June 1, 2022

2023-2070 Integrated Water Master Plan

PO 327730

Prepared for:

City of Laredo

INTERIM REVIEW ONLY
Document incomplete: not intended for permit, bidding or construction.

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Date: June 10, 2022

Water Supply

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Hydraulic Modeling

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Capital Projects & Impact Fees

Executive Summary

The City of Laredo Integrated Water Master Plan (IWMP or Plan) presents findings and recommendations resulting from analysis and needs assessment of water supply, treatment, transmission, and distribution systems over the next 50 years. The IWMP builds on previous capital improvements and master planning efforts but is a stand-alone document.

The Plan includes the evaluation of the existing water system and water supply, water demand projections, the exploration of Emergency and Secondary water supplies, ***and a phased capital improvement plan*** *(CIP)*. The recommended improvements will serve as a basis for design, construction, and financing required to improve the City's current water service and prepare for projected population growth. The Plan focuses on the short-term identification and correction of existing deficiencies, while identifying and sequencing future alternatives to accommodate growth. Public outreach and participation were key components of the plan. A financial analysis of the capacity of the City's water utility is also included to facilitate decisions about financing the capital improvements identified.

Population Growth

Estimated from the 2020 US Census, the 2022 population of Laredo is 267,396. Laredo is the 10th largest city in Texas and the 82nd largest city in the United States. Laredo is currently growing at a 0.62% rate annually and population has increased by 12.3% since the 2010 US Census population of 236,091. **Figure ES-1** shows Texas Water Development Board estimates for the 2070 population of Laredo to be over 600,000.

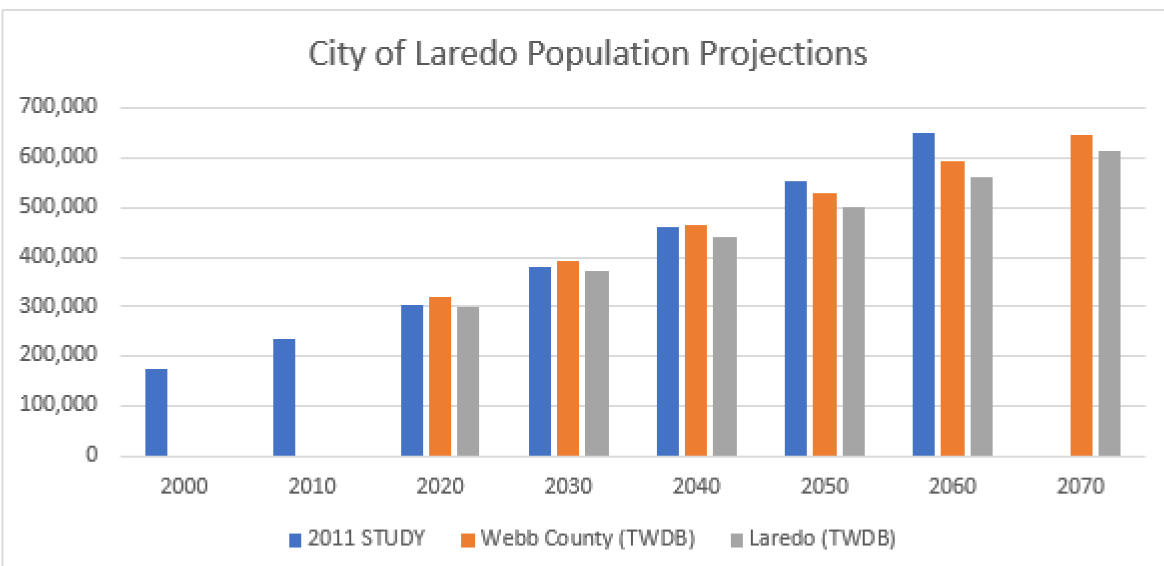


Figure ES-1: Laredo Population Projections

Population and Future land use are essential elements in the analysis of the water system. Water demand projections are dependent on residential population and commercial development served by the water system. This will determine the water supply needed to accommodate growth, size, and location of system infrastructure along with future water supply. The IWMP is intended to provide a road map for the next 50 years that will allow the City's Department of Utilities to prepare for future growth while improving the water system for existing residents and businesses.

Public Involvement and Outreach

A key component of the IWMP is public involvement and outreach. Outreach consisted of social media, website, cable television commercials, surveys, livestream townhalls (virtual and hybrid), and workshops. Over the course of two years, posts and tweets were published with information regarding public involvement and outreach. The community was invited to participate in townhalls, attend workshops, and complete online surveys. On average, there were more than 25 participants per townhall, and 1,000 surveys completed. A summary of social media outreach is shown in **Table ES-1** below.

Table ES-1: Social Media Outreach

Platform	Posts/Tweets	Followers
Facebook	Approximately 186	348
Instagram	Approximately 186	408
Twitter	Approximately 186	34
LinkedIn	Approximately 186	09

Existing Water System

The City historically has relied on the Rio Grande for its source of raw water and has approximately 62,000 acre-feet of municipal water in the river. In 1957, the City entered into an agreement with Webb County to use Lake Casa Blanca Reservoir as off-channel storage for Emergency use. This agreement is still in effect. This reservoir has an impoundment capacity of 77,800 acre-feet at top of the dam and 58,600 acre-feet at maximum pool, of which 20,000 acre-feet are reserved for Emergency use.

The City currently operates two surface Water Treatment Plants (WTP) with a combined capacity of approximately 85 million gallons per day (MGD). At 65-MGD, the Jefferson WTP has always been the largest plant supplying most of the City. El Pico WTP, rated for 20-MGD, was completed in 2016 and allowed for decommissioning the smaller two WTPs. Currently, Jefferson and El Pico are the two WTPs treating water for the City.

The backbone of Laredo's water system starts with pumping water from the Rio Grande, which is then treated at the Jefferson WTP. The water is then distributed thru transmission lines ranging from 20- to 36-inches and then through five booster pump stations into additional (BPS) in smaller pipelines leading to each neighborhood. The combined pumping capacity for the five pumps stations is 52-MGD with maximum daily demands of approximately 15-MGD.

The system was modified significantly when the El Pico WTP began operations in 2016. The 60-inch transmission lines originating at El Pico WTP extend eastward across the northern part of the water system service area. Further Improvements will continue to extend the delivery of water produced at El Pico to other parts of the system. Connections between old/existing parts of the system and new transmission lines may reduce the need to improve/expand other existing facilities.

The average daily consumption during 2019 was approximately 33.8-MGD and peak demand for 2019 was 53.4-MGD. The number of connections as of September 30, 2019, were 72,859. The system consists of approximately 1,108 miles of transmission and distribution lines with 7,980 fire hydrants. The average number of water meters read each month is approximately 72, 392.

The City's water distribution system, pipes smaller than 24-inches, includes more than 900 miles of waterlines. Approximately two-thirds of the waterlines are 6- to 8-inches in diameter. Almost 90% of the pipe is either cast iron or polyvinyl chloride material.

Water Demand Projections

Steady growth has characterized the City since about 1990 and continued growth is forecast for the near future. Understanding potential future water demand is vital to plan future infrastructure to meet that demand. Water use is most strongly correlated to the population served. **Figure ES-2** shows the projected water demand growth. Laredo has done well acquiring water supply and is positioned for growth but must continue to secure additional supplies including possible reuse and other Supplemental supplies. This is discussed in more detail in the next section.

2021 Regional Water Plan - Water Demand Projections for 2020-2070
Municipal Water User Group Summary in Acre-Feet

EntityID	WUG Name	Region	County	Basin	2020	2030	2040	2050	2060	2070
1306	LAREDO	M	WEBB	RIO GRANDE	42,028	50,530	58,812	66,591	74,190	81,096
LAREDO Total Water Demand					42,028	50,530	58,812	66,591	74,190	81,096

Texas Water Development Board

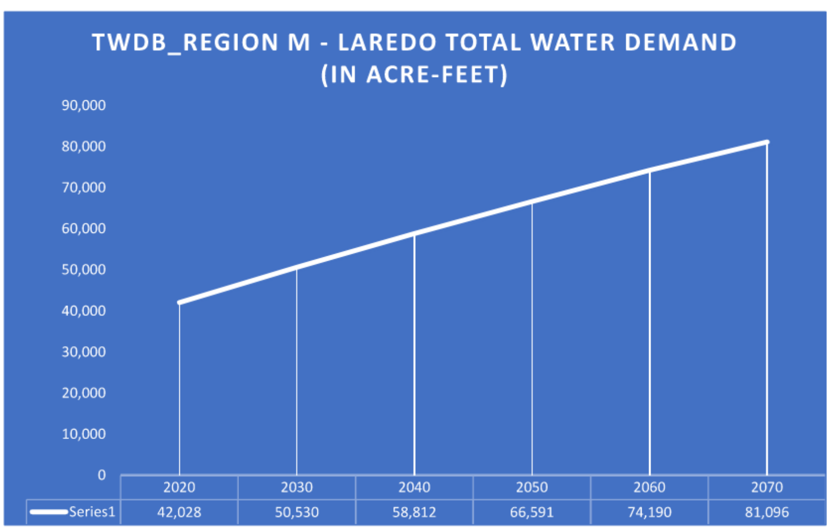


Figure ES-2: Growing Water Demand

Water Supply

The City has relied almost entirely on the Rio Grande for its water supplies. To the City's credit, the City has acquired and currently has available for water supply almost 60,000 AF/yr. This supply should be sufficient to meet the City's water needs through the year 2040. As the City's water demands are expected to continue increasing, a predicted 2070 shortfall of existing supply versus anticipated demand is over 22,000 AF/yr. However, if the City growth or water needs exceed the Region M projections, additional water supply could be needed earlier than estimated.

Since the Rio Grande River is Laredo's main source of water supply, there exists the potential of an event or act that would cause an unexpected outage, preventing the City from diverting its water supply from the River. For many years, the Laredo City Council and City management have recognized these vulnerabilities. Efforts continue to identify a viable water supply source (Secondary Water Supply) that could provide a sufficient supply during emergency conditions triggered by an outage of the Rio Grande supply.

A major objective of this report is to identify potential secondary sources, characterize them in terms of potential supply for short-term (emergency outages) and for long-term supply (supply needed for future growth), and provide information and recommendations regarding additional evaluations needed to move forward with implementing a secondary supply source. Over the past 20 to 25 years, the City has investigated various water supply alternatives involving groundwater resources including importing fresh groundwater, developing local or nearby brackish groundwater sources, and implementing aquifer storage and recovery (ASR). This report includes an update on groundwater sources, including an update to previously considered sources as well as new possibilities throughout Section 5. Numerous prior studies related to Secondary Water Supply were consulted for this report. These are referenced in **Appendix B**. Also included in the Appendix, as Item 8, is a list showing the numerous City Council sessions during recent years that involved Secondary Water Supply considerations.

This IWMP identifies and assess potential secondary water supply sources in **Section 5**, providing pertinent, planning-level information, as well as recommendations on future follow-up investigations needed. Further, that section also identifies and discusses the alternative supply sources evaluated to satisfy the Supplemental supply, the Emergency supply, or to supply the Supplemental and Emergency supply.

Water System Analyses

A water model was developed and calibrated using Bentley WaterCAD Version 10.03 to conduct hydraulic analyses and identify deficiencies in the City's water system. Various combinations of improvements and system modifications were investigated to determine the most appropriate approach to meet projected water demands. As recommended by City staff, pipes installed prior to 1988 were modeled as being cast iron pipe and those installed after that year were modelled as PVC, unless record drawings or additional information from staff was available.

The hydraulics of water distribution systems follow recognized rules and can be analyzed accordingly. Hydraulic models calculated pressures, flowrates, and velocities, as well as changes in storage as they simulate operation of the actual system. With sufficiently detailed and accurate input, models may predict system response and behavior for specified conditions hours and perhaps days into the future. Model input and updates were based on the best information available including coordination with water utility operations staff, treatment plant and BPS production records, record drawings, Supervisory Control and Data Acquisition (SCADA) history, pump curves and settings, and tank data from record information.

The City has several improvement projects in various stages of planning, design, and construction. Updates to the hydraulic model include these projects. LAN's effort to develop a Capital Improvements Program (CIP) followed an organized approach to identify projects to address current problem areas with capacity to serve growing demand and future projects to develop a structured system to serve future users.

Treated Water System Capital Improvement Program

While there is existing water treatment capacity to meet the current and projected water demand for the next five years, there are some improvements needed to move that water, once treated, from the Jefferson and El Pico WTPs into the water system. The primary objective the City's CIP is to improved water system reliability. The reliability improvements are focused on the transmission lines because the existing system has sufficient water treatment capacity. The transmission waterlines move water from the treatment plants to the neighborhoods and service areas for the City but have limited capacity. Additional water transmission lines will improve the system reliability for most of the water system when emergencies occur, for normal system and pressure, and for some water age concerns.

The FY 2023 – 2027 proposed CIP includes transmission waterline connections between PBSs and from the Jefferson and El Pico WTPs into the City as well. Other projects along Loop 20 and from the MHOC BPS to the Bartlett Elevated Storage Tank (EST) were already in progress and are also included in the FY 2023 – 2027 CIP.

The FY 2028 – 2032 CIP transmission lines continues to fill-in and extend the transmission system across the city and towards planned developments.

The FY 2033 and beyond CIP focuses on the construction of an "Outer Loop" Transmission Line.

Impact Fees

All Texas cities must follow Texas Local Government Code, Chapter 395 procedures to create and implement impact fees. Chapter 395 defines an impact fee as a "charge or assessment imposed by a political subdivision against a new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development."

The Texas Local Government Code, Chapter 395, §052 requires a political subdivision imposing an impact fee to update land use assumptions and capital improvements plans at least every five years. The planning period for this impact fee assessment is the 10-year period from 2023 to 2033.

The impact fee for each infrastructure system is calculated by dividing the eligible cost of the capital improvements by the increase of service units from projected new development during the study period. The plan uses the 10-year water CIP and land use assumptions to calculate the maximum allowable impact fees for reimbursement of water infrastructure.

The calculated maximum adjusted water impact fee of $15,237 for a standard service unit (a 3/4-inch meter) can be viewed in **Table ES-2** below and details for the calculation are shown in Section 7. The impact fee analysis must also include a schedule that reduces the fee by the amount of utility service revenues or ad valorem taxes allocated to capital improvements. A credit of 50% can be applied to the eligible CIP cost to estimate this discount. **Table ES-3** also shows the adjusted maximum water impact fee with the 50% credit applied.

Table ES-2: Adjusted Water Maximum Impact Fees

Land Use	Total Eligible Costs	Total 2020-2030 SUE Increase	Maximum Impact Fee	Adjusted Max Impact Fee
Commercial	$302,668,479	19,864	$15,237	$7,619
Residential				

Comparison of Local Impact Fees

Table ES-3 and **Figure ES-3** show the impact fees charged by other similar sized Texas cities along with a possible fee for Laredo. The City of Laredo fee reflects the values with the 50% adjustment. The source data for the municipalities can be referenced in **Appendix I**.

Table ES-3: Regional Impact Fees

Municipality	Population	Water Impact Fee	Base Meter Size
Laredo	261,639	$7,619	3/4"
Brownsville	186,738	$1,250	1"
Harlingen	65,436	$2,900	1"
Lubbock	258,871	$576	1"
McKinney	195,308	$2,929	1"
Arlington	394,266	$3,024	5/8"

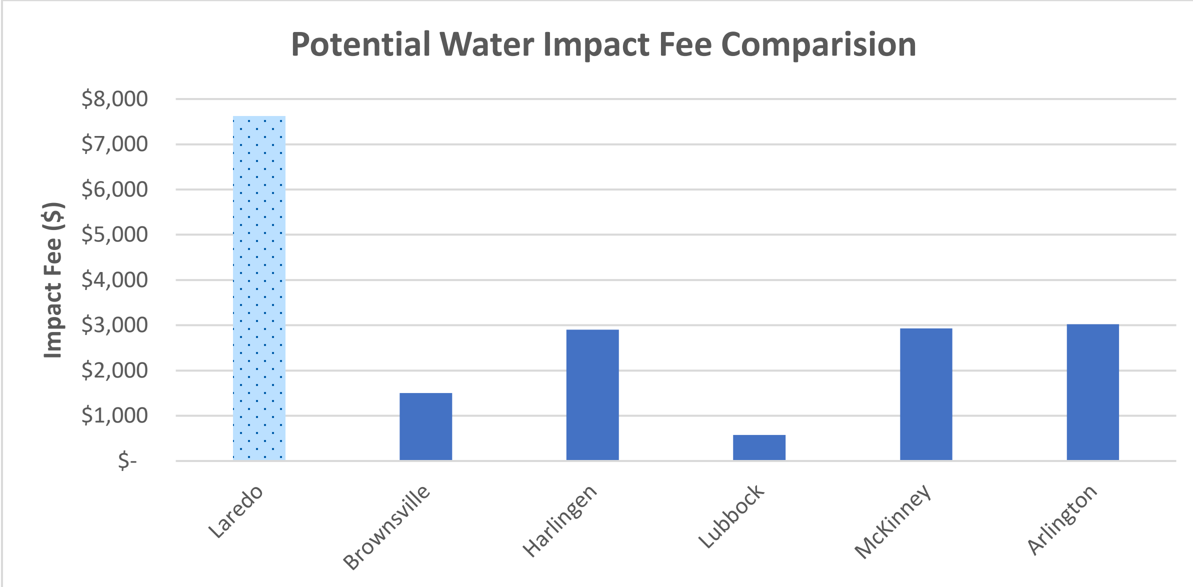


Figure ES-3: Regional Impact Fees

Financial Analysis

The purpose of this section of the 2022 IWMP is to present an analysis of the capacity of the City's water utility to fund the debt service needed to finance the City's CIP. In Section 9.1 the City's water utility revenues and expenses are presented for the current year ("Test Year") and forecast for the 20-year period FY 2022 – FY 2041. The goal was to determine the extent to which the water utility can fund new debt service related to the master plan improvements outlined in this study. To complete these analyses, the Project Team made a series of assumptions about current operations, future account growth, future water consumption, and overall cost increases. These assumptions are outlined in detail throughout Section 9 of the IWMP. A summary of forecast of the water utility's cash flow are presented in **Appendix J** and for an alternative scenario in **Appendix K**.

The cash flow analysis reveals that the current rate plan is forecasted to be sufficient to begin the CIP by funding a combined par value of $175,835,000 over the next 10 years.

The analysis makes several notable assumptions. The City continues to implement the 3.0% annual water rate adjustment for the entire forecast period. Total water revenues increase from $57,118,122 to $83,823,381 by FY 2041[1]. Net revenues for debt service, after subtracting operating expenses, increase from $28,202,657 to $41,917,412 by FY 2031[2].

Table ES-4 shows a possible funding schedule within the limits of the financial analysis.[3]

[1] Line 15, Table 9-7 in Section 9 of this report.
[2] Line 27, Table 9-7 in Section 9 of this report.
[3] Appendix L of this Report.

Table ES-4 Possible Funding Schedule for Proposed Water CIP projects for FY 23-27

Project	Proposed Water CIP Projects (FY23-FY27) - $163mm	2022 Tranche	Future Issuance	Other Funding Source
1	Phase A of 5 Year Neighborhood waterlines identified for replacement	$ 20,000,000	$ 9,765,000	$ -
2	JWTP to Lyon PS_New	20,000,000	-	-
3	Connect Hendricks to mid-sized JWTP	13,908,000	-	-
4	Along Loop 20 from Bianka Ln to Cielito Lindo Blvd	7,665,000	-	-
5	Along Loop 20 from Clark Blvd to Hwy 359	7,416,000	-	-
6	Barlett; MHOC to Bartlett	6,773,625	-	-
7	Hendricks PS Retrofit	5,795,000	-	-
8	Along Loop 20 from Hwy 359 to Los Presidentes Ave	5,666,000	-	-
9	Looping in Colonias Area	-	-	2,903,000
10	Hendricks to Lyon	-	4,795,000	-
11	Additional 12" Transmission for Looping	-	10,050,000	-
12	Milmo to Sierra Vista	-	11,935,000	-
13	Along various alignments: S Ejido Ave to Bianka Ln to Sierra Vista PS	-	7,335,000	-
14	From Logan Ave and E Lane St to Milmo PS providing add'l water	-	13,919,000	-
15	New, larger pumps to provide standby capacity	-		3,145,000
16	JWTP header and yard piping	-	1,504,000	-
17	Along Loop 20 in Sierra Vista service area	-	2,672,000	-
18	Build new .05 MG EST	-	4,515,000	-
19	Recoat existing EST	-		1,844,000
20	Along Loop 20 in Milmo service area	-	1,455,000	-
21	Feasibility Study for targeted groundwater sites	-	-	200,000
22	Field tests for targeted groundwater sites	-	-	250,000
	Total	**$ 87,223,625**	**$ 67,945,000**	**$ 8,342,000**

Appendix K explores an alternate or modified rate schedule to finance all the capital improvements recommended in the IWMP.

Table of Contents

List of Tables

List of Figures

List of Exhibits

Defined Terms and Acronyms Used

$M or $m	million dollars
AACE	American Association for the Advancement of Cost Engineering
AF/yr	Acre-Feet per Year
ASR	Aquifer Storage & Recovery
BFZ	Balcones Fault Zone
BGL	Below Ground Level
BPS	Booster Pump Station
CCN	Certificate of Convenience and Necessity
CIP	Capital Improvement Program
CSC	Concrete Steel Cylinder
CY	Cubic Yards
DCP	Drought Contingency Plan
DFC	Desired Future Condition
DMI	Domestic, Municipal, and Industrial
DUWSC	Dimmit Utility Water Supply Corporation
ENR	*Engineering News-Record*
EPWTP	El Pico Water Treatment Plant
EST	Elevated Storage Tank
EWS	Emergency Water Supply
FY	Fiscal Year
GCD	Groundwater Conservation District
GIS	Geographic Information System
GMA	Groundwater Management Area
gpcd	Gallons per capita per day
gpm	Gallons per Minute
IG	“Imported Groundwater” supply sources outside Webb County and imported via pipeline to the city of Laredo
IWMP	Integrated Water Master Plan
JWTP	Jefferson Water Treatment Plant
Kwh	Kilowatt-hour
LCB	Lake Casa Blanca
LCC	Life Cycle Cost
LCCA	Life Cycle Cost Analysis
LUE	Living Unit Equivalent
MAG	Modeled Available Groundwater
MDD	Maximum Day Demand
MG	Million Gallon
mg/l	Milligrams per Liter
MGD	Million Gallons per Day

MHOC	Mary Help of Christian
MTP	Metropolitan Transportation Plan
OPCC	Opinion of Probable Construction Cost
PCI	Pavement Condition Index
PMF	Probable Maximum Flood
PPT	Precipitation
PUB	Public Utilities Board
PVC	Polyvinyl Chloride
RO	Reverse Osmosis
RWP	Regional Water Plan
RWPF	Reclaimed Water Production Facility
RWPG	Regional Water Planning Group
RWPG	Regional Water Planning Group
SAWS	San Antonio Water System
SCADA	Supervisory Control and Data Acquisition
SUE	Service Unit Equivalents
SWP	State Water Plan
SWS	Secondary Water Supply
TAWWA	Texas Section of the American Water Works Association
TAZ	Traffic Analysis Zone
TCEQ	Texas Commission on Environmental Quality
TDS	Total Dissolved Solids
TEES	Texas Engineering Experiment Station
TGI	The Thornhill Group, Inc.
TNRIS	Texas Natural Resources Information System
TPDES	Texas Pollutant Discharge Elimination System
TWDB	Texas Water Development Board
TXDOT	Texas Department of Transportation
UISD	United Independent School District
USACE	U.S. Army Corps of Engineers
VCP	Vapor Compression Process
WMP	Water Master Plan
WMS	Water Management Strategy
WR	Water Rights
WST	Water Supply Targets
WTP	Water Treatment Plant
WUG	Water User Group
WWP	Wholesale Water Provider
WWTP	Wastewater Treatment Plant

1 Introduction

1.1 Master Plan Objectives

The City of Laredo was identified as the second fastest growing city in the United States in the 2000 Census. The TWDB predicts that the planning area will exhibit significant population growth, from 301,000 in 2020 to 530,000 in 2050 and 613,000 in 2070. **Figure 1-1** shows past, present, and projected Laredo population by decade.

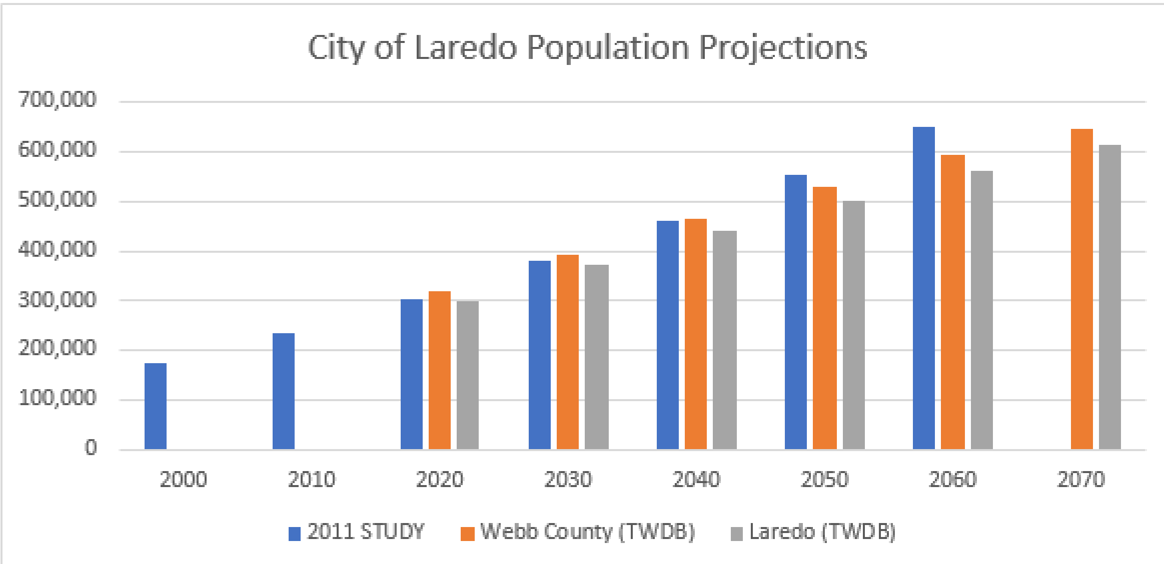


Figure 1-1: City of Laredo Population Projections

The IWMP is intended to provide a roadmap that will allow the City of Laredo Utilities Department to accommodate the future growth in a planned and orderly fashion. Specific Master Plan goals include:

- An overall planning period from 2020 through 2070.
- Analysis and needs assessment for water supply, treatment, transmission, and distribution system including identification and correction of existing deficiencies, and identification and sequencing of future expansions to accommodate growth

The Master Plan boundary follows the current CCN boundary for the City issued by the TCEQ. The planning area covers 407 square miles.

1.2 Texas Water Development Board Region M Planning

At the initiation of this Master Plan project, the City emphasized the desire to make use of existing information as much as possible and to make updates where necessary. With the availability of 2020 Census data and nearing completion of Texas' five-year water planning cycle, updates of population and water demand were expected to assist the development of this WMP. The City directed LAN to use the 2021 Region M Plan projections of population and water demand. A notable change in planning methodology is that while prior regional and state water plans were aligned to political boundaries (e.g., city limits), the TWDB's updated methodology aligns projections to water utility service areas.

In the Region M Plan, the City is a WUG. The TWDB prepared draft population and municipal water demand projections for the period 2020-2070 for all municipal WUGs using projections from the 2017 SWP but aggregating those projections by water utility service area.

As a baseline, a new set of population estimates for the 2010 Census year were developed based on utility service areas of each WUG. The TWDB used multiple sources to estimate the 2010 baseline population, including TWDB Water Use Survey information, GIS analysis of 2010 Census data, and population and connection data from the TCEQ's public water system database. The TWDB assembled the projection data into a single set to determine the 2010 baseline. The 2010 baselines were further adjusted to reconcile with the corresponding total county population used in the 2017 SWP.

For Region M and all other planning areas, the 2017 SWP projections were carried over. The TWDB explained:

> "Because there will not be new decennial census data available for use in the 2021 RWPs, the 2017 SWP region and county-level population projections were carried over and used as draft projections for the 2021 RWPs. As noted above, these county-level values were maintained for the upcoming plan, and the initial estimates of the WUG-level populations using the boundaries of the new utility-based planning unit were reconciled so that the original county totals from the 2017 SWP were maintained."

The municipal water demand projections, assembled by the WUG's utility service area, use a base daily use measured in gallons per capita per day (gpcd) and the water conservation factors from the 2017 SWP. The following formula was applied:

Demand = Population x ((Base gpcd – Water Efficiency Savings) x 365 days)

This was converted into AF/yr with the conversion factor of 325,851 gallons per acre foot (gal/ac-ft) using the formula below:

Demand (ac-ft) = Demand gallons per year / (325,851 gal/ac-ft)

The TWDB develops 50-year population projections for cities, counties, and significant communities in Texas. Projections include estimates for 2020, 2030, 2040, 2050, 2060, 2070, and are adopted at the regional planning level as 2020 RWP. Following coordination to resolve potential conflicts, the regional plans are adopted as the 2021 SWP. The regional plans forecast population at the local city and county level. The City of Laredo is in Region M — Rio Grande. TWDB projected populations are used for this master plan study.

1.1.1 Application of Region M Projections

Region M population projections for the Laredo water user group (WUG) are shown in **Table 1-1**.

Table 1-1: Region M 2021 Municipal Water User Group Summary Population Projection

Year	2020	2030	2040	2050	2060	2070
Laredo Population	301,124	372,380	440,247	502,142	560,482	613,020

Region M population and water demand projections require other input and processing to be used for master planning. Region M water demand is the annual average and for master planning peak day and peak hour demand is needed to size future water infrastructure. Region M population is for the City's planning area and must be distributed at a more discrete level to accurately model the existing water system and properly locate and size future water infrastructure.

The following sections describe the other inputs and process to put Region M projections to use for master planning. Other inputs include information provided by the City's Planning Department such as:

- 2016 City limits
- Existing water system facilities
- Land use; both existing and future
- Metropolitan Transportation Plan TAZ geography and estimated population for 2013, 2018, and forecast population for 2030, 2040, and 2045

Of this information, analysis zones are important to distribute Region M population to the more discrete level to support modeling the existing water system and identify future water infrastructure.

1.3 Use of Traffic Analysis Zones

TAZs are used by transportation planners as they address mobility and transportation system impacts on quality of life, economic vitality, patterns of growth, and movement of goods and people. Information for TAZs is updated as part of the Laredo Metropolitan Transportation Plan (MTP) 2020-2045 Update.

TAZ boundaries are typically chosen to encompass areas of similar land use, for example, residential, commercial, industrial, public spaces, open spaces, and agricultural areas. Planners use these areas to better forecast development and population growth. Forecasts are aggregated to larger city, county, and state level forecasts. TAZs provided the means to distribute Region M population within the IWMP planning area.

The City's Planning Department provided TAZ shapefiles with 527 analysis zones in the planning area. Each TAZ has an estimated population for 2013, 2018, and forecast population for 2030, 2040, 2045. In addition to population, the data include households and employment estimates and forecasts.

The population change from 2013 to 2018 provided the rate of growth to estimate population in 2020, which was compared to the Region M projection of approximately 301,000. The difference was made up in proportion to the TAZ's fraction of total population. Final values were rounded to integers and a few manual adjustments were necessary to match Region M's 2020 population of 301,124.

In year 2020, high population densities (persons/acre) were noted. These were used as a 'cap' to check later distributions of population to each TAZ and ensure subsequent densities remained reasonable and do not suggest a change in type of development for the TAZ.

The TAZ population change from 2040 to 2045 provided the rate of growth to estimate population in 2050, which was compared to the Region M projection of approximately 502,000. The difference was made up in proportion to the TAZ's fraction of the total population. Final values were rounded to integers and a few manual adjustments made to match Region M's 2050 population of 502,142.

With 2050 population estimated at the TAZ level, population was forecast to 2060 and 2070 while observing the cap on density. Populations were rounded to integers and manual adjustments made to match Region M's 2060 population of 560,482 and 2070 population of 613,020.

1.4 Background and Data Collection

Current demographic trends indicate that the City of Laredo will continue to see a positive trend in population growth spanning the study period of 2020 to 2070. The IWMP is intended to provide guidance to the City by estimating the future water demands. Specific Master Plan data needs related to the following:

- An overall planning period from 2020 through 2070.
- Interim planning conducted in 10-year increments: 2020, 2030, 2040, 2050, 2060, and 2070.
- Analysis and needs assessment for water supply, treatment, transmission, and distribution system including, identification and correction of existing deficiencies, and identification and sequencing of future expansions to accommodate growth.

The data collected for this IWMP included available topographic data and LiDAR data from 2020 was obtained from the City of Laredo Planning Department and the City of Laredo GIS Department. GIS files related to the existing water distribution network, land use, storm sewer, WaterGEMS models of the existing and future systems. **Appendix A** has a detailed list of all items received in support of this project.

Horizontal control is referenced to the Texas Coordinate System of 1983, South Zone (4205) (NAD 83 – 1993 ADV).

1.4.1 Study Area Characteristics

The City of Laredo is located on the United States / Mexico border across from Nuevo Laredo, Tamaulipas, Mexico. Laredo is the county seat for Webb County and the City has a total area of 107.33 square miles.

The City is on the west end of the Rio Grande Plains, south of the Edwards Plateau, west of the coastal plains, and east of the Mexican mountains. The area consists of few hills and is primarily flat land covered with grasses, oaks, and mesquite. Notable sources of surface water include Chacon Creek, Lake Casa Blanca, San Ildefonso Creek, San Ygnacio Creek, Santa Isabel Creek, Sombrerillito Creek, Rio Grande, and Zacate Creek.

Laredo is the largest inland port in the United States. Laredo is approximately 145 miles south of San Antonio with interstate highway IH 35 cutting through the center of the City. The southern tip or beginning of IH 35 extends from the Gateway to the Americas International Bridge to Mexico. Other major thoroughfares in Laredo include U.S. Highway 59, U.S. Highway 83, SH 259, and SH 359.

1.4.1.1 Climate and Topography of the Study Area

The City has a hot, semi-arid type of climate with long, hot summers and short, mild winters. The main influences on the City’s climate are the Sierra Madre Oriental Mountains, Gulf of Mexico, and Chihuahua desert.

The average high temperature is 100°F (37.8°C) at the peak of August. Approximately one-third of the year temperatures are above 90°F and many days are above 100°F. Winters are cold compared to other areas in South Texas, with the average overnight low temperatures of 46°F. The average daily temperature in winter reaches 66°F.

Laredo receives approximately 21-inches of rainfall with the majority occurring from May through October. Laredo has an average of 220 sunny days and more than 2,700 hours of sunshine during the year. Snowfall is rare with instances of 1- to 2-inches of snow. The air is dry as Laredo is surrounded by desert. Substantial temperature differences exist between day and night that can fluctuate 30°F.

Topography in the City is characterized by mild hills and elevation that varies from 400- to 700-feet above sea level. Elevations trend higher in the north and east to lower in the south and west with the Rio Grande as the low point.

1.4.1.2 Land Use of the Study Area

Laredo is the United States largest inland port and located on the border with Mexico. The City is a primarily gridded historic and central business district experiencing rapid greenfield growth. Laredo is transitioning to a suburban development pattern as the City expands. Historically, Laredo began as a city built from the railway and eventually gave way to the highway-based development commonly found throughout the United States. The existing main corridors in the City include FM 1472 (NW), SH 20 (E), SH 59 (E), SH 83 (S), SH 359(E), and IH 35 (N). The future thoroughfare plan extends the existing system out to a future Loop at the edge of the extraterritorial jurisdiction (ETJ).

Laredo land use is primarily commercial along the main corridors with single family and multi-family neighborhoods in-between. The northwestern part of the City is primarily industrial with some new single family residential beginning to mix in. The central business district is found at the bend in the river. There are historic districts and an arts and entertainment district within the central business district. There is a mixed-use development north of downtown where the City's first ring suburbs developed. There are still large areas within the city limits that are yet to be developed.

1.4.1.3 Demography of the Study Area

Laredo is the county seat of Webb County, Texas, and has an estimated 2020 population of 255,205 making Laredo the 10th largest city in Texas and the 81st largest city in the United States. Laredo's population has grown by 19,114 people (8%) in the decade between the 2010 and 2020 Censuses.

Spanning more than 107 square miles, Laredo has a population density of 2,503 people per square mile. Throughout the 20th and 21st centuries, Laredo has seen consistent population growth. Median household income in Laredo is $51,120 with a poverty rate of 24%. The median age in Laredo is 28.9 years, 27.6 years for males, and 30.0 years for females. For every 100 females there are 95.7 males.

2 Public Involvement and Outreach

An infrastructure master plan affects everyone in the City. It was critical for the Utility to share information as the plan was being developed. Public engagement and stakeholder outreach began on the first day of the project. Our outreach consisted of social media, website, cable tv commercials, surveys, livestreamed townhalls (virtual and hybrid), and workshops for elected officials. This section documents the efforts to include the citizens and businesses of Laredo in the plans for the water system.

2.1 Social Media

In April of 2020, all social media platforms were created including, Facebook, Instagram, LinkedIn, Twitter, and YouTube. @Laredowater was the primary page name used for all platforms. Over the course of two years, posts and tweets were published with information about surveys, townhall meetings, workshops, presentations, and general information about the City of Laredo's Utilities System. **Table 2-1** shares some social media statistics by platform while Figure 2-1 illustrates some of the posts and graphics created for the public outreach effort.

Table 2-1: Social Media Platform Followers

Platform	Posts/Tweets	Followers
Facebook	Approximately 186	348
Instagram	Approximately 186	408
Twitter	Approximately 186	34
LinkedIn	Approximately 186	09

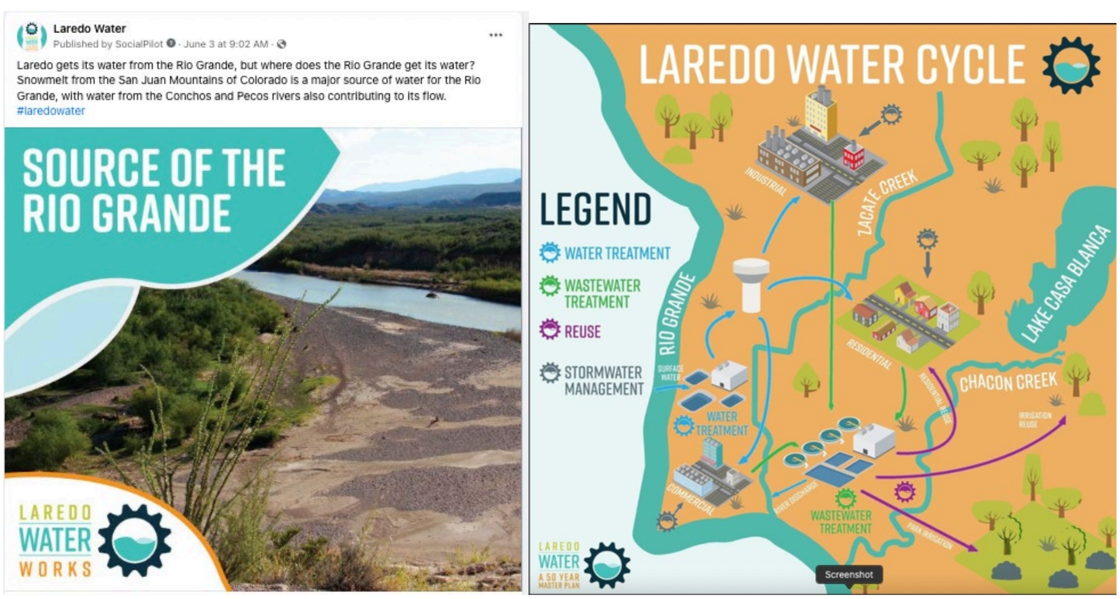


Figure 2-1: Example of Social Media Post and Graphic

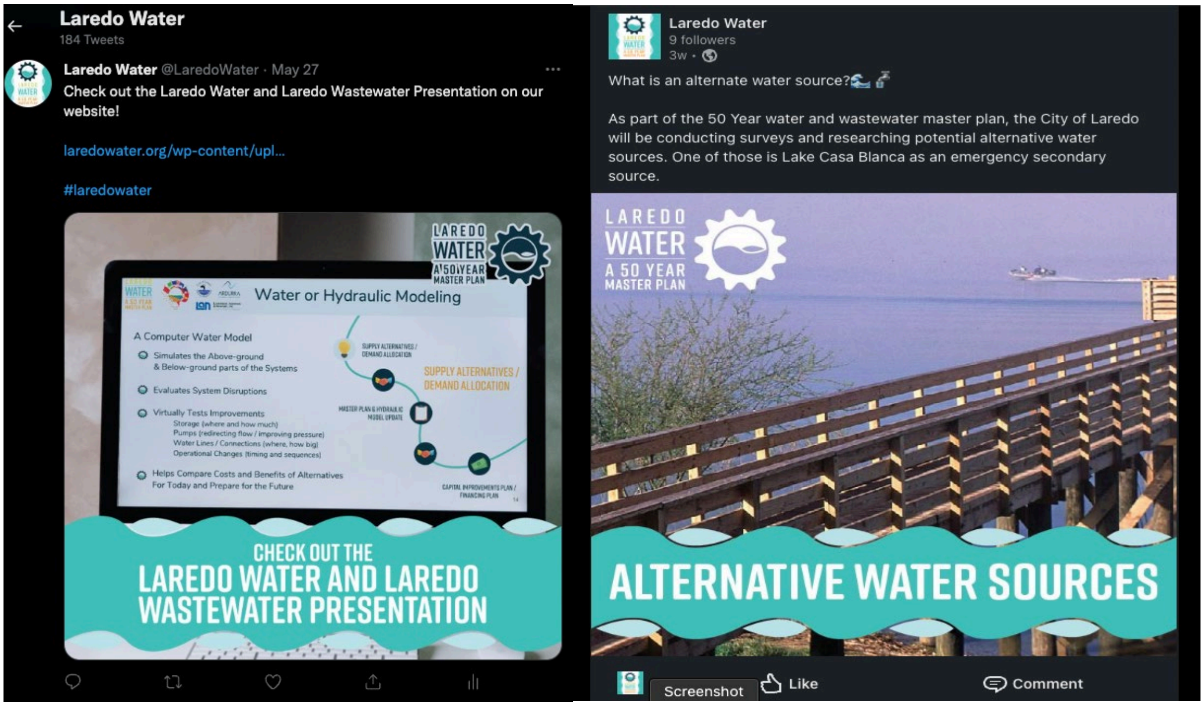


Figure 2-2: Example of Facebook Post??

Additionally, in September of 2020 a simple but dynamic website was added to hold and display information for the public. Survey links, registration portals for Virtual Townhalls, and contact information were added. The website remains today and will be completed and remain live as a repository for the IWMP. Please visit laredowater.org.

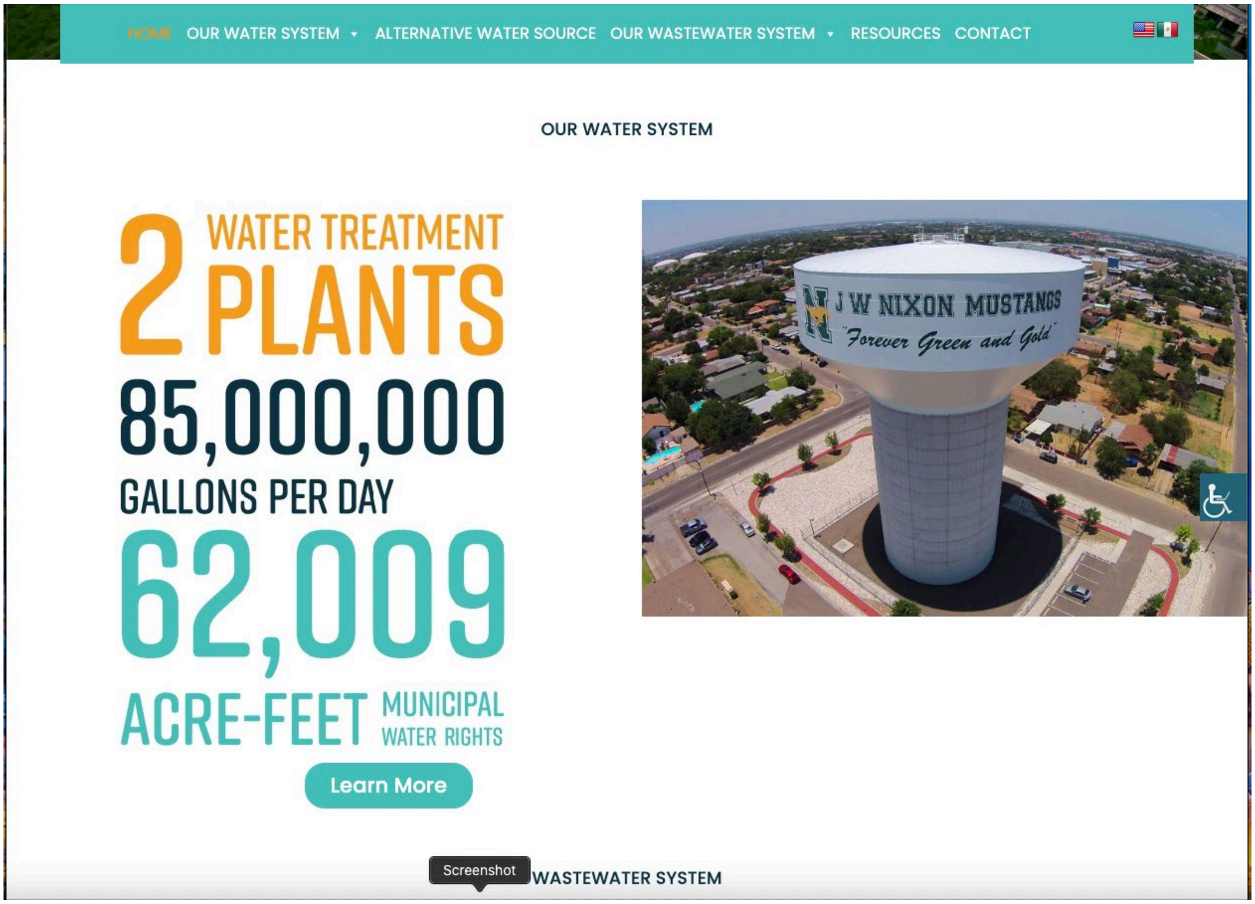


Figure 2-3: City of Laredo Website

2.2 Townhalls and Workshops

Initially, a townhall was proposed for every council district and one additional general townhall. Due to Covid, there were only six townhalls and three workshops. Presentations were also made at City Council meetings on a regular basis to keep staff and Council members informed on the progress.

The virtual townhalls were very well attended despite Covid impacts. On average there were more than 25 participants from a good cross section of the community. Council members attended both virtual and hybrid events. All events were livestreamed on social media and the website for the public to view and comment.

Many questions and concerns revolved around two major topics.

- Alternative (Secondary) and or Emergency Water Sources
- Water Quality and Infrastructure Improvements

Additional Items brought forth for discussion were

- Water Rates
- Boil Water Notices
- Communications Issues

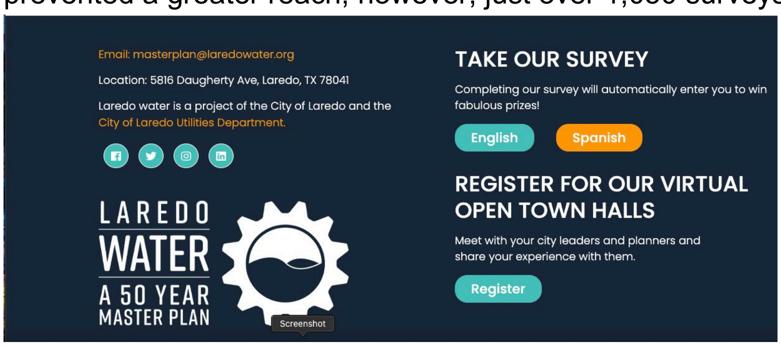
Additional townhall meetings are planned to disseminate the water and wastewater master plan prior to adoption. Examples of a townhall and or workshop presentation and a townhall notice including the live link are included below:

https://laredowater.org/wp-content/uploads/2021/07/Laredo_water_laredo_wastewater_workshops_V3.pdf

2.3 Surveys

An in-depth 103 question informal survey was created, advertised on social media, and at each townhall and workshop as well as at Council meetings. The surveys were in English and Spanish.

A giveaway of 10, 50-inch smart TVs was used to incentivize the participation. Again, Covid prevented a greater reach; however, just over 1,050 surveys were submitted.



Please refer to **Appendix N** for a complete list of the presentation materials, recorded meetings, social media excerpt and the survey.

3 Existing Water System

3.1 Overview

The City of Laredo uses surface water from the Rio Grande as its source of raw water and holds approximately 62,009 acre-feet of municipal water rights in the river. The City serves potable water to approximately 275,000 people in Webb County. The service area consists of residential, commercial, and industrial developments as well as open space such as community parks, golf courses and cemeteries. The services areas are concentrated along IH 35, IH 69, SH 83, SH 359, U.S. Highway 59, and FM 1472.

In 1957, the City entered into an agreement with Webb County to use Lake Casa Blanca Reservoir as off-channel storage for emergency use. This agreement is still in effect. This reservoir has an impoundment capacity of 77,800 acre-feet at top of the dam, 58,600 acre-feet at maximum pool, of which 20,000 acre-feet are reserved for emergency use.

- Average daily water demand during calendar years 2016 through 2019 was approximately 34.1-MGD and peak day demand for the same years was 58.5-MGD occurring in August 2016.
- Connections to the water system through September 2020 were 75,854. The system includes more than 1,091 miles of transmission and distribution pipes based on the City's water utility GIS.

3.1.1 Surface Water Treatment

The City currently uses two surface WTPs with a permitted capacity of approximately 85-MGD. In the past, the City used other WTPs; however, the Jefferson WTP has always been the largest plant supplying most of the City while other, smaller WTPs served limited customers. The City's El Pico WTP completed in 2016 allowed the City to decommission the two smaller WTPs so that Jefferson and El Pico are the City's current WTPs with a combined capacity of 85-MGD.

The two current WTPs produce potable water conveyed throughout the system relying on other BPS where required due to increases in elevation and distance from the WTPs. BPSs are shown on **Exhibit(s) 3-1** through **3-4**. As water produced at the El Pico WTP is conveyed to new areas of the system, or improvements are made at select facilities, other small BPSs may be decommissioned.

The City's water system has grown out of a hub-and-spoke arrangement with the Jefferson WTP as the hub. Until completion of the El Pico WTP and its major transmission waterline, the 'spokes' in the City's water system all emanated from the Jefferson WTP as transmission lines varying in diameter from 20- to 36-inches. The transmission waterlines supply major BPSs that, in turn, deliver water to customers in their service areas and, in a few cases, to other BPSs farther out and at higher elevations in the system. Table 3-1 shows the City's historic water production.

Table 3-1: Laredo Water Production

Fiscal Year Ended 9/30	Average Day Production (1,000 Gallons)	Peak Day Production (1,000 Gallons)	Total Yearly Production (1,000 Gallons)
2009	35,900	51,810	13,047,594
2010	32,565	47,470	11,900,196
2011	32,600	47,470	11,726,000
2012	28,386	52,312	10,427,878
2013	35,528	48,000	11,883,850
2014	25,936	47,594	9,465,347
2015	31,900	54,389	11,654,700
2016	36,291	58,506	12,520,848
2017	34,050	49,616	12,434,677
2018	33,770	53,430	12,326,452
2019	33,904	52,918	12,374,989
2020	34,750	44,212	12,729,606

3.1.1.1 Jefferson Water Treatment Plant

The backbone of the City's existing water system consists of the Jefferson WTP, transmission waterlines ranging from 20- to 36-inches in diameter and five pump stations that receive water from the transmission lines and feed respective service areas. The combined pumping capacity for the five pump stations is 52-MGD with maximum daily demands of approximately 15-MGD.

The Jefferson WTP is west of downtown Laredo on Jefferson Street at the Rio Grande. Two river intakes divert Rio Grande flow to the Jefferson WTP through separate structures and their associated pumps. The plant has a maximum capacity of 65-MGD, and it would be difficult to increase capacity on the existing site.

The Jefferson WTP has two separate river intakes, two separate river pump structures, and related multiple pump units. The electrical system includes an underground electrical power distribution system including three electrical buildings housing motor control centers. The SCADA system combined with magnetic flow meters and motor operated valves allow increased precision in chemical addition for reduced operating costs. The traveling water screens, flocculators, re-lift pumps, and five clarifiers provide a more reliable hydraulic capacity. Twelve gravity filters allow the facility to respond to wide variations in river water turbidity. The two high service pump stations and three clear wells provide a uniform water system pressure.

Jefferson's six high service pumps are separated into two banks of three pumps each. All pumps share the same design point of 11,000 gpm (15.8-MGD) at 185 feet of head. Three pumps in the west bank of pumps supply the majority of the WTPs service area and water to repump at the Lyon and Milmo BPSs.

Three pumps in the east bank of pumps supply water to repump at the MHOC BPS. See .

Table 3-2: Jefferson WTP Existing High Service Pumps

Station	Design Flow (gpm)	Design Head (feet)	Notes
Jefferson East PS			
P2 (East)	11,000	185	VFD
P4 (East)	11,000	185	VFD
P6 (East)	11,000	185	VFD
Jefferson West PS			
P1 (West)	11,000	185	
P3 (West)	11,000	185	
P5 (West)	11,000	185	

3.1.1.2 El Pico Water Treatment Plant

El Pico WTP was put in service in April 2015. It consists of a forebay for the raw water intake followed by the raw water pump station, rapid mix, flocculation, sedimentation, filtration, filter building, backwash pumping, backwash equalization, backwash clarifier, intermediate pumping, clearwell, high service pump station, sludge thickener, sludge holding tank, sludge dewatering, dewatering building, chemical building, chemical feed and bulk storage, administration building, effluent transmission main, electrical and instrumentation including the SCADA control. The WTP's stated capacity is 20-MGD.

El Pico WTP's three high service pumps are of two capacities at a design head of 250 feet. The smaller pump is rated at 6,950 gpm (10-MGD) and two pumps at 16,700 gpm (24-MGD). The high service pump station is sized to support two future pumps (five pumps total). The City is currently working to install an additional pump sized to improve operation depending on production, storage, and demand. See **Table 3-3**.

Table 3-3: El Pico WTP Existing High Service Pumps

Station	Design Flow (gpm)	Design Head (feet)	Notes
P601	6,950	250	
P602	16,700	250	
P603	16,700	250	

3.1.2 Booster Pump Stations and Ground Storage

Water produced at the Jefferson and El Pico WTPs is repumped by the BPS shown in **Table 3-4**. Note, that Sierra Vista is supplied by Milmo BPS and not directly by the Jefferson WTP.

Table 3-4: Booster Pump Stations Existing Pump Capacity

Station	Number of Pumps	Total Capacity (gpm)	Notes
Hachar (serves area previously supplied by Unitec BPS)	4	3,000	Firm capacity 1,500 gpm. P4 rated head higher than pumps 1–3.

Station	Number of Pumps	Total Capacity (gpm)	Notes
Highland	5	4,240	Limited operation. Includes jockey pump at lower flow and head than other pumps.
Hwy 359	3	2,600	P3 is newest and rated for higher head than pumps 1–2.
Lyon	5	17,000	All pumps have VFD drives.
MHOC (pumps 3, 6)	2	7,000	Pumps sized to work with Killam EST.
MHOC (pumps 1, 2, 4, 5)	4	20,000	P1 rated for lower head than pumps 2, 4, 5.
Milmo	4	16,000	All pumps have VFD drives.
SINE	4	2,800	Limited operation.
Sierra Vista	2	10,000	Station built to accommodate three pumps.

Each BPS above has storage associated with it to balance differences between supply and water demand in its service area. **Table 3-5** lists the amount of storage at each of the City's BPS.

Table 3-5: Ground Storage Tank Volume at Booster Pump Stations

Booster Pump Station	GST Volume (MG)
Hachar	0.2
Hwy 359	0.2
Lyon St	5.0
MHOC	10.1
Milmo	3.0
SINE	0.3
Sierra Vista	5.2
TOTAL	**24.0**

Note: Highland BPS pumps in-line (or from the McPherson EST) without ground storage.

3.1.3 Elevated Storage

Elevated storage is located throughout the water system. Elevated storage serves two purposes:

1) As a reserve when BPSs are unable to deliver an adequate quantity of water.
2) To balance daily differences in supply and demand allowing available pumping capacity to fill elevated storage during times of lower demand and drawing from storage during high demand.

Note that the Airport and Mines Road ESTs are not included in **Table 3-6** because both tanks are out of service at this time.

Table 3-6: Elevated Storage Tank Volume

Elevated Storage Tank	Volume (MG)
Bartlett	3.0
Cuatro Vientos	1.9
Killam	2.1

Elevated Storage Tank	Volume (MG)
Las Blancas	0.5
McPherson	1.0
Northwest	1.0
SINE	2.5
South Laredo	1.1
TOTAL	**13.1**

Exhibit 3-1 shows the locations in the existing system of the WTPs, BPSs, and ESTs described above.

3.1.4 Transmission Lines

Transmission and distribution waterlines are often distinguished by size and whether they deliver water directly to customers or not. Though there are exceptions, in systems such as Laredo's it is common to categorize 24-inch and larger waterlines as transmission lines and, typically, customers would not be connected to these lines.

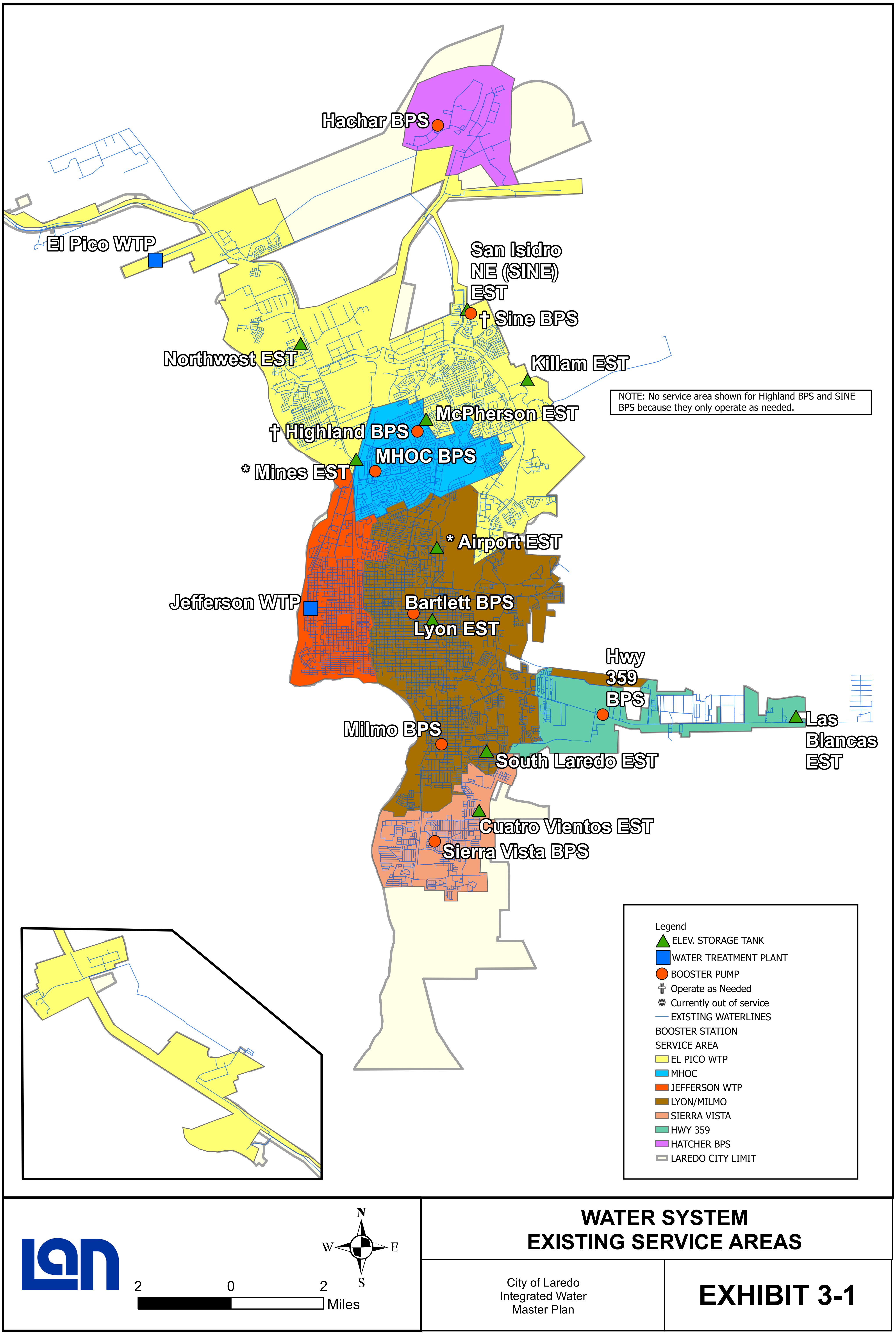
Exhibit 3-2 shows the waterlines in the City's water system in addition to the BPSs and ESTs. Note that the largest lines originate at the Jefferson and El Pico WTPs. The pipes decrease in size down to the smallest pipes within neighborhoods. The source of water in a large part of the system changed significantly when the El Pico WTP began operation. The 60-inch transmission lines originating at the El Pico WTP extend east across the northern part of the water system service area. Future improvements will continue to extend delivery of water produced at El Pico WTP to other parts of the system. Connections between existing parts of the system and new transmission lines may reduce the need to improve and expand other existing facilities.

3.1.5 Distribution Lines

The City's water distribution system (pipes smaller than 24-inches) includes more than 900 miles of waterlines. **Exhibits 3-2 and 3-3** show the various water main sizes and pipe materials. **Table 3-7** shows that approximately two-thirds of the waterlines are 6- to 8-inches in diameter. Almost 90% of the pipe is either cast iron or PVC material. Primarily through its asset management activities, the City continues to update its GIS with 'installation date' to aid in finding old pipes in the system although this is generally understood and agrees with the pipe materials common at different times during growth of the system. Age as a factor should be part of a regular program of pipe renewal to address infrastructure needing increasingly frequent repair.

Table 3-7: Waterlines by Diameter and Material

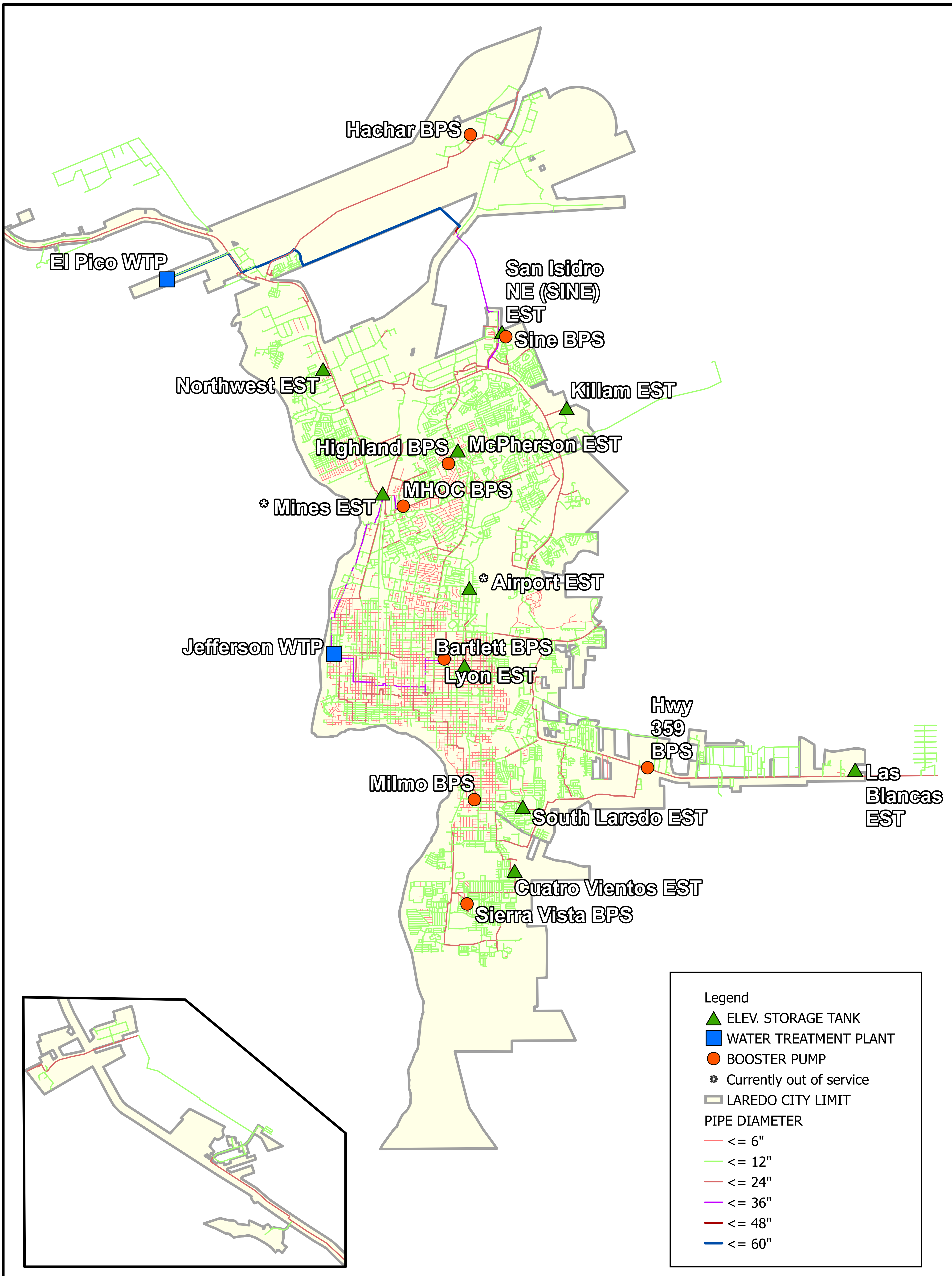
Pipe Dia. (in)	Pipe Material and Length (Feet)								TOTALS	
	Asbestos Cement	Cast Iron	CSC	Copper	Ductile Iron	PVC	Steel	Unknown	Length	%
1						1,095			1,095	0%
2		13,965		112	1,027	10,231		54,603	79,938	1%
3				337	273	1,466		5,398	7,474	0%
4	1,233	2,103			610	5,725		19,741	29,412	1%
6	70,975	714,254			30,199	398,823		40,116	1,254,367	22%
8	33,861	417,193			5,911	2,151,333		28,494	2,636,792	46%
10		53,869			228	102,040		90	156,227	3%
12	13,063	122,724			8,088	664,364		18,169	826,408	14%
14		10,814			180	653			11,647	0%
16		54,194			35,378	332,425		2,796	424,793	7%
18			21,795		113	18,011			39,919	1%
20		9,689			5,653	10,649			25,991	0%
24		1,295	9,271		20,712	114,581		50	145,909	3%
30		1,229	24,305		1,955	1,182			28,671	0%
36			51,097		856				51,953	1%
42			704		150				854	0%
60					194	5	39,828	62	40,089	1%
TOTAL	**119,132**	**1,401,329**	**107,172**	**449**	**111,527**	**3,812,583**	**39,828**	**169,519**	**5,761,539**	**100%**
	2%	24%	2%	0%	2%	66%	1%	3%	100%	



WATER SYSTEM
EXISTING SERVICE AREAS

City of Laredo
Integrated Water
Master Plan

EXHIBIT 3-1



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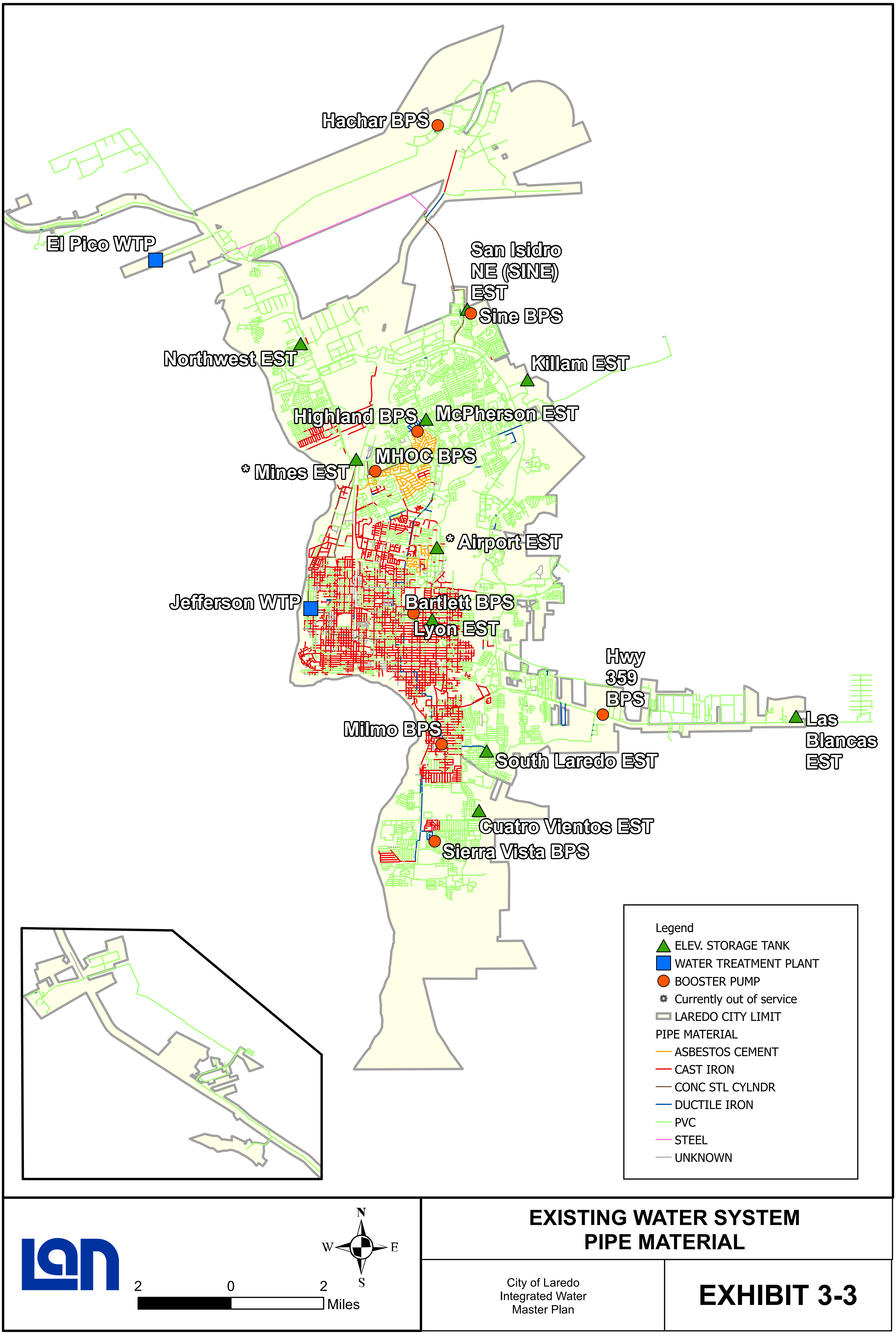
2 0 2 Miles

EXISTING WATER SYSTEM
PIPE DIAMETER

City of Laredo
Integrated Water
Master Plan

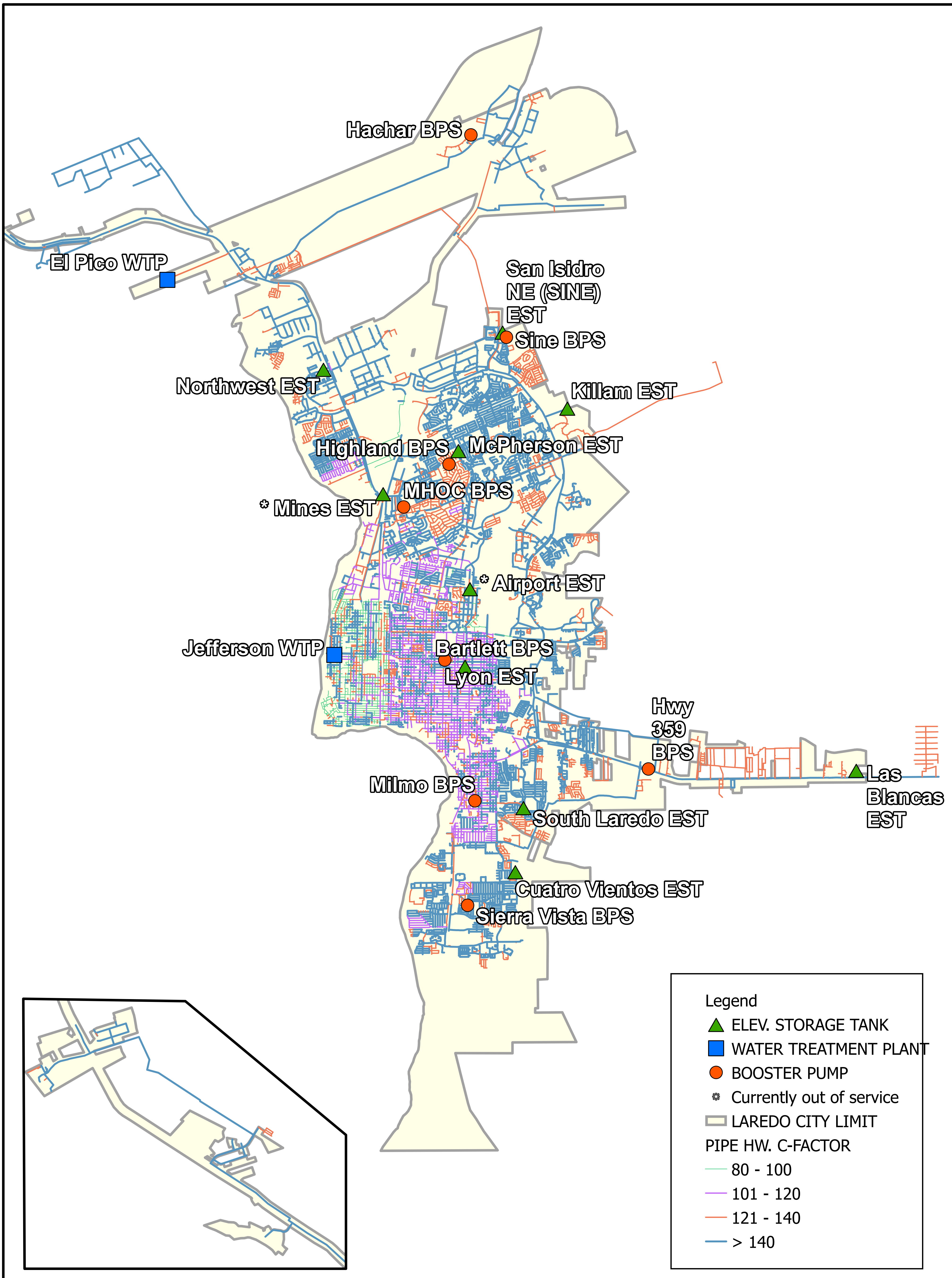
EXHIBIT 3-2



EXISTING WATER SYSTEM PIPE MATERIAL

City of Laredo
Integrated Water
Master Plan

EXHIBIT 3-3



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EXISTING WATER SYSTEM
MODELED HAZEN WILLIAMS COEFFICIENT

City of Laredo
Integrated Water
Master Plan

EXHIBIT 3-4

4 Water Demand Projections

Steady growth has characterized the City since 1990 and continued growth is forecast for the near future. Understanding potential future water demand is vital to planning future infrastructure to meet that demand. Water use is most strongly correlated to the population served. Therefore, the first step to forecast future water demand is to project population growth.

