



AGENDA
WATER IMPACT FEE
CAPITAL IMPROVEMENT ADVISORY COMMITTEE (CIAC)
OCTOBER 19, 2023 @ 7:00 PM

Notice is hereby given that the Water Impact Fee Capital Improvement Advisory Committee for the City of Parker will hold a Regular Meeting on Thursday, October 19, 2023 at 7:00 P.M. at Parker City Hall, 5700 E. Parker Road, Parker, Texas, 75002. The City Council meeting will be open to the public and live streamed.

Pursuant to Texas Government Code § 551.127, notice is given that it is the intent of the City Council that a quorum of the Council will be physically present for the above-referenced meeting at Parker City Hall, 5700 E. Parker Road, Parker, Texas. Some council members or City employees may participate in this meeting remotely by means of video conference call in compliance with state law.

CALL TO ORDER – Roll Call and Determination of a Quorum

PLEDGE OF ALLEGIANCE

AMERICAN PLEDGE: I pledge allegiance to the flag of the United States of America; and to the republic for which it stands, one nation under God, indivisible with liberty and justice for all.

TEXAS PLEDGE: Honor the Texas flag; I pledge allegiance to thee, Texas, one state under God, one and indivisible.

PUBLIC COMMENTS The City Council invites any person with business before the Council to speak to the Council. No formal action may be taken on these items at this meeting. Please keep comments to 3 minutes.

ROUTINE ITEMS

1. PRESENTATION, REVIEW, AND DISCUSSION OF THE CITY OF PARKER, TEXAS WATER IMPACT FEE STUDY 2023 - 2033 REPORT BASED ON PREVIOUSLY ADOPTED LAND USE ASSUMPTIONS IN COMPLIANCE WITH GOVERNMENT CODE CHAPTER 395.
CONSIDERATION AND/OR ANY APPROPRIATE ACTION CONCERNING CITY OF PARKER, TEXAS WATER IMPACT FEE STUDY 2023 - 2033 REPORT.

FUTURE AGENDA ITEMS

ADJOURN

In addition to any specifically identified Executive Sessions, the Planning and Zoning Commission may convene into Executive Session at any point during the open meeting to discuss any item posted on this Agenda. The Open Meetings Act provides specific exceptions to the requirement that a meeting be open. Should Commission elect to convene into Executive Session, those exceptions will be specifically identified and announced. Any subsequent action, as a result of this Executive Session, will be taken and recorded in open session.

I certify that this Notice of Meeting was posted on or before October 13, 2023, by 5:00 p.m. at the Parker City Hall, and required by Texas Open Meetings Act (TOMA) is also posted to the City of Parker Website at www.parkertexas.us.

Date Notice Removed

Patti Scott Grey
City Secretary

The Parker City Hall is Wheelchair accessible. Sign interpretations or other special assistance for disabled attendees must be requested 48 hours in advance by contacting the City Secretary's Office at 972 442 6811.



WATER IMPACT FEE CIAC Agenda Item

Budget Account Code:	Meeting Date: See above
Budgeted Amount:	Department/ Requestor: WATER IMPACT FEE CIAC
Fund Balance-before expenditure:	Prepared by: Public Works Director Gary Machado
Estimated Cost:	Date Prepared: October 12, 2023
Exhibits:	Water Impact Fee Report 2023-2033

AGENDA SUBJECT

1. PRESENTATION, REVIEW, AND DISCUSSION OF THE CITY OF PARKER, TEXAS WATER IMPACT FEE STUDY 2023 - 2033 REPORT BASED ON PREVIOUSLY ADOPTED LAND USE ASSUMPTIONS IN COMPLIANCE WITH GOVERNMENT CODE CHAPTER 395.
2. CONSIDERATION AND/OR ANY APPROPRIATE ACTION CONCERNING CITY OF PARKER, TEXAS WATER IMPACT FEE STUDY 2023 - 2033 REPORT.

SUMMARY

Section 395.052 of the Texas Local Government Code requires that the City periodically update its land use assumptions and related water impact fee capital improvement plans for the imposition of a water impact fee every 5 years.

The Water Impact Fee Capital Improvement Advisory Committee will make a recommendation to the governing body concerning the water impact fees proposed above.

RECOMMENDED ACTION

Inter – Office Use			
Approved by:			
ACA/CS:	<i>Patti Scott Grey</i>	Date:	10/12/2023
City Attorney:	<i>Amy J. Stanphill</i>	Date:	10/xx/2023
Public Works Director:	<i>Gary Machado</i>	Date:	10/xx/2023

WATER IMPACT FEE REPORT 2023 - 2033

Submitted To The City Of



Submitted By

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

October 2023

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Mr. Luke Olson
City Administrator
City of Parker
5700 E. Parker Road
Parker, Texas 75002

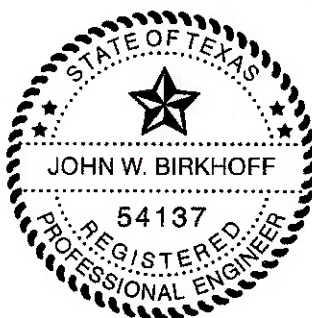
Re: Water Impact Fee Update

Dear Mr. Olson:

This report presents the results of the City of Parker Water Impact Fee Update for the planning years 2023 through 2033. This report includes the updated impact fee Capital Improvements Plan and the updated Maximum Impact Fees by meter size for water. 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 \$8,269.17

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 Parker.



Sincerely yours,

A handwritten signature in blue ink that reads "John W. Birkhoff".

John W. Birkhoff, P.E.

