unless a smaller diameter water line is expected to be constructed by the City of Ovilla, only those proposed water lines 6-inches in diameter or larger were considered in the Impact Fee calculations. The cost of water lines includes construction cost, appurtenances (water valves, fire hydrants, taps, etc.), utility relocations, purchase of easements and engineering costs. Financing cost is included for each project assuming a bond rate of 5% over a 20-year term.

Unit cost for water lines 12-inches in diameter or larger, which are anticipated to be constructed by private development, include the City's oversize cost participation only. City initiated water lines include the full cost of the proposed facility. Developer initiated water line projects which are 8-inches or less in diameter are not included in this Impact Fee analysis, unless otherwise shown on the CIP map. The cost for these size lines are the responsibility of the developer.

## **F.3 Water Distribution System Capital Improvement Plan**

In order to meet the demands of the anticipated growth over the next 10-years, as provided in the Land Use Assumption Report, certain water distribution system improvements are required. Figure No. 1 shows the recommended system improvements and Table F-3 itemizes each project and the project cost. These recommended improvements form the basis for the Water Distribution System Impact Fee Calculation and totals \$2,440,598. Adding the cost of financing brings the total 10-year Water Distribution System Capital Improvement cost to \$3,711,891.



# CITY OF OVILLA, TEXAS WATER DISTRIBUTION SYSTEM 2023-2033 CAPITAL IMPROVEMENT PLAN

## LEGEND

- CITY LIMITS
- EXISTING WATER CCN LIMITS
- EXISTING WATER LINE (NO IMPACT FEE)
- P=11 8" EXISTING WATER LINE (IMPACT FEE)
- P=183 8" PROPOSED WATER LINE (IMPACT FEE)
- PROPOSED WATER LINE (NO IMPACT FEE)
- EXISTING WATER FACILITIES (IMPACT FEE)

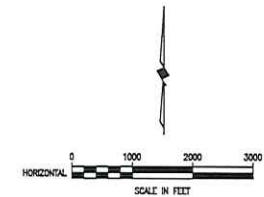


FIGURE NO. 2

BIRKHOFF, HENDRICKS & CARTER, L.L.P.  
 PROFESSIONAL ENGINEERS  
 DALLAS, TEXAS  
 APRIL 2023

#### **F.4 Cost of Facilities**

The existing facilities and waterlines are the major contributor to the Water Distribution System Impact Fee calculation and totals \$10,580,711. Adding the cost of financing brings the total 10-year Existing Water Distribution System Capital Improvement cost to \$13,071,626. The cost for the existing capital improvements were derived from previous impact fee studies. Water distribution facilities that are eligible to be included in the impact fee calculation and have been constructed within the previous impact fee period were added to the Existing Water Distribution System Capital cost.

The average unit costs for the proposed Capital Improvements were derived from a limited survey of projects, which bid recently, plus an estimated cost for engineering and easements. The cost and the utilized capacity of the existing water lines, pump stations, ground storage reservoirs, elevated storage tanks, and existing facility proposed improvements during the impact fee period are included in the Water and Wastewater Impact Fee Tables at the end of the Water/Wastewater Impact Fee section of this report.

**TABLE F-3**  
**CITY OF OVILLA, TEXAS**  
**2023 IMPACT FEE UPDATE**  
**WATER DISTRIBUTION SYSTEM**  
**10-YEAR CAPITAL IMPROVEMENT PLAN**

#### **PROPOSED WATER LINES**

<b>Project No. <sup>(3)</sup></b>	<b>Project</b>	<b>Size</b>	<b>Opinion of Project Cost <sup>(1)</sup></b>	<b>Debt Service <sup>(2)</sup></b>	<b>Total Project Cost</b>
1	1) Silverwood 8-inch Water Line Extension	8"	\$ 279,300	\$ 146,633	\$ 425,933
2	2) Pike Peaks Way 8-inch Water Line Extension	8"	\$ 222,500	\$ 116,813	\$ 339,313
3	3) Hummingbird Lane 6-inch Water Line Extension	6"	\$ 259,350	\$ 136,159	\$ 395,509
4	4) FM 664 8-inch Water Line Crossing	8"	\$ 45,600	\$ 23,940	\$ 69,540
5	5) Johnson Lane 12-inch Water Line Extension	12"	\$ 562,500	\$ 295,313	\$ 857,813
6	6) Elm Wood 12-inch Water Line Extension	12"	\$ 227,250	\$ 119,306	\$ 346,556
7	7) Ovilla Rd 12-inch Water Line Upsize from 8-inch	12"	\$ 324,360	\$ 170,289	\$ 494,649
<b>Subtotal: Proposed Water Lines</b>			<b>\$ 1,920,860</b>	<b>\$ 1,008,453</b>	<b>\$ 2,929,313</b>

*Continued on next page.*

## PLANNING EXPENSES

Project No.	Project	Opinion of Cost (1)(b)	Debt Service <sup>(2)</sup>	Total Project Cost
	Water Impact Fee Update	\$ 19,090	\$ -	\$ 19,090
	<b>Subtotal, Planning Expenses:</b>	<b>\$ 19,090</b>	<b>\$ -</b>	<b>\$ 19,090</b>
	<b>Water Distribution System CIP Grand Total:</b>	<b>\$ 1,939,950</b>	<b>\$ 1,008,453</b>	<b>\$2,948,403</b>

### Notes:

- (1) Opinion of Project Cost includes:
  - a) Engineer's Opinion of Construction Cost
  - b) Professional Services Fees (Survey, Engineering, Testing, Legal)
  - c) Cost of Easement or Land Acquisitions
- (2) Debt Service based on 20-year simple interest bonds at 5%

## F.5 Utilized Capacity

Utilized capacity for the water distribution system was calculated based on the size of water line required for each model year (2023, 2033 and build-out). Master planning of the water distribution system is based on the 72-hour extended period simulation (EPS). The pump stations' capacities are generally based on the maximum daily system demand while transmission and distribution facilities are sized based on either the maximum hourly demand or the minimum hourly demand, whichever demand is greater for a particular water line. Often times, the capacity of a water line is determined by the flows generated by the minimum hourly demand. The minimum hourly flows are usually higher in those lines which are used to refill elevated storage. Table F-4 on the following page shows the unit flows used for analysis of each element of the distribution system.

**TABLE F-4**  
**WATER DISTRIBUTION SYSTEM ANALYSIS**  
**BASIS OF DEMAND CALCULATION**

Type of Facilities	Demand Type	Impact Fee Per Capita Use
Pumping	Maximum Day	350 gallons/day
Distribution System	Maximum Hour	700 gallons/day
Ground Storage	Maximum Day x 6/24 Hours	
Elevated Storage	Maximum Hour - Maximum Day x 6/24 Hours	
Residential Fire-Flow	1,000 gallons/minute	
Commercial Fire Flow	3,000 gallons/minute	

For each line segment in the water distribution model, the build-out flow rate in any given line was compared to the flow rate in the same line for the 2023 and the 2033 models. The utilized capacity was then calculated for each year based on the build-out being 100% capacity. The utilized capacity during the Impact Fee period is the difference between the year 2023 percent utilized and the year 2033 percent utilized. The utilized capacity for each water distribution facility, both existing and proposed, is presented in detail in the Impact Fee Capacity Calculation Tables. Table F-5 summarizes the project cost and utilized cost over the impact fee period of 2023 to 2033 for each element of the Water Distribution System.

**TABLE F-5**  
**SUMMARY OF ELIGIBLE CAPITAL COST  
& UTILIZED CAPACITY COST**

<b>Water System</b>	<b>Total Capital Cost (\$)</b>	<b>Total 20-Year Project Cost (\$)</b>	<b>Utilized Capacity During Fee Period (\$)</b>
Existing Water Lines	\$ 3,633,961	\$ 3,813,480	\$ 621,179
Existing Water Facilities (City & DWU)	\$ 6,625,000	\$ 8,936,396	\$ 1,726,850
<b>Existing Water System Subtotal:</b>	<b>\$ 10,258,961</b>	<b>\$ 12,749,876</b>	<b>\$ 2,348,029</b>
Proposed Water Lines	\$ 1,920,860	\$ 2,929,313	\$ 1,853,867
Impact Fee Expenses	\$ 19,090	\$ 19,090	\$ 19,090
<b>Proposed Water System Subtotal:</b>	<b>\$ 1,939,950</b>	<b>\$ 2,948,403</b>	<b>\$ 1,872,957</b>
<b>TOTAL:</b>	<b>\$ 12,198,911</b>	<b>\$ 15,698,279</b>	<b>\$ 4,220,986</b>

## **G. WASTEWATER COLLECTION SYSTEM**

### **G.1 General**

The Trinity River Authority (TRA) owns and operates a substantial number of the wastewater facilities, and trunk mains within the City of Ovilla. The City pays for these services as well as portions of the system expansions in order to support growth. The project costs for these improvements and the City participation were obtained from TRA for those projects where the construction cost were known. Where the existing and future project costs were unknown, the TRA provided estimated project and City participation costs.

A Master Plan for the City's wastewater collection system has not been formally adopted, and hydraulic models were not available. Therefore, the utilized capacity for the impact fee eligible pipe segments within the collection system were calculated by comparing the existing wastewater flows with the calculated future flows. The capacity of the pipe segments was determined using Manning's equation with approximate slopes taken from U.S.G.S. mapping. Dividing the existing and future flows by the pipe capacity, a percent utilization was obtained for the years 2023 and 2033. The difference between the utilized capacity in 2033 and 2023 was used in calculating the maximum allowable impact fee for the Wastewater Collection System.

### **G.2 Collection Lines**

The wastewater collection system analysis covered all drainage basins within the study area. Sanitary sewer line sizes 8-inches in diameter and smaller were typically omitted from the study, leaving only the interceptor and main sewer lines to be included. However, hydraulically significant 8-inch lines were included as necessary.

The wastewater project cost includes necessary appurtenances (manholes, aerial crossings and the like), purchase of easements, utility relocation, pavement removal and replacement, and engineering costs. For existing Impact Fee projects, actual costs were utilized where known. Future project cost estimates were based on 2023 average unit cost per linear feet and includes engineering, easements, and construction cost. Financing cost is included for each project assuming a bond rate of 5% over a 20-year term.

This impact fee study anticipates developer initiated and funded sanitary sewer lines up to 8-inches in diameter. Therefore, the City's predicted up size cost for sanitary sewers larger than 8-inches were included in the impact fee calculations. The City anticipates participating in the upsizing of these sanitary sewer lines to support the future growth, and those costs are included in the impact fee calculations.