The IWMP provides guidance to the City by estimating the future water demands. Master Plan goals include:

- An overall planning period from 2020 through 2070.
- Analysis and needs assessment for water system infrastructure to identify and correct existing deficiencies.
- Develop a CIP and sequence future improvements to accommodate growth.

4.1 Region M Projected Water Demand

The City's IWMP population and water demand projections are shown below. Laredo is recognized in the regional plan as a major WUG and a wholesale water provider. In the Region M Plan, Table 5.3-251 provides the water supply balance for Laredo based on the City's existing supplies. That table is reproduced below as **Table 4-1**. Region M projections show Laredo's water demand growing rapidly and increasing significantly by 2070. The City has substantial water supply reserves currently, but demand is projected to exceed existing supply shortly after 2040.

Table 4-1: Laredo Existing Water Supply Balance (ac-ft/yr)

LAREDO	2020	2030	2040	2050	2060	2070
WUG Demand	42,028	50,530	58,812	66,591	74,190	81,096
Webb County Irrigation - Contract Demand	1,657	1,656	1,656	1,655	1,655	1,655
Webb County Manufacturing - Contract Demand	100	100	100	100	100	100
Webb County Mining - Contract Demand	66	66	66	66	66	66
WWP Demand	43,851	52,352	60,634	68,412	76,011	82,917
WWP Supplied	61,827	61,826	61,826	61,825	61,825	61,825
WWP Need/Surplus	17,976	9,474	1,192	-6,587	-14,186	-21,092

Laredo has done well acquiring water supply and is positioned for growth but must continue to secure additional reuse supplies. Region M identified additional supplies as part of WMS in the Region M Plan that could supplement future demand. These supplemental supplies are identified in Table 5.3-252 of the 2021 Region M plan and included in this report as **Table 4-2**.

Table 4-2: Laredo Water Management Strategies (ac-ft/yr)

LAREDO	2020	2030	2040	2050	2060	2070
Advanced Municipal Water Conservation	0	0	221	3,030	6,713	10,902
Municipal Drought Management	0	0	0	2,406	2,686	2,938
Zacate Creek WWTP Potable Reuse	0	0	3,360	3,360	6,720	6,720
Urbanization	0	0	0	0	0	980
New Supplies from WMS	0	0	3,581	8,796	16,119	21,540
Balance After WMS	17,976	9,474	4,773	2,209	1,933	448

4.1.1 Laredo and Webb County Projections

Using the Region M Plan, LAN summarized Laredo's projected population and water demand in **Figure 4-1** below. For Webb County, water demand projections by water user type are shown in **Figure 4-2** on the following page.

2021 Regional Water Plan - Water Demand Projections for 2020-2070
Municipal Water User Group Summary in Acre-Feet

EntityID	WUG Name	Region	County	Basin	2020	2030	2040	2050	2060	2070
1306	LAREDO	M	WEBB	RIO GRANDE	42,028	50,530	58,812	66,591	74,190	81,096
LAREDO Total Water Demand					42,028	50,530	58,812	66,591	74,190	81,096

Texas Water Development Board

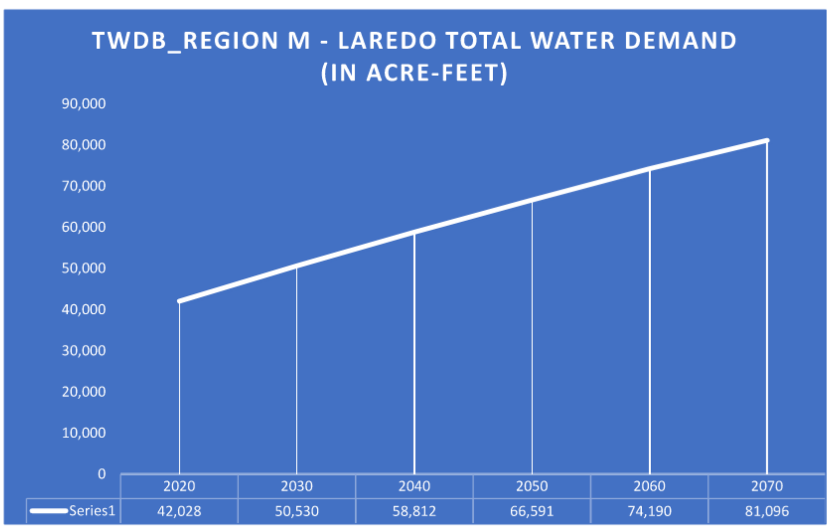

Figure 4-1: City of Laredo Municipal Water Demand Projections

2021 Regional Water Plan

Water Demand Projections by County for 2020-2070 in Acre-Feet

Total Water Demand for WEBB County

County	Category	2020	2030	2040	2050	2060	2070
WEBB	IRRIGATION	10,425	10,090	9,756	9,421	9,086	8,752
WEBB	LIVESTOCK	963	963	963	963	963	963
WEBB	MANUFACTURING	251	296	296	296	296	296
WEBB	MINING	10,331	8,047	6,038	4,112	1,846	1,343
WEBB	MUNICIPAL	44,013	52,898	61,561	69,702	77,655	84,883
WEBB	STEAM ELECTRIC POWER	152	152	152	152	152	152
WEBB County Total		**66,135**	**72,446**	**78,766**	**84,646**	**89,998**	**96,389**

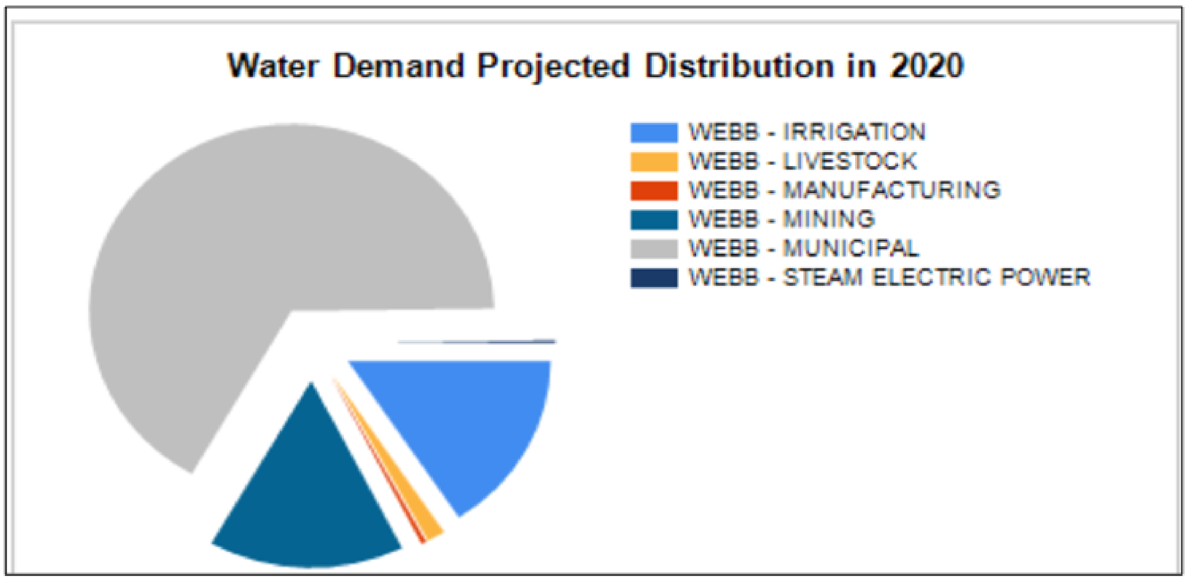

Figure 4-2: Water Demands for Webb County by Water User Type

5 Water Supply

5.1 Purpose and Objectives

The City of Laredo has historically relied almost entirely on the Rio Grande for its water supplies. To the City's credit, Laredo has acquired, and currently has available for water supply, almost 60,000 AF/yr. As discussed in Section 4.1, according to the Region M Plan water demand projections for Laredo, this supply should be sufficient to meet the City's water needs through the year 2040. However, Laredo continues to grow at a rate that can exceed the Region M projections; therefore, additional supply will be needed in the future.

There is also an inherent vulnerability with Laredo having the Rio Grande as its primary source of water supply. Contamination due to spills, potential sabotage, natural disasters, severe drought, or other catastrophic events. As prior City Council agenda show, the City Council and management have recognized vulnerability for some time.

Two issues drive the need for the City to consider a secondary water supply:

1) An unexpected inability to access the Rio Grande supply,
2) The future need for additional water supply to meet water of the City's anticipated growth.

Over the past 20 to 25 years, the City has investigated various water supply alternatives involving potential surface and groundwater resources including Lake Casa Blanca and importing fresh groundwater, developing local or nearby brackish groundwater sources, and implementing ASR. This report includes an update on groundwater sources, including an update to previously considered sources as well as new possibilities.

5.2 Organization and Goal of Section

The goal of this Secondary Water Supply is to identify and assess potential secondary water supply sources, to provide pertinent, planning-level information, and to provide recommendations on future follow-up investigations needed. The Secondary Supply Section includes:

1) A description of the water supply needs (or goals), and the water supply alternatives identified that could potentially provide supplies sufficient to meet an emergency water need or support growing long-term future water demands or both.
2) Sections 5.1 through 5.4 describe Laredo's existing water supply and the existing and projected demands on the system.
3) Sections 5.5 through 5.7, the primary water supply alternatives are presented. This includes a detailed description of the potential use of Lake Casa Blanca.
4) The planning-level cost estimates, including a LCCA based on preliminary data and information are addressed in Sections 5-21 and 5-22.
5) The conclusions and recommendations are included in Section 5-23 and, for individual projects, in Section 5.24.

6) At the conclusion of Section 5, a table scores the primary water supply alternatives to a set of criteria. Also included are Alternative Summary Evaluation Sheets that summarize pertinent information on each primary water supply alternatives considered (see **Table 5-36**).
7) **Appendix B** identifies City Council discussion related to Secondary water supply and includes a listing of pertinent prior studies referenced, calculations, exhibits, and other pertinent information.

5.3 Prior Studies and Investigations

Numerous prior studies related to Secondary Water Supply were consulted for this report. These are referenced in **Appendix B.** Also included in the Appendix is a table showing the numerous City Council sessions during recent years that considered Secondary Water Supply options.

5.4 Existing Water Supply and Projected Demand

Over the past decades, the City has been diligent in acquiring water rights from the Rio Grande. This substantial supply will meet the City's water demands for many years; however, as the City continues to grow in population, and as commerce and manufacturing expands, additional water supply will be needed.

5.4.1 Existing Water Supply and Projected Water Demand

The City currently has 58,726 AF/yr of firm water supply all from the Rio Grande system[4]. The City's foresight has resulted in a supply that will meet the City's existing and future water supply needs. According to the *Region M RWP* report the City's current supplies will be adequate, based on the projected population growth and water demand, until approximately 2040. After 2040, the City's water demands are expected to continue to increase, reaching almost 81,000 AF/yr by the year 2070. This future, 2070, shortfall in supply versus anticipated demand is just over 22,000 AF/yr.

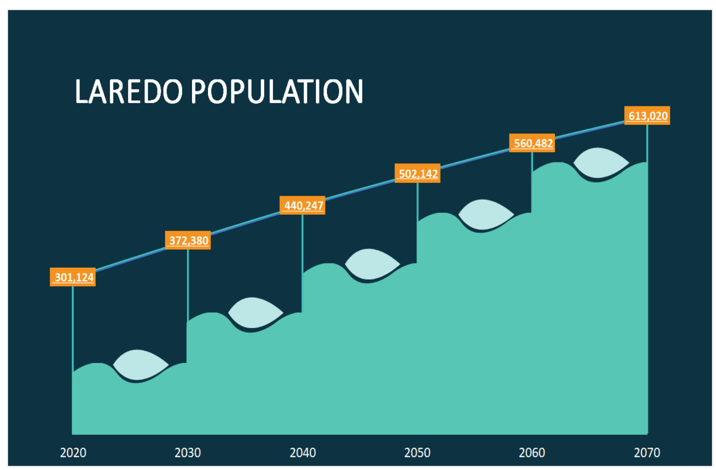

Figure 5-1: Population Projection

5.4.1.1 Vulnerabilities with Sole-source Water Supply

There are inherent risks in having the Rio Grande as the one major source of water supply. Particularly for a large, growing city like Laredo. Simply put, depending on potential, unforeseen

[4] The Rio Grande 'system' refers to the operation for water supply purposes of the Rio Grande and its two major reservoirs, Falcon, and Amistad. A good summary of this system is provided in the TWDB Region M Regional Plan in Section 3.1.1.4 beginning on page 3-9.

circumstances, the availability of Rio Grande supplies could be compromised or even completely lost. Several actions or incidents could result in interruption of the Rio Grande supply. **Table 5-1** below shows the types of possible incidents and the comparative impacts in terms of loss of supply.

Table 5-1: Vulnerabilities of Sole-Source Water Supply

Incident	Water Supply Impact	Anticipated Mitigating Response	Risk
Chemical or toxic spill upstream of Jefferson WTP intake	Complete interruption of diversion until contamination completely passes the intake area	• Maximize use of existing supply? • Implement highest level conservation measures • Monitor flow and anticipate time (days) for contamination to completely depart the intake	Although minimized by spill containment at both the Columbia Bridge and the World Trade Bridge, a potential for a spill reaching the river cannot be eliminated.
Deliberate assault or sabotage of WTP intake facilities or deliberate release of toxic or contaminating substances	Potential for complete or partial interruption of all or portions of the supply system	Similar response as the response to a chemical or toxic spill	Potential exists but based on the years of operation without an incident of this sort, it would be low to remote risk.
Major, extended drought (loss of river flow) from a drought greater than the drought of record (DGTDR)	Potential for long-term interruption in water supply availability	Conservation and implementing most severe triggers under the City's Drought Contingency Plan	Potential exists but based on the years of operation without an incident of this sort, it would be low to remote risk.

The loss of Rio Grande supply will vary depending on the magnitude and length of time the problem persists, the time required for the contamination to flow past the intake area, and the ability of the City to use existing or enhanced storage. Clean-up of spills or other contamination will vary depending on the contaminants involved, the concentration of pollutants, and the geographical extent of the pollution.

For many years, the Laredo City Council and City management have recognized these vulnerabilities. Efforts continue to identify a practical water supply source that could provide sufficient supply during emergency conditions triggered by an outage of the Rio Grande supply. This report is intended to contribute to those efforts, not supersede those efforts.

A major goal of this report is to identify potential secondary sources, characterize them in terms of potential supply for short-term (emergency outages) and for long-term supply (needed for future growth), and provide information and recommendations regarding additional evaluations needed to move forward implementing a secondary supply source.

5.4.2 Secondary Water Supply

Two critical water supply conditions or needs are evaluated below:

- Providing additional or secondary water supply to meet the predicted shortfall after 2040.

- Providing an interim or emergency supply that could be triggered by an unexpected outage with the Rio Grande supply.

The needs correspond to two types of water supply:

1) Supplemental supply to meet long-term, future needs.
2) Emergency supply to provide an interim supply in the event of an unexpected outage of water from the Rio Grande, the City's main water supply.

Section 5.5 identifies and discusses the alternative supply sources evaluated to satisfy the supplemental supply, the emergency supply, or to supply both the supplemental and emergency supply.

5.4.2.1 Supplemental Water Supply

A ***supplemental supply source*** would augment the City's existing water supply for future, long-term demands resulting from future growth—the shortfalls predicted to occur after 2040. With a lead-time of more than 20 years, supplies for supplemental supply, such as the City's ongoing efforts to acquire additional Rio Grande water rights, can be added incrementally.

5.4.2.2 Emergency Water Supply

Should an unexpected outage of the City's Rio Grande supply occur, an ***emergency supply source*** would provide water supply from a source or sources independent of the Rio Grande to meet the City's demands. Although unlikely based on the long-term history of use by Laredo, an unexpected outage of the Rio Grande supply could be triggered by a catastrophic event, such as accidental pollution to deliberate actions. Severe drought and failure of water deliveries from Mexico in accordance with the 1944 Treaty[5] are additional factors that could restrict the Rio Grande supply availability. It is assumed that should such an emergency occur that it would trigger the most restrictive water use measures included in the City's Drought DCP.

5.4.5 Water Supply Needed (Targets)

Critical to identifying and assessing the potential secondary water supply sources is determining the quantity of supply needed. The quantity of additional water supply differs by the purpose of the supply, whether to supplement future demands or to provide sufficient supply for an emergency condition. The following discusses the water supply "targets" considered necessary for each type of need.

5.4.5.1 Supplemental Water Supply Target

For the ***supplemental supply*** – needed to meet future demands due to growth – the goal would be the quantity needed in addition to the City's current long-term, dependable water supply to meet future 2070 water demands. From its Rio Grande water rights, the City has a dependable supply of 58,726 AF/yr or 52.4-MGD. As presented in **Table 4-1** above, the latest Region M Plan shows that water demands are expected to continue to increase, reaching almost 81,000 AF/yr by the year 2070. Based on the Region M water demand projections, the City's current supplies will be adequate until approximately 2040. Unless the City's existing supply is supplemented, the shortfall in water supply by 2070 is just over 22,000 AF/yr. Therefore, the supplemental water supply target is 22,000 AF/yr or 20-MGD.

The ***supplemental supply target*** is 22,000-AF/yr or 20.0-MGD to meet the City's projected water demand in 2070.

5.4.5.2 Emergency Supply Target

For an emergency condition resulting from an unexpected reduced or total loss of supply from the Rio Grande, the ***emergency supply*** goal is to satisfy Laredo's MDD, after the City's, DCP and other emergency measures are implemented (see Ordinance, Section 31-141), until the problem or outage is corrected, and standard operations can resume. The amount needed would be the MDD, which would vary by two factors: 1) seasonal conditions; and 2) the effectiveness of emergency water conservation measures that would be implemented by the City.

An ***emergency supply target*** of 35.0-MGD was set as the target needed to provide essential water needs until the full-service could be restored.

For the period from January 2015 through March 2020, the MDD for the City was 58.5-MGD and the average day demand was 33.7 MGD. The City's high usage occurred during summer months (June to September) with peak day occurring in the mid-August timeframe. The high water use during summer months is primarily related to residential and commercial irrigation demands. For purposes of identifying an ***emergency supply goal***, it is assumed that the irrigation use along with other large water uses (see the City's DCP) would be eliminated. This would result in reducing the MDD to levels approaching the average day during non-emergency conditions. Using to the average day production of 33.7-MGD; an ***emergency supply goal*** of 35-MGD should provide essential water needs until the full-service could be restored.

5.5 Water Supply Alternatives

To identify potential secondary water supply alternatives to meet either the Supplemental or Emergency Supply targets, several water supply alternatives – both surface water and groundwater – were included for evaluation. These were identified from prior studies, reports, City Council briefings, and communications with city management and staff, reports from groundwater hydrologists, recent field investigations in Webb County, and input from the TWDB hydrologists and planners. Based on these evaluations, the suitability each potential water supply source was considered with respect to its use by the city as an emergency or supplemental water supply source.

5.6 Classification of Alternatives

The alternatives were further classified as either ***primary*** or ***secondary*** alternatives. An alternative was classified as primary if sufficient information, engineering reports, or other evaluations were available to provide reliable estimates of supply availability, quantity (yield or production), and water quality. Primary alternatives had sufficient cost-related information to allow development or updated cost estimates, estimates of operation and maintenance cost, and production of LCC.

Primary water supply alternative has sufficient information for reliable, planning-level estimates of supply availability, cost, and quality.

For the primary alternatives, the evaluation included a description of location, estimated yield, or production; cost estimates including capital cost, operation and maintenance estimates, and LCC. For each primary alternative, an *Alternative Evaluation Summary Sheet* is provided at the end of this section. These summaries provide pertinent evaluation results in a concise summary format for ready access and review.

Secondary alternatives, as opposed to primary alternatives, are those where the following applied:

- There was insufficient information for yield and cost estimates.
- There was not a specific project identified but only the potential for providing supply.

Secondary water supply alternative did not have sufficient information for reliable, planning-level estimates of supply availability, cost, and quality.

The secondary alternatives have had limited investigation but were considered to have potential to provide or augment supplemental or emergency supplies.

If additional water supply alternatives are identified, or if more information on the alternatives considered in this report becomes available in the future, it is anticipated and recommended that, as appropriate, this information would be included in an update to the IWMP.

5.6.1 Listing of Alternatives by Classification

The following are the alternatives evaluated by classification:

- Primary Alternatives:
  - Lake Casa Blanca (with and without dredging)
  - North Webb County Groundwater
  - Dimmit County Groundwater
  - Val Verde/Kinney County Groundwater

- South Laredo Wastewater System Reuse (Phase 1 and Phase 2)
- Additional Rio Grande Water Rights

- Secondary Alternatives:
  - Falcon Reservoir Diversion Option
  - Brackish Groundwater (Desalination)
  - Laredo Rio Grande Weir (off-channel)
  - Aquifer Storage and Recovery (ASR)

The groundwater alternatives are further recognized in terms of “Local” and “Imported.” The potential groundwater sources located within Webb County were considered “local” and those outside Webb County, “imported.”

Local refers to secondary sources within Webb County; ***Imported*** refers to sources outside Webb County.

5.7 Description of Water Supply Alternatives

This section contains pertinent information on both the Primary and Secondary Water Supply alternatives. The information available has not been exhaustively reviewed but is presented as reliable planning-level information. Additional due diligence will be required for any secondary alternative that the City considers worthy of further development. For the Primary Water Supply Alternatives, both surface water and groundwater, summary sheets that provide concise information on each alternative are included at the end of this section.

5.7.1 Primary Surface Water Supply Alternatives

The following section describes the water supply alternatives identified as “Primary” (see definition in Section 5.6 above). The information provided is based primarily on existing studies and information. Cost estimates are preliminary and based on available cost information.

5.7.1.1 Lake Casa Blanca (LCB) Description

Because of its location within the City and potential accessibility, LCB has been considered a strong candidate as a secondary water supply. The purpose of this evaluation is to reanalyze and update the potential for LCB to provide an emergency and/or secondary water supply source for the City. The evaluation process for the alternative included:

- Records research for previous evaluations and an availability analysis of the specific source. Requirements to develop and secure the source were investigated.
- Development of additional analyses to update and better quantify the extent of emergency supply availability based on criteria provided by the City and determined as part of the Master Plan.
- Analysis of detailed data to provide needed lake storage volume including availability and source development needs (permitting, conveyance, costs, etc.).
- Summary report of findings.

This review does not include any analysis of methods, sizes, or costs of pumping and conveyance of lake water to City treatment facilities. The methods and costs for these operations are included in evaluations by others including the temporary storage and reuse of effluent in LCB. This analysis focuses solely on the volume of water that could be available as an emergency or supplemental source for the City.

Records Research

Lake Casa Blanca is located on the east side of Laredo, just north of US 59 and is within the Chacon Creek watershed. It was impounded in 1950 when the LCB dam was constructed by Webb County. According to records at the TCEQ Dam Safety Office, the original lake has a spill elevation of 446-feet, a surface area of 1,680 square feet, and a maximum storage volume of 20,000 acre-feet. The dam construction was designed by Foster Engineering Co. That company no longer exists but Howland Engineering & Surveying (HES) purchased their complete assets and archives. As part of this alternative's investigation effort, personnel at HES searched the Foster Engineering records for the original plans and calculations for LCB. No record drawings or calculations supporting the original impoundment numbers were found.

The impoundment capacity for LCB was studied in 2007 by Espey Consultants under contract to Foster Engineering and Webb County for a dam rehabilitation analysis and design. The Espey files and report were obtained by LAN for this review. The Lake Casa Blanca Dam *Hydrologic and Hydraulic Analysis Report* by Espey Consultants is dated November 2007. The report and associated data show that approximate bathymetric soundings of the lake bottom were performed to update the storage capacity of the existing lake. Figure 5-2 shows the results of the Espey study. The report states that the lake has a 1,650-acre surface area at the spillway with a maximum storage volume of approximately 11,000 acre-feet.

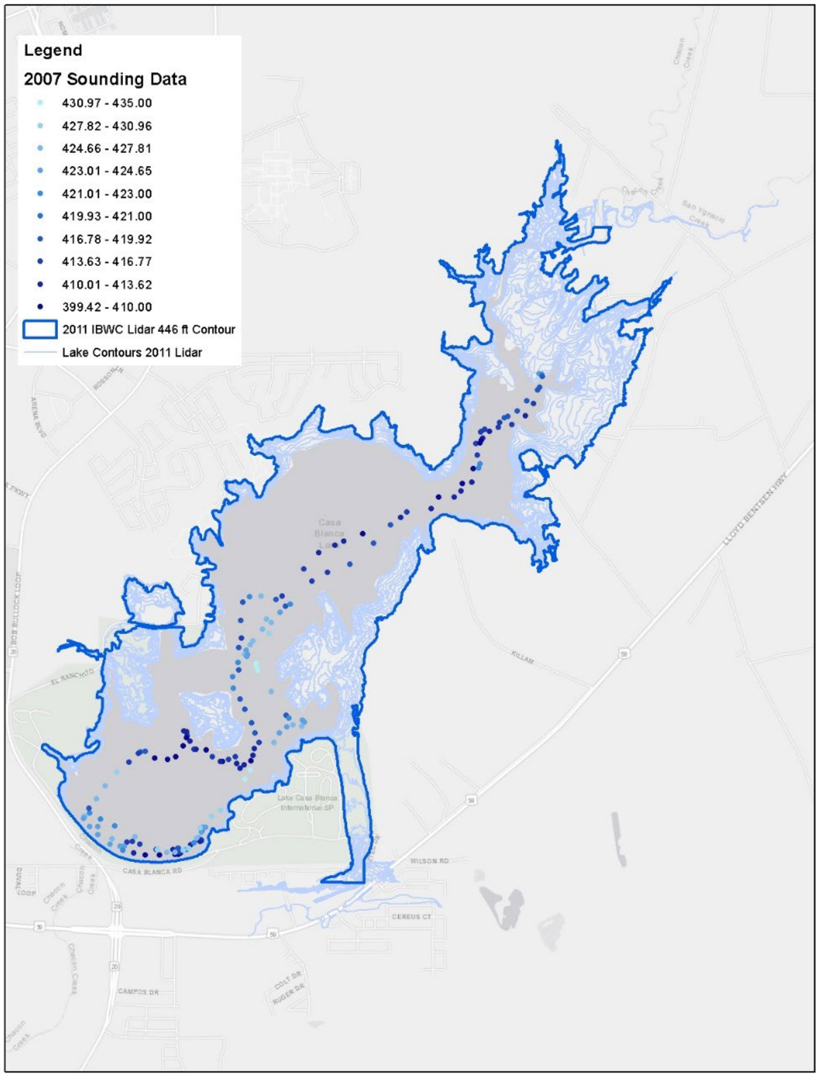

Figure 5-2: Espey Consultants Bathymetric Survey

LAN also performed a records and literature research effort concerning lake dredging methods and costs. This information is explored in more detail in **Section 5.7**. The primary source identified is the December 2005, *Dredging vs. New Reservoirs* report prepared by Alan Plummer & Associates, Inc. for the TWDB.

Lake Casa Blanca Storage and Prior Surveys

A bathymetric model was created to estimate the current volume of the reservoir. Several datasets were available for the development of the model:

- 2007 Sounding Data
- 2008 LiDAR Data
- 2011 International Boundary and Water Commission (IBWC) LiDAR Data
- 2018 LiDAR Data

All these data sets were evaluated for this analysis since there is limited development around the lake perimeter. Observations of 2018 aerial imagery obtained from TNRIS showed no appreciable change to topography of lake edges or islands. Note that the only available bathymetric data for the lake bottom, for this analysis, is the 2007 sounding results by Espey Consultants.

The 2008 and 2018 LiDAR were hydro-flattened, providing only one value for the lake surface at the 446-foot contour line. The 2011 LiDAR had the lowest lake elevation of the three (436.79 feet) and was not hydro-flattened. This data provided a good model of the lake contours from the 446-feet mark to the 2011 elevation.

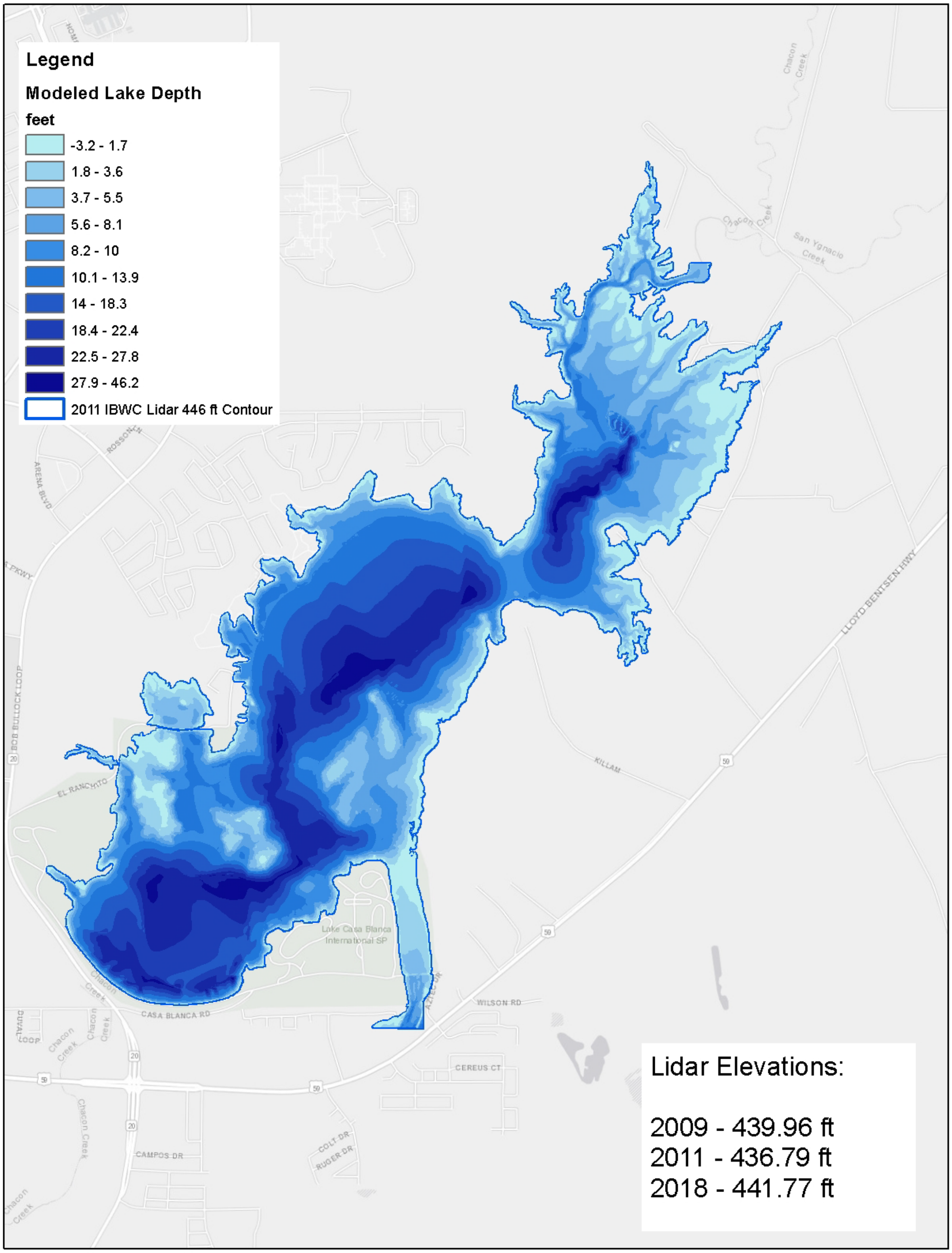

Figure 5-3: Modeled Lake Depths

The 2007 sounding data reported by Espey Consultants consisted of GPS locations and soundings of the deepest and/or representative points of the lake bottom elevation. The elevation values ranged between 399- to 438-feet. The area between the dam and the large island had an average depth of 20-feet below the spillway elevation. Contours were created from the TIN and merged with the 2011 contours to create the final bathymetric model, as shown in Figure 5-2. The maximum volume, before spill, was calculated to be 15,447.70 acre-foot with a maximum storage surface area of 1,366 acres.

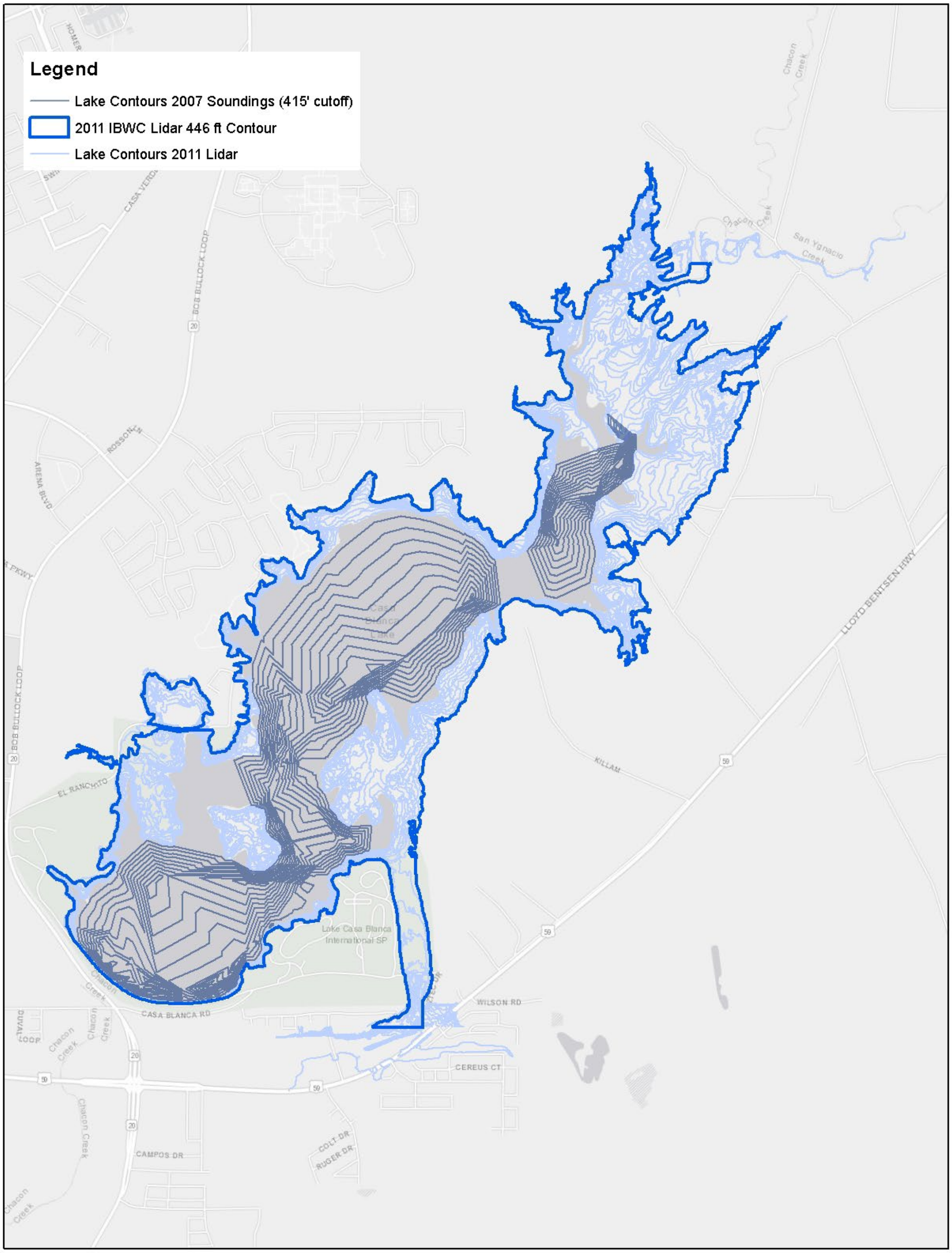

Figure 5-4: LiDAR with Soundings Contours

The volume of lake storage available for Secondary or Emergency water use is also affected by evaporation from the lake surface. The TWDB maintains a statistical database of lake evaporation measurements. The database contains information from 1940 through 2019. The data includes information on precipitation and lake evaporation for each county, including Webb County. **Table 5-2** is a summation of data for Webb County taken directly from the TWDB website for the entire period of record and for the latest 10-year period.

Table 5-2: Texas Water Development Board Water Data for Webb County, Texas

Lake Evaporation and Rainfall						
	1940 - 2019			2010 - 2019		
	PPT Mean (in)	Gross Evap. Mean (in)	Net Evap. Mean (in)	PPT Mean (in)	Gross Evap. Mean (in)	Net Evap. Mean (in)
AVG/YR	20.38	65.09	44.54	19.55	64.31	44.76
AVG/MONTH	1.70	5.42	3.71	1.63	5.36	3.73

The data shows that Lake Casa Blanca experiences significantly more evaporation on average than is replenished by rainfall. It has been observed in the 2007 dam and lake analysis for the County, and from historical aerial images, that the "average daily" lake level is typically 5-feet or more less than the maximum storage level. This is also clear from the fact that the lake never overflowed before 2005 and has overflowed the spillway on only 2-3 storm events since then. This imbalance of rainfall-evaporation keeps the lake volume lower than the maximum available volume. The "average daily" volume may be closer to the Webb County report volume of 11,000 acre-feet.

To increase storage capacity in Lake Casa Blanca there are two options, 1) is to increase the storage capacity of the lake by dredging the existing lake bottom. This option will be explored in the following section, and 2) is to increase daily volume by pumping treated wastewater into the lake for temporary storage and then pump, as needed, to a City water treatment facility. This option is being explored as part of the evaluation for effluent reuse in another section. Note that both options will be heavily affected by the loss of water volume expected due to lake evaporation as noted above.

Siltation and Consideration of Dredging

The evidence previously developed by Webb County and reviewed for this report shows that significant siltation of the Lake Casa Blanca bottom has occurred since the lake was impounded in the 1950s. Siltation is likely a result of natural erosion during runoff events as well as erosion of disturbed soil due to development within the City. Removal of accumulated sediment, due to the nature of the impoundment can only be accomplished through dredging the bottom of the reservoir. Dredging to develop or enhance existing water supply volume within a lake is a large undertaking. A large amount of sediment needs to be removed to create meaningful storage.

An investigation of dredging methods, strategies, and costs was undertaken. Limited data was found for Texas. The primary source for this review was a 2005 report for the TWDB entitled *Dredging vs. New Reservoirs*. This report provides a comprehensive look at the dredging processes, methodologies, constraints, and limited cost data.

Two Basic Dredging Methods

There are two basic methods that can be employed to remove sediment and/or deepen a water body like Lake Casa Blanca. The selection of the proper method depends on several cost factors.

The first method is mechanical dredging. This involves the use of draglines from the shore or on barges. The draglines excavate the sediment and transfer to barges and/or trucks for removal. Mechanical dredging may also include the use of heavy equipment if the lake water surface can be lowered sufficiently to reach the material to be removed (**Figure 5-5**). This is the simpler of the two methods but is usually only used in small, shallow water bodies without access issues. This could be used for portions of Lake Casa Blanca, including the main basin area within the State Park. However much of the upper lake shoreline is not readily accessible.

Figure 5-5: Mechanical Dredging – Clamshell (Cashman) and Backhoe (Seatools)

The second, and more complicated method is hydraulic dredging. This typically employs a barge mounted pump that hydraulically pumps water and sediment through a pipeline to an onshore dewatering area (**Figure 5-6**). The dewatering area is usually found near the water body but not on the shoreline because the dredged flow cannot return directly to the lake. This method requires more permitting and land issues. It is the method of choice when a large volume of sediment must be efficiently removed as may be the case for LCB.

Figure 5-6: Hydraulic Dredging (Ellicott Dredges)

Dredging Related Considerations

There are two basic methods to accomplish dredging; however, there are several cost factors that influence and/or determine the method selected and the overall costs for the operation. These factors drive the cost of any dredging operation and include:

- Engineering and Permitting Costs
- Mobilization Costs
- Depth and Type of Sediment
- Run Times
- Transport Distance
- Disposal Options
- Water Management

Planning for engineering design and construction is the combination, interaction, and implementation of facets of a proposed dredging operation.

5.7.1.1.1 ENGINEERING AND PERMITTING CONSIDERATIONS

Federal and state regulations can add to the final cost of dredging. Section 404 of the Clean Water Act requires the submittal of a permit to the USACE for discharge of any dredging material in jurisdictional waters. At a minimum, Lake Casa Blanca is considered Waters of the U.S. Any work done in jurisdictional waters could add to cost of dredging due to required mitigation efforts. Depending on the nature of the permit—nationwide, general, or individual permit—the submittal of a 404 Permit can result in application fees once the USACE issues the permit. A Section 404 Permit application requires engineering plans, endangered species reports, archeological site reports, mitigation plans, among other requirements which contribute to the final cost.

Along with the Section 404 Permit, the TCEQ conducts a Section 401 Water Quality Certification to ensure that the dredged material complies with water quality standards. It is required that the material be tested to meet these requirements. Dredged material that does not meet the water quality standards can add to total costs. If the sediment material is contaminated with harmful chemicals such as toxic metals, pesticides, and PCBs, this can affect the handling and storage of the material. Removal costs for impacted sediments can range from $100-$400/CY.

Other agencies such as National Marine Fisheries Service, U.S. Fish and Wildlife Service, Texas Water Commission, Texas Parks and Wildlife, Texas General Land Office and Texas Historical Commission could have an impact on a dredging project depending on the type of operation proposed and the location of dredge disposal/dewatering.

5.7.1.1.2 MOBILIZATION COSTS

Mobilization is a fixed cost encompassing the transportation of all necessary equipment. Removal of the dredged material is based on cubic yards, which is an additional cost to the fixed cost. Projects that operate throughout multiple years typically have multiple mobilization costs due to breakdown and re-mobilization that occurs when equipment is removed off site for repairs or off-season.

5.7.1.1.3 DEPTH AND TYPE OF SEDIMENT

A bathymetric survey is done to identify the dredge area and to provide the thickness information of the sediment. The type of material can ultimately affect the cost. Heavier and harder materials such as clay, gravel, and debris are harder to remove and result in higher costs. Softer materials would require less power to pump and would be more cost efficient.

5.7.1.1.4 RUN TIMES

Time optimization during the start and shutdown of the process can result in cost minimization.

Longer workdays, running from 10-12 hours per day are preferred. Twenty-four-hour operations are the most cost efficient, given that equipment can run 24 hours per day. If equipment is down, cost continues to accrue. By running continuously there is the ability to maximize production impact costs.

5.7.1.1.5 TRANSPORT DISTANCE

The cost to transport the dredged material depends on distance and sediment type. The total distance between the location of the dredged materials to their final disposal destination, as well as the different soil types or combinations of soil types, individually affect the dredging process. Transportation costs can change significantly depending on the dredging method used. Hydraulically dredged materials can be pumped for more than 10 miles, requiring a booster about every mile. Conversely, mechanical dredging requires more equipment to truck spoil longer distances.

5.7.1.1.6 DISPOSAL

Disposal of the dredged material varies by dredging method. Mechanically dredged material, although it requires less water to manage, still requires consideration of water management. Hydraulically dredged material has two main methods of disposal, settling basins and dewatering pads. Settling basins require an area that is around two times the total dredge volume. An additional cost for this method includes the upfront work required for the location and design. Dewatering pads require a large laydown area. The time required to dispose of dredged material through a dewatering pad depends on the material type. Sand and gravel soil types take less time to process, while muck and clay soil types take longer because they are more difficult to move through the pipeline. Another method of disposal of the dredged material is re-use by repurposing it as construction material such as sand or gravel, bricks, fertilizers, or even fill dirt.

5.7.1.1.7 WATER MANAGEMENT

The handling of the water accumulated from the dredging process is the biggest challenge. The type of sediment determines the level of effort required to separate the water from the dredged material. Sand and gravel sediments are easier because they can be collected through physical processes. If the dredged material slurry involves muck and clay, more management is required. Chemical processes such as coagulation would be required to separate the sediment from the water. This can lead to even more effort to remove chemicals from the water. The City might require that the treated water be discharged through a treatment plan to ensure that it meets water quality standards. Additionally, it needs to be taken into consideration that possible loss of water quality downstream of the reservoir can occur.

General Cost Analysis

More information on cost evaluation is provided in Section 5.0; the following relates to general cost consideration for dredging options.

There is no typical “unit cost” applicable to dredging operations. As noted in the sections above, the variability in costs can be caused by differences in sediment type and depth and lake bottom conditions. Distance to the dredged solids dewatering sites can affect costs. Land costs for dewatering areas vary significantly depending on the lake setting (rural, suburban, or urban). This cost was characterized in the TCEQ report as ranging from $1,000 per acre to $30,000 per acre. Lake Casa Blanca can be considered suburban to rural placing the cost on the low end of this range.

TCEQ estimated a low-end starting estimate for dredging at $2.00/CY. However, they also note that costs may range up to four times this initial estimate. Site-specific information for a proposed operation is critical. Information for sediment characteristics, bottom conditions, and dewatering areas should be factored into the cost equation to refine the direct unit costs. Actual dredging cost data is limited within Texas. Research did reveal two recent operations that are relevant to this discussion. White Rock Lake in Dallas was last dredged in 1998 at a cost of $18,000,000, or approximately $6.00/CY. In 2012, Lake Worth in Fort Worth was dredged at a cost of $12,500,000, or approximately $6.95/CY.

Lake Casa Blanca has experienced siltation and loss of storage volume of up to 1,000 ac-ft. We can therefore assume that a maximum of the equivalent 1,610,000 CY. could be dredged to increase capacity. The range of costs for this operation is $3.2 M to $12.9 M.

Conclusions related to Dredging

Dredging of material in LCB is a viable solution for increasing its storage capacity.

Lake Casa Blanca has been identified as a potential source of emergency and/or secondary water supply. The proximity of the lake to the City is a favorable factor in its use. However, there is no existing infrastructure (pipelines and pump stations) to use this resource. Other investigations underway for the WMP may provide information and project costs for this need.

This report focuses on the lake storage capacity that may be available for water supply. Initial estimates, when the dam and lake were constructed in 1960, placed the capacity at approximately 20,000 acre-feet. A study for Webb County in 2007 determined that the lake had reduced capacity due to siltation and lake evaporation. That study placed the average lake storage volume at 11,000 acre-feet with an average water surface elevation of 5-feet below maximum pool elevation. This report reexamined and updated that 2007 data. The lake volume was recalculated based on 2011 LiDAR topography and computer manipulation of the 2007 soundings. Based on the revised data, the maximum lake storage capacity was calculated at approximately 15,450 acre-feet.

A dredging report prepared for the TCEQ has estimated costs ranging from $2.00/CY to $8.00/CY. Actual costs found for operations in Texas ranged from $6.00- $7.00/CY for hydraulic dredging of lakes.

State of Texas data for average lake evaporation was also evaluated. Records show that this part of the state averages an evaporation total of more than three times the average rainfall. The net evaporation is more than 40 inches per year. This fact helps to explain the average lake level below the maximum pool elevation.

Dredging of sediment from LCB can be considered a viable solution for increasing storage capacity. However, data research shows that the estimated costs can vary widely based on the dredging methodology, type of sediment, bottom conditions, availability of adequate dewatering area, and permitting.

5.7.2 Groundwater Alternatives

The City has historically relied almost entirely on surface water from the Rio Grande for its water supplies. Various water alternatives involving groundwater resources including importing fresh groundwater, developing local or nearby brackish groundwater sources, and implementing ASR are possible candidates for providing either emergency or long-term supplement water supply.

Information regarding the groundwater alternatives came from various reports and direct communications. As noted elsewhere, additional review and due diligence based on the planning level evaluation will be needed.

Significant information from these resources was used to inform the following:

- Geographical locations of identified potential groundwater development areas and approximate distances from the City's treatment plant.
- General assessment of aquifer and well productivity in selected areas including potential annual allocation of groundwater, associated peak pumping rates, and general water quality characterization (i.e., fresh groundwater with TDS concentrations of less than 1,000 mg/l and brackish groundwater focused on TDS concentrations of less than 3,000 mg/l).
- Estimate of the optimal individual well pumping rates, the number of wells needed, and depths and spacing of water wells to produce desired and available supplies.
- Preliminary costs of wells and other infrastructure.
- Regulatory and management frameworks including rules of GCDs, modeled available groundwater (MAG) for each aquifer and county as determined by GMAs in the joint-planning process, and possible concerns due to potential impacts that could be caused by prospective pumping.

As mentioned above, groundwater supplies considered for Laredo's secondary water supply needs were classified by location: Local Groundwater (within Webb County) and Imported Groundwater (locations outside Webb County and imported into Webb County). The following is a summary of the sources considered by location.

5.7.1.2 Location of Potential Groundwater Sources

Figure 5-7 shows the areas of potential groundwater supply that could be developed including fresh groundwater that would not require any advance treatment (other than normal disinfection and adjustments for compatibility with the City's system) and marginally fresh or brackish groundwater that would require some degree of demineralization and/or blending to meet potable quality. The groundwater resources include freshwater within the Carrizo-Wilcox Aquifer in northern Webb County and Dimmit County, fresh water from the Edwards-Trinity (Plateau) aquifer in Kinney and Val Verde counties, and local brackish groundwater zones.

Even though it is not a "supply source," ASR is also included under the heading Local Groundwater because it would "store and recover" temporarily stored groundwater within Webb County. ASR can be important in managing the use of existing water supply functioning in a similar manner as supplemental storage during high demand months.

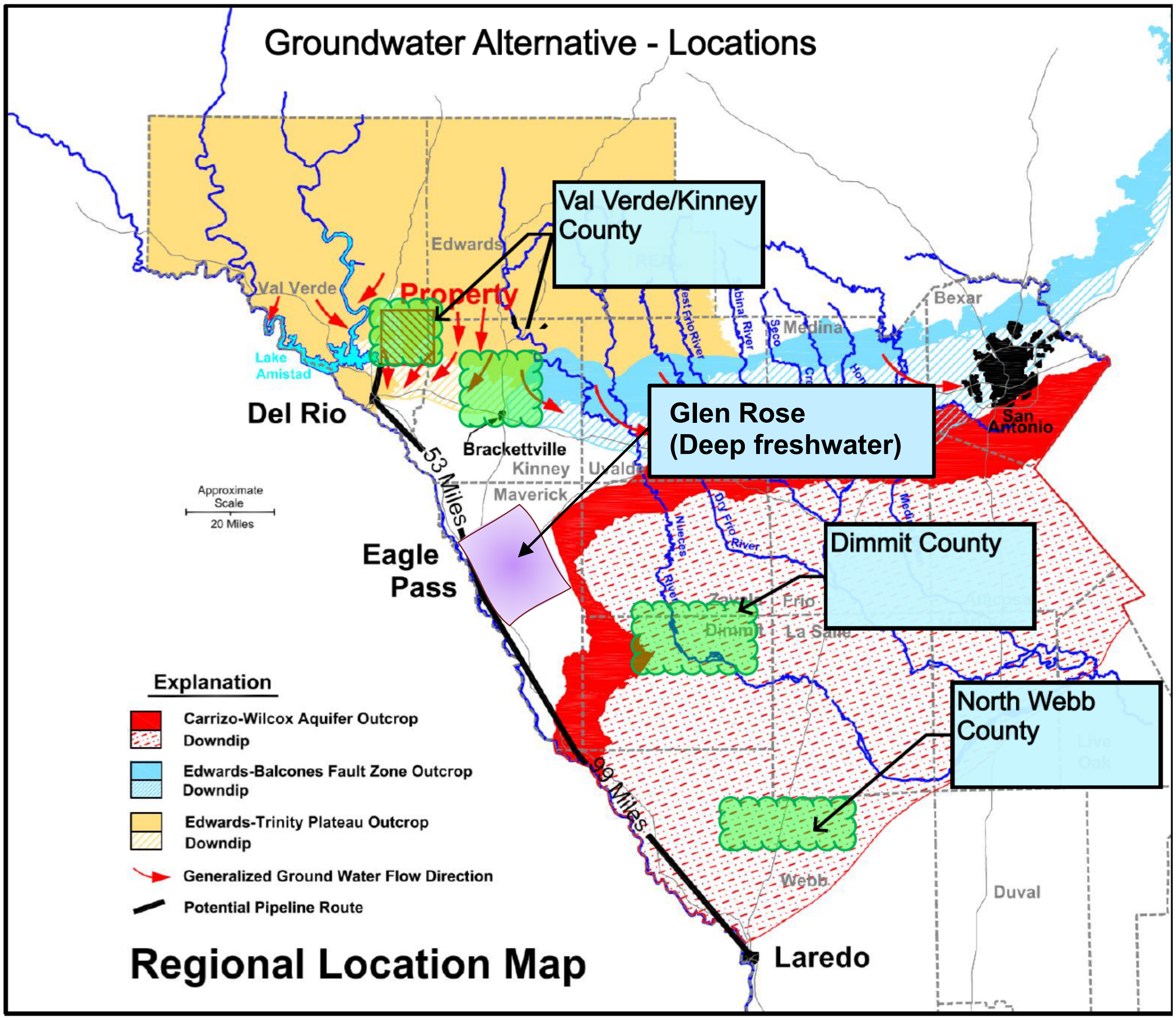

Figure 5-7: Location of Groundwater Sources

5.7.3 Brief Description of Potential Groundwater Sources

5.7.3.1 Local Groundwater Sources

North Webb County Groundwater near Dimmit County Line: Potential groundwater supply of sufficient quantity and quality for supplementing the Laredo system is in northern Webb County. The property owners have been delayed in having well tests completed due to supply-delivery problems.

Legacy Water Supply Corporation: This potential groundwater supply is located adjacent to Laredo's northern-most CCN, in the area bounded by IH 35 and US Highway 83. As described below additional testing to properly quantify production and quality are being considered.

Local ASR Project: The City obtained funding from the TWDB and in 1996 CH2MHill began conducting Step 1 and Step 2 of a Feasibility Investigation. The primary target storage/ production zone in the study was the shallow Laredo formation, with some evaluation of the deeper Bigford and Carrizo formations. The study generally concluded that the permeability of the Laredo formation is low such that injection and recovery rates would be lower than desired, and that the formation may be susceptible to plugging.

5.7.3.2 Imported Groundwater Sources

Dimmit County Supply: Groundwater production from Dimmit County was evaluated and considered by the City Council in 2006. Freshwater with estimated yield of 40 MGD from a Carrizo-Wilcox Aquifer well field is located 70 miles from Laredo. Water from the well field would have TDS concentrations of less than 300 mg/l and may not require any advanced treatment.

Val Verde/Kinney County Groundwater: Based on the investigations to date, this area has the potential to produce large quantities of excellent quality groundwater. This area could provide approximately 22.3-MGD of fresh groundwater with TDS concentrations of 230 to 390 mg/l from wells completed in the Edwards-Trinity (Plateau) Aquifer. The project is located approximately eight miles northwest of the City of Brackettville and is about 130 miles from Laredo.

Maverick County Deep Glen Rose Groundwater: In recent months, a deep, freshwater formation part of the Glen Rose Aquifer, has been identified and recognized as a potential water supply source by the TWDB and other agencies. At this point, only tentative information is available on the aquifer, potential water supply production, and water quality. However, the City should monitor the ongoing investigations of this aquifer to consider possible further action, particularly if a regional groundwater production and delivery system is ever developed.

5.7.3.3 Local (Webb County) Groundwater Supplies

The term 'local groundwater' refers to potential groundwater supplies located in Webb County. These supplies are obviously more proximal to the City than others identified outside Webb County and are discussed below.

For several decades private landowners have contemplated making available to the City large land holdings or groundwater leases to produce water from the Carrizo-Wilcox aquifer, including parts of Dimmit, Zavala, Frio, LaSalle, McMullen, and northern Webb counties. The nearest area in which fresh groundwater can likely be produced in sufficient quantities for the City is in northern Webb County near the boundary with Dimmit and LaSalle counties (see **Figure 5-9**).

5.7.4 Location of Potential Webb County Groundwater Sources

The permeability of sands in the Carrizo formation in Webb County is lower than found in other parts of the Winter Garden area. Based on available information the transmissivity in the identified potential production area likely ranges from 5,000 to 20,000 gpd/ft. Based on estimated depths-to-water and anticipated aquifer productivity, wells in a well field should be spaced about 5,000-feet apart and long-term maximum pumping rates would likely be between

1,000 and 2,000 gpm. Preliminary modeling indicates that a well field or well fields could be developed to produce long-term supplies of at least 25,000 AF/yr from northern Webb County.

Due to variation in groundwater sources within Webb County, additional investigations are needed, but preliminary results are encouraging that quantity and quality within the Carrizo-Wilcox Aquifer located in the northern and central parts of the County could provide sufficient supply to meet the emergency supply goal. Site-specific test-well documentation of both quantity and quality is needed and initial tests have been conducted, but no definitive results have been received.

For this evaluation, available information cited was used to estimate quantity (production potential) and quality. However, field studies, including geotechnical investigations and follow-up test wells, will be needed to confirm the production available. Due to the nature of the Carrizo-Wilcox sands within the northern area of Webb County, detailed field investigations are critical.

There is currently no GCD within Webb County. Therefore, no permits are required to produce groundwater. Webb County is located within GMA 13. The GCDs within GMA 13 have developed DFCs for the Carrizo-Wilcox aquifer through 2070. Based on the current DFCs the TWDB has determined that the MAG for the Carrizo-Wilcox Aquifer in Webb County is 916 AF/yr. While there is no regulatory restriction to produce the groundwater, the limited MAG could lead to difficulties in obtaining State funding (i.e., SWIFT) for the groundwater project. Based on the potential for developing groundwater within Webb County, the City participated recently in the GMA 13 planning process. The City asked GMA 13 to allow substantial groundwater production in Webb County and to revise the DFC, which would lead to an increased MAG from the TWDB. The City also needs to petition Region M RWPG to get the project included in the regional water plan.

The Region M RWPG currently does not include water management strategies (WMS) or alternative strategies for providing groundwater to the City. However, the TWDB reported in 1976 that areas in northern Webb County and southern Dimmit County are suitable for additional groundwater development.

Based on limited data from wells in the area, the water quality is potable with TDS concentrations ranging from 630 to 800 mg/l. With long-term pumping the TDS concentrations could slowly increase due to upward leakage from higher TDS zones. Site specific data is critical to support a decision to develop groundwater in Webb County.

Two areas, one in central Webb County and the other in northern Webb County, have had preliminary investigations conducted.

5.7.4.1 Legacy Water Supply Corporation

The Legacy Water Supply Corporation (Legacy WSC) spans more than 18,000 acres on numerous tracts of land approximately 18 miles north of the City along IH 35. Simeon Escondido, LLC plans to develop the ranch property using locally sourced groundwater from the Laredo Formation (approximately 700 ft below ground surface) and from the Carrizo Aquifer (approximately 3,400- to 3,600-ft below ground surface). The tracts are located near the confluence of IH 35 and US 83, as well as where the Camino Colombia TX-255 Toll Road crosses both US 83 and IH 35.

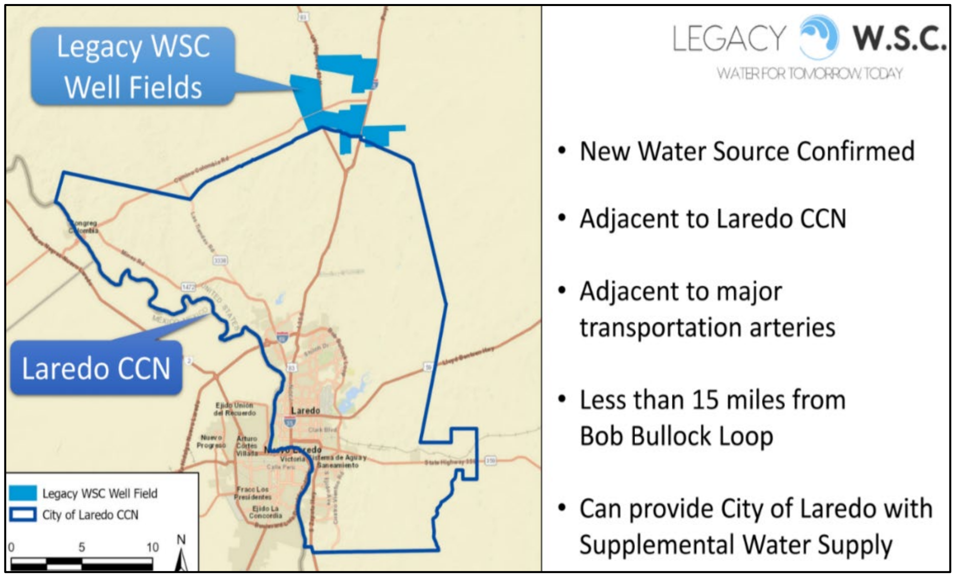

Figure 5-8: Legacy Water Supply Corporation (provided by Legacy WSC)

The City joined Simeon Escondido, LLC in a petition to GMA-13 to include up to 35,000-AF/yr of groundwater pumping from Webb County within its DFCs. Much of this groundwater pumping would come from wells located on Walker Ranch property. Much of this quantity of water could be provided to the City as an alternative water supply.

Simeon Escondido, LLC drilled a test well on its property, extending 3,600-feet below ground surface and extending through the Carrizo Aquifer. The well tests, which were completed in early 2022, were disappointing. Both high temperature and high TDSs were found[6].

[6] In recent correspondence with LRE Engineering, the consultants overseeing the pump tests at Legacy WSC, has concerns that the results of the latest tests may not be valid due to the methods used and duration of the pump tests. Further testing may be undertaken to determine if the test results were invalid and assert whether additional well test are needed.

5.7.4.2 North Webb County Groundwater – Carrizo-Wilcox Aquifer

The Carrizo sand forms the fresh groundwater interval in the Carrizo-Wilcox Aquifer in the area delineated for this study. Depths to the top of the formation generally range from 2,000- to 2,600-feet below ground level (BGL). The freshwater sand occurs at the top of the formation and ranges in thickness from 100- to 200-feet within Webb County. Therefore, wells producing freshwater would likely range in depth from 2,100- to 2,800-feet. Note that net sand thicknesses containing fresh groundwater increase to 300-feet in Dimmit and LaSalle counties. Also, the Carrizo in northern Webb County also has sand zones ranging from 100- to 200-feet thick that lie immediately beneath the freshwater zone and contain slightly saline groundwater with TDS concentrations ranging from 1,000 to 3,000 mg/l. Therefore, there could potentially be opportunities for developing brackish groundwater for blending or desalination to conjunctively use with the fresh groundwater.

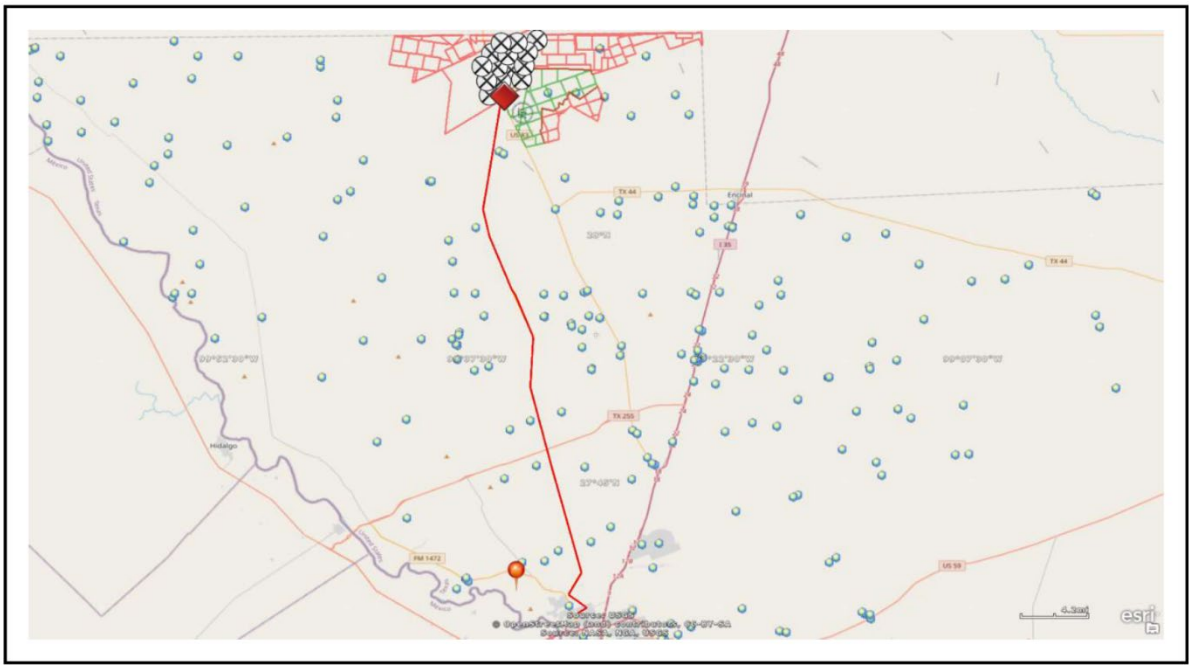

Figure 5-9: Location of North Webb County Groundwater (at Dimmit County Line)

Table 5-3 on the following page provides a general summary of the potential source.

Table 5-3: Summary of North Webb County Groundwater Source

North Webb County	
Productivity and Water Quality	
Distance to Laredo	40 miles
Estimated Availability	25,000 AF/yr
Assumed Peak Pumping Rate	24,000 gpm (34.6-MGD)
Pumping Rate Per Well	1,000 to 2,000 gpm
Number of Wells	12 to 24
Distance Between Wells	5,000 feet
Well Depths	2,100 to 2,800 feet
Cost Per Well	$1.8 million to $2.7 million
Initial TDS Concentration	630 to 800 mg/l
Regulatory, Management, and Planning Factors	
Groundwater District	None
GMA	GMA 13
MAG	916 AF/yr
Planning Region	Region M
WMS In Regional Plan	No
Alt. WMS in Regional Plan	No

Preliminary engineering design and cost estimates indicate that a 25,000 AF/yr fresh groundwater supply, which a peak pumping rate of 24,000 gpm, or 34.6-MGD, could be constructed for approximately $184,960,000 to deliver water to the City's treatment plant. Preliminary estimates for unit water cost are $3.19 per thousand gallons. Further details on cost estimates and LCC are provided in Section 5.21.2.

5.7.4.3 Aquifer Storage and Recovery (ASR)

The concept of ASR is straightforward. Wells are used to store water available during times of the year when the water treatment plant can produce excess amounts of treated water (not needed to meet system demands). This "stored" water is later recovered by pumping the wells. The recovered water then augments the supply available for high demand periods.

The City has previously evaluated the feasibility and benefits of ASR. A detailed feasibility report on ASR was completed in late 1998 and published in 1999. At that time, test wells were drilled to evaluate the potential for implementing ASR. This testing included four boreholes at three locations in east-central and northeast Laredo. Also, 17 existing wells were located and sampled. The information collected was used to help characterize the local Laredo Aquifer (see **Figure 5-10**.).

The Laredo Aquifer supports limited production; yields were typically around 60 gpm. Water quality of these wells was mineralized, with high chloride concentrations ranging from 400 mg/l to more than 900 mg/l.