**CITY OF PARKER, TEXAS
WATER IMPACT FEE STUDY
2023 TO 2033**

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**CITY OF PARKER, TEXAS
WATER IMPACT FEE STUDY
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 and 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 necessitated by and attributable to the new development.¹ 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. Next, a Capital Improvements Plan must be created to describe the water distribution system infrastructure that will be necessary to serve the anticipated land uses and growth. Following the preparation of the Capital Improvements Plan the Water Impact Fee is calculated.

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

B. WATER IMPACT FEES

The following items can be included in the water 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.
- 3) Interest and other finance charges on bonds issued by the City to cover its portion of the cost.
- 4) Cost of the Impact Fee Analysis.

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 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 for the construction of facilities to serve the new developments and support new 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 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 system is based on established land use in the year 2023, projected land use patterns through the year 2033, and on proposed infrastructure.

The engineering analysis portion of the City of Parker's 2023 Impact Fee determines utilized capacity cost of the water distribution system master plan between the years 2023 and 2033.

C. 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 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 Parker, 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 Collin 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. 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.
23. 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.
24. 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.
25. Water meter means a device for measuring the flow of water to a development, whether for domestic or for irrigation purposes.

D. LAND USE ASSUMPTIONS SUMMARY

Under Chapter 395, of the Local Government Code, “Land Use Assumptions” includes a description of service area and projected 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. For this analysis the existing land use plan was utilized as no changes in land use has been made by the city.

Table 1 provides a summary of the growth assumptions used for the water distribution system.

TABLE NO. 1
POPULATION GROWTH ASSUMPTIONS

	2023	2033	Buildout
Population Assumption	5,884	8,710	12,000
Percent of Buildout Population (%)	49%	73%	100%
2023 to 2033 Population Growth:	148%		

E. DEFINITION OF A WATER SERVICE UNIT

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 Parker has previously defined a water service unit to be a 1-inch water meter and has referred to these service units as Single Family Living Unit Equivalents (SFLUE). The service unit is based on the continuous duty capacity of a 1-inch water meter. This is the typical meter used for a single family detached dwelling within the City, and therefore is considered to be equivalent to one “living unit”. Other meter sizes can be compared to the 1-inch meter through a ratio of water flows as published by the American Water Works Association and shown in Table No. 1 below. This same ratio is then used to determine the proportional water impact fee amount for each water meter size.

TABLE NO. 2
LIVING UNIT EQUIVALENCIES
FOR VARIOUS TYPES AND SIZES OF WATER METERS

Meter Type	Meter Size	Continuous Duty Maximum Rate ^(a)	Living Unit Per Meter Size
Simple	1”	25	1.0
Simple	2”	80	3.2
Compound	2”	80	3.2
Turbine	2”	100	4.0

^(a) Source: AWWA Standard C700 - C702

F. CALCULATION OF WATER LIVING UNIT EQUIVALENTS 2023-2033

The City of Parker provided the existing water meter count by size category as of October 2023. In total, there are 2,100 water meters serving the existing population of 5,882 residents in the Water Service Area. Table No. 2 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 No. 2, the new LUE's during the impact fee period total 1,136.

TABLE NO. 3
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 1" Used	Total Number of Living Units	Future Meter Size	Number of Water Meters	Living Unit Equivalent Ratio for 1" Used	Total Number of Living Units	
5/8" x 3/4"	197	1.0	197	1"	292	1.0	292	95
1"	1,820	1.0	1,820	1"	2,701	1.0	2,701	881
2"	83	4.0	332	2"	123	4.0	492	160
Totals	2,100		2,349		3,116		3,485	1,136

G. WATER DISTRIBUTION SYSTEM

Computer models for the years 2023 and 2033 were prepared based on the City's Water Distribution System Master Plan. The models were developed from residential population projections as shown in Table 1. The water distribution system include major distribution lines, pressure reducing valves, pump stations, elevated storage tanks and ground storage reservoirs.

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

G.1 Existing Pump Stations, Ground Storage Reservoirs & Elevated Storage Tanks

The existing water distribution system includes the facilities as shown in Table No. 4 and Table No. 5 below.

TABLE NO. 4
WATER DISTRIBUTION SYSTEM
EXISTING PUMP STATIONS & GROUND STORAGE

Pump Station	Number Of Pumps	Rated Capacity (MGD)	Number of Ground Storage Reservoirs	Total Ground Storage Available (MG))
East Side Pump Station	4	3.50	2	0.5
Total:	4	3.50	2	0.5

TABLE NO. 5
WATER DISTRIBUTION SYSTEM
EXISTING ELEVATED STORAGE

Pump Station	Capacity (MG)
City Hall Elevated Storage Tank	1.0
Total:	1.0

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.

G.2 Distribution Lines

The distribution lines consist of all lines within the service area planning boundary supplying water to customers in the City of Parker. Lines vary in size from 3/4-inch service lines to 18-inch transmission lines. Unless a smaller diameter water line is expected to be constructed by the City of Parker, only those proposed water lines 8-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.

H. CAPITAL IMPROVEMENT PLAN

H.1 Executive Summary

The City of Parker owns and operates their water distribution system comprised of pump stations, ground storage reservoirs, elevated storage tanks and pipeline infrastructure. This system is being improved and expanded to meet the needs of the water demands imposed by the current residents and future residents of Parker, Texas. A schedule for future improvements and investments in the water distribution system is known as the Capital Improvements Plan. Chapter 395 of the Texas Local Government Code requires the political subdivision create its Capital Improvement Plan to impose impact fees. The Capital Improvement Plan and its costs are required for the calculation of the water impact fee. Birkhoff, Hendricks, and Carter, with assistance of City staff, created the Capital Improvements Plan. Only projects from the Capital Improvement Plan that are required to provide capacity to serve growth during the impact fee (2023-2033) period can be included in the impact fee calculation.