### **G.3 Treatment**

The City of Ovilla does not own, or operate any wastewater treatment facilities at this time. The City pays the TRA for the treatment of wastewater at the Red Oak Wastewater Treatment Plant. The cost associated with the treatment of wastewater is billed to the City at a rate determined by the TRA and the flow is measured at the existing TRA Meter Station. This Impact Fee study includes the City's share cost of the collection and treatment facilities, both existing and proposed.

Future development of the Red Oak Creek Region is projected to necessitate the expansion of the Red Oak Wastewater Treatment Plant. The future expansion would increase the capacity of the wastewater treatment plant from 6.0 million gallons per day to 9.0 million gallons per day. The capacity of the trunk lines are anticipated to increase from 6.0 million gallons per day to 9.0 million gallons per day as well. These improvements are included in the Wastewater Impact Fee Calculation and The TRA totals is \$154,800,000 with the City contributing \$5,653,425. Adding the cost of financing brings the City's share of the total 10-year Wastewater Collection System Capital Improvement cost to \$8,621,473.

### **G.4 Capital Improvement Plan**

#### **a) Proposed**

To meet the demands of the anticipated growth over the next 10-years, as provided in the City's Land Use Report, certain wastewater collection system improvements are required. The recommended improvements are shown on Figure No. 2 (page 28) and listed on Table G-1 (page 29). Table G-1 itemizes the cost of each lift station, gravity sewer, and wastewater treatment plant expansions included in the Impact Fee Report. These recommended improvements form the basis for the Wastewater Collection System Impact Fee calculation and totals \$6,764,785. Adding the cost of financing brings the total 10-year Wastewater Collection System Capital Improvements cost to \$10,310,102.

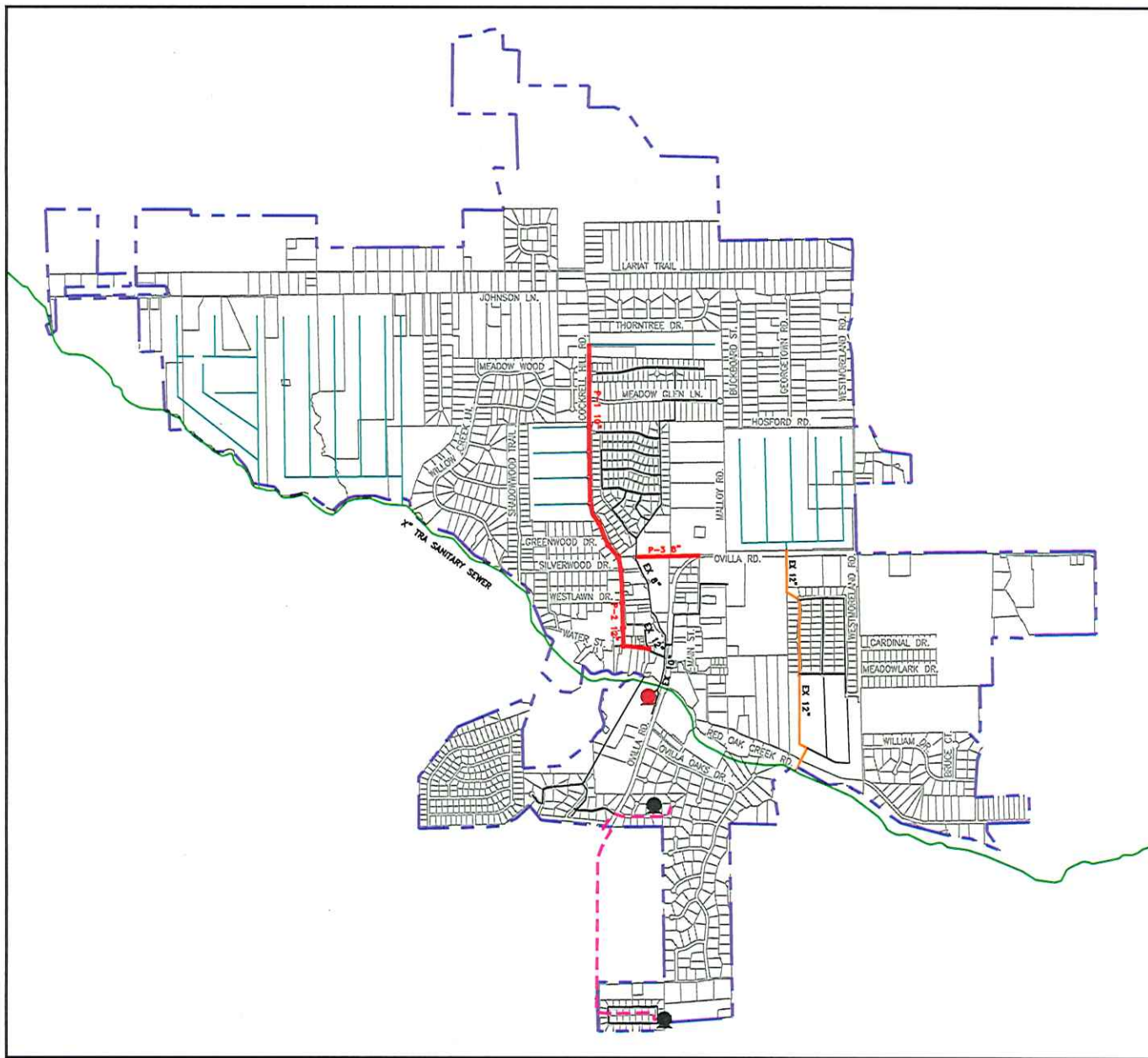
#### **b) Existing**

Over time as growth has occurred, the City has improved the wastewater collection system by constructing collection lines, and participating in the expansion of TRA facilities to meet the increasing wastewater demands.



The existing wastewater treatment components that are included in the Impact Fee Calculations include a treatment capacity increase to 9.00 million gallons per day with 9.00 million gallons per day in trunk main capacity. The existing rated capacity of the wastewater treatment plant is anticipated to be exceeded during the impact fee period, triggering the proposed expansion described above.

The City anticipates a significant amount of growth in a number of areas in the planning boundary since a significant amount of the land within the City's corporate limits is undeveloped, or vacant. The planning boundary analyzed in this study was the City of Ovilla's existing Wastewater CCN. A significant amount of the wastewater flow produced by these developments is to be conveyed to the existing Red Oak Wastewater Treatment Plant. Therefore, the capacity of the existing Red Oak Wastewater Treatment Plant will need to be expanded to accommodate the additional wastewater flow.



"PRIDE IN OUR PAST... ENTHUSIASM FOR THE FUTURE"

# CITY OF OVILLA, TEXAS

## WASTEWATER COLLECTION SYSTEM

### 2023-2033 CAPITAL IMPROVEMENT PLAN

#### LEGEND

- CITY LIMITS
- EXISTING SANITARY SEWER (NO IMPACT FEE)
- EXISTING FORCE MAIN (NO IMPACT FEE)
- EXISTING SANITARY SEWER (IMPACT FEE)
- PROPOSED SANITARY SEWER (NO IMPACT FEE)
- PROPOSED SANITARY SEWER (IMPACT FEE)
- EXISTING RED OAK CREEK REGIONAL SANITARY SEWER (TRA)
- EXISTING LIFT STATION (NO IMPACT FEE)
- EXISTING LIFT STATION TO BE ABANDONED (IMPACT FEE)

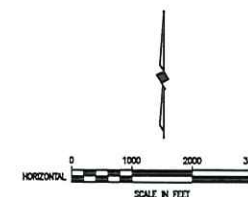


FIGURE NO. 3

BIRKHOFF, HENDRICKS & CARTER, L.L.P.  
PROFESSIONAL ENGINEERS  
DALLAS, TEXAS  
APRIL 2023

**TABLE G-1**  
**WASTEWATER COLLECTION SYSTEM**  
**10-YEAR CAPITAL IMPROVEMENT PLAN**

**PROPOSED SANITARY SEWER LINES**

Project No. <sup>(4)</sup>	Project	Size	Opinion of Project Cost <sup>(1)</sup>	Debt Service <sup>(2)</sup>	Total Project Cost
1 **	Proposed Wastewater Collection Lines (City)	10	\$ 693,150	\$ 363,904	\$ 1,057,054
2**	Proposed Wastewater Collection Lines (City)	12	\$ 167,960	\$ 88,179	\$ 256,139
3	Proposed Wastewater Collection Lines (City)	8	\$ 238,450	\$ 125,186	\$ 363,636
<b>Subtotal: Proposed Sanitary Sewer Lines</b>			<b>\$ 1,099,560</b>	<b>\$ 577,269</b>	<b>\$ 1,676,829</b>

**PROPOSED FACILITY IMPROVEMENTS**

Project No. <sup>(3)</sup>	Project	Capacity	Opinion of Project Cost <sup>(1)*</sup>	Debt Service <sup>(2)</sup>	Total Project Cost
6 *	Future Red Oak WWTP Improvements	3.0 MGD	\$ 3,787,245	\$ 1,988,304	\$ 5,775,549
7 *	Future TRA Trunk Line Improvements	3.0 MGD	\$ 1,566,180	\$ 822,245	\$ 2,388,425
8	Lift Station Abandonment (City)	-----	\$ 300,000	\$ 157,500	\$ 457,500
<b>Subtotal, Lift Station &amp; Treatment Facilities:</b>			<b>\$ 5,653,425</b>	<b>\$ 2,968,048</b>	<b>\$ 8,621,473</b>

**PLANNING EXPENSES**

Project No.	Project	Opinion of Cost (1)(b)	Debt Service <sup>(2)</sup>	Total Project Cost
	Wastewater Impact Fee Update	\$ 11,800	\$ -	\$ 11,800
<b>Subtotal, Planning Expenses:</b>		<b>\$ 11,800</b>	<b>\$ -</b>	<b>\$ 11,800</b>
<b>Wastewater Collection System CIP Grand Total:</b>		<b>\$ 6,764,785</b>	<b>\$ 3,545,317</b>	<b>\$ 10,310,102</b>

**Notes:**

- (1) Opinion of Project Cost includes:
  - a) Engineer's Opinion of Construction Cost
  - b) Professional Services Fees (Survey, Engineering, Testing, Legal)
  - c) Cost of Easement or Land Acquisitions
- (2) Debt Service based on 20-year simple interest bonds at 5%
- (3) \* - City Share Cost of TRA Improvements (3.465%)
- (4) \*\* - Developer Initiated & Participation: Oversize Cost Paid by City

## **G.5 Utilized Capacity**

The utilized capacities for the wastewater collection system were calculated based on land absorption from population growth projections provided by the Land Use Report prepared by the City's Planning Department. The population and employment growth in each wastewater drainage sub-basin was determined utilizing the City's growth projections. These growth rates were used to calculate the 2023, 2033 and build-out design flows. The following summarizes each design flow component utilized to calculate the wastewater design flows.