The investigations of production and water quality indicated that storage of water in the Laredo formation, "…may be possible. However, the aquifer is known to have a very low transmissivity." Low transmissivity indicates a higher potential for plugging of the aquifer during injection. A further, small-scale test was conducted to estimate response to plugging known as a 'aquifer compatibility test.' This test resulted in "…relatively high heads being required to inject water into the aquifer and confirmed that the aquifer has a high tendency to plug." (CH2MHILL, 1999)

For the current report, TGI reviewed the results of the 1999 study and compared those finding with available literature on the Laredo Aquifer. Based on the review, TGI agreed with the finding of the CH2MHILL investigation.

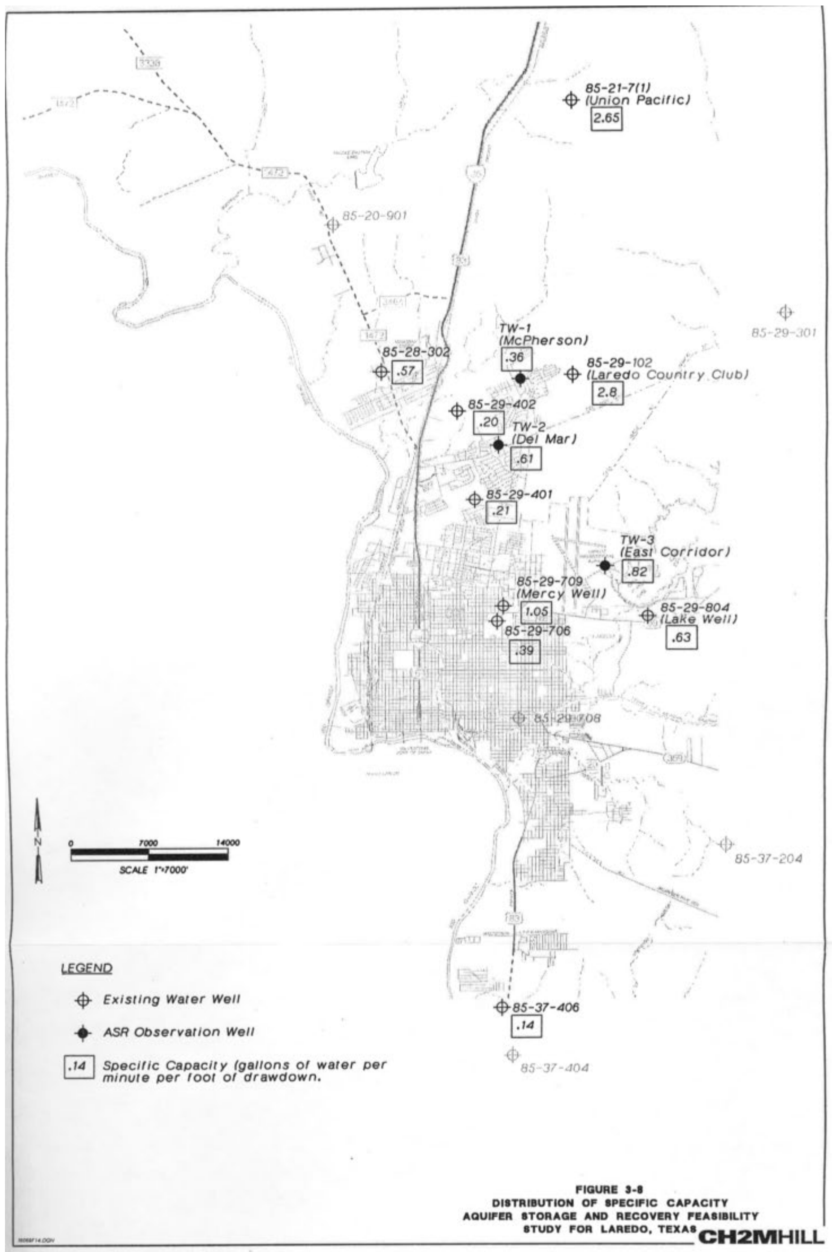

Figure 5-10: Groundwater Sites Included in the 1999 ASR Study

5.7.4.4 Brackish Groundwater Supplies in Webb County

As a part of its Brackish Resources Aquifer Characterization Study (BRACS) program, the TWDB has delineated potential brackish water development zones for the Carrizo-Wilcox, Queen City, and Sparta aquifers within GMA 13, including a "potential production area" in Webb County that includes areas in and near Laredo. Maps presented by the TWDB show that the net sand thickness of slightly saline (TDS concentrations of between 1,000 and 3,000 mg/l) water is as much as 300-feet near the City, and there is about 200 feet of saturated sand containing moderately saline water (i.e., TDS concentrations of 3,000 to 10,000 mg/l).

There is little aquifer testing information for the portions of the Carrizo-Wilcox Aquifer beneath Laredo and nearby areas. The available data show that the production characteristics of the aquifer are significantly less favorable in the deeper (i.e., downdip) areas than in the areas updip in northern Webb County and adjacent counties. More study is needed to assess the potential productivity and water availability from the brackish portion of the Carrizo-Wilcox aquifer beneath the City. Additionally, some preliminary cost-feasibility assessments could be made to compare the capital and operating/maintenance costs of desalinating local brackish water as compared to importing fresh groundwater. Currently, there is no recommended or alternative WMS in the Region M RWP for developing brackish groundwater.

5.7.4.5 City's Experience with Desalination Treatment

Although no longer in operation, the City has had recent operational history with treatment of brackish groundwater. The Santa Isabella WTP was a 50,000 gpd RO plant designed to treat local, brackish groundwater. The treatment struggled and encountered problems of high temperature product water and overall high cost for treatment. In 2010, the RO process was replaced with a VCP. Working with the Engineering Experiment Station (TEES), a member of the Texas A&M University System, the plant employed Terrabon's innovated VCP technology. The project was intended to demonstrate the commercial viability of the process. However, problems with the treatment process were encountered and the treatment was converted to a reserve osmosis treatment. Due to high cost, low production, and difficulties in operation, the plant was closed and is no longer in operation.

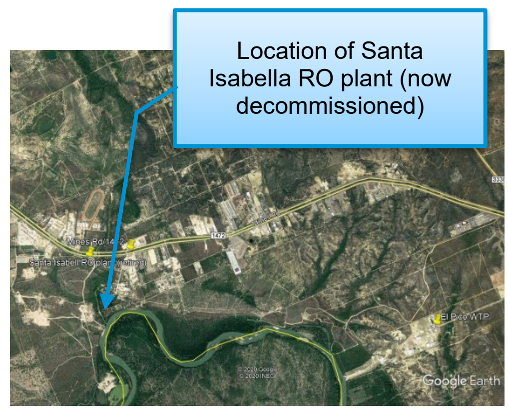

Figure 5-11: Location of Former Santa Isabella RO Plant

5.7.5 Imported Groundwater Supplies

Several locations in counties northwest of Laredo have the potential for importing groundwater to the City. These areas are known to have large groundwater supplies of good to excellent quality water available. Supplies imported from these areas would meet and exceed both the Emergency and Supplemental Supply targets discussed in Section 5.4.5.

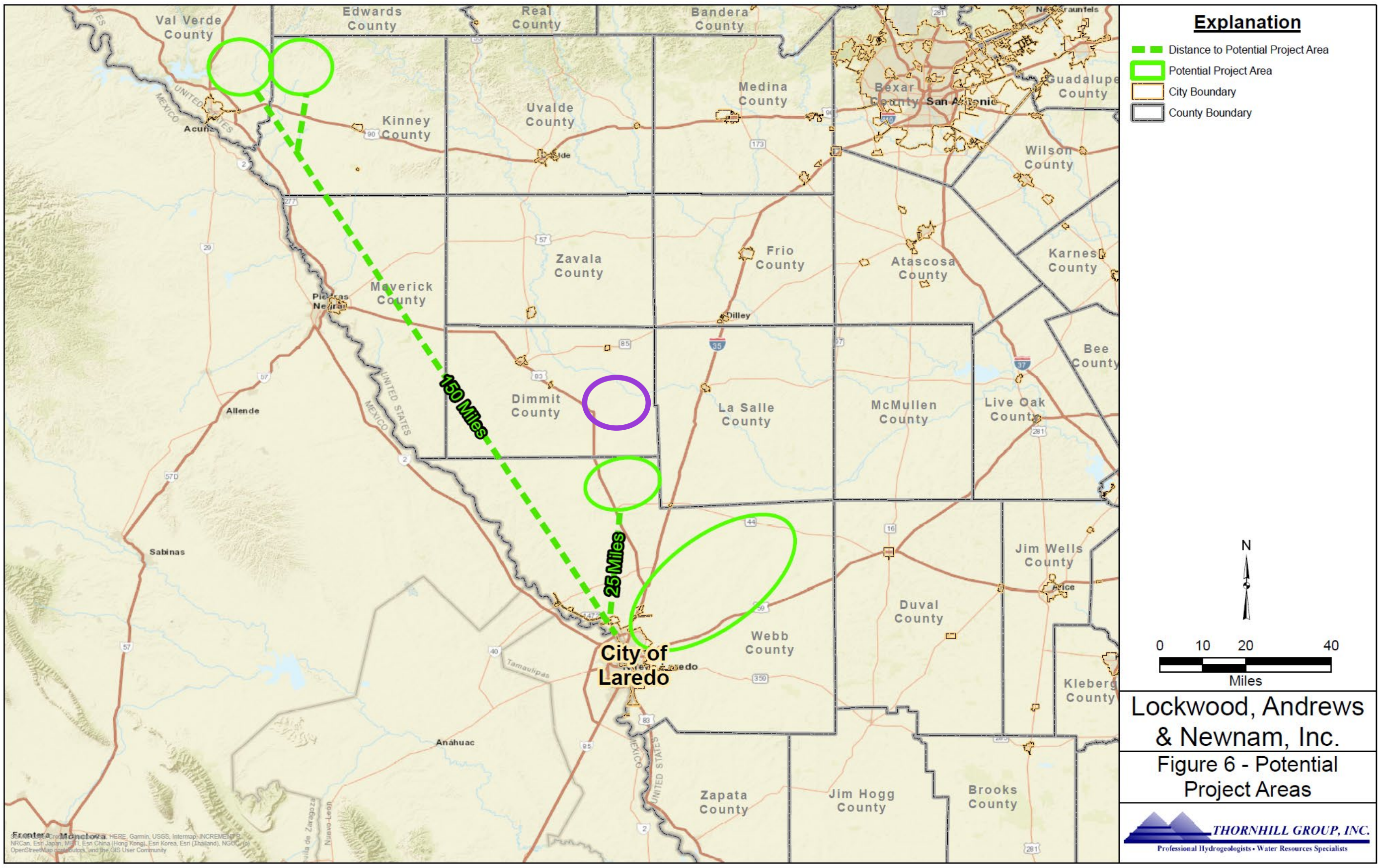

Figure 5-12: Groundwater Locations and Relative Distances to Laredo

5.7.3.4 Dimmitt County Groundwater Supply

Of the potential imported supplies, the Dimmitt County groundwater is most proximal to Laredo. The general location of the Dimmit County groundwater is shown on **Figure 5-12**. The well field is located 70 miles from Laredo. The freshwater with estimated yield of the Carrizo-Wilcox Aquifer in this area is estimated at just under 45,000 AF/yr or 40-MGD. Water from the well field would have TDS concentrations of less than 300 mg/l and may not require any advanced treatment.

In February 2007, the DUWSC made a presentation to the Laredo City Council on a potential groundwater project to produce significant groundwater from the Ivy well field located in the greater aquifer area of Winter Garden within Dimmit, Zavala, and LaSalle Counties that could be conveyed to the City.

The DUWSC is an important resource for the City in considering the potential use of this secondary water source. As with all the potential sources, the Dimmit County groundwater supply source will need to be reviewed; however, the DUWSC has broad information on the location, source, potential production, and water quality.

5.7.3.5 Val Verde and Kinney Counties – Edwards-Trinity (Plateau) Aquifer

These two groundwater sources are adjacent to each other (see **Figures 5-7** and **5-12**) and for the purpose of this evaluation, can be considered together as one source. The distances to Laredo are similar and both are from the same aquifer, providing similar water quality and quantities.

Starting in the late 1990s and early 2000s landowners from Kinney County and Val Verde County have approached the City regarding large volumes of fresh groundwater. Based on a long history of irrigation, Kinney County has proven groundwater resources from the Edwards-Trinity (Plateau) Aquifer. Landowners in southeastern Val Verde County (and western Kinney County) have between 50,000 and 100,000 acres of land lying atop the Edwards-Trinity (Plateau) Aquifer, which is essentially untapped in the area.

Landowners in Kinney County have historically pumped large supplies of water from the Edwards-Trinity (Plateau) Aquifer for irrigating crops. Note that the Edwards-Trinity (Plateau) Aquifer in Kinney County, while prolific, is considered hydraulically separate from the Edwards Balcones Fault Zone (BFZ) Aquifer that provides water to San Antonio and others. The quantity of water in the Kinney County irrigation areas has been reliable for decades and the water quality is known to be potable with TDS concentrations ranging from 290 to 400 mg/l. Landowners and water marketing groups have sponsored several studies to demonstrate the reliability of the water and the lack of significant adverse impacts due to pumping. The landowners in Kinney County have obtained permits from the Kinney County GCD to produce 25,000 AF/yr of groundwater. However, permits to export or transport the water outside of Kinney County have not been obtained. Kinney County is within GMA 7 and the current MAG for the Edwards-Trinity (Plateau) Aquifer in Kinney County is 71,351 AF/yr. Kinney County is in the Region J RWPG. There is currently no recommended or alternative WMS to transport water from Kinney County to the City of Laredo.

There are at least two groups of landowners in Val Verde County that have aggregated groundwater rights and have approached the City regarding large potential groundwater supplies. One landowner group has aggregated 50,000 contiguous acres in Val Verde County and has additional contiguous land holdings across the county line in Kinney County (separate from the Kinney County project described above). At least three local wells indicate that the aquifer is highly productive and yields excellent quality water with TDS concentrations between 300 and 360 mg/l.

SAWS commissioned CH2MHill to develop a groundwater model to evaluate the potential project. CH2MHill concluded from the model that 75,000 to 125,000 AF/yr of groundwater could be produced from a well field in southeastern Val Verde County and the flows of San Felipe Springs would remain above their historical low flows, which occurred prior to the filling of Lake Amistad. The model also led to the conclusion that there would be some minor decreases in flows from the Devils River system and a proportionally small amount of additional leakage from Lake Amistad, particularly as compared to the evaporation rate from the reservoir.

The City of Del Rio and Val Verde County commissioned another modeling study. In 2014, Eco-Kai Environmental, Inc. and Dr. William Hutchison generated a new groundwater model and reported similar results to the CH2MHill model study. Wells in Val Verde County would likely range in depth from 500- to 800-feet and would yield 1,400 to 2,000 gpm at favorable well sites. While the location of wells would primarily be dependent upon locating favorable sites in the karst aquifer, the optimal space between wells is estimated to be about 5,000-feet. Val Verde County currently is not within a GCD, but it does lie within GMA 7. The current MAG for the Edwards-Trinity (Plateau) Aquifer is 50,000 AF/yr in Val Verde County. Annual pumping in Val Verde County is a small volume; however, for a large project it is possible that the MAG would need to be increased for such a project to acquire State funding. Val Verde County is in the Region J RWPG. There is currently no recommended or alternative WMS to transport water from Val Verde County to the City of Laredo.

Table 5-4 provides a general summary of potential groundwater supply projects in Kinney and Val Verde counties:

Table 5-4: Summary of Val Verde and Kinney Counties Groundwater Supplies

	Val Verde County	Kinney County
	Productivity and Water Quality	
Distance to Laredo	150 miles	150 miles
Estimated Availability	50,000 to 100,000 AF/yr	25,000 AF/yr
Assumed Peak Pumping Rate	46,600 to 93,000 gpm	23,300 gpm
Pumping Rate Per Well	1,400 to 2,000 gpm	1,400 to 2,000 gpm
Number of Wells	24 to 67	12 to 17
Distance Between Wells	5,000 feet	5,000 feet
Depths of Wells	500 to 800 feet	500 to 800 feet
Cost Per Well	$715,400 TO $974,000	$715,400 to $974,000
TDS Concentration	300 to 360 mg/l	290 to 400 mg/l
	Regulatory, Management and Planning Factors	
Groundwater District	None	Kinney County GCD
GMA	GMA 7	GMA 7
MAG	70,351 AF/yr	50,000 AF/yr
Planning Region	Region J	Region J
WMS In Region M Plan	No	No
Alt. WMS in Region M Plan	No	No

TGI has not had access to any cost-feasibility studies conducted for transporting water from Kinney or Val Verde counties to the City of Laredo. In 2006, LAN developed preliminary cost-feasibility numbers for transporting between 45- and 80-MGD to SAWS, which is a similar distance from the water source as the City. The capital costs ranged from $360 million to slightly more than $520 million for the 45- and 80-MGD scenarios, respectively. These costs need to be updated for appropriate comparisons to be made to current costs of other alternatives.

5.7.3.6 Regional Participation on Imported Groundwater Project

Due to high capital and operation cost (see Section 5.31) of conveying large quantities of good quality groundwater from outside Webb County, the potential for a regional project linking several water systems should be considered. A regional system would allow other users to benefit and would provide an economy of scale that could make imported supplies affordable.

The TWDB can support efforts to develop a regional groundwater production and conveyance project.
Development of a regional project of this scale and magnitude will require significant resources and time, but the possible benefits from economies of scale and the ability to tap into distant groundwater sources with large quantities of supply supports pursuing them. It is recommended that the City investigate the potential for regional groundwater development and consider potential benefits to the City.

5.8 Other Primary Alternatives

5.8.1 Reuse and Water Conservation

The City has an approved Drought Contingency Plan as well as a Water Conservation Plan in place. These two plans include related City Ordinances for compliance and are important tools used by the City to reduce demand and conserve water supply and distribution during periods of drought.

The quantity and year the supply is anticipated to be available do not satisfy either the Supplemental or Emergency supply goals; however, the project will provide conservation of the City's water supply at an affordable cost. Although it is not the complete solution, wastewater reuse is a viable approach to recycling, reducing the demand for treated potable water, and generally helping to conserve a portion of the City's water supply for future demands (supplemental water supply). The City has worked with the Region M Water Planning Group to identify two future reuse projects using treated effluent wastewater from the South Laredo WWTP (see Section 5.8.1.1 below).

5.8.1.1 South Laredo Wastewater System Reuse Project

The South Laredo Wastewater System Reuse Project (South Laredo Reuse) is a strategy that is recommended in Region M Plan. It is a means to reduce demand for treated water supply through reuse of the treated wastewater.

The location of the reuse project components, the South Laredo WWTP, the Jefferson WTP, and the conveyance pipeline are shown on Figure 5-13).

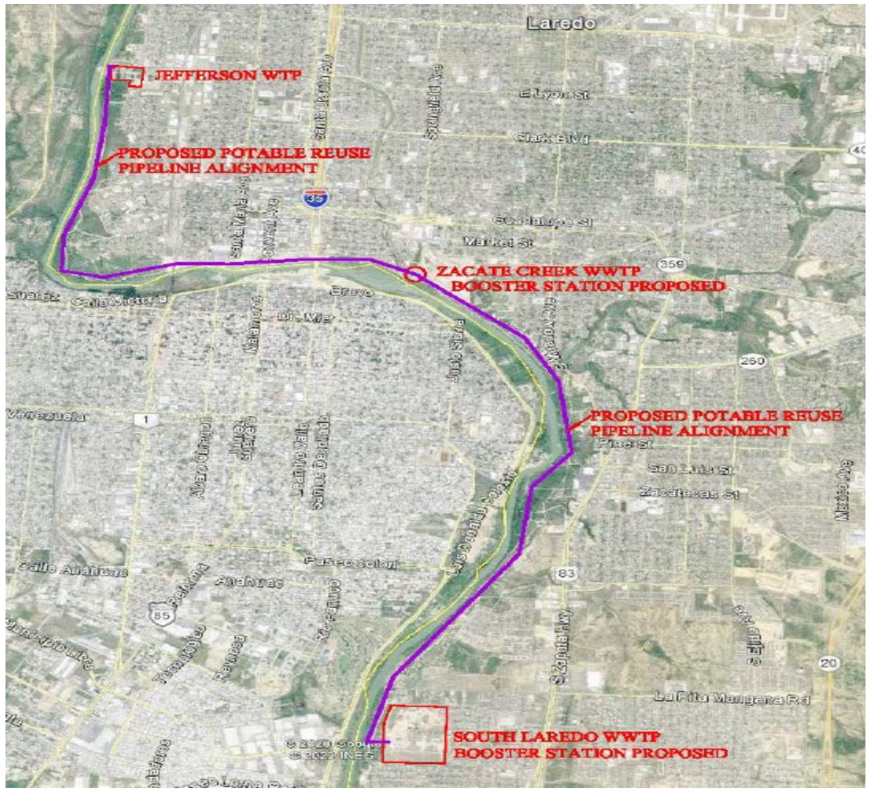

Figure 5-13: South Laredo WWTP Reuse Project

The reuse project will pump treated effluent from the South Laredo WWTP to the Jefferson WTP. After completion of an anticipated expansion of the WWTP to approximately 18-MGD, the reuse project would be implemented in two phases:

- Phase 1 would be completed by 2040 and is estimated to provide up to 3.360 AF/yr (3-MGD) available as indirect potable reuse.
- Phase 2 would be completed in the 2060 timeframe and is expected to produce another 6,720 AF/yr (6-MGD) of reuse water to help meet Laredo's future water needs.

Additional treatment for the WWTP effluent would be required, including microfiltration, reverse osmosis, and advanced oxidation. A new pump station and ground storage tank will be needed at the South Laredo WWTP. A conveyance pipeline, sized for both phases, would be constructed. The pump station would be in phases to match the available reuse supply.

5.8.2 Water Reuse

The City has devoted efforts to plan for a secondary water supply and address the infrastructure challenges to meet future water demands. Current conservation efforts were compared with the water reuse project included in the TWDB 2021 Rio Grande RWP. City planning documents are projecting the population to continue to grow at an approximate 3.4% rate and more than double by the anticipated 2070 buildout year. In addition to the South Laredo WWTP Reuse Project, other potential water reuse systems could offset potable water usage during high demand times in the summer. The City may wish to change project schedules or construction timelines of recommendations shown in this report. Also, other areas or WWTP projects may be considered as needed.

Potential reuse customers were identified and consideration of development projects with costs to connect them with reclaimed water were identified as a guide for the City. The original planning is included in the 2021 Rio Grande RWP completed in November 2020.

The specific project objectives are to provide the City with a reuse feasibility analysis addressing the following project needs:

- Review regulatory agency requirements and procedures.
- Identify potential reuse customers.
- Grade and rank potential reuse customers.
- Provide recommendations for reuse system projects.

5.8.3 Existing Wastewater Facilities and System Description

The City is located on the border with Nuevo Laredo, Tamaulipas, Mexico and is the county seat for Webb County. The City is located approximately 145 miles south of downtown San Antonio with IH 35 cutting through the center of the City.

Laredo's topography requires lines be placed strategically to use gravity and be cost efficient.

The elevations statistics are as follows:

- Maximum elevation: 893 ft.
- Minimum elevation: 354 ft.
- Average elevation: 551 ft.

The City serves potable water to approximately 275,000 people in Webb County. The service area consists of residential, commercial, and industrial developments as well as open space such as community parks, golf courses, and cemeteries. The service areas are concentrated along IH 35, IH 69, SH 83, SH 359, US 59, and FM 1472.

As a public water utility, the City is regulated by the TCEQ. The City is actively seeking economical and environmentally friendly means of reducing potable water consumption while at the same time reducing the long-term cost to the City.

5.8.4 Section Objective

The objective of this study is to perform an analysis of the proposed water reuse infrastructure presented in the TWDB 2021 Rio Grande RWP. The efforts of this IWMP will provide:

- **Introduction:** The project background, objectives, and scope are explained, and the structure of the report reviewed.
- **Texas Reuse Regulations and Procedures:** The TCEQ regulations and procedures related to treatment, distribution, and usage of reclaimed water are reviewed and summarized.

- **Summary of Existing and Proposed Reuse Infrastructure:** This section summarizes the existing and proposed wastewater treatment systems in the City that can be used for water reuse.
- **Potential Reuse Customers:** This section identifies the potential reclaimed water projects/users and their demand, required water quality, type of customer, and the applicable requirements pertaining to their customer classification.
- **Potential Projects and Evaluation Matrix:** This section presents the evaluation criteria used to evaluate the projects. The project grading and ranking matrix is also presented.
- **Limitations of Study:** The findings and recommendations contained in this study are valid as of the date of this report and based on the information referenced herein. Changes in the amount or patterns of growth within the study area, changes in wastewater flow generation, implementation of more detailed investigations or changes in regulations may affect the conclusions and recommendations presented. A detailed investigation to closely monitor usage for the golf courses and the potential peak users should be considered in the future. The City should also determine the appropriate timing and duration of reclaimed water supply use for all their peak users. A detailed preliminary engineering report should be prepared prior to implementation of any projects detailed in this report.

5.9 Texas Reuse Regulations and Procedures

This section examines the regulatory framework for reclaimed water implementation and use within Texas. The term "reclaimed water" is synonymous to "water reuse" or simply, "reuse." Both terms are used herein to describe the TCEQ regulatory term of "reclaimed water."

5.9.1 Texas Reuse Water Regulations

The TCEQ administers and enforces the State's regulations that govern the quality, use, and authorization to use water reclaimed from treated effluent through the implementation of its TPDES program. In the State of Texas, there are two opportunities for reuse: 1) reclaimed water obtained from the wastewater treatment facility, and 2) reclaimed water obtained from remote/satellite water reclamation facilities. Both programs are qualified exclusively for use by TPDES-permitted WWTPs. This section presents an overview of both water reuse opportunities as well as issues regarding water rights, purchase of WWTP effluent, and project implementation.

5.9.2 Reuse Water from WWTP

The treatment and use of reclaimed water is regulated by the TCEQ on a state level. Chapter 210 of the Texas Administrative Code (TAC), Title 30, Part 1, outlines the rules and regulations for reclaimed water in Texas. Section 2 provides an overview of the applicable regulations. **Appendix M** is a copy of the current TCEQ Chapter 210 regulations.

Title 30 TAC Chapter 210, Subchapters A-C govern the quality, use, and authorization to use water reclaimed from the treated effluent from a municipal WWTP, as permitted by TCEQ. The municipal reclaimed water rules were last amended in 1997. A 210 Reuse Authorization is applied for, reviewed, and once revised and finalized by TCEQ, is a general permit that is appended to the source WWTP's TPDES permit.

Chapter 210, Subchapter C provides the "Quality Criteria and Specific Uses for Reclaimed Water." In general, two types of reclaimed water quality are recognized for use in Texas and are based on the probability of public exposure when reclaimed water is applied:

Type I Reuse includes uses in areas where the public has site access and may be present when irrigation or other authorized Type I uses may be practiced. Type I reclaimed water provides the highest quality of water reuse in the State. It requires tertiary treatment that uses filtration media polishing of effluent for unrestricted uses where the potential for unintentional human exposure may occur. Other specific Type I uses include residential irrigation, urban irrigation of public golf courses, parks, athletic fields, school yards, maintenance of water impoundments, and toilet flush water, among others. Type I sampling for BOD5 or CBOD5, E. coli, enterococci, and turbidity is performed twice per week.

Type II Reuse includes uses in areas where the public access is restricted and where the public is not present when Type II uses may be practiced. Type II reclaimed water provides reclaimed water that is in the secondary or intermediate wastewater treatment quality. Private golf courses, sod farms, and limited-access roadway medians and rights-of-way are all authorized Type II reuse applications for irrigation. Other specific Type II uses include cooling tower makeup water, irrigation or use at permitted WWTP source, soil compaction or dust control, maintenance of water impoundments where direct human contact (wading, fishing, swimming, etc.) is not likely, plus others. Type II sampling for BOD5 or CBOD5, E. coli, and enterococci is performed once per week.

The requirements for Type I and Type II reclaimed water are outlined in **Table 5-5**.

Table 5-5: TAC Rule § 210.33 Requirements for Reclaimed Water

Constituent	Type I	Type II[1]	Type II[2]
BOD5	5	20	30
Turbidity	3 NTU	N/A	N/A
Fecal Coliform[3]	20 CFU/100 mL	200 CFU/100 mL	200 CFU/100 mL
Fecal Coliform[4] (not to exceed)	75 CFU/100 mL	800 CFU/100 mL	800 CFU/100 mL

Notes:
1. For a system other than a pond system
2. For a pond system
3. Limit shown for fecal coliform is geometric mean of multiple samples
4. Limit shown for fecal coliform is grab sample; meaning this value applies to a single sample

It should be noted Texas does not have a disinfection standard for water reuse systems. The Texas Section AWWA Water Conservation & Reuse Division/210 Rules Revision Committee recommended to TCEQ in 2004 that a minimum level of 0.2 mg/l total chlorine standard be set for reclaimed water systems as is consistent with the potable water standard; those regulations were not approved and, therefore, no chlorine requirements currently exist.

The process of permitting a Chapter 210 Reuse Authorization must be done in conjunction with the source WWTP's TPDES permit. For instance, the North Laredo WWTP is currently authorized for the approximate irrigation use of 0.25- 0.35-MGD under TCEQ Reuse Authorization R10681004. The reuse water is currently sent to the Laredo Country Club and Casa Blanca golf courses. To apply for a reclaimed water authorization, an applicant must complete TCEQ Form 20427 (Application to Use Reclaimed Water) and provide maps indicating proposed areas and types of use, proposed storage areas, O&M procedures, the proposed customer, and a means of compliance plan for meeting the Chapter 210 requirements. The form is reviewed by the TCEQ applications team and Water Quality Division. TCEQ comments and revisions to the application are then finalized before the 210.5 Reclaimed Water Authorization is issued.

5.9.3 Reuse Water from Reuse Water Production Facility

30 TAC Chapter 321, Subchapter P (321 P) was promulgated in November 2008 to provide the State of Texas with a rule that authorizes RWPF for the production and use of reclaimed water at approved areas adjacent to the RWPF. Texas was one of the first states to implement RWPF rules for these types of plants that are often termed as “scalping” plants, water factories, or satellite plants. In all cases, RWPFs produce reclaimed water at a facility located at a different site than the associated domestic WWTP that is permitted under the TPDES program by TCEQ. For additional details, the reader is referred to 30 TAC Chapter 321.

Advantages of implementing a 321 P RWPF are the ability to site a water reuse treatment source along the main wastewater trunkline near identified areas of customers. The alternative is having to convey the wastewater to the main WWTP for treatment and then pumping the reclaimed water back to the reuse customer demand area. Another advantage, if qualified, is the opportunity to proceed with less or no public notice.

5.10 Design Summary of Existing Reuse Infrastructure

Laredo’s wastewater collection system is transmitted to six separate WWTPs around the City: Laredo-Colombia WWTP, Peñitas WWTP, Unitec WWTP, North Laredo WWTP, Zacate Creek WWTP, and South Laredo WWTP.

Table 5-6: Summary of Existing Reuse Infrastructure

WWTP Facilities	Facility Permitted Capacity (MGD)
Laredo-Colombia WWTP	0.035
Peñitas WWTP	0.072
Unitec WWTP	0.360
North Laredo WWTP	2.926
Zacate Creek WWTP	14.000
South Laredo WWTP	18.000

There is currently effluent reuse from the North Laredo WWTP (NLWWTP) that feeds two golf courses (Laredo Country Club Golf Course and Casa Blanca Golf Course) for purposes of irrigation.

During November 2021, the NLWWTP had a total effluent flow of 44.935-MGD and averaged approximately 1.498-MGD. The minimum effluent flow was 1.013-MGD while the maximum was 1.758-MGD.

In May 2021, the NLWWTP sent an approximate daily average of 0.35-MG of effluent for water reuse to the Laredo Country Club Golf Course. From August 4, 2020, to August 30, 2020, the NLWWTP sent an approximate daily average of 0.26-MG of effluent for water reuse to the Casa Blanca Golf Course.

5.11 Potential Reuse Customers and Reuse Water Demand

Potential reclaimed water projects and users are identified in this section. The demand, required water quality, type of customer and the applicable requirements pertaining to their customer classification. This section includes the potential reuse customer and demand development utilized in the original study as well as for the updated feasibility study. **Table 5-7** shows the top 20 commercial users from July 2019 to June 2020. The top 20 commercial users use approximately 986,000 gallons of water daily.

Table 5-7: Top 20 Commercial Users from July 2019 to June 2020

No.	Customer	Address	Total Usage (GAL)	Average Monthly Use (GAL)	Average Daily Use (GAL)
1	UISD South 9th Grade Campus	3819 Aguanieve Dr	55,286,700	4,607,225	151,471
2	Laredo Community College	5552 S US 83	35,257,800	2,938,150	96,597
3	United High School	2811 United Ave	27,841,600	2,320,134	76,279
4	Texas A&M University System	Lamar Bruni Vergara S.C.	21,400,400	1,783,337	59,840
5	City of Laredo Father McNaboe Park	200 Rancho Viejo Dr	19,458,000	1,621,500	53,310
6	Texas A&M University System	Student Center	19,382,300	1,615,192	53,103
7	Texas A&M University System	Athletic Field	19,157,100	1,596,425	52,486
8	UISD Student Activity Complex	5208 Santa Claudia	17,973,500	1,497,792	49,243
9	UISD High 9th Grade Campus	2811 Hillcroft Dr	15,412,100	1,284,342	42,225
10	Doctors Hospital of Laredo	10700 McPherson Rd	14,482,200	1,206,850	39,678
11	City of Laredo (Cigarroa Rec)	2200 Zacatecas St	13,794,300	1,149,525	37,793
12	Parks & Recreation	200 Stone Ave	13,760,100	1,146,675	37,699
13	UISD LBJ High School	5256 Cielito Lindo Blvd	13,473,200	1,122,767	36,913
14	Laredo Community College	LCC Intramural Sports Com	13,118,100	1,093,175	35,940
15	UISD Alexander 9th Grade Camp	4601 Victory Dr	11,659,300	971,609	31,944
16	Webb Co Road & Bridge	Road & Bridge Entr HWY 59 2	10,814,500	901,209	29,629
17	Laredo Ready Mix	18015 FM 1472	10,265,000	855,417	28,124
18	UISD LBJ 9th Grade Camp	5511 St Luke Blvd	9,225,400	768,784	25,275
19	United Day School	1701 San Isidro Pkwy	9,032,700	752,725	24,748
20	Parks & Recreation	Chacon & McClelland	8,534,000	711,167	23,381

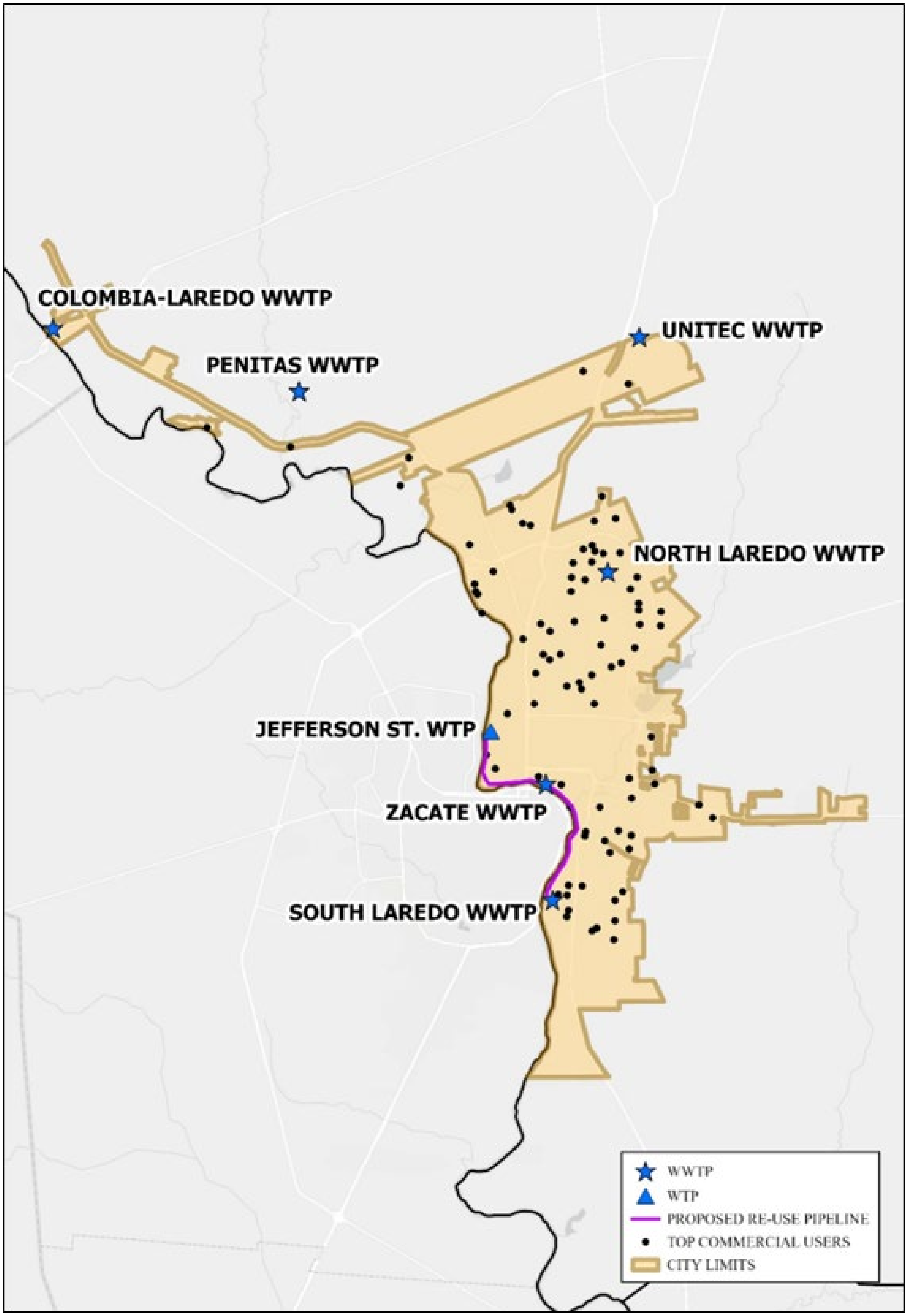

Figure 5-14: Top 100 Commercial Users from July 2019 and June 2020

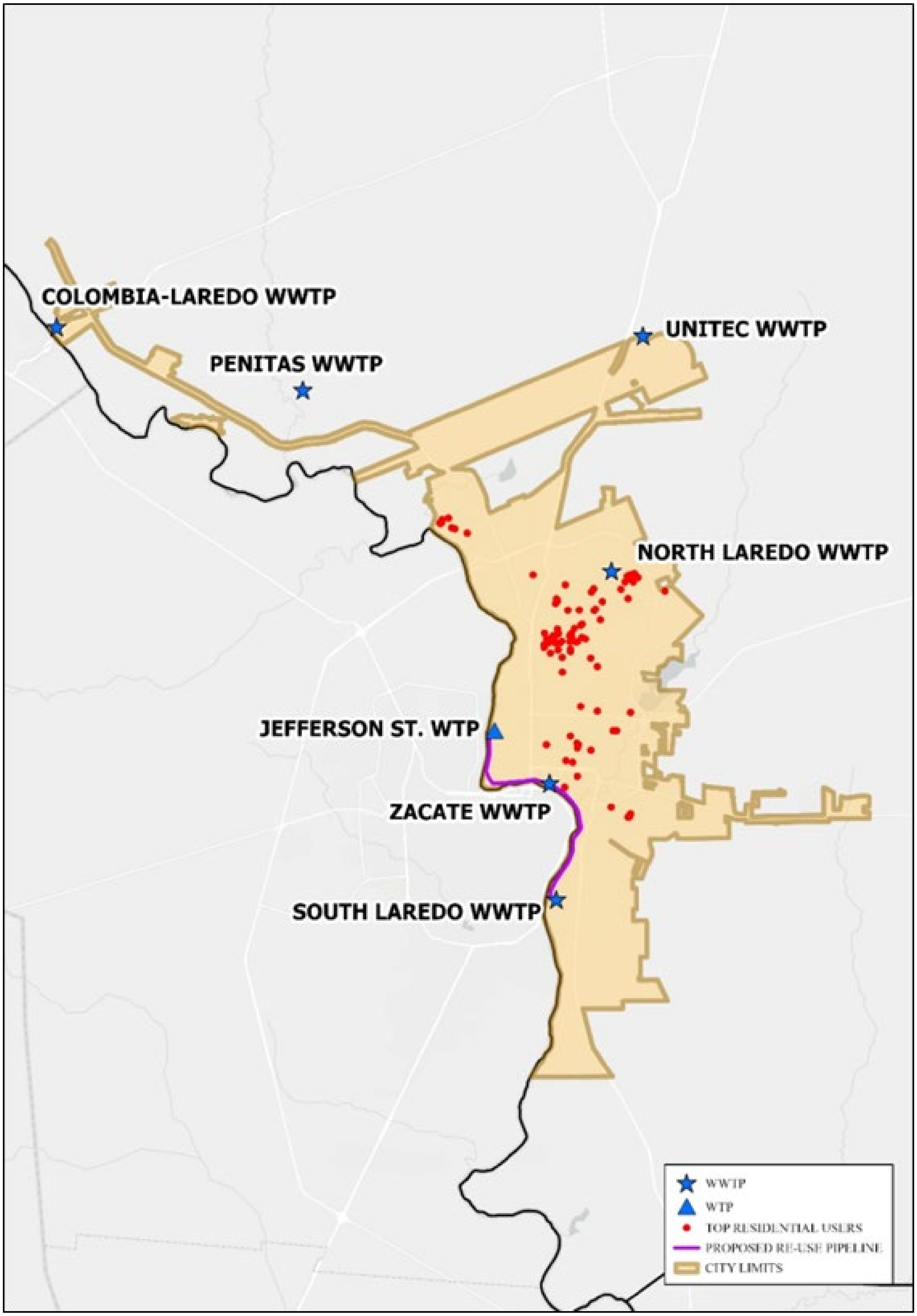

Figure 5-15: Top 100 Residential Users from July 2019 to June 2020

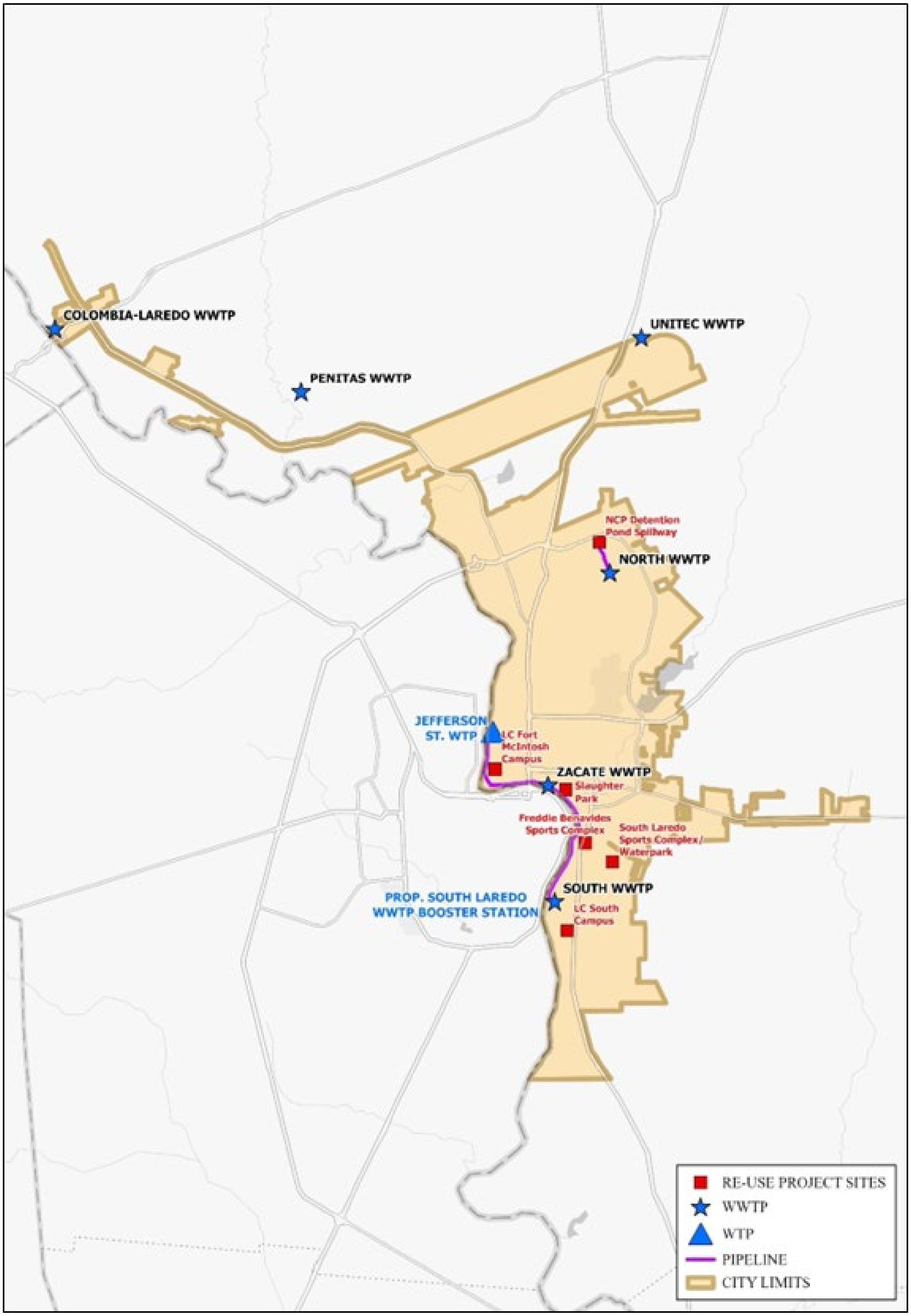

Figure 5-16: Proposed Water Reuse Projects

5.12 Potential Reuse Projects (Beyond 2040)

Table 5-8: Cost Estimate Summary for Laredo Sports Complex / Water Park

Item	Estimated Costs for Facilities
Capital Cost	
Upgrade Pump Station	$3,000,000
Transmission Pipeline (12 in. diameter, 5.5 miles)	$4,400,000
Total Cost of Facilities	**$7,400,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Issuance, and Contingency	$2,440,000
Environmental and Archaeology Studies and Mitigation	$74,000
Surveying, Site Location, and Misc.	$185,000
Interest During Construction	$259,000
Total Cost of Project	**$10,358,000**
Annual Cost	**$517,900**

The proposed Laredo Sports Complex/Water Park will be located along TX 359. The proposed connection from the SLWWTP to the Sports Complex/Water Park is approximately 5.5 miles. This project will provide reuse water for irrigation purposes. The total cost of the project is approximately $10,358,000. Some sport complexes in the city are in the top 20 water users; this sports complex/water park would be in consideration when construction occurs and would benefit from water reuse.

Table 5-9: Cost Estimate Summary for South Laredo Parks

Item	Estimated Costs for Facilities
Capital Cost	
Transmission Pipeline (12 in. diameter, 0.8 miles)	$650,000
Total Cost of Facilities	**$650,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Issuance, and Contingency	$195,000
Environmental and Archaeology Studies and Mitigation	$6,500
Surveying, Site Location, and Misc.	$16,000
Interest During Construction	$23,000
Total Cost of Project	**$890,500**
Annual Cost	**$44,525**

Slaughter Park is in the "Chacon" area on Stone Avenue. The Freddie Benavides Sports Complex is in south Laredo on S Malinche Avenue near Zapata Hwy. The proposed connection may be part of the proposed pipeline project to feed these areas for irrigation purposes. The connections are approximately 0.8 miles in length. The total cost of the project is approximately $890,500. Both south Laredo parks are in the top 20 water users and would greatly benefit from future water reuse.

Table 5-10: Cost Estimate Summary for North Central Park Detention Pond Spillway

Item	Estimated Costs for Facilities
Capital Cost	
Booster Pump Station	$6,000,000
Transmission Pipeline (12 In. Diameter, 1 Miles)	$800,000
Total Cost of Facilities	**$6,800,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Issuance, and Contingency	$1,360,000
Environmental and Archaeology Studies and Mitigation	$68,000
Surveying, Site Location, and Misc.	$170,000
Interest During Construction	$204,000
Total Cost of Project	**$8,600,000**
Annual Cost	**$430,000**

North Central Park is in north Laredo along International Blvd. The proposed connection from the SLWWTP to the North Central Park Detention Pond Spillway is approximately 1 mile. This project will provide reuse water for recreation and irrigation purposes. The total cost of the project is approximately $8,600,000. Parks & Recreation is in the top 20 water users. This detention pond spillway would be in consideration and benefit from future water reuse.

Table 5-11: Cost Estimate Summary for Laredo College (LC) South Campus

Item	Estimated Costs for Facilities
Capital Cost	
Pump Station Upgrades	$2,000,000
Transmission Pipeline (12 In. Diameter, 2 Miles)	$1,600,000
Total Cost of Facilities	**$3,600,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Issuance, and Contingency	$1,180,000
Environmental and Archaeology Studies and Mitigation	$36,000
Surveying, Site Location, and Misc.	$90,000
Interest During Construction	$126,000
Total Cost of Project	**$5,032,000**
Annual Cost	**$251,600**

LC South Campus is in south Laredo along Zapata Hwy. The proposed connection from the SLWWTP to the LC South Campus is approximately two miles. The proposed connection may be part the proposed pipeline project for irrigation purposes. This project will provide reuse water for recreation and irrigation purposes. The total cost of the project is approximately $5,032,000. LC South Campus is the 2nd highest water user and would greatly benefit for water reuse.

Table 5-12: Laredo College (LC) Fort McIntosh Campus

Item	Estimated Costs for Facilities
Capital Cost	
Transmission Pipeline (12 In. Diameter, 0.2 Miles)	$160,000
Total Cost of Facilities	**$160,000**
Engineering And Feasibility Studies, Legal Assistance, Financing, Bond Issuance, and Contingency	$48,000
Environmental and Archaeology Studies and Mitigation	$1,600
Surveying, Site Location, and Misc.	$4,000
Interest During Construction	$5,600
Total Cost of Project	**$219,200**
Annual Cost	**$10,960**

LC Fort McIntosh Campus is in west central Laredo on Washington St. The proposed connection from the SLWWTP to the LC Fort McIntosh Campus is approximately 0.2 miles. The proposed connection will be part the proposed pipeline project for irrigation purposes. This project will provide reuse water for recreation and irrigation purposes. The total cost of the project is approximately $219,200. LC Fort McIntosh Campus is in the top 20 highest water users at 14th and would greatly benefit for water reuse.

5.13 Potential Reuse Projects Ranking

This section describes the methodology used to identify the potential projects and the evaluation process.

The potential projects identified in **Table 5-13** were developed through several internal workshops and evaluated considering a range of project differentiators. The following criteria were used as part of the evaluation and scoring process.

- **Economics:** For this criterion, the number of years required to appreciate return on investment was considered. A score of 5 was issued to projects where return on investment was achieved in a short period; a score of 1 was issued to the projects with the longest cost recovery period.
- **Water Savings:** This criterion considered the impact of water reuse on potable water usage; reductions in potable water use are viewed favorably. Phasing of the reclaimed water demand was also taken into consideration for this criterion; significant demands that are anticipated in the future received lower scores than those that are existing. Projects with the highest amount of immediate potable water reduction were scored as 5.
- **Location:** This evaluates physical location of the project, proximity to the reclaimed water source, and significant reclaimed water users. Locations that included significant reclaimed users located near the reclaimed water source were issued a score of 5.
- **Project Reliability:** This criterion considered the potential for the project to provide reliable and uninterrupted water supply. All proposed projects with looped systems were

deemed as reliable and given a score of 5; systems without loops are issued a score of 3.

- **Other Considerations:** Other considerations such as constructability, permitting requirements and challenges, public acceptance, and current WWTP effluent quality were also considered as part of the project development and evaluation. An explicit score for these criteria was not assigned because they were not evaluated in detail and/or they were not considered significant differentiators between projects.

Table 5-13: Evaluation Matrix for Potential Water Reuse Projects

Project	Customer	Criteria			Total	Rank
		Economics	Water Savings	Location		
Sports Complex/ Waterpark	Municipal	3	3	4	10	3
Laredo South Parks	Municipal	5	5	4	14	2
North Central Park Detention Pond Spillway	Municipal	3	3	2	8	5
Laredo College (South Campus)	University	3	3	3	9	4
Laredo College (Main College)	University	5	5	5	15	1

5.17.3 Additional Rio Grande Water Rights

Part of the IWMP Master Plan efforts is to advise the City whether to pursue several of the potential possibilities to benefit future water supply. While several activities are proposed to be explored, this summary deals with the following three items and only these items will be addressed in this document:

1) Apply for New Water Right (Rio Grande).
2) Apply for New Water Right (Other water course).
3) Purchase Existing Water Right(s).

Under TCEQ's rules for evaluating water availability for consideration of a new water right, several analyses must be considered to determine if a new water right application can be granted by the TCEQ. One of the most important of this analysis is a water availability analysis, which requires the applicant to show that there is enough unappropriated water available in the source of supply to support the applicant's proposed use reliably enough to meet TCEQ's beneficial use guidelines. Generally, this is demonstrated by using a water availability model, such as the Rio Grande WAM, that simulates a long period of the hydrologic record, and which has all existing water rights represented with their full authorized amounts. The concept is that if after all existing water rights, represented at their full legal authorized amounts, are met and there is still water available for the proposed use, the TCEQ can consider authorizing a new water right to appropriate the remaining amount of water that appears to be "unappropriated."

Some basins, especially in the easter portion of Texas, have large amounts of unappropriated water available during some portion of the test simulation period because these areas experience large amounts of rainfall and do not have substantial amounts of water rights authorized. However, in the Rio Grande, neither of these cases are true. Review of the TCEQ water rights master file for the Rio Grande Basin indicates there are 1,485 water rights records representing approximately 1,030 water rights with an authorized diversion amount of approximately 3.1 million AF/yr, excluding water authorized for hydropower generation. The distribution of the authorized diversions, expressed in acre-feet per year, of water rights according to type of use are summarized below (excluding hydropower generation):

Table 5-14: Summary of Existing Water Rights

Type of Water Rights	Diversion	%
Use-Class Water Rights (Amistad-Falcon Reservoirs)		
Domestic-Municipal-Industrial	345,874	16.7
Class A Agriculture and Mining	1,557,073	75.3
Class B Agriculture and Mining	166,182	8.0
Total	**2,069,130**	
Prior Appropriation Water Rights		
Domestic-Municipal-Industrial	73,115	6.9
Agriculture and Mining	989,504	93.0
Domestic and Livestock	124	<0.1
Recreation	1,000	0.1
Total	**1,063,743**	

As noted in **Table 5-20** above, Texas water rights in the Rio Grande Basin are distributed into two categories. One group includes those that rely on stored water in the Amistad-Falcon reservoir system with their priorities for supply based on type of use consistent with the 1969 Valley Water Case. The other group includes all water rights that are located upstream of Amistad Reservoir or on tributaries of the Rio Grande, with their priorities for supply based on the Prior Appropriation Doctrine – “first in time, first in right.”

There are approximately 790 water rights in the Use-Class group, and as shown, more than 80% of the total authorized diversions are for agricultural and mining uses, with the balance used for domestic, municipal, and industrial purposes. All these water rights are dependent upon releases of stored water from the Amistad-Falcon reservoir system and, therefore, are located on the mainstem of the Rio Grande at or downstream of Amistad Reservoir. The number of Prior Appropriation water rights is about 250, and as shown above, these are also used substantially for agricultural and mining purposes (93%), with the remainder used primarily for domestic, municipal, and industrial purposes. It should be noted that the Region M WPG estimates the firm yield of the Amistad/Falcon Reservoir System to be about 1,060,000 AF/yr in 2020, which is approximately 51% of the total volume of water authorized for use from the system (2,069,130 acre-feet).

The Rio Grande Water Master Program, set up and operated by the TCEQ, provides management of day-to-day operations for all water rights at and downstream of Lake Amistad that are authorized under the Use-Class priority logic. A complex set of accounting rules are used to ensure there is enough water to meet all Domestic-Municipal-Industrial water rights, plus a reserve, with water allocated into and out of the Class A and Class B accounts to ensure the higher priority Domestic-Municipal-Industrial water rights are always met. [7]

In addition to the water rights summarized above, permit number 5259 was issued to the Brownsville PUB in the 1990s which authorizes the PUB the right to construct a dam, called the Brownsville Weir (Weir), on the Rio Grande near Brownsville. Since the Weir constitutes an international structure between the United States and Mexico, the PUB was issued a right to impound 6,000 acre-feet (approximately half of its proposed physical storage capacity) with no right to call on inflows or stored water from any existing water right. Although the Weir has not been built, the PUB amended an existing surplus water right (permit 1838) to authorize the diversion of up to 40,000-AF/yr of surplus water from the Weir to supplement the PUB's existing water rights. Because the authorized location for this dam is near the mouth of the Rio Grande, much of its ability to capture surplus water will simply be due to its location, which would enable it to take advantage of inefficiencies in the delivery of water from the Falcon Reservoir, some 225 river miles upstream, as well as times when there is excess "no charge" water available in the lower basin.

Although the authorizations for the Weir do not have the right to call on inflows to any existing water rights upstream, it is likely any new proposed water rights upstream would be treated as being "junior" to all existing water rights including the Weir. Due to the over-appropriated situation of water rights in the Rio Grande and Laredo's location being upstream of Falcon, the pursuit of a new water rights authorization from the Rio Grande for the City would likely be a difficult endeavor.

5.17.3.1 Purchase Existing Water Rights

As outlined above, there are about 800 water rights authorized to use water from the Rio Grande in the reach at and downstream of Amistad Reservoir to the mouth of the Rio Grande. Because all these rights have access to water stored in the Amistad/Falcon system, the precise location in which they divert from the Rio Grande is less crucial than in other river basins in the state. Therefore, the ability to purchase and amend existing water rights is much easier than in other basins. For the Rio Grande, the TCEQ has specific rules for changing the type of use for water rights, which simplify and facilitate the amending and changing the use from one of the designated class water rights to another[8].

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[7] More information related to the Rio Grande Watermaster's Duties can be found in Texas Administrative Code, Title 30, Part 1, Chapter 303.

[8] Specific details related to the conversion of Water Rights in the Rio Grande can be found in Texas Administrative Code, Title 30, Part 1, Chapter 303, Subchapter E, Rule 303.43.

5.18 Secondary Alternatives

5.18.1 Laredo Rio Grande Weir (Off-Channel)

In June 2010, the Dos Laredos Weir Team submitted its final report to the Binational Study Committee on the entitled, "Preliminary Analysis: Dos Laredos Low Water Weir."

This project was considered to meet the water availability and quality requirements "…for the next 100 years…". Two proposed locations were identified: 1) approximately one mile upstream from the World Trade Bridge or in the northwest section of the City; and 2) 2.8 miles upstream of World Trade Bridge. This project will also provide the generation of electrical power as well as flood control benefits for the community. Federal funding was being sought to fund the development of this project.

Figure 5-17 shows one of the configurations considered for a low water weir with a normal reservoir elevation of 400-feet.

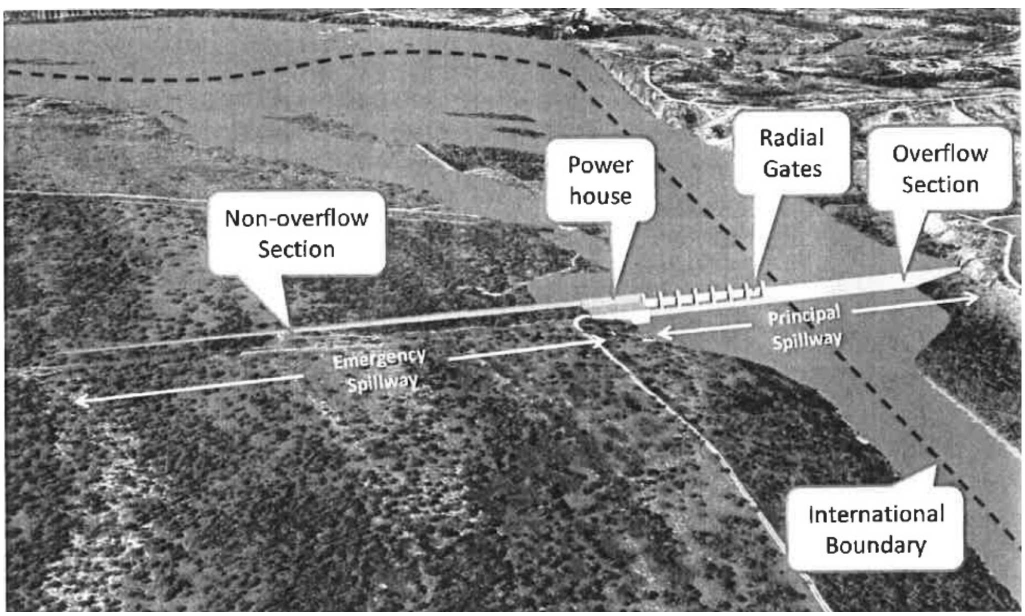


Figure 5-17: Conceptual Layout

5.18.1.1 Background

Article 5 of the 1944 Water Treaty between the United States and Mexico allows for construction of a third dam on the Rio Grande/Rio Bravo. The third dam was identified to be constructed between Falcon and Amistad Dams. This Low Water Weir Project will provide an environmental improvement along the border, improve the raw water quality, serve as a security barrier, and provide additional water supply to the City of Laredo and Webb County. It will also provide flood control benefits downstream of the proposed project to the upstream of Falcon Dam.

If such a Low Water Weir were considered for the production and sale of hydro-electric power, then the revenue created would be advantageous to project financing. Dannenbaum Engineering determined that it was feasible to produce hydropower at a rate that would be beneficial to both the City of Laredo as well as the City of Nuevo Laredo, Tamps., Mexico.

5.18.1.2 Work Done to Date

The work that has been completed to date is:

- USGS maps of the Rio Grande were obtained for 20 miles both upstream and downstream of the proposed weir site.
- Flow data was obtained from the IBWC.
- The profile of the river was reviewed.
- Flows were developed from 1976 to 1993 using the Laredo gage data. This data was analyzed by a range of distribution methods and an acceptable minimum flow number was established. Maximum day flows were reviewed, especially regarding the height of water over the weir in instances of extreme flow conditions.
- The maximum flow water height was established to determine that there would be no interference with bridges. This set the preliminary height of the weir which was used for the preliminary calculations of available hydropower generation.
- Power calculations were computed which identified the range of power production possibilities based on flow and weir height.
- Power output was also calculated using the low head generation curves and a possible array of machine layouts were considered to produce power both from the base flows and a range of higher flows.
- A variety of hydro purchase prices were obtained, and a conservative revenue estimate was generated from that data.
- The limits of the reservoir created by the weir were identified on the U.S. side where contours were available.
- Options for the weir heights were studied for the flood benefits of the proposed weir.

The Preliminary Engineering Feasibility Study was completed in July 2010 at a cost of $294,000. Also, an addendum was issued to the final report on November 4, 2014, to include the flood benefits of the proposed weir project.

The proposed project is expected to generate enough power to pay for the cost of construction reasonably within the 25-year life of the power generating equipment. The lake created by a weir of this modest height will be approximately nine miles long and flood few areas outside of the existing river floodplain on the U.S. side where the riverbanks are not so steep. The weir height will also be established to permit the maximum flood flow over the weir so that the top water level will not cause serious flooding up the riverbanks.

This project is designed to allow the waters of the Rio Grande to flow over it once the weir is full. The storage capacity is estimated to be 20,000 to 30,000 acre-feet depending on the height of the weir and could be obtained from purchasing irrigation water from an Irrigation District of the Lower Rio Grande. This project will also assist the process of water treatment by allowing the suspended solids to settle and, therefore, decrease the turbidity of the water.

5.18.2 Falcon Reservoir Diversion Option

This option would not supplement the available Rio Grande supplies but would provide an alternative diversion location downstream of the City's current diversion location, at Falcon Reservoir. Due to the limited information and anticipated high cost of this option, it was classified as a Secondary Consideration as a Laredo water supply alternative. If more information is available or as the water supply circumstances change, this option may gain viability; if so, further consideration of this option would be justified.

The benefits would come from providing the City with greater flexibility in responding to a contamination or other event at the current diversion location on the river. The alternate diversion point would provide a location downstream; in the Falcon Reservoir, which would provide significant isolation from contaminated water upstream.

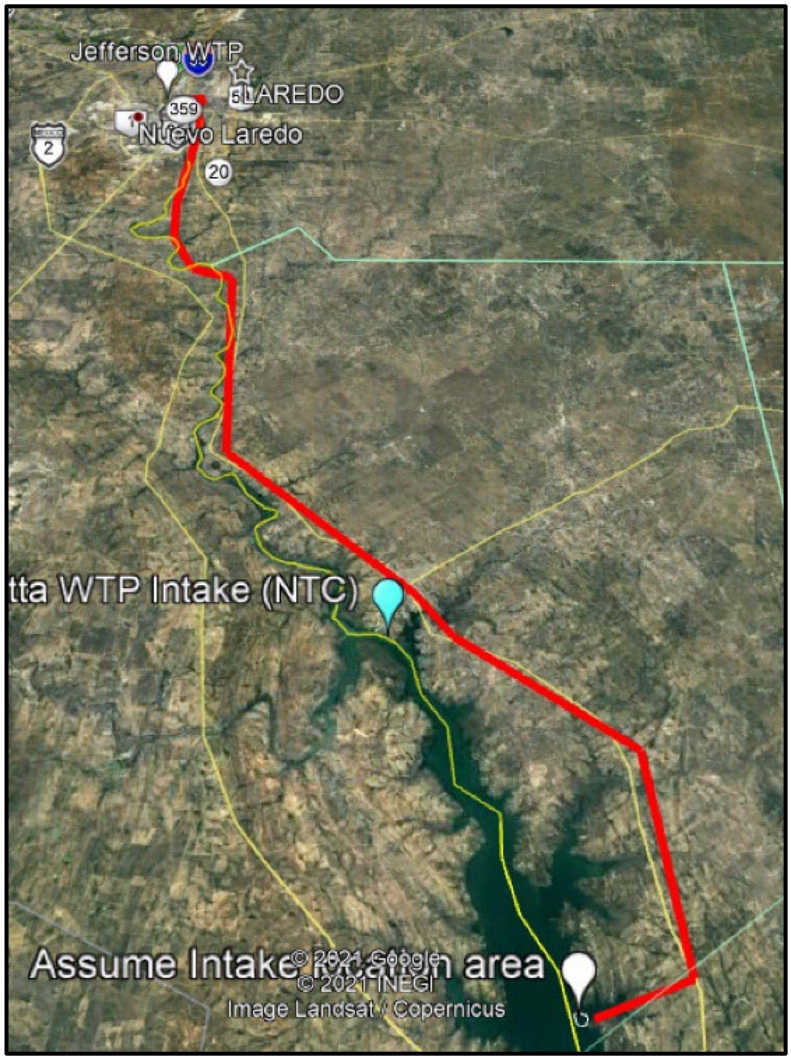


Figure 5-18: Falcon Reservoir Diversion Option 5

However, this option would come with a high cost. The Falcon Reservoir supply would require treatment; therefore, a conveyance pipeline from the reservoir to the nearest treatment plant, the Jefferson WTP, would be required. The approximate distance from a suitable Falcon Reservoir diversion location to the Jefferson WTP is on the scale of 80 to 90 miles. **Figure 5-18** shows a very rough location for a reservoir intake at reservoir depth that provides sufficient depth for diversion of Laredo's entire water supply.

In addition to the conveyance pipeline, the cost of a diversion structure, required permitting, and right-of-way and utility constraints would be major cost considerations. Based on TWDB planning cost estimating methods, **Figure 5-19** shows the intake construction cost per MGD of capacity. Using this table, the cost to convey the Emergency water supply goal volume of 33.5-MGD would be approximately $11.0 million, and the cost for an intake that would divert the City's currently available supply would be approximately $12.5 million.

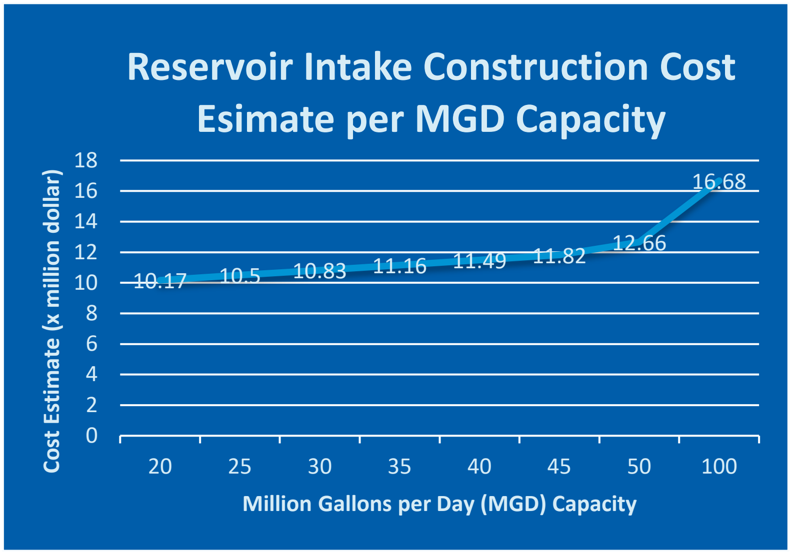


Figure 5-19: Estimate of Intake Construction Costs

Operation cost for an 80 mile-plus pipeline would need to be estimated and included. Therefore, further studies are needed to consider benefits and reduced cost of diverting less quantity and reducing the diversion and pipeline capacity requirements. Regardless of the quantity to be diverted the pipeline and required pumping will be significant.

5.19 Comparison and Ranking of Water Supply Alternatives

In reviewing the Primary water supply alternatives, both the descriptions and the cost as well as other pertinent information is discussed for each Alternative in Section 5.4 below. Several significant factors related to comparing and ranking the alternatives are evident: supply quantity and dependability, cost, public acceptability, environmental and permitting factors, water quality, etc. Collectively, these factors indicate how well an alternative could possibly meet the Emergency or Supplemental water supply goals.

The estimated cost for the water supply alternatives, including an estimate of LCC is presented in Section 5.21. Using the above factors and other considerations, a ranking of the water supply alternatives is provided in Section 5.23 as well.

5.19.1 Considerations

This section reviews the Primary water supply alternatives, providing more detailed cost estimates and comparing the alternatives with respect to meeting the Emergency and

Supplemental water supply goals discussed above. **Table 5-20** below is a summary of the pertinent data, information, and estimates of supply considered for each primary alternative.

The table presents several important attributes of the various alternatives; these are defined as follows:

- **Supply** (Consideration of surface supply yield or groundwater production or water rights available)

  Lake Casa Blanca has minimal supply considered as dependable yield. This is primarily due to the lake's lack of storage, high evaporation (a factor of the lake's surface area versus its depth), and limitations on diversion quantity based on restrictions in the lake's water rights permit. Using LCB for water supply will require pipeline conveyance to the Jefferson WTP as well as treated water distribution piping. Collectively, these factors result in LCB not being capable of providing either the Emergency or Supplemental water supply targets.

  .

  Groundwater options are available that can meet the Emergency or Supplemental water supply targets. Sources within Webb County are encouraging; however, final consideration will depend on results of additional well tests to confirm production quantity and water quality. Outside of Webb County, the quantities and quality are more plentiful and better, respectively. Dimmit County is the closest source with sufficient supply of acceptable quality to meet the Laredo supply targets. Importantly, Webb County does not have a groundwater conservation district (GCD), whereas groundwater locations outside of Webb County have established GCDs and would require rules to be followed.