H.2 Introduction

In accordance with Chapter 395 of the Texas Local Government Code, the City of Parker has retained Birkhoff, Hendricks & Carter, L.L.P. to establish the Capital Improvement Plan in conjunction with the Water Impact Fee Study. This section establishes the engineering basis for the capital projects and costs which are included in the water impact fee calculations.

The Capital Improvements Plan consists of the necessary water distribution system improvements to support the projected water demands placed on the distribution system due to future growth.

H.3 Facility Capacity Requirements

H.3.1 General

This section of the report discusses the capacity of those facilities that are required to be included in the Impact Fee Capital Improvements Plan and are also eligible in the calculation of the impact fee. The capacities evaluated are the existing available capacities and the increased capacities due to projected growth. These increased capacities serve the growth projected during the impact fee period.

H.3.2 Water Usage

The water distribution system must be improved in accordance with this Capital Improvement Plan in order to support the water demands imposed on the system by the projected growth the City is envisioning within the next 10-year period. The City's existing 2023 residential population is approximately 5,882 residents. In year 2033 the City projects the residential population to grow to approximately 8,710 residents. Based on a water demand study conducted for the City in August of 2023, the residential per capita water usage rate for maximum daily demand is 666 gallons per capita per day (gpcd). Table No. 6 illustrates the water demand rates used to calculate the water demands for the projected population.

TABLE NO. 6
2023 DESIGN WATER DEMAND RATES

Land Use	Maximum Daily Demand Rate	Maximum Hourly Demand Rate
Residential	666 g.p.c.d.	1,078 g.p.c.d.

g.p.c.d. – gallons per capita per day

g.p.a.d. – gallons per acre per day

residential peaking factor 1.62

Table No. 7 summarizes the calculated water demands for year 2023 and 2033, within the City's planning area.

TABLE NO. 7
WATER DEMANDS

Water Demand Capacities	Maximum Daily Demand (MGD)	Maximum Hourly Demand (MGD)
2023 Water Demands	3.92	6.34
2033 Water Demands	5.80	9.39
Additional Capacity Required:	1.88	3.05

H.3.3 Water Supply

The City currently receives treated water supply from the North Texas Municipal Water District (NTMWD) at the East Side Pump Station delivery point located at the southwest corner of the Parker Road and F.M. 1378 intersection. The East Side Pump Station delivery point has capacity to receive up to 3.50 MGD supply rate. It does not have enough capacity to support the additional supply required for the growth within the next ten year period. This site also does not have sufficient area for expansions. Based on the growth projections and the calculated water demands, a second delivery point for water supply will be needed to meet the new water demands. This new delivery point will be the Central Pump Station delivery point. The locations of the existing and proposed delivery points are shown on the Capital Improvement Plan Map included in this report. Table No. 8 summarizes the maximum day supply capacity requirements at each delivery point within the next ten-year impact fee period.

TABLE NO. 8
WATER SUPPLY

Water Supply Capacities	East Side Supply (MGD)	Central Supply (MGD)
2023 NTMWD Supply	3.50	0.00
2033 NTMWD Supply	3.50	2.30
Additional Supply Capacity Required:	0.00	2.30

H.3.4 Water Distribution System

The City's existing water distribution system can support the water demands applied to the system from the existing residential population. As the City grows within the next ten-year period, additional water distribution system facilities will need to be constructed to support water demand created from new growth. In addition to facilities, the water distribution system will require additional water lines.

The design of the proposed water distribution system is based on three separate demand conditions. The first condition is based on the maximum daily demand. This demand is the rate at which water is supplied and the rate which pump stations must be sized to deliver water to the system. The second condition is the maximum hourly demand rate on the day of maximum demand. Maximum hourly demand rate is used to size distribution lines and to determine the volume of elevated storage. The third condition used is the minimum hourly demand rate on the day of maximum demand. This rate is used to analyze the refill rates of elevated storage tanks. These three demand conditions were modeled over a three-day period with an Extended Period Simulation (EPS) in the hydraulic water model utilizing the InfoWater Pro water model software.

The existing and proposed distribution lines along with facilities are shown on the Capital Improvement Plan Map presented in this section of the Impact Fee Report. Table No. 9 summarizes the maximum hourly demands that the proposed distribution system will need to support.

TABLE NO. 9
WATER LINE DEMANDS

Waterline Capacities	Maximum Hourly Demand (MGD)
2023 Waterline Demands	6.34
2033 Waterline Demands	9.39
Addition Waterline Capacity Required:	3.05

H.3.5 High Service Pump Stations

The City can meet its pumping system demand requirements with the existing East Side Pump Station. This pump station has a firm pumping capacity of 3.50 MGD with the largest pump on standby to meet the Texas Commission on Environmental Quality (TCEQ) regulations. In order to meet the projected maximum daily demands, a second pump station with an initial firm capacity of 3.0 MGD will be required to be in service to meet the additional maximum daily demands. Table No. 10 summarizes the pump station capacities.