- a) Population Based Flow (Residential): For the purpose of this wastewater impact fee study base residential units flow of 95 gallons per capita per day (gpcd) is a reasonable basis for the design of the wastewater collection and treatment facilities.
- b) Infiltration and Inflow: Groundwater can infiltrate into the sanitary sewer system through faulty sewer pipe joints, breaks in sewer pipes and manholes, and faulty service lines. This infiltration can create a surcharge burden on the wastewater collection system and the wastewater treatment plant. Normal plant capacity must be designed to handle these infiltration related conditions.

Inflow is generally related to storm based events that increase groundwater and surface water flow into the wastewater system. The additional flow is generally recognized to enter through manholes, service lines, damaged and old collection lines, roof drains and storm drains. Excessive inflow can cause surcharged sewers, sanitary sewer overflows and put the treatment facilities capacity at risk of being exceeded. It is estimated that the combined infiltration and inflow is 750 gallons per acre per day (gpac).

The calculation of peak flows often requires the development of a unit hydrograph (Diurnal Curve). At the time of this report flow data was not available and a unit hydrograph could not be created specific to the City of Ovilla. The peak wet weather flows were calculated directly by applying the densities, usage rates, approximate inflow and infiltration rates, and population projections to the overall land area. These peak hour wastewater flows are the basis for design of most components in the wastewater system. The most significant exception is wastewater treatment, which is typically designed on the basis of average daily flow.

The percent-utilized capacity was calculated for the design flow of each study year based on the build-out capacity. The utilized capacity during the Impact Fee period is the difference between the year 2023 capacity and the year 2033 capacity. Table G-2 below summarizes the project cost and utilized cost over the impact fee period of 2023 – 2033 for each element of the wastewater system. The utilized capacity for each existing and proposed wastewater facility and collection line is presented in detail in Impact Fee Capacity Calculation Tables.

**TABLE G-2**  
**WASTEWATER COLLECTION SYSTEM**  
**SUMMARY OF ELIGIBLE CAPITAL COST & UTILIZED CAPACITY COST**

<b>Wastewater System</b>	<b>20-Year Project Cost</b>	<b>Utilized Capacity (\$) in the CRF Period</b>
Existing Sanitary Sewer Line (City)	\$ 320,555	\$ 29,445
Existing Red Oak Creek WasteWater Treatment Plant (TRA)	\$ 1,100,104	\$ 335,191
Existing Red Oak Creek WWTP Trunk Lines (TRA)	\$ 393,667	\$ -
<b>Existing Wastewater System Subtotal:</b>	<b>\$ 1,814,326</b>	<b>\$ 364,636</b>
Proposed Wastewater Collection Lines (City)	\$ 1,676,829	\$ 393,963
Proposed Red Oak Creek WasteWater Treatment Plant Expansion (TRA)	\$ 5,775,549	\$ 3,869,618
Proposed Red Oak Creek Trunk Lines (TRA)	\$ 2,388,425	\$ 1,600,244
Proposed Lift Station Abandonment (City)	\$ 457,500	\$ 457,500
<b>Proposed Wastewater System Subtotal:</b>	<b>\$ 10,298,302</b>	<b>\$ 6,321,325</b>
<b>Total:</b>	<b>\$ 12,112,628</b>	<b>\$ 6,685,961</b>

#### **H. CALCULATION OF MAXIMUM IMPACT FEES – WATER & WASTEWATER**

The maximum impact fees for the water and wastewater systems are calculated separately by dividing the cost of the capital improvements or facility expansions necessitated and attributable to new development in the service area within the 10-year period by the number of living units anticipated to be added to the City within the 10-year period as shown on Table H-1 and H-2. The calculations are shown below.

**TABLE H-1**  
**MAXIMUM ALLOWABLE WATER IMPACT FEE**

Maximum Water Impact Fee =	Eligible Existing Utilized Cost	+	Eligible Proposed Utilized Cost	
	Number of New Living Unit Equivalent over the Next 10 Years			
=	\$2,348,029	+	\$1,872,957	\$4,220,986
		629		629
<b>Maximum Water Impact Fee =</b>	<b><u>\$6,710.63</u></b>			
<b>Allowable Maximum Water Impact Fee: (Max Impact Fee x 50%) =</b>	<b><u>\$3,355.31</u></b>			

**TABLE H-2**  
**MAXIMUM ALLOWABLE WASTEWATER IMPACT FEE**

Maximum Wastewater Impact Fee =	Eligible Existing Utilized Cost	+	Eligible Proposed Utilized Cost	
	Number of New Living Unit Equivalent over the Next 10 Years			
=	\$364,636	+	\$6,321,325	\$6,685,961
		629		629
<b>Maximum Wastewater Impact Fee =</b>	<b><u>\$10,629.51</u></b>			
<b>Allowable Maximum Wastewater Impact Fee: (Max Impact Fee x 50%) =</b>	<b><u>\$5,314.75</u></b>			

Based on the Maximum Impact Fee Calculation for Water and Wastewater, Table H-3 calculates the maximum impact fee for the various sizes of water meters.

**TABLE H-3**  
**ALLOWABLE MAXIMUM FEE PER LIVING UNIT EQUIVALENT**  
**AND**  
**PER METER SIZE AND TYPE**

50% Max . Water Impact fee /LUE \_\_\_\_\_ \$ 3,355.31  
 50% Max . Wastewater Impact fee /LUE \_\_\_\_\_ \$ 5,314.75

Typical Land Use	Meter Type	Meter Size	LUE	Maximum Impact Fee		Total
				Water	Wastewater	
Single Family Residential	Simple	5/8"x3/4"	1	\$ 3,355.31	\$ 5,314.75	\$ 8,670.06
Single Family Residential	Simple	1"	2.5	\$ 8,388.29	\$ 13,286.88	\$ 21,675.16
Single Family Residential	Simple	1-1/2"	5	\$ 16,776.57	\$ 26,573.75	\$ 43,350.32
Single Family Residential	Simple	2"	8	\$ 26,842.52	\$ 42,518.00	\$ 69,360.52
Commercial/Retail	Compound	2"	8	\$ 26,842.52	\$ 42,518.00	\$ 69,360.52
Commercial/Retail	Turbine	2"	10	\$ 33,553.15	\$ 53,147.50	\$ 86,700.65
Commercial/Retail/Multi Family	Compound	3"	16	\$ 53,685.04	\$ 85,036.00	\$ 138,721.04
Commercial/Retail/Multi Family	Turbine	3"	24	\$ 80,527.55	\$127,554.00	\$ 208,081.55



*"PRIDE IN OUR PAST . . . ENTHUSIASM FOR THE FUTURE"*

# **10 YEAR WATER AND WASTEWATER IMPACT FEE REVIEW**

## **APPENDIX "A"**

### **WATER DISTRIBUTION SYSTEM IMPACT FEE DATA**

**PUMP STATION  
GROUND STORAGE RESERVOIRS  
ELEVATED STORAGE TANK  
TRANSMISSION LINE  
DISTRIBUTION LINES**



**TABLE NO. A-1**  
**CITY OF OVILLA, TEXAS**  
**WATER DISTRIBUTION SYSTEM IMPACT FEE STUDY**  
**EXISTING IMPACT FEE WATER LINES**

Pipe Number	Length (Ft.)	Diameter (Inches)	*Avg. Unit Cost (\$/Ft.)	Total Project Cost (\$)	Debt Service Interest Rate	20 Year Debt Service Utilizing Simple Interest	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(S) Utilized Capacity		
								2022	2032	During Fee Period	2022	2032	During Fee Period
1) Duncanville 12-inch Water Line													
2 P-156	363	12	\$100.00	\$36,300		\$0	\$36,300	54%	73%	19%	\$19,602	\$26,499	\$6,897
Subtotal:	363			\$36,300	0%	\$0	\$36,300				\$19,602	\$26,499	\$6,897
2) Johnson Lane 12-inch Water Line													
1 P-41	1,874	12	\$60.00	\$112,440		\$55,809	\$168,249	89%	94%	5%	\$149,742	\$158,154	\$8,412
1 P-42	1,338	12	\$60.00	\$80,280		\$39,847	\$120,127	74%	79%	5%	\$88,894	\$94,900	\$6,006
1 P-70	867	12	\$60.00	\$52,020		\$25,820	\$77,840	90%	100%	10%	\$70,056	\$77,840	\$7,784
1 P-71	1,396	12	\$60.00	\$83,760		\$41,574	\$125,334	80%	100%	20%	\$100,267	\$125,334	\$25,067
1 P-73	553	12	\$60.00	\$33,180		\$16,469	\$49,649	8%	57%	49%	\$3,972	\$28,300	\$24,328
Subtotal:	6,028			\$361,680	4.73%	\$179,519	\$541,199				\$412,931	\$484,528	\$71,597
3) Willowood Lane 12-inch Water Line and Silverwood Drive 8-inch Water Line													
2 P-54	1,436	8	\$90.00	\$129,240		\$0	\$129,240	69%	90%	21%	\$89,176	\$116,316	\$27,140
2 P-66	2,237	6	\$70.00	\$156,590		\$0	\$156,590	100%	100%	0%	\$156,590	\$156,590	\$0
2 P-121	630	12	\$100.00	\$63,000		\$0	\$63,000	67%	83%	16%	\$42,210	\$52,290	\$10,080
2 P-175	598	12	\$100.00	\$59,800		\$0	\$59,800	71%	88%	17%	\$42,458	\$52,624	\$10,166
Subtotal:	4,901			\$408,630.00	0%	\$0	\$408,630.00				\$330,434.00	\$377,820.00	\$47,386.00
4) Westmoreland Road 8-inch Water Line													
2 P-7	672	8	\$90.00	\$60,480		\$0	\$60,480	28%	63%	35%	\$16,934	\$38,102	\$21,168
2 P-95	1,441	8	\$90.00	\$129,690		\$0	\$129,690	63%	70%	7%	\$81,705	\$90,783	\$9,078
2 P-97	1,753	8	\$90.00	\$157,770		\$0	\$157,770	95%	100%	5%	\$149,882	\$157,770	\$7,889
2 P-107	1,841	8	\$90.00	\$165,690		\$0	\$165,690	24%	33%	9%	\$39,766	\$54,678	\$14,912
2 P-165	1,576	6	\$70.00	\$110,320		\$0	\$110,320	1%	63%	62%	\$1,103	\$69,502	\$68,398
Subtotal:	7,283			\$623,950.00	0%	\$0	\$623,950.00				\$289,390.00	\$410,835.00	\$121,445.00
5) Lariat Trail 6-inch Water Line													
2 P-11	1,036	6	\$70.00	\$72,520		\$0	\$72,520	84%	91%	7%	\$60,917	\$65,993	\$5,076
2 P-12	2,938	6	\$70.00	\$205,660		\$0	\$205,660	86%	92%	6%	\$176,868	\$189,207	\$12,340
2 P-115	1,239	6	\$70.00	\$86,730		\$0	\$86,730	95%	100%	5%	\$82,394	\$86,730	\$4,337
Subtotal:	5,213			\$364,910.00	0%	\$0	\$364,910.00				\$320,179.00	\$341,930.00	\$21,753.00
6) Red Oak Creek Road 8-inch Water Line (Ovilla Road & East University)													
2 P-227	1,030	8	\$90.00	\$92,700		\$0	\$92,700	42%	78%	36%	\$38,934	\$72,306	\$33,372
Subtotal:	1,030			\$92,700	0%	\$0	\$92,700				\$38,934	\$72,306	\$33,372
7) Malloy Lane-Hosford Road 8-inch Water Line													
2 P-13	966	8	\$90.00	\$86,940		\$0	\$86,940	100%	100%	0%	\$86,940	\$86,940	\$0
2 P-52	1,646	8	\$90.00	\$148,140		\$0	\$148,140	100%	100%	0%	\$148,140	\$148,140	\$0
2 P-52A	1,131	8	\$90.00	\$101,790		\$0	\$101,790	100%	100%	0%	\$101,790	\$101,790	\$0
2 P-53	1,294	8	\$90.00	\$116,460		\$0	\$116,460	100%	100%	0%	\$116,460	\$116,460	\$0
Subtotal:	5,037			\$453,330	0%	\$0	\$453,330				\$453,330	\$453,330	\$0