  Reuse identified in the Region M Plan and discussed in this report would provide a beneficial use of treated wastewater (effluent) from the South Laredo WWTP, but this reuse would help reduce the City's water demand and is not sufficient to meet either water supply target.

- **Distance** (estimated distance from the supply to the nearest point of connection to the City's water system) is a critical factor, particularly for the cost of conveyance pipes and other infrastructure. The cost of deliver is discussed in the individual sections discussing groundwater supply.
- **Year available** is a consideration related to the estimated year available for use by the City considering planning, design, construction, permitting, right-of-way acquisition, etc.
- **Supply Duration in days** relates to the estimated of number of days the Emergency and Supplemental water supply goals could be meet from the alternative. **Table 5-15** reviews the variation in days available to meet City's supply targets.
- **Cost Estimates**, recognizing these are planning-level estimates, for the water supply alternatives evaluated is presented by collectively and by individual alternative. Cost is presented in several manners:
  - Capital

- Engineering and other upfront costs
- Financing
- Annual cost

- Unit Cost ($/1,000 gallons) based on Using Total Supply Available

Table 5-15: Supply Amounts, Availability, and Cost

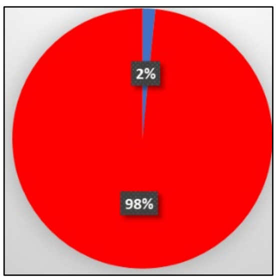
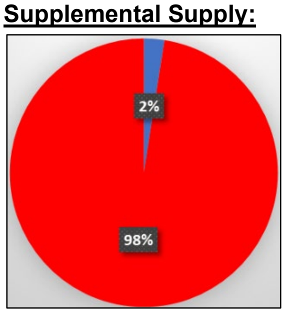
COMPARISON TABLE: Supplemental/Emergency Supply Options							
Supply Source	**Total Supply Available (MGD)**		**Emergency Days Available (days)**			**Emergency Supply Cost ($/1000 gal)**	
	Avg Day	Peak Day	Avg Day	Peak Day	Year Available	Avg Day	Peak Day
Lake Casa Blanca - Opt 1	0.54	0.54	8.77	5.84	2026	$ 93.32	$ 140.23
Lake Casa Blanca - Opt 2	0.54	0.54	8.77	5.84	2027	$ 124.55	$ 187.17
North Webb County	22.3	33.5	365	243	2030	$ 3.16	$ 3.16
Dimmit Co GW	40	40	365	365	2030	$ 3.49	$ 5.24
Val Verde/Kinney Co	40	40	365	365	2032	$ 3.82	$ -
South Laredo WWTP *Potable* Reuse*							
Phase 1 (2030 start)	3.00	NA	365	NA	2040	$ 1.91	NA
Phase 2 (2060 start)	3.00	NA	365	NA	2060	$ 5.18	NA

5.20 Potential for Meeting Emergency and Supplemental Supply Goals: Supply

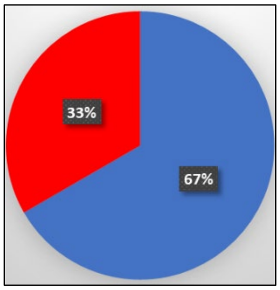
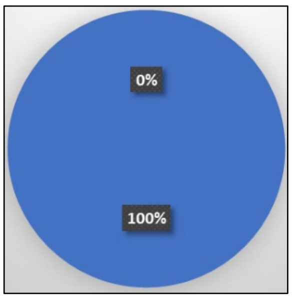
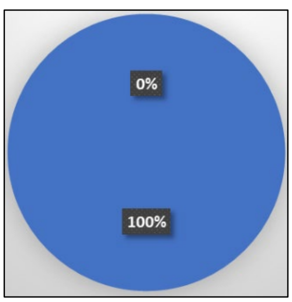
The following table is a summary of each primary water supply alternative, to what extent if any the alternative can meet or help one or both of the City's water supply goals, a review of prerequisite information is needed, as well as additional studies or investigations.

The following summary of the key issues includes a gauge[9] of the alternative relative capacity to meet the Emergency and Supplemental water supply goals. The summary discusses the capacity of the supply source to meet the Emergency and Supplemental Supply targets previously discussed. The pie chart shows the percentage of days where Emergency and Supplemental Supply targets could be met.

Table 5-16: Supplemental and Emergency Supply Targets

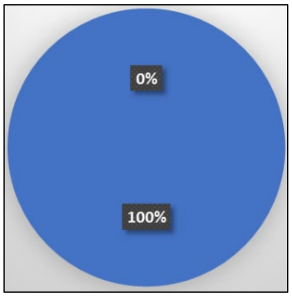
Emergency Supply  **Goal[10]:** Supply goal met 6 days **Supplemental Supply:**  Supply goal met 9 days	**Lake Casa Blanca:** The limited supply available from LCB, coupled with high rates of evaporation and the need to convey LCB water to the Jefferson WTP for treatment, renders LCB unsuitable for providing either Emergency or Supplement water supply. At the dependable yield available based on current capacity, LCB could provide the Emergency water supply goal for about six days or 1.6% of a year. On an average day supply basis, LCB would provide about 9 days of supply or 2.4% of a year. Further the cost for providing that supply is estimated at around $140/1,000 gallons. More detail on cost is available in Section 5.21 below. **Recommendation:** Due to limited supply and high cost, the LCB is not a recommended alternative supply for meeting either the Emergency or Supplemental water supply goals. **Additional Study/Investigations:** No additional studies are recommended for the alternative.

[10] For a 365-day period, the red portion of the pie graph shows the proportion and indicates the percentage of time that the supply source *cannot* meet the supply goal. The blue portion shows the proportion and percentage of time that the supply source can meet the supply goal.

Emergency Supply Goal:  Supply goal met 243 days **Supplemental Supply:**  Supply goal met 365 days	**North Webb County Groundwater** (near Dimmit County line): This groundwater alternative has an estimated average annual production of 25,000 AF/yr or 22.3-MGD. The maximum day available would be 33.5-MGD, which would be available for 243 days continuously or 67% of a year. Therefore, the Emergency water supply goal could be met for a continuous 243 days. The Supplement water supply goal of 20-MGD can be met continuously. The cost for Emergency or Supplement supply use is around $3.16 in 2021 based on full use of the supply available. **Prerequisites:** The yield (anticipated production) and water quality will need to be carefully evaluated through field survey and pilot well construction if sufficient well data is not available. **Recommendation:** If further investigations and fieldwork are needed to confirm the quantity and quality of this alternative then it is recommended that those be completed before implementation. The supply would be an excellent redundant supply and should provide sufficient time (~243 days) to address and resolve any interruption of the City's main source from the Rio Grande. The reasonable cost can be attributed to its proximal location (40 miles), which provides an advantage for this alternative. **Additional Study/Investigations:** Additional investigations, including field studies and possibly pilot-well construction, will be needed to pinpoint the best quantity and quality supply. Concurrently with these investigations, the City should consider property owners' potential requirements and develop a more informed cost estimate for leasing of groundwater rights
Emergency Supply Goal:  Supply goal met 365 days	**Imported Groundwater Projects** (Dimmit County and Kinney/Val Verde Counties): As shown in **Table 5-21**, any one of the imported groundwater projects (due to close proximity of source, Kinney and Val Verde County groundwater can be considered together) can deliver supplies that exceed either the Emergency or Supplemental supply goals. The question of annual cost factors down to the trade-off between distance and quantity available. The unit cost is attributable to both annual cost and the quantity (units used or needed). Then, as expected, the Dimmit County supply being around half the distance to Laredo compared to the Kinney/Val Verde supply, is considerably less as unit cost (approximately $3.76/1,000 gallons at full use compared to approximately $4.56/1,000 gallons for the Kinney/Val Verde supply, see **Table 5-21** and footnote on quantities[11]). **Prerequisites:** Even though the imported groundwater projects have been studied, some for several years, including quantity and quality determinations, the yield (anticipated production) and water quality will need to be evaluated and field survey and pilot well findings confirmed. **Recommendations:** The cost of importing groundwater will be difficult to justify if alternative supplies closer to Laredo are found feasible. Further, the quantities are much greater than the Emergency or Supplemental goals. However, the water quality from these sources is good to excellent and would probably not require treatment. Also, the large quantities could be attractive to building a regional water supply system serving several communities that would then pay pro rata portion of costs.

[11] The production from Kinney and Val Verde counties is estimated at between 40-MGD for Val Verde and an additional 22.3-MGD for Kinney; however, these are conservative estimates, and the quantities could be considerably larger. This is an important consideration if a regional project is considered in the future.

Supplemental Supply:



Supply goal met 365 days

Additional Study/Investigations: The location, quantities, quality information, and studies will need to be reviewed and confirmed to determine if more investigations are needed. Consideration of building or joining in a regional approach is an important consideration in sharing costs of a major groundwater import project.

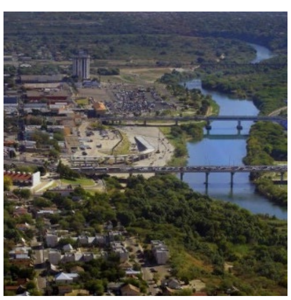
South Laredo WWTP Reuse Project:
This reuse project was not considered as a potential supply to meet either the Emergency or Supplement supply goals; however, if the goals are not satisfied completely by the time Phase 1 comes online in 2040 the project will reduce the goal requirement by 3-MGD. If goals are not satisfied by the anticipated date of Phase 2 operation, the reuse project will reduce the goal requirement by a collectively 9-MGD.

The project is included in the Region M RWP, making it eligible for beneficial funding programs through the TWDB.

Importantly, the first phase of the South Laredo Reuse project, providing 3-MGD, corresponds to the first-year additional Supplemental water supply is forecast to be needed.

Recommendation: The South Laredo Reuse project is a stand-alone, beneficial water supply project. It is a smart water conservation effort and certainly worthy of further development and implementation.

Additional Study/Investigations: A major first step in development of this project was accomplished with its inclusion in the Region M RWP. Considering the positive economics of Phase 1, the opportunity to advance this effort should be undertaken.



Additional Rio Grande Water Rights.
Since the water supply source is the Rio Grande, any additional water rights obtained will only reduce the Supplemental water supply goal not the Emergency supply goal. As discussed above, the Rio Grande has been, and continues to be, a reliable and most affordable source of water supply for the City.

It is a proximal supply sources, adjacent to the City's two water treatment plants. The treatment costs are typical for a freshwater, surface water source. No demineralization or other specialized water treatment is currently required.

For comparison with the cost of alternative water supply sources, the City staff reports that the cost to divert from the Rio Grande and treat at the City's water treatment plants is under $2.00/1,000 gallons.

Recommendation: The City has been diligent in acquiring Rio Grande water rights over the past decades. Given the relatively low cost of treatment and existing infrastructure for diversion and treatment, the City should, and will continue to pursue additional water rights.

	Additional Study/Investigations: The City has a long history of acquiring Rio Grande water rights. No additional studies or investigations are needed to support these ongoing efforts.

5.20.1 Trade-offs – Quantity, Quality, Conveyance Distance, and Related Cost

From the above comparison of primary water supply alternatives, several, particularly the groundwater options, discussed the major trade-offs between quantity available and the distance to convey the supply. However, it is important to restate that the pipeline cost, including pump stations, property acquisition and rights-of-way, permitting, and operation cost are directly proportional to the distance required to convey the supply to Laredo. For the imported groundwater alternatives, the sources furthest from the City (Kinney and Val Verde County supplies) were estimated to provide the greatest quantities. The conveyance distance/cost relationship is also a factor that should prompt consideration of the feasibility of a regional (involving more than one entity) project.

There is also a water quality 'trade-off' related to conveyance distance or location of the groundwater source. Even though the imported groundwater is a considerable distance from Laredo, the anticipated quality appears to be excellent. In fact, little or no treatment of the source water may be required.[12] The more proximal groundwater in Webb County is interspersed with areas of marginal to poor water quality. As stated above, field investigations will be needed to confirm an optimal location that will tap into the best quantity and quality groundwater.

5.20.2 Consideration of Regional Project (multiple entities) for Imported Groundwater Project

The anticipated supply from the imported groundwater alternatives discussed above exceeds both the Emergency and Supplement supply goals. This is particularly true for the Kinney/Val Verde groundwater supply. For this option and others, achieving the lowest water supply unit cost typically requires using the full capacity of the supply source. With the cost of conveyance and the supply exceeding Laredo's supply goals, it would not be cost effective for the City to undertake the project alone. However, with a regional project, partnering with other participants, the economies could be achievable.

Determining the feasibility of a regional imported groundwater project, involving multiple water users, will require several steps:

- Determining interest of other communities that could potentially benefit from participation.
- Updating the groundwater supply availability.
- Identifying any constraints on development and conveyance of the supply on a regional approach basis.
- Assessing the water need by potential participants.

[12] Consideration of treatment prior to blending with the City's existing water will need to be investigated.

- Developing an initial layout or plan for delivery of the needed supply by entity.
- Scheduling meetings with potential participants at key points in project development.
- Coordinating with Region M and any other Planning Groups from the potential service area.

The TWDB supports regional water projects in several ways, including regional planning group coordination, technical assistance, experience with development of successful regional water projects, and funding opportunities for both planning and implementation. Therefore, the TWDB would be an excellent resource should the City be interested in pursuing larger water supply projects with regional partners to defray the costs.

5.20.3 Need for Additional, More Detailed Evaluation

Each of the water supply alternatives considered in the Laredo IWMP will require additional, more detailed evaluation before the City commits to its further development; that is, moving forward with a project feasibility evaluation. The level of effort required varies with the alternative considered.

The secondary alternatives (see Section 5.5 above) will require more extensive study or other actions. For example, the Laredo weir project is dependent on external developments such as federal participation and international agreement. For the primary alternatives, the planning level cost estimates will need to be reviewed and updated based and verified. **Table 5-16** includes a brief section on more in-depth, site-specific information. In some cases, such as the Webb County groundwater supplies, field investigations will be required to help pinpoint the sources of best quantity and quality groundwater. The City should authorize feasibility-level studies on any alternative before final decision to develop or implement it.

For each of the primary water supply alternatives, the Alternative Evaluation Summary Sheets, found at the end of this section, includes specific recommendations for “Further Investigations.” As discussed below, the cost estimates used for this report are Class 4 estimates. For any alternative selected for further consideration, the cost estimates will need to be updated and further quantified.

5.21 Cost Estimates and LCCA

Cost estimates for the primary water supply alternatives are critical input to the ranking and recommendations discussed below in Section 8. For this evaluation the cost estimates are considered “Class 4”, a classification developed by the AACE, see **Table 5-20**. Class 4 estimates are based on limited project information, such as the reports and other documentation available for the Laredo water supply alternatives. Class 4 estimates are typically used for project screening and comparisons, feasibility evaluations, project concept considerations, and project budgets.

5.21.1 Estimates Methodology

For the primary water supply alternatives, several categories of cost were estimated. The estimates used are based on ‘best available information’ and assumptions related to the anticipated supply quantities, conveyance distance, financing cost, etc. In some cases, where costs had been documented in reports or publications, the costs were updated using the ENR ratios. Where costs were independently derived for this report, the TWDB cost-model was? endorsed for the State’s Regional Water Planning, was used. In some cases, costs were estimated using recent construction bid tabulation with appropriate adjustments for sizing, materials used, type of terrain encountered, etc. **In all cases, cost estimates are preliminary, based on available information, use of standard preliminary engineering methods for Class 4 cost estimating. The cost estimating methods were uniformly applied to like project components (e.g., pipelines, pump stations, intakes, etc.) to support comparison between project alternatives.**

Table 5-17: Planning-level Cost

<table>
<tr><th colspan="2">CLASS 4 ESTIMATE</th></tr>
<tr>
<td>Description:
Class 4 estimates are generally prepared based on limited information and subsequently have fairly wide accuracy ranges. They are typically used for project screening, determination of feasibility, concept evaluation, and preliminary budget approval. Typically, engineering is from 1% to 15% complete, and would comprise at a minimum the following: plant capacity, block schematics, indicated layout, process flow diagrams (PFDs) for main process systems, and preliminary engineered process and utility equipment lists.

Level of Project Definition Required:
1% to 15% of full project definition.

End Usage:
Class 4 estimates are prepared for a number of purposes, such as but not limited to, detailed strategic planning, business development, project screening at more developed stages, alternative scheme analysis, confirmation of economic and/or technical feasibility, and preliminary budget approval or approval to proceed to next stage.</td>
<td>Estimating Methods Used:
Class 4 estimates virtually always use stochastic estimating methods such as equipment factors, Lang factors, Hand factors, Chilton factors, Peters-Timmerhaus factors, Guthrie factors, the Miller method, gross unit costs/ratios, and other parametric and modeling techniques.

Expected Accuracy Range:
Typical accuracy ranges for Class 4 estimates are -15% to -30% on the low side, and +20% to +50% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances.

Effort to Prepare (for US$20MM project):
Typically, as little as 20 hours or less to perhaps more than 300 hours, depending on the project and the estimating methodology used.

ANSI Standard Reference Z94.2-1989 Name:
Budget estimate (typically -15% to + 30%).

Alternate Estimate Names, Terms, Expressions, Synonyms:
Screening, top-down, feasibility, authorization, factored, pre-design, pre-study.</td>
</tr>
</table>

5.21.1.1 Capital Costs.

Capital costs include estimates of the total cost of a project or alternative, including planning, design, and construction. Capital cost components considered for the Laredo alternatives included planning studies, engineering design, property acquisitions including rights-of-way, permitting (both federal and state), and construction cost including construction management costs. As discussed above, the initial cost estimates were based on information from available reports. These reports or documentation varied with respect to project or alternative details, and, in some cases, the cost information was limited or itself very preliminary. In keeping with the planning-level objectives of the Laredo alternative evaluation, these costs were scaled to anticipated capacity or yield of an alternative. The unit costs were updated using ENR

Construction Cost indices. In some cases, such as the cost evaluation for LCB preliminary pipeline routing, estimates of pipeline construction cost based on recent bid tabulations with the same or similar size pipe were used.

Where capital cost components were difficult to monetize, such as permitting cost and property acquisition costs, estimates were used based on prior project experience and available land cost estimates.

5.21.1.2 Operating Costs

For each primary alternative evaluated, the estimated annual cost to operate and maintain the associated project were determined. Operating costs will include the costs of energy for pumps and treatment, operators or labor cost, and maintenance of equipment. Operating costs were also Class 4, based on prior reports or documentation, and were escalated in a similar manner to the capital cost. Energy costs were estimated at $0.07/Kwh. Annual O&M costs were estimated at 2.0% of project cost. For groundwater supply alternatives, the annual fees for property leases and owner royalties were estimated at $400/AF.

5.21.1.3 Debt Service & Financing Costs

Debt service was estimated using the following factors and terms:

- Assumed interest rate of 3.0%
- Bond issuance cost estimated a 1.5% of capital cost
- Coverage (if applicable) at 3.0%
- 30-year term

5.21.2 Life Cycle Cost Analyses (LCCA)

The LCCA provides an estimate of the cost of a project over its operating life. LCCA provides an estimate of the “total cost of ownership,” and is therefore an important factor in comparing and ranking water supply alternatives that have differing timetables. LCCA is a way to understand the balance between the initial monetary investment and the long-term expense of its operation. Like the initial cost estimates, the LCCA requires additional assumptions, including:

- Year construction begins and year completed
- Number of years the project will provide dependable supply
- Estimating periodic major repairs and replacement of project components
- Number of easements (property acquisition required)

For the Laredo IWMP comparison of alternatives, the LCCA approximated many of these life-cycle factors based on standard planning approaches, including guidelines provided by the TWDB regional and state water planning process. The City can use this estimate level for preliminary decisions or to select alternatives for more robust, detailed LCCA[13].

[13] By comparing the life cycle costs of various projects, the LCCA can explore trade-offs between low initial costs and long-term cost savings, identify the most cost-effective system for a given use, and determine

5.21.2.1 LCCA Method, Formula and Factors Used

The LCCA formula used for all alternatives is shown below:

$$PV = \frac{FV}{(1+r)^n}$$

Where: PV present value of the cost or benefit
FV the future value of the cost or benefit
r the discount rate
n the current time period in years

The discount rate of 2.5% is from the USACE recent economic guidance memorandum.[14]

5.22 Primary Alternative Pertinent Information and Cost Estimates

Table 5-23 below shows the cost estimates for the primary alternatives. Cost estimates for individual alternatives are presented and discussed below.

Table 5-18: Pertinent Data (Supply, Days Available and Estimated Unit Cost)

COMPARISON TABLE: Supplemental/Emergency Supply Options

Supply Source	Total Supply Available (MGD)		Emergency Days Available (days)			Emergency Supply Cost ($/1000 gal)	
	Avg Day	Peak Day	Avg Day	Peak Day	Year Available	Avg Day	Peak Day
Lake Casa Blanca - Opt 1	0.54	0.54	8.77	5.84	2026	$ 93.32	$ 140.23
Lake Casa Blanca - Opt 2	0.54	0.54	8.77	5.84	2027	$ 124.55	$ 187.17
North Webb County	22.3	33.5	365	243	2030	$ 3.16	$ 3.16
Dimmit Co GW	40	40	365	365	2030	$ 3.49	$ 5.24
Val Verde/Kinney Co	40	40	365	365	2032	$ 3.82	$ -
South Laredo WWTP *Potable* Reuse*							
Phase 1 (2030 start)	3.00	NA	365	NA	2040	$ 1.91	NA
Phase 2 (2060 start)	3.00	NA	365	NA	2060	$ 5.18	NA

5.22.1 Lake Casa Blanca Cost Evaluations

This section provides an evaluation of the Lake Casa Blanca alternative.

The LCB use as an emergency water supply that requires the available, stored LCB water be first conveyed to the Jefferson WTP for treatment. **Figure 5-20** is a general location of a possible conveyance. An intake at LCB, pump station, easements, storage, valves, and other appurtenances would also be required. The construction cost estimates for these components are shown in **Table 5-24** below.

Footnote 13 continued: how long it will take for a specific system to "pay back" its incremental cost. Creating an exhaustive life cycle cost estimate for every potential design element of a project would not be practical; therefore, LCCA typically focuses on features and systems most likely to impact long-term costs. (Taken from *Guidelines for Life Cycle Cost Analysis,* Stanford University, Land and Buildings, 2005)

[14] Economic Guidance Memorandum, 21-01, Federal Interest Rates for Corps of Engineers Projects for Fiscal Year 2021, November 6, 2020.

The annual operation and maintenance (O&M) and debt service were estimated and are included in **Table 5-19**.

As discussed above in the LCB section, the total diversion authorized by the water rights permit for LCB is only 600 AF/yr, about 537,000 gallons per day; however, dredging may be required to ensure that this permitted diversion amount remains reliable. With a limited supply, the unit cost is high: estimated at over $22/1,000 gallons without dredging and about $30/1,000 gallon with dredging. Recognize also that the treatment cost would be added to these raw water costs.

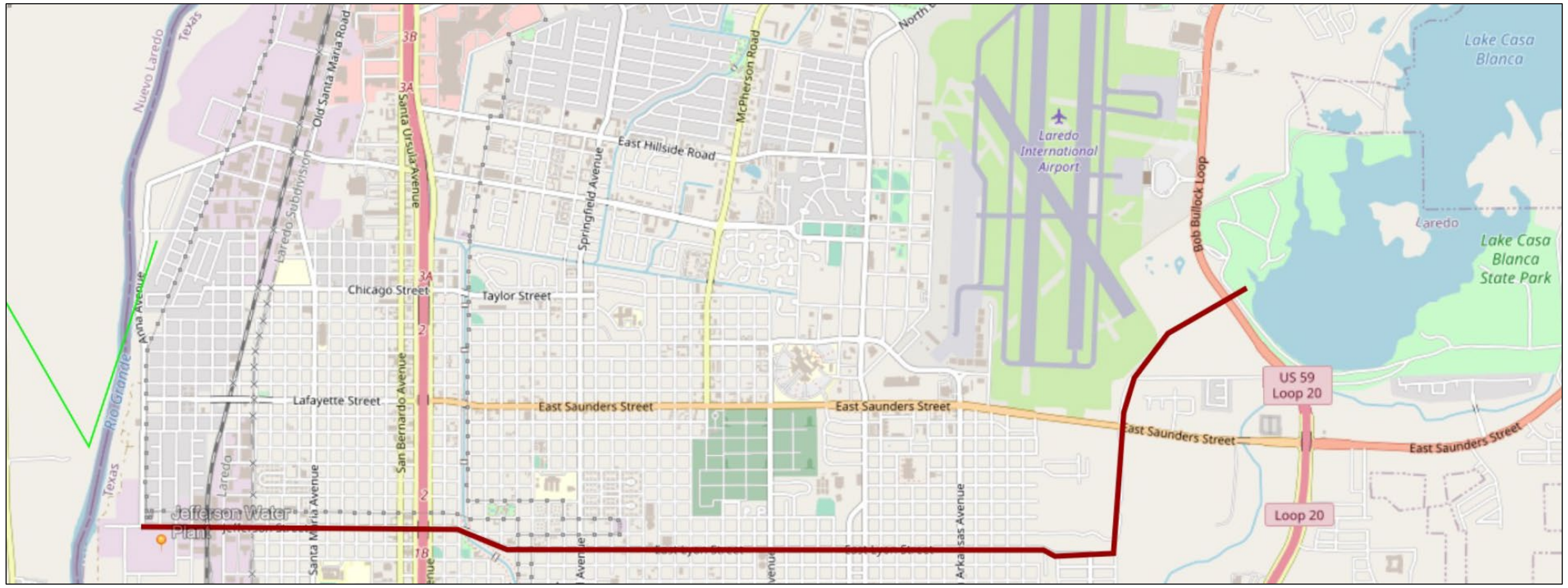


Figure 5-20: Conceptual Conveyance Route from LCB to Jefferson

WTP Table 5-19: Laredo IWMP Water Supply Options

	SUPPLY ALTERNATIVE	COMPONENTS REQUIRED *	Location / Distance to Laredo System Connection (miles)	Year Available to System (estimate)	Permitting Req'mts	Cost Estimates: Capital – Component	Capital – Cost Est	Engineering & Upfront – Component	Engineering & Upfront – Cost Est	Financing (F) / Legal (L) – Component	Financing (F) / Legal (L) – Cost Est	Annual Cost (Debt Service/O&M/Other) – Component	Annual Cost – Cost Est	$/1000 GAL (SUPPLIED) ♦	
Lake Casa Blanca (LCB)												Opt 1			
Opt1	Existing/available storage	Lake Intake	Webb Co / 5.2 miles to Jefferson WTP	2025	Transfer WR from Webb Co to City; use change to M&IR	Pump station & Intake	$ 15,000,000.00	Eng., Geotech, Survey, specialty	$ 6,420,000.00	FA	$ 638,311.50	Annual O&M (2% Project Cost)	$ 1,064,679.05		
Opt2	Increased storage (dredging)	Lake RW Pump station		2027		Pipeline & related to Jefferson WTP	$ 16,961,750.00	Construction Mg & Inspection	$ 2,140,000.00	Legal (Bonds)	$ 425,541.00	Annual P&I	$ 2,715,957.00		
		Pipeline (convey to Jefferson WTP)				2 MG Storage	$ 2,500,000.00	Material Testing	$ 856,000.00	Permit transfer & amendmts	$ 200,000.00	Power cost (1.2% Project Cost)	$ 638,807.43		
		Dredging (Acre-feet removed) Opt 2 only - see Note 1				Deliver point improvements	$ 1,000,000.00					**TOTAL ANNUAL COST**	$ 4,419,443	**AVG:**	
						Plus 20% Contingency	$ 7,092,350.00					**COST/1000 ++ (see #days available = 365)**	$ 22.55		
						Construction Cost without dredging	*$ 42,554,100.00*	*Prof service cost w/out dredging*	*$ 9,416,000.00*	*Financing & Legal w/out dredging*	*$ 1,263,852.50*			COST/1000 ++ (see #days available for use = 8.77)	$ 93.32
						Opt 2 only - Dredging (add cost)						Opt 2			
						5,000 acre-feet	*$ 16,000,000.00*	Eng dredge & disposal plan	$ 100,000.00	Dredging permit	$ 25,000.00	Annual O&M (2% Project Cost)	$ 1,422,679.05	**PEAK:**	
								Land acquisition	$ 1,500,000.00	Land lease for disposal site(s)	$ 250,000.00	Annual P&I	$ 3,622,367.00		$ 140.23
								Permit application	$ 25,000.00			Power cost (1.2% Project Cost)	$ 853,607.43	**AVG:**	
						Construction Cost w/ 5K dredging	*$ 58,554,100.00*	*Prof service cost w/ 5K dredging*	*$ 11,041,000.00*	*Financing & Legal with 5K dredging*	*$ 1,538,852.50*	**TOTAL ANNUAL COST**	$ 5,898,653.48		
						Total Project Cost						**COST/1000 ++ (see #days available = 365)**	$ 30.09	COST/1000 ++ (see #days available for use = 8.77)	$ 124.55
						With Dredge	$ 71,133,952.50								
						No Dredge	$ 53,233,952.50							**PEAK:**	$ 187.17

Table 5-20: Pipeline Cost Estimate for Lake Casa Blanca to Jefferson WTP

Cost Estimate

Lake Casa Blanca to Jefferson: Pipeline & Pump Station/Intake

Item Description	Quantity	Units		Unit Price [1]		Total
42-inch Waterline (Urban Construction)	24,750	LF	$	409	$	10,122,750
42-inch Waterline (Rural Construction)	-	LF	$	293	$	-
42-inch Waterline in Tunnel (Urban Construction)	2,750	LF	$	1,636	$	4,499,000
42-inch Waterline in Tunnel (Rural Construction)		LF	$	1,172	$	-
Pump Station & Lake Intake	1	EA	$	15,000,000	$	15,000,000
2 MG Ground Storage Tank	1	EA	$	2,500,000	$	2,500,000
- Misc Items	1	EA	$	200,000	$	200,000
Railroad Crossing - Misc Items	1	EA	$	100,000	$	100,000
Minor Road Crossings - Open Cut Temporary Pavement, Traffic Control, Restoration	15	EA	$	50,000	$	750,000
Creek/Stream Crossings Dewatering, mitigations, misc.	-	EA	$	35,000	$	-
Pipeline Crossings	10	EA	$	50,000	$	500,000
42-inch Butterfly Valve	6	EA	$	90,000	$	540,000
Site Restoration	1	LS	$	250,000	$	250,000
Cathodic Protection	1	LS	$	200,000	$	200,000
Deliver Point	1	LS	$	1,000,000	$	1,000,000
Subtotal					$	35,661,750
Plus Contingency	20%				$	7,132,350
Construction Cost Subtotal					$	42,800,000
Professional Services						
Eng., Geotech, Surveying, and Specialty Services	15%				$	6,420,000
Construction Management & Inspection	5%				$	2,140,000
Material Testing	2%				$	856,000
Professional Services Subtotal					$	9,420,000
Total Cost for Pipeline & Pump Station/Intake					**$**	**52,220,000**

Notes:
(1) Cost obtained from TWDB's Unified Costing Model User's Guide dated May 2013 and adjusted to current 2019 using ENR's Construction Cost Index.

5.22.1.1 Lake Casa Blanca LCCA:

Separate LCCA were evaluated for the LCB, with and without dredging cost. For each of these analyses, the PV for each major cost component was identified. The results are provided in **Tables 5-21 and 5-22**, respectively, for the no-dredge and dredge alternatives.

For the no-dredge alternative, the life cycle and PV estimates were as follows:

Table 5-21: No Dredge Alternative

Total 2020 Life Cycle Estimate	$ 120,095,797
Total Present Value Estimate	$ 70,431,938

Table 5-22: LCB Dredge Alternative

Total 2020 Life Cycle Estimate	$ 137,478,487
Total Present Value Estimate	$ 84,631,611

Table 5-23: Cost Outlay - Life Cycle Cost Analysis Option 1

Lake Casa Blanca			
Options Considered			
Option 1 - No dredging included			
Year Available (completion)			
2026			
Supply Avialable (Avg Day/Peak Day)			
0.54 MGD			
Days Available for Emergency Supply (Max Day)			
5.84			
Cost Components	***Description***	***Total Cost***	
		Discount rate: (2020)	
A. Capital Cost			
	Pump station & Intake	$	15,000,000
	Pipeline & related to Jefferson WTP	$	16,961,750
	2 MG Storage	$	2,500,000
	Deliver point improvements	$	1,000,000
	Plus 20% Contingency	$	7,092,350
	TOTAL	$	42,554,100
	Present Value (discount rate @ 2.5% for 2020)	***$***	***37,329,707***
B. Engineering & Upfront Costs			
	Eng., Geotech, Survey, specialty	$	6,420,000
	Construction Mg & Inspection	$	2,140,000
	Material Testing	$	856,000
	TOTAL	$	9,416,000
	Present Value (discount rate @ 2.5% for 2020)	***$***	***8,319,940***
C. Financing & Legal			
	FA	$	638,311.50
	Legal (Bonds)	$	425,541.00
	Permit transfer & amendmts	$	200,000.00
	TOTAL	$	1,263,852.50
	Present Value (discount rate @ 2.5% for 2020)	***$***	***1,135,726***
d. Operation & Maintenance Estimate			
	Annual O&M (2% Project Cost)	$	1,064,679.05
	Power cost (1.2% Project Cost)	$	638,807.43
	TOTAL	$	66,861,844.34
	Present Value (discount rate @ 2.5% for 2020)	***$***	***31,966,505***
TOTAL ANNUAL COST			
OPTION 1 (no dredging)	TOTAL 2020 LIFE CYCLE ESTIMATE	$	120,095,796.84
	TOTAL PRESENT VALUE ESTIMATE	***$***	***70,431,938***

Table 5-24: LCB Cost Outlay - Life Cycle Cost Analysis Option 2

Lake Casa Blanca		
Options Considered		
Option 2 - Dredging Estimate included		
Provide addn 5,000 AF storage		
Dredging estimate incld all related costs		
Cost Components	***Description***	***Total Cost***
		Discount rate: (2020)
A. Capital Cost		
	Pump station & Intake	$ 15,000,000
	Pipeline & related to Jefferson WTP	$ 16,961,750
	2 MG Storage	$ 2,500,000
	Deliver point improvements	$ 1,000,000
	Dredging Estimate (for 5,000 AF)	$ 16,000,000
	Plus 20% Contingency	$ 7,092,350
	TOTAL	$ 58,554,100
	Present Value (discount rate @ 2.5% for 2020)	***$ 51,303,175***
B. Engineering & Upfront Costs		
	Eng., Geotech, Survey, specialty	$ 6,420,000
	Construction Mg & Inspection	$ 2,140,000
	Material Testing	$ 856,000
	20% add-on for Dredging design/permitting & related	$ 1,129,920
	TOTAL	$ 10,545,920
	Present Value (discount rate @ 2.5% for 2020)	***$ 8,319,940***
C. Financing & Legal		
	FA	$ 638,311.50
	Legal (Bonds)	$ 425,541.00
	Permit transfer & amendmts	$ 200,000.00
	20% add-on for Dredging design/permitting & related	$ 252,770.50
	TOTAL	$ 1,516,623.00
	Present Value (discount rate @ 2.5% for 2020)	***$ 1,361,931***
d. Operation & Maintenance Estimate		
	Annual O&M (2% Project Cost)	$ 1,064,679.05
	Power cost (1.2% Project Cost)	$ 638,807.43
	TOTAL	$ 66,861,844.34
	Present Value (discount rate @ 2.5% for 2020)	***$ 31,966,505***
TOTAL ANNUAL COST		
OPTION 1 (no dredging)	TOTAL 2020 LIFE CYCLE ESTIMATE	$ 137,478,487.34
	TOTAL PRESENT VALUE ESTIMATE	***$ 84,631,611***

5.22.2 Webb County Groundwater Supplies

Two potential groundwater supply locations were identified. Both could offer cost advantages for Laredo compared to groundwater that would be imported from outside the County. However, information on Webb County groundwater is limited, particularly regarding location of ample quantity (sufficient to meet Laredo's supply goals) of acceptable water quality. Test well information is needed to support available report information. Properly locating acceptable groundwater in Webb County is critical and a challenge that will require accurate well log information.

The two locations of potential groundwater supplies in Webb County ("local groundwater"), evaluated in this report, are shown in **Figures 5-7** and **5-12**.

The trade-off discussed above between location (distance to Laredo) and quantity/quality applies to these Webb County locations. The groundwater supply closest to Laredo will likely incur less conveyance cost (pipeline and pumping costs); however, if the quantity or quality of these supplies is not sufficient, then the added cost of the more distant groundwater, if it is of sufficient quantity and quality, can be justified.

5.22.2.1 Legacy WSC Location

This groundwater location is approximately 15 miles from Laredo. The supply would tie-in to the City's northern water transmission system. During the preparation of this report, LAN has consulted with LRE Engineering, Inc. (LRE) that is conducting the hydrologic investigations and supervising the location, construction, and testing of a pilot well. LRE is optimistic that the production and quality of the groundwater supply will be adequate; however, at this time, the pilot well testing is not complete. It is expected that those tests, including production and water quality, will be completed by the end of 2022. At that time, a supplemental technical memorandum will be prepared with the findings and submitted to the City.

Cost estimates for Legacy WSC production and conveyance were not prepared because definitive well test results were not available. However, since this source location is the most proximal to Laredo, if future testing should confirm adequate supply and water quality being available, then cost estimates should be prepared and included in the next update to the Laredo IWMP.

5.22.2.2 North Webb County Groundwater

This potential groundwater supply is in far north Webb County near the Dimmit County line (see **Figure 5-9**), approximately 48 miles from Laredo. The cost components for this project were identified and capital cost and operation/maintenance costs were estimated. As discussed in this section, the groundwater availability is estimated at 25,000 AF/yr (22.3-MGD) with a peaking pump rate estimated at 24,000 gpm or 34.6-MGD.

The construction cost estimates for the production wells, conveyance waterline, pumps, storage, and other appurtenances is provided in **Table 5-30**. As discussed above, the construction costs were obtained from the TWDB 2013 costing guide and then updated using ENR ratios to 2019 dollars.

Table 5-25: Construction Cost Estimates North Webb County Groundwater

Cost Estimates							
Capital		**Engineering & Upfront**		**Financing (F) / Legal (L)**		**Annual Cost (Debt Service/O&M/Other)**	
Component	Cost Est	Component	Cost Est	Component	Cost Est	Component	Cost Est
42-inch rural (186,300 LF)	$ 54,585,900.00	Eng., Geotech, Survey, specialty	$ 22,740,000.00	**Total amount financed**	**$ 184,948,680.00**	Annual O&M	$ 3,699,200.00
30-inch rural (64,900 LF)	$ 12,720,000.00	Construction Mg & Inspection	$ 7,580,000.00	Annual Interest rate (assumed)	3.0%	GW Royalities- $400/AF	$ 10,000,000.00
16-inch rural (5,300 LF)	$ 434,600.00	Material Testing	$ 3,032,000.00	Bond Issue Cost	$ 2,774,400.00	Power @ $.07/kwh	$ 2,395,862.00
Production wells (12)	$ 31,800,000.00		$ 33,352,000.00	Coverage	$ 5,548,800.00	Subtotal	*$ 16,095,062.00*
2 MG Storage (2)	$ 10,000,000.00			Total finance cost	$ 8,323,200.00	P&I (Annual - 30 year)	*$ 9,861,166*
High Service PS	$ 10,000,000.00						
2 MG GST	$ 2,500,000.00						
Misc required items	$ 2,790,000.00						
Delivery point infrastructure	$ 1,500,000.00						
Contingency (20%)	$ 25,266,180.00						
				TOTAL Financed	***$ 193,283,200***	***TOTAL ANNUAL COST***	**$ 25,956,228.00**
TOTAL CAPITAL COST	***$ 151,596,680***	*TOTAL ENG & UPFRONT*	***$ 33,360,000***		***AVG SUPPLY USE***	**COST/1000 ++**	**$ 3.16**
					PEAK SUPPLY USE	**COST/1000 ++**	**$ 3.16**

Table 5-26: North Webb County Groundwater Cost Breakdown

Cost Estimate

Well Field and 42- inch Diameter Transmission Line

Item Description	Quantity	Units	Unit Price [1]	Total
42-inch Waterline (Urban Construction)		LF	$ 409	$ -
42-inch Waterline (Rural Construction)	186,300	LF	$ 293	$ 54,585,900
42-inch Waterline in Tunnel (Urban Construction)		LF	$ 1,636	$ -
42-inch Waterline in Tunnel (Rural Construction)		LF	$ 1,172	$ -
36-inch Waterline (Rural Construction)		LF	$ 244	$ -
36-inch Waterline in Tunnel (Rural Construction)		LF	$ 976	$ -
30-inch Waterline (Rural Construction)	64,900	LF	$ 196	$ 12,720,400
30-inch Waterline in Tunnel (Rural Construction)		LF	$ 784	$ -
16-inch Waterline (Rural Construction)	5,300	LF	$ 82	$ 434,600
Production Wells & Site Work	12	EA	$ 2,650,000	$ 31,800,000
2 MG Elevated Storage	2	EA	$ 5,000,000	$ 10,000,000
High Service Pump Station	1	EA	$ 10,000,000	$ 10,000,000
2 MG Ground Storage Tank	1	EA	$ 2,500,000	$ 2,500,000
- Misc Items	1	EA	$ 200,000	$ 200,000
Railroad Crossing - Misc Items	-	EA	$ 100,000	$ -
Minor Road Crossings - Open Cut				
Temporary Pavement, Traffic Control, Restoration	15	EA	$ 50,000	$ 750,000
Creek/Stream Crossings				
Dewatering, mitigations, misc.	5	EA	$ 35,000	$ 175,000
Pipeline Crossings	10	EA	$ 50,000	$ 500,000
Railroad Crossing	-	EA	$ 150,000	$ -
42-inch Butterfly Valve	6	EA	$ 90,000	$ 540,000
Site Restoration	1	LS	$ 250,000	$ 250,000
Cathodic Protection	1	LS	$ 375,000	$ 375,000
Deliver Point	1	LS	$ 1,500,000	$ 1,500,000
Subtotal				$ 126,330,900
Plus Contingency	20%			$ 25,266,180
Construction Cost Subtotal				$ 151,600,000
Professional Services				
Eng., Geotech, Surveying, and Specialty Services	15%			$ 22,740,000
Construction Management & Inspection	5%			$ 7,580,000
Material Testing	2%			$ 3,032,000
Professional Services Subtotal				$ 33,360,000
Total Cost for Well Field and 42-inch Transmission Main				**$ 184,960,000**

Notes:
(1) Cost obtained from TWDB's Unified Costing Model User's Guide dated May 2013 and adjusted to current 2019 using ENR's Construction Cost Index.

Debt Service		
Project Cost	$	184,960,000
Assumed Interest Rate		0.03
Bond Issue Cost	$	2,774,400
Coverage	$	5,548,800
TOTAL	$	193,283,200
Annual P&I		($9,861,165.70)

Annual Cost:		$/1000 gal
Annual O&M Cost (2% of Project Cost)	$ 3,699,200	$ 0.45
Grondwater Fees & Owner Royalty @ $400/AF	$ 10,000,000	$ 1.23
Power Cost @ $0.07/kwh	$ 2,395,862	$ 0.29
Principal & Interest	$9,861,166	$ 1.21
Total Annual Cost	**$ 25,956,228**	**$ 3.19**

Power Cost per Million Gallons					
Avg Day @ 22.3 MGD			Peak Day @ 33.5 MGD	
Wells	HS Pumps		Wells	HS Pumps
Kw-hrs/Mgal			Kw-hrs/Mgal	
3700	505		3800	1350
@ $.07/Kwh	$ 294.35		@ $.07/Kwh	$ 360.50

5.22.2.3 Groundwater LCCA:

The LCCA for the North Webb County groundwater project included estimates of the PV for each major cost component and an estimated of the total life cycle cost for the entire project. The results are provided in **Table 32**.

For the project, the life cycle and PV estimates were as follows:

Table 5-27: North Webb County Groundwater Cost Estimate

Total 2020 Life Cycle Estimate	$ 592,667,939
Total Present Value Estimate	$ 351,108,472

A detailed breakdown of North Webb County Groundwater's LCCA is provide in **Table 5-28**.

Table 5-28: Cost Outlay - Life Cycle Cost Analysis for North Webb County

North Webb Co Groundwater		
Options Considered		
Without additional costs for transmission & distribution to south Laredo		
Cost Components	***Description***	***Total Cost***
		Discount rate: (2020)
A. Capital Cost		
	42-inch rural (186,300 LF)	$ 54,585,900.00
	30-inch rural (64,900 LF)	$ 12,720,000.00
	16-inch rural (5,300 LF)	$ 434,600.00
	Production wells (12)	$ 31,800,000.00
	2 MG Storage (2)	$ 10,000,000.00
	High Service PS	$ 10,000,000.00
	2 MG GST	$ 2,500,000.00
	Misc required items	$ 2,790,000.00
	Delivery point infrastructure	$ 1,500,000.00
	Contingency (20%)	$ 25,266,180.00
	TOTAL	**$ 151,596,680**
	Present Value (discount rate @ 2.5% for 2020)	***$ 120,810,429***
B. Engineering & Upfront Costs		
	Eng., Geotech, Survey, specialty	$ 22,740,000.00
	Construction Mg & Inspection	$ 7,580,000.00
	Material Testing	$ 3,032,000.00
	ROW & Easements	$ 700,000.00
	Landowner & related costs	$ 170,100,000.00
	TOTAL	
	TOTAL	**$ 204,152,000**
	Present Value (discount rate @ 2.5% for 2020)	***$ 115,419,423***
C. Financing & Legal		
	FA	$ 2,774,230.20
	Legal (Bonds)	$ 1,849,486.80
	TOTAL	**$ 4,623,717**
	Present Value (discount rate @ 2.5% for 2020)	***$ 3,818,618***
d. Operation & Maintenance Estimate		
	O&M LCCE	$ 145,184,713.80
	Power cost (LCCE)	$ 87,110,828.28
	TOTAL	**$ 232,295,542.08**
	Present Value (discount rate @ 2.5% for 2020)	***$ 111,060,002***
TOTAL ANNUAL COST		
OPTION 1 (no dredging)	TOTAL 2020 LIFE CYCLE ESTIMATE	**$ 592,667,939**
	TOTAL PRESENT VALUE ESTIMATE	***$ 351,108,472***

5.22.3 Imported Groundwater Alternatives

As discussed in Section 5.2.2, imported groundwater options are those potential supplies located outside of Webb County. Two imported groundwater alternatives were evaluated: 1) a Dimmitt County groundwater supply that is approximately 70 miles from Laredo and, 2) a Val Verde/Kinney County supply that is approximately 150 from Laredo. **Figures 5-7** and **5-12** show the approximate locations of these supply sources relative to Laredo.

The trade-offs between the cost of transmission of these imported supplies versus the quantities available was discussed in Section 5.20.1. As expected, the construction and operation cost, overall annual cost, and related debt service were found to be significantly more than the Webb County groundwater alternatives; however, the quantities available are also an order of magnitude greater.

5.22.3.1 Dimmitt County Groundwater

Groundwater supplies in Dimmitt County are estimated to potentially produce 45,000 AF/yr or around 40-MGD of good quality, dependable groundwater supply. The groundwater supplies are in the greater aquifer area of the Winter Garden within Dimmitt, Zavala, and LaSalle counties.

Table 5-29: Dimmit County Groundwater Estimated Cost

Dimmit County Groundwater											
Hydrogeology investigations to locate optimal well field	Dimmit Count	2030		60-inch rural (369,600 LF)	$ 129,360,000	Easements, Parcel fees, etc^	$ 2,917,733	TOTAL Project constr + upfront	$ 327,007,005	Groundwater (Royalties cost/yr)	$ 17,920,000
Legal instruments incld. GW Supply Agmt (take or pay)	**Distances:**			Production wells (18)	$ 27,000,000	Eng Design (10%)	$ 24,929,944.00	Interest rate	3%	O&M^	$ 10,622,200
Well-field: wells (~12), collection piping	**TOTAL to Laredo: 70 miles**		For additional Kinney Co GW, export GCD permit required	Well Field piping	$ 24,000,000	Construction Mg & Inspection (5%)	$ 12,464,972.00	Financing fees (1.5%)	$ 4,905,105	Annual P&I	$ 17,434,000
Conveyance pipeline (well field to Laredo system connection)				High Service PS (inclusive)^	$ 3,340,000	Environmental Mitigation (2%)	$ 4,985,988.80	Bond Coverage	$ 9,810,210	Power Cost est @ 2% of project cost	$ 4,985,988.80
Necessary imprv Laredo transmission to south Laredo	60-inch rural (369,600 LF)	$ 129,360,000		1 MG Storage (4) & appurtenances^	$ 6,568,800	management (8%)	$ 19,943,955.20	TOTAL Financed			
Treatment for blending into Laredo system, as needed	Production wells (18)	$ 27,000,000		Delivery point infrastructure	$ 1,500,000.00	Legal Costs (4%)	$ 9,971,977.60	Annual P&I			
Regional (joint) participation req'd to share cost	High Service PS (inclusive)^	$ 3,340,000				Public Outreach (1%)	$ 2,492,994.40		**$ 341,722,320**		
Permits - GWCD + construct related + TCEQ blending	1 MG Storage (5) & appurtenances^	$ 6,568,800		*Subtotal*	$ 191,768,800	*Subtotal*	$ 77,707,565		**$ 17,434,000**		
Blending or treatment potentially	Delivery point infrastructure	$ 1,500,000.00		*Contingency (30%)*	$ 57,530,640						
Investigate potential env or hydrologic constraints		$ 167,768,800		Total Construction Cost:	**$ 249,299,440**	Total Eng/PM/Env	**$ 77,707,565**				
Public outreach with multiple entities & stakeholders		$ 191,768,800				F & L cost	**$ 14,715,315**				
Political issues and challenges										**TOTAL ANNUAL COST:**	**$ 50,962,189**
				TOTAL CAPITAL COST (constr + eng)	***$ 327,007,005***			$ 41,681.90		**COST/1000 GAL++**	$ 3.49

The cost per 1,000 gallons is based on delivery and use of the entire 45,000 AF/yr. The unit cost estimated at $3.15/1,000 gallons (in 2020 dollars) is reasonable. The 45,000 AF/yr amount exceeds both the Emergency Use goal of 35-MGD and the Supplemental Future Need of 20-MGD. However, as discussed previously, the excess supplies could open an opportunity for development of a regional water supply project where the City of Laredo partners with others to participate in the project supply and cost.

5.22.3.2 Dimmitt County Groundwater LCCA

The Dimmitt County groundwater LCCA includes estimates of the PV for each major cost component and an estimated of the total life cycle cost for the entire project. The results are provided in **Table 5-35**.

For the project, the life cycle and PV estimates were as follows:

Table 5-30: Life Cycle Cost Estimates

Total 2020 Life Cycle Estimate	$ 529,984,169
Total Present Value Estimate	$ 987,873,588

Table 5-31: Cost Outlay - Life Cycl e Cos t Analysis for Dimmit County

Dimmit Co Groundwater		
Options Considered		
Without additional costs for transmission & distribution to south Laredo		
Cost Components	***Description***	***Total Cost***
		Discount rate: (2020)
A. Capital Cost		
	60-inch rural (369,600 LF)	$ 129,360,000
	Production wells (17)	$ 27,000,000
	High Service PS (inclusive)^	$ 3,340,000
	1 MG Storage (5) & appurtenances^	$ 19,943,955
	Delivery point infrastructure	$ 1,500,000
	Subtotal	$ 328,347,352
	Contingency (20%)	$ 65,669,470
	TOTAL	$ 394,016,822
	Present Value (discount rate @ 2.5% for 2020)	***$ 424,937,809***
B. Engineering & Upfront Costs		
	Easements, Parcel fees, etc^	$ 17,920,000
	Eng Design (10%)	$ 24,929,944.00
	Construction Mg & Inspection (5%)	$ 12,464,972.00
	Environmental Mitigation (2%)	$ 4,985,988.80
	Project management (8%)	$ 19,943,955.20
	Legal Costs (4%)	$ 9,971,977.60
	Public Outreach (1%)	$ 2,492,994.40
	TOTAL	**$ 92,709,832**
	Present Value (discount rate @ 2.5% for 2020)	***$ 66,842,740***
C. Financing & Legal		
	FA	$ 4,905,105.07
	Legal (Bonds)	$ 9,810,210.14
	TOTAL	**$ 14,715,315**
	Present Value (discount rate @ 2.5% for 2020)	***$ 12,153,029***
D. Operation & Maintenance Estimate		
	O&M	$ 10,622,200
	Groundwater permit cost (annual)	$ 17,920,000
	TOTAL	**$ 28,542,200**
	Present Value (discount rate @ 2.5% for 2020)	***$ 483,940,010***
TOTAL ANNUAL COST		
	TOTAL 2020 LIFE CYCLE ESTIMATE	**$ 529,984,169**
	TOTAL PRESENT VALUE ESTIMATE	***$ 987,873,588***

5.22.3.3 Val Verde/Kinney County Groundwater

Significant, good quality, groundwater supplies are potentially available in Val Verde County and the contiguous area of western Kinney County (see **Figure 5-7** above). The groundwater production from this area is discussed in some detail in Section 5.7.2. As discussed in this Section, this area can potentially produce up to 70,000 AF/yr (estimates for Val Verde at 40- and 22.3-MGD for Kinney County). For purposes of cost analysis and for cost comparison, the 40-MGD or 44,800 AF/yr was used for production. This compares with the Dimmitt County supply and is in line with the Laredo Emergency Supply need.

Table 5-32: Val Verde Cost Estimate

COMPONENTS REQUIRED *	Location / Distance to Laredo System Connection (miles)	Year Available to System (estimate)	Permitting Req'mts	Cost Estimates							
				Capital		Engineering & Upfront		Financing (F) / Legal (L)		Annual Cost (Debt Service/O&M/Other)	
				Component	Cost Est	Component	Cost Est	Component	Cost Est	Component	Cost Est
Val Verde County Groundwater											
Hydrogeology investigations to locate optimal well field	Southeast Val Verde County (see location map)	2029	No GCD in Val Verde	60-inch rural (802,560 LF)	$ 280,896,000	Easements, Parcel fees, etc^	$ 6,335,648	**TOTAL Project cost:**	**$ 532,332,331**	Landowner (GW Royalities)	$ 17,920,000
Legal instruments incld. GW Supply Agmt (take or pay)	**Distances:**		Kinney Co GW, export GCD permit	Production wells (20)	$ 30,000,000	Eng Design (10%)	$ 43,114,482.22	Interest rate	3%	O&M^	$ 10,622,200
Well-field: wells (~12), collection piping	53 mile to Eagle Pass			Well Field piping	$ 30,940,000	Construction Mg & Inspection (5%)	$ 21,557,241.11	Financing fees (1.5%)	$ 7,984,985	Annual P&I	$ 27,159,000
Conveyance pipeline (well field to Laredo system connection)	99 miles Eagle Pass to Laredo			High Service PS (inclusive)^	$ 8,211,000	Environmental Mitigation (2%)	$ 8,622,896.44	Bond Coverage	$ 15,969,970		
Necessary imprv Laredo transmission to south Laredo	**TOTAL to Laredo: 152 miles**			1 MG Storage (5) & appurtenances^	$ 7,740,352	management (2%)	$ 8,622,896.44	Total finance cost	$ 23,954,955	**TOTAL ANNUAL COST:**	**$ 55,701,200**
Treatment for blending into Laredo system, as needed		45,000.00		Delivery point infrastructure	$ 1,500,000	Legal Costs (2.5%)	$ 10,778,620.56				
Regional (joint) participation req'd to share cost						Public Outreach (0.05%)	$ 2,155,724.11	TOTAL Financed	$ 532,332,331		
Permits - GWCD + construct related + TCEQ blending				*Subtotal*	$ 359,287,352	*Subtotal*	$ 101,187,509				
Blending or treatment potentially		280896000		*Contingency (20%)*	$ 71,857,470						
Investigate potential env or hydrologic constraints				Total Construction Cost:	**$ 431,144,822**						
Public outreach with multiple entities & stakeholders											
Political issues and challenges				**TOTAL CAPITAL COST:**	***$ 532,332,331***	**Total Eng/PM/Env**	**$ 101,187,509**	**Annual P&I**	**$ 27,159,000**	**Cost/1000 gallons**	**$ 3.82**

5.22.3.4 Val Verde/Kinney County Groundwater LCCA

The Val Verde/Kinney County groundwater LCCA includes estimates of the PV for each major cost component and an estimated of the total life cycle cost for the entire project. The results are provided in **Table 5-37**.

For the project, the life cycle and PV estimates were as follows:

Table 5-33: Life Cycle Cost Estimates

Total 2020 Life Cycle Estimate	$ 1,188,230,765
Total Present Value Estimate	$ 1,110,600,189

Table 5-34: Cost Outlay - Life Cycle Cost Analysis for Val Verde/Kinney Counties

Val Verde/Kinney Co GW			
Options Considered			
Without additional costs for transmission & distribution to south Laredo			
Cost Components	***Description***	***Total Cost***	
		Discount rate: (2020)	
A. Capital Cost			
	60-inch rural (802,560 LF)	$	280,896,000
	Production wells (20)	$	30,000,000
	High Service PS (inclusive)^	$	8,211,000
	1 MG Storage (5) & appurtenances^	$	7,740,352
	Delivery point infrastructure	$	1,500,000.00
	Subtotal	$	328,347,352
	Contingency (20%)	$	65,669,470
	TOTAL	$	394,016,822
	Present Value (discount rate @ 2.5% for 2020)	***$***	***533,060,139***
B. Engineering & Upfront Costs			
	Easements, Parcel fees, etc^	$	6,335,648
	Eng Design (10%)	$	39,401,682.22
	Construction Mg & Inspection (5%)	$	19,700,841.11
	Environmental Mitigation (2%)	$	7,880,336.44
	Project management (8%)	$	31,521,345.78
	Legal Costs (4%)	$	15,760,672.89
	Public Outreach (1%)	$	3,940,168.22
	TOTAL	**$**	**124,540,695**
	Present Value (discount rate @ 2.5% for 2020)	***$***	***87,299,703***
C. Financing & Legal			
	FA	$	4,577,202.49
	Legal (Bonds)	$	3,051,468.33
	TOTAL	**$**	**7,628,671**
	Present Value (discount rate @ 2.5% for 2020)	***$***	***6,300,338***
D. Operation & Maintenance Estimate			
	O&M	$	393,021,399
	Groundwater permit cost (annual)	$	663,040,000
	TOTAL	**$**	**1,056,061,399**
	Present Value (discount rate @ 2.5% for 2020)	***$***	***483,940,010***
TOTAL ANNUAL COST			
	TOTAL 2020 LIFE CYCLE ESTIMATE	**$**	**1,188,230,765**
	TOTAL PRESENT VALUE ESTIMATE	***$***	***1,110,600,189***

5.23 Alternative Comparisons, Rankings, and Recommendations

5.23.1 Comparison of Primary Alternatives

5.23.1.1 Cost Comparisons

Table 5-35 shows the comparison to provide for the Emergency Use and Supplemental Use goals.

Table 5-35: Emergency Use vs Supplemental Use Goals

Lake Casa Blanca			
AVG:			
COST/1000 ++ (see #days available for use = 8.77)	**$**	**93.32**	
PEAK:			
	$	**140.23**	
AVG:			
COST/1000 ++ (see #days available for use = 8.77)	**$**	**124.55**	
PEAK:	**$**	**187.17**	
TO DELIVER TOTAL AVAILABLE		**22.32**	MGD
Avg Day - 365	$	3.19	$/1000 gal
Peak day - 243	$	4.79	$/1000 gal
TO DELIVER EMERGENCY GOAL ONLY:		**33.5**	MGD
243 days	$	3.19	$/1000 gal
365 days	Not available beyond 243 days		$/1000 gal

North Webb County GW			
TO DELIVER TOTAL AVAILABLE		**22.32**	MGD
Avg Day - 365	$	3.19	$/1000 gal
Peak day - 243	$	4.79	$/1000 gal
TO DELIVER EMERGENCY GOAL ONLY:		**33.5**	MGD
243 days	$	3.19	$/1000 gal
365 days	Not available beyond 243 days		$/1000 gal

Dimmit County GW			
TO DELIVER TOTAL AVAILABLE		**40**	MGD
Avg Day - 365	$	3.15	$/1000 gal
Peak day - 243	$	4.73	$/1000 gal
TO DELIVER EMERGENCY GOAL ONLY:		**33.5**	MGD
243 days	$	5.65	$/1000 gal
365 days	$	3.76	$/1000 gal

Val Verde/Kinney County GW			
TO DELIVER TOTAL AVAILABLE		**40**	MGD
243 days	$	5.73	$/1000 gal
365 days	$	3.82	$/1000 gal
TO DELIVER EMERGENCY GOAL ONLY:		33.5	MGD
243 days	$	6.84	$/1000 gal
365 days	$	4.56	$/1000 gal

5.23.1.2 Proximity Considerations

As previously discussed, a primary factor related to cost is the conveyance distance from the supply source to the City. **Figure 5-21** shows the estimated conveyance distances required for each of the groundwater supplies evaluated. Clearly, LCB offers the greatest proximity advantage; however, as discussed above, the supply goals cannot be met. The second most proximal supply is the Webb County groundwater. If it is confirmed that either or both Webb County supplies can meet the City's supply goals and provide adequate quality water, then it would be expected that these would have a cost advantage compared to sources outside the County[15].

For the imported groundwater supplies, a regional water supply, involving the City's participation with other users, might decrease the conveyance distance and reduce the cost. The efforts involved in exploring the development and use of a regional system are discussed in Section 5.20.2.

[15] Note that Webb County Groundwater Area 2, based on preliminary investigations, does meet the requirements of adequate supply and acceptable quality, but these findings, along with the completed field evaluation of the Area 1 supply are needed to confirm.

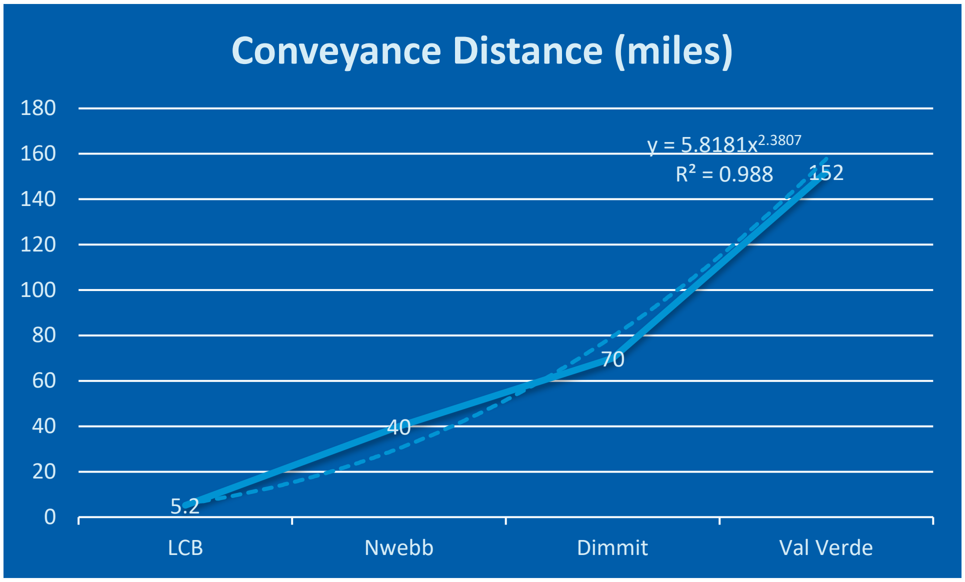


Figure 5-21: Distance to Conveyance Pipeline Cost Correlation

5.23.1.3 Availability

In addition to cost and the related conveyance distance, the alternative supplies should be compared based on the availability of the firm water supply. That is, how many days could an alternative supply be expected to adequately meet the Emergency Supply Goal of 35-MGD Inspecting this graphically provides an ideal means of comparison. **Figures 5-22 and 5-23** provide this type of comparison. An important trade-off here is the year supply is estimated to be available compared to both the number of days available as well as the unit costs for the days available.

Starting with **Figure 5-22**, which a 'bubble chart' showing three key factors for each alternative, the LCB supply is estimated to have the earliest availability, year 2026; the North Webb County Groundwater (Area 2) and the Dimmitt County supplies have availability estimates of the year 2030; and the Val Verde imported groundwater availability is the year 2033. The two reuse supplies' availability comes from the estimates provided in the Region M Water Plan. **Figure 5-22** also shows the number of days available to meet the City's Emergency Water Supply Goal and the unit cost based on the days available. LCB is estimated to have sufficient supply to meet the Emergency Supply Goal for just under six days and at an estimated cost of more than \$187/1,000 gallons delivered. Conversely, the imported groundwater projects, Dimmit, and Val Verde counties, can meet the Emergency Supply Goal for 365 days. It is estimated that the Webb County groundwater (Area 2) can meet the Emergency Supply Goal for 243 days (two-thirds of a year). The unit cost of these groundwater supplies, **at full use**, is estimated to be between just over \$3.00/1,000 gallons (Webb County Area 2) and just over \$3.50/1,000 gallons (Val Verde).

Figure 5-19 is a standard bar chart, which is another effective way in showing the relationship between unit cost, days available, and conveyance distance. The comparison of the three groundwater alternatives clearly shows the unit cost, days available, and conveyance distance relationships. Due to the limited availability of treated effluent, the two phases of the reuse project are not adequate for meeting the Emergency Supply Goal. However, the groundwater alternatives could provide substantial number of days delivering the Emergency goal amount.

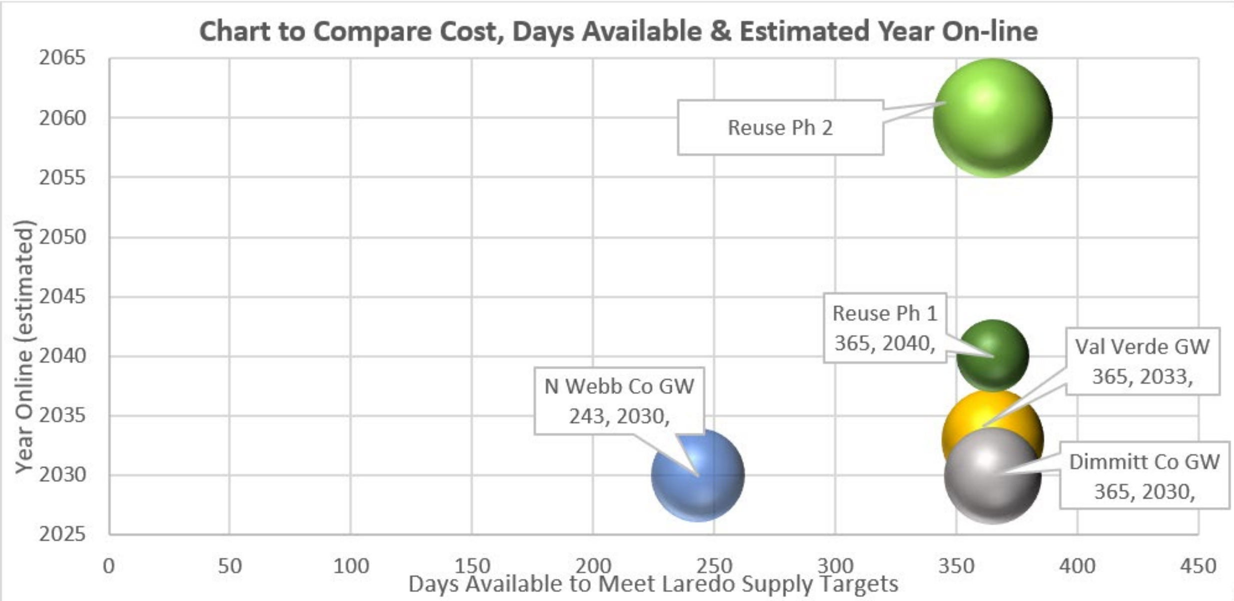


Figure 5-22: Comparison of Supply Availability

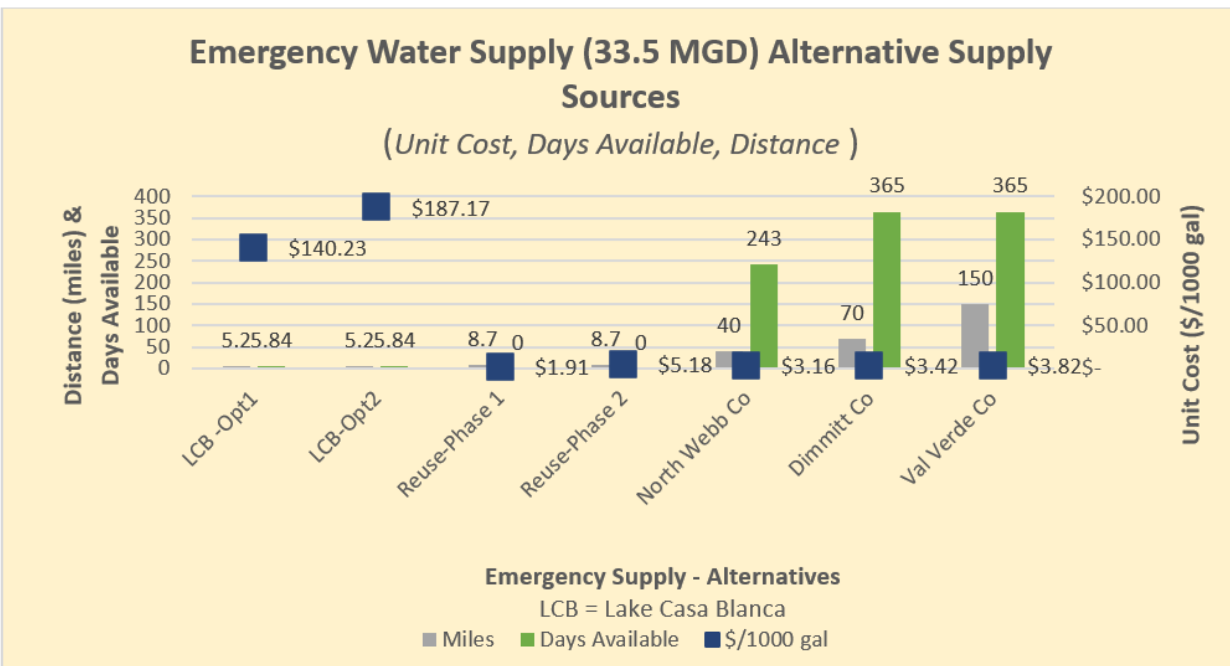


Figure 5-23: Distance, Supply Availability and Unit Cost Estimates

5.23.2 Evaluation Criteria and Method Used

Other than planning level cost estimates, the criteria used to evaluate the various water supply alternatives were chosen to reflect the value or merits from a water supply perspective of each alternative. The values used for ranking were purposely held to three comparability and in recognition that this is a planning-level value. Selection of one or more of the alternatives for actual implementation will require in-dept evaluation and a more robust ranking approach. The table below summarizes the evaluation of 8 alternatives with 12 weighted criteria.