TABLE NO. 10
PUMP STATIONS

Pump Station Capacities	East Side Pump Station (MGD)	Central Pump Station (MGD)
2023 Pumping Capacity	3.50	0.00
2033 Pumping Capacity	0.00	3.0
Additional Pumping Capacity Required:	0.00	3.0

H.3.6 Ground Storage Reservoirs

Ground Storage within the system is necessary to provide a dependable supply and during periods of interruption in supply. The volume of ground storage was designed for a 6-hour drawdown for the maximum demand pumping. The East Side Pump Station currently has a 200,000-gallon and a 300,000-gallon ground storage reservoir. These two existing reservoirs serve the East Side delivery point and pump station. The new delivery point will require additional ground storage to meet TCEQ

regulations and to provide a dependable supply to the Central Pump Station. Table No. 11 illustrates the ground storage capacity requirements. The ground storage reservoir at the Central Pump Station will need to be constructed congruently with the proposed pump station.

TABLE NO. 11
GROUND STORAGE RESERVOIR REQUIREMENTS

Ground Storage Capacities	Ground Storage Added (MG)	Ground Storage Available (MG)
2023 Ground Storage Capacity	0.00	0.50
2033 Ground Storage Capacity	1.0	1.5
Reservoir Capacity Required:	1.0	1.5

H.3.7 Elevated Storage Tanks

Elevated storage within the system is required by TCEQ to maintain system pressure. In the Parker system, elevated storage is sized to meet the maximum hourly demands working in conjunction with the pump stations, while maintaining system pressures.

The City currently has one 1.0-MG elevated storage tank located on Parker Road, adjacent to City Hall, with a high water level at 800-ft above mean sea level (MSL). Table No. 12 summarizes the elevated storage requirements to meet maximum hourly demand rates within the 10-year study period.

TABLE NO. 12
ELEVATED STORAGE TANK REQUIREMENTS

Elevated Storage Capacities	Elevated Storage Added (MG)	Elevated Storage Available (MG)
2023 Elevated Storage Capacities	0.0	1.0
2033 Elevated Storage Capacities	1.0	2.0
Elevated Storage Capacity Required:	1.0	2.0

H.4 Facilities – Utilized Capacity

Utilized capacity for the water distribution system was calculated based on the demand required for each model year (2023, 2033 and Buildout). The models of the water distribution system are based on the 72-hour extended period simulation (EPS). Transmission and distribution facilities are sized based on either the maximum hour demand or the minimum hour 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 hour demand. The minimum hour flows are usually higher in those lines which are used to refill elevated storage. Table No. 13 below shows the unit flow assumptions used for analysis of each element of the distribution system.