**TABLE NO. A-1**  
**CITY OF OVILLA, TEXAS**  
**WATER DISTRIBUTION SYSTEM IMPACT FEE STUDY**  
**EXISTING IMPACT FEE WATER LINES**

Pipe Number	Length (Ft.)	Diameter (Inches)	*Avg. Unit Cost (\$/Ft.)	Total Project Cost (\$)	Debt Service Interest Rate	20 Year Debt Service Utilizing Simple Interest	Total 20 Year Project Cost (\$)	Utilized Capacity			(\$ Utilized Capacity		
								2022	2032	During Fee Period	2022	2032	During Fee Period
8) Elmwood 12-inch Water Line													
2 P-167	1,429	12	\$100.00	\$142,900		\$0	\$142,900	29%	75%	46%	\$41,441	\$107,175	\$65,734
Subtotal:	1,429			\$142,900	0%	\$0	\$142,900				\$41,441	\$107,175	\$65,734
9) Greenwood Drive 6-inch Water Line													
2 P-173	1,819	6	\$70.00	\$127,330		\$0	\$127,330	100%	100%	0%	\$127,330	\$127,330	\$0
Subtotal:	1,819			\$127,330	0%	\$0	\$127,330				\$127,330	\$127,330	\$0
10) Westlawn Drive 6-inch Water Line													
2 P-176	1,447	6	\$70.00	\$101,290		\$0	\$101,290	62%	89%	27%	\$62,800	\$90,148	\$27,348
Subtotal:	1,447			\$101,290	0%	\$0	\$101,290				\$62,800	\$90,148	\$27,348
11) East University 6-inch Water Line													
2 P-50	1,880	6	\$70.00	\$131,600		\$0	\$131,600	20%	100%	80%	\$26,320	\$131,600	\$105,280
Subtotal:	1,880			\$131,600	0%	\$0	\$131,600				\$26,320	\$131,600	\$105,280
12) Red Oak Creek Road 8-inch Water Line (East University to Westmoreland Road)													
2 P-58	1,307	8	\$90.00	\$117,630		\$0	\$117,630	92%	100%	8%	\$108,220	\$117,630	\$9,410
2 P-109	939	8	\$90.00	\$84,510		\$0	\$84,510	80%	100%	20%	\$67,608	\$84,510	\$16,902
2 P-111	1,127	8	\$90.00	\$101,430		\$0	\$101,430	88%	100%	12%	\$89,258	\$101,430	\$12,172
2 P-192	900	8	\$90.00	\$81,000		\$0	\$81,000	53%	100%	47%	\$42,930	\$81,000	\$38,070
Subtotal:	4,273			\$384,570.00	0%	\$0	\$384,570				\$308,016	\$384,570	\$76,554
13) Water Street 12-Inch Water Line													
2 P-37	471	12	\$115.00	\$54,165		\$0	\$54,165	76%	90%	14%	\$41,165	\$48,749	\$7,583
2 P-37A	391	12	\$115.00	\$44,965		\$0	\$44,965	73%	87%	14%	\$32,824	\$39,120	\$6,295
2 P-38	743	12	\$115.00	\$85,445		\$0	\$85,445	67%	79%	12%	\$57,248	\$67,502	\$10,253
2 P-122	695	12	\$115.00	\$79,925		\$0	\$79,925	70%	81%	11%	\$55,948	\$64,739	\$8,792
2 P-182	288	12	\$115.00	\$33,120		\$0	\$33,120	93%	100%	7%	\$30,802	\$33,120	\$2,318
2 P-182A	573	12	\$187.00	\$107,151		\$0	\$107,151	92%	100%	8%	\$98,579	\$107,151	\$8,572
Subtotal:	3,161			\$404,771.00	0%	\$0	\$404,771				\$316,566	\$360,381	\$43,813
EXISTING TOTAL:													
43,864				\$3,633,961.00		\$179,519	\$3,813,480				\$2,747,273	\$3,368,452	\$621,179

1 - City Participated in Cost Oversize    2 - City Initiated and Funded

\*- Construction Cost known + additional 20% for engineering & easements

**TABLE NO. A-2**  
**CITY OF OVILLA, TEXAS**  
**WATER DISTRIBUTION IMPACT FEE STUDY**  
**EXISTING WATER FACILITIES**

+ Costs provided by financial institution.

Pump Station Improvements	Year Const.	Projected Capacity	Pump Station Cost (\$)					Capacity Utilized (%)			Capacity Utilized (\$)		
			*Const.	Engineering, Testing and Property Acquisition	Debt Service Interest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost \$	2022	2032	In The CRF Period	2022	2032	In The CRF Period
Ovilla Pump Station and Ground Storage Reservoir No. 1 (at Duncanville Road)													
Pump Station	2004	3.1 MGD	\$802,916	\$0	3.323%	\$280,130	\$1,083,046	47%	71%	24%	\$509,032	\$768,963	\$259,931
Ground Storage Reservoir No. 1	2004	0.75 MG	\$224,367	\$0	3.323%	\$78,279	\$302,646	49%	74%	25%	\$148,297	\$223,958	\$75,662
City Hall Elevated Storage Tank													
0.50 MG Elevated Storage Tank	2004	0.50 MG	\$797,964	\$0	3.323%	\$278,401	\$1,076,365	73%	100%	27%	\$785,746	\$1,076,365	\$290,619
D.W.U. Supply Line and Meter Station													
30-inch DWU Supply Line	2004	4.55 MGD	\$4,799,753	\$0	3.323%	\$1,674,586	\$6,474,339	32%	49%	17%	\$2,071,788	\$3,172,426	\$1,100,638
Existing Facility Total			\$6,625,000			\$2,311,396	\$8,936,396				\$3,514,863	\$5,241,712	\$1,726,850

**TABLE NO. A-3**  
**CITY OF OVILLA, TEXAS**  
**WATER SYSTEM IMPACT FEE STUDY**  
**PROPOSED CIP - WATER LINES**

+ Average Unit costs are based in '2022' dollars unless otherwise indicated and includes engineering and easements.

Pipe Number	Length (Ft.)	Diameter (Inches)	+Avg. Unit Cost (\$/Ft.)	Total Capital Cost (\$)	Debt Service Interest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Year Project Cost (\$)	Utilized Capacity			Utilized Capacity		
								(%)		During Fee Period	(\$)		During Fee Period
								2022	2032		2022	2032	
<b>1) Silverwood 8-inch Water Line Extension</b>													
2 P-57	1,470	8	\$190.00	\$279,300		\$146,633	\$425,933	0%	66%	66%	\$0	\$281,116	\$281,116
<b>Subtotal:</b>	<b>1,470</b>			<b>\$279,300</b>	<b>5.0%</b>	<b>\$146,633</b>	<b>\$425,933</b>				<b>\$0</b>	<b>\$281,116</b>	<b>\$281,116</b>
<b>2) Pike Peaks Way 8-inch Water Line Extension</b>													
2 P-203	890	12	\$250.00	\$222,500		\$116,813	\$339,313	0%	40%	40%	\$0	\$135,725	\$135,725
<b>Subtotal:</b>	<b>890</b>			<b>\$222,500</b>	<b>5.0%</b>	<b>\$116,813</b>	<b>\$339,313</b>				<b>\$0</b>	<b>\$135,725</b>	<b>\$135,725</b>
<b>3) Hummingbird Lane 6-inch Water Line Extension</b>													
2 P-184	1,365	8	\$190.00	\$259,350		\$136,159	\$395,509	0%	75%	75%	\$0	\$296,632	\$296,632
<b>Subtotal:</b>	<b>1,365</b>			<b>\$259,350</b>	<b>5.0%</b>	<b>\$136,159</b>	<b>\$395,509</b>				<b>\$0</b>	<b>\$296,632</b>	<b>\$296,632</b>
<b>4) FM 664 8-inch Water Line Crossing</b>													
2 P-183	240	8	\$190.00	\$45,600		\$23,940	\$69,540	0%	63%	63%	\$0	\$43,810	\$43,810
<b>Subtotal:</b>	<b>240</b>			<b>\$45,600</b>	<b>5.0%</b>	<b>\$23,940</b>	<b>\$69,540</b>				<b>\$0</b>	<b>\$43,810</b>	<b>\$43,810</b>
<b>5) Johnson Lane 12-inch Water Line Extension</b>													
2 P-100	930	12	\$250.00	\$232,500		\$122,063	\$354,563	0%	59%	59%	\$0	\$209,192	\$209,192
P-215	1,320	12	\$250.00	\$330,000		\$173,250	\$503,250	0%	39%	39%	\$0	\$196,268	\$196,268
<b>Subtotal:</b>	<b>2,250</b>			<b>\$562,500</b>	<b>5.0%</b>	<b>\$295,313</b>	<b>\$857,813</b>				<b>\$0</b>	<b>\$405,460</b>	<b>\$405,460</b>
<b>6) Elm Wood 12-inch Water Line Extension</b>													
2 P-87	909	8	\$250.00	\$227,250		\$119,306	\$346,556	0%	77%	77%	\$0	\$266,848	\$266,848
<b>Subtotal:</b>	<b>909</b>			<b>\$227,250</b>	<b>5.0%</b>	<b>\$119,306</b>	<b>\$346,556</b>				<b>\$0</b>	<b>\$266,848</b>	<b>\$266,848</b>
<b>7) Ovilla Rd 12-inch Water Line Upsize from 8-inch</b>													
1 P-43	539	12	\$60.00	\$32,340		\$16,979	\$49,319	0%	89%	89%	\$0	\$43,893	\$43,893
1 P-47	1,172	12	\$60.00	\$70,320		\$36,918	\$107,238	0%	90%	90%	\$0	\$96,514	\$96,514
1 P-48	1,450	12	\$60.00	\$87,000		\$45,675	\$132,675	0%	87%	87%	\$0	\$115,427	\$115,427
1 P-228	2,245	12	\$60.00	\$134,700		\$70,718	\$205,418	0%	82%	82%	\$0	\$168,442	\$168,442
<b>Subtotal:</b>	<b>5,406</b>			<b>\$324,360</b>	<b>5.0%</b>	<b>\$170,289</b>	<b>\$494,649</b>				<b>\$0</b>	<b>\$424,276</b>	<b>\$424,276</b>
<b>PROPOSED TOTAL:</b>	<b>12,530</b>			<b>\$1,920,860</b>		<b>\$1,008,453</b>	<b>\$2,929,313</b>				<b>\$0</b>	<b>\$1,853,867</b>	<b>\$1,853,867</b>