Table 5-36: Primary Alternatives Criteria Rankings

Criteria/Merit	LCB - no dredge	LCB - dredge	Reuse - Phase 1	Reuse - Phase 2	North Webb Co GW	Webb Co GW (Legacy WSC)	Dimmit Co GW	Val Verde/Kinney Co GW	Weighting Scale
Supply Availability (to meet Emergency & Supplemt Goals)	3	3	3	3	1	?	2	2	Meets both Emergency + supplemt goals = 1 Meets Supplemental goal but exceeds Emergency goal = 2 Does not meet either goal = 3
Capital Cost (Upfront $ Required)	1	2	1	1	2	?	2	3	Capital cost <$50M = 1 Capital cost $50 to $150M = 2 Capital cost >$150M = 3
Life-Cycle Cost Est (Combined cost for project life)	1	1	1	1	2	?	2	3	LCC<$200M = 1 LCC = $200 M - $1B = 2 LCC > $1B = 3
Affordability ($/1000 gal at full use)	3	3	1	2	2	?	2	3	Unit cost < $2.00/1000 gal = 1 Unit cost $2 to $5 /1000 gal = 2 Unit cost > $5 /1000 gal = 3
Affordability ($/1000 gal at Emergency Use)	3	3	3	3	2	?	2	3	Unit cost < $2.00/1000 gal = 1 Unit cost $2 to $5 /1000 gal = 2 Unit cost > $5 /1000 gal = 3
Supply Reliability (at Emergency Use)	3	3	1	1	2	?	1-2	2-3	One or less curtailment factors = 1 Two potential curtailment factors = 2 Three or more curtaillment factors = 3
Supply Accessibility (distance to convey)	1	1	1	1	1	?	2-3	3	No or limited constraints =1 Two or more constraints possible = 2 Constraints identified and expected =3
Water Quality/Treatment Need	3	3	2	3	2	?	2	1	Water quality good, no or limited treatment = 1 Some non-adv (not RO) trtmnt possible = 2 Significant treatment anticipated =3
Environmental (atypical env concerns)	2	2	2	2	2	?	2	2	Limited env issues expected = 1 Moderate or unknown env issues = 2 Significant env issues/constraints = 3
Public Acceptance	2	2	2	2	1-2	?	1-2	2-3	Option found favorable by City Council/Public Meeting = 1 Option rated favoable on public survey (City website) = 2 Option is new & not previously known to public = 3
Contract Requirements	2	2	1	1	2-3	2-3	2-3	3	No outside (city) agmts reqd = 1 Contracts w/ city residents only; low ED = 2 Out side city owners/mod/hghED potential =3
Property Acquisition	1	1	1	1	2	2	2-3	3	Distance <10 miles (urban) = 1 Distance 10-40 miles (rural) = 2 Distance >50 miles = 3

Legend:

Cannot supply or greatly exceeds the Emergency Goal (35 MGD)

5.24 Alternative Evaluation Sheets

The Alternative Supply Evaluation Sheets provide pertinent information, organized to provide a quick reference and summary of information on each primary alternative supply source considered for the City's secondary supply. The following are included as Exhibits on the following pages:

- Lake Casa Blanca
- North Webb County Groundwater
- Dimmit County Groundwater

- Kinney/Val Verde Groundwater
- South Laredo WWTP Reuse Project

Exhibit 5-1: Lake Casa Blanca Alternative Evaluation

Alternative Evaluation Summary Sheet

Project Name: Lake Casa Blanca (Option ❶: No Dredging; Option ❷: With Dredging)

Description/Key Components

LCB was created in the 1950s when Webb County forces constructed the LCB Dam and impounded flow from the Chacon Creek watershed. The first time, after construction, that flow occurred through the dam spillway was in 2005. Flow from the lake by the spillway has also happened on a couple of occasions since that time. Ordinarily the dam and lake impound all watershed runoff because evaporation causes the normal pool elevation to be 8-10 feet below the maximum conservation pool elevation and the primary spillway.

TCEQ inspected the dam in 2005 and required a Dam Safety Analysis as part of rehabilitation plans for the LCB Dam. A Hydrologic & Hydraulic Analysis of the Dam and lake was completed in 2007. One of TCEQ comments involved the storage capacity of the lake conservation pool. A preliminary bathymetric analysis of the lake bottom was included in the study to establish a new conservation pool volume.

The original plans for the dam indicated an existing maximum depth of 40 feet just upstream of the dam. This was verified by the existing creek channel downstream of the dam. The bathymetric analysis indicated that significant siltation of the lake bottom had occurred over the intervening years. The maximum conservation pool depth in 2007 was found to be +/- 20 feet. The study report states that the surface area of the conservation pool is 1,650 acres. The conservation pool volume of storage is now shown as 11,000 acre-feet. The volume is further reduced on an average basis because the water surface may be as much as 10 feet below the maximum pool elevation due to evaporation and infiltration.

Approximately 10 years the City briefly investigated the option of using Lake Casa Blanca as an emergency water source. In addition to concerns about ownership of the water, it was found that the new maximum impoundment volume would be insufficient. Dredging as an option to increase the volume was also briefly investigated. A rough estimate of dredging and permitting costs ranged from +/- $500,000 to over $1 million depending on methodology and disposal location.

Issues: Potential Benefits & Concerns

Issues	Responses & Considerations
• Location within the City	Provides the closest location for additional surface water (outside Rio Grande)
• Limitations on the available supply (yield)	Supply (yield) very limited (compared with other alternatives)
• Dredging – expense and limited benefit	Would increase yield marginally but at high cost; yield restricted by Water Rights diversion limit (600 AF/Yr)
• Infrastructure required for delivery of available supply to Jefferson WTP .	Supply would require treatment at Jefferson WTP with pumping and conveyance costs

Supply & Cost Summary:

Water Supply Alternative	Supply*		Distance to System Connect	Year Available	Supply Duration^ (days)		Cost				Unit Cost for Supply Duration ($/1000 gal)	
Lake Casa Blanca	AF/Year	MGD			Avg Day Dmd	Peak Day Dmd	Capital	Eng & Upfront#	Financing*	Annual Cost$	Avg Day	Peak Day
Opt 1 - no dredge	604.8	0.54	5.2&	2025	8.77	5.84	$ 42,554,100	$ 9,416,000	$ 1,263,853	$ 4,419,443	$ 93.32	$ 140.23
Opt 2 - dredging	604.8	0.54	5.2&	2027	8.77	5.84	$ 58,554,100	$ 11,041,000	$ 1,538,853	$ 5,898,653	$ 124.55	$ 187.17

Life Cycle Cost Analysis & Present Value

Water Supply Alternative	Capital Cost		Engineering & Upfront Costs		Financing & Legal		Operaterion & Maintenance/Other Annual Operation Costs		Landowner & Related Costs (GW Lease)		TOTAL ANNUAL COST	
	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value
Lake Casa Blanca												
Opt 1 - no dredge	$ 42,554,100	$ 37,329,707	$ 9,416,000	$ 8,319,940	$ 1,263,853	$ 1,135,726	$ 66,861,844	$ 31,966,505	$ -	NA	$ 120,095,797	$ 70,431,938
Opt 2 - dredging	$ 58,554,100	$ 51,303,175	$ 10,545,920	$ 8,319,940	$ 1,516,623	$ 1,361,931	$ 66,861,844	$ 31,966,505	$ -	NA	$ 137,478,487	$ 84,631,611

Further Investigations: None recommended due to limited supply and high cost.

Cost Calculations, References & Existing Reports: See Appendix

F-2614

Exhibit 5-2: North Webb County Alternative Evaluation

Alternative Evaluation Summary Sheet

Project Name: North Webb County Groundwater Supply

Description/Key Components

The potential groundwater supply is located in northern Webb County; very near the corner of Webb County and the Dimmit-LaSalle County boundaries. Estimated possible production is 25,000 acre-feet/year, making this the largest potential good quality, groundwater source in Webb County. approximately 35 miles (accounting for pipeline distance) from Laredo. A total of 12 to 14 wells at an estimated cost of $2.65 million would be needed to produce 22.3 million gallons per day (MGD) on an average day basis. A rate of 2,400 gallon per minute (gpm) was estimated for each well. A peaking factor of 1.5 was applied to provide an estimated 33.5 MGD on a maximum day basis.

The groundwater would be delivered initially to the north Laredo water system. Major components for conveyance to Laredo system would include 186,300 linear feet (LF) of 42-inch diameter waterline, two 2.0 MG elevated storage tanks and two 2.0MG ground storage tanks, one high service pump station (see attached Cost Estimate). Transmission facilities for delivery of additional supply to the south Laredo water system are required (the south Laredo conveyance is discussed in Section 5.)

Potential Issues

Issue	Responses & Considerations
• In this area of the fresh/brackish water contact is stratified and sometimes "interfingering layers" occur. The total dissolved solids could increase with time as production continues.	• Blending or treatment could be required to ensure stable, good quality supply is delivered to the Laredo system. • Additional geological investigation and on-site work needed to identify optimal well locations to avoid poor quality areas to the extent possible
• The capital cost for acquiring groundwater (importing to the Laredo system) is discussed in Section 5. The cost estimate for the North Webb County Groundwater Supply is attached.	• In consideration of the cost, recognize that this supply is closest to Laredo and provides sufficient supply to meet the Emergency Supply Goal for up to 8 months, at an estimated $3.16 per 1,000 gallons (before improvements for transmission facility improvements needed convey to south Laredo), and with the shortest lead time for imported groundwater.

Supply & Cost Summary:

Supply*		Distance to System Connect	Year Available	Supply Duration^ (days)		Cost				Unit Cost for Supply Duration ($/1000 gal)	
AF/Year	MGD			Avg Day Dmd	Peak Day Dmd	Capital	Eng & Upfront#	Financing+	Annual Cost$	Avg Day	Peak Day
25,200	22.5	40	2030	365	243	$ 151,600,000	$ 33,360,000	$ 8,323,200	$ 25,956,228	$ 3.16	$ 3.16

* No peak considered in unit costing because pipeline is sized for delivery of total supply

Life Cycle Cost Analysis & Present Value

Capital Cost		Engineering & Upfront Costs		Financing & Legal		Operaterion & Maintenance/Other Annual Operation Costs		Landowner & Related Costs (GW Lease)		TOTAL ANNUAL COST	
Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value
$ 151,596,680	$ 120,810,429	$ 34,052,000	$ 14,201,253	$ 4,623,717	$ 14,201,253	$ 224,897,595	$ 105,104,452	$ 450,000,000	$ 231,380,324	$ 865,169,992	$ 475,315,076

Further Investigations:

- Further site-specific hydrogeologic investigations
- Prepare report with updated recommendations & risk report based on hydrogeologic information
- Continued data collection, including available well reports
- Based on positive hydrogeologic results, prepare an engineering feasibility & refined route study for delivery to Laredo water system

Cost Calculations, References & Existing Reports:

See Appendix

Exhibit 5-3: Dimmit County Alternative Evaluation

Alternative Evaluation Summary Sheet

Project Name: Dimmit County Groundwater

Description/Key Components

Prior Reports Considered: Since the late 1990's, the City of Laredo has considered proposals for the potential use of groundwater supplies located in Dimmit County. has been considered. Dimmit County groundwater was included in a presentation to the Laredo City Council in June 1999. At that time, the Dimmit County groundwater ranked fourth among the 13 water supply alternatives considered. In 2007, the Dimmit Utility Water Supply Corporation (Dimmit Utility WSC) prepared a report on the groundwater supply and the willingness of landowners in the production area to contract with public agencies to access available water supply. This report stated that the Dimmit Utility WSC could provide 40 million gallons per day (MGD). The report included proposed a number of water pricing scenarios, over a 20-to-25-year period, with initial cost ramping over time; the cost per 1000 gallons (in 2007) ranged from arranged from around $1.60 to just over $2.50; if the buyer opted not to ramp cost, the price was $2.27 through 2029. It is unclear what the ongoing cost for operation would be after that time.

Current Information: The 2011 *Integrated Water and Wastewater Master Plan* reported that the Dimmit County Well Fields could provide a freshwater with estimated yield of 40 MGD from a Carrizo-Wilcox aquifer well field located 70 miles from Laredo. Water from the well field would have total dissolved solids (TDS) concentrations of less than 300 milligrams per liter (mg/l) and may not require any advanced treatment. For consideration in the current Laredo IWMP, this information was verified by the Thornhill Group, Inc. as reasonable for the water supply alternative evaluation. This information was used in the cost estimates, life cycle cost analysis and present value reported below.

Issues: Potential Benefits & Concerns

Issues	Responses & Considerations
• Imported groundwater trade-offs – sufficient supply versus conveyance distance/cost	After North Webb County, Dimmit County is next available groundwater supply proximal to the City
• Need for updated hydrogeologic information	If the Dimmit County groundwater is considered further, the information needs to be reviewed and updated
• Water quality	Potential for iron removal has been mentioned in prior reports
• Impact on other aquifer users	If the Dimmit County groundwater is considered further, the impact on Carrizo Springs should be evaluated
• Infrastructure required for delivery of available supply to south Laredo	Supply would require treatment at Jefferson WTP with pumping and conveyance costs

++Supply & Cost Summary:

Supply*		Distance to System Connect	Year Available	Supply Duration^ (days)		Cost				Unit Cost for Supply Duration ($/1000 gal)	
AF/Year	MGD			Avg Day Dmd	Peak Day Dmd	Capital	Eng & Upfront[#]	Financing[+]	Annual Cost[$]	Avg Day	Peak Day
44,800	40	70	2030	365	365	$ 344,177,405	$ 81,669,965	$ 15,487,983	$ 56,189,160	$ 3.49	$

^ No peak considered in unit costing because pipeline is sized for delivery of total supply available.

Life Cycle Cost Analysis & Present Value

Capital Cost		Engineering & Upfront Costs		Financing & Legal		Operaterion & Maintenance/Other Annual Operation Costs		Landowner & Related Costs (GW Lease)		TOTAL ANNUAL COST	
Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value
$ 469,527,070	$ 346,766,811	$ 81,669,965	$ 57,074,621	$ 8,214,129	$ 6,783,854	$ 1,615,472,564	$ 894,565,295	$ 663,040,000	$ 303,838,001	$1,615,472,564	$ 894,565,295

Further Investigations:

- Updates from current groundwater purveyor
- Options for regional use to lower unit cost
- Update potential GW supply
- Update on GW permit constraints

References & Existing Reports: See Appendix

Exhibit 5-4: Val Verde/Kinney Counties Alternative Evaluation

Alternative Evaluation Summary Sheet

Project Name: Val Verde/Kinney County Imported Groundwater Project

Description/Key Components

Both the Val Verde and Kinney County groundwater projects can provide large potential supplies but are also the furthest distance from Laredo. Because of the distances involved, these imported groundwater projects are the costliest water supply alternatives considered. The table provides pertinent information on each of these alternatives. The Val Verde and Kinney projects are in fairly close-proximity; additional groundwater supply could be added to the Kinney County project from wells developed in Val Verde County. An advantage for the Val Verde project is the absence of a groundwater conservation district.

	VAL VERDE COUNTY	KINNEY COUNTY
	Productivity and Water Quality	
Distance to Laredo	150 miles	150 miles
Estimated Availability	50,000 to 100,000 AFY	25,000 AFY
Assumed Peak Pumping Rate	46,600 to 93,000 gpm	23,300 gpm
Pumping Rate Per Well	1,400 to 2,000 gpm	1,400 to 2,000 gpm
Number of Wells	24 to 67	12 to 17
Distance Between Wells	5,000 feet	5,000 feet
Depths of Wells	500 to 800 feet	500 to 800 feet
Cost Per Well	$715,400 TO $974,000	$715,400 TO $974,000
TDS Concentration	300 to 360 mg/l	290 to 400 mg/l
	Regulatory, Management and Planning Factors	
Groundwater District	None	Kinney County GCD
GMA	GMA 7	GMA 7
MAG	70,351 acre-feet per year	50,000 acre-feet per year
Planning Region	Region J	Region J
WMS In Region M Plan	No	No
Alt. WMS in Region M Plan	No	No

Potential Issues

Issue	Responses & Considerations
• Supply, Cost & Distance • GW export permit required for Kinney Co supply	• While providing sufficient supply (particularly the Val Verde option) the delivery distance is approx. 150 miles • Definite trade-off between supply available & conveyance cost

Supply & Cost Summary: Val Verde/Kinney Counties Supply

Supply*		**Distance to System Connect**	**Year Available**	**Supply Duration^ (days)**		**Cost**				**Unit Cost for Supply Duration ($/1000 gal)**	
AF/Year	MGD			Avg Day Dmd	Peak Day Dmd	Capital	Eng & Upfront#	Financing+	Annual Cost$	Avg Day	Peak Day
44,800	40	150	2029	365	365	$ 566,823,917	$135,679,095	$ 25,507,076	$ 56,189,160	$ 3.49	$ *

* No peak considered in unit costing because pipeline is sized for delivery of total supply available

Life Cycle Cost Analysis & Present Value

Capital Cost		**Engineering & Upfront Costs**		**Financing & Legal**		**Operaterion & Maintenance/Other Annual Operation Costs**		**Landowner & Related Costs (GW Lease)**		**TOTAL ANNUAL COST**	
Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value
$ 753,304,174	$ 555,956,341	$ 124,540,695	$ 87,299,703	$ 7,628,671	$ 6,300,338	$ 393,021,399	$ 180,102,009	$ 663,040,000	$ 303,838,001	$1,941,534,939	$ 829,658,391

Rankings[1]:

Firm Supply =/> Emergency Supply Goal	Life Cycle Cost	Year Supply Available	Env/Permit Issues	Add'n Investigations

Further Investigations: No additional investigations are recommended. Should additional customers or regional partners for development be identified, then the City should re-evaluate this option.

Cost Calculations, References & Existing Reports: See Appendix

[1] See Section 5 for discussion/explanation of alternative ranking criteria.

Exhibit 5-5: South Laredo WWTP Alternative Evaluation

Alternative Evaluation Summary Sheet

Project Name: South Laredo WWTP Reuse[1]

Description/Key Components

The following is the reuse strategy recommended in the latest Rio Grande Regional Water Plan. It is recommended as a means to reduce demand for treated water supply. The reuse project will pump treated effluent from the South Laredo WWTP to the Laredo's Jefferson Water Treatment Plant. After completion of an anticipated expansion of the WWTP to approximately 18 MGD, the reuse project would be implemented in two phases:

Phase 1 would be completed by 2040 and is estimated to provide up to 3.360 AF/year (3.0 MGD) available as indirect potable reuse; and,

Phase 2 would be completed in the 2060 timeframe and is expected to produce another 6,720 AF/year (6.0 MGD) of reuse water to help meet Laredo's future water need.

Additional treatment for the WWTP effluent would be required, including microfiltration, reverse osmosis, and advanced oxidation. A new pump station and ground storage tank will be needed at the South Laredo WWTP. A conveyance pipeline, sized for at capacity for both phases, would be constructed. The pump station would be in phases to match the available reuse supply.

Issues: Potential Benefits & Concerns

Issues	Responses & Considerations
• Direct potable reuse (phase 2) will require TCEQ approval	Although today not a common practice, by the timeframe for implementation of this reuse project, more indirect and direct reuse projects will likely be in operation and the needed treatment technologies will have also advanced significantly
• Public opinion regarding reuse, particularly direct potable reuse will likely be strong	A significant public awareness effort will be needed to completely inform and answer questions, concerns

Supply & Cost Summary:

Supply*		Distance to System Connect	Year Available	Supply Duration^ (days)		Cost				Unit Cost for Supply Duration ($/1000 gal)	
AF/Year	MGD			Avg Day Dmd	Peak Day Dmd	Capital	Eng & Upfront[#]	Financing[+]	Annual Cost[$]	Avg Day	Peak Day
3360	3.0	8.7	2040	365	NA	$ 17,701,000	$	7,013,000	$ 2,088,000	$ 1.91	$ 1.91
6720	6.0	8.7	2060	365	NA	$ 26,743,000	$	30,338,000	$ 5,670,000	$ 5.18	5.18

Life Cycle Cost Analysis & Present Value

Capital Cost		Engineering & Upfront Costs		Financing & Legal		Operaterion & Maintenance/Other Annual Operation Costs		Landowner & Related Costs (GW Lease)		TOTAL ANNUAL COST	
Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value	Life-Cycle Cost	Present Value
$ 17,701,000	$ 10,793,150	$ 7,013,000	$ 4,598,754	$ 370,710	$ 252,841	$ 7,590,750	$ 2,890,555	$ -	NA	$ 32,304,750	$ 18,282,460
$ 26,743,000	$ 9,975,824	$ 10,608,000	$ 4,244,588	$ 560,265	$ 236,079	$ 64,166,850	$ 57,055,917	$ -	NA	$ 101,517,850	$ 71,276,329

Further Investigations:

- Continue to monitor and have input based on future availability and demand for South Laredo WWTP effluent
- Monitor both treatment technologies and regulatory issues related to indirect and direct potable reuse
- Monitor other implementation of other indirect and direct potable reuse project in Texas

Cost Calculations, References & Existing Reports: See Appendix

[1] The "South Laredo WWTP Potable Reuse" project is identified, described, and recommended in the Rio Grande Regional Water Plan (Region M), 2021 Adopted Plan

6 Water System Analysis

6.1 Hydraulic Model Development

Development of the City's hydraulic model dates to at least 2004. Major updates have been made in 2011, 2015, and now in 2020. The City uses Bentley's WaterCAD to model its water system and to understand problem areas and help identify causes of low pressure, poor utilization of storage in tanks, and high velocities that impact service to customers. Model input and updates were based on the best information available including coordination with water utility operations staff, treatment plant and BPS production, record drawings, SCADA history, pump curves and settings, and tank data from record information.

The pipe system represented in these exhibits and **Table 3-7** is based primarily on the City's GIS information. Recent developments may not be included. Waterlines smaller than 6 inches in diameter are generally not included in the model. Lengths shown in **Table 3-7** for those pipe sizes are based solely on GIS information. The City assumes waterlines installed prior to 1988 are cast iron, while waterlines installed later are assumed to be PVC unless record drawings, maps, or City staff can provide better information.

Based on data received in October 2021, there are approximately 82,800 connections in the City's water utility. This number is adjusted down from the little more than 83,500 records in the customer data base to account for the almost 750 fire hydrant (FH) meter records that are no longer current as those meters are relocated. Note, that the category "Other" accounts for the approximately 1,640 records (2%) with incomplete data that prevents correctly assigning them in **Table 6-1**. The City's *2020 UTILITY SYSTEM* report indicates 75,854 connections to the water system. The difference of about 6,900 (9%) connections is attributable to a combination of the manner of accounting for fire hydrant meters, compound meters, and potentially inactive accounts.

Table 6-1: Water Service Inventory, 2020

Meter Size		Compound Meter			Service								
CODE	INCH	CODE	INCH	COUNT	FH		WATER			IRRIGATION			TOTAL
					Residential	Commercial	Residential	Multifamily	Commercial	Residential	Multifamily	Commercial	
A	5/8				0	0	57,877	1,853	3,309	1,074	0	267	64,380
B	3/4				0	0	8,374	91	431	2,451	0	191	11,538
C	1				0	0	725	125	701	83	0	360	1,994
D	1-1/2	DA	5/8	1	0	1	56	154	691	20	0	219	1,141
E	2	EA	5/8	636	0	87	36	159	902	9	0	464	1,657
F	3	FA	5/8	122	1	44	0	34	242	0	0	49	370
		FC	1	1									
G	4	GB	3/4	24	0	0	0	14	45	0	0	5	64
H	6	HC	1	2	0	0	0	6	11	0	0	0	17
		HD	1-1/2	2									
I	8				0	0	0	0	4	0	0	0	4
	SUBTOTAL			788	1	132	67,068	2,436	6,336	3,637	0	1,555	81,165
		OTHER			744		1,519			125			2,388
		TOTAL (by Service)			877		77,359			5,317			83,553

Total Water Production for the average and peak day demands are summarized in **Table 3-1**. LAN's analysis of the City's water demand updated to include years since 2015 is consistent with the previously estimated 130 gpcd average day consumption and 188 gpcd peak day consumption.

With sufficiently detailed and accurate input, models may predict system response and behavior for specified conditions hours and perhaps days into the future. Hydraulic modeling for Master Planning attempts to simulate the system during average and peak day conditions to identify deficiencies in tank 'turn-over,' high and low system pressures, and age of water in the system (as an indicator of disinfectant residual). These are evaluated based on average day conditions. Peak day is simulated to identify low pressures, and facilities where pumping and storage are not performing as needed. Based on a review of water utility records, August 14, 2020, was found to be representative of peak day conditions. SCADA data was compared to model simulations of these days to confirm the updated model continues to adequately represent the City's system.

6.2 Updating the Hydraulic Model

LAN compared GIS data of system pipes to the existing hydraulic model to identify areas of new development to add to the model. In addition, conversations with City staff provided valuable information regarding service areas and operations since the introduction of water from the El Pico WTP. **Exhibit 3-1** through **3-4** shows the existing water system.

LAN used the City's GIS layers of its waterlines to identify areas of new development and pipes added to the system since the 2015 model update. The "Water and Wastewater Hydraulic Model" report dated December 2015, (2015 Report) describes the process to develop the current model. This update applied similar GIS and WaterCAD tools to add new pipes and connections (LUEs) to the model. GIS information, City staff, and engineering judgement were applied regarding modeling parallel pipes, dead-end pipes, and whether crossing pipes should be connected.

The City's parcel shapefile was used to distribute water meters throughout the model under the premise that each parcel or lot has one active water meter or service connection associated with it. To generate the connection count at each model junction, GIS was used to assign each connection to the closest junction. The placement of meters was checked against meter data provided by the City in October 2021, for agreement with number of residential, commercial, and irrigation connections. Manual scrubbing of connections for large areas of empty lots was performed with the aid of aerial background images. Service connections were cross referenced to the City's GIS for residential, commercial, and/or industrial data that would allow later application of appropriate water demand patterns.

The City provided information regarding closed valves in the system that was used to update service areas in the model. However, LAN learned that at least seasonally valves may be adjusted for reasons including water quality, controlling pressure – both high pressure and to improve low pressures – and when supply may be limited to a BPS service area. Supply limitations are often the underlying cause of symptoms such as inability to refill storage tanks and the low-pressure problems already mentioned. Because service areas seem to change regularly, it is difficult to establish a single state of the “existing” system.

The WTPs or BPSs move water from lower pressure planes and service areas to service areas at higher elevations through transmission waterlines to GSTs. Water is then available to move from higher service areas to lower areas (either by design or as needed) through pressure reducing valves (PRVs).

Pump curves are based on record information, where available, and name plate and pump manufacturer catalog information when necessary, according to the 2015 Report. Pump on/off settings and controls were updated based on SCADA information and input from operations personnel. Several iterations were usually required to approximate the combination of automated and operator driven results observed in SCADA data. WaterCAD “controls” were developed to achieve this while allowing flexibility for changing conditions. Multiple control points are usually required to perform well for the wide range of flows at peak and average conditions.

6.3 Allocation of Water Demand

The 2015 model update describes the allocation of water demand within the existing system based on the City’s survey of connections by pressure zone. LAN performed a high-level review of data to confirm key factors developed during the 2015 model update and found no significant differences. Therefore, no adjustments were made to the previous allocation of demands in the model of the existing system.

The City’s parcel shapefile was converted to a point shape format to spatially distribute water meters throughout the model under the premise that each lot within the City limits has one active meter at its geometric centroid. To generate the meter count at each model junction, GIS was used to assign each meter point to its spatially closest junction. The placement of the meters was verified with the meter data spreadsheet provided by the City in October 2021. Manual scrubbing of excessive meter allocations to large areas of empty lots was later performed with the aid of recent, aerial background images. During meter input, each service was cross referenced to the City’s zoning shapefile for a supplemental residential, commercial, and/or industrial marker that would allow later application of specific water demand patterns.

6.4 Demand Patterns in the Model

As described in the 2015 Report, patterns representing customer water use were based on analysis of BPSs that directly serve a primarily residential customer base. It is important that they do not supply a downstream BPS so that they provide a more direct estimate of customers’ water demands at a point in time. Demand patterns relied on the City’s SCADA data for the selected peak and average days. Recall that water demand in the City’s WaterCAD model is calculated based on applying a factor of gpm/LUE to LUEs allocated to nodes in the model rather than applying a unitless factor to a ‘base’ demand. **Figure 6-1** shows the patterns applied for average day to residential LUEs and **Figure 6-2** shows the patterns applied for peak day to residential LUEs in the model.

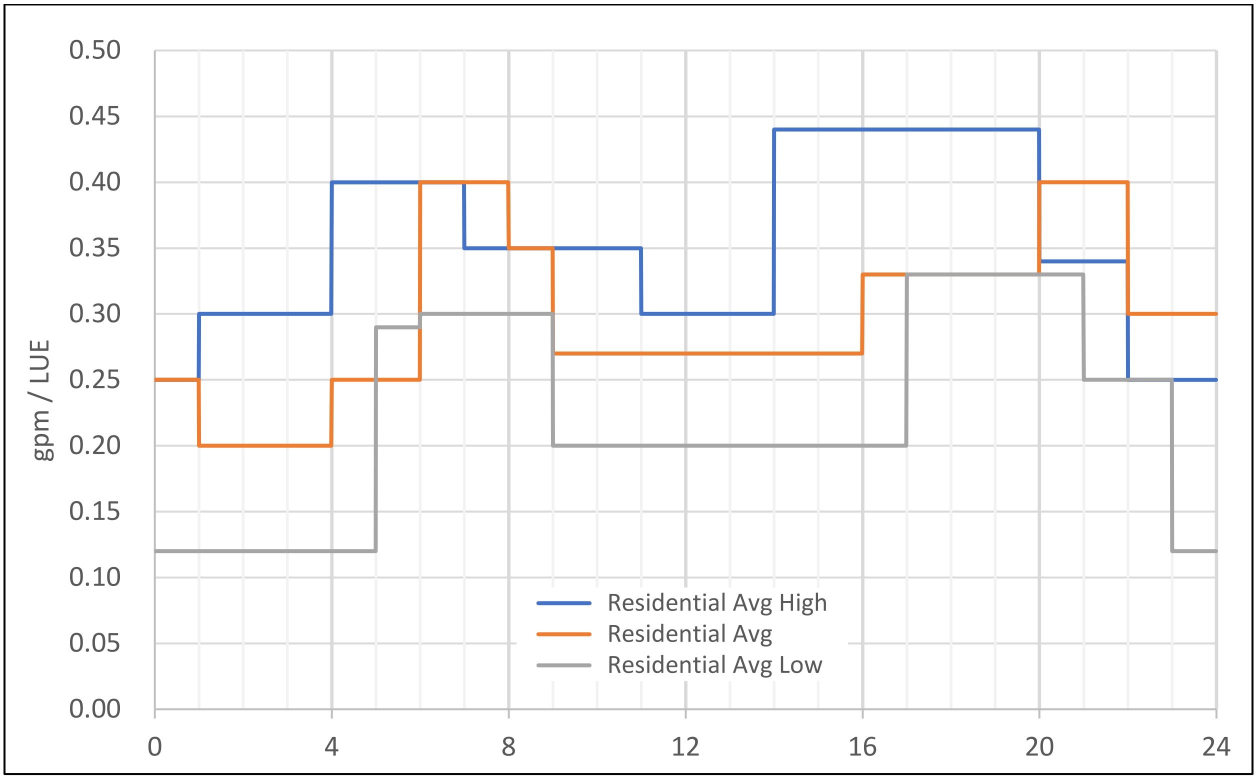


Figure 6-1: Average Day Residential Water Use Patterns

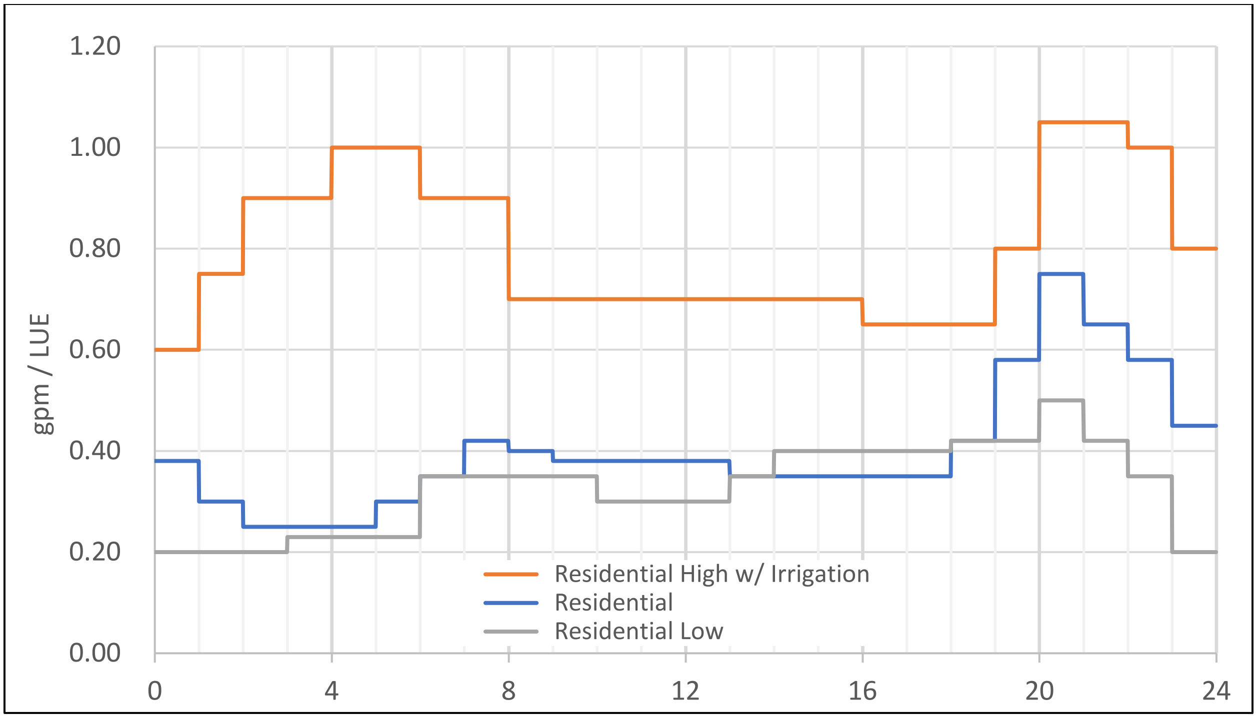


Figure 6-2: Peak Day Residential Water Use Patterns

Significant differences in patterns indicates they should be applied to specific service areas and not uniformly across the water system. The northern part of the City experiences larger demand with tell-tale indications of irrigation occurring during morning and evening hours. See the 2015 Report for additional information regarding development and application of water demand patterns.

For other users including irrigation, industrial, and commercial water demands, patterns are based on expected or commonly encountered patterns for the specific type of water use. LAN did not modify those patterns in the hydraulic model and further applied them to areas that have developed since 2015. **Figure 6-3** shows the patterns applied to non-residential LUEs in the model.

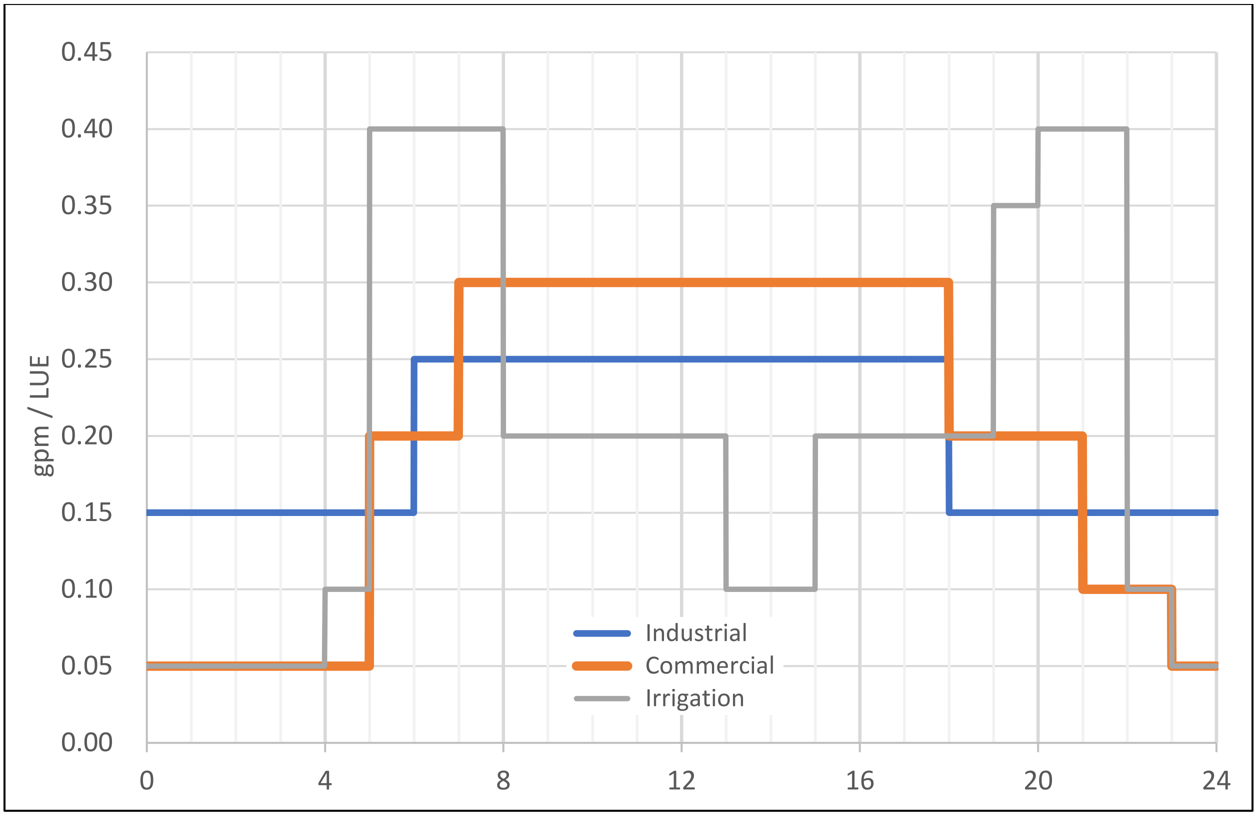


Figure 6-3: Non-Residential Water Use Patterns

The model also includes patterns for the largest users of water in the irrigation, hotel/apartment, and commercial categories. The 2015 Report documents that these "top" users were assigned 576 gal/LUE based on their similarity to the demand pattern for the Sierra Vista BPS. The industrial pattern is one-half this amount (288 gal/LUE) based on their consistently lower demand for water.

To estimate population at a more discrete level within the City of Laredo WUG (compared to Region M's WUG-level projections), LAN used the City's TAZs from the Metropolitan Transportation Plan 2020-2045 Update (MTP). There are 527 TAZs within the planning area. Notable observations from the TAZ projections include that the Lyon BPS area is expected to experience the greatest growth. In addition to Lyon BPs, major growth in the future is anticipated in the southeast part of the City's service area. The service area in which the Jefferson WTP supplies customers directly will experience the least growth.

Finally, demands for large irrigation and commercial users is set at one-half of peak day to account for their seasonal nature. Application of these patterns to the allocated LUEs produces good agreement with the City's recorded peak and average day water use. The City's SCADA data for these days is within 10% of water demand calculated by the hydraulic model. LAN's evaluation of recent data found good agreement with the 2015 Report and use of the water demand patterns as they have been assigned.

6.2 Methodology for Facilities Improvements

The City of Laredo has improvement projects in various stages of planning, design, and construction. Updates to the hydraulic model include these projects. LAN's development of a CIP followed an organized approach to identify projects to address current problem areas with capacity to serve growing demand and future projects to develop a structured system to serve future users.

- Planned spending includes continued repair and replacement of infrastructure at the Jefferson WTP to maintain the existing 65-MGD capacity.
- The City intends to maximize use of capacity at the Jefferson WTP before expanding capacity at the El Pico WTP.
- After reviewing current facilities and their service areas, LAN developed proposed projects to achieve logical growth consistent with the City's plans.
- Development of the transmission/distribution system includes minimizing repumping as much as possible.

Linear Assets

The prioritization for the linear asset renewal was based on work order history, material type, location, and prioritized into five-year groupings for a 15-year CIP recommendation. Age was not considered as a factor in the prioritization as only 10% of mains have an associated installation date listed in the City's GIS. The installation dates range from 1960 to 2019. The Project Team reviewed the City's current CIP to exclude any mains already designated for replacement from the prioritization process. The PCI of roadways associated with the mains was also considered in the selection process as to target those mains in roadways with low PCI scores. Consequently, the average PCI score for the mains selected for renewal was 47. The average PCI score for City roadways is 73, for reference. The mains identified for renewal range from 6- to 24-inches in diameter with most of the material type being listed as cast-iron pipe and are summarized in **Table 6-2.**

Table 6-2: Asset by Material and Linear Quantity

CIP Years	Pipe Material	Length (FT)	Total
1-5	Unknown	18,136	151,772
	AC	4,454	
	CAS	54,435	
	CI	41,789	
	CI; DI	324	
	DI	6,811	
	DIP	4,457	
	PVC	21,366	
6-10	Unknown	13,152	158,329
	CAS	56,163	
	Cast Iron	55	
	CI	47,822	
	CI; DI	1,543	
	DI	7,414	
	DIP	3,527	
	PVC	28,653	
11-15	Unknown	19,373	149,668
	CAS	40,384	
	Cast Iron	7,261	
	Cast Iron	1,278	
	CI	40,420	
	CI; DI	593	
	DI	1,696	
	DIP	1,468	
	PVC	37,195	

*AC = Asbestos Cement Pipe
*CAS = Cast Iron Pipe (Grey)
*CI = Cast Iron Pipe
*DI = Ductile Iron Pipe
*DIP = Ductile Iron Pipe
*PVC = Polyvinyl Chloride Pipe

6.3 Production Facilities

The production facility improvements have been developed with the staff for the ongoing efforts for water quality and optimization of the water system and have been incorporated into this IWMP. A series of assessments of the City's WWTPs, BPSs, GSTs, and ESTs were conducted, and a set of recommended action items were developed to optimize the water system and ultimately, to mitigate the risk of future nitrification occurrences.

6.5.1 Production Facilities Renewal Cost

Providing OPCC in this time has become challenging due to uncertainties in material and supply chain issues. It is anticipated that in the future, these issues may subside but, the cost shown may fluctuate dependent on the final selected period of construction.

All the work described is considered immediate in need; however, not all work can be accomplished within the same period. As a result, the recommendations were split into an estimated timeline to complete. The following are the timelines considered:

The **Table 6-4** below presents a breakdown of the categories, a target for completion, and planning costs.

Table 6-3: Facilities Project Planning

Project	CIP Years	Planning Cost
Tank and BPS Residual Management Systems	1 – 5	$3,500,000
Chlorine Dioxide Improvements JWTP & EPWTP	1 – 5	$3,000,000
Caustic System Improvements JWTP & EPWTP	1 – 5	$800,000
Chlorine Solution Piping Upgrades JWTP & EPWTP	1 – 5	$500,000
CW Baffling at JWTP	1 – 5	$400,000
Chemical Feed Modifications JWTP	1 – 5	$800,000
On-Line Analyzers and System Automation	1 – 5	$2,000,000
Recycle EQ Basin Improvements EPWTP	1 – 5	$3,000,000
Raw Water Pump Replacements EPWTP	1 – 5	$400,000
SCADA & HMI Programming	1 – 5	$1,500,000
WTP Miscellaneous Improvements	1 – 5	$5,000,000
El Pico 40-MGD Expansion	6 – 10	$20,000,000
	Total	

7 Treated Water System Capital Improvement Program

This section of the report describes CIP projects for the water system. The CIP is a tool the City uses to fund major rehab ($10,000 or more) and new facilities ($25,000 or more) that are developed through a process including the Mayor, City Council, and City management. The CIP serves the City's needs, plans, goals, objectives, and vision[16]. These projects include acquisition, construction, and improvement of major equipment, property, facility improvements of public works, facilities, and vehicles.

Critical water system projects as well as previously planned projects and projects in progress were developed and included in a 15-year CIP. The FY 2023 – FY 2033+ CIP is included in **Appendix C**. A project location map is included as **Exhibit 7-1**. The focus of first five years of the CIP (FY 2023 – FY 2027) is to improve the reliability of the existing Laredo water system by delivering water throughout the City with major transmission water line projects and continued positioning for future water supply projects. The second five years CIP ((FY 2028 – FY 2032) continues the focus on the existing water system with transmission and distribution waterlines as well as addressing aging treatment plant and booster pump station improvements. The remaining CIP (FY 2033+) outlines continued renewal of aging infrastructure as well as additional transmission lines that will need to be built for future growth and development or to incorporate additional water supply.

7.1 Aging Infrastructure and System Reliability

Laredo, like many cities, has infrastructure that has been in place for many decades that is too critical to be out of service for repair and inspection. New transmission waterlines provide additional capacity for the system and an opportunity to take major waterlines out of service for repair, inspection, or renewal.

7.1.1 Emergencies

While this master plan was in progress, the City experienced a major waterline rupture on an older transmission line between the Jefferson WTP and the BPS at Lyon. The Lyon BPS provides water to the central and southern parts of the City and to other BPSs further out. The impact of the waterline break compounded once the line repair time exceeded the time that remote tanks and BPSs could operate with water from storage. This in turn caused most of the City to experience low or no water pressure and triggered a TCEQ Boil Water Notice until a temporary bypass could be installed, and the water quality demonstrated to the TCEQ.

7.1.2 New and Renewal Water Transmission Lines

While the master plan already included a new transmission line to replace the Jefferson to Lyon line that ruptured, that replacement line was accelerated with the design to begin in FY 2022 and the construction to follow in FY 2023. Further discussions and reviews with City staff emphasized the desire of the Mayor and City Council to improve the reliability and resilience of

[16] City of Laredo Adopted FY 2022-2026 Capital Improvement Program

the Laredo water system with additional transmission waterline connections between BPSs and from the Jefferson and El Pico WTPs into the City as well. Other projects along Loop 20 and from the MHOC BPS to the Bartlett EST were already in progress and are also included in the FY 2023 – 2027 CIP.

7.1.2.1 Growth

The FY 2028 – 2032 CIP transmission lines continues to fill-in and extend the transmission system across the City and towards planned developments. The FY 2033 and beyond CIP focuses on the construction of an “Outer Loop” transmission line. This project will not only support development but also aid in the reliability of the existing system by continuing to provide alternate transmission line routes for water throughout the City.

7.1.2.2 System Pressure and Supply

In several instances, the growth of the City and development has outpaced the supply or transmission infrastructure and the local water demanded exceeds what the underlying infrastructure system can deliver from the treatment plants. Additional transmission waterlines are needed to bring more water to the regional BPSs and to provide alternate or additional routes throughout the City.

7.1.2.3 Water Age

In some instances, waterlines are built for future development that is slow to materialize. Water systems require regular movement of the water and operate best in a gridded or looped system. Long extension lines that are not connected back to the system and have smaller demands can require regular flushing of the water to maintain the movement of the water and the disinfection residual. New waterlines can be built in some instances to reconnect isolated or low-demand parts of the water system, reducing the water age, and providing additional water supply where demand is higher.

7.1.3 Water Treatment Improvements

While there is existing water treatment capacity to meet the current and projected water demand for the next five years, there are some improvements needed to move that water, once treated, from the Jefferson WTP into the water system. A project to review and update the plant header and yard piping is part of the first five years CIP focus on reliability.

The production facility improvements have been developed with the staff for the on-going efforts for water quality and optimization of the water system and have been incorporated into this IWMP. A series of assessments of the City’s WTPs, BPs, GSTs, and ESTs were conducted and a set of recommended action items to optimize the water system and ultimately, to mitigate the risk of future nitrification occurrences were developed. **Table 7-1** shows the recommended production facilities improvements for the next five years. These were estimated to be $10M per year work packages and are being detailed in a separate water quality study.

Table 7-1: CIP Facility Improvement Timeline

Project	CIP Years
Tank and BPS Residual Management Systems	1 – 5
Chlorine Dioxide Improvements	1 – 5
Caustic System Improvements	1 – 5
Chlorine Solution Piping Upgrades JWTP & EPWTP	1 – 5
CW Baffling at JWTP	1 – 5
Chemical Feed Modifications JWTP	1 – 5
On-Line Analyzers and System Automation	1 – 5
EPWTP Recycle EQ Basin Improvements	1 – 5
EPWTP Raw Water Pump Replacements	1 – 5
SCADA & HMI Programming	1 – 5
WTP Miscellaneous Improvements	1 – 5
El Pico 40 MGD Expansion	6 – 10

7.1.4 Booster Pump Stations

Updating and rehabilitation the BPS are a critical to the effectiveness of the transmission system and are part of the reliability focus for the first five years of the CIP. Returning the Hendricks BPS to service will provide additional water supply storage and pumping for the City's water system close to the Jefferson WTP in partnership with the Lyon plant. There is also a project in the first 5-year CIP to replace existing pumps at MHOC with larger pumps and other improvements to provide both plant capacity and reliability.

7.1.5 Elevated Storage Tanks

When supplied water from the transmission waterlines, the ESTs are an important part of the water system. Water in elevated storage uses gravity to add pressure to the water system. There are TCEQ standards for storage and pressure in water systems, and ESTs are a method to achieve both. In the first five years of the CIP there is a new EST project to maintain the regulatory limits for elevated storage in the airport area and a project to rehabilitate the Northwest EST.

7.1.6 Distribution Line Renewal

In addition to the major treatment and transmission system infrastructure, a historic City like Laredo has a significant amount of distribution or neighborhood waterlines that are approaching the end of their predicted useful life. While this predicted useful life varies, it can range from 30 to 80 years with outliers that last even longer or much shorter.

The City began using a comprehensive database for tracking waterline breaks in 2017. The water distribution line prioritization table in **Appendix D** and the heat map or frequency of breaks map in **Figure 7-1** illustrates the distribution waterline breaks using more intense colors to indicate more line breaks.

The Project Team reviewed existing data, CityWorks data, and conducted various interviews with staff to determine the current renewal needs of the distribution and treatment assets within the City. The prioritization was based on work order history, material type, and location, and prioritized into five-year groupings for a 15-year CIP recommendation.

Figure 7-2 is a planning map assembling the most critical waterlines by CIP five-year grouping.

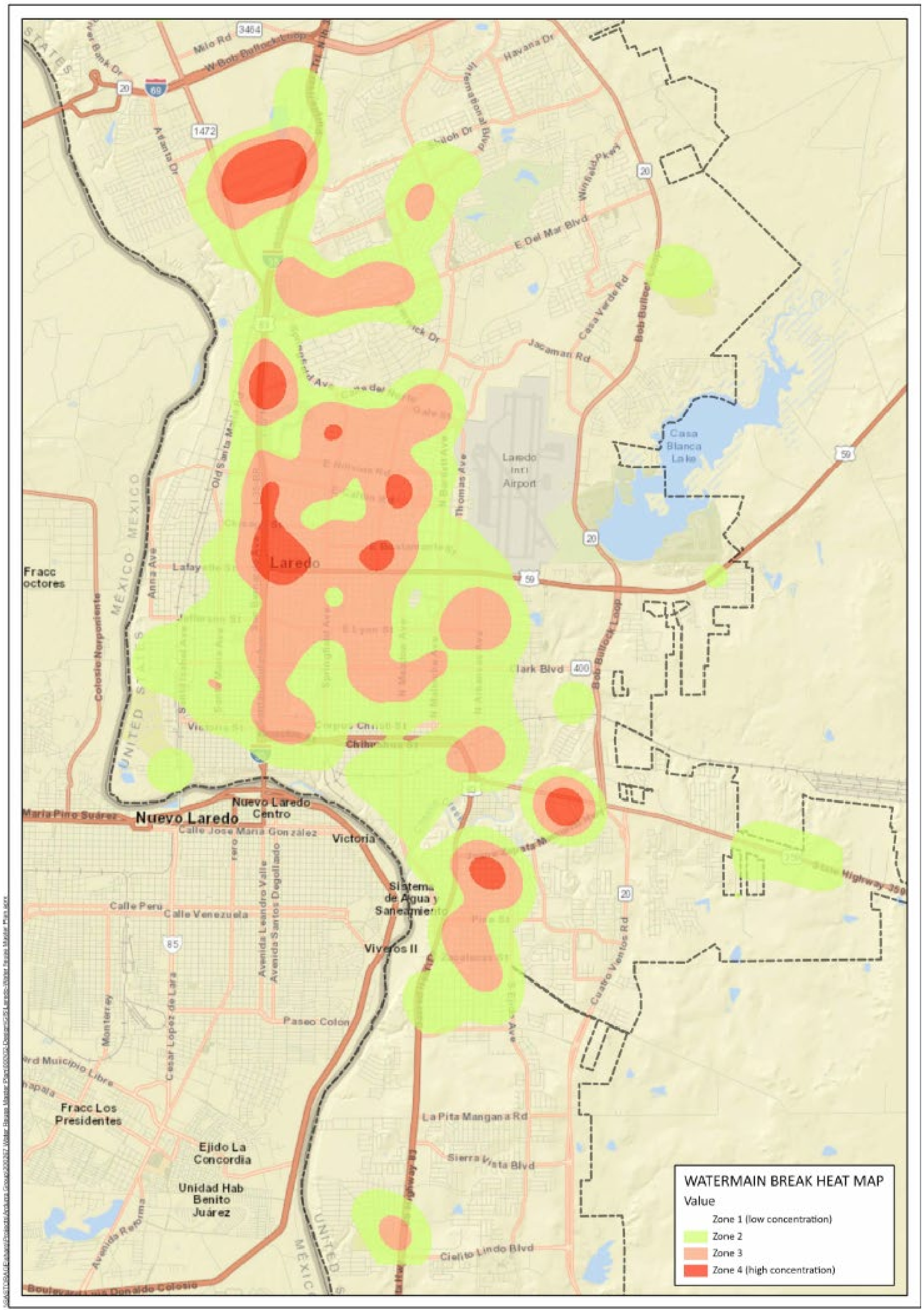


Figure 7-1: 2017 to 2019 Water Line Break Heat Map

Only 10% of waterlines have an installation date listed in the City's GIS. Those installation dates range from 1960 to 2019. The Project Team reviewed the City's current CIP to exclude any waterlines already designated for replacement from the prioritization process. The PCI of roadways associated with the waterlines was also considered in the selection process as to target those waterlines in roadways with low PCI scores. Consequently, the average PCI score for the waterlines selected for renewal was 47. The average PCI score for City roadways is 73, for reference. The waterlines identified for renewal range from 6- to 24- inches in diameter with most of the material type being listed as cast-iron pipe. **Table 7-2** shows the breakdown of renewal needs by five-year groupings and **Figure 7-2** shows the spatial distribution of these renewal needs across the City.

Table 7-2: Asset by Material and Linear Quantity

CIP Years	Pipe Material	Length (FT)	Total
1-5	Unknown	18,136	**151,772**
	AC	4,454	
	CAS	54,435	
	CI	41,789	
	CI; DI	324	
	DI	6,811	
	DIP	4,457	
	PVC	21,366	
6-10	Unknown	13,152	**158,329**
	CAS	56,163	
	Cast Iron	55	
	CI	47,822	
	CI; DI	1,543	
	DI	7,414	
	DIP	3,527	
	PVC	28,653	
11-15	Unknown	19,373	**149,668**
	CAS	40,384	
	Cast Iron	7,261	
	Cast Iron	1,278	
	CI	40,420	
	CI; DI	593	
	DI	1,696	
	DIP	1,468	
	PVC	37,195	

*AC = Asbestos Cement Pipe
*CAS = Cast Iron Pipe (Grey)
*CI = Cast Iron Pipe
*DI = Ductile Iron Pipe
*DIP = Ductile Iron Pipe
*PVC = Polyvinyl Chloride Pipe

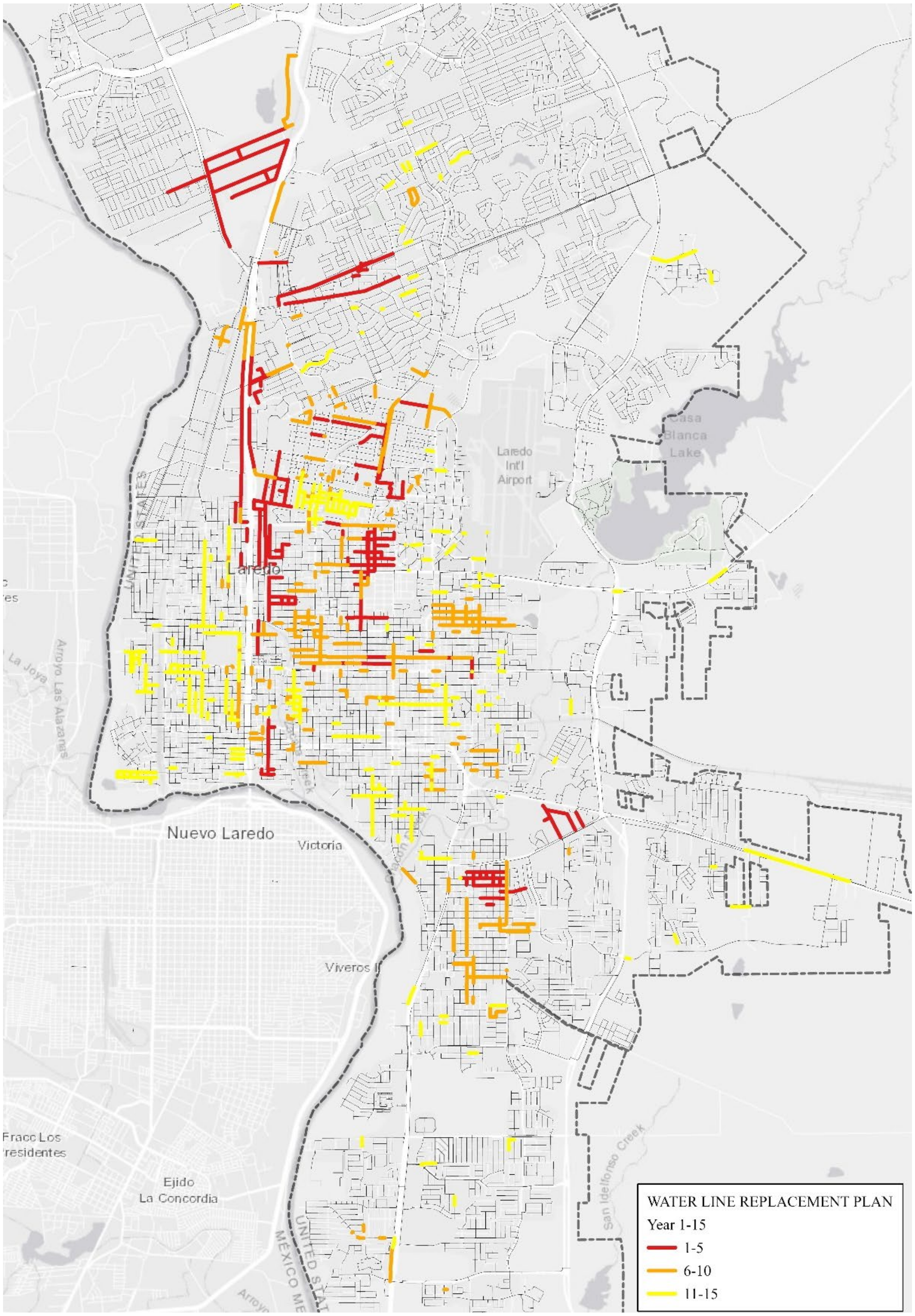


Figure 7-2: Distribution Water Line Renewal Planning Map

7.2 Cost of Recommended Water System Facilities

Providing OPCC has become challenging due to uncertainties in material and supply chain issues. It is anticipated that in the future, these issues may subside but, the planning level costs shown may fluctuate dependent on the final selected period of construction.

7.2.1 Water Supply Studies

As the secondary and emergency water supply studies are critical, on-going, and long-lasting, there are two projects included to perform independent verification of the feasibility and suitability of specific groundwater sites under review. These total nearly half a million dollars but will provide reliable information for decision making.

7.2.2 CIP Projects by Fiscal Year

7.2.2.1 FY 2022 – 2026: $102 M

The Laredo IWMP CIP (FY 2023 - FY 2033+) continues ten existing projects from the ongoing CIP (FY 2022 - 2026). Five projects have already begun but have construction remaining in the first five years: 1) the El Pico regulatory requirement expansion, 2) the Loop 20 waterline, 3) the Loop 20 TXDOT relocation, 4) the Corpus Christi area improvements, and 5) the project to improve pressure in the SH 359/Cuatro Vientos area. These projects total $23 million and are already funded but are included for annual cash flow and project management purposes. The remaining five are annual projects for waterline repair, information technology, water rights, equipment updates and upgrades, and water quality projects. Over the first five years these total $128 million but $102.5 million has already been funded, leaving a $25.6 million balance for FY 2027. An existing and continuing CIP excerpt from the FY 2023 – FY 2033+ CIP is included as **Table 7-3**.

Table 7-3: Projects from FY 2022 – 2026 CIP

Integrated Water Master Plan Capital Improvements FY2023-FY2027

		Project Name	Purpose	FY23			FY24			FY25			FY26			FY27			FY23-FY27
				Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Total Project Cost
every year	A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 10,500,000			$ 10,500,000			$ 10,500,000			$ 10,500,000			**$ 10,500,000**	$ 52,500,000
	B	17-WAT-001 - Water IT Improvement Projects - All	Replace Equipment for Better Monitoring and Control			$ 125,000			$ 125,000			$ 125,000			$ 125,000			**$ 125,000**	$ 625,000
	C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			**$ 2,000,000**	$ 10,000,000
	D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000			**$ 3,000,000**	$ 15,000,000
	E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000			**$ 10,000,000**	$ 50,000,000
FY22 - FY26	F	20-WAT-03 - El Pico 10 MG Expansion	TCEQ Regulatory Requirement						$ 1,500,000										$ 1,500,000
	G	17-WAT-008 - 24" Waterline along Loop 20	Provide Pressure and Flow for South Laredo												$ 5,131,000				$ 5,131,000
	H	20-WAT-02-TXDOT 24" Wtl Reloc LP20/Del Mar	Relocation due to Fwy/Hwy Upgrade						$ 6,000,000										$ 6,000,000
	I	22-WAT-002 - Corpus Christi Water Improvements	Replace Waterlines over 40-years old			$ 4,500,000													$ 4,500,000
	J	22-WAT-003 - 24" Cuatro Vientos Rd. Crossing	Provide Pressure and Flow for SH 359 Area			$ 6,000,000													$ 6,000,000
			Subtotal			$ 36,125,000			$ 33,125,000			$ 25,625,000			$ 30,756,000			**$ 25,625,000**	

7.2.2.2 FY 2023 – 2027: $315M

The focus of first five years of the CIP (FY 2023 – FY 2027) is to improve the reliability of the Laredo water system. The reliability improvements are focused on the transmission lines because the existing system has sufficient water treatment capacity, and the demand network is typically built as part of development. The transmission waterlines move water from the treatment plants to the neighborhoods and service areas for the City but have limited capacity.

Overtime, that capacity is diminished and abnormal demands in one part of the City can cause a regional or system-wide disruption in service. For Laredo, additional water transmission lines will improve the system reliability for most of the water system when emergencies occur, for normal system and pressure, and for some water age concerns.

The FY 2023 – FY 2027 CIP is included as **Table 7-4.** There are over $125 million of existing projects and $189 million of new projects proposed totaling almost $315 million. The FY 2023-2027 CIP category totals are summarized in **Table 7-5**. A project location map is included as **Exhibit 7-2**

Table 7-4: CIP FY 23 to FY 27

City of Laredo - Integrated Water Master Plan Capital Improvements FY2023-FY2027

	Project Name	Purpose	FY23 Acquisition	FY23 Engineering	FY23 Construction	FY24 Acquisition	FY24 Engineering	FY24 Construction	FY25 Acquisition	FY25 Engineering	FY25 Construction	FY26 Acquisition	FY26 Engineering	FY26 Construction	FY27 Acquisition	FY27 Engineering	FY27 Construction	FY23-FY27 Total Project Cost
Existing CIP (FY22-FY26)																		
A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 10,500,000			$ 10,500,000			$ 10,500,000			$ 10,500,000			$ 10,500,000	$ 52,500,000
B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000			$ 125,000			$ 125,000			$ 125,000			$ 125,000	$ 625,000
C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000	$ 15,000,000
E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000	$ 50,000,000
F	20-WAT-03 - El Pico 10 MG Expansion	TCEQ Regulatory Requirement						$ 1,500,000										$ 1,500,000
G	17-WAT-008 - 24" Waterline along Loop 20	Provide Pressure and Flow for South Laredo												$ 5,131,000				$ 5,131,000
H	20-WAT-02-TXDOT 24" Wtl Reloc LP20/Del Mar	Relocation due to Fwy/Hwy Upgrade						$ 6,000,000										$ 6,000,000
I	22-WAT-002 - Corpus Christi Water Improvements	Replace Waterlines over 40-years old			$ 4,500,000													$ 4,500,000
J	22-WAT-003 - 24" Cuatro Vientos Rd. Crossing	Provide Pressure and Flow for SH 359 Area			$ 6,000,000													$ 6,000,000
					$ 36,125,000			$ 33,125,000			$ 25,625,000			$ 30,756,000				
Proposed CIP Projects (FY23-FY27																		
1	Bartlett; MHOC to Bartlett	The Transmission system needs to be expanded to suuply water for the Distribution system to ensure that water is delivered to homes and businesses.		$ 1,000,000	$ 5,773,625													$ 6,773,625
2	JWTP tp Lyon	The Transmission Line from the Jefferson Water Treatment Plant to the Lyon Booster Pump Station is a critical water supply line for most of the City. The line was planned for replacement, but the recent line break has accelerated the project.	$ 1,197,000	$ 1,710,000				$ 17,093,000										$ 20,000,000
3	Looping in Colonias Area	Additional lines for looping in the Colonias will help water quality.	$ 281,000	$ 188,000				$ 2,434,000										$ 2,903,000
4	Hendricks PS Retrofit	Rehab of the Hendricks Booster Pump Station will help the Lyon Booster Pump Statino provide water for South Laredo.					$ 414,000	$ 5,381,000										$ 5,795,000
5	Hendricks to Lyon	The Transmission Line from the Hendricks Booster Pump Station to the Lyon Booster Pump Station will allow the two booster stations to work together to supply South Laredo.					$ 343,000	$ 4,452,000										$ 4,795,000
6	Additional 12" Transmission for Looping	Improved water quality through looping	$ 211,000	$ 703,000							$ 9,136,000							$ 10,050,000
7	Connect Hendricks to mid-sized JWTP extension line	The Hendricks Booster Pump Station can be fed by existing transmission lines from the Jefferson Water Treatment Plant.					$ 994,000				$ 12,914,000							$ 13,908,000
8	Along Loop 20 from Clark Blvd to Hwy 359	Loop 20 WLs ongoing, coordinate with Utiliites							$ 354,000	$ 505,000				$ 6,557,000				$ 7,416,000
9	Along Loop 20 from Hwy 359 to Los Presidentes Ave	Loop 20 WLs ongoing, coordinate with Utiliites							$ 270,000	$ 386,000				$ 5,010,000				$ 5,666,000
10	Along Loop 20 from Bianka Ln to Cielito Lindo Blvd	Extend existing system to accommodate smart growth										$ 365,000	$ 522,000				$ 6,778,000	$ 7,665,000
11	Milmo to Sierra Vista	Transmission system extension for existing system.										$ 569,000	$ 812,000				$ 10,554,000	$ 11,935,000
12	Along various alignments from S Ejido Ave at Bianka Ln to Sierra Vista	Transmission system extension for existing system.	$ 350,000	$ 499,000							$ 6,486,000							$ 7,335,000
13	From Logan Ave and E Lane St to Milmo PS providing add'l water for south Laredo	Transmission system extension for existing system.							$ 663,000	$ 947,000							$ 12,309,000	$ 13,919,000
14	New, larger pumps to provide standby capacity	Booster station improvements for existing system reliability.	$ 150,000	$ 214,000							$ 2,781,000							$ 3,145,000
15	JWTP header and yard piping improvements to allow more flow into the Transmission system	Transmission improvements to use existing production capacity.	$ -	$ 156,000							$ 1,348,000							$ 1,504,000
16	Along Loop 20 in Sierra Vista service area	Transmission system extension for existing system.	$ 57,000	$ 187,000							$ 2,428,000							$ 2,672,000
17	Build new 0.5 MG EST	TCEQ Regulatory Requirement for existing system.	$ 329,000	$ 299,000							$ 3,887,000							$ 4,515,000
18	Recoat existing EST	TCEQ Regulatory Requirement for existing system.							$ -	$ 137,000				$ 1,707,000				$ 1,844,000
19	Along Loop 20 in Milmo service area	Transmission system extension for existing system.										$ 70,000	$ 99,000				$ 1,286,000	$ 1,455,000
20	Phase A of 5 Year Neighborhood waterlines identified for replacement	Replace Waterlines over 40-years old	$ 105,333	$ 701,333				$ 9,115,000	$ 105,333	$ 701,333		$ 105,333	$ 701,333	$ 9,115,000			$ 9,115,000	$ 29,765,000
21	Feasibility Study for Targeted Groundwater Sites	Mid-term Water Supply Independent Verification		$ 200,000														$ 200,000
22	Field Tests for Targeted Groundwater Sites	Mid-term Water Supply Independent Verification		$ 250,000														$ 250,000

	FY23 Acquisition	FY23 Engineering	FY23 Construction	FY24 Acquisition	FY24 Engineering	FY24 Construction	FY25 Acquisition	FY25 Engineering	FY25 Construction	FY26 Acquisition	FY26 Engineering	FY26 Construction	FY27 Acquisition	FY27 Engineering	FY27 Construction	Subtotal
Proposed CIP TOTAL	$ 2,680,333	$ 6,107,333	$ 5,773,625	$ -	$ 1,751,000	$ 38,475,000	$ 1,392,333	$ 2,676,333	$ 38,980,000	$ 1,109,333	$ 2,134,333	$ 22,389,000	$ -	$ -	$ 65,667,000	$ 189,135,625
Existing CIP Total	$ -	$ -	$ 36,125,000	$ -	$ -	$ 33,125,000	$ -	$ -	$ 25,625,000	$ -	$ -	$ 30,756,000	$ -	$ -	$ -	$ 125,631,000
TOTAL	$ 2,680,333	$ 6,107,333	$ 41,898,625	$ -	$ 1,751,000	$ 71,600,000	$ 1,392,333	$ 2,676,333	$ 64,605,000	$ 1,109,333	$ 2,134,333	$ 53,145,000	$ -	$ -	$ 65,667,000	$ 314,766,625

Table 7-5: FY 2023 - 2027 CIP Summary

Project Category	5-year budget	% of Total
Existing Projects	$125,631,000	40%
Annual Projects *(one additional year)*	$25,625,000	8%
Transmission	$116,492,625	37%
Distribution	$29,625000	9%
Boosters and Tanks	$15,299,000	5%
Treatment and Supply	$1,954,000	1%
Total	**$314,766,625**	**100%**

Transmission and Looping Lines: $117M

Fourteen of the 22 projects for the first five years of the CIP are transmission waterlines or looping projects and total nearly $117 million out of the $189 million proposed. The twelve transmission waterline projects connect water storage across the City:

- MHOC BPS to the Bartlett EST
- Jefferson WTP to the Lyon BPS
- Jefferson WTP to the Hendricks BPS
- Hendricks BPS to the Lyon BPS
- Hendricks/Lyon BPSs to Milmo
- Milmo to Sierra Vista
- Five projects along Loop 20 bringing water further south, and Loop 20 / Cuatro Vientos to Sierra Vista

The two transmission line projects help provide additional looping in the service area like those along SH 359 and in the Colonias.

The general planning paths of the transmission and looping line projects are shown in **Exhibits 7-1** and **7-2**.

Distribution Lines: $30M

Approximately $30 million is proposed to accelerate the ongoing renewal of distribution or neighborhood waterlines. The waterline breaks were reviewed and used to prioritize replacements but will be further defined and scheduled as specific neighborhood waterline projects.