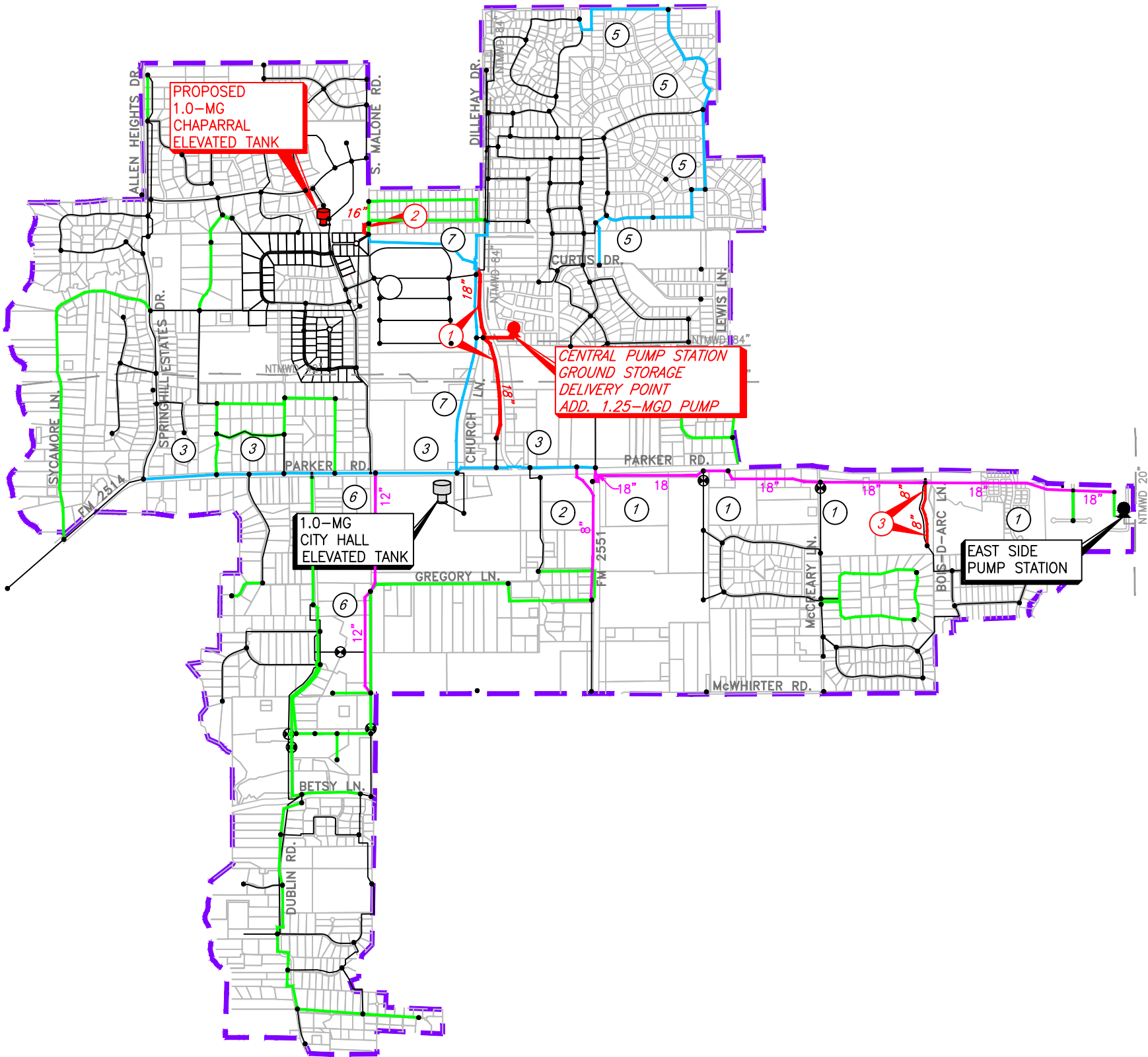
TABLE NO. 13
WATER DISTRIBUTION SYSTEM ANALYSIS
BASIS OF DEMAND CALCULATION

Type of Facilities	Demand Type	Impact Fee Per Capita Use
Pumping	Maximum Day	666 gallons/day
Distribution System	Maximum Hour	1,078 gallons/day
Ground Storage	Maximum Day x 6/24 Hours	
Elevated Storage	Maximum Hour - Maximum Day x 6/24 Hours	

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 the Impact Fee Capacity Calculation Tables provided in Appendix A. Table No. 14 summarizes the project cost and utilized cost over the impact fee period of 2023 - 2033 for each element of the Water Distribution System.

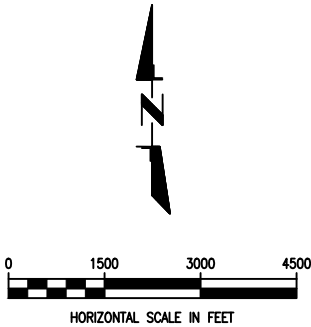


WATER DISTRIBUTION SYSTEM
2023-2033 WATER IMPACT FEE
CAPITAL IMPROVEMENT PLAN
AND RECOVERY WATERLINE MAP



LEGEND

- PLANNING AREA BOUNDARY
- EXISTING WATER LINE (NO IMPACT FEE)
- EXISTING WATER LINE (IMPACT FEE)
- PROPOSED WATER LINE (IMPACT FEE)
- CITY PARTICIPATED IN OVERSIZE COST (IMPACT FEE)
- CITY PURCHASED FROM PECAN ORCHARD (IMPACT FEE)
- EXISTING NTMWD SUPPLY LINE
- EXISTING PUMP STATION
- PROPOSED PUMP STATION
- EXISTING ELEVATED STORAGE TANK
- EXISTING PRESSURE REDUCING VALVE
- PROPOSED PRESSURE REDUCING VALVE
- EXISTING WATER LINE (IMPACT FEE)
- PROPOSED WATER LINE PROJECTS



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

H.6 Capital Improvement Plan Cost

In order to meet the demands of the anticipated growth over the next 10-years, certain water distribution system improvements are required. These recommended improvements form the basis for the Water Distribution System Impact Fee Calculation and totals \$13,916,225. Adding the cost of financing brings the total 10-year Water Distribution System Capital Improvement cost to \$22,321,381. Table No. 16 represents a summary of the existing and proposed facilities capital costs within the planning period.

The existing facilities that were determined to be impact fee eligible due to available capacity that can be utilized to support growth were included in the impact fee calculations. The actual cost of construction for these facilities were used in the calculations when known. Existing eligible infrastructure without available project costs were estimated based on average unit cost.

The average unit cost for the proposed capital improvement projects and the existing facilities was derived from a limited survey of projects, which bid recently, plus an estimated cost for engineering, easements and debt service. The cost and the utilized capacity of the proposed water lines, pump stations, ground storage reservoirs elevated storage tanks and existing facility proposed improvements during the impact fee period are included in Table No. 15.

TABLE No. 14
CITY OF PARKER, TEXAS
2023 IMPACT FEE
WATER DISTRIBUTION SYSTEM
10-YEAR CAPITAL IMPROVEMENT PLAN

PROPOSED WATER LINES

Project No. ⁽³⁾	Project	Size	Opinion of Project Cost ⁽¹⁾	Debt Service ⁽²⁾	Total Project Cost
1	Dillehay Drive 18-Inch Water Line	18"	\$ 1,546,875	\$ 935,630	\$ 2,482,505
2	Chaparral Elevated Storage Tank 16-Inch Water Line	16"	\$ 96,250	\$ 58,217	\$ 154,467
3	Bois-D-Arc Lane 8-Inch Water Line	8"	\$ 317,300	\$ 191,919	\$ 509,219
Subtotal: Proposed Water Lines			\$ 1,960,425	\$ 1,185,766	\$ 3,146,191

SUPPLY, PUMPING, STORAGE FACILITIES AND FACILITY IMPROVEMENTS

Project No. ⁽⁴⁾	Project	Capacity	Opinion of Project Cost ⁽¹⁾	Debt Service ⁽²⁾	Total Project Cost
4	Central Pump Station - 1.75 MGD P.S.	1.75 MGD	\$ 4,391,800	\$ 2,656,388	\$ 7,048,188
5	Central Pump Station - 1.0 MG G.S.R.	0.75 MG	\$ 1,160,000	\$ 701,628	\$ 1,861,628
6	NTMWD Delivery Point No. 2	5 MGD	\$ 1,320,000	\$ 798,404	\$ 2,118,404
7	Chaparral 1.0-MG Elevated Storage Tank	1 MG	\$ 4,920,000	\$ 2,975,871	\$ 7,895,871
8	Additional 1.25-MGD Pump at Central Pump Station		\$ 144,000	\$ 87,099	\$ 231,099
Subtotal, Supply, Pumping and Storage Facilities:			\$ 11,935,800	\$ 7,219,390	\$ 19,155,190