1 - City Participates in Cost Oversize

2 - City Initiates and Funds



*"PRIDE IN OUR PAST... ENTHUSIASM FOR THE FUTURE"*

# **10 YEAR WATER AND WASTEWATER IMPACT FEE REVIEW**

## **APPENDIX "B"**

### **WASTEWATER COLLECTION SYSTEM**

#### **IMPACT FEE DATA**

**TRA WASTEWATER TREATMENT PLANT  
TRA TRUNK MAINS  
CITY COLLECTION LINES**

**TABLE NO. B-1**  
**CITY OF OVILLA, TEXAS**  
**WASTEWATER SYSTEM IMPACT FEE STUDY**  
**EXISTING FACILITY IMPROVEMENTS**

\* Average Unit costs are based in 2022 dollars unless otherwise indicated and includes 20% for engineering and easements.

WWTP	Capacity Increment	Units	Const. Date	Total Construction Cost	Ovilla's Share (3.465%) Total Capital Cost (\$)	20 Year Debt Service @ 5% Simple Interest	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(\$) Utilized Capacity		
								2023	2033	During Fee Period	2023	2033	During Fee Period
Existing Red Oak Creek WasteWater Treatment Plant (TRA)													
This Project includes the existing 6.0 MGD WasteWater Treatment Facility to handle increased flow of 3.12 MGD from the Red Oak Creek Region, currently conveying 4.01% of wastewater in 2016 from the City.													
TRA Red Oak Regional WW System - Participation Fee	----	----	1990	\$100,000	----	----	\$100,000	0%	100%	100%	\$0	\$100,000	\$100,000
Red Oak WWTP *	6.00	MGD	2008	\$18,926,575	\$655,806	\$344,298	\$1,000,104	76%	100%	24%	\$764,913	\$1,000,104	\$235,191
Subtotal:	6.00			\$19,026,575	\$655,806	\$344,298	\$1,100,104				\$764,913	\$1,100,104	\$335,191
Existing Red Oak Creek WWTP Trunk Lines (TRA)													
This Project includes the existing 3.50 MGD capacity WasteWater Trunk Lines to handle the current 3.12 MGD flow from the Red Oak Creek Region.													
Existing Red Oak Creek Trunk Lines *	3.50	MGD	1990	\$7,450,000	\$258,143	\$135,525	\$393,667	100%	100%	0%	\$393,667	\$393,667	\$0
Subtotal:				\$7,450,000	\$258,143	\$135,525	\$393,667				\$393,667	\$393,667	\$0
WasteWater Treatment Facilities CIP Total:				\$26,476,575	\$913,948	\$479,823	\$1,493,771				\$1,158,580	\$1,493,771	\$335,191

**TABLE NO. B-2**  
**CITY OF OVILLA, TEXAS**  
**WASTEWATER SYSTEM IMPACT FEE STUDY**  
**PROPOSED FACILITY IMPROVEMENTS**

WWTP	Capacity Increment	Units	Const. Date	Total Construction Cost	Ovilla's Share (3.465%) Total Capital Cost (\$)	20 Year Debt Service @ 5% Simple Interest	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(\$) Utilized Capacity			
								2023	2033	During Fee Period	2023	2033	During Fee Period	
Proposed Red Oak Creek WasteWater Treatment Plant Expansion (TRA)														
This project includes the expansion of the existing 6 MGD WWTP facility to 9 MGD to handle the increased flow from the Red Oak Creek Region by 2032.														
Future Red Oak WWTP Improvements	*	3.00	MGD	2033	\$109,300,000	\$3,787,245	\$1,988,304	\$5,775,549	0%	67%	67%	\$0	\$3,869,618	\$3,869,618
Subtotal:					\$109,300,000	\$3,787,245	\$1,988,304	\$5,775,549				\$0	\$3,869,618	\$3,869,618
Proposed Red Oak Creek Trunk Lines (TRA)														
This project includes the expansion of the existing 6 MGD Wastewater Trunk Lines to 9 MGD to handle the increased flow from the Red Oak Creek Region by 2032.														
Future TRA Trunk Line Improvements	*	3.00	MGD	2033	\$45,200,000	\$1,566,180	\$822,245	\$2,388,425	0%	67%	67%	\$0	\$1,600,244	\$1,600,244
Subtotal:					\$45,200,000	\$1,566,180	\$822,245	\$2,388,425				\$0	\$1,600,244	\$1,600,244
Proposed Lift Station Abandonment (City)														
This Project includes the abandonment of the existing lift station along Ovilla Road and Red Oak Creek Road. Proposed Sanitary Sewer (P-2) to bypass lift station and connect to TRA Red Oak Creek Trunk main.														
Lift Station Abandonment (City)	*	----	----	2023	\$300,000	\$300,000	\$157,500	\$457,500	0%	100%	100%	\$0	\$457,500	\$457,500
Subtotal:					\$ 300,000	\$ 300,000	\$ 157,500	\$ 457,500				\$0	\$457,500	\$457,500
WasteWater Treatment Facility CIP Totals														
Total					\$ 154,800,000	\$ 5,653,425	\$ 2,968,048	\$ 8,621,473					\$ 5,927,362	\$ 5,927,362

**TABLE NO. B-3 (Developer Initiated)**  
**CITY OF OVILLA, TEXAS**  
**WASTEWATER SYSTEM IMPACT FEE STUDY**  
**EXISTING WASTEWATER COLLECTION LINES**

*Average Unit costs are based in 2022 dollars unless otherwise indicated and includes 20% for engineering and easements.*

Pipe Number	Length (Ft.)	Pipe Diam. (Inches)	Date of Const.	Average Unit Cost (\$/Ft.)	Total Capital Cost (\$)	Projected City Participation (\$)	Projected Developer Cost (\$)	20 Year Debt Service @ 5% Simple Interest (\$)	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(\$ ) Utilized Capacity			
										2023	2033	During Fee Period	2023	2033	During Fee Period	
Existing Sanitary Sewer Line (City)																
These projects include approximately 4,200 LF of 12" sanitary sewer collection line commencing at Red Oak Creek Road, ending at Ovilla Road.																
1	O-1	2,090	12	2018	\$160.00	\$334,400	\$83,600	\$250,800	\$43,890	\$127,490	60%	69%	9%	\$75,857	\$87,568	\$11,711
1	O-2	2,110	12	2018	\$180.00	\$379,800	\$126,600	\$253,200	\$66,465	\$193,065	78%	87%	9%	\$150,768	\$168,503	\$17,734
Subtotal:		4,200	L.F.	2018		\$714,200	\$210,200	\$504,000	\$110,355	\$320,555				\$226,625	\$256,071	\$29,445
EXISTING TOTAL:		4,200	L.F.			\$714,200	\$210,200	\$504,000	\$110,355	\$320,555				\$226,625	\$256,071	\$29,445

1 - City Initiated and Funded



**TABLE NO. B-4 (Developer Initiated)**  
**CITY OF OVILLA, TEXAS**  
**WASTEWATER SYSTEM IMPACT FEE STUDY**  
**PROPOSED CIP - WASTEWATER COLLECTION LINES**

Pipe Number	Length (Ft.)	Pipe Diam. (Inches)	Date of Const.	Average Unit Cost (\$/Ft.)	Total Capital Cost (\$)	Projected City Participation in Cost Oversize (\$)	Projected Developer Cost (\$)	20 Year Debt Service @ 5% Simple Interest (\$)	Total 20 Year Project Cost (\$)	Utilized Capacity			Utilized Capacity		
										(%)			(%)		
										2023	2033	During Fee Period	2023	2033	During Fee Period
<b>Proposed Wastewater Collection Lines (City)</b>															
These projects include approximately 6,597 LF of new 10" and 12" sanitary sewer collection lines commencing within the City of Ovilla and conveying flow south into the TRA Red Oak Creek Interceptor.															
1	P-1	4,621	10	\$220	\$1,016,620	\$693,150	\$323,470	\$363,904	\$1,057,054	77%	80%	2%	\$814,496	\$840,567	\$26,071
1	P-2	1,976	12	\$250	\$494,000	\$167,960	\$326,040	\$88,179	\$256,139	54%	55%	2%	\$137,571	\$141,827	\$4,256
1	P-3	1,255	8	\$190	\$238,450	\$238,450	\$0	\$125,186	\$363,636	0%	100%	100%	\$0	\$363,636	\$363,636
<b>Subtotal:</b>		<b>7,852</b>	<b>L.F.</b>		<b>\$1,749,070</b>	<b>\$1,099,560</b>	<b>\$649,510</b>	<b>\$577,269</b>	<b>\$1,676,829</b>				<b>\$952,067</b>	<b>\$1,346,030</b>	<b>\$393,963</b>
<b>CIP Total:</b>		<b>7,852</b>	<b>L.F.</b>		<b>\$1,749,070</b>	<b>\$1,099,560</b>	<b>\$649,510</b>	<b>\$577,269</b>	<b>\$1,676,829</b>				<b>\$952,067</b>	<b>\$1,346,030</b>	<b>\$393,963</b>