Booster Pump Stations and Elevated Storage Tanks: $15M

The Hendricks BPS is a critical component of the transmission system to back-up the Lyon plant. The MHOC improvements will also help provide system reliability in the first five years. These improvements total almost $9 million.

To study, repair, and rehabilitate the existing Northwest EST and to build a new EST in the airport area totals more than $6 million.

Water Treatment and Supply: $2M

The improvements to move the water from Jefferson WTP into the system is $1.5 million and the targeted groundwater supply studies are $450,000.

7.2.2.3 FY 2028 – 2032: $312M

The second five years of the CIP (FY 2028 – FY 2033) continue the reliability improvements. The FY 2028 – FY 2032 CIP is included as **Table 7-6.** A project location map is included as **Exhibit 7-3**

The annual waterline rehabilitation and contingency line break projects were reduced from $10 million per year to $2 million per year for the second five years as the neighborhood waterline renewal program projects were accelerated. The other annual projects for information technology, water rights, equipment updates and upgrades, and water quality projects were kept the same making the second five years total $85.6 million. An excerpt from the FY 2023 – FY 2033+ CIP illustrating this is included as **Table 7-7**

The annual projects along with more than $225 million of proposed projects total of approximately $312 million.

The FY 2028-2032 CIP category totals are summarized in **Table 7-8**.

7.2.2.4 FY 2033 and beyond: $522 M

The CIP for FY 2033 and beyond is included as **Table 7-9**. A project location map is included as **Exhibit 7-4**

The annual projects for waterline rehabilitation and contingency line breaks, information technology, water rights, equipment updates and upgrades, and water quality projects were continued at the FY 2028 - 2032 rates totaling $17.1 million per year.

Some of the projects that began in FY 2028 - 2032 will not be constructed until FY 2033 or later and total $42.6 million.

The annual projects, along with approximately $462 million of proposed projects, total approximately $522 million.

The FY 2028 - 2032 CIP category totals are summarized in **Table 7-10**.

Table 7-6: CIP FY 28 to FY 32

City of Laredo - Integrated Water Master Plan Capital Improvements FY2028-FY2032

	Project Name	Purpose	FY28			FY29			FY30			FY31			FY32			FY28-FY32
			Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Total Project Cost
A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000			$ 125,000			$ 125,000			$ 125,000			$ 125,000	$ 625,000
C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000	$ 15,000,000
E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000	$ 50,000,000
	LAN Proposed CIP Projects (FY28-FY32)																	
23	SlipLine existing 36" Line from JWTP to Lyon	Additional Transmission line from Jefferson to Lyon Booster Pump Station					$ 1,273,000				$ 12,727,000							$ 14,000,000
24	JWTP to Quick Line Extension	Increased Capacity from Jefferson to Hendricks											$ 596,000	$ 7,741,000				$ 8,337,000
25	Cuatro Vientos PS (Sports Complex) Supply and initial distribution pipes	Regional Booster Pump Station and Connections	$ 629,000	898000				11666000										$ 13,193,000
26	Along Clark Blvd (or similar alignment) from Lyon PS to Clark	Transmission system extension for existing system.	962000	1374000				17858000										$ 20,194,000
27	La Pita Mangana Rd from Loop 20 to CV PS and Outer Loop	Transmission system extension for existing system.				$ 364,000	$ 520,000				$ 6,752,000							$ 7,636,000
28	Along Mines Rd at Santa Isabel Ck to control high pressures	Improve LOS to far north Mines Rd by eliminating in-line PRV				83000	276000				3584000							$ 3,943,000
29	Along I-35 from existing 60" water line to Unitec and other	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems				$ 502,000	$ 718,000				$ 9,324,000							$ 10,544,000
30	Along I35 from Mines Rd to Tejas Loop	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems				$ 44,000	$ 144,000				$ 1,866,000							$ 2,054,000
31	Along McPherson from EST to Shiloh Dr to allow EST to supply lower	Low Pressure (LOS), allow McPherson EST to serve low elevations to NW							$ 17,000	$ 54,000				$ 702,000				$ 773,000
32	International Blvd crossing Loop 20 to improve conveyance and nearby	Reliability, better supply to distribution system, improved system operation and service area control							$ 202,000	$ 289,000				$ 3,747,000				$ 4,238,000
33	Along Hwy 359 BPS service area for system interconnection and	Increase supple and pressure, in the Hwy 359 / HS area							$ 67,000	$ 222,000				$ 2,882,000				$ 3,171,000
34	Future Bianka Ln from Gabriela Ln to Loop 20	Connect existing and future system, provide loop, reliability/reduce down-time										$ 8,000	$ 26,000				$ 330,000	$ 364,000
35	Future Wormser Rd from Ave Mexico to Loop 20	Reliability, connect existing and proposed WLs										$ 3,000	$ 10,000				$ 127,000	$ 140,000
36	Along Loop 20 from Cielito Lindo Blvd to future road with existing	Extend existing system to accommodate smart growth										$ 73,000	$ 241,000				$ 3,129,000	$ 3,443,000
37	Phase B of 5 Year Neighborhood waterlines identified for	Replace Distribution waterlines over 40-years old	$ 345,000	$ 2,299,000				$ 29,881,000										$ 32,525,000
38	Neighborhood waterlines identified for replacement	Replace Distribution waterlines over 40-years old				$ 638,000	$ 4,250,000				$ 55,240,000							$ 60,128,000
39	Region M Reuse Phase 1	Mid-long term supply development											$ 7,120,000				$ 20,683,440	$ 27,803,440
40	Rio Bravo Interconnect	Mid-long term supply development and emergency connection	$ 278,000	$ 555,000	$ 7,205,000													$ 8,038,000
41	Future Ejido from St Luke Blvd to Future Road	Extend existing system in South Laredo													$ 59,000	$ 196,000		$ 255,000
42	Along I35 fron San Lorenzo Dr, then along I69-W to Sandia Dr.	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems													$ 99,000	$ 328,000		$ 427,000
43	Along I-35 from Mercury Dr to HUPS	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.													$ 280,000	$ 399,000		$ 679,000
44	Along I-35 from HUS to Border Dr	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.													$ 399,000	$ 570,000		$ 969,000
45	Along I-35 from Loop 20 to existing 60" water line	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems													$ 950,000	$ 1,357,000		$ 2,307,000
46	MHOC PS to McPherson parallel/replacement capacity to	Supplement / replace existing 24" WL													$ 302,000	$ 431,000		$ 733,000
			FY28			**FY29**			**FY30**			**FY31**			**FY32**			**Subtotal**
			Acquisition	**Engineering**	**Construction**	**Acquisition**	**Engineering**	**Construction**	**Acquisition**	**Engineering**	**Construction**	**Acquisition**	**Engineering**	**Construction**	**Acquisition**	**Engineering**	**Construction**	
		Proposed CIP TOTAL	**$ 2,214,000**	**$ 5,126,000**	**$ 24,330,000**	**$ 1,631,000**	**$ 7,181,000**	**$ 76,530,000**	**$ 286,000**	**$ 565,000**	**$ 106,618,000**	**$ 84,000**	**$ 7,993,000**	**$ 32,197,000**	**$ 2,089,000**	**$ 3,281,000**	**$ 41,394,440**	**$ 311,519,440**

Table 7-7: Annual Projects FY 2028 through FY 2032

City of Laredo - Integrated Water Master Plan Capital Improvements FY2028-FY2032

Prepared by Lockwood, Andrews & Newnam, Inc.

		Project Name	Purpose	FY28			FY29			FY30			FY31			FY32			Total Project
				Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	
Annual Projects																			
every year	A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
	B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000			$ 125,000			$ 125,000			$ 125,000			$ 125,000	$ 625,000
	C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
	D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000	$ 15,000,000
	E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000	$ 50,000,000
						$17,125,000			$17,125,000			$17,125,000			$17,125,000			$17,125,000	$85,625,000

Table 7-8: FY 2028-2032 CIP Summary

Project Category	5-year budget	% of Total
Annual Projects	$85,625,000	27%
Transmission	$97,400,000	31%
Distribution	$92,653,000	30%
Treatment and Supply	$35,841,440	12%
Total	**$311,519,440**	**100%**

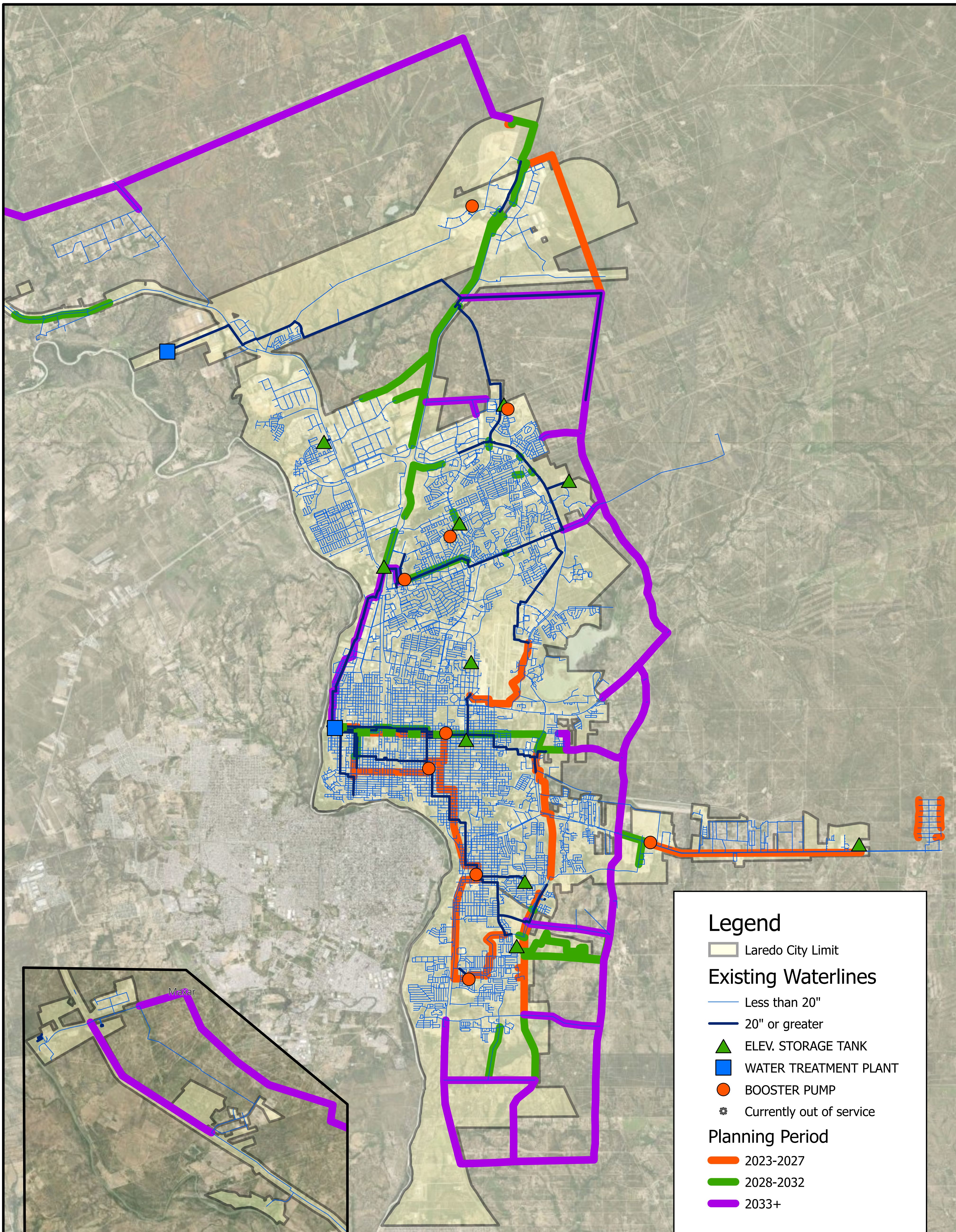
Table 7-9: CIP FY 33+

City of Laredo - Integrated Water Master Plan Capital Improvements — FY2033+

	Project Name	Purpose	FY 2033+ Acquisition	FY 2033+ Engineering	FY 2033+ Construction	FY33+ Total/Annual Project Cost
A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 2,000,000	$ 2,000,000
B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000	$ 125,000
C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000	$ 2,000,000
D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000	$ 3,000,000
E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000	$ 10,000,000
39	Region M Reuse Phase 1	Mid-long term supply development				
40	Rio Bravo Interconnect	Mid-long term supply development and emergency connection				
41	Future Ejido from St Luke Blvd to Future Road	Extend existing system in South Laredo			$ 2,538,000	$ 2,538,000
42	Along I35 fron San Lorenzo Dr, then along I69-W to Sandia Dr.	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems			$ 4,264,000	$ 4,264,000
43	Along I-35 from Mercury Dr to HUPS	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.			$ 5,185,000	$ 5,185,000
44	Along I-35 from HUS to Border Dr	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.			$ 7,404,000	$ 7,404,000
45	Along I-35 from Loop 20 to existing 60" water line	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems			$ 17,640,000	$ 17,640,000
46	MHOC PS to McPherson parallel/replacement capacity to	Supplement / replace existing 24" WL			$ 5,600,000	$ 5,600,000
	LAN Proposed CIP Projects (FY33 & Beyond)					
47	Along US 59 from Wilson Rd to Outer	Connect existing and future system, provide loop, reliability/reduce down-time	$ 58,000	$ 191,000	$ 2,481,000	$ 2,730,000
48	Along Clark Rd from Loop 20 to Outer	Transmission system extension for existing system.	$ 454,000	$ 649,000	$ 8,430,000	$ 9,533,000
49	Clark Blvd PS	development.	$ 2,348,000	$ 2,134,000	$ 27,739,000	$ 32,221,000
50	Outer Loop from US-59 to Clark PS	Extend future service. Maintain coordinated, looped system	$ 1,336,000	$ 1,215,000	$ 15,788,000	$ 18,339,000
51	Outer Loop from Hwy 359 to eastward	Extend future service. Maintain coordinated, looped system	$ 2,372,000	$ 2,157,000	$ 28,033,000	$ 32,562,000
52	Outer Loop from Clark PS to Hwy 359	Extend future service. Maintain coordinated, looped system	$ 1,131,000	$ 1,028,000	$ 13,364,000	$ 15,523,000
53	Future Cielito Lindo Blvd from Loop 20	System reliability, improve service to South Laredo, and serve future development.	$ 92,000	$ 307,000	$ 3,984,000	$ 4,383,000
54	Along extension of Crepusculo Rd fron	Connect existing and future system, provide loop, reliability/reduce down-time	$ 46,000	$ 153,000	$ 1,980,000	$ 2,179,000
55	Along future extension of Lomas Del S	Connect existing and future service areas to maximize reliability	$ 246,000	$ 351,000	$ 4,553,000	$ 5,150,000
56	Outer Loop from I-35 to extension of S	Extend future service. Maintain coordinated, looped system	$ 4,096,000	$ 3,724,000	$ 48,404,000	$ 56,224,000
57	Along Del Mar from Loop 20 to Outer	Connect existing system and future OL TL, provide support from El Pico.	$ 213,000	$ 304,000	$ 3,942,000	$ 4,459,000
58	Along Mines Rd from Pinto Valle Ind'l	Provide service along Mines Road	$ 183,000	$ 609,000	$ 7,907,000	$ 8,699,000
59	Future road from 83 to Ejido	Extend system to future South Laredo	$ 53,000	$ 176,000	$ 2,281,000	$ 2,510,000
60	Future road from Ejido to Loop 20	Extend system to future South Laredo	$ 56,000	$ 186,000	$ 2,408,000	$ 2,650,000
61	Along US 83 from Don Camilo Blvd to	Extend service to future S Laredo, provide major arterials (backbone)	$ 71,000	$ 237,000	$ 3,075,000	$ 3,383,000
62	Outer Loop from Cielito Lindo Blvd to	Extend future service. Maintain coordinated, looped system	$ 718,000	$ 1,026,000	$ 13,330,000	$ 15,074,000
63	Outer Loop from extension of Simon B	Extend future service. Maintain coordinated, looped system	$ 563,000	$ 512,000	$ 6,647,000	$ 7,722,000
64	Along Loop 20 from future road with e	Extend existing system to accommodate smart growth	$ 107,000	$ 356,000	$ 4,618,000	$ 5,081,000
65	Along future road at south edge of ser	Extend service to future S Laredo, provide major arterials (backbone)	$ 660,000	$ 942,000	$ 12,240,000	$ 13,842,000
66	Along US 83 from Fut-1 to south of Ma	Extend service to future S Laredo, provide major arterials (backbone)	$ 108,000	$ 360,000	$ 4,671,000	$ 5,139,000
67	Neighborhood waterlines identified fo	Replace Distribution waterlines over 40-years old	$ 588,000	$ 3,916,000	$ 50,898,000	$ 55,402,000
68	MHOC parallel/replacement from I35	High velocity, increase JWTP supply to MHOC	$ 137,000	$ 195,000	$ 2,527,000	$ 2,859,000
69	Northern Loop along future roads fro	Extend future service, maintain looped system	$ 1,537,000	$ 2,195,000	$ 28,532,000	$ 32,264,000
70	Along future roads Las Tiendas Rd to	Extend future service, maintain looped system	$ 454,000	$ 1,513,000	$ 19,663,000	$ 21,630,000
71	Outer Loop from extension of Crepus	Extend future service. Maintain coordinated, looped system	$ 1,239,000	$ 1,127,000	$ 14,641,000	$ 17,007,000
72	Future development bet I35 and SINE	Extend service, provide looping	$ 87,000	$ 290,000	$ 3,763,000	$ 4,140,000
73	Outer Loop from San Ignacio Rd to US	Extend future service. Maintain coordinated, looped system	$ 2,877,000	$ 2,615,000	$ 33,995,000	$ 39,487,000
74	Cuatro Vientos PS Tank and Pumps Ex	Expand Transmission Booster Pump Station for reliable and extended service.	$ 225,000	$ 321,000	$ 4,170,000	$ 4,716,000
75	Region M Reuse Phase 2	Long term supply development		$ 9,185,000	$ 27,740,000	$ 36,925,000
			FY33+ Acquisition	FY33+ Engineering	FY33+ Construction	Subtotal
		Proposed CIP TOTAL	**$ 22,055,000**	**$ 37,974,000**	**$ 461,560,000**	**$ 521,589,000**

Table 7-10: FY 2033+ CIP Summary

Project Category	5-year budget	% of Total
Annual Projects	$85,625,000	27%
Transmission	$97,400,000	31%
Distribution	$92,653,000	30%
Treatment and Supply	$35,841,440	12%
Total	**$311,519,440**	**100%**



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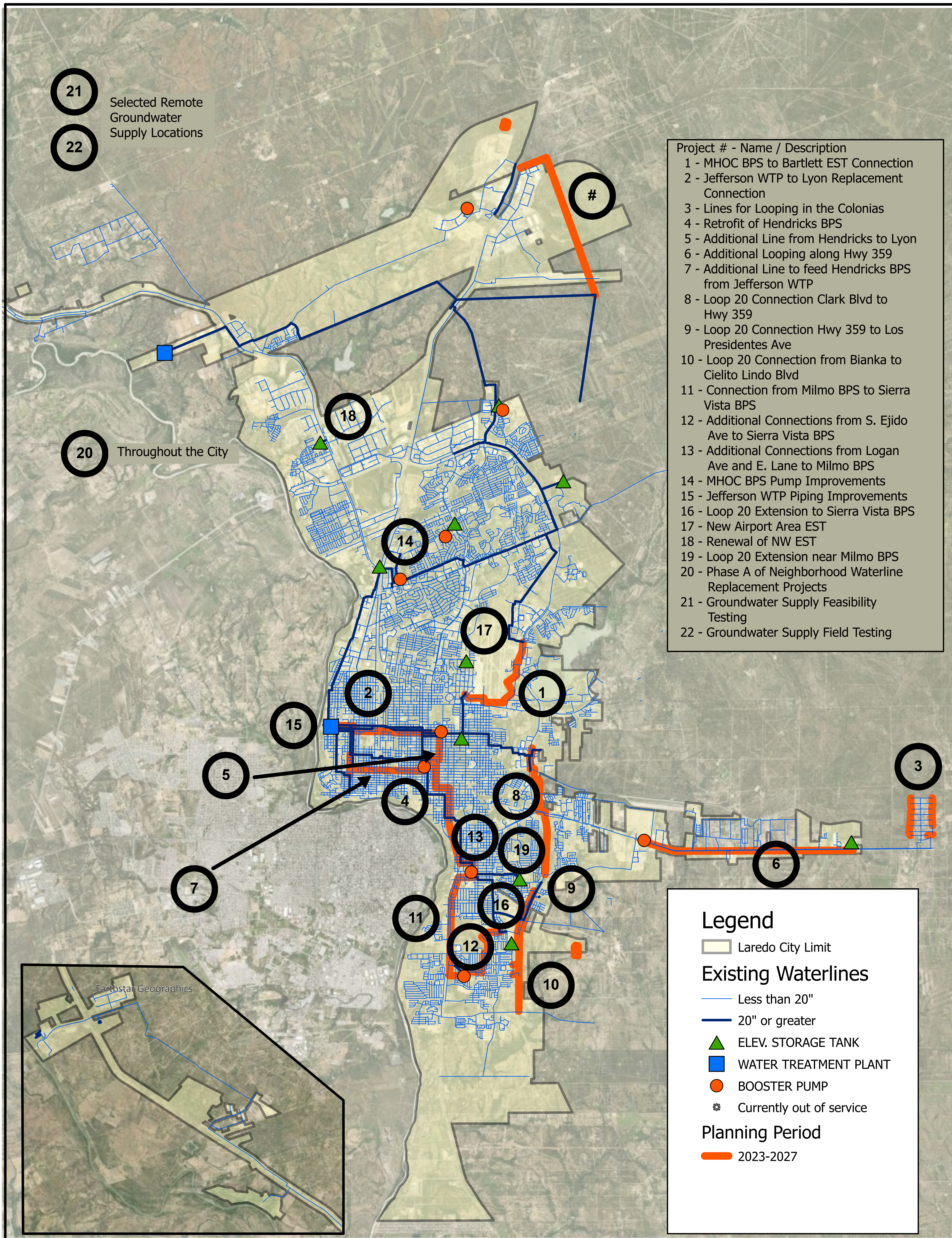
WATER SYSTEM
CAPITAL IMPROVEMENT PROJECTS 2023-2033+

City of Laredo Integrated Water Master Plan

EXHIBIT 7-1



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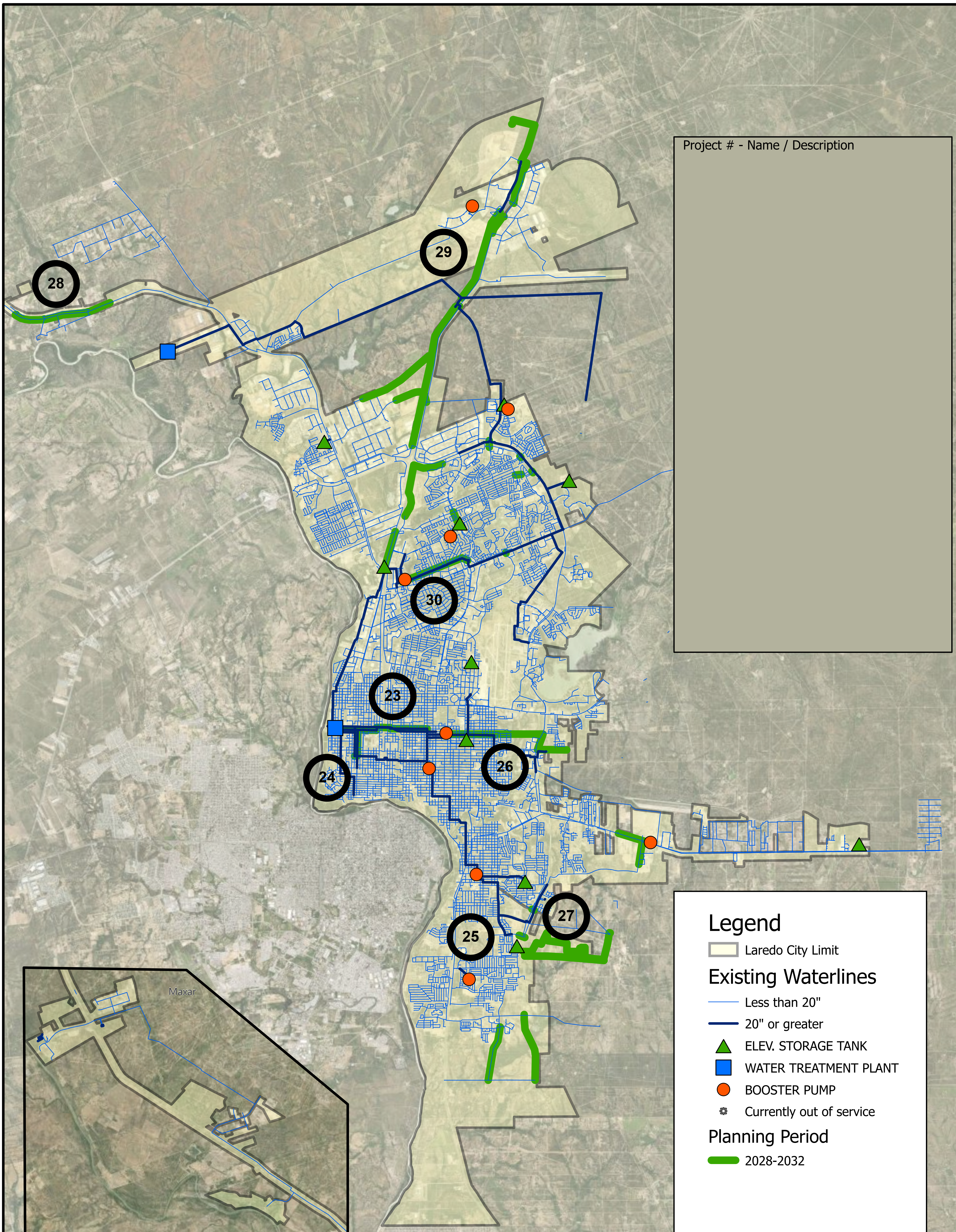
WATER SYSTEM
CAPITAL IMPROVEMENT PROJECTS 2023-2027

City of Laredo Integrated Water Master Plan

EXHIBIT 7-2



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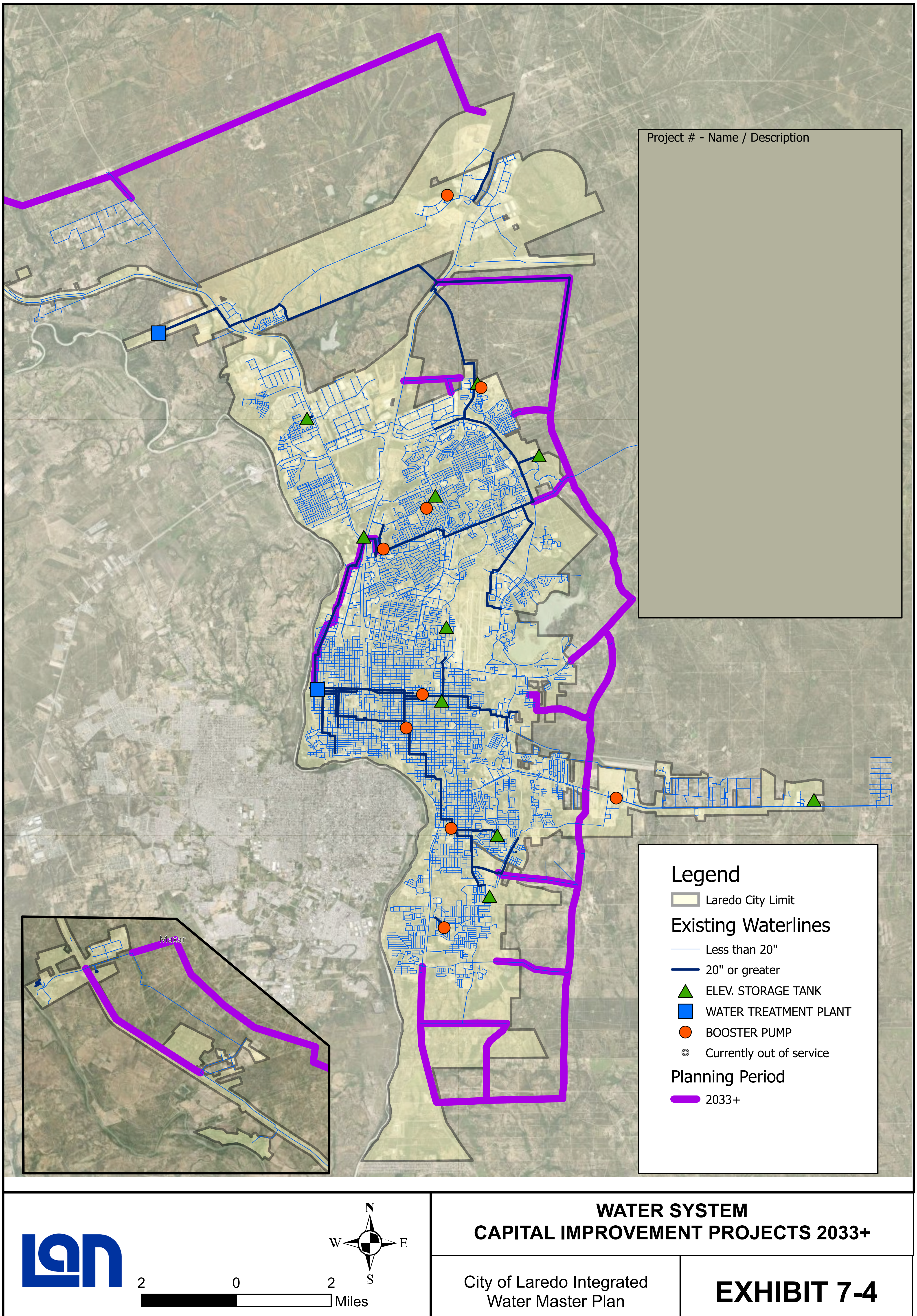
WATER SYSTEM
CAPITAL IMPROVEMENT PROJECTS 2028-2032

City of Laredo Integrated
Water Master Plan

EXHIBIT 7-3



WATER SYSTEM
CAPITAL IMPROVEMENT PROJECTS 2033+

City of Laredo Integrated Water Master Plan

EXHIBIT 7-4

8 Impact Fees

8.1 Introduction

LAN used the 10-year water CIP and land use assumptions to determine maximum allowable impact fees for reimbursement of water infrastructure. All Texas cities must follow Texas Local Government Code, Chapter 395 procedures to create and implement impact fees. Chapter 395 defines an impact fee as a “charge or assessment imposed by a political subdivision against a new development in order to generate revenue for funding or recouping the costs of capital improvements or facility expansions necessitated by and attributable to the new development.”

The Texas Local Government Code, Chapter 395, §052 requires a political subdivision imposing an impact fee to update land use assumptions and CIPs at least every five years. The planning period for this impact fee assessment is the 10-year period from 2023 to 2033.

To determine the maximum allowable impact fee, the cost of the infrastructure being used by growth in the next 10 years is divided by the number of new SUE added in the next 10 years (also shown in the equation). Chapter 395 of the Texas Local Government Code defines a service unit as “a standardized measure of consumption attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards and based on historical data and trends applicable to the political subdivision in which the unit of development is located during the previous 10 years.”

$$Maximum\ Allowable\ Impact\ Fee = \frac{Cost\ of\ Infrastructure\ Utilized\ by\ 10\ Year\ Growth}{10\ Year\ SUE\ Growth}$$

8.1.1 Cost of Infrastructure Utilized by 10-Year Growth

The 10-year (2020-2030) CIP includes master plan infrastructure in the areas of the City where development and increase of usage of the existing system is expected in the next 10 years. The CIP is detailed in prior sections of this report and can be seen in **Appendix C.** The impact fee also includes existing infrastructure in operation that was built and sized to serve future growth.

Detailed cost estimates and unit costs for the existing and 10-year CIP assets are provided in **Appendix F**. The OPCC were developed based on actual construction costs for similar sized projects in Laredo or neighboring cities. The estimates include the following items:

- Price per linear foot per inch-diameter for transmission and distribution waterlines
- Price per volume for storage tank type
- Price per flowrate for pump stations
- Price per volume for treatment plants

An impact fee can only include the capital improvement costs attributable to that portion of capacity used by new development within the 10-year planning period. The infrastructure utilization is defined in the following equation.

$$New\ Development\ Utilization\ (\%) = \frac{10\ Year\ Flow - Existing\ Flow}{Buildout\ Flow}$$

As an example, assume a 1- MG storage tank is needed to accommodate future demands. The pressure plane using the storage tank is only using 10% of its ultimate capacity and will be 30% built out in 2030. Therefore, only 20% of the total cost of the storage tank is eligible for the impact fee.

The model which was used to develop the master plan and CIP infrastructure was also used to determine the flowrates through the infrastructure at the different time steps to determine the utilization percentage. Utilization percentages were determined for every pipe, pump, tank, and plant. The utilization percentages are available as part of **Appendix F** which details model data outputs and referenced reports.

The total cost of the infrastructure proportional to its utilization for the growth in the next 10 years is eligible for inclusion in the impact fee calculation. **Table 8-1** shows the eligible costs of the existing and CIP water projects. **Appendix F** includes the eligible cost for pipelines, pumps, tanks, and treatment plants attributable to new development in the City.

Table 8-1: Eligible Project Cost Summary

Infrastructure	Total Project Costs	Eligible Project Costs
Pipes	$546,510,609	$274,737,970
Pumps	$15,400,000	$10,484,971
Tanks	$23,600,00	15,939,537
El Pico Expansion	-	**$1,500,00**

8.1.2 10-Year SUE Growth

The approved land use assumptions used for the CIP are also used to determine the maximum allowable impact fee. Land use assumptions for the purposes of an impact fee study are defined as descriptions of the service area and projections of changes in land uses, densities, intensities, and population in the service area given the 10-year planning period. **Table 8-2** shows the anticipated growth projections for the City of Laredo.

Table 8-2: Population and Growth Rate Projections

Year	2020	2030	2040	2050	2060	2070
Population	301,124	372,380	440,247	502,142	560,482	613,020
Population Growth Rate	-	2.4%	1.8%	1.4%	1.2%	0.9%
Households	80,734	103,161	126,864	-	-	-
Employment	109,991	133,613	166,083	-	-	-

Source: Texas Water Development Board & 2020 U.S. Census

The growth rate of Laredo for households and employments is applied to the growth of SUEs for the impact fee calculation. The number of residential services is related to the increase of households in the City, and the number of commercial services is related to the increase of employment. These projections are derived from the *2020 Laredo Metropolitan Transportation Plan*, and can be referenced in **Appendix H**. The base service unit for the purposes of water impact fee studies is a water service connection to a single-family residence. In Laredo, a 3/4-inch water meter is currently used for single-family residences and will be used as the base meter size for the duration of this study. LAN established from data received by the City, that any meter size over 3/4-inch is considered commercial land use. The consumption attributable to other land use types can be related to a single-family residence by a comparison of the water meter size required to serve the particular uses.

Table 8-3 shows standard water meter sizes and their maximum operating capacities as established by the manufacturer specifications, respectively. The water meter data, provided by the City, can be referenced in **Appendix G**, and was used to determine the number of existing meters.

Table 8-3 also shows the ratio of each meter's capacity to a 3/4-inch meter's capacity, also known as a SUE factor. Chapter 395 of the Texas Local Government Code defines a service unit as "a standardized measure of consumption attributable to an individual unit of development calculated in accordance with generally accepted engineering or planning standards and based on historical data and trends applicable to the political subdivision in which the unit of development is located during the previous 10 years." This factor is used to relate the demand attributable to service units with larger water meters to the demand of a single-family residence, which is the base service unit. For instance, an industrial facility with an 8-inch meter has the potential of using 90 times as much water as a single-family residence, and thus counts as 90 service units. A single-family residence counts as a single service unit.

Table 8-3: Service Unit Equivalents

Meter Size (Inches)	Meter Type	Maximum Capacity (gpm)	Ratio to 3/4" Meter (SUE)	Existing Meters	Existing SUEs	Projected 2030 Meters	Projected 2030 SUEs
5/8	Turbine	20	0.67	65,138	43,425	83,233	55,488
3/4	Turbine	30	1	11,562	11,562	14,774	14,774
1	Turbine	50	1.67	1,998	3,330	2,484	4,139
1 1/2	Turbine	125	4.17	1,141	4,754	1,418	5,910
2	Compound	160	5.33	1,021	5,445	1,269	6,769
3	Compound	400	13.3	248	3,307	308	4,110
4	Compound	800	26.7	40	1,067	50	1,326
6	Compound	1600	53.3	15	800	19	994
8	Compound	2700	90	2	180	2	224

Table 8-4 shows the existing and 2030 SUE count for each region noted as commercial or residential. Existing development is not expected to redevelop in the future.

Table 8-4: SUE Counts

Land Use	2020 Existing SUE Counts	2030 Projected SUE Counts	2020-2030 SUE Increase
Commercial	18,883	23,472	4,589
Residential	54,987	70,262	15,275
Total	**73,870**	**93,734**	**19,864**

8.2 Water Impact Fees

The impact fee for each infrastructure system is calculated by dividing the eligible cost of the capital improvements by the increase of service units from projected new development during the study period. The calculated maximum adjusted water impact fee of $15,237 for a standard service unit (a 3/4-inch meter) can be viewed in **Table 8-5**.

The impact fee analysis must also include a schedule that reduces the maximum fee by the amount of utility service revenues or ad valorem taxes allocated to capital improvements. A credit of 50% can be applied to the eligible CIP cost to estimate this discount. **Table 8-5** shows the adjusted maximum water impact fee with the 50% credit applied.

Table 8-5: Adjusted Water Maximum Impact Fees

Land Use	Total Eligible Costs	Total 2020-2030 SUE Increase	Maximum Impact Fee	Adjusted Maximum Impact Fee
Commercial	$302,668,479	19,864	$15,237	$7,619
Residential				

8.3 Comparison of Local Impact Fees

Table 8-6 and **Figure 8-1** show the actual impact fees by other Texas municipalities for their base meter size. The source data for the municipalities shown can be referenced in **Appendix I**. The City fee reflects the values with the 50% adjustment.

Table 8-6: Potential Regional Impact Fee Comparison

Municipality	Population	Water Impact Fee	Base Meter Size
Laredo	*261,639*	*$7,619*	*3/4"*
Brownsville	186,738	$1,250	1"
Harlingen	65,436	$2,900	1"
Lubbock	258,871	$576	1"
McKinney	195,308	$2,929	1"
Arlington	394,266	$3,024	5/8"

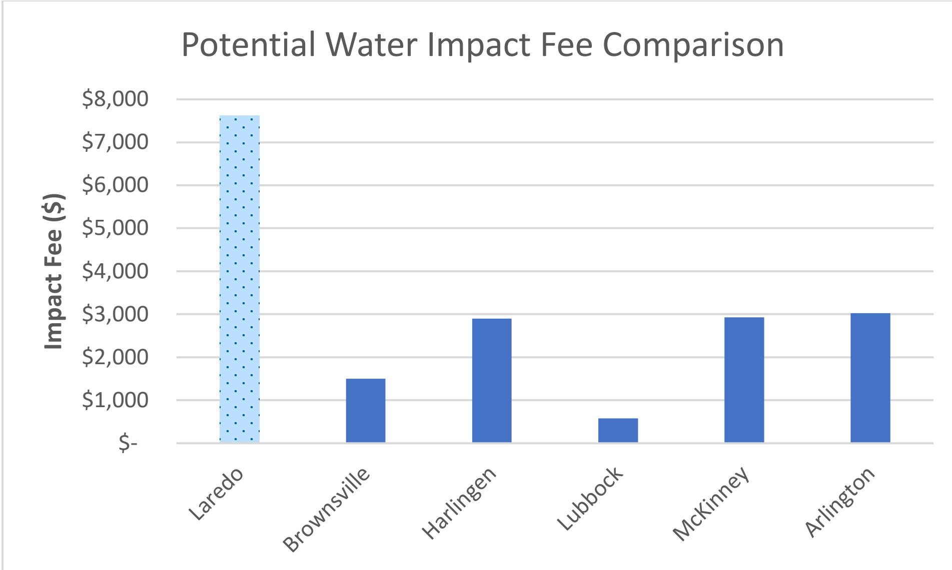


Figure 8-1: Regional Water Impact Fee Comparisons

9 Financial Analysis

9.1 Introduction

The purpose of this section of the 2022 Master Plan is to present an analysis of the capacity of the City's water utility to fund the debt service required to finance the City's CIP. The City's water utility revenues and expenses are presented for the current year ("Test Year") and forecast for the 20-year period FY 2022 – FY 2041. The objective is to determine the extent to which the water utility can fund new debt service related to the master plan improvements outlined in this study.

To complete this analysis, the Project Team made a series of assumptions about current operations, future account growth, future water consumption, and overall cost increases. These assumptions are outlined in detail throughout this section. Summary forecasts of the water utility's cash flow are presented in **Appendix J** and an alternative scenario in **Appendix K**.

It should be noted that the Project Team has relied upon the extensive data supplied by the City. Thus, the integrity of this analysis is largely dependent on the accuracy of this financial and customer data. Every effort has been made by the Project Team to validate and confirm the information contained herein prior to the preparation of the final analysis. **This report presents no assurance or guarantee that the forecast contained herein will be consistent with actual results or performances**. These represent forecasts based on a series of assumptions about future behavior and are not guarantees. Any changes in assumptions or actual events may result in significant revisions to the forecast and its conclusions. The cash flow projections and debt service coverage calculations are not intended to present overall financial positions, results of operations, and/or cash flows for the periods indicated, which is in conformity with guidelines for presentation of a forecast established by the American Institute of Certified Public Accountants.

9.2 Current Water Rate Plan

In 2019 the City adopted a comprehensive ordinance (2019-O-071) setting water rates for the period FY 2019 and beyond. A specific set of adjustments was recommended for Fiscal Years 2019 – 2022, after which 3.0% annual rate adjustments were to be implemented. The rate plan was based on a comprehensive cost of service and rate study prepared by Willdan Financial Services, the City's long-time water and wastewater rate consultants. Senior City Management and the City Council have expressed a preference to continue to follow this current plan for the near future.

Table 9-1 presents a summary of the adopted rate plan for the current year and a period 10 years into the future. Per the ordinance, annual adjustments of 3.0% are to continue for all years beyond 2031. **Table 9-2** illustrates the impact of the rate plan on average monthly water charges at defined usage levels. It should be noted that the average residential account in the City uses approximately 8,127 gpm.

Table 9-1: Adopted Rate Plan 10-Year Forecast

CITY OF LAREDO
ADOPTED WATER RATE PLAN

					EFFECTIVE							
			Current	Oct-22	Oct-23	Oct-24	Oct-25	Oct-26	Oct-27	Oct-28	Oct-29	Oct-30
Residential & Irrigation					Scenario:	2022 05 27 Master Plan -- 3.0% Annual Water Adjustments						
Minimum Charge -- 1st 2,000 Gallons												
5/8" or 3/4"			$ 11.60	**$ 11.95**	$ 12.31	$ 12.68	$ 13.06	$ 13.45	$ 13.85	$ 14.27	$ 14.70	$ 15.14
1"			25.24	**26.00**	26.78	27.58	28.41	29.26	30.14	31.04	31.98	32.94
1 1/2"			35.71	**36.78**	37.89	39.02	40.19	41.40	42.64	43.92	45.24	46.59
2"			55.45	**57.11**	58.83	60.59	62.41	64.28	66.21	68.20	70.24	72.35
Volume Rate Per 1,000 Gal												
	2,001	4,000	2.27	**2.34**	2.41	2.48	2.55	2.63	2.71	2.79	2.87	2.96
	4,001	10,000	2.43	**2.50**	2.57	2.65	2.73	2.81	2.90	2.98	3.07	3.16
	10,001	20,000	2.51	**2.58**	2.66	2.74	2.82	2.91	3.00	3.09	3.18	3.27
	20,001	30,000	2.66	**2.74**	2.82	2.90	2.99	3.08	3.17	3.27	3.37	3.47
	30,001	40,000	2.84	**2.92**	3.01	3.10	3.19	3.29	3.39	3.49	3.59	3.70
	40,001	50,000	2.96	**3.05**	3.14	3.24	3.33	3.43	3.54	3.64	3.75	3.86
	50,001	Above	5.90	**6.08**	6.26	6.45	6.64	6.84	7.05	7.26	7.48	7.70
Commercial												
Minimum Charge -- 1st 2,000 Gallons												
5/8" or 3/4"			$ 43.67	**$ 44.98**	$ 46.33	$ 47.72	$ 49.15	$ 50.62	$ 52.14	$ 53.71	$ 55.32	$ 56.98
1"			47.44	**48.86**	50.33	51.84	53.39	54.99	56.64	58.34	60.09	61.90
1 1/2"			52.76	**54.35**	55.98	57.66	59.38	61.17	63.00	64.89	66.84	68.84
2"			72.85	**75.03**	77.29	79.60	81.99	84.45	86.99	89.60	92.28	95.05
3"			144.87	**149.21**	153.69	158.30	163.05	167.94	172.98	178.17	183.52	189.02
4"			218.79	**225.35**	232.11	239.08	246.25	253.64	261.24	269.08	277.15	285.47
6"			394.04	**405.87**	418.04	430.58	443.50	456.80	470.51	484.62	499.16	514.14
8" and Larger			580.81	**598.23**	616.18	634.66	653.70	673.32	693.51	714.32	735.75	757.82
Volume Rate Per 1,000 Gal												
	2,001	4,000	2.76	**2.84**	2.93	3.02	3.11	3.20	3.30	3.40	3.50	3.60
	4,001	10,000	3.40	**3.50**	3.61	3.72	3.83	3.94	4.06	4.18	4.31	4.44
	10,001	40,000	4.28	**4.41**	4.54	4.68	4.82	4.97	5.12	5.27	5.43	5.59
	40,001	150,000	4.52	**4.65**	4.79	4.93	5.08	5.23	5.39	5.55	5.72	5.89
	150,001	300,000	4.88	**5.03**	5.18	5.34	5.50	5.66	5.83	6.00	6.19	6.37
	300,001	600,000	5.40	**5.56**	5.73	5.90	6.07	6.26	6.44	6.64	6.84	7.04
	600,001	1,000,000	6.37	**6.56**	6.76	6.96	7.17	7.39	7.61	7.84	8.07	8.32
	1,000,001	Above	6.52	**6.72**	6.92	7.13	7.34	7.56	7.79	8.02	8.26	8.51
Fire Hydrant												
Base Charge (Includes 53,750 Gallons)			$ 451.50	**$ 465.05**	$ 479.00	$ 493.37	$ 508.17	$ 523.41	$ 539.11	$ 555.29	$ 571.95	$ 589.11
Volume Rates Per 1,000 Gallons												
	53,750	150,000	4.52	**4.65**	4.79	4.93	5.08	5.23	5.39	5.55	5.72	5.89
	150,001	300,000	4.88	**5.03**	5.18	5.34	5.50	5.66	5.83	6.00	6.19	6.37
	300,001	600,000	5.40	**5.56**	5.73	5.90	6.07	6.26	6.44	6.64	6.84	7.04
	600,001	1,000,000	6.37	**6.56**	6.76	6.96	7.17	7.39	7.61	7.84	8.07	8.32
	1,000,001	Above	6.52	**6.72**	6.92	7.13	7.34	7.56	7.79	8.02	8.26	8.51

Table 9-2: Adopted Rate Plan 10-Year Monthly Charge Impacts

CITY OF LAREDO

WATER RATE PLAN - IMPACT ON MONTHLY CHARGES

			EFFECTIVE								
		Current	Oct-22	Oct-23	Oct-24	Oct-25	Oct-26	Oct-27	Oct-28	Oct-29	Oct-30
Residential Monthly Charge											
5,000 Gallons	Total	$ 18.56	**$ 19.12**	$ 19.69	$ 20.29	$ 20.89	$ 21.52	$ 22.17	$ 22.83	$ 23.52	$ 24.22
	Dollar Inc		**0.56**	0.57	0.59	0.61	0.63	0.65	0.66	0.68	0.71
			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
10,000 Gallons	Total	30.69	**31.61**	32.56	33.54	34.54	35.58	36.65	37.75	38.88	40.05
	Dollar Inc		**0.92**	0.95	0.98	1.01	1.04	1.07	1.10	1.13	1.17
			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Commercial Monthly Charge											
20,000 Gallons	Total	112.44	**115.82**	119.29	122.87	126.56	130.35	134.26	138.29	142.44	146.71
3/4" Meter	Dollar Inc		**3.37**	3.47	3.58	3.69	3.80	3.91	4.03	4.15	4.27
			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
50,000 Gallons	Total	272.45	**280.63**	289.05	297.72	306.65	315.85	325.32	335.08	345.14	355.49
2" Meter	Dollar Inc		**8.17**	8.42	8.67	8.93	9.20	9.48	9.76	10.05	10.35
			3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%

9.2.1 Rate Comparison to other Texas cities

Figure 9-1 compares the City's monthly residential water charges to surrounding cities in Texas. The comparison uses a volume of 10,000 gallons, as that volume represents typical water usage for an average household. The comparison is based on inside City rates. The rate data is based on published rates and ordinances posted by each municipality on their website. These rates do not include sales tax, activation or other charges beyond the basic minimum, and volume charges and will not match a customer's bill or anecdotal data.

The comparison reveals that the City's current water rates compare very favorably to other utilities both within the border region and throughout the state of Texas. Laredo's water rates are among the lowest in the region and are significantly below the statewide average. Further, while the City is forecast to increase its rates by 3.0% per year, the average utility in the United States has been implementing annual adjustments of 3.0% or higher over the past decade. The Project Team forecasts that under the current rate plan the City's monthly charges will remain favorable compared to other utilities.

The following points are also notable:

- Many cities do not assess rates that recover the full cost of service, choosing instead to subsidize their water and wastewater utilities with other revenues or to defer needed repairs and maintenance at the expense of system reliability and integrity.
- Some cities use tax bonds to fund water/wastewater system construction. This results in lower rates but higher ad valorem taxes.

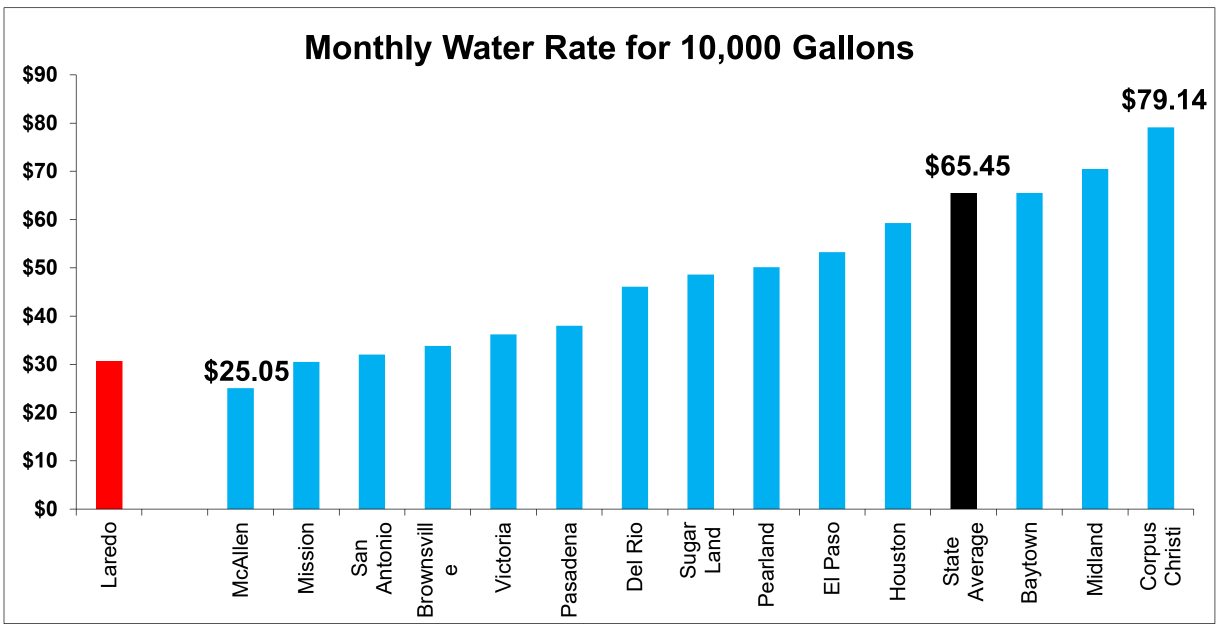


Figure 9-1: Texas Comparative Water Rates for 10,000 gal/month

9.3 Accounts and Consumption

One of the key components to forecasting future water utility revenues and expenses is to incorporate expected levels of account and volume growth. The Project Team reviewed monthly account and consumption records for the period from October 2013 to the present. This allowed for the development of general trends both in account growth and usage. Additionally, the project team reviewed City forecasts and discussed growth assumptions in detail with City staff.

As a result, the Project Team is forecasting an account growth rate of 1-2% during the forecast period. Each new account results in additional revenues to help offset rising costs. This means that managed growth will be beneficial financially for a community such as Laredo.

Table 9-3 presents historical and forecast account growth by defined customer class. The table reveals that accounts are forecast to increase from 76,318 at the end of 2021 to 93,860 by 2031. This robust growth is forecast to continue in years beyond 2031.

Table 9-4 and **Figure 9-2** present historical and forecast water billed consumption for the period 2014 – 2031. **Table 9-4** shows that the residential customer class continues to be the largest user, both historically and throughout the forecast period. Consumption can vary due to unexpected weather patterns, but the general trend is for overall usage to increase significantly in the next decade.

Table 9-3: Growth by Customer Class

CITY OF LAREDO

FORECAST TOTAL CUSTOMERS

WATER Customer Classes

	Residential	Res. Irrigation	Commercial	Com. Irrigation	Outside	Fire Hydrant	Unitec	Total
WATER Total Customers								
2014	56,394	2,889	7,139	1,042	10	60	38	**67,572**
2015	57,341	3,026	7,258	1,069	12	62	39	**68,807**
2016	58,195	3,137	7,406	1,115	12	75	40	**69,980**
2017	59,236	3,234	7,509	1,153	13	85	37	**71,267**
2018	60,180	3,294	7,578	1,205	13	86	36	**72,392**
2019	61,230	3,319	7,610	1,231	13	83	36	**73,522**
2020	62,578	3,378	7,675	1,258	5	85	33	**75,012**
2021	63,776	3,424	7,708	1,288	2	88	32	**76,318**
2022	65,716	3,510	7,867	1,316	1	96	32	**78,538**
2023	67,030	3,580	8,024	1,342	1	98	33	**80,109**
2024	68,371	3,652	8,185	1,369	1	100	33	**81,711**
2025	69,738	3,725	8,349	1,397	1	102	34	**83,345**
2026	71,133	3,799	8,515	1,424	1	104	35	**85,012**
2027	72,556	3,875	8,686	1,453	1	106	35	**86,712**
2028	74,007	3,953	8,860	1,482	1	108	36	**88,447**
2029	75,487	4,032	9,037	1,512	1	110	37	**90,215**
2030	76,997	4,113	9,217	1,542	1	112	37	**92,020**
2031	78,537	4,195	9,402	1,573	1	115	38	**93,860**
WATER Annual New Customers								
2015	947	137	119	27	2	2	1	**1,235**
2016	854	111	148	46	-	13	1	**1,173**
2017	1,041	97	103	38	1	10	(3)	**1,287**
2018	944	60	69	52	-	1	(1)	**1,125**
2019	1,050	25	32	26	-	(3)	-	**1,130**
2020	1,348	59	65	27	(8)	2	(3)	**1,490**
2021	1,198	46	33	30	(3)	3	(1)	**1,306**
2022	1,940	86	159	28	(1)	8	-	**2,220**
2023	1,314	70	157	26	0	2	1	**1,571**
2024	1,341	72	160	27	0	2	1	**1,602**
2025	1,367	73	164	27	0	2	1	**1,634**
2026	1,395	74	167	28	0	2	1	**1,667**
2027	1,423	76	170	28	0	2	1	**1,700**
2028	1,451	78	174	29	0	2	1	**1,734**
2029	1,480	79	177	30	0	2	1	**1,769**
2030	1,510	81	181	30	0	2	1	**1,804**
2031	1,540	82	184	31	0	2	1	**1,840**

Table 9-4: Consumption Growth by Customer Class

CITY OF LAREDO

	FORECAST BILLED CONSUMPTION							
	WATER Customer Classes							
	Residential	Res. Irrigation	Commercial	Com. Irrigation	Outside	Fire Hydrant	Unitec	Total
	WATER Total Billed Consumption							
2014	6,057,800,000	666,200,000	2,606,000,000	1,070,500,000	1,800,000	105,500,000	20,600,000	**10,528,400,000**
2015	5,762,800,000	611,300,000	2,602,600,000	973,200,000	1,700,000	67,600,000	19,700,000	**10,038,900,000**
2016	6,239,440,000	743,200,000	2,717,810,000	1,220,920,000	2,710,000	104,490,000	23,560,000	**11,052,130,000**
2017	6,296,590,000	730,170,000	2,752,920,000	1,182,920,000	3,350,000	127,770,000	18,740,000	**11,112,460,000**
2018	6,116,740,000	791,050,000	2,685,980,000	1,358,600,000	3,710,000	114,390,000	13,110,000	**11,083,580,000**
2019	5,942,060,000	731,820,000	2,659,090,000	1,278,830,000	3,620,000	104,470,000	11,920,000	**10,731,810,000**
2020	6,303,420,000	800,820,000	2,516,480,000	1,406,380,000	1,160,000	92,580,000	10,500,000	**11,131,340,000**
2021	6,434,130,000	798,420,000	2,471,350,000	1,376,940,000	580,000	124,380,000	9,660,000	**11,215,460,000**
2022	6,408,739,136	794,128,662	2,569,476,086	1,314,849,509	520,000	138,100,000	9,810,000	**11,235,623,392**
2023	6,536,913,918	810,011,235	2,620,865,607	1,341,146,499	530,400	140,862,000	10,006,200	**11,460,335,860**
2024	6,667,652,197	826,211,460	2,673,282,920	1,367,969,429	541,008	143,679,240	10,206,324	**11,689,542,578**
2025	6,801,005,241	842,735,689	2,726,748,578	1,395,328,818	551,828	146,552,825	10,410,450	**11,923,333,429**
2026	6,937,025,345	859,590,403	2,781,283,550	1,423,235,394	562,865	149,483,881	10,618,659	**12,161,800,098**
2027	7,075,765,852	876,782,211	2,836,909,221	1,451,700,102	574,122	152,473,559	10,831,033	**12,405,036,100**
2028	7,217,281,169	894,317,855	2,893,647,405	1,480,734,104	585,604	155,523,030	11,047,653	**12,653,136,822**
2029	7,361,626,793	912,204,212	2,951,520,353	1,510,348,786	597,317	158,633,491	11,268,606	**12,906,199,558**
2030	7,508,859,329	930,448,296	3,010,550,760	1,540,555,762	609,263	161,806,161	11,493,979	**13,164,323,549**
2031	7,659,036,515	949,057,262	3,070,761,775	1,571,366,877	621,448	165,042,284	11,723,858	**13,427,610,020**
	Water Annual Increase/(Decrease) in Billed Consumption							
2015	(295,000,000)	(54,900,000)	(3,400,000)	(97,300,000)	(100,000)	(37,900,000)	(900,000)	**(489,500,000)**
2016	476,640,000	131,900,000	115,210,000	247,720,000	1,010,000	36,890,000	3,860,000	**1,013,230,000**
2017	57,150,000	(13,030,000)	35,110,000	(38,000,000)	640,000	23,280,000	(4,820,000)	**60,330,000**
2018	(179,850,000)	60,880,000	(66,940,000)	175,680,000	360,000	(13,380,000)	(5,630,000)	**(28,880,000)**
2019	(174,680,000)	(59,230,000)	(26,890,000)	(79,770,000)	(90,000)	(9,920,000)	(1,190,000)	**(351,770,000)**
2020	361,360,000	69,000,000	(142,610,000)	127,550,000	(2,460,000)	(11,890,000)	(1,420,000)	**399,530,000**
2021	130,710,000	(2,400,000)	(45,130,000)	(29,440,000)	(580,000)	31,800,000	(840,000)	**84,120,000**
2022	(25,390,864)	(4,291,338)	98,126,086	(62,090,491)	(60,000)	13,720,000	150,000	**20,163,392**
2023	128,174,783	15,882,573	51,389,522	26,296,990	10,400	2,762,000	196,200	**224,712,468**
2024	130,738,278	16,200,225	52,417,312	26,822,930	10,608	2,817,240	200,124	**229,206,717**
2025	133,353,044	16,524,229	53,465,658	27,359,389	10,820	2,873,585	204,126	**233,790,852**
2026	136,020,105	16,854,714	54,534,972	27,906,576	11,037	2,931,056	208,209	**238,466,669**
2027	138,740,507	17,191,808	55,625,671	28,464,708	11,257	2,989,678	212,373	**243,236,002**
2028	141,515,317	17,535,644	56,738,184	29,034,002	11,482	3,049,471	216,621	**248,100,722**
2029	144,345,623	17,886,357	57,872,948	29,614,682	11,712	3,110,461	220,953	**253,062,736**
2030	147,232,536	18,244,084	59,030,407	30,206,976	11,946	3,172,670	225,372	**258,123,991**
2031	150,177,187	18,608,966	60,211,015	30,811,115	12,185	3,236,123	229,880	**263,286,471**

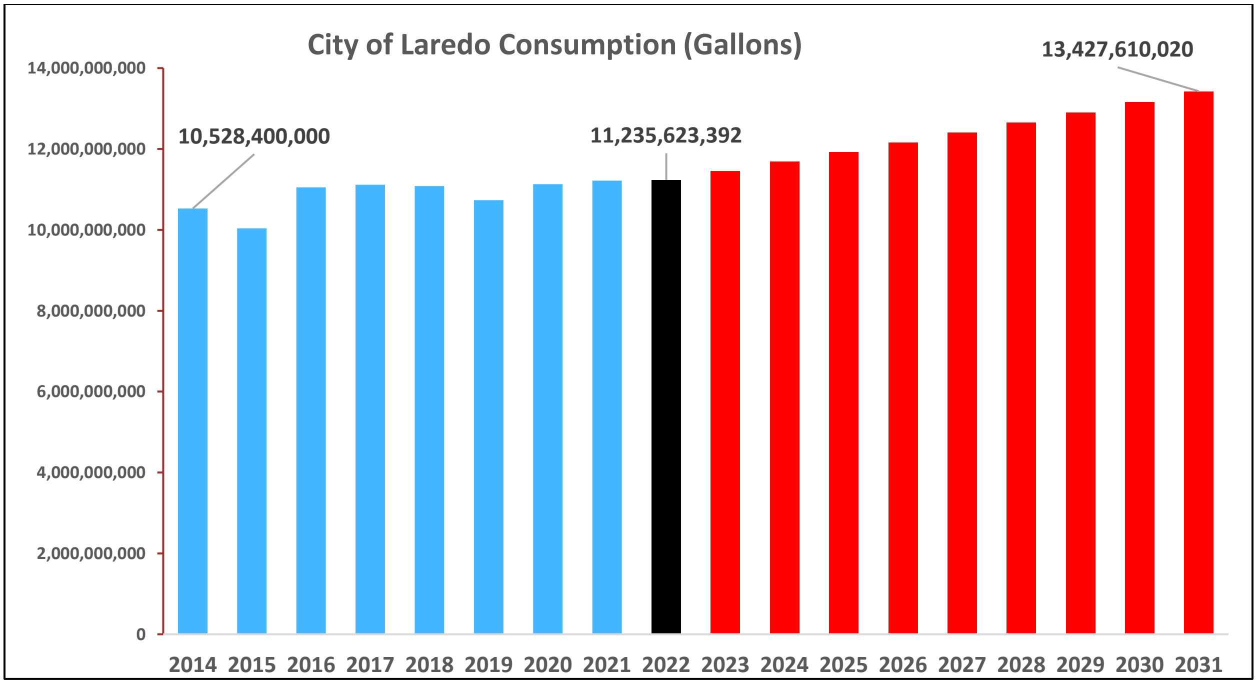


Figure 9-2: Actual and Forecast Water Consumption

9.4 Proposed Bond Financing Plan

The City's long-time bond advisors, Estrada Hinojosa, developed a plan to finance the initial portion of the City's CIP, as outlined in this Master Plan and included as **Appendix L**. The recommended financing plan incorporated an analysis of the utility's existing debt, overall debt capacity, bond ratings, water utility net revenues, and current market conditions.

Table 9-5 presents Estrada Hinojosa's May 2022 summary of the CIP projects to be funded over the five-year period 2023-2027. The table reveals the following about the financing plan outlined by Estrada Hinojosa:

- It provides a total of $163,510,625 in funding for CIP projects. The first tranche would be issued in 2022 and the second would be issued in 2024.
- The debt issued has a par amount of $175,835,000.
- Debt is issued over a 30-year period.
- Annual principal and interest ranges from $5,936,808 to $11,294,591 during the 20-year period that encompasses this forecast.

Table 9-5: Possible Water 5-Year CIP Financing

Project	Proposed Water CIP Projects (FY23-FY27) - $163mm	2022 Tranche	Future Issuance	Other Funding Source
1	Phase A of 5 Year Neighborhood waterlines identified for replacement	$ 20,000,000	$ 9,765,000	$ -
2	JWTP to Lyon PS_New	20,000,000	-	-
3	Connect Hendricks to mid-sized JWTP	13,908,000	-	-
4	Along Loop 20 from Bianka Ln to Cielito Lindo Blvd	7,665,000	-	-
5	Along Loop 20 from Clark Blvd to Hwy 359	7,416,000	-	-
6	Barlett; MHOC to Bartlett	6,773,625	-	-
7	Hendricks PS Retrofit	5,795,000	-	-
8	Along Loop 20 from Hwy 359 to Los Presidentes Ave	5,666,000	-	-
9	Looping in Colonias Area	-	-	2,903,000
10	Hendricks to Lyon	-	4,795,000	-
11	Additional 12" Transmission for Looping	-	10,050,000	-
12	Milmo to Sierra Vista	-	11,935,000	-
13	Along various alignments: S Ejido Ave to Bianka Ln to Sierra Vista PS	-	7,335,000	-
14	From Logan Ave and E Lane St to Milmo PS providing add'l water	-	13,919,000	-
15	New, larger pumps to provide standby capacity	-		3,145,000
16	JWTP header and yard piping	-	1,504,000	-
17	Along Loop 20 in Sierra Vista service area	-	2,672,000	-
18	Build new .05 MG EST	-	4,515,000	-
19	Recoat existing EST	-		1,844,000
20	Along Loop 20 in Milmo service area	-	1,455,000	-
21	Feasibility Study for targeted groundwater sites	-	-	200,000
22	Field tests for targeted groundwater sites	-	-	250,000
	Total	**$ 87,223,625**	**$ 67,945,000**	**$ 8,342,000**

Table 9-6 presents the annual principal and interest from the two bond issues for the 20-year period 2022 – 2041.

Table 9-6: Principal and Interest for 5-Year CIP Financing

CITY OF LAREDO

FORECAST WATER AND WASTEWATER DEBT SERVICE TO FUND CIP

Scenario: 2022 05 27 Master Plan -- 3.0% Annual Water Adjustments

	Series 2022	Series 2024	Total
Par Amount	$ 92,820,000	$ 83,015,000	**$ 175,835,000**
Project Fund	87,223,625	76,287,000	**163,510,625**
2022	$ -	$ -	$ -
2023	5,936,808	-	5,936,808
2024	5,937,216	-	5,937,216
2025	5,936,841	5,354,103	11,290,944
2026	5,937,591	5,351,375	11,288,966
2027	5,939,216	5,355,375	11,294,591
2028	5,936,216	5,355,875	11,292,091
2029	5,934,591	5,352,875	11,287,466
2030	5,937,841	5,356,125	11,293,966
2031	5,936,091	5,355,375	11,291,466
2032	5,939,091	5,355,500	11,294,591
2033	5,938,731	5,351,375	11,290,106
2034	5,939,013	5,352,750	11,291,763
2035	5,937,187	5,354,250	11,291,437
2036	5,938,198	5,355,625	11,293,823
2037	5,936,390	5,351,750	11,288,140
2038	5,936,788	5,352,375	11,289,163
2039	5,939,333	5,352,125	11,291,458
2040	5,938,552	5,355,625	11,294,177
2041	5,934,584	5,352,625	11,287,209
SOURCE: Estrada Hinojosa, 5-22-2022 Presentation to City			11,294,591

9.4.1 Forecast Cost of Service

The Project Team has updated its comprehensive water utility cost of service and rate model to calculate the impact of the proposed debt service on revenues, expenses, and fund balance. This is the same rate model that has been used to set the City's water rate plan as reflected in the 2019 ordinance.

As with any long-term forecast, the model relies on a series of assumptions about current and future conditions. This forecast is not a guarantee of future performance; it is a prediction based on these assumptions. If any of these assumptions require revision, the forecast may be subject to significant change.

The primary assumptions used in developing the cost of service include the following:

1) Operating expenses are based on the City's FY 2022 water utility budget.
2) Most operating expenses are forecast to increase at a rate of 3.0% per year. It should be noted that while this 3.0% assumption is used at this time, present inflation trends are

pointing to higher potential inflation rates in the future. Therefore, the Project Team recommends that these inflation trends continue to be closely monitored. If the 3.0% inflation rate used in this model is revised upward at any time, it could have a significant impact on operating expenses and the availability of funds to finance future debt service.

3) Certain expenses are forecast to increase at greater than inflation rates. This includes such items as chemicals, electricity, insurance, and workers compensation. Certain expense items also increase because of the addition of new accounts and volumes, as outlined in the previous section.
4) The Project Team assumes that transfer payments to the general fund remain fixed and do not increase during the forecast period.
5) Current debt payments are in line with the City's water utility obligations.

Figure 9-3 summarizes the forecast cost of service. The chart reveals that the water utility's total cost of service increases from $56,566,995 in FY 2022 to $94,802,303 by FY 2041.

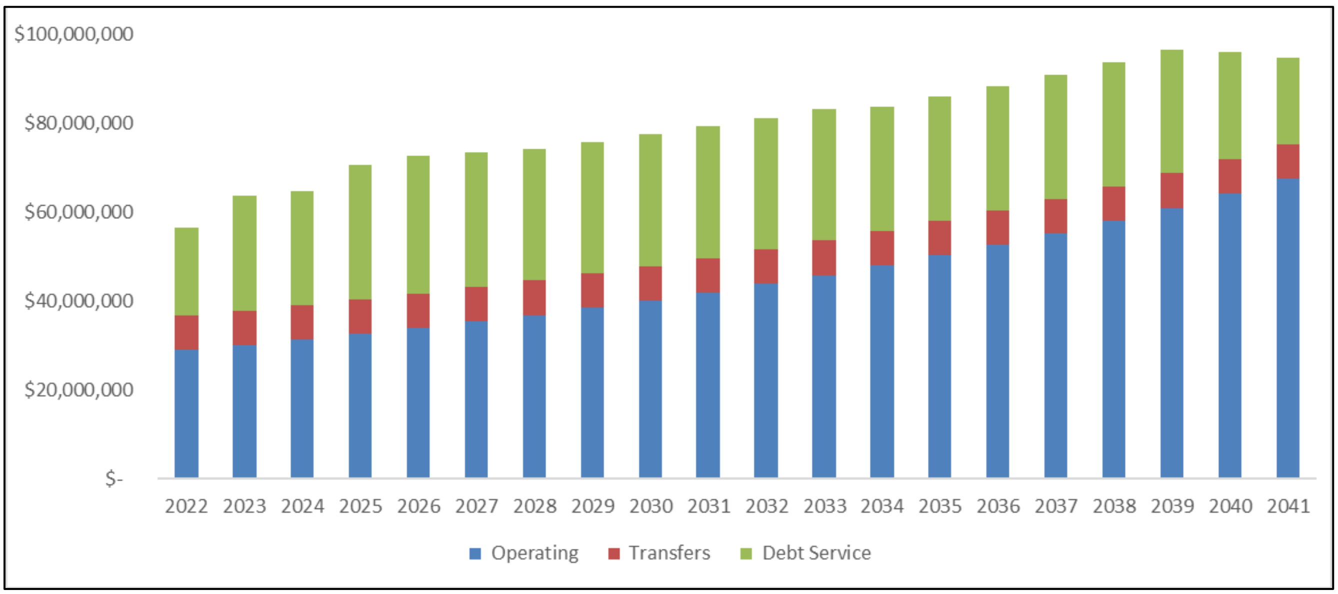


Figure 9-3: Forecast Cost of Service by Fund

9.5 Forecast Caveats

However, it must be noted that the forecast and recommendations presented in this study represent a combination of the best information available from the City and the Project Team's expertise. This forecast relies in part on assumptions about future events and events beyond the control of the Project Team (such as account growth rates within the City). The forecast and recommendations contained in this study may be subject to revision if any of the following events occur:

- Actual growth in accounts and consumed volumes is less than (or significantly greater than) forecast.