PLANNING EXPENSES

Project No.	Project	Opinion of Cost (1)(b)	Debt Service ⁽²⁾	Total Project Cost
	Water Impact Fee	\$ 20,000	\$ -	\$ 20,000
Subtotal, Planning Expenses:		\$ 20,000	\$ -	\$ 20,000
Water Distribution System CIP Grand Total:		\$ 13,916,225	\$ 8,405,156	\$ 22,321,381

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%

H.7 Utilized Capacity Costs

TABLE NO. 15
SUMMARY OF ELIGIBLE CAPITAL COST & UTILIZED CAPACITY COST

Water System	Total Capital Cost (\$)	Total 20-Year Project Cost (\$)	Utilized Capacity During Fee Period (\$)
Existing Water Lines	\$ 2,259,443	\$ 3,580,694	\$ 287,912
Existing Water Facilities	\$ 3,494,971	\$ 5,511,919	\$ 1,322,514
Existing Water System Subtotal:	\$ 5,754,414	\$ 9,092,613	\$ 1,610,426
Proposed Water Lines	\$ 1,960,425	\$ 3,146,191	\$ 1,842,802
Proposed Water Facilities	\$ 11,935,800	\$ 19,155,189	\$ 15,314,320
Impact Fee Expenses	\$ 20,000	\$ 20,000	\$ 20,000
Proposed Water System Subtotal:	\$ 13,916,225	\$ 22,321,380	\$ 17,177,122
TOTAL:	\$ 19,670,639	\$ 31,413,993	\$ 18,787,548

I. CALCULATION OF MAXIMUM WATER IMPACT FEES

The maximum impact fees for the water distribution system is calculated 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 No. 16. The calculations are shown below.

TABLE NO. 16
MAXIMUM ALLOWABLE WATER IMPACT FEE

Maximum Water Impact Fee	=	$\frac{\text{Eligible Existing Utilized Cost} + \text{Eligible Proposed Utilized Cost}}{\text{Number of New Living Unit Equivalent over the Next 10 Years}}$	
	=	$\frac{\$1,610,426 + \$17,177,122}{1,136}$	$\frac{\$18,787,548}{1,136}$
Maximum Impact Fee	=	<u>\$16,538.33</u>	
Allowable Maximum Water Impact Fee: (Max Impact Fee x 50%)*	=		<u><u>\$8,269.17</u></u>
<i>* Maximum allowable impact fee is 50% of the maximum calculated impact fee per Chapter 395 LGC</i>			

Based on the Maximum Impact Fee Calculation for Water, Table No. 17 calculates the maximum impact fee for the various sizes of water meters.

TABLE NO. 17
ALLOWABLE MAXIMUM FEE PER LIVING UNIT EQUIVALENT
AND
PER METER SIZE AND TYPE

50% Max . Water Impact fee /LUE **\$ 8,269.17**

Typical Land Use	Meter Type	Meter Size	LUE	Maximum Water	
				Impact Fee	
Single Family Residential	Simple	1"	1	\$	8,269.17
Single Family Residential	Simple	2"	4	\$	33,076.67