1 - City Participte in Cost Oversize



*"PRIDE IN OUR PAST . . . ENTHUSIASM FOR THE FUTURE"*

## **CITY OF OVILLA, TEXAS WATER AND WASTEWATER IMPACT FEE UPDATE**

---

**PREPARED BY**

 birkhoff,  
hendricks &  
carter, L.L.P.  
*Professional Engineers*  
*Dallas, Texas*

**April 2023**



# Capital Improvements Advisory Committee Meeting for the 2023 Water & Wastewater Impact Fee Update

Prepared and Presented by:



**BIRKHOFF, HENDRICKS & CARTER, L.L.P.**  
*SPECIALIZING IN CIVIL ENGINEERING FOR  
MUNICIPALITIES AND GOVERNMENTAL AGENCIES*



## PURPOSE

- Impact Fee Basics
- Capital Improvements Advisory Committee Responsibilities
- Land Use Assumptions Update
- Capital Improvements Plan Update
  - Water
  - Wastewater
- Impact Fee Calculation
- Next Steps



## BASICS

- Mechanism to raise and recover funds required to serve new and future development, one time fee, 5-year updates
- Governed by Chapter 395 of the Texas Local Government Code; Established in Texas in 1987
- Water, Wastewater, Roadway, and Drainage impact fees allowed in Texas
- Not used for Existing or Maintenance Purposes
- Provides for Additional Funding Tools for Infrastructure Systems



## CIAC RESPONSIBILITIES

- Review the Land Use Assumptions Updates
- Review the Capital Improvements Plan for the Water and Wastewater
- Monitor the Implementation of the CIP
- Prepare Semi-Annual Reports and Report to Council
- Advises Council of Need to Update CIP, LUA, or Impact Fees



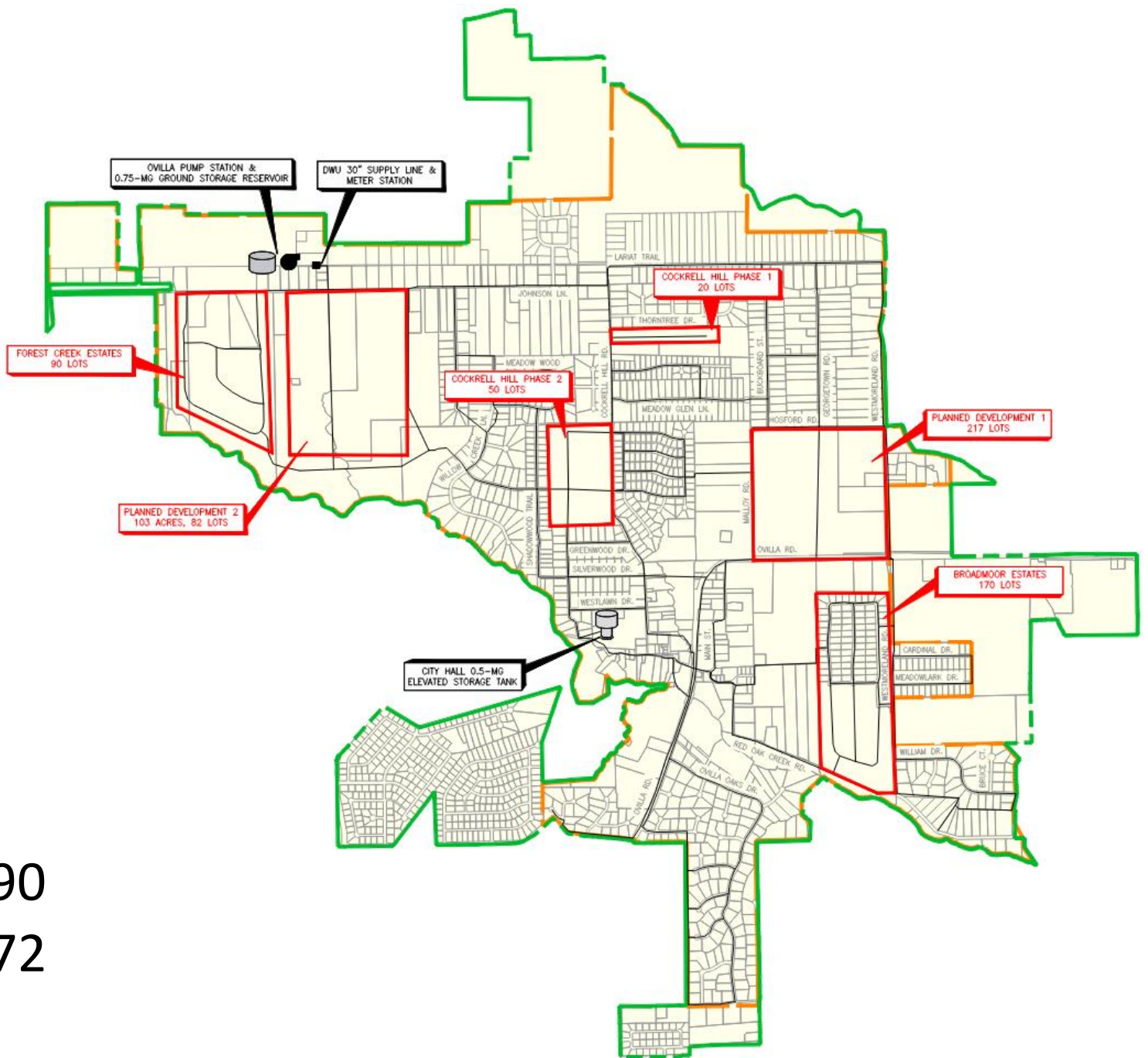


*"PRIDE IN OUR PAST . . . ENTHUSIASM FOR THE FUTURE"*

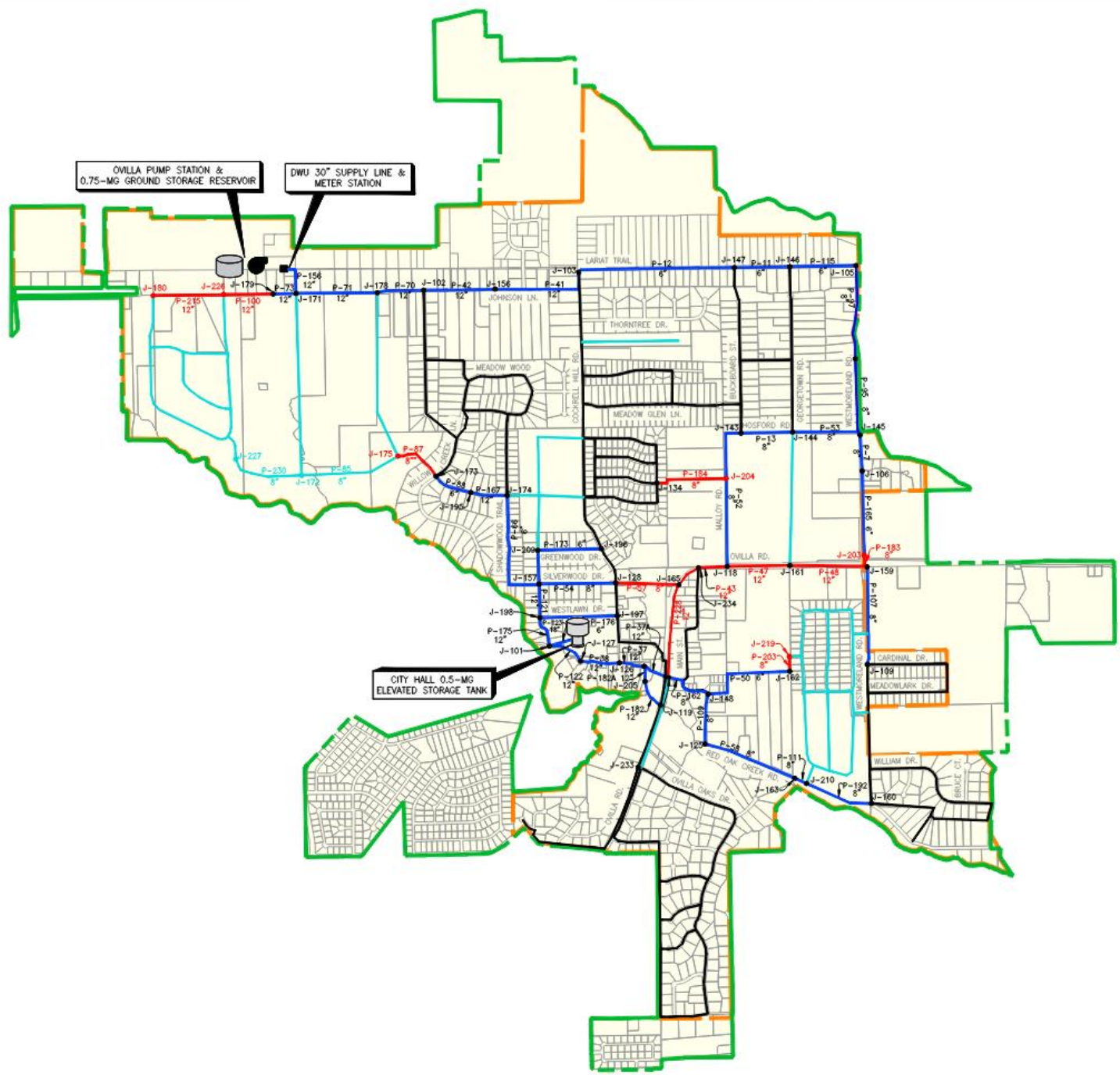
# Land Use Assumptions

Planning Boundary  
within the Water and  
Sewer CCN

Existing Population: 4,190  
10-year Population: 5,972



REVISED: 4/25/23 - SMEN002A  
H:\Projects\Ovilla\_2022-127\_Impact\_Fee\_Upgrade\2022\_Impact\_Fee\_Upgrade.dwg  
PLOT SCALE: 1:2  
PLOT STYLE: sml\_mn002a.ctb  
PLOTTED BY: SML MN002A ON 4/25/2023



# CITY OF OVILLA, TEXAS

## WATER DISTRIBUTION SYSTEM

### 2023-2033 CAPITAL IMPROVEMENT PLAN

#### LEGEND

- CITY LIMITS
- EXISTING WATER CCN LIMITS
- EXISTING WATER LINE (NO IMPACT FEE)
- EXISTING WATER LINE (IMPACT FEE)
- PROPOSED WATER LINE (IMPACT FEE)
- PROPOSED WATER LINE (NO IMPACT FEE)
- EXISTING WATER FACILITIES (IMPACT FEE)