- CIP funding costs increase significantly due to the rising cost of materials or other factors such as inflation.
- An unforeseen event, such as an extended recession, natural catastrophe, or terrorist attack.
- Significant and long-lasting changes in weather patterns that affect usage.
- Increases or decreases in inflation rates, interest rates, coverage requirements, or reserve requirements for long-term debt.
- The City budget levels, or priorities change significantly from those forecast in this study. This is especially true regarding the Project Team's assumption that the City does not increase the Transfer from the Utility Fund to the General Fund. A significant increase in this transfer would warrant a change in the rate plan recommendations.

9.6 Summary, Forecasts, and Conclusions

Table 9-7 presents a summary of the 10-year forecast of revenues, expenses, and net revenues available for debt service for the Laredo Water Utility. Detailed forecasts are presented in **Appendix J**. The first 10 years are summarized in **Table 9-7.** The following is notable about this forecast:

1) The forecast assumes that the City continues to implement 3.0% annual water rate adjustments for the entire forecast period.
2) Total water revenues are forecast to increase from $57,118,122 in FY 2022 to $83,823,381 by FY 2041 (Line 15).
3) After subtracting operating expenses, net revenues for debt service are forecast to increase from $28,202,657 to $41,917,412 by FY 2031 (Line 27).
4) These net revenues are forecast to be sufficient to fund the Series 2022 and Series 2024 debt service outlined in the previous section.
5) **The City is not forecast to generate sufficient revenue to fund its forecast contingencies and transfers (Line 32) in most of the fiscal years through FY 2031.**
6) **Debt coverage is forecast to be limited in FY 2023 – FY 2026 and adequate in years beyond FY 2026.**

In conclusion, **the cash flow analysis reveals that the current rate plan is forecast to be sufficient to fund the two bond issues with a combined par value of $175,835,000 over the next 10 years.** This would allow the City to begin the CIP improvements recommended.

Table 9-7: Adopted Rate Plan Ten-Year Cash Flow

CITY OF LAREDO

WATER UTILITY -- FORECAST REVENUES, EXPENSES AND CASH FLOW

			Fiscal Year									
			2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
			Scenario:	2022 05 27 Master Plan -- 3.0% Annual Water Adjustments								
1	**Fund Balance, Revenues and Expenses**											
2	**Revised Beginning Fund Balance**		**$ 28,364,194**	**$ 28,915,321**	**$ 24,925,068**	**$ 22,307,762**	**$ 16,530,765**	**$ 11,312,454**	**$ 8,470,218**	**$ 7,722,658**	**$ 8,680,809**	**$ 11,347,692**
3	**Revenues and Cost of Service**											
4	**Revenues**											
5	Water Rate Revenues											
6	W.1	Residential	$ 21,539,876	$ 22,664,807	$ 23,811,646	$ 25,016,516	$ 26,282,351	$ 27,612,238	$ 29,009,417	$ 30,477,294	$ 32,019,445	$ 33,639,629
7	W.2	Res. Irrigation	2,503,482	2,634,227	2,767,519	2,907,556	3,054,678	3,209,245	3,371,633	3,542,237	3,721,474	3,909,781
8	W.3	Commercial	14,958,597	15,739,817	16,536,251	17,372,986	18,252,059	19,175,613	20,145,899	21,165,282	22,236,245	23,361,399
9	W.4	Com. Irrigation	7,271,294	7,651,041	8,038,183	8,444,916	8,872,228	9,321,163	9,792,814	10,288,330	10,808,920	11,355,851
10	W.5	Outside	5,197	5,468	5,744	6,035	6,340	6,661	6,998	7,352	7,724	8,115
11	W.6	Fire Hydrant	850,298	894,706	939,978	987,540	1,037,510	1,090,008	1,145,162	1,203,108	1,263,985	1,327,943
12	W.7	Unitec	136,157	143,267	150,517	158,133	166,134	174,541	183,373	192,651	202,399	212,641
13		Sub-Total	47,264,900	49,733,333	52,249,839	54,893,681	57,671,301	60,589,469	63,655,296	66,876,254	70,260,193	73,815,359
14	Non-Rate Revenues		9,853,222	9,869,091	9,885,278	9,901,789	9,918,630	9,935,807	9,953,329	9,971,200	9,989,429	10,008,023
15	**Total Revenues**		**57,118,122**	**59,602,424**	**62,135,118**	**64,795,470**	**67,589,931**	**70,525,277**	**73,608,625**	**76,847,455**	**80,249,622**	**83,823,381**
16	**Cost of Service**											
17	Operating Expenses											
18	UB	Utility Billing	5,715,293	5,906,074	6,104,128	6,309,795	6,523,439	6,745,444	6,976,215	7,216,185	7,465,812	7,725,582
19	WT	Water Treatment	9,821,824	10,342,287	10,899,350	11,496,053	12,135,715	12,821,957	13,558,731	14,350,353	15,201,539	16,117,439
20	WD	Water Distribution	5,613,886	5,837,626	6,071,672	6,316,578	6,572,935	6,841,369	7,122,546	7,417,174	7,726,005	8,049,841
21	WPC	Water Pollution Control	533,451	549,027	565,275	582,230	599,930	618,418	637,737	657,935	679,061	701,170
22	A	Administration	4,974,414	5,107,764	5,224,124	5,345,197	5,471,220	5,602,450	5,739,155	5,881,623	6,030,160	6,185,092
23	GIS	GIS	445,841	461,338	477,470	494,269	511,770	530,010	549,028	568,867	589,569	611,184
24	ENG	Engineering	1,497,905	1,551,610	1,607,629	1,666,087	1,727,120	1,790,869	1,857,487	1,927,137	1,999,992	2,076,238
25	AM	Asset Management	312,851	324,485	336,649	349,371	362,685	376,625	391,228	406,534	422,584	439,424
26		Sub-Total	28,915,465	30,080,212	31,286,296	32,559,581	33,904,816	35,327,143	36,832,129	38,425,809	40,114,724	41,905,969
27	**Net Revenues for Total Debt Service, Conting Transfers and Capital Outlays**		**28,202,657**	**29,522,212**	**30,848,822**	**32,235,889**	**33,685,115**	**35,198,134**	**36,776,496**	**38,421,646**	**40,134,898**	**41,917,412**
28	Debt Service -- Current		19,877,981	19,802,106	19,755,362	18,948,393	19,840,910	18,972,229	18,458,415	18,402,479	18,400,500	18,406,478
29	**Net Revenues for Proposed Debt Service, Cc Transfers and Capital Outlays**		**8,324,677**	**9,720,106**	**11,093,460**	**13,287,497**	**13,844,205**	**16,225,905**	**18,318,081**	**20,019,167**	**21,734,399**	**23,510,934**
30	**Series 2022 Senior Lien Revenue Debt**		**-**	**5,936,808**	**5,937,216**	**5,936,841**	**5,937,591**	**5,939,216**	**5,936,216**	**5,934,591**	**5,937,841**	**5,936,091**
31	**Series 2024 Senior Lien Revenue Debt**		**-**	**-**	**-**	**5,354,103**	**5,351,375**	**5,355,375**	**5,355,875**	**5,352,875**	**5,356,125**	**5,355,375**
32	**Net Revenues for Contingencies, Transfers**		**8,324,677**	**3,783,298**	**5,156,244**	**1,996,553**	**2,555,239**	**4,931,314**	**7,025,990**	**8,731,701**	**10,440,433**	**12,219,468**
33	Contingencies and Transfers		7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550
34	Capital Outlays		-	-	-	-	-	-	-	-	-	-
35	**Total Cost of Service**		**56,566,995**	**63,592,676**	**64,752,424**	**70,572,467**	**72,808,242**	**73,367,513**	**74,356,185**	**75,889,303**	**77,582,739**	**79,377,463**
36	**Net Revenues**		**551,127**	**(3,990,252)**	**(2,617,306)**	**(5,776,997)**	**(5,218,311)**	**(2,842,236)**	**(747,560)**	**958,151**	**2,666,883**	**4,445,918**
37	Percent of COS		1.0%	-6.7%	-4.2%	-8.9%	-7.7%	-4.0%	-1.0%	1.2%	3.3%	5.3%
38	**Ending Water Fund Balance**		**$ 28,915,321**	**$ 24,925,068**	**$ 22,307,762**	**$ 16,530,765**	**$ 11,312,454**	**$ 8,470,218**	**$ 7,722,658**	**$ 8,680,809**	**$ 11,347,692**	**$ 15,793,610**
39	**Revenue Adequacy Tests**											
40	**Debt Coverage (27/(28+30))**		**1.42**	**1.15**	**1.20**	**1.07**	**1.08**	**1.16**	**1.24**	**1.29**	**1.35**	**1.41**
41	Fund Balance as a percentage of revenues		50.6%	41.8%	35.9%	25.5%	16.7%	12.0%	10.5%	11.3%	14.1%	18.8%
42	One Day Operating Expenditures		$ 79,220	$ 82,412	$ 85,716	$ 89,204	$ 92,890	$ 96,787	$ 100,910	$ 105,276	$ 109,903	$ 114,811
43	Days of Operating Expenditures		365	302	260	185	122	88	77	82	103	138
44	**Percent Annual Rate Adjustment**		**5.00%**	**3.00%**	**3.00%**	**3.00%**	**3.00%**	**3.00%**	**3.00%**	**3.00%**	**3.00%**	**3.00%**

9.6.1 Alternative or Modified Rate Scenario

The Project Team has prepared an additional scenario that calculates the levels of rate adjustments that would be required to fund the entire CIP as outlined in this Master Plan. The summary pages from this alternative scenario are presented in **Appendix K.**

Table 9-8 reveals that the total amount of debt that would be required to fund the entire CIP as calculated in this Master Plan would be approximately **$607,510,625**. This includes the Series 2022 and Series 2024 bonds estimated by Estrada Hinojosa, and the additional debt required in 2026 – 2032 to fund the remainder of the CIP.

Table 9-8: Annual Dept Issues Required to Fund CIP

Year	Annual Dept
2022	$87,223,625
2023	-
2024	$76,287,000
2025	-
2026	$66,000,000
2027	$66,000,000
2028	$32,000,000
2029	$86,000,000
2030	$108,000,000
2031	$40,000,000
2032	$46,000,000
Total Dept Required	**$607,510,625**

The project team calculates that to fund these bond issues, **the City would be required to implement annual water rate adjustments of 6.0% for the period 2022 – 2031**. The 6% increase would be the existing annual 3% increase and an additional annual 3% increase. After 2031, the City would be required to implement only the currently adopted annual water rate adjustments of 3.0%.

Table 9-9 presents the rate plan through 2031, while **Table 9-10** presents the impact on monthly charges through 2031. As mentioned, beyond 2031 the City would be required to implement annual adjustments of 3.0%.

Table 9-9: Modified Rate Plan 10-Year Forecast

CITY OF LAREDO
ADOPTED WATER RATE PLAN

				EFFECTIVE							
		Current	Oct-22	Oct-23	Oct-24	Oct-25	Oct-26	Oct-27	Oct-28	Oct-29	Oct-30
Residential & Irrigation				Scenario:	2022 05 27 Master Plan -- 6.0% Annual Water Adjustments						
Minimum Charge -- 1st 2,000 Gallons											
5/8" or 3/4"		$ 11.60	**$ 12.30**	$ 13.04	$ 13.82	$ 14.65	$ 15.53	$ 16.46	$ 17.45	$ 18.49	$ 19.60
1"		25.24	**26.76**	28.36	30.06	31.87	33.78	35.81	37.95	40.23	42.65
1 1/2"		35.71	**37.85**	40.12	42.53	45.08	47.79	50.66	53.70	56.92	60.33
2"		55.45	**58.78**	62.30	66.04	70.00	74.21	78.66	83.38	88.38	93.68
Volume Rate Per 1,000 Gal											
2,001	4,000	2.27	**2.40**	2.55	2.70	2.86	3.04	3.22	3.41	3.61	3.83
4,001	10,000	2.43	**2.57**	2.73	2.89	3.06	3.25	3.44	3.65	3.87	4.10
10,001	20,000	2.51	**2.66**	2.82	2.99	3.17	3.36	3.56	3.77	4.00	4.24
20,001	30,000	2.66	**2.82**	2.98	3.16	3.35	3.55	3.77	3.99	4.23	4.49
30,001	40,000	2.84	**3.01**	3.19	3.38	3.58	3.79	4.02	4.26	4.52	4.79
40,001	50,000	2.96	**3.14**	3.33	3.53	3.74	3.96	4.20	4.45	4.72	5.00
50,001	Above	5.90	**6.26**	6.63	7.03	7.45	7.90	8.37	8.87	9.41	9.97
Commercial											
Minimum Charge -- 1st 2,000 Gallons											
5/8" or 3/4"		$ 43.67	**$ 46.29**	$ 49.07	$ 52.01	$ 55.13	$ 58.44	$ 61.95	$ 65.66	$ 69.60	$ 73.78
1"		47.44	**50.29**	53.30	56.50	59.89	63.48	67.29	71.33	75.61	80.15
1 1/2"		52.76	**55.93**	59.28	62.84	66.61	70.61	74.84	79.34	84.10	89.14
2"		72.85	**77.22**	81.85	86.76	91.97	97.49	103.34	109.54	116.11	123.08
3"		144.87	**153.56**	162.77	172.54	182.89	193.87	205.50	217.83	230.90	244.75
4"		218.79	**231.92**	245.83	260.58	276.22	292.79	310.36	328.98	348.72	369.64
6"		394.04	**417.69**	442.75	469.31	497.47	527.32	558.96	592.50	628.05	665.73
8" and Larger		580.81	**615.66**	652.60	691.75	733.26	777.25	823.89	873.32	925.72	981.26
Volume Rate Per 1,000 Gal											
2,001	4,000	2.76	**2.93**	3.10	3.29	3.49	3.70	3.92	4.15	4.40	4.67
4,001	10,000	3.40	**3.61**	3.82	4.05	4.29	4.55	4.83	5.12	5.42	5.75
10,001	40,000	4.28	**4.54**	4.81	5.10	5.41	5.73	6.08	6.44	6.83	7.24
40,001	150,000	4.52	**4.79**	5.07	5.38	5.70	6.04	6.40	6.79	7.20	7.63
150,001	300,000	4.88	**5.18**	5.49	5.82	6.16	6.53	6.93	7.34	7.78	8.25
300,001	600,000	5.40	**5.72**	6.06	6.43	6.81	7.22	7.66	8.12	8.60	9.12
600,001	1,000,000	6.37	**6.76**	7.16	7.59	8.05	8.53	9.04	9.58	10.16	10.77
1,000,001	Above	6.52	**6.91**	7.33	7.77	8.23	8.73	9.25	9.80	10.39	11.02
Fire Hydrant											
Base Charge (Includes 53,750 Gallons)		$ 451.50	**$ 478.59**	$ 507.31	$ 537.74	$ 570.01	$ 604.21	$ 640.46	$ 678.89	$ 719.62	$ 762.80
Volume Rates Per 1,000 Gallons											
53,750	150,000	4.52	**4.79**	5.07	5.38	5.70	6.04	6.40	6.79	7.20	7.63
150,001	300,000	4.88	**5.18**	5.49	5.82	6.16	6.53	6.93	7.34	7.78	8.25
300,001	600,000	5.40	**5.72**	6.06	6.43	6.81	7.22	7.66	8.12	8.60	9.12
600,001	1,000,000	6.37	**6.76**	7.16	7.59	8.05	8.53	9.04	9.58	10.16	10.77
1,000,001	Above	6.52	**6.91**	7.33	7.77	8.23	8.73	9.25	9.80	10.39	11.02

Table 9-10: Modified Rate Plan 10-Year Monthly Charge Impacts

CITY OF LAREDO
WATER RATE PLAN - IMPACT ON MONTHLY CHARGES

		Current	EFFECTIVE Oct-22	Oct-23	Oct-24	Oct-25	Oct-26	Oct-27	Oct-28	Oct-29	Oct-30
Residential Monthly Charge											
5,000 Gallons	Total	$ 18.56	**$ 19.68**	$ 20.86	$ 22.11	$ 23.44	$ 24.84	$ 26.33	$ 27.91	$ 29.59	$ 31.36
	Dollar Inc		**1.11**	1.18	1.25	1.33	1.41	1.49	1.58	1.67	1.78
			6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
10,000 Gallons	Total	30.69	**32.53**	34.48	36.55	38.75	41.07	43.54	46.15	48.92	51.85
	Dollar Inc		**1.84**	1.95	2.07	2.19	2.32	2.46	2.61	2.77	2.94
			6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
Commercial Monthly Charge											
20,000 Gallons	Total	112.44	**119.19**	126.34	133.92	141.96	150.48	159.50	169.07	179.22	189.97
3/4" Meter	Dollar Inc		**6.75**	7.15	7.58	8.04	8.52	9.03	9.57	10.14	10.75
			6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%
50,000 Gallons	Total	272.45	**288.80**	306.13	324.50	343.97	364.60	386.48	409.67	434.25	460.31
2" Meter	Dollar Inc		**16.35**	17.33	18.37	19.47	20.64	21.88	23.19	24.58	26.06
			6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%	6.0%

Table 9-11 presents a summary of the 10-year forecast of revenues, expenses, and net revenues available for debt service for the Laredo Water Utility. Detailed forecasts are presented in **Appendix K**. The following is notable about this forecast:

1) The forecast assumes that the City continues to implement 6.0% annual water rate adjustments through 2031, and 3.0% adjustments afterwards.
2) Total water revenues are forecast to increase from $57,118,122 in FY 2022 to $105,368,078 by FY 2041 (Line 15).
3) After subtracting operating expenses, net revenues for debt service are forecast to increase from $28,202,657 to $63,462,108 by FY 2031 (Line 27).
4) These net revenues are forecast to be sufficient to fund the debt service outlined in **Table 9-11**.
5) Debt coverage is forecast to be stronger than in the existing scenario.

In conclusion, the cash flow analysis reveals that the modified rate plan or alternate forecast would be sufficient to fund the entire debt service required to finance the capital improvements required in this Master Plan.

Table 9-11: Modified Rate Plan 10-Year Cash Flow

CITY OF LAREDO

WATER UTILITY -- FORECAST REVENUES, EXPENSES AND CASH FLOW

		Fiscal Year									
		2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
		Scenario:	2022 05 27 Master Plan -- 6.0% Annual Water Adjustments								
1	**Fund Balance, Revenues and Expenses**										
2	**Revised Beginning Fund Balance**	$ 28,364,194	$ 28,915,321	$ 26,256,131	$ 26,599,810	$ 25,623,075	$ 27,274,554	$ 28,901,943	$ 30,501,731	$ 34,422,849	$ 37,138,743
3	**Revenues and Cost of Service**										
4	**Revenues**										
5	Water Rate Revenues										
6	W.1 Residential	$ 21,539,876	$ 23,271,408	$ 25,161,046	$ 27,204,123	$ 29,413,098	$ 31,801,441	$ 34,383,718	$ 37,175,676	$ 40,194,341	$ 43,458,122
7	W.2 Res. Irrigation	2,503,482	2,704,730	2,924,354	3,161,811	3,418,551	3,696,137	3,996,263	4,320,760	4,671,605	5,050,940
8	W.3 Commercial	14,958,597	16,161,077	17,473,357	18,892,193	20,426,239	22,084,850	23,878,140	25,817,044	27,913,388	30,179,956
9	W.4 Com. Irrigation	7,271,294	7,855,813	8,493,705	9,183,394	9,929,086	10,735,327	11,607,036	12,549,527	13,568,549	14,670,315
10	W.5 Outside	5,197	5,614	6,070	6,563	7,096	7,672	8,295	8,969	9,697	10,485
11	W.6 Fire Hydrant	850,298	918,651	993,246	1,073,897	1,161,098	1,255,379	1,357,316	1,467,530	1,586,693	1,715,533
12	W.7 Unitec	136,157	147,102	159,046	171,961	185,924	201,021	217,344	234,993	254,074	274,705
13	Sub-Total	47,264,900	51,064,396	55,210,824	59,693,943	64,541,092	69,781,828	75,448,113	81,574,499	88,198,349	95,360,055
14	Non-Rate Revenues	9,853,222	9,869,091	9,885,278	9,901,789	9,918,630	9,935,807	9,953,329	9,971,200	9,989,429	10,008,023
15	**Total Revenues**	**57,118,122**	**60,933,487**	**65,096,103**	**69,595,732**	**74,459,721**	**79,717,636**	**85,401,441**	**91,545,700**	**98,187,778**	**105,368,078**
16	**Cost of Service**										
17	Operating Expenses										
18	UB Utility Billing	5,715,293	5,906,074	6,104,128	6,309,795	6,523,439	6,745,444	6,976,215	7,216,185	7,465,812	7,725,582
19	WT Water Treatment	9,821,824	10,342,287	10,899,350	11,496,053	12,135,715	12,821,957	13,558,731	14,350,353	15,201,539	16,117,439
20	WD Water Distribution	5,613,886	5,837,626	6,071,672	6,316,578	6,572,935	6,841,369	7,122,546	7,417,174	7,726,005	8,049,841
21	WPC Water Pollution Control	533,451	549,027	565,275	582,230	599,930	618,418	637,737	657,935	679,061	701,170
22	A Administration	4,974,414	5,107,764	5,224,124	5,345,197	5,471,220	5,602,450	5,739,155	5,881,623	6,030,160	6,185,092
23	GIS GIS	445,841	461,338	477,470	494,269	511,770	530,010	549,028	568,867	589,569	611,184
24	ENG Engineering	1,497,905	1,551,610	1,607,629	1,666,087	1,727,120	1,790,869	1,857,487	1,927,137	1,999,992	2,076,238
25	AM Asset Management	312,851	324,485	336,649	349,371	362,685	376,625	391,228	406,534	422,584	439,424
26	Sub-Total	28,915,465	30,080,212	31,286,296	32,559,581	33,904,816	35,327,143	36,832,129	38,425,809	40,114,724	41,905,969
27	**Net Revenues for Total Debt Service, Contingencies, Transfers and Capital Outlays**	**28,202,657**	**30,853,275**	**33,809,807**	**37,036,152**	**40,554,905**	**44,390,493**	**48,569,312**	**53,119,891**	**58,073,054**	**63,462,108**
28	Debt Service -- Current	19,877,981	19,802,106	19,755,362	18,948,393	19,840,910	18,972,229	18,458,415	18,402,479	18,400,500	18,406,478
29	**Net Revenues for Proposed Debt Service, Contingencies, Transfers and Capital Outlays**	**8,324,677**	**11,051,169**	**14,054,445**	**18,087,759**	**20,713,995**	**25,418,264**	**30,110,898**	**34,717,412**	**39,672,555**	**45,055,630**
30	**Series 2022 Senior Lien Revenue Debt**	-	5,936,808	5,937,216	5,936,841	5,937,591	5,939,216	5,936,216	5,934,591	5,937,841	5,936,091
31	**Series 2024 Senior Lien Revenue Debt**	-	-	-	5,354,103	5,351,375	5,355,375	5,355,875	5,352,875	5,356,125	5,355,375
	Additional Future Debt	-	-	-	-	-	4,722,734	9,445,468	11,735,279	17,889,145	25,617,255
32	**Net Revenues for Contingencies, Transfers**	**8,324,677**	**5,114,361**	**8,117,229**	**6,796,815**	**9,425,029**	**9,400,939**	**9,373,338**	**11,694,667**	**10,489,444**	**8,146,909**
33	Contingencies and Transfers	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550
34	Capital Outlays	-	-	-	-	-	-	-	-	-	-
35	**Total Cost of Service**	**56,566,995**	**63,592,676**	**64,752,424**	**70,572,467**	**72,808,242**	**78,090,247**	**83,801,653**	**87,624,582**	**95,471,884**	**104,994,718**
36	**Net Revenues**	**551,127**	**(2,659,189)**	**343,679**	**(976,735)**	**1,651,479**	**1,627,389**	**1,599,788**	**3,921,117**	**2,715,894**	**373,359**
37	Percent of COS	1.0%	-4.4%	0.5%	-1.4%	2.2%	2.0%	1.9%	4.3%	2.8%	0.4%
38	**Ending Water Fund Balance**	**$ 28,915,321**	**$ 26,256,131**	**$ 26,599,810**	**$ 25,623,075**	**$ 27,274,554**	**$ 28,901,943**	**$ 30,501,731**	**$ 34,422,849**	**$ 37,138,743**	**$ 37,512,102**
39	**Revenue Adequacy Tests**										
40	**Debt Coverage (27/(28+30))**	**1.42**	**1.20**	**1.32**	**1.22**	**1.30**	**1.47**	**1.63**	**1.79**	**1.96**	**2.14**
41	Fund Balance as a percentage of revenues	50.6%	43.1%	40.9%	36.8%	36.6%	36.3%	35.7%	37.6%	37.8%	35.6%
42	One Day Operating Expenditures	$ 79,220	$ 82,412	$ 85,716	$ 89,204	$ 92,890	$ 96,787	$ 100,910	$ 105,276	$ 109,903	$ 114,811
43	Days of Operating Expenditures	365	319	310	287	294	299	302	327	338	327
44	**Percent Annual Rate Adjustment**	**5.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**	**6.00%**

10 APPENDIX A
List of Data Received

11 APPENDIX B

Water Supply Report

Investigations and Information Used

The following brief summaries for groundwater alternatives that have historically been considered by the city. Figure 1 shows the study area for potential groundwater alternatives. The following is a summary of groundwater studies considered:

1. The 2021 DRAFT Rio Grande Regional Water Plan for the Region M Regional Water Planning Group (RWPG) which includes recommended and alternative Water Management Strategies (WMSs) for Laredo.
2. Joint planning documentation for groundwater management areas (GMAs) within the study area. Potential groundwater resources that could be available to Laredo are generally located within GMA 7, GMA 13, and GMA 16. Figure 3 illustrates the boundaries of GMAs and groundwater conservation districts (GCDs) within the study area.
3. Reports, memoranda, and technical notes from the TWDB, the United States Geological Survey (USGS), and other consultants regarding groundwater availability, brackish production area delineation and potential ASR projects. Figure 4 shows the extents of the Major and Minor aquifers within the study area.
4. The Lake Casa Blanca Dam *Hydrologic and Hydraulic Analysis Report* by Espey Consultants is dated November 2007. The report and associated data show that approximate bathymetric soundings of the lake bottom were performed to update the storage capacity of the existing lake
5. Reports and compilation of information from Dimmit County WSC.
6. TGI's experience assessing private projects in the region particularly including the Edwards-Trinity Plateau aquifer in Kinney and Val Verde counties.
7. "Feasibility Study of Groundwater Supply and Delivery from Northwest Webb County to Southern Webb County" by Dannenbaum Engineering Corporation, December 1998.
8. MWH, Inc. study of secondary water, 2003, recommended 2.5-MGD from Laredo Sands, later Council abandoned the recommendation, 2004.
9. Laredo City Council and other City Committee presentations and minutes:
   - Northwest Webb County groundwater discussion – April 8, 1999
   - Council Workshop and presentations – April 20, 2000
   - Council Discussion and Presentation on groundwater development – June 28, 1999
   - Council presentation regarding the Rio Grande – June 2000
   - Staff reports and Presentations on potential supplies -November 29, 2006
     - Grass Valley Water, Kinney County
     - Laredo Water Company, Northern Webb County
     - South Texas Pipeline, Dimmit County (Carrizo Springs)
     - City of Encinal (Webb County)
   - Lake Casa Blanca Presentation, Rio Grande International Study Center – February 20, 2007

12 APPENDIX C
FY 2023 – FY 2033+ CIP

City of Laredo - Integrated Water Master Plan Capital Improvements FY2023-FY2027

	Project Name	Purpose	FY23 Acquisition	FY23 Engineering	FY23 Construction	FY24 Acquisition	FY24 Engineering	FY24 Construction	FY25 Acquisition	FY25 Engineering	FY25 Construction	FY26 Acquisition	FY26 Engineering	FY26 Construction	FY27 Acquisition	FY27 Engineering	FY27 Construction	FY23-FY27 Total Project Cost
Existing CIP (FY22-FY26)																		
A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 10,500,000			$ 10,500,000			$ 10,500,000			$ 10,500,000			$ 10,500,000	$ 52,500,000
B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000			$ 125,000			$ 125,000			$ 125,000			$ 125,000	$ 625,000
C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000	$ 15,000,000
E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000	$ 50,000,000
F	20-WAT-03 - El Pico 10 MG Expansion	TCEQ Regulatory Requirement						$ 1,500,000										$ 1,500,000
G	17-WAT-008 - 24" Waterline along Loop 20	Provide Pressure and Flow for South Laredo												$ 5,131,000				$ 5,131,000
H	20-WAT-02-TXDOT 24" Wtl Reloc LP20/Del Mar	Relocation due to Fwy/Hwy Upgrade						$ 6,000,000										$ 6,000,000
I	22-WAT-002 - Corpus Christi Water Improvements	Replace Waterlines over 40-years old			$ 4,500,000													$ 4,500,000
J	22-WAT-003 - 24" Cuatro Vientos Rd. Crossing	Provide Pressure and Flow for SH 359 Area			$ 6,000,000													$ 6,000,000
					$ 36,125,000			$ 33,125,000			$ 25,625,000			$ 30,756,000				
Proposed CIP Projects (FY23-FY27																		
1	Bartlett; MHOC to Bartlett	The Transmission system needs to be expanded to suuply water for the Distribution system to ensure that water is delivered to homes and businesses.		$ 1,000,000	$ 5,773,625													$ 6,773,625
2	JWTP tp Lyon	The Transmission Line from the Jefferson Water Treatment Plant to the Lyon Booster Pump Station is a critical water supply line for most of the City. The line was planned for replacement, but the recent line break has accelerated the project.	$ 1,197,000	$ 1,710,000				$ 17,093,000										$ 20,000,000
3	Looping in Colonias Area	Additional lines for looping in the Colonias will help water quality.	$ 281,000	$ 188,000				$ 2,434,000										$ 2,903,000
4	Hendricks PS Retrofit	Rehab of the Hendricks Booster Pump Station will help the Lyon Booster Pump Statino provide water for South Laredo.					$ 414,000	$ 5,381,000										$ 5,795,000
5	Hendricks to Lyon	The Transmission Line from the Hendricks Booster Pump Station to the Lyon Booster Pump Station will allow the two booster stations to work together to supply South Laredo.					$ 343,000	$ 4,452,000										$ 4,795,000
6	Additional 12" Transmission for Looping	Improved water quality through looping	$ 211,000	$ 703,000							$ 9,136,000							$ 10,050,000
7	Connect Hendricks to mid-sized JWTP extension line	The Hendricks Booster Pump Station can be fed by existing transmission lines from the Jefferson Water Treatment Plant.					$ 994,000				$ 12,914,000							$ 13,908,000
8	Along Loop 20 from Clark Blvd to Hwy 359	Loop 20 WLs ongoing, coordinate with Utiliites							$ 354,000	$ 505,000				$ 6,557,000				$ 7,416,000
9	Along Loop 20 from Hwy 359 to Los Presidentes Ave	Loop 20 WLs ongoing, coordinate with Utiliites							$ 270,000	$ 386,000				$ 5,010,000				$ 5,666,000
10	Along Loop 20 from Bianka Ln to Cielito Lindo Blvd	Extend existing system to accommodate smart growth										$ 365,000	$ 522,000				$ 6,778,000	$ 7,665,000
11	Milmo to Sierra Vista	Transmission system extension for existing system.										$ 569,000	$ 812,000				$ 10,554,000	$ 11,935,000
12	Along various alignments from S Ejido Ave at Bianka Ln to Sierra Vista	Transmission system extension for existing system.	$ 350,000	$ 499,000							$ 6,486,000							$ 7,335,000
13	From Logan Ave and E Lane St to Milmo PS providing add'l water for south Laredo	Transmission system extension for existing system.							$ 663,000	$ 947,000							$ 12,309,000	$ 13,919,000
14	New, larger pumps to provide standby capacity	Booster station improvements for existing system reliability.	$ 150,000	$ 214,000							$ 2,781,000							$ 3,145,000
15	JWTP header and yard piping improvements to allow more flow into the Transmission system	Transmission improvements to use existing production capacity.	$ -	$ 156,000							$ 1,348,000							$ 1,504,000
16	Along Loop 20 in Sierra Vista service area	Transmission system extension for existing system.	$ 57,000	$ 187,000							$ 2,428,000							$ 2,672,000
17	Build new 0.5 MG EST	TCEQ Regulatory Requirement for existing system.	$ 329,000	$ 299,000							$ 3,887,000							$ 4,515,000
18	Recoat existing EST	TCEQ Regulatory Requirement for existing system.							$ -	$ 137,000				$ 1,707,000				$ 1,844,000
19	Along Loop 20 in Milmo service area	Transmission system extension for existing system.										$ 70,000	$ 99,000				$ 1,286,000	$ 1,455,000
20	Phase A of 5 Year Neighborhood waterlines identified for replacement	Replace Waterlines over 40-years old	$ 105,333	$ 701,333				$ 9,115,000	$ 105,333	$ 701,333		$ 105,333	$ 701,333	$ 9,115,000			$ 9,115,000	$ 29,765,000
21	Feasibility Study for Targeted Groundwater Sites	Mid-term Water Supply Independent Verification		$ 200,000														$ 200,000
22	Field Tests for Targeted Groundwater Sites	Mid-term Water Supply Independent Verification		$ 250,000														$ 250,000

	FY23 Acquisition	FY23 Engineering	FY23 Construction	FY24 Acquisition	FY24 Engineering	FY24 Construction	FY25 Acquisition	FY25 Engineering	FY25 Construction	FY26 Acquisition	FY26 Engineering	FY26 Construction	FY27 Acquisition	FY27 Engineering	FY27 Construction	Subtotal
Proposed CIP TOTAL	**$ 2,680,333**	**$ 6,107,333**	**$ 5,773,625**	**$ -**	**$ 1,751,000**	**$ 38,475,000**	**$ 1,392,333**	**$ 2,676,333**	**$ 38,980,000**	**$ 1,109,333**	**$ 2,134,333**	**$ 22,389,000**	**$ -**	**$ -**	**$ 65,667,000**	**$ 189,135,625**
Existing CIP Total	$ -	$ -	$ 36,125,000	$ -	$ -	$ 33,125,000	$ -	$ -	$ 25,625,000	$ -	$ -	$ 30,756,000	$ -	$ -	$ -	$ 125,631,000
TOTAL	$ 2,680,333	$ 6,107,333	$ 41,898,625	$ -	$ 1,751,000	$ 71,600,000	$ 1,392,333	$ 2,676,333	$ 64,605,000	$ 1,109,333	$ 2,134,333	$ 53,145,000	$ -	$ -	$ 65,667,000	**$ 314,766,625**

City of Laredo - Integrated Water Master Plan Capital Improvements FY2028-FY2032

	Project Name	Purpose	FY28			FY29			FY30			FY31			FY32			FY28-FY32
			Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Total Project Cost
A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000			$ 125,000			$ 125,000			$ 125,000			$ 125,000	$ 625,000
C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000	$ 15,000,000
E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000	$ 50,000,000
	LAN Proposed CIP Projects (FY28-FY32)																	
23	SlipLine existing 36" Line from JWTP to Lyon	Additional Transmission line from Jefferson to Lyon Booster Pump Station					$ 1,273,000				$ 12,727,000							$ 14,000,000
24	JWTP to Quick Line Extension	Increased Capacity from Jefferson to Hendricks											$ 596,000	$ 7,741,000				$ 8,337,000
25	Cuatro Vientos PS (Sports Complex) Supply and initial distribution pipes	Regional Booster Pump Station and Connections	$ 629,000	898000				11666000										$ 13,193,000
26	Along Clark Blvd (or similar alignment) from Lyon PS to Clark	Transmission system extension for existing system.	962000	1374000				17858000										$ 20,194,000
27	La Pita Mangana Rd from Loop 20 to CV PS and Outer Loop	Transmission system extension for existing system.				$ 364,000	$ 520,000				$ 6,752,000							$ 7,636,000
28	Along Mines Rd at Santa Isabel Ck to control high pressures	Improve LOS to far north Mines Rd by eliminating in-line PRV				83000	276000				3584000							$ 3,943,000
29	Along I-35 from existing 60" water line to Unitec and other	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems				$ 502,000	$ 718,000				$ 9,324,000							$ 10,544,000
30	Along I35 from Mines Rd to Tejas Loop	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems				$ 44,000	$ 144,000				$ 1,866,000							$ 2,054,000
31	Along McPherson from EST to Shiloh Dr to allow EST to supply lower	Low Pressure (LOS), allow McPherson EST to serve low elevations to NW							$ 17,000	$ 54,000				$ 702,000				$ 773,000
32	International Blvd crossing Loop 20 to improve conveyance and nearby	Reliability, better supply to distribution system, improved system operation and service area control							$ 202,000	$ 289,000				$ 3,747,000				$ 4,238,000
33	Along Hwy 359 BPS service area for system interconnection and	Increase supple and pressure, in the Hwy 359 / HS area							$ 67,000	$ 222,000				$ 2,882,000				$ 3,171,000
34	Future Bianka Ln from Gabriela Ln to Loop 20	Connect existing and future system, provide loop, reliability/reduce down-time										$ 8,000	$ 26,000				$ 330,000	$ 364,000
35	Future Wormser Rd from Ave Mexico to Loop 20	Reliability, connect existing and proposed WLs										$ 3,000	$ 10,000				$ 127,000	$ 140,000
36	Along Loop 20 from Cielito Lindo Blvd to future road with existing	Extend existing system to accommodate smart growth										$ 73,000	$ 241,000				$ 3,129,000	$ 3,443,000
37	Phase B of 5 Year Neighborhood waterlines identified for	Replace Distribution waterlines over 40-years old	$ 345,000	$ 2,299,000				$ 29,881,000										$ 32,525,000
38	Neighborhood waterlines identified for replacement	Replace Distribution waterlines over 40-years old				$ 638,000	$ 4,250,000				$ 55,240,000							$ 60,128,000
39	Region M Reuse Phase 1	Mid-long term supply development											$ 7,120,000				$ 20,683,440	$ 27,803,440
40	Rio Bravo Interconnect	Mid-long term supply development and emergency connection	$ 278,000	$ 555,000	$ 7,205,000													$ 8,038,000
41	Future Ejido from St Luke Blvd to Future Road	Extend existing system in South Laredo													$ 59,000	$ 196,000		$ 255,000
42	Along I35 fron San Lorenzo Dr, then along I69-W to Sandia Dr.	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems													$ 99,000	$ 328,000		$ 427,000
43	Along I-35 from Mercury Dr to HUPS	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.													$ 280,000	$ 399,000		$ 679,000
44	Along I-35 from HUS to Border Dr	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.													$ 399,000	$ 570,000		$ 969,000
45	Along I-35 from Loop 20 to existing 60" water line	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems													$ 950,000	$ 1,357,000		$ 2,307,000
46	MHOC PS to McPherson parallel/replacement capacity to	Supplement / replace existing 24" WL													$ 302,000	$ 431,000		$ 733,000
			FY28			**FY29**			**FY30**			**FY31**			**FY32**			**Subtotal**
			Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	
		Proposed CIP TOTAL	$ 2,214,000	$ 5,126,000	$ 24,330,000	$ 1,631,000	$ 7,181,000	$ 76,530,000	$ 286,000	$ 565,000	$ 106,618,000	$ 84,000	$ 7,993,000	$ 32,197,000	$ 2,089,000	$ 3,281,000	$ 41,394,440	$ 311,519,440

City of Laredo - Integrated Water Master Plan Capital Improvements FY2033+

	Project Name	Purpose	FY 2033+ Acquisition	Engineering	Construction	FY33+ Total/Annual Project Cost
A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 2,000,000	$ 2,000,000
B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000	$ 125,000
C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000	$ 2,000,000
D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000	$ 3,000,000
E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000	$ 10,000,000
39	Region M Reuse Phase 1	Mid-long term supply development				
40	Rio Bravo Interconnect	Mid-long term supply development and emergency connection				
41	Future Ejido from St Luke Blvd to Future Road	Extend existing system in South Laredo			$ 2,538,000	$ 2,538,000
42	Along I35 fron San Lorenzo Dr, then along I69-W to Sandia Dr.	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems			$ 4,264,000	$ 4,264,000
43	Along I-35 from Mercury Dr to HUPS	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.			$ 5,185,000	$ 5,185,000
44	Along I-35 from HUS to Border Dr	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.			$ 7,404,000	$ 7,404,000
45	Along I-35 from Loop 20 to existing 60" water line	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems			$ 17,640,000	$ 17,640,000
46	MHOC PS to McPherson parallel/replacement capacity to	Supplement / replace existing 24" WL			$ 5,600,000	$ 5,600,000
	LAN Proposed CIP Projects (FY33 & Beyond)					
47	Along US 59 from Wilson Rd to Outer I	Connect existing and future system, provide loop, reliability/reduce down-time	$ 58,000	$ 191,000	$ 2,481,000	$ 2,730,000
48	Along Clark Rd from Loop 20 to Outer	Transmission system extension for existing system.	$ 454,000	$ 649,000	$ 8,430,000	$ 9,533,000
49	Clark Blvd PS	development.	$ 2,348,000	$ 2,134,000	$ 27,739,000	$ 32,221,000
50	Outer Loop from US-59 to Clark PS	Extend future service. Maintain coordinated, looped system	$ 1,336,000	$ 1,215,000	$ 15,788,000	$ 18,339,000
51	Outer Loop from Hwy 359 to eastward	Extend future service. Maintain coordinated, looped system	$ 2,372,000	$ 2,157,000	$ 28,033,000	$ 32,562,000
52	Outer Loop from Clark PS to Hwy 359	Extend future service. Maintain coordinated, looped system	$ 1,131,000	$ 1,028,000	$ 13,364,000	$ 15,523,000
53	Future Cielito Lindo Blvd from Loop 20	System reliability, improve service to South Laredo, and serve future development.	$ 92,000	$ 307,000	$ 3,984,000	$ 4,383,000
54	Along extension of Crepusculo Rd fron	Connect existing and future system, provide loop, reliability/reduce down-time	$ 46,000	$ 153,000	$ 1,980,000	$ 2,179,000
55	Along future extension of Lomas Del S	Connect existing and future service areas to maximize reliability	$ 246,000	$ 351,000	$ 4,553,000	$ 5,150,000
56	Outer Loop from I-35 to extension of S	Extend future service. Maintain coordinated, looped system	$ 4,096,000	$ 3,724,000	$ 48,404,000	$ 56,224,000
57	Along Del Mar from Loop 20 to Outer	Connect existing system and future OL TL, provide support from El Pico.	$ 213,000	$ 304,000	$ 3,942,000	$ 4,459,000
58	Along Mines Rd from Pinto Valle Ind'l I	Provide service along Mines Road	$ 183,000	$ 609,000	$ 7,907,000	$ 8,699,000
59	Future road from 83 to Ejido	Extend system to future South Laredo	$ 53,000	$ 176,000	$ 2,281,000	$ 2,510,000
60	Future road from Ejido to Loop 20	Extend system to future South Laredo	$ 56,000	$ 186,000	$ 2,408,000	$ 2,650,000
61	Along US 83 from Don Camilo Blvd to I	Extend service to future S Laredo, provide major arterials (backbone)	$ 71,000	$ 237,000	$ 3,075,000	$ 3,383,000
62	Outer Loop from Cielito Lindo Blvd to s	Extend future service. Maintain coordinated, looped system	$ 718,000	$ 1,026,000	$ 13,330,000	$ 15,074,000
63	Outer Loop from extension of Simon B	Extend future service. Maintain coordinated, looped system	$ 563,000	$ 512,000	$ 6,647,000	$ 7,722,000
64	Along Loop 20 from future road with e	Extend existing system to accommodate smart growth	$ 107,000	$ 356,000	$ 4,618,000	$ 5,081,000
65	Along future road at south edge of ser	Extend service to future S Laredo, provide major arterials (backbone)	$ 660,000	$ 942,000	$ 12,240,000	$ 13,842,000
66	Along US 83 from Fut-1 to south of Ma	Extend service to future S Laredo, provide major arterials (backbone)	$ 108,000	$ 360,000	$ 4,671,000	$ 5,139,000
67	Neighborhood waterlines identified fo	Replace Distribution waterlines over 40-years old	$ 588,000	$ 3,916,000	$ 50,898,000	$ 55,402,000
68	MHOC parallel/replacement from I35	High velocity, increase JWTP supply to MHOC	$ 137,000	$ 195,000	$ 2,527,000	$ 2,859,000
69	Northern Loop along future roads fro	Extend future service, maintain looped system	$ 1,537,000	$ 2,195,000	$ 28,532,000	$ 32,264,000
70	Along future roads Las Tiendas Rd to	Extend future service, maintain looped system	$ 454,000	$ 1,513,000	$ 19,663,000	$ 21,630,000
71	Outer Loop from extension of Crepus	Extend future service. Maintain coordinated, looped system	$ 1,239,000	$ 1,127,000	$ 14,641,000	$ 17,007,000
72	Future development bet I35 and SINE	Extend service, provide looping	$ 87,000	$ 290,000	$ 3,763,000	$ 4,140,000
73	Outer Loop from San Ignacio Rd to US	Extend future service. Maintain coordinated, looped system	$ 2,877,000	$ 2,615,000	$ 33,995,000	$ 39,487,000
74	Cuatro Vientos PS Tank and Pumps Ex	Expand Transmission Booster Pump Station for reliable and extended service.	$ 225,000	$ 321,000	$ 4,170,000	$ 4,716,000
75	Region M Reuse Phase 2	Long term supply development		$ 9,185,000	$ 27,740,000	$ 36,925,000

	FY33+ Acquisition	FY33+ Engineering	FY33+ Construction	Subtotal
Proposed CIP TOTAL	**$ 22,055,000**	**$ 37,974,000**	**$ 461,560,000**	**$ 521,589,000**

13 APPENDIX D
Distribution Water Line Renewal Prioritization

14 APPENDIX E

Project Planning Cost Sheets

Project cost elements were compiled from historical project database in Laredo with missing price categories extrapolated from appropriate projects in the Houston area and Central Texas.

15 APPENDIX F
Unit Costs, Detailed Cost Utilizations, and CIP Model Output

16 APPENDIX G
Laredo Customer Meter Data

17 APPENDIX H
Metropolitan Transportation Plan (2020-2045)

18 APPENDIX I
Regional Impact Fee Resources

19 APPENDIX J
Water Utility Cost of Service: 20-Year 3% Forecast

20 APPENDIX K
Alternative Water Utility Cost of Service: 20-Year 6% Forecast

21 APPENDIX L
Estrada Hinojosa May 2022 Utility Debt Presentation

22 Appendix M
TCEQ Chapter 210 Regulations

22 Appendix N
Public Presentations, Engagement Survey and Social Media

10 APPENDIX A
List of Data Received

Data Received from the City of Laredo

- Treatment Plant Historic Flow Data in xlsx format (5/1/2020)
- Water Billing Data (Revenue by Jurisdiction) in txt format (6/2/2020)
- Exhibit of 2016 Billing 'Cycles' in pdf format (6/2/2020)
- Monthly FY2016-FY2017 Water Utility Business Report in xlsx format (6/4/2020)
- Monthly FY2017-FY2018 Water Utility Business Report in xlsx format (6/4/2020)
- Monthly FY2018-FY2019 Water Utility Business Report in xlsx format (6/4/2020)
- Monthly FY2019-FY2020 Water Utility Business Report in xlsx format (6/4/2020)
- Top Ten Utility Consumers FY 18-19 in pdf format (6/10/2020)
- Disinfectant Residual Data in xlsx format (7/23/2020)
- Lyons PS HSC Submittal Rev 1 in pdf format (8/3/2020)
- Water Storage Tank Data in xls format (8/5/2020)
- Historic Data for Santa Isabel RO Plant (MORs, Power Use, Chem Analysis, etc.) in pdf format (9/3/2020)
- Exhibit of GIS edits of water system valves status in pdf format (9/11/2020)
- GIS Pipe Diameter Data for Select Pipes (in xlsx format) to Compare and Correct or Confirm Hydraulic Model (10/9/2020)
- GIS Shapefile of Water System Pressure Planes in shp format (10/17/2020)
- Updates of Water System Valve Status in xlsx format (10/18/2020, 10/23, 10/25, 10/28, 11/3/2020)
- Water System Flushing Locations in xlsx format (11/3/2020)
- SCADA Pressure and Flow for Treatment Plants on 14-Aug-2020 in xlsx format (1/11/2021)
- Improvement Construction Plan Sheets for Hendricks, Milmo, Lyon PSs in pdf format (2/10/2021)
- Yard Piping Exhibits for Jefferson WTP Site in pdf format (2/10/2021)
- Markup of Model to Confirm or Correct Model Connectivity (3/1/2021)
- Improvement Construction Plan Sheets for San Isidro EST in pdf format (2/10/2021)
- Conceptual Alignment of Sierra Vista PS Water Supply Pipe (6/9/2021)
- GIS Shapefile of Master Planned Communities in shp format (6/28/2021)
- Master Planned Community Data in xlsx and shp format (7/30/2021)
- GIS and Record Drawing Info for Water Lines at Bob Bullock Loop and McPherson Ave (8/4/2021)
- Residential Development in Southeast Laredo in pdf format (8/24/2021)
- Construction Plan Sheets for Hwy 359, MHOC, and Sierra Vista PSs in pdf format (9/9/2021)
- Summary of Length of GIS Water Lines by Size in xlsx format (10/13/2021)
- Water Meter Sizes and Dials Data in xlsx format (10/19/2021)
- GIS Shapefile of Water System Pressure Planes in shp format (10/22/2021, 10/25/2021)
- GIS Exhibits of Webb County Rio Grande Watershed in pdf, jpg formats (10/27/2021)
- Sports Complex Preliminary Water Facilities in pdf format (11/24/2021)
- Water and Wastewater Current Capital Projects if xlsx format (11/29/2021)
- Site Plan for Future North Laredo Elevated Storage in pdf, dwg formats (12/2/2021)
- Jefferson WTP Clear Well Record Drawing Information in pdf format (1/6/2022)
- Updated Water System Pipe and Valve GIS data in shp, mxd, lyr formats (3/24/2022)

11 APPENDIX B

Water Supply Report

Investigations and Information Used

The following brief summaries for groundwater alternatives that have historically been considered by the city. Figure 1 shows the study area for potential groundwater alternatives. The following is a summary of groundwater studies considered:

1. The 2021 DRAFT Rio Grande Regional Water Plan for the Region M Regional Water Planning Group (RWPG) which includes recommended and alternative Water Management Strategies (WMSs) for Laredo.
2. Joint planning documentation for groundwater management areas (GMAs) within the study area. Potential groundwater resources that could be available to Laredo are generally located within GMA 7, GMA 13, and GMA 16. Figure 3 illustrates the boundaries of GMAs and groundwater conservation districts (GCDs) within the study area.
3. Reports, memoranda, and technical notes from the TWDB, the United States Geological Survey (USGS), and other consultants regarding groundwater availability, brackish production area delineation and potential ASR projects. Figure 4 shows the extents of the Major and Minor aquifers within the study area.
4. The Lake Casa Blanca Dam *Hydrologic and Hydraulic Analysis Report* by Espey Consultants is dated November 2007. The report and associated data show that approximate bathymetric soundings of the lake bottom were performed to update the storage capacity of the existing lake
5. Reports and compilation of information from Dimmit County WSC.
6. TGI's experience assessing private projects in the region particularly including the Edwards-Trinity Plateau aquifer in Kinney and Val Verde counties.
7. "Feasibility Study of Groundwater Supply and Delivery from Northwest Webb County to Southern Webb County" by Dannenbaum Engineering Corporation, December 1998.
8. MWH, Inc. study of secondary water, 2003, recommended 2.5-MGD from Laredo Sands, later Council abandoned the recommendation, 2004.
9. Laredo City Council and other City Committee presentations and minutes:
   - Northwest Webb County groundwater discussion – April 8, 1999
   - Council Workshop and presentations – April 20, 2000
   - Council Discussion and Presentation on groundwater development – June 28, 1999
   - Council presentation regarding the Rio Grande – June 2000
   - Staff reports and Presentations on potential supplies -November 29, 2006
     - Grass Valley Water, Kinney County
     - Laredo Water Company, Northern Webb County
     - South Texas Pipeline, Dimmit County (Carrizo Springs)
     - City of Encinal (Webb County)
   - Lake Casa Blanca Presentation, Rio Grande International Study Center – February 20, 2007

12 APPENDIX C
FY 2023 – FY 2033+ CIP

City of Laredo - Integrated Water Master Plan Capital Improvements FY2023-FY2027

	Project Name	Purpose	FY23			FY24			FY25			FY26			FY27			FY23-FY27
			Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Total Project Cost
Existing CIP (FY22-FY26)																		
A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 10,500,000			$ 10,500,000			$ 10,500,000			$ 10,500,000			$ 10,500,000	$ 52,500,000
B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000			$ 125,000			$ 125,000			$ 125,000			$ 125,000	$ 625,000
C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000	$ 15,000,000
E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000	$ 50,000,000
F	20-WAT-03 - El Pico 10 MG Expansion	TCEQ Regulatory Requirement						$ 1,500,000										$ 1,500,000
G	17-WAT-008 - 24" Waterline along Loop 20	Provide Pressure and Flow for South Laredo												$ 5,131,000				$ 5,131,000
H	20-WAT-02-TXDOT 24" Wtl Reloc LP20/Del Mar	Relocation due to Fwy/Hwy Upgrade						$ 6,000,000										$ 6,000,000
I	22-WAT-002 - Corpus Christi Water Improvements	Replace Waterlines over 40-years old			$ 4,500,000													$ 4,500,000
J	22-WAT-003 - 24" Cuatro Vientos Rd. Crossing	Provide Pressure and Flow for SH 359 Area			$ 6,000,000													$ 6,000,000
					$ 36,125,000			$ 33,125,000			$ 25,625,000			$ 30,756,000				
Proposed CIP Projects (FY23-FY27																		
1	Bartlett; MHOC to Bartlett	The Transmission system needs to be expanded to suuply water for the Distribution system to ensure that water is delivered to homes and businesses.		$ 1,000,000	$ 5,773,625													$ 6,773,625
2	JWTP tp Lyon	The Transmission Line from the Jefferson Water Treatment Plant to the Lyon Booster Pump Station is a critical water supply line for most of the City. The line was planned for replacement, but the recent line break has accelerated the project.	$ 1,197,000	$ 1,710,000				$ 17,093,000										$ 20,000,000
3	Looping in Colonias Area	Additional lines for looping in the Colonias will help water quality.	$ 281,000	$ 188,000				$ 2,434,000										$ 2,903,000
4	Hendricks PS Retrofit	Rehab of the Hendricks Booster Pump Station will help the Lyon Booster Pump Statino provide water for South Laredo.					$ 414,000	$ 5,381,000										$ 5,795,000
5	Hendricks to Lyon	The Transmission Line from the Hendricks Booster Pump Station to the Lyon Booster Pump Station will allow the two booster stations to work together to supply South Laredo.					$ 343,000	$ 4,452,000										$ 4,795,000
6	Additional 12" Transmission for Looping	Improved water quality through looping	$ 211,000	$ 703,000							$ 9,136,000							$ 10,050,000
7	Connect Hendricks to mid-sized JWTP extension line	The Hendricks Booster Pump Station can be fed by existing transmission lines from the Jefferson Water Treatment Plant.					$ 994,000				$ 12,914,000							$ 13,908,000
8	Along Loop 20 from Clark Blvd to Hwy 359	Loop 20 WLs ongoing, coordinate with Utiliites							$ 354,000	$ 505,000				$ 6,557,000				$ 7,416,000
9	Along Loop 20 from Hwy 359 to Los Presidentes Ave	Loop 20 WLs ongoing, coordinate with Utiliites							$ 270,000	$ 386,000				$ 5,010,000				$ 5,666,000
10	Along Loop 20 from Bianka Ln to Cielito Lindo Blvd	Extend existing system to accommodate smart growth										$ 365,000	$ 522,000				$ 6,778,000	$ 7,665,000
11	Milmo to Sierra Vista	Transmission system extension for existing system.										$ 569,000	$ 812,000				$ 10,554,000	$ 11,935,000
12	Along various alignments from S Ejido Ave at Bianka Ln to Sierra Vista	Transmission system extension for existing system.	$ 350,000	$ 499,000							$ 6,486,000							$ 7,335,000
13	From Logan Ave and E Lane St to Milmo PS providing add'l water for south Laredo	Transmission system extension for existing system.							$ 663,000	$ 947,000							$ 12,309,000	$ 13,919,000
14	New, larger pumps to provide standby capacity	Booster station improvements for existing system reliability.	$ 150,000	$ 214,000							$ 2,781,000							$ 3,145,000
15	JWTP header and yard piping improvements to allow more flow into the Transmission system	Transmission improvements to use existing production capacity.	$ -	$ 156,000							$ 1,348,000							$ 1,504,000
16	Along Loop 20 in Sierra Vista service area	Transmission system extension for existing system.	$ 57,000	$ 187,000							$ 2,428,000							$ 2,672,000
17	Build new 0.5 MG EST	TCEQ Regulatory Requirement for existing system.	$ 329,000	$ 299,000							$ 3,887,000							$ 4,515,000
18	Recoat existing EST	TCEQ Regulatory Requirement for existing system.							$ -	$ 137,000				$ 1,707,000				$ 1,844,000
19	Along Loop 20 in Milmo service area	Transmission system extension for existing system.										$ 70,000	$ 99,000				$ 1,286,000	$ 1,455,000
20	Phase A of 5 Year Neighborhood waterlines identified for replacement	Replace Waterlines over 40-years old	$ 105,333	$ 701,333				$ 9,115,000	$ 105,333	$ 701,333		$ 105,333	$ 701,333	$ 9,115,000			$ 9,115,000	$ 29,765,000
21	Feasibility Study for Targeted Groundwater Sites	Mid-term Water Supply Independent Verification		$ 200,000														$ 200,000
22	Field Tests for Targeted Groundwater Sites	Mid-term Water Supply Independent Verification		$ 250,000														$ 250,000

	FY23			FY24			FY25			FY26			FY27			Subtotal
	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	Acquisition	Engineering	Construction	
Proposed CIP TOTAL	**$ 2,680,333**	**$ 6,107,333**	**$ 5,773,625**	**$ -**	**$ 1,751,000**	**$ 38,475,000**	**$ 1,392,333**	**$ 2,676,333**	**$ 38,980,000**	**$ 1,109,333**	**$ 2,134,333**	**$ 22,389,000**	**$ -**	**$ -**	**$ 65,667,000**	**$ 189,135,625**
Existing CIP Total	$ -	$ -	$ 36,125,000	$ -	$ -	$ 33,125,000	$ -	$ -	$ 25,625,000	$ -	$ -	$ 30,756,000	$ -	$ -	$ -	$ 125,631,000
TOTAL	$ 2,680,333	$ 6,107,333	$ 41,898,625	$ -	$ 1,751,000	$ 71,600,000	$ 1,392,333	$ 2,676,333	$ 64,605,000	$ 1,109,333	$ 2,134,333	$ 53,145,000	$ -	$ -	$ 65,667,000	**$ 314,766,625**

City of Laredo - Integrated Water Master Plan Capital Improvements FY2028-FY2032

	Project Name	Purpose	FY28 Acquisition	FY28 Engineering	FY28 Construction	FY29 Acquisition	FY29 Engineering	FY29 Construction	FY30 Acquisition	FY30 Engineering	FY30 Construction	FY31 Acquisition	FY31 Engineering	FY31 Construction	FY32 Acquisition	FY32 Engineering	FY32 Construction	FY28-FY32 Total Project Cost
A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000			$ 125,000			$ 125,000			$ 125,000			$ 125,000	$ 625,000
C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000			$ 2,000,000	$ 10,000,000
D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000			$ 3,000,000	$ 15,000,000
E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000			$ 10,000,000	$ 50,000,000
	LAN Proposed CIP Projects (FY28-FY32)																	
23	SlipLine existing 36" Line from JWTP to Lyon	Additional Transmission line from Jefferson to Lyon Booster Pump Station					$ 1,273,000				$ 12,727,000							$ 14,000,000
24	JWTP to Quick Line Extension	Increased Capacity from Jefferson to Hendricks											$ 596,000	$ 7,741,000				$ 8,337,000
25	Cuatro Vientos PS (Sports Complex) Supply and initial distribution pipes	Regional Booster Pump Station and Connections	$ 629,000	898000				11666000										$ 13,193,000
26	Along Clark Blvd (or similar alignment) from Lyon PS to Clark	Transmission system extension for existing system.	962000	1374000				17858000										$ 20,194,000
27	La Pita Mangana Rd from Loop 20 to CV PS and Outer Loop	Transmission system extension for existing system.				$ 364,000	$ 520,000				$ 6,752,000							$ 7,636,000
28	Along Mines Rd at Santa Isabel Ck to control high pressures	Improve LOS to far north Mines Rd by eliminating in-line PRV				83000	276000				3584000							$ 3,943,000
29	Along I-35 from existing 60" water line to Unitec and other	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems				$ 502,000	$ 718,000				$ 9,324,000							$ 10,544,000
30	Along I35 from Mines Rd to Tejas Loop	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems				$ 44,000	$ 144,000				$ 1,866,000							$ 2,054,000
31	Along McPherson from EST to Shiloh Dr to allow EST to supply lower	Low Pressure (LOS), allow McPherson EST to serve low elevations to NW							$ 17,000	$ 54,000				$ 702,000				$ 773,000
32	International Blvd crossing Loop 20 to improve conveyance and nearby	Reliability, better supply to distribution system, improved system operation and service area control							$ 202,000	$ 289,000				$ 3,747,000				$ 4,238,000
33	Along Hwy 359 BPS service area for system interconnection and	Increase supple and pressure, in the Hwy 359 / HS area							$ 67,000	$ 222,000				$ 2,882,000				$ 3,171,000
34	Future Bianka Ln from Gabriela Ln to Loop 20	Connect existing and future system, provide loop, reliability/reduce down-time										$ 8,000	$ 26,000				$ 330,000	$ 364,000
35	Future Wormser Rd from Ave Mexico to Loop 20	Reliability, connect existing and proposed WLs										$ 3,000	$ 10,000				$ 127,000	$ 140,000
36	Along Loop 20 from Cielito Lindo Blvd to future road with existing	Extend existing system to accommodate smart growth										$ 73,000	$ 241,000				$ 3,129,000	$ 3,443,000
37	Phase B of 5 Year Neighborhood waterlines identified for	Replace Distribution waterlines over 40-years old	$ 345,000	$ 2,299,000				$ 29,881,000										$ 32,525,000
38	Neighborhood waterlines identified for replacement	Replace Distribution waterlines over 40-years old				$ 638,000	$ 4,250,000				$ 55,240,000							$ 60,128,000
39	Region M Reuse Phase 1	Mid-long term supply development											$ 7,120,000				$ 20,683,440	$ 27,803,440
40	Rio Bravo Interconnect	Mid-long term supply development and emergency connection	$ 278,000	$ 555,000	$ 7,205,000													$ 8,038,000
41	Future Ejido from St Luke Blvd to Future Road	Extend existing system in South Laredo													$ 59,000	$ 196,000		$ 255,000
42	Along I35 fron San Lorenzo Dr, then along I69-W to Sandia Dr.	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems													$ 99,000	$ 328,000		$ 427,000
43	Along I-35 from Mercury Dr to HUPS	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.													$ 280,000	$ 399,000		$ 679,000
44	Along I-35 from HUS to Border Dr	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.													$ 399,000	$ 570,000		$ 969,000
45	Along I-35 from Loop 20 to existing 60" water line	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems													$ 950,000	$ 1,357,000		$ 2,307,000
46	MHOC PS to McPherson parallel/replacement capacity to	Supplement / replace existing 24" WL													$ 302,000	$ 431,000		$ 733,000
			FY28			**FY29**			**FY30**			**FY31**			**FY32**			**Subtotal**
			Acquisition	**Engineering**	**Construction**	**Acquisition**	**Engineering**	**Construction**	**Acquisition**	**Engineering**	**Construction**	**Acquisition**	**Engineering**	**Construction**	**Acquisition**	**Engineering**	**Construction**	
		Proposed CIP TOTAL	**$ 2,214,000**	**$ 5,126,000**	**$ 24,330,000**	**$ 1,631,000**	**$ 7,181,000**	**$ 76,530,000**	**$ 286,000**	**$ 565,000**	**$ 106,618,000**	**$ 84,000**	**$ 7,993,000**	**$ 32,197,000**	**$ 2,089,000**	**$ 3,281,000**	**$ 41,394,440**	**$ 311,519,440**

City of Laredo - Integrated Water Master Plan Capital Improvements FY2033+

	Project Name	Purpose	FY 2033+ Acquisition	FY 2033+ Engineering	FY 2033+ Construction	FY33+ Total/Annual Project Cost
A	07-WAT-003 - Line Rehab & Contingency Water Break - All	Replace Waterlines over 40-years old			$ 2,000,000	$ 2,000,000
B	17-WAT-001 - Water IT Improvement Projects - All Districts	Replace Equipment for Better Monitoring and Control			$ 125,000	$ 125,000
C	17-WAT-011 - Water Rights - All Districts	Mid-term Water Supply Needs			$ 2,000,000	$ 2,000,000
D	21-WAT-06 - Equipment	Replace Equipment			$ 3,000,000	$ 3,000,000
E	22 WAT - 001 - Water Quality Projects	Improve Water Quality			$ 10,000,000	$ 10,000,000
39	Region M Reuse Phase 1	Mid-long term supply development				
40	Rio Bravo Interconnect	Mid-long term supply development and emergency connection				
41	Future Ejido from St Luke Blvd to Future Road	Extend existing system in South Laredo			$ 2,538,000	$ 2,538,000
42	Along I35 fron San Lorenzo Dr, then along I69-W to Sandia Dr.	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems			$ 4,264,000	$ 4,264,000
43	Along I-35 from Mercury Dr to HUPS	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.			$ 5,185,000	$ 5,185,000
44	Along I-35 from HUS to Border Dr	Reliability, provide elevated storage to supply Hachar/Unitec during service interruption. Consolidate existing BPSs on single site.			$ 7,404,000	$ 7,404,000
45	Along I-35 from Loop 20 to existing 60" water line	Increase reliability, provide service in existing service area, loop lines to avoid WQ problems			$ 17,640,000	$ 17,640,000
46	MHOC PS to McPherson parallel/replacement capacity to	Supplement / replace existing 24" WL			$ 5,600,000	$ 5,600,000
	LAN Proposed CIP Projects (FY33 & Beyond)					
47	Along US 59 from Wilson Rd to Outer	Connect existing and future system, provide loop, reliability/reduce down-time	$ 58,000	$ 191,000	$ 2,481,000	$ 2,730,000
48	Along Clark Rd from Loop 20 to Outer	Transmission system extension for existing system.	$ 454,000	$ 649,000	$ 8,430,000	$ 9,533,000
49	Clark Blvd PS	development.	$ 2,348,000	$ 2,134,000	$ 27,739,000	$ 32,221,000
50	Outer Loop from US-59 to Clark PS	Extend future service. Maintain coordinated, looped system	$ 1,336,000	$ 1,215,000	$ 15,788,000	$ 18,339,000
51	Outer Loop from Hwy 359 to eastward	Extend future service. Maintain coordinated, looped system	$ 2,372,000	$ 2,157,000	$ 28,033,000	$ 32,562,000
52	Outer Loop from Clark PS to Hwy 359	Extend future service. Maintain coordinated, looped system	$ 1,131,000	$ 1,028,000	$ 13,364,000	$ 15,523,000
53	Future Cielito Lindo Blvd from Loop 20	System reliability, improve service to South Laredo, and serve future development.	$ 92,000	$ 307,000	$ 3,984,000	$ 4,383,000
54	Along extension of Crepusculo Rd from	Connect existing and future system, provide loop, reliability/reduce down-time	$ 46,000	$ 153,000	$ 1,980,000	$ 2,179,000
55	Along future extension of Lomas Del S	Connect existing and future service areas to maximize reliability	$ 246,000	$ 351,000	$ 4,553,000	$ 5,150,000
56	Outer Loop from I-35 to extension of S	Extend future service. Maintain coordinated, looped system	$ 4,096,000	$ 3,724,000	$ 48,404,000	$ 56,224,000
57	Along Del Mar from Loop 20 to Outer	Connect existing system and future OL TL, provide support from El Pico.	$ 213,000	$ 304,000	$ 3,942,000	$ 4,459,000
58	Along Mines Rd from Pinto Valle Ind'l	Provide service along Mines Road	$ 183,000	$ 609,000	$ 7,907,000	$ 8,699,000
59	Future road from 83 to Ejido	Extend system to future South Laredo	$ 53,000	$ 176,000	$ 2,281,000	$ 2,510,000
60	Future road from Ejido to Loop 20	Extend system to future South Laredo	$ 56,000	$ 186,000	$ 2,408,000	$ 2,650,000
61	Along US 83 from Don Camilo Blvd to	Extend service to future S Laredo, provide major arterials (backbone)	$ 71,000	$ 237,000	$ 3,075,000	$ 3,383,000
62	Outer Loop from Cielito Lindo Blvd to	Extend future service. Maintain coordinated, looped system	$ 718,000	$ 1,026,000	$ 13,330,000	$ 15,074,000
63	Outer Loop from extension of Simon B	Extend future service. Maintain coordinated, looped system	$ 563,000	$ 512,000	$ 6,647,000	$ 7,722,000
64	Along Loop 20 from future road with e	Extend existing system to accommodate smart growth	$ 107,000	$ 356,000	$ 4,618,000	$ 5,081,000
65	Along future road at south edge of ser	Extend service to future S Laredo, provide major arterials (backbone)	$ 660,000	$ 942,000	$ 12,240,000	$ 13,842,000
66	Along US 83 from Fut-1 to south of Ma	Extend service to future S Laredo, provide major arterials (backbone)	$ 108,000	$ 360,000	$ 4,671,000	$ 5,139,000
67	Neighborhood waterlines identified fo	Replace Distribution waterlines over 40-years old	$ 588,000	$ 3,916,000	$ 50,898,000	$ 55,402,000
68	MHOC parallel/replacement from I35	High velocity, increase JWTP supply to MHOC	$ 137,000	$ 195,000	$ 2,527,000	$ 2,859,000
69	Northern Loop along future roads fro	Extend future service, maintain looped system	$ 1,537,000	$ 2,195,000	$ 28,532,000	$ 32,264,000
70	Along future roads Las Tiendas Rd to	Extend future service, maintain looped system	$ 454,000	$ 1,513,000	$ 19,663,000	$ 21,630,000
71	Outer Loop from extension of Crepus	Extend future service. Maintain coordinated, looped system	$ 1,239,000	$ 1,127,000	$ 14,641,000	$ 17,007,000
72	Future development bet I35 and SINE	Extend service, provide looping	$ 87,000	$ 290,000	$ 3,763,000	$ 4,140,000
73	Outer Loop from San Ignacio Rd to US	Extend future service. Maintain coordinated, looped system	$ 2,877,000	$ 2,615,000	$ 33,995,000	$ 39,487,000
74	Cuatro Vientos PS Tank and Pumps Ex	Expand Transmission Booster Pump Station for reliable and extended service.	$ 225,000	$ 321,000	$ 4,170,000	$ 4,716,000
75	Region M Reuse Phase 2	Long term supply development		$ 9,185,000	$ 27,740,000	$ 36,925,000
			FY33+ Acquisition	FY33+ Engineering	FY33+ Construction	Subtotal
		Proposed CIP TOTAL	**$ 22,055,000**	**$ 37,974,000**	**$ 461,560,000**	**$ 521,589,000**