***APPENDIX
WATER IMPACT FEE UTILIZED
CAPACITY TABLES***

TABLE NO. 19
CITY OF PARKER, TEXAS
2023 WATER SYSTEM IMPACT FEE STUDY
EXISTING WATER LINES

Pipe Number	Length (Ft.)	Diameter (Inches)	Date of Const.	Avg. Unit Cost (\$/Ft.)	Construction Cost (\$)	20 Year Debt Service Utilizing Simple Interest	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(\$) Utilized Capacity		
								2023	2033	During Fee Period	2023	2033	During Fee Period
1 - Parker Road 12 & 18-Inch Water Line (East Side P.S. to F.M. 2551)													
P-1078	358	12	0	\$61.79	\$22,119	\$13,379	\$35,498	68%	72%	4%	\$24,139	\$25,559	\$1,420
P-1084	2,615	12	0	\$61.79	\$161,569	\$97,726	\$259,295	68%	72%	4%	\$176,321	\$186,692	\$10,372
P-1271	7,903	18	0	\$61.79	\$488,292	\$295,344	\$783,636	100%	100%	0%	\$783,636	\$783,636	\$0
P-1289	2,072	18	0	\$61.79	\$128,020	\$77,433	\$205,453	100%	100%	0%	\$205,453	\$205,453	\$0
Subtotal:	12,948				\$800,000	\$483,881	\$1,283,881				\$1,189,549	\$1,201,340	\$11,792
2 - F.M. 2551 8-Inch Water Line													
P-1035	3,315	8	0	\$77.08	\$255,515	\$154,549	\$410,063	79%	85%	6%	\$323,950	\$348,554	\$24,604
Subtotal:	3,315				\$255,515	\$154,549	\$410,063				\$323,950	\$348,554	\$24,604
3 - Parker Road 12-Inch Water Line (F.M. 2551 to Springhill Estates Drive)													
P-1068	1,989	12	0	\$30.00	\$59,670	\$36,092	\$95,762	100%	100%	0%	\$95,762	\$95,762	\$0
P-1069	585	12	0	\$30.00	\$17,550	\$10,615	\$28,165	100%	100%	0%	\$28,165	\$28,165	\$0
P-1070	1,008	12	0	\$30.00	\$30,240	\$18,291	\$48,531	100%	100%	0%	\$48,531	\$48,531	\$0
P-1071	560	12	0	\$30.00	\$16,800	\$10,162	\$26,962	100%	100%	0%	\$26,962	\$26,962	\$0
P-1072	645	12	0	\$30.00	\$19,350	\$11,704	\$31,054	100%	100%	0%	\$31,054	\$31,054	\$0
P-1073	1,009	12	0	\$30.00	\$30,270	\$18,309	\$48,579	100%	100%	0%	\$48,579	\$48,579	\$0
P-1074	944	12	0	\$30.00	\$28,320	\$17,129	\$45,449	96%	100%	4%	\$43,631	\$45,449	\$1,818
P-1075	812	12	0	\$30.00	\$24,360	\$14,734	\$39,094	100%	100%	0%	\$39,094	\$39,094	\$0
P-1076	953	12	0	\$30.00	\$28,590	\$17,293	\$45,883	100%	100%	0%	\$45,883	\$45,883	\$0
P-1077	596	12	0	\$30.00	\$17,880	\$10,815	\$28,695	100%	100%	0%	\$28,695	\$28,695	\$0
P-1178	1,927	12	0	\$30.00	\$57,810	\$34,966	\$92,776	77%	94%	17%	\$71,438	\$87,210	\$15,772
Subtotal:	11,028				\$330,840	\$200,109	\$530,949				\$507,794	\$525,384	\$17,590
4 - Chaparral Elevated Storage Tank 16-Inch Water Line													
P-1260	2,956	16	0	\$33.83	\$100,000	\$60,485	\$160,485	7%	71%	64%	\$11,234	\$113,944	\$102,711
Subtotal:	2,956				\$100,000	\$60,485	\$160,485				\$11,234	\$113,944	\$102,711
5 - Muddy Creek 12-Inch Water Line													
P-1169	2,780	12	0	\$30.00	\$83,400	\$50,445	\$133,845	100%	100%	0%	\$133,845	\$133,845	\$0
P-1170	3,035	12	0	\$30.00	\$91,050	\$55,072	\$146,122	35%	39%	4%	\$51,143	\$56,987	\$5,845
P-1171	1,890	12	0	\$30.00	\$56,700	\$34,295	\$90,995	100%	100%	0%	\$90,995	\$90,995	\$0
P-1176	325	12	0	\$30.00	\$9,750	\$5,897	\$15,647	100%	100%	0%	\$15,647	\$15,647	\$0
P-1280	1,570	12	0	\$30.00	\$47,100	\$28,489	\$75,589	70%	70%	0%	\$52,912	\$52,912	\$0
P-1317	3,350	12	0	\$30.00	\$100,500	\$60,788	\$161,288	100%	100%	0%	\$161,288	\$161,288	\$0
P-1319	320	12	0	\$30.00	\$9,600	\$5,807	\$15,407	100%	100%	0%	\$15,407	\$15,407	\$0
P-1321	990	12	0	\$30.00	\$29,700	\$17,964	\$47,664	54%	54%	0%	\$25,739	\$25,739	\$0
Subtotal:	14,260				\$427,800	\$258,756	\$686,556				\$546,976	\$552,820	\$5,845

TABLE NO. 19
CITY OF PARKER, TEXAS
2023 WATER SYSTEM IMPACT FEE STUDY
EXISTING WATER LINES

Pipe Number	Length (Ft.)	Diameter (Inches)	Date of Const.	Avg. Unit Cost (\$/Ft.)	Construction Cost (\$)	20 Year Debt Service Utilizing Simple Interest	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(\$) Utilized Capacity		
								2023	2033	During Fee Period	2023	2033	During Fee Period
6 - 2009 12-Inch Water Line Phase-2													
P-1181	2,419	12	2009	\$50.43	\$121,996	\$73,789	\$195,785	52%	81%	29%	\$101,808	\$158,586	\$56,778
P-1254	2,940	12		\$50.43	\$148,271	\$89,682	\$237,953	72%	100%	28%	\$171,326	\$237,953	\$66,627
Subtotal:	5,359				\$270,267	\$163,471	\$433,738				\$273,134	\$396,539	\$123,405
7 - Church Road Waterline													
P-1080	3,124	12	2002	\$15.72	\$49,113	\$0	\$49,113	96%	100%	4%	\$47,148	\$49,113	\$1,965
P-1220	1,648	12		\$15.72	\$25,908	\$0	\$25,908	100%	100%	0%	\$25,908	\$25,908	\$0
Subtotal:	4,772				\$75,021	\$0	\$75,021				\$73,056	\$75,021	\$1,965
Total:	54,638				\$2,259,443	\$1,321,251	\$3,580,694				\$2,925,693	\$3,213,602	\$287,912

TABLE NO. 20
CITY OF PARKER, TEXAS
2023 WATER DISTRIBUTION IMPACT FEE STUDY
EXISTING WATER SUPPLY, PUMPING AND STORAGE FACILITIES

Pump Station Improvements	Year Const.	Capacity	Units	Pump Station Cost (\$)					Capacity Utilized (%)			Capacity Utilized (\$)		
				Construction Cost (\$)	Engineering, Testing and Property Acquisition	Debt Service Interest Rate %	20 Year Debt Service Utilizing Simple Interest	Total 20 Yr. Project Cost (\$)	2023	2033	In The CRF Period	2023	2033	In The CRF Period
Existing Pump Stations, Ground Storage, and Elevated Storage Facilities														
Facilities & Water Line Purchase From Pecan Orchard	1988	-----	-----	\$196,000	\$0	Special	\$21,560	\$217,560	68%	72%	4%	\$147,941	\$156,643	\$8,702
East Side Pump Station Improvements	2003	3.60	MGD	\$396,700	\$79,340	5%	\$287,934	\$763,974	100%	100%	0%	\$763,974	\$763,974	\$0
City Hall Elevated Storage Tank	2011	1.0	MG	\$2,352,442	\$470,488	5%	\$1,707,455	\$4,530,385	61%	90%	29%	\$2,763,535	\$4,077,347	\$1,313,812
Existing Facilities Total:				\$2,945,142	\$549,828		\$2,016,948	\$5,511,919				\$3,675,449	\$4,997,964	\$1,322,514