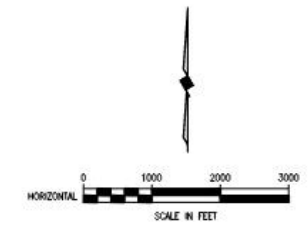
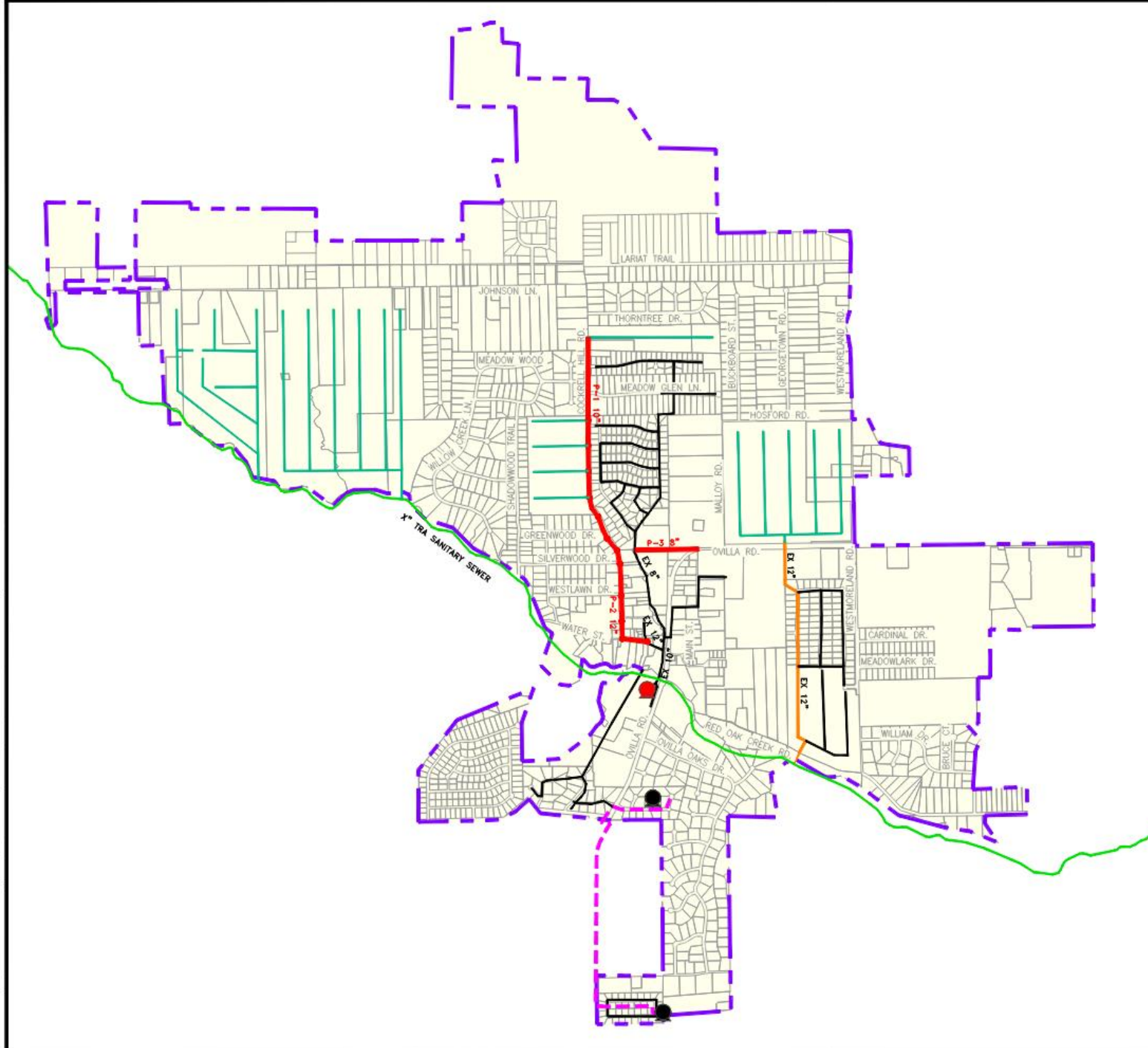


FIGURE NO. 2

BIRKHOFF, HENDRICKS & CARTER, L.L.P.  
PROFESSIONAL ENGINEERS  
DALLAS, TEXAS  
APRIL 2023





"PRIDE IN OUR PAST... ENTHUSIASM FOR THE FUTURE"

# CITY OF OVILLA, TEXAS

## WASTEWATER COLLECTION SYSTEM 2023-2033 CAPITAL IMPROVEMENT PLAN

### LEGEND

- CITY LIMITS
- EXISTING SANITARY SEWER (NO IMPACT FEE)
- EXISTING FORCE MAIN (NO IMPACT FEE)
- EXISTING SANITARY SEWER (IMPACT FEE)
- PROPOSED SANITARY SEWER (NO IMPACT FEE)
- PROPOSED SANITARY SEWER (IMPACT FEE)
- EXISTING RED OAK CREEK REGIONAL SANITARY SEWER (TRA)
- EXISTING LIFT STATION (NO IMPACT FEE)
- EXISTING LIFT STATION TO BE ABANDONED (IMPACT FEE)

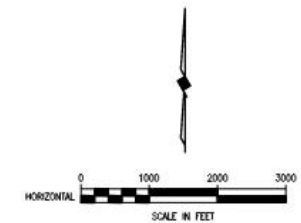


FIGURE NO. 3

BIRKHOFF, HENDRICKS & CARTER, L.L.P.  
 PROFESSIONAL ENGINEERS  
 DALLAS, TEXAS  
 APRIL 2023



"PRIDE IN OUR PAST . . . ENTHUSIASM FOR THE FUTURE"

Water System	Total Capital Cost (\$)	Total 20-Year Project Cost (\$)	Utilized Capacity During Fee Period (\$)
Existing Water Lines	\$ 3,633,961	\$ 3,813,480	\$ 621,179
Existing Water Facilities (City & DWU)	\$ 6,625,000	\$ 8,936,396	\$ 1,726,850
Existing Water System Subtotal:	\$ 10,258,961	\$ 12,749,876	\$ 2,348,029
Proposed Water Lines	\$ 1,920,860	\$ 2,929,313	\$ 1,853,867
Impact Fee Expenses	\$ 19,090	\$ 19,090	\$ 19,090
Proposed Water System Subtotal:	\$ 1,939,950	\$ 2,948,403	\$ 1,872,957
TOTAL:	\$ 12,198,911	\$ 15,698,279	\$ 4,220,986

Wastewater System	20-Year Project Cost	Utilized Capacity (\$ in the CRF Period)
Existing Sanitary Sewer Line (City)	\$ 320,555	\$ 29,445
Existing Red Oak Creek WasteWater Treatment Plant (TRA)	\$ 1,100,104	\$ 335,191
Existing Red Oak Creek WWTP Trunk Lines (TRA)	\$ 393,667	\$ -
Existing Wastewater System Subtotal:	\$ 1,814,326	\$ 364,636
Proposed Wastewater Collection Lines (City)	\$ 1,676,829	\$ 393,963
Proposed Red Oak Creek WasteWater Treatment Plant Expansion (TRA)	\$ 5,775,549	\$ 3,869,618
Proposed Red Oak Creek Trunk Lines (TRA)	\$ 2,388,425	\$ 1,600,244
Proposed Lift Station Abandonment (City)	\$ 457,500	\$ 457,500
Proposed Wastewater System Subtotal:	\$ 10,298,302	\$ 6,321,325
Total:	\$ 12,112,628	\$ 6,685,961

# Water & Wastewater Utilized Capacity Costs



"PRIDE IN OUR PAST . . . ENTHUSIASM FOR THE FUTURE"

# Water & Wastewater Living Unit Equivalents

WATER LIVING UNIT EQUIVALENTS BY METER SIZE

Meter Size	2023			2033			New Living Units During Impact Fee Period
	Number of Water Meters	Living Unit Equivalent Ratio for 5/8" Used	Total Number of Equivalent Living Units	Number of Water Meters	Living Unit Equivalent Ratio for 5/8" Used	Total Number of Equivalent Living Units	
5/8"x3/4"	950	1.0	950	1,579	1.0	1,579	629
1"	355	2.5	888	355	2.5	888	0
2"	9	10.0	90	9	10.0	90	0
Totals	1,314		1,928	1,943		2,557	629

WASTEWATER LIVING UNIT EQUIVALENTS BY METER SIZE

Meter Size	2023			2033			New Living Units During Impact Fee Period
	Number of Water Meters	Living Unit Equivalent Ratio for 5/8" Used	Total Number of Living Units	Number of Water Meters	Living Unit Equivalent Ratio for 5/8" Used	Total Number of Living Units	
5/8"x3/4"	692	1.0	692	1,321	1.0	1,321	629
Totals	692		692	1,321		1,321	629



"PRIDE IN OUR PAST . . . ENTHUSIASM FOR THE FUTURE"

# Water & Wastewater Impact Fee Calculation

## MAXIMUM ALLOWABLE WATER IMPACT FEE

Maximum Water Impact Fee =	Eligible Existing Utilized Cost	+	Eligible Proposed Utilized Cost	
	Number of New Living Unit Equivalent over the Next 10 Years			
=	\$2,348,029	+	\$1,872,957	\$4,220,986
		629		629
Maximum Water Impact Fee =	<u>\$6,710.63</u>			
Allowable Maximum Water Impact Fee: (Max Impact Fee x 50%) =	<u>\$3,355.31</u>			

## MAXIMUM ALLOWABLE WASTEWATER IMPACT FEE

Maximum Wastewater Impact Fee =	Eligible Existing Utilized Cost	+	Eligible Proposed Utilized Cost	
	Number of New Living Unit Equivalent over the Next 10 Years			
=	\$364,636	+	\$6,321,325	\$6,685,961
		629		629
Maximum Wastewater Impact Fee =	<u>\$10,629.51</u>			
Allowable Maximum Wastewater Impact Fee: (Max Impact Fee x 50%) =	<u>\$5,314.75</u>			



## NEXT STEPS

- Review and Approve the Land Use Assumptions
- Review and Approve the Capital Improvements Plans for the Water and Wastewater
- Prepare Written Recommendation to Council



## QUESTIONS/COMMENTS



## DIVISION 2

**Five-Year Water and Wastewater Impact Fee Review****§ 13.04.031. General provisions.**

- (a) The engineering analysis portion of the five-year water and wastewater impact fee review determines utilized capacity cost of major water distribution facilities, wastewater collection system facilities, water distribution lines and wastewater collection lines between the year 2011 and the year 2021. Facilities include pump stations, storage tanks and TRA treatment plant. The study period is a ten-year period with 2011 as the base year. The engineering analysis of the water and wastewater systems is based on established land use in the year 2011, projected land use patterns through the year 2021 and on the existing and proposed infrastructure.
- (b) The city's water distribution master plan was updated in January 1998 and wastewater collection system master plan was created in 2004. These master plans include the city's current land use plan. Projections today include a build-out population of approximately 9,700 people. The equivalency factors conform to the latest American Water Works Association Standards (C700–C703).