TABLE NO. 21
CITY OF PARKER, TEXAS
2023 WATER SYSTEM IMPACT FEE STUDY
PROPOSED WATER LINES

*** Average Unit costs are based in 2023 dollars unless otherwise indicated and includes 20% for engineering and easen*

Pipe Number	Length (Ft.)	Diameter (Inches)	Avg. Unit Cost (\$/Ft.)	Construction Cost (\$)	20 Year Debt Service @ 5% Simple Interest	Total 20 Year Project Cost (\$)	(%) Utilized Capacity			(\$) Utilized Capacity			
							2023	2033	During Fee Period	2023	2023	During Fee Period	
1 - Dillehay Drive 18-Inch Water Line													
This project begins at the proposed Central Pump Station and bears north and south. The northern segment terminates near Kara Lane approximately 1,500 feet south of Chapparral while the southern segment continues to just south of Lindsey Lane approximately 2,000 feet north of Parker Road.													
2	P-1252	2,490	18"	\$375.00	\$933,750	\$564,780	\$1,498,530	0.0%	91.0%	91.0%	\$0	\$1,363,663	\$1,363,663
2	P-1253	1,635	18"	\$375.00	\$613,125	\$370,850	\$983,975	0.0%	24.0%	24.0%	\$0	\$236,154	\$236,154
Subtotal:		4,125			\$1,546,875	\$935,630	\$2,482,505				\$0	\$1,599,817	\$1,599,817
2 - Chaparral Elevated Storage Tank 16-Inch Water Line													
This water line begins at the proposed Chaparral Elevated Storage Tank and continues northerly connecting to the existing 16-inch water line at the intersection of Malone Drive and Nestledown Road.													
2	P-1191	385	16"	\$250.00	\$96,250	\$58,217	\$154,467	0.0%	65.0%	65.0%	\$0	\$100,404	\$100,404
Subtotal:		385			\$96,250	\$58,217	\$154,467				\$0	\$100,404	\$100,404
3 - Bois-D-Arc Lane 8-Inch Water Line													
The water line begins at a point for connection to the existing 18-inch Parker Road Water Line and continues southerly connecting to the existing 8-inch water line south of Bois-D-Arc Lane.													
2	P-1157	1,670	8"	\$190.00	\$317,300	\$191,919	\$509,219	0.0%	28.0%	28.0%	\$0	\$142,581	\$142,581
Subtotal:		1,670			\$317,300	\$191,919	\$509,219				\$0	\$142,581	\$142,581
CIP Total:		6,180			\$1,960,425	\$1,185,766	\$3,146,191				\$0	\$1,842,802	\$1,842,802

1 - City Participate in Cost Oversize

2 - City Initiated & Funded

TABLE NO. 22
CITY OF PARKER, TEXAS
2023 WATER DISTRIBUTION IMPACT FEE STUDY
PROPOSED WATER FACILITIES

Facility Improvements		Projected Capacity	Units	Water Facilities Cost (\$)					Capacity Utilized (%)			Capacity Utilized (\$)		
				Capital Cost (\$)	Engineering, Testing and Property Acquisition 20% (\$)	Opinion of Project Total Cost (\$)	20 Year Debt Service Utilizing 5% Simple Interest (\$)	Total 20 Yr. Project Cost (\$)	2023	2033	In The CRF Period	2023	2033	In The CRF Period
Proposed Pump Stations, Ground Storage, and Elevated Storage Facilities														
8.	Central Pump Station - 1.75 MGD P.S.	1.75	MGD	\$4,391,800	\$0	\$4,391,800	\$2,656,388	\$7,048,188	0.0%	73.0%	73.0%	\$0	\$5,145,177	\$5,145,177
9.	Central Pump Station - 1.0 MG G.S.R.	0.75	MG	\$1,160,000	\$0	\$1,160,000	\$701,628	\$1,861,628	0.0%	73.0%	73.0%	\$0	\$1,358,988	\$1,358,988
10.	NTMWD Delivery Point No. 2	5.0	MGD	\$1,100,000	\$220,000	\$1,320,000	\$798,404	\$2,118,404	0.0%	73.0%	73.0%	\$0	\$1,546,435	\$1,546,435
11.	Chaparral 1.0-MG Elevated Storage Tank	1.0	MG	\$4,100,000	\$820,000	\$4,920,000	\$2,975,871	\$7,895,871	0.0%	89.8%	89.8%	\$0	\$7,086,544	\$7,086,544
12.	Additional 1.25-MGD Pump at Central Pump Station	1.25	MGD	\$120,000	\$24,000	\$144,000	\$87,099	\$231,099	0.0%	76.7%	76.7%	\$0	\$177,176	\$177,176
Proposed Facility Total:				\$10,871,800	\$1,064,000	\$11,935,800	\$7,219,389	\$19,155,189					\$15,314,320	\$15,314,320



2023 - 2033
WATER IMPACT FEE STUDY

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October 2023