(Ordinance 2015-003 adopted 1/12/15)

**§ 13.04.032. Cost of facilities.**

- (a) Actual construction cost of the various elements of the water distribution and wastewater collection system was utilized where the information was known. The existing cost of facilities was determined from contractors' final pay requests and from bid tabulation forms.
- (b) Cost for most of the water distribution lines and the sewer collection trunks have not been located. Debt service has been added to all projects where cost is known. For projects which have no cost data, equivalent 2011 dollars have been attached to those projects and no debt service included in the total cost. A copy of the cost data is located in appendix A of the Engineering Evaluation Report of the Five-Year Water and Wastewater Impact Review submitted to the city by Birkhoff, Hendricks & Carter, L.L.P., dated June 2001 ("Five-Year Report").

(Ordinance 2015-003 adopted 1/12/15)

**§ 13.04.033. Utilized capacity.**

- (a) Utilized capacity for the water distribution and wastewater collection systems was calculated based on population growth projections provided by the city. Projected household starts by year were provided from 2011 through 2020, as shown in table no. 1. Utilized capacity of improvements in the period is used to calculate the dollar value associated with growth for that period.

<b>Table No. 1 Summary of Population Projection</b>				
<b>Projection</b>				
<b>End of Year</b>	<b>(%)</b>	<b>Number of Starts</b>	<b>Household Units</b>	<b>Population*</b>
2011	.75	9	1,259	3,865
2012	1.0	13	1,272	3,905
2013	1.0	13	1,285	3,945
2014	1.15	19	1,304	4,003
2015	1.5	20	1,324	4,065
2016	2.0	26	1,350	4,145

Table No. 1 Summary of Population Projection				
End of Year	Projection (%)	Number of Starts	Household Units	Population*
2017	2.5	34	1,384	4,249
2018	3.0	41	1,425	4,375
2019	3.0	42	1,467	4,504
2020	3.0	43	1,510	4,636
2021	3.0	45	1,555	4,774

\* Population density 3.07 people per household unit.

(b) Water distribution system.

- (1) Computer models for the years 2011 and 2021 were prepared based on the city's water distribution master plan.
- (2) All computer models were run for the maximum hourly demand and the minimum hourly demand in a three-day extended period simulation to ensure proper sizing of the facilities to meet peak demands.
- (3) The existing system includes the following facilities:
  - (A) One pump station - 4 pumps - 3.10 mgd capacity;
  - (B) One ground storage reservoir - 0.75 mg capacity;
  - (C) One elevated tank - 0.50 mg capacity.
- (4) The pump station and ground storage facility were analyzed on the maximum daily demand, while elevated storage was analyzed utilizing the difference between the maximum hourly demand and the maximum daily demand. This analysis is consistent with the sizing of these facilities in the master plan.
- (5) Utilized capacity cost for each water system facility is summarized in table no. 2. Appendix B of the five-year report includes the data for all components of the system that were determined to have utilized capacity during the study period.

Table No. 2 Summary of Eligible Capital Cost and Utilized Capacity Cost		
Water System	Total 20-Year Project Cost (\$)	Utilized Capacity (\$) in the CRF Period
Existing water facilities (pump station, reservoir, and elevated tank)	\$2,462,057.00	\$248,200.00
Existing DWU supply line and meter station	\$6,474,339.00	\$512,255.00
Existing water lines	\$4,124,519.00	\$826,648.00
<b>Existing water system subtotal:</b>	<b>\$13,060,915.00</b>	<b>\$1,587,103.00</b>
Proposed water facilities	\$0.00	\$0.00
Proposed distribution lines	\$403,363.00	\$279,239.00
<b>Proposed water system subtotal:</b>	<b>\$403,363.00</b>	<b>\$279,239.00</b>
<b>Total:</b>	<b>\$13,464,278.00</b>	<b>\$1,866,342.00</b>



- (6) 10-year capital improvement program for water projects. The additions to the water distribution system that are included in the 10-year capital improvement plan are as follows in table no. 3 and as shown in figure no. 1 attached to Ordinance 2015-003.

<b>Table No. 3 Proposed Distribution Lines</b>			
<b>Pipe Number</b>	<b>Location</b>	<b>Pipe Size</b>	<b>Year to be Canst.</b>
P-37	Water street	14"	2016
P-38	Water street	14"	2016
P-122	Water street	14"	2016

(c) Wastewater collection system.

- (1) The wastewater collection system analysis, a more static system than the dynamic water distribution model, covered all of the drainage basins within the study area. Capacity spreadsheets for the years 2011 and 2021 were prepared based on the city's wastewater collection system master plan.
- (2) Utilized capacity between the years 2011 and 2021 was based on land absorption from the population projections categorized by traffic survey zones.
- (3) The facilities in the impact fee analysis include the TRA Red Oak Creek Wastewater Treatment Plant (WWTP) and the city's collection trunk lines equal to or greater than 10 inches in diameter. The total cost of the wastewater treatment plant and trunk collection lines are included in the impact fee study.
- (4) Utilized capacity cost for the wastewater collection system is summarized in table no. 4. Appendix C includes the data for all components of the collection system that were determined to have utilized capacity during the study period.

<b>Table No. 4 Summary of Eligible Capital Cost and Utilized Capacity Cost</b>		
<b>Wastewater System</b>	<b>20-Year Project Cost</b>	<b>Utilized Capacity (\$) in the CRP Period</b>
Existing wastewater collection lines (city)	\$25,065.00	\$18,798.00
Existing Red Oak Creek WWTP (IRA)	\$198,000.00	\$97,020.00
Existing Red Oak Creek Trunk Lines (IRA)	\$77,938.00	\$9,798.00
<b>Existing wastewater system subtotal:</b>	<b>\$301,003.00</b>	<b>\$125,616.00</b>
Proposed wastewater collection lines (city)	\$772,108.00	\$420,159.00
Proposed Red Oak Creek Wastewater Treatment Plant Expansion (TRA)	\$294,123.00	\$176,473.00
Proposed Red Oak Creek Trunk Lines (TRA)	\$149,924.00	\$89,954.00
<b>Proposed wastewater system subtotal:</b>	<b>\$1,216,155.00</b>	<b>\$686,586.00</b>
<b>Total:</b>	<b>\$1,517,158.00</b>	<b>\$812,202.00</b>

- (5) 10-year capital improvement program. The additions to the wastewater collection system that are included in the 10-year capital improvements program are as follows in tables no. 5 and 6 and as shown in figure no. 2 attached to Ordinance 2015-003.

Table No. 5 Proposed TRA Facilities Improvements			
Approximate Date to be Placed in Service	Facility	Capacity of Improvement (MGD)	Total Capacity After Improvement (MGD)
2015	TRA treatment plant improvements and trunk line expansions	4.0	10.0

Table No. 6 Proposed City Collection Lines		
Pipe Number	Location	Pipe Size (in.)
M-1	Ovilla Road	10
O-1	South Red Oak Creek	10
O-2	South Red Oak Creek	12
P-1	Cockrell Hill Road	10
P-2	Cockrell Hill Road	12

(Ordinance 2015-003 adopted 1/12/15)

#### § 13.04.034. Living unit equivalency calculation.

- The approach taken to determine the growth in living units to take place during the capital recovery fee period was to relate the number of equivalent living units of 1,413 in 2011 (table no. 7) to the TCEQ minimum required peak hourly demand of 3.63 mgd. Therefore, the system has a maximum hourly demand of 2,569 gallons per day per living unit.
- Based on the water distribution analysis, the maximum hourly demand in the year 2021 is estimated to be 4.36 mgd. The year 2021 service units calculate to be 1,694 living units. Therefore, the number of living units in the capital recovery period calculates to be 282 (1,694 - 1,413).
- Living unit equivalency has been tied to meter size. The meter ratio to a 3/4" meter is based on the continuous daily maximum rate in million gallons per day (table no. 8). These rates are from the American Water Works Association standards for water meters. These standards are updated on a regular basis. The current standards used for establishing the ratio to the 3/4" meter is 1995 for C700 and 1996 for C703.

Table No. 7 Water Living Unit Equivalents								
Meter size	2011 Number of water meters	2011 Living unit equivalent ratio for 3/4" used	2011 Total number of living units	2011-2021 Growth multiplier	2021 Number of water meters	2021 Living unit equivalent ratio for 3/4" used	2021 Total number of living units	New Living units during impact fee period
3/4"	911	1.0	911	1.20	1,093	1.0	1,093	182
1	301	1.7	502	1.20	361	1.7	602	100
<b>Totals</b>	<b>1,212</b>		<b>1,413</b>		<b>1,454</b>		<b>1,695</b>	<b>282</b>

<sup>(a)</sup>Number of meters within city limits.

<sup>(b)</sup>Derived from AWWA C700–C703 standards for continuous rated flow performance of meters scaled to 3/4" meter.

<b>Table No. 8 Living Unit Equivalencies for Various Types and Sizes of Water Meters</b>			
<b>Meter Type</b>	<b>Meter Size</b>	<b>Continuous Duty Maximum Rate (mgd)</b>	<b>Ratio to 3/4" Meter</b>
Simple	3/4"	15	1.0
Simple	1"	25	1.7
Simple	1-1/2"	50	3.3
Simple	2"	80	5.3
Compound	2"	80	5.3
Turbine	2"	100	6.7
Compound	3"	160	10.7
Turbine	3"	240	16.0
Compound	4"	250	16.7
Turbine	4"	420	28.0
Compound	6"	500	33.3
Turbine	6"	920	61.3
Compound	8"	800	53.3
Turbine	8"	1,600	106.7
Compound	10"	2,300	153.3
Turbine	10"	2,500	166.7
Turbine	12"	3,300	220.0

<sup>(c)</sup>Source: AA Standard C700 (1995) – C703 (2004).

(Ordinance 2015-003 adopted 1/12/15)

#### **§ 13.04.035. Impact fee amounts adopted.**

The amount of water and wastewater impact fees adopted by the city council are set forth in section A7.009 of appendix A to this code.

(Ordinance 2015-003 adopted 1/12/15)