13 APPENDIX D
Distribution Water Line Renewal Prioritization

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
3	District 5	WD-WM-000390	CI	6	2	4	Year 1-5	655
4	District 7	WD-WM-000449	CAS	8	1	3	Year 1-5	647
5	District 7	WD-WM-000450	CAS	8	1	3	Year 1-5	968
6	District 7	WD-WM-000599	CAS	8	1	3	Year 1-5	289
7	District 8	WD-WM-000604	CAS	6	2	4	Year 1-5	304
8	District 8	WD-WM-000605	CAS	6	1	4	Year 1-5	327
9	District 8	WD-WM-000627	CAS	6	1	4	Year 1-5	342
10	District 8	WD-WM-000629	CAS	8	2	4	Year 1-5	336
11	District 8	WD-WM-000630	DIP	8	1	4	Year 1-5	334
12	District 8	WD-WM-000632	CAS	8	1	4	Year 1-5	1020
14	District 4	WD-WM-000648	CAS	6	1	4	Year 1-5	336
15	District 4	WD-WM-000661	CAS	6	1	4	Year 1-5	335
16	District 4	WD-WM-000672	CAS	6	1	3	Year 1-5	796
17	District 4	WD-WM-000697	CI	8	2	3	Year 1-5	304
21	District 4	WD-WM-000721	PVC	8	3	4	Year 1-5	331
22	District 4	WD-WM-000722	CAS	6	1	3	Year 1-5	322
30	District 4	WD-WM-000919	CAS	6	1	3	Year 1-5	321
31	District 8	WD-WM-000928	CAS	6	3	4	Year 1-5	304
32	District 4	WD-WM-000933	CAS	6	1	4	Year 1-5	293
34	District 7	WD-WM-001162	CAS	12	2	3	Year 1-5	496
35	District 5	WD-WM-001166	CI	8	1	3	Year 1-5	916
36	District 7	WD-WM-001266	CI	12	2	3	Year 1-5	446
37	District 5	WD-WM-001272	CI	8	2	4	Year 1-5	1314
38	District 5	WD-WM-001365	CAS	8	1	3	Year 1-5	731
39	District 5	WD-WM-001404	DI	16	1	3	Year 1-5	1334
41	District 5	WD-WM-001450	CI	8	1	3	Year 1-5	105
42	District 5	WD-WM-001465	CAS	8	1	4	Year 1-5	824
43	District 5	WD-WM-001489	CAS	8	2	4	Year 1-5	599
44	District 5	WD-WM-001503	CAS	6	1	4	Year 1-5	274
45	District 5	WD-WM-001504	CAS	6	2	4	Year 1-5	82

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
46	District 5	WD-WM-001505	CAS	6	2	4	Year 1-5	265
53	District 5	WD-WM-001635	CAS	6	1	3	Year 1-5	242
54	District 5	WD-WM-001636	CI	12	1	3	Year 1-5	665
55	District 5	WD-WM-001647	CI	8	1	3	Year 1-5	346
56	District 5	WD-WM-001656	CI	6	1	3	Year 1-5	338
64	District 5	WD-WM-001811	CAS	12	2	4	Year 1-5	785
77	District 4	WD-WM-003210	CAS	6	1	3	Year 1-5	22
80	District 4	WD-WM-003331	CI	10	1	4	Year 1-5	354
86	District 4	WD-WM-003428	CAS	6	3	3	Year 1-5	346
87	District 4	WD-WM-003429	CAS	6	2	3	Year 1-5	336
88	District 4	WD-WM-003444	DI	16	1	3	Year 1-5	342
102	District 4	WD-WM-003637	PVC	6	1	3	Year 1-5	292
115	District 8	WD-WM-003863	CAS	8	3	4	Year 1-5	364
116	District 8	WD-WM-003864	CAS	6	1	4	Year 1-5	366
118	District 8	WD-WM-003876	CAS	8	1	4	Year 1-5	328
119	District 8	WD-WM-003877	CAS	8	1	4	Year 1-5	367
120	District 8	WD-WM-003885	CAS	8	1	4	Year 1-5	235
121	District 8	WD-WM-003892	CAS	8	1	4	Year 1-5	296
122	District 4	WD-WM-003928	CI	6	2	4	Year 1-5	334
123	District 4	WD-WM-003931	CAS	6	4	4	Year 1-5	292
124	District 4	WD-WM-003943	CAS	6	1	4	Year 1-5	301
125	District 4	WD-WM-003944	CAS	6	1	4	Year 1-5	331
131	District 4	WD-WM-004176	CAS	6	2	3	Year 1-5	329
132	District 4	WD-WM-004177	DIP	6	2	3	Year 1-5	293
133	District 4	WD-WM-004179	CAS	6	1	3	Year 1-5	355
150	District 8	WD-WM-004710	CI	6	1	3	Year 1-5	369
151	District 8	WD-WM-004711	CI	6	4	3	Year 1-5	335
152	District 8	WD-WM-004712	CAS	6	3	3	Year 1-5	294
163	District 4	WD-WM-004918	CI	6	2	3	Year 1-5	334
164	District 4	WD-WM-004919	CI	6	1	3	Year 1-5	332

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
176	District 4	WD-WM-005202	CAS	8	1	2	Year 1-5	353
179	District 4	WD-WM-005254	CAS	6	2	3	Year 1-5	345
181	District 4	WD-WM-005275	CAS	6	1	3	Year 1-5	335
182	District 4	WD-WM-005276	CAS	6	1	3	Year 1-5	292
183	District 4	WD-WM-005315	CAS	6	1	3	Year 1-5	332
184	District 4	WD-WM-005328	CI	16	1	3	Year 1-5	330
188	District 4	WD-WM-005413	CI	6	1	2	Year 1-5	335
189	District 4	WD-WM-005433	CAS	6	2	2	Year 1-5	305
235	District 8	WD-WM-006460	CAS	8	1	1	Year 1-5	259
260	District 2	WD-WM-006968	CAS	6	1	4	Year 1-5	349
261	District 2	WD-WM-006974	CAS	6	1	4	Year 1-5	346
262	District 2	WD-WM-006975	CAS	6	1	4	Year 1-5	292
263	District 2	WD-WM-006976	CAS	6	1	4	Year 1-5	331
265	District 2	WD-WM-006987	CAS	6	1	4	Year 1-5	296
271	District 2	WD-WM-007192	CAS	6	2	4	Year 1-5	314
272	District 1	WD-WM-007194	CAS	6	2	3	Year 1-5	339
273	District 1	WD-WM-007198	CAS	6	1	3	Year 1-5	335
274	District 2	WD-WM-007200	CAS	6	2	3	Year 1-5	334
275	District 2	WD-WM-007239	CAS	8	3	4	Year 1-5	315
276	District 2	WD-WM-007240	CAS	6	1	4	Year 1-5	311
277	District 2	WD-WM-007241	CAS	6	1	4	Year 1-5	335
278	District 1	WD-WM-007242	CAS	6	3	3	Year 1-5	337
279	District 4	WD-WM-007365	CAS	6	2	3	Year 1-5	349
291	District 2	WD-WM-008578	CI	6	6	4	Year 1-5	1082
292	District 2	WD-WM-008582	CI	8	2	4	Year 1-5	923
293	District 2	WD-WM-008589	PVC	8	1	4	Year 1-5	777
297	District 4	WD-WM-008857	CAS	6	1	3	Year 1-5	349
320	District 2	WD-WM-012621	CAS	6	1	4	Year 1-5	34
321	District 2	WD-WM-012870	CAS	6	1	4	Year 1-5	284
325	District 4	WD-WM-014265	CAS	8	2	3	Year 1-5	308

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
332	District 8	WD-WM-014307	CAS	6	4	3	Year 1-5	303
335	District 4	WD-WM-014996	PVC	8	1	4	Year 1-5	342
336	District 4	WD-WM-015002	PVC	12	1	4	Year 1-5	346
337	District 4	WD-WM-015016	CAS	6	1	4	Year 1-5	334
338	District 4	WD-WM-015020	CAS	6	1	4	Year 1-5	350
339	District 4	WD-WM-015023	CAS	6	2	3	Year 1-5	294
340	District 4	WD-WM-015028	CAS	8	1	3	Year 1-5	355
341	District 4	WD-WM-015040	CAS	6	4	3	Year 1-5	329
342	District 4	WD-WM-015048	CAS	10	2	4	Year 1-5	292
343	District 4	WD-WM-015055	PVC	6	1	4	Year 1-5	661
344	District 4	WD-WM-015057	PVC	12	1	4	Year 1-5	334
347	District 5	WD-WM-015082	CI	6	1	3	Year 1-5	250
348	District 5	WD-WM-015098	CAS	8	1	3	Year 1-5	1357
356	District 7	WD-WM-015445	CAS	12	1	3	Year 1-5	1870
358	District 7	WD-WM-015916	CI	6	1	3	Year 1-5	866
361	District 5	WD-WM-016312	CI	6	1	4	Year 1-5	650
362	District 5	WD-WM-016320	CAS	6	1	3	Year 1-5	749
363	District 5	WD-WM-016334	CI	6	1	3	Year 1-5	329
364	District 5	WD-WM-016348	CAS	6	2	3	Year 1-5	1166
365	District 5	WD-WM-016351	CI	6	1	3	Year 1-5	293
367	District 7	WD-WM-016520	PVC	8	1	2	Year 1-5	603
368	District 7	WD-WM-016568	CI	10	3	4	Year 1-5	3438
369	District 7	WD-WM-016570	CI	16	2	4	Year 1-5	3264
372	District 7	WD-WM-016582	CI	8	1	4	Year 1-5	2019
373	District 7	WD-WM-016603	PVC	8	1	1	Year 1-5	274
380	District 7	WD-WM-017793	CI	12	1	4	Year 1-5	835
381	District 7	WD-WM-017796	DI	8	2	4	Year 1-5	685
383	District 7	WD-WM-017799	DI	16	1	4	Year 1-5	569
384	District 7	WD-WM-017802	DI	16	2	4	Year 1-5	688
385	District 7	WD-WM-017848	CI	8	2	4	Year 1-5	610

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
386	District 7	WD-WM-017849	CI	6	3	4	Year 1-5	483
387	District 7	WD-WM-017850	CAS	6	1	4	Year 1-5	173
388	District 7	WD-WM-017856	CAS	8	1	4	Year 1-5	21
389	District 7	WD-WM-017870	CI	8	3	4	Year 1-5	517
390	District 7	WD-WM-017878	CI	8	1	4	Year 1-5	147
391	District 7	WD-WM-017890	CI	8	1	3	Year 1-5	231
393	District 6	WD-WM-017976	AC	6	2	3	Year 1-5	320
410	District 7	WD-WM-018781	CI	8	1	4	Year 1-5	615
419	District 6	WD-WM-019366	AC	6	1	3	Year 1-5	475
422	District 7	WD-WM-019564	PVC	16	1	3	Year 1-5	4521
423	District 6	WD-WM-019869	PVC	12	1	3	Year 1-5	1102
427	District 6	WD-WM-020548	PVC	24	1	3	Year 1-5	6659
428	District 7	WD-WM-020558	CI	6	5	3	Year 1-5	556
432	District 5	WD-WM-021076	PVC	8	3	4	Year 1-5	1470
443	District 7	WD-WM-023518	CI	16	2	4	Year 1-5	1220
449	District 4	WD-WM-024329	PVC	8	1	4	Year 1-5	307
456	District 5	WD-WM-024613	CAS	8	1	4	Year 1-5	1397
457	District 4	WD-WM-046351	PVC	8	1	3	Year 1-5	311
458	District 8	WD-WM-000631	NULL	8	99	4	Year 1-5	329
459	District 8	WD-WM-000927	NULL	8	99	4	Year 1-5	302
460	District 4	WD-WM-015017	CAS	6	99	4	Year 1-5	359
461	District 7	WD-WM-017794	CI	12	99	4	Year 1-5	484
463	District 7	WD-WM-017798	DI	16	99	4	Year 1-5	97
464	District 7	WD-WM-017800	DI	16	99	4	Year 1-5	337
465	District 7	WD-WM-017801	DI	16	99	4	Year 1-5	62
467	District 7	WD-WM-017829	DI	16	99	4	Year 1-5	463
468	District 7	WD-WM-017830	DI	8	99	4	Year 1-5	483
469	District 7	WD-WM-017837	DI	8	99	4	Year 1-5	312
470	District 7	WD-WM-017853	CI	12	99	4	Year 1-5	89
471	District 7	WD-WM-017854	CAS	12	99	4	Year 1-5	52

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
472	District 7	WD-WM-017855	CI	12	99	4	Year 1-5	272
473	District 7	WD-WM-017857	CAS	12	99	4	Year 1-5	16
474	District 7	WD-WM-017876	CAS	12	99	3	Year 1-5	768
475	District 7	WD-WM-016571	CI	16	99	4	Year 1-5	838
476	District 7	WD-WM-016572	CI	16	99	4	Year 1-5	171
477	District 7	WD-WM-016573	CI	16	99	4	Year 1-5	93
479	District 7	WD-WM-016575	CI	16	99	4	Year 1-5	58
481	District 7	WD-WM-046306	<Null>	8	99	4	Year 1-5	615
482	District 7	<Null>	CAS	10	99	4	Year 1-5	959
491	District 2	WD-WM-007193	CAS	6	99	4	Year 1-5	328
501	District 4	WD-WM-004178	DIP	6	99	3	Year 1-5	281
502	District 4	WD-WM-011273	PVC	8	99	3	Year 1-5	63
503	District 4	WD-WM-011303	PVC	8	99	3	Year 1-5	7
504	District 4	WD-WM-011304	PVC	6	99	3	Year 1-5	15
505	District 4	WD-WM-011305	PVC	8	99	3	Year 1-5	7
506	District 4	WD-WM-011306	PVC	6	99	3	Year 1-5	16
509	District 4	WD-WM-005274	CAS	6	99	3	Year 1-5	341
512	District 4	WD-WM-000696	NULL	8	99	3	Year 1-5	37
517	District 7	WD-WM-001163	CAS	12	99	3	Year 1-5	234
518	District 7	WD-WM-001267	CAS	12	99	3	Year 1-5	394
525	District 2	WD-WM-006969	CAS	6	99	4	Year 1-5	267
526	District 2	WD-WM-012620	CAS	6	99	4	Year 1-5	19
527	District 2	WD-WM-012843	CAS	6	99	4	Year 1-5	28
533	District 4	WD-WM-005412	CAS	6	99	2	Year 1-5	344
544	District 8	WD-WM-003897	NULL	8	99	4	Year 1-5	283
563	District 8	WD-WM-004697	PVC	8	99	3	Year 1-5	138
564	District 8	WD-WM-004705	CI	8	99	3	Year 1-5	297
565	District 8	WD-WM-004706	CI	8	99	3	Year 1-5	212
566	District 8	WD-WM-014961	<Null>	8	99	3	Year 1-5	44
567	District 8	WD-WM-000628	NULL	6	99	4	Year 1-5	303

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
568	District 8	WD-WM-003898	NULL	6	99	4	Year 1-5	68
569	District 8	WD-WM-003899	NULL	6	99	4	Year 1-5	272
570	District 4	WD-WM-005277	CI	6	99	3	Year 1-5	334
571	District 4	WD-WM-005278	CAS	6	99	3	Year 1-5	346
572	District 4	WD-WM-005316	CI	6	99	3	Year 1-5	335
575	District 7	WD-WM-020888	PVC	8	99	1	Year 1-5	59
576	District 7	WD-WM-020891	PVC	8	99	1	Year 1-5	118
577	District 7	WD-WM-016567	CI	12	99	4	Year 1-5	911
578	District 7	WD-WM-016583	CI	8	99	4	Year 1-5	77
579	District 7	WD-WM-018780	CI	8	99	3	Year 1-5	157
580	District 7	WD-WM-016569	CI	12	99	4	Year 1-5	587
581	District 7	WD-WM-016584	DIP	12	99	3	Year 1-5	1847
582	District 7	WD-WM-016585	CI	12	99	3	Year 1-5	573
583	District 7	WD-WM-024410	CI	12	99	4	Year 1-5	863
584	District 7	WD-WM-001164	CI	8	99	3	Year 1-5	203
585	District 7	WD-WM-001165	CI	8	99	3	Year 1-5	76
586	District 5	WD-WM-001176	CI	8	99	3	Year 1-5	54
587	District 5	WD-WM-001178	CI	8	99	3	Year 1-5	277
588	District 7	WD-WM-017891	CI	8	99	3	Year 1-5	483
589	District 7	WD-WM-017893	CI	8	99	3	Year 1-5	239
590	District 7	WD-WM-017930	CI	8	99	3	Year 1-5	448
599	District 5	WD-WM-020483	CI	6	99	4	Year 1-5	8
600	District 5	WD-WM-020484	CI	8	99	4	Year 1-5	41
601	District 5	WD-WM-020499	CI	8	99	4	Year 1-5	10
602	District 5	WD-WM-020500	CI	8	99	4	Year 1-5	2
603	District 5	WD-WM-001639	CI	8	99	3	Year 1-5	172
604	District 5	WD-WM-001641	CI	8	99	3	Year 1-5	832
605	District 6	WD-WM-016304	PVC	8	99	3	Year 1-5	181
606	District 6	<Null>	AC	8	99	3	Year 1-5	420
607	District 6	<Null>	PVC	8	99	3	Year 1-5	170

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
608	District 7	<Null>	CAS	6	99	3	Year 1-5	238
612	District 1	WD-WM-002987	NULL	8	99	2	Year 1-5	155
613	District 1	WD-WM-003006	NULL	8	99	2	Year 1-5	137
614	District 1	WD-WM-003009	NULL	8	99	3	Year 1-5	138
615	District 1	WD-WM-003043	NULL	8	99	3	Year 1-5	253
616	District 1	WD-WM-003045	NULL	8	99	3	Year 1-5	303
622	District 4	WD-WM-000726	NULL	6	99	4	Year 1-5	23
623	District 4	WD-WM-015056	PVC	6	99	4	Year 1-5	31
624	District 4	WD-WM-015058	PVC	6	99	4	Year 1-5	277
625	District 4	WD-WM-015041	NULL	6	99	4	Year 1-5	312
634	District 5	WD-WM-001490	NULL	8	99	4	Year 1-5	162
635	District 5	WD-WM-001506	NULL	6	99	4	Year 1-5	41
636	District 5	WD-WM-001507	NULL	6	99	4	Year 1-5	96
639	District 8	WD-WM-000621	CAS	6	99	4	Year 1-5	356
640	District 5	WD-WM-000622	CAS	6	99	3	Year 1-5	1257
657	District 2	WD-WM-006967	CAS	6	99	4	Year 1-5	336
658	District 2	WD-WM-006970	CAS	6	99	4	Year 1-5	293
659	District 2	WD-WM-006971	CAS	8	99	3	Year 1-5	365
660	District 1	WD-WM-006972	CAS	6	99	3	Year 1-5	328
661	District 2	WD-WM-006973	CAS	6	99	4	Year 1-5	306
662	District 2	WD-WM-006977	CAS	6	99	4	Year 1-5	345
663	District 1	WD-WM-006978	CAS	6	99	3	Year 1-5	335
664	District 2	WD-WM-007073	CAS	6	99	4	Year 1-5	296
665	District 2	WD-WM-012641	CAS	6	99	4	Year 1-5	22
666	District 2	WD-WM-012642	CAS	6	99	4	Year 1-5	24
667	District 2	WD-WM-012868	CAS	6	99	4	Year 1-5	5
668	District 2	WD-WM-012869	CAS	6	99	4	Year 1-5	4
669	District 2	WD-WM-012871	CAS	6	99	4	Year 1-5	29
670	District 2	WD-WM-012872	CAS	6	99	4	Year 1-5	8
698	District 4	WD-WM-003427	CAS	6	99	3	Year 1-5	324

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
699	District 4	WD-WM-003442	DIP	16	99	3	Year 1-5	335
700	District 4	WD-WM-003638	CAS	6	99	3	Year 1-5	347
701	District 4	WD-WM-003664	PVC	12	99	3	Year 1-5	326
702	District 4	WD-WM-003665	PVC	12	99	3	Year 1-5	333
703	District 4	WD-WM-003666	DIP	12	99	3	Year 1-5	375
704	District 4	WD-WM-003443	DI	16	99	3	Year 1-5	342
712	District 5	WD-WM-001653	CAS	6	99	3	Year 1-5	344
713	District 5	WD-WM-001663	NULL	6	99	3	Year 1-5	459
714	District 5	WD-WM-001664	CI	6	99	3	Year 1-5	244
715	District 5	WD-WM-001665	CI	8	99	3	Year 1-5	292
716	District 5	WD-WM-001651	CI	8	99	3	Year 1-5	279
717	District 5	WD-WM-001652	CI	8	99	3	Year 1-5	673
718	District 5	WD-WM-001654	CI	8	99	3	Year 1-5	679
719	District 5	WD-WM-001671	CI	8	99	3	Year 1-5	324
720	District 5	WD-WM-002338	CI	8	99	3	Year 1-5	56
721	District 7	WD-WM-017868	CI	8	99	4	Year 1-5	110
722	District 7	WD-WM-017869	CI	8	99	4	Year 1-5	102
723	District 7	WD-WM-017877	CI	10	99	4	Year 1-5	534
777	District 4	WD-WM-014998	NULL	6	99	4	Year 1-5	326
778	District 4	WD-WM-015022	NULL	6	99	4	Year 1-5	329
779	District 4	WD-WM-015032	NULL	6	99	4	Year 1-5	336
780	District 4	WD-WM-015046	NULL	6	99	4	Year 1-5	302
781	District 4	WD-WM-022336	<Null>	6	99	4	Year 1-5	331
782	District 4	WD-WM-000659	CAS	8	99	4	Year 1-5	349
783	District 8	WD-WM-000438	CAS	8	99	3	Year 1-5	27
784	District 8	WD-WM-000439	CAS	8	99	4	Year 1-5	250
785	District 8	WD-WM-000441	CAS	8	99	4	Year 1-5	300
786	District 5	WD-WM-001268	CI	8	99	4	Year 1-5	136
787	District 8	WD-WM-001269	CAS	8	99	4	Year 1-5	289
788	District 5	WD-WM-001270	NULL	8	99	4	Year 1-5	851

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
789	District 5	WD-WM-001271	CI	8	99	4	Year 1-5	24
790	District 8	WD-WM-001275	CAS	8	99	4	Year 1-5	8
791	District 7	WD-WM-017803	DI	16	99	4	Year 1-5	241
792	District 7	WD-WM-017865	CI	8	99	4	Year 1-5	361
793	District 7	WD-WM-017866	CI	8	99	4	Year 1-5	561
894	District 8	WD-WM-006022	NULL	12	99	3	Year 1-5	273
895	District 8	WD-WM-006023	NULL	12	99	3	Year 1-5	277
896	District 8	WD-WM-006024	NULL	12	99	3	Year 1-5	339
897	District 8	WD-WM-006025	NULL	12	99	3	Year 1-5	358
898	District 8	WD-WM-006376	NULL	12	99	3	Year 1-5	239
899	District 8	WD-WM-006440	NULL	8	99	1	Year 1-5	256
900	District 8	WD-WM-006461	NULL	8	99	2	Year 1-5	240
901	District 8	WD-WM-006462	NULL	8	99	2	Year 1-5	269
902	District 8	WD-WM-006463	NULL	8	99	2	Year 1-5	254
903	District 8	WD-WM-006464	NULL	8	99	3	Year 1-5	246
904	District 8	WD-WM-006468	NULL	6	99	1	Year 1-5	312
905	District 8	WD-WM-006469	NULL	6	99	1	Year 1-5	323
906	District 8	WD-WM-006497	NULL	8	99	2	Year 1-5	281
907	District 6	WD-WM-017957	AC	8	99	3	Year 1-5	737
908	District 7	WD-WM-017958	AC	8	99	3	Year 1-5	762
909	District 7	WD-WM-017959	AC	8	99	3	Year 1-5	562
910	District 7	WD-WM-017960	NULL	8	99	3	Year 1-5	276
911	District 7	WD-WM-017984	NULL	8	99	3	Year 1-5	736
912	District 7	WD-WM-017986	AC	8	99	3	Year 1-5	329
913	District 6	WD-WM-018014	AC	8	99	3	Year 1-5	324
914	District 7	WD-WM-019871	AC	8	99	3	Year 1-5	525
915	District 7	WD-WM-021202	PVC	12	99	3	Year 1-5	189
916	District 7	WD-WM-021205	PVC	12	99	3	Year 1-5	443
917	District 7	WD-WM-016476	NULL	8	99	3	Year 1-5	127
918	District 7	WD-WM-016477	NULL	8	99	3	Year 1-5	195

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
919	District 7	WD-WM-016478	NULL	8	99	3	Year 1-5	154
920	District 7	WD-WM-016602	NULL	8	99	3	Year 1-5	527
931	District 7	WD-WM-001161	CAS	12	99	3	Year 1-5	900
937	District 2	WD-WM-008579	CI	6	99	4	Year 1-5	261
938	District 2	WD-WM-008580	NULL	2	99	4	Year 1-5	342
939	District 2	WD-WM-008581	CI	8	99	4	Year 1-5	431
940	District 2	WD-WM-008590	CI	8	99	4	Year 1-5	1151
948	District 4	WD-WM-000666	NULL	6	99	4	Year 1-5	310
949	District 5	WD-WM-000667	NULL	6	99	4	Year 1-5	328
950	District 5	WD-WM-000668	PVC	6	99	4	Year 1-5	316
951	District 4	WD-WM-014261	CI; DI	6	99	4	Year 1-5	324
952	District 4	WD-WM-014262	CAS	6	99	4	Year 1-5	333
973	District 2	WD-WM-006979	CAS	8	99	4	Year 1-5	316
974	District 2	WD-WM-006990	CAS	6	99	4	Year 1-5	305
975	District 2	WD-WM-007190	CAS	8	99	4	Year 1-5	283
976	District 2	WD-WM-007191	CAS	8	99	4	Year 1-5	359
977	District 2	WD-WM-007226	CAS	6	99	4	Year 1-5	324
978	District 2	WD-WM-007235	CAS	8	99	4	Year 1-5	311
979	District 2	WD-WM-008816	CAS	6	99	4	Year 1-5	307
980	District 2	WD-WM-012646	CAS	6	99	4	Year 1-5	36
981	District 2	WD-WM-012866	CAS	8	99	4	Year 1-5	354
982	District 2	WD-WM-012915	CI	8	99	4	Year 1-5	16
983	District 2	WD-WM-012916	CI	8	99	4	Year 1-5	19
984	District 2	WD-WM-012918	CAS	8	99	4	Year 1-5	26
985	District 2	WD-WM-013607	PVC	8	99	4	Year 1-5	20
988	District 4	WD-WM-000723	NULL	6	99	4	Year 1-5	13
989	District 4	WD-WM-000724	NULL	6	99	4	Year 1-5	39
990	District 4	WD-WM-000725	CAS	6	99	4	Year 1-5	272
991	District 4	WD-WM-000727	CAS	6	99	4	Year 1-5	340
992	District 4	WD-WM-001752	NULL	6	99	4	Year 1-5	28

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
993	District 4	WD-WM-001753	NULL	6	99	4	Year 1-5	49
994	District 4	WD-WM-004161	CAS	8	99	3	Year 1-5	317
995	District 4	WD-WM-004166	CAS	6	99	3	Year 1-5	345
996	District 4	WD-WM-004181	CAS	6	99	3	Year 1-5	327
997	District 4	WD-WM-004182	CAS	6	99	3	Year 1-5	336
998	District 4	WD-WM-004183	CAS	6	99	3	Year 1-5	323
999	District 4	WD-WM-004184	CAS	6	99	3	Year 1-5	351
1000	District 4	WD-WM-004200	CAS	12	99	3	Year 1-5	329
1001	District 5	WD-WM-001167	CI	8	99	3	Year 1-5	200
1069	District 4	WD-WM-015029	CAS	8	99	4	Year 1-5	373
1230	District 4	WD-WM-000728	NULL	6	99	3	Year 1-5	332
1231	District 4	WD-WM-000729	CAS	6	99	3	Year 1-5	336
1234	District 4	WD-WM-000753	NULL	6	99	4	Year 1-5	320
1235	District 4	WD-WM-000754	DI	16	99	3	Year 1-5	320
1236	District 4	WD-WM-000918	NULL	6	99	3	Year 1-5	301
1237	District 4	WD-WM-015003	NULL	6	99	4	Year 1-5	324
1238	District 4	WD-WM-015004	CAS	8	99	4	Year 1-5	341
1239	District 4	WD-WM-015007	DIP	16	99	4	Year 1-5	346
1240	District 4	WD-WM-015008	DIP	16	99	4	Year 1-5	314
1241	District 4	WD-WM-015018	DIP	16	99	4	Year 1-5	332
1242	District 4	WD-WM-015037	NULL	6	99	4	Year 1-5	335
1243	District 4	WD-WM-015038	CAS	8	99	4	Year 1-5	281
1244	District 4	WD-WM-024408	PVC	6	99	4	Year 1-5	327
1257	District 4	WD-WM-003926	CAS	8	99	4	Year 1-5	322
1258	District 4	WD-WM-003927	CAS	8	99	4	Year 1-5	323
1259	District 8	WD-WM-004155	CAS	8	99	3	Year 1-5	317
1260	District 4	WD-WM-004156	CAS	8	99	3	Year 1-5	371
1261	District 4	WD-WM-004157	CAS	8	99	3	Year 1-5	323
1262	District 4	WD-WM-004158	CAS	8	99	3	Year 1-5	326
1263	District 4	WD-WM-004159	CAS	8	99	3	Year 1-5	350

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1264	District 8	WD-WM-009272	CAS	6	99	3	Year 1-5	169
1324	District 4	WD-WM-003333	NULL	6	99	4	Year 1-5	333
1325	District 4	WD-WM-015024	NULL	6	99	4	Year 1-5	336
1326	District 4	WD-WM-015025	NULL	6	99	4	Year 1-5	355
1327	District 4	WD-WM-015026	NULL	6	99	4	Year 1-5	311
1328	District 4	WD-WM-015027	NULL	6	99	4	Year 1-5	336
1329	District 4	WD-WM-015030	NULL	6	99	3	Year 1-5	308
1330	District 4	WD-WM-015031	NULL	6	99	3	Year 1-5	326
1334	District 5	WD-WM-001366	NULL	8	99	4	Year 1-5	271
1335	District 5	WD-WM-001367	NULL	8	99	4	Year 1-5	185
1336	District 5	WD-WM-001469	DI	16	99	4	Year 1-5	241
1337	District 5	WD-WM-001471	NULL	8	99	4	Year 1-5	84
1338	District 5	WD-WM-001472	NULL	8	99	4	Year 1-5	81
1339	District 5	WD-WM-001473	DI	16	99	4	Year 1-5	228
1340	District 5	WD-WM-001477	DI	16	99	4	Year 1-5	67
13	District 5	WD-WM-000641	CAS	6	1	3	Year 6-10	330
18	District 4	WD-WM-000699	CAS	6	1	3	Year 6-10	316
19	District 4	WD-WM-000700	CAS	6	1	3	Year 6-10	313
20	District 5	WD-WM-000713	CAS	6	1	3	Year 6-10	375
24	District 5	WD-WM-000791	CAS	6	1	3	Year 6-10	364
25	District 5	WD-WM-000796	CAS	6	1	3	Year 6-10	212
26	District 5	WD-WM-000802	NULL	6	2	3	Year 6-10	358
27	District 5	WD-WM-000872	CAS	8	2	3	Year 6-10	263
40	District 5	WD-WM-001439	CI	8	2	3	Year 6-10	952
47	District 5	WD-WM-001540	CI	6	1	3	Year 6-10	192
48	District 5	WD-WM-001558	CI	8	1	3	Year 6-10	90
49	District 5	WD-WM-001565	CI	6	1	3	Year 6-10	160
50	District 5	WD-WM-001573	CI	6	1	3	Year 6-10	235
51	District 5	WD-WM-001577	CAS	6	1	3	Year 6-10	218
52	District 5	WD-WM-001600	CI	6	1	3	Year 6-10	115

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
57	District 5	WD-WM-001674	CAS	8	1	3	Year 6-10	383
58	District 5	WD-WM-001684	CI	6	1	3	Year 6-10	387
59	District 5	WD-WM-001691	CAS	6	1	3	Year 6-10	30
60	District 5	WD-WM-001704	CI	6	1	3	Year 6-10	249
61	District 5	WD-WM-001709	CI	6	1	3	Year 6-10	275
62	District 5	WD-WM-001715	CI	6	1	3	Year 6-10	284
63	District 5	WD-WM-001759	CI	6	1	3	Year 6-10	745
72	District 1	WD-WM-002585	CI	6	1	2	Year 6-10	240
73	District 3	WD-WM-002776	CAS	10	3	2	Year 6-10	321
74	District 3	WD-WM-002778	CAS	8	1	2	Year 6-10	313
78	District 4	WD-WM-003310	CAS	8	1	3	Year 6-10	342
79	District 4	WD-WM-003313	CAS	6	1	3	Year 6-10	332
84	District 4	WD-WM-003400	CAS	8	1	3	Year 6-10	363
85	District 4	WD-WM-003408	DIP	16	1	3	Year 6-10	342
90	District 4	WD-WM-003487	PVC	6	1	3	Year 6-10	1015
91	District 4	WD-WM-003496	CAS	6	1	3	Year 6-10	301
92	District 4	WD-WM-003515	CAS	6	1	3	Year 6-10	297
93	District 4	WD-WM-003530	CAS	6	1	3	Year 6-10	319
94	District 4	WD-WM-003536	CAS	6	2	3	Year 6-10	344
95	District 4	WD-WM-003539	CI	8	1	3	Year 6-10	326
96	District 4	WD-WM-003540	CI	8	2	3	Year 6-10	335
97	District 4	WD-WM-003553	CAS	8	1	3	Year 6-10	347
99	District 4	WD-WM-003581	DIP	6	1	3	Year 6-10	235
101	District 4	WD-WM-003607	PVC	6	1	3	Year 6-10	396
103	District 4	WD-WM-003663	CAS	10	2	3	Year 6-10	293
105	District 4	WD-WM-003709	CAS	14	1	3	Year 6-10	312
106	District 4	WD-WM-003719	CI	6	1	3	Year 6-10	333
107	District 4	WD-WM-003723	CI	6	2	3	Year 6-10	315
108	District 4	WD-WM-003731	CAS	6	1	3	Year 6-10	331
109	District 4	WD-WM-003732	CAS	6	2	3	Year 6-10	288

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
110	District 4	WD-WM-003733	CAS	6	1	3	Year 6-10	788
111	District 4	WD-WM-003736	CI	6	1	3	Year 6-10	329
112	District 4	WD-WM-003745	CI	6	1	3	Year 6-10	332
113	District 4	WD-WM-003748	CI	8	1	3	Year 6-10	332
117	District 8	WD-WM-003867	PVC	6	1	3	Year 6-10	331
126	District 4	WD-WM-003952	CAS	8	1	3	Year 6-10	292
128	District 8	WD-WM-004098	CI	12	1	2	Year 6-10	334
129	District 8	WD-WM-004123	CAS	6	1	3	Year 6-10	304
130	District 4	WD-WM-004173	DIP	8	1	3	Year 6-10	351
134	District 4	WD-WM-004195	PVC	6	1	3	Year 6-10	670
135	District 4	WD-WM-004198	CAS	12	1	3	Year 6-10	306
136	District 2	WD-WM-004407	CI	8	2	2	Year 6-10	287
137	District 2	WD-WM-004408	CI	6	1	2	Year 6-10	582
138	District 2	WD-WM-004415	CI	6	1	3	Year 6-10	340
139	District 2	WD-WM-004444	CAS	8	1	3	Year 6-10	298
140	District 2	WD-WM-004453	PVC	12	1	3	Year 6-10	1641
141	District 2	WD-WM-004460	CAS	8	1	3	Year 6-10	1289
142	District 1	WD-WM-004462	CI	8	1	2	Year 6-10	648
143	District 1	WD-WM-004472	CI	8	2	2	Year 6-10	333
144	District 2	WD-WM-004499	CAS	12	4	3	Year 6-10	974
154	District 4	WD-WM-004744	PVC	6	1	3	Year 6-10	368
155	District 4	WD-WM-004746	PVC	20	1	3	Year 6-10	368
156	District 4	WD-WM-004762	CAS	6	1	3	Year 6-10	24
157	District 4	WD-WM-004771	CAS	6	1	3	Year 6-10	36
158	District 4	WD-WM-004805	CAS	6	1	3	Year 6-10	310
159	District 4	WD-WM-004818	CAS	8	1	3	Year 6-10	308
160	District 4	WD-WM-004838	CAS	6	1	3	Year 6-10	347
173	District 8	WD-WM-005109	CAS	6	1	2	Year 6-10	305
174	District 8	WD-WM-005125	CAS	8	1	3	Year 6-10	322
175	District 8	WD-WM-005129	CAS	6	1	3	Year 6-10	354

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
177	District 4	WD-WM-005214	CAS	6	1	3	Year 6-10	313
178	District 3	WD-WM-005241	CAS	6	1	2	Year 6-10	378
180	District 4	WD-WM-005256	CAS	6	1	3	Year 6-10	367
185	District 4	WD-WM-005364	CI	6	1	3	Year 6-10	327
187	District 4	WD-WM-005388	CAS	6	1	3	Year 6-10	327
198	District 8	WD-WM-005614	CAS	8	1	3	Year 6-10	296
199	District 8	WD-WM-005616	CAS	8	1	3	Year 6-10	286
200	District 8	WD-WM-005626	PVC	6	1	3	Year 6-10	350
201	District 8	WD-WM-005641	CAS	14	1	3	Year 6-10	317
202	District 8	WD-WM-005642	CAS	14	1	3	Year 6-10	285
203	District 8	WD-WM-005648	CAS	6	1	3	Year 6-10	354
204	District 8	WD-WM-005652	CAS	6	1	3	Year 6-10	322
205	District 8	WD-WM-005670	CAS	6	1	3	Year 6-10	331
206	District 8	WD-WM-005671	PVC	6	1	3	Year 6-10	316
207	District 3	WD-WM-005677	CAS	6	1	3	Year 6-10	295
208	District 3	WD-WM-005759	CAS	6	2	3	Year 6-10	328
209	District 3	WD-WM-005764	CAS	6	3	3	Year 6-10	346
210	District 3	WD-WM-005798	CAS	16	1	3	Year 6-10	335
211	District 3	WD-WM-005808	CAS	6	1	3	Year 6-10	297
212	District 3	WD-WM-005812	CAS	6	2	3	Year 6-10	315
213	District 3	WD-WM-005828	CAS	8	3	3	Year 6-10	333
214	District 3	WD-WM-005838	CI	6	1	3	Year 6-10	331
215	District 3	WD-WM-005839	CAS	6	1	3	Year 6-10	336
219	District 8	WD-WM-005969	CAS	8	1	3	Year 6-10	322
220	District 8	WD-WM-005971	CAS	8	1	3	Year 6-10	326
221	District 8	WD-WM-005983	CAS	6	1	3	Year 6-10	338
222	District 8	WD-WM-006012	CAS	6	1	3	Year 6-10	311
223	District 8	WD-WM-006039	CAS	6	1	3	Year 6-10	327
224	District 8	WD-WM-006044	CAS	6	1	3	Year 6-10	313
225	District 8	WD-WM-006094	CAS	6	3	3	Year 6-10	317

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
228	District 3	WD-WM-006205	CAS	6	2	2	Year 6-10	360
230	District 3	WD-WM-006275	CI	6	1	3	Year 6-10	309
231	District 3	WD-WM-006283	CI	8	1	3	Year 6-10	329
232	District 2	WD-WM-006294	CI	8	1	3	Year 6-10	339
233	District 2	WD-WM-006297	CI	8	4	3	Year 6-10	354
234	District 8	WD-WM-006428	CAS	8	1	2	Year 6-10	303
236	District 8	WD-WM-006476	CAS	12	1	3	Year 6-10	148
237	District 3	WD-WM-006519	CAS	6	1	1	Year 6-10	330
238	District 8	WD-WM-006522	CAS	6	1	2	Year 6-10	346
243	District 3	WD-WM-006647	CAS	6	1	2	Year 6-10	341
244	District 3	WD-WM-006651	CAS	6	1	3	Year 6-10	330
245	District 3	WD-WM-006652	CI	6	1	3	Year 6-10	338
246	District 3	WD-WM-006655	CAS	10	1	3	Year 6-10	334
247	District 3	WD-WM-006671	CI	6	1	3	Year 6-10	334
248	District 3	WD-WM-006691	CAS	6	2	3	Year 6-10	320
249	District 2	WD-WM-006694	CI	6	1	3	Year 6-10	334
250	District 2	WD-WM-006695	CI	6	1	3	Year 6-10	335
251	District 3	WD-WM-006701	CAS	6	1	3	Year 6-10	347
258	District 3	WD-WM-006847	CI	6	1	2	Year 6-10	299
259	District 3	WD-WM-006849	CI	6	1	3	Year 6-10	279
264	District 2	WD-WM-006982	CAS	8	1	3	Year 6-10	290
269	District 3	WD-WM-007068	CI	6	1	1	Year 6-10	946
270	District 2	WD-WM-007148	CAS	6	1	3	Year 6-10	305
285	District 8	WD-WM-008288	CAS	6	1	3	Year 6-10	333
287	District 2	WD-WM-008351	PVC	8	1	2	Year 6-10	399
295	District 3	WD-WM-008725	CAS	16	2	3	Year 6-10	1731
298	District 4	WD-WM-009279	CAS	6	1	3	Year 6-10	297
300	District 1	WD-WM-009661	PVC	8	1	1	Year 6-10	153
304	District 3	WD-WM-010060	CAS	8	1	2	Year 6-10	50
305	District 3	WD-WM-010069	CAS	10	2	3	Year 6-10	273

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
307	District 8	WD-WM-010156	PVC	8	1	3	Year 6-10	309
311	District 2	WD-WM-010646	PVC	24	1	3	Year 6-10	1002
312	District 1	WD-WM-010658	PVC	12	1	2	Year 6-10	39
313	District 8	WD-WM-010694	PVC	14	1	3	Year 6-10	437
317	District 1	WD-WM-011142	CAS	6	1	1	Year 6-10	107
322	District 2	WD-WM-013108	CAS	6	1	3	Year 6-10	25
324	District 5	WD-WM-014264	CI; DI	6	1	3	Year 6-10	289
326	District 8	WD-WM-014272	CAS	6	1	3	Year 6-10	340
330	District 3	WD-WM-014301	CI; DI	6	3	3	Year 6-10	311
331	District 2	WD-WM-014304	CAS	6	3	3	Year 6-10	146
345	District 5	WD-WM-015066	CI	6	1	3	Year 6-10	467
346	District 5	WD-WM-015070	CI	6	1	3	Year 6-10	84
349	District 5	WD-WM-015102	CAS	6	1	3	Year 6-10	200
350	District 7	WD-WM-015238	CAS	10	1	3	Year 6-10	722
351	District 7	WD-WM-015261	CI; DI	8	2	3	Year 6-10	247
354	District 6	WD-WM-015370	PVC	6	2	3	Year 6-10	834
355	District 6	WD-WM-015372	PVC	12	1	3	Year 6-10	795
357	District 5	WD-WM-015513	CI	8	2	3	Year 6-10	352
370	District 7	WD-WM-016577	CI	12	1	2	Year 6-10	1642
371	District 7	WD-WM-016578	CI	12	1	3	Year 6-10	1758
375	District 5	WD-WM-017491	CI	8	1	3	Year 6-10	261
376	District 5	WD-WM-017497	CAS	8	2	3	Year 6-10	292
379	District 7	WD-WM-017715	CI	12	1	2	Year 6-10	1087
382	District 7	WD-WM-017797	DI	16	1	3	Year 6-10	1513
396	District 5	WD-WM-018365	CAS	8	1	2	Year 6-10	632
397	District 5	WD-WM-018391	CI	8	1	2	Year 6-10	550
398	District 5	WD-WM-018415	CI	6	1	3	Year 6-10	454
399	District 5	WD-WM-018416	CI	6	1	3	Year 6-10	11
400	District 5	WD-WM-018431	DI	6	1	2	Year 6-10	447
401	District 7	WD-WM-018443	CAS	8	1	3	Year 6-10	6

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
402	District 7	WD-WM-018474	PVC	8	1	3	Year 6-10	411
403	District 7	WD-WM-018569	CI	6	1	3	Year 6-10	281
404	District 7	WD-WM-018570	PVC	6	3	3	Year 6-10	603
405	District 7	WD-WM-018575	PVC	6	1	3	Year 6-10	551
406	District 7	WD-WM-018576	PVC	6	1	3	Year 6-10	323
407	District 7	WD-WM-018648	PVC	16	1	2	Year 6-10	960
408	District 7	WD-WM-018650	PVC	16	1	2	Year 6-10	2155
411	District 7	WD-WM-018789	PVC	12	1	3	Year 6-10	1021
412	District 7	WD-WM-018790	PVC	8	1	3	Year 6-10	1832
420	District 7	WD-WM-019386	CAS	6	1	3	Year 6-10	97
421	District 6	WD-WM-019501	PVC	16	1	2	Year 6-10	2075
429	District 6	WD-WM-020585	PVC	8	1	3	Year 6-10	297
431	District 7	WD-WM-020915	PVC	12	1	3	Year 6-10	1079
441	District 5	WD-WM-023278	PVC	8	1	1	Year 6-10	102
444	District 8	WD-WM-024231	PVC	8	2	3	Year 6-10	80
448	District 8	WD-WM-024283	PVC	6	1	3	Year 6-10	116
450	District 3	WD-WM-024347	PVC	8	1	3	Year 6-10	332
451	District 3	WD-WM-024349	PVC	8	1	3	Year 6-10	12
452	District 3	WD-WM-024357	PVC	8	2	3	Year 6-10	367
455	District 5	WD-WM-024542	PVC	8	1	2	Year 6-10	456
462	District 7	WD-WM-017795	DI	8	99	3	Year 6-10	983
466	District 7	WD-WM-017820	DI	8	99	3	Year 6-10	634
478	District 7	WD-WM-016574	CI	16	99	3	Year 6-10	376
480	District 7	WD-WM-016579	CI	12	99	3	Year 6-10	412
483	District 7	WD-WM-020800	PVC	8	99	3	Year 6-10	453
484	District 7	WD-WM-021105	PVC	8	99	3	Year 6-10	292
487	District 8	WD-WM-005970	CAS	8	99	3	Year 6-10	324
488	District 8	WD-WM-022569	CAS	8	99	3	Year 6-10	44
489	District 8	WD-WM-006004	NULL	12	99	3	Year 6-10	313
490	District 8	WD-WM-006005	CAS	12	99	3	Year 6-10	311

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
492	District 2	WD-WM-004455	CI	6	99	3	Year 6-10	650
493	District 2	WD-WM-004454	NULL	6	99	3	Year 6-10	327
494	District 2	WD-WM-013062	<Null>	6	99	3	Year 6-10	48
495	District 2	WD-WM-004484	CI	6	99	3	Year 6-10	320
496	District 2	WD-WM-004498	CAS	6	99	3	Year 6-10	636
497	District 2	WD-WM-013094	CAS	6	99	3	Year 6-10	38
507	District 4	WD-WM-003398	CAS	8	99	3	Year 6-10	335
508	District 4	WD-WM-003399	CAS	8	99	3	Year 6-10	308
510	District 4	WD-WM-000694	CAS	8	99	3	Year 6-10	248
511	District 4	WD-WM-000695	NULL	8	99	3	Year 6-10	52
513	District 4	WD-WM-002318	PVC	8	99	3	Year 6-10	67
514	District 4	WD-WM-002320	PVC	8	99	3	Year 6-10	11
515	District 4	WD-WM-002321	PVC	8	99	3	Year 6-10	7
516	District 4	WD-WM-014263	CI; DI	8	99	3	Year 6-10	69
519	District 3	WD-WM-006520	NULL	6	99	2	Year 6-10	322
520	District 8	WD-WM-006521	CAS	6	99	2	Year 6-10	299
521	District 3	WD-WM-006848	CI	6	99	2	Year 6-10	334
522	District 3	WD-WM-013206	<Null>	6	99	2	Year 6-10	30
523	District 2	WD-WM-007149	CAS	6	99	3	Year 6-10	158
524	District 2	WD-WM-012925	CAS	6	99	3	Year 6-10	22
528	District 2	WD-WM-006295	CI	8	99	3	Year 6-10	346
529	District 2	WD-WM-006296	CI	6	99	3	Year 6-10	318
534	District 4	WD-WM-003214	CAS	6	99	3	Year 6-10	9
535	District 4	WD-WM-004837	CAS	6	99	3	Year 6-10	15
536	District 4	WD-WM-004839	CAS	6	99	3	Year 6-10	334
537	District 4	WD-WM-004840	CAS	6	99	3	Year 6-10	340
540	District 4	WD-WM-003582	DIP	6	99	3	Year 6-10	14
541	District 4	WD-WM-003583	DIP	6	99	3	Year 6-10	62
542	District 4	WD-WM-003584	PVC	6	99	3	Year 6-10	336
545	District 5	WD-WM-001774	CAS	8	99	3	Year 6-10	289

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
546	District 8	WD-WM-005613	CAS	8	99	3	Year 6-10	310
547	District 8	WD-WM-005972	CAS	8	99	3	Year 6-10	297
548	District 8	WD-WM-008257	CAS	8	99	3	Year 6-10	11
549	District 8	WD-WM-022504	Cast Iron	8	99	3	Year 6-10	55
550	District 8	WD-WM-023648	CAS	8	99	3	Year 6-10	27
551	District 8	WD-WM-023649	CAS	8	99	3	Year 6-10	27
552	District 4	WD-WM-011135	PVC	8	99	3	Year 6-10	44
553	District 4	WD-WM-011224	PVC	8	99	3	Year 6-10	102
554	District 4	WD-WM-011225	PVC	8	99	3	Year 6-10	119
555	District 4	WD-WM-011226	PVC	8	99	3	Year 6-10	125
556	District 4	WD-WM-011228	PVC	8	99	3	Year 6-10	341
557	District 2	WD-WM-008350	CI	8	99	2	Year 6-10	209
558	District 2	WD-WM-010661	CI	8	99	2	Year 6-10	108
559	District 3	WD-WM-024340	PVC	8	99	3	Year 6-10	3
560	District 3	WD-WM-024341	PVC	8	99	3	Year 6-10	9
561	District 3	WD-WM-024342	PVC	8	99	3	Year 6-10	343
591	District 1	WD-WM-004471	CI	6	99	2	Year 6-10	319
592	District 1	WD-WM-011141	CI	6	99	1	Year 6-10	746
593	District 1	WD-WM-013142	<Null>	6	99	2	Year 6-10	24
595	District 5	WD-WM-002213	CI	8	99	3	Year 6-10	25
596	District 5	WD-WM-002214	CI	6	99	3	Year 6-10	9
597	District 5	WD-WM-002215	CI	8	99	3	Year 6-10	28
598	District 5	WD-WM-002216	CI	8	99	3	Year 6-10	2
609	District 7	WD-WM-016576	CI	12	99	2	Year 6-10	325
610	District 7	WD-WM-019475	NULL	12	99	1	Year 6-10	34
611	District 7	WD-WM-019476	NULL	12	99	2	Year 6-10	25
617	District 1	WD-WM-007299	CI	8	99	2	Year 6-10	185
618	District 1	WD-WM-011146	CI	8	99	1	Year 6-10	916
692	District 4	WD-WM-004756	CAS	12	99	3	Year 6-10	27
693	District 4	WD-WM-004759	CAS	12	99	3	Year 6-10	269

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
694	District 4	WD-WM-004760	CAS	12	99	3	Year 6-10	315
695	District 4	WD-WM-004765	CAS	6	99	3	Year 6-10	307
696	District 4	WD-WM-021882	PVC	12	99	3	Year 6-10	39
697	District 4	WD-WM-046172	CAS	6	99	3	Year 6-10	26
752	District 7	WD-WM-017773	CI	8	99	2	Year 6-10	317
753	District 7	WD-WM-017774	CI	8	99	2	Year 6-10	60
754	District 7	WD-WM-017775	CI	8	99	2	Year 6-10	66
755	District 7	WD-WM-017776	CI	8	99	2	Year 6-10	53
756	District 7	WD-WM-017777	CI	8	99	2	Year 6-10	76
757	District 7	WD-WM-017778	CI	8	99	2	Year 6-10	58
758	District 7	WD-WM-017781	CI	6	99	1	Year 6-10	332
759	District 7	WD-WM-017782	CI	6	99	2	Year 6-10	370
760	District 7	WD-WM-017783	CI	8	99	2	Year 6-10	89
761	District 7	WD-WM-017784	NULL	8	99	2	Year 6-10	44
762	District 7	WD-WM-017785	CI	6	99	1	Year 6-10	304
794	District 7	WD-WM-018283	CI	8	99	3	Year 6-10	350
795	District 7	WD-WM-021149	DI	16	99	3	Year 6-10	1340
796	District 7	WD-WM-021150	CI	8	99	3	Year 6-10	54
797	District 1	WD-WM-006996	NULL	8	99	3	Year 6-10	355
798	District 1	WD-WM-006997	NULL	8	99	3	Year 6-10	299
799	District 1	WD-WM-006998	NULL	8	99	3	Year 6-10	333
800	District 1	WD-WM-006999	NULL	8	99	2	Year 6-10	176
801	District 1	WD-WM-007212	NULL	8	99	3	Year 6-10	242
802	District 1	WD-WM-007213	NULL	8	99	3	Year 6-10	308
803	District 1	WD-WM-007214	NULL	8	99	3	Year 6-10	334
804	District 1	WD-WM-007215	NULL	8	99	3	Year 6-10	300
805	District 1	WD-WM-007216	NULL	8	99	3	Year 6-10	331
806	District 1	WD-WM-007303	NULL	8	99	3	Year 6-10	59
807	District 1	WD-WM-007304	NULL	8	99	3	Year 6-10	263
808	District 1	WD-WM-012826	<Null>	8	99	3	Year 6-10	69

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
809	District 1	WD-WM-013017	<Null>	8	99	3	Year 6-10	25
810	District 2	WD-WM-004525	CI	6	99	3	Year 6-10	33
811	District 2	WD-WM-004526	CI	6	99	3	Year 6-10	131
812	District 2	WD-WM-007308	NULL	8	99	3	Year 6-10	326
813	District 2	WD-WM-007309	NULL	8	99	2	Year 6-10	293
814	District 2	WD-WM-007334	CI	6	99	3	Year 6-10	39
815	District 2	WD-WM-007335	CI	6	99	3	Year 6-10	277
816	District 2	WD-WM-007336	CI	6	99	3	Year 6-10	45
817	District 2	WD-WM-007337	CI	6	99	3	Year 6-10	620
818	District 2	WD-WM-007338	NULL	6	99	2	Year 6-10	44
819	District 2	WD-WM-007339	CI	6	99	2	Year 6-10	292
820	District 2	WD-WM-004429	NULL	6	99	3	Year 6-10	286
821	District 2	WD-WM-004456	CI	8	99	3	Year 6-10	1013
822	District 4	WD-WM-003763	DIP	12	99	3	Year 6-10	289
932	District 7	WD-WM-015262	CI; DI	8	99	3	Year 6-10	360
933	District 7	WD-WM-015263	CI; DI	8	99	3	Year 6-10	267
934	District 7	WD-WM-017714	CI	12	99	3	Year 6-10	94
935	District 7	WD-WM-017791	CI	12	99	3	Year 6-10	628
936	District 7	WD-WM-017792	CI	12	99	3	Year 6-10	748
953	District 4	WD-WM-003494	CI	6	99	3	Year 6-10	312
954	District 4	WD-WM-003495	CAS	6	99	3	Year 6-10	333
955	District 4	WD-WM-003497	CI	6	99	3	Year 6-10	346
956	District 4	WD-WM-003535	CI	6	99	3	Year 6-10	316
957	District 4	WD-WM-003537	CI	6	99	3	Year 6-10	323
958	District 4	WD-WM-003538	CI	8	99	3	Year 6-10	335
959	District 4	WD-WM-003541	NULL	6	99	3	Year 6-10	321
960	District 4	WD-WM-003552	CI	8	99	3	Year 6-10	333
961	District 4	WD-WM-003749	CI	8	99	3	Year 6-10	335
962	District 4	WD-WM-003490	NULL	6	99	3	Year 6-10	311
963	District 4	WD-WM-003491	CAS	6	99	3	Year 6-10	335

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
964	District 4	WD-WM-003492	CAS	6	99	3	Year 6-10	339
965	District 4	WD-WM-003493	CAS	6	99	3	Year 6-10	337
966	District 4	WD-WM-003506	CAS	8	99	3	Year 6-10	323
967	District 4	WD-WM-003507	CAS	8	99	3	Year 6-10	303
968	District 4	WD-WM-003528	CAS	6	99	3	Year 6-10	327
969	District 4	WD-WM-003529	CAS	6	99	3	Year 6-10	291
970	District 4	WD-WM-003543	NULL	6	99	3	Year 6-10	328
971	District 4	WD-WM-003544	NULL	6	99	3	Year 6-10	304
972	District 4	WD-WM-012292	<Null>	6	99	3	Year 6-10	40
986	District 1	WD-WM-008795	CI	6	99	1	Year 6-10	1074
987	District 1	WD-WM-011140	CI	6	99	1	Year 6-10	324
1002	District 5	WD-WM-001168	CI	8	99	3	Year 6-10	119
1003	District 5	WD-WM-001169	CI	12	99	3	Year 6-10	620
1004	District 5	WD-WM-001170	CI	8	99	3	Year 6-10	74
1005	District 5	WD-WM-001171	CI	8	99	3	Year 6-10	54
1006	District 5	WD-WM-001645	NULL	12	99	3	Year 6-10	380
1007	District 4	WD-WM-003687	DIP	6	99	3	Year 6-10	299
1008	District 4	WD-WM-003688	DIP	6	99	2	Year 6-10	301
1009	District 3	WD-WM-005299	DIP	6	99	3	Year 6-10	362
1010	District 4	WD-WM-005300	DIP	6	99	3	Year 6-10	352
1011	District 4	WD-WM-005301	DIP	6	99	3	Year 6-10	336
1012	District 4	WD-WM-022233	PVC	8	99	2	Year 6-10	46
1013	District 5	WD-WM-001362	NULL	8	99	3	Year 6-10	319
1014	District 5	WD-WM-001363	NULL	8	99	3	Year 6-10	105
1015	District 5	WD-WM-001364	NULL	8	99	3	Year 6-10	587
1016	District 5	WD-WM-001368	NULL	8	99	3	Year 6-10	3
1017	District 5	WD-WM-001403	DI	16	99	3	Year 6-10	441
1018	District 5	WD-WM-001405	DI	16	99	3	Year 6-10	369
1019	District 5	WD-WM-001426	DI	16	99	3	Year 6-10	397
1020	District 5	WD-WM-018535	NULL	8	99	3	Year 6-10	698

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1021	District 5	WD-WM-015512	CI	8	99	3	Year 6-10	350
1022	District 5	WD-WM-017500	CAS	8	99	3	Year 6-10	653
1023	District 5	WD-WM-020514	PVC	8	99	3	Year 6-10	1184
1024	District 5	WD-WM-018352	DI	16	99	3	Year 6-10	221
1025	District 5	WD-WM-018353	DI	16	99	3	Year 6-10	252
1026	District 5	WD-WM-018354	DI	16	99	3	Year 6-10	90
1027	District 5	WD-WM-018355	DI	16	99	3	Year 6-10	192
1028	District 5	WD-WM-018356	DI	16	99	3	Year 6-10	331
1029	District 5	WD-WM-018377	DI	16	99	3	Year 6-10	94
1030	District 5	WD-WM-018388	DI	16	99	3	Year 6-10	110
1031	District 5	WD-WM-018529	NULL	8	99	3	Year 6-10	139
1032	District 5	WD-WM-018530	NULL	8	99	3	Year 6-10	57
1033	District 5	WD-WM-018531	NULL	8	99	3	Year 6-10	156
1034	District 5	WD-WM-018532	NULL	8	99	3	Year 6-10	26
1035	District 5	WD-WM-018533	NULL	8	99	3	Year 6-10	57
1036	District 5	WD-WM-018534	NULL	8	99	3	Year 6-10	72
1037	District 5	WD-WM-018539	NULL	8	99	3	Year 6-10	7
1038	District 5	WD-WM-018547	NULL	8	99	3	Year 6-10	86
1039	District 5	WD-WM-018548	NULL	8	99	3	Year 6-10	85
1040	District 4	WD-WM-000681	CI	6	99	3	Year 6-10	264
1041	District 4	WD-WM-000720	PVC	8	99	3	Year 6-10	168
1042	District 4	WD-WM-000734	NULL	6	99	3	Year 6-10	270
1043	District 4	WD-WM-000735	CAS	6	99	3	Year 6-10	347
1044	District 4	WD-WM-000736	CAS	6	99	3	Year 6-10	339
1045	District 4	WD-WM-000743	CI	6	99	3	Year 6-10	297
1046	District 4	WD-WM-000744	CI	6	99	3	Year 6-10	307
1047	District 4	WD-WM-000916	NULL	6	99	3	Year 6-10	299
1048	District 4	WD-WM-014077	CI	6	99	3	Year 6-10	22
1049	District 4	WD-WM-014078	CI	6	99	3	Year 6-10	31
1050	District 4	WD-WM-024407	PVC	12	99	3	Year 6-10	309

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1063	District 4	WD-WM-003334	CAS	6	99	3	Year 6-10	351
1064	District 4	WD-WM-003430	CAS	6	99	3	Year 6-10	320
1065	District 4	WD-WM-003431	CAS	6	99	3	Year 6-10	356
1066	District 4	WD-WM-007361	CAS	6	99	3	Year 6-10	331
1067	District 4	WD-WM-009310	CAS	6	99	3	Year 6-10	333
1068	District 4	WD-WM-014995	CAS	6	99	3	Year 6-10	295
1084	District 4	WD-WM-005172	PVC	6	99	2	Year 6-10	331
1085	District 4	WD-WM-005173	PVC	6	99	2	Year 6-10	340
1086	District 4	WD-WM-005218	CAS	6	99	3	Year 6-10	296
1087	District 4	WD-WM-005219	CAS	6	99	3	Year 6-10	327
1088	District 4	WD-WM-005220	CAS	6	99	2	Year 6-10	349
1089	District 4	WD-WM-005221	PVC	6	99	2	Year 6-10	327
1090	District 4	WD-WM-005222	PVC	6	99	2	Year 6-10	356
1091	District 4	WD-WM-005251	CAS	6	99	3	Year 6-10	275
1092	District 4	WD-WM-005252	CAS	6	99	3	Year 6-10	310
1093	District 4	WD-WM-005253	CAS	6	99	3	Year 6-10	293
1094	District 4	WD-WM-005273	CAS	6	99	3	Year 6-10	346
1095	District 4	WD-WM-008856	CAS	6	99	3	Year 6-10	312
1096	District 4	WD-WM-005175	CAS	6	99	2	Year 6-10	345
1097	District 4	WD-WM-005223	CAS	6	99	3	Year 6-10	295
1098	District 4	WD-WM-005224	CAS	6	99	3	Year 6-10	199
1099	District 4	WD-WM-005225	CAS	6	99	2	Year 6-10	464
1100	District 4	WD-WM-005226	CAS	6	99	2	Year 6-10	358
1101	District 4	WD-WM-005227	CAS	6	99	2	Year 6-10	307
1102	District 4	WD-WM-005255	CAS	6	99	3	Year 6-10	307
1103	District 4	WD-WM-022115	PVC	8	99	3	Year 6-10	2
1104	District 4	WD-WM-022116	PVC	6	99	3	Year 6-10	7
1105	District 4	WD-WM-022117	PVC	8	99	3	Year 6-10	46
1106	District 4	WD-WM-022118	PVC	8	99	3	Year 6-10	25
1107	District 4	WD-WM-022242	PVC	8	99	3	Year 6-10	408

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1179	District 4	WD-WM-003542	NULL	6	99	3	Year 6-10	345
1180	District 4	WD-WM-003716	NULL	8	99	3	Year 6-10	320
1181	District 4	WD-WM-003717	NULL	6	99	3	Year 6-10	335
1182	District 4	WD-WM-003718	CI	6	99	3	Year 6-10	333
1183	District 4	WD-WM-003729	NULL	6	99	3	Year 6-10	342
1184	District 4	WD-WM-003730	NULL	6	99	3	Year 6-10	335
1222	District 2	WD-WM-004458	NULL	6	99	3	Year 6-10	335
1223	District 2	WD-WM-004459	NULL	6	99	3	Year 6-10	220
1224	District 2	WD-WM-007236	CAS	6	99	3	Year 6-10	612
1225	District 2	WD-WM-007286	NULL	6	99	3	Year 6-10	323
1226	District 2	WD-WM-007287	CI	6	99	3	Year 6-10	339
1227	District 2	WD-WM-007288	CI	6	99	3	Year 6-10	302
1228	District 2	WD-WM-007289	CI	6	99	3	Year 6-10	289
1229	District 2	WD-WM-007291	CAS	6	99	3	Year 6-10	289
1232	District 4	WD-WM-000751	CI	6	99	3	Year 6-10	328
1233	District 4	WD-WM-000752	CI	6	99	3	Year 6-10	293
1245	District 4	WD-WM-004782	CAS	6	99	3	Year 6-10	312
1246	District 4	WD-WM-004787	CAS	6	99	3	Year 6-10	349
1247	District 4	WD-WM-004820	PVC	6	99	3	Year 6-10	266
1248	District 4	WD-WM-004821	CAS	6	99	3	Year 6-10	338
1249	District 4	WD-WM-004822	CAS	6	99	3	Year 6-10	337
1250	District 4	WD-WM-005205	CAS	6	99	2	Year 6-10	322
1251	District 4	WD-WM-005206	CAS	6	99	2	Year 6-10	298
1252	District 8	WD-WM-004154	CI	6	99	3	Year 6-10	568
1253	District 8	WD-WM-004704	CI	8	99	3	Year 6-10	257
1254	District 8	WD-WM-004724	CI	8	99	3	Year 6-10	261
1255	District 8	WD-WM-008844	CAS	8	99	3	Year 6-10	296
1256	District 8	WD-WM-008845	CAS	8	99	3	Year 6-10	322
1283	District 4	WD-WM-004752	CAS	6	99	3	Year 6-10	183
1284	District 4	WD-WM-004807	CAS	6	99	3	Year 6-10	305

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1285	District 4	WD-WM-004808	CAS	6	99	3	Year 6-10	332
1286	District 4	WD-WM-004809	CAS	6	99	3	Year 6-10	307
1287	District 4	WD-WM-004791	CAS	6	99	3	Year 6-10	354
1288	District 4	WD-WM-004792	CAS	6	99	3	Year 6-10	136
1289	District 4	WD-WM-004793	CAS	6	99	3	Year 6-10	14
1290	District 4	WD-WM-004794	CAS	6	99	3	Year 6-10	169
1298	District 7	WD-WM-000448	CAS	8	99	3	Year 6-10	651
1299	District 4	WD-WM-005327	CI	16	99	3	Year 6-10	330
1300	District 4	WD-WM-005329	CI	16	99	3	Year 6-10	343
1301	District 4	WD-WM-005330	CAS	16	99	3	Year 6-10	314
1302	District 4	WD-WM-005331	CAS	16	99	3	Year 6-10	352
1303	District 4	WD-WM-005332	CI	16	99	3	Year 6-10	336
1304	District 4	WD-WM-005333	CI	16	99	3	Year 6-10	331
1305	District 4	WD-WM-005334	CI	16	99	3	Year 6-10	333
1306	District 4	WD-WM-005335	CI	16	99	3	Year 6-10	333
1307	District 4	WD-WM-005353	CAS	6	99	3	Year 6-10	313
1308	District 4	WD-WM-005355	CI	6	99	3	Year 6-10	344
1309	District 4	WD-WM-005356	CI	6	99	3	Year 6-10	334
1310	District 4	WD-WM-005357	CI	6	99	3	Year 6-10	331
1311	District 4	WD-WM-005394	CAS	16	99	3	Year 6-10	330
1312	District 4	WD-WM-005397	CAS	6	99	2	Year 6-10	300
1313	District 4	WD-WM-005398	CAS	6	99	3	Year 6-10	337
1314	District 4	WD-WM-008855	CI	6	99	3	Year 6-10	366
1315	District 4	WD-WM-008858	CI	6	99	3	Year 6-10	331
1316	District 4	WD-WM-008859	CI	6	99	3	Year 6-10	340
1317	District 4	WD-WM-008860	CI	6	99	3	Year 6-10	331
1318	District 4	WD-WM-008861	CI	6	99	3	Year 6-10	298
1319	District 4	WD-WM-003290	CAS	6	99	3	Year 6-10	292
1320	District 4	WD-WM-003291	CAS	6	99	3	Year 6-10	359
1321	District 4	WD-WM-003292	DIP	6	99	3	Year 6-10	262

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1322	District 4	WD-WM-003320	DIP	6	99	3	Year 6-10	322
1323	District 4	WD-WM-003332	NULL	6	99	3	Year 6-10	327
1331	District 4	WD-WM-004171	PVC	6	99	3	Year 6-10	352
1332	District 4	WD-WM-004211	CAS	6	99	3	Year 6-10	336
1333	District 4	WD-WM-004784	CAS	6	99	3	Year 6-10	298
1376	District 5	WD-WM-016319	CI	6	99	3	Year 6-10	401
1377	District 5	WD-WM-016331	CI	6	99	3	Year 6-10	330
1378	District 5	WD-WM-016332	CI	6	99	3	Year 6-10	162
1379	District 5	WD-WM-016333	CI	6	99	3	Year 6-10	194
1380	District 5	WD-WM-016337	CI	6	99	3	Year 6-10	327
1381	District 5	WD-WM-016338	CI	6	99	3	Year 6-10	328
1382	District 5	WD-WM-016339	CI	6	99	3	Year 6-10	365
1	District 5	WD-WM-000360	PVC	10	1	1	Year 11-15	5
2	District 5	WD-WM-000364	CAS	8	1	2	Year 11-15	577
23	District 5	WD-WM-000760	PVC	12	1	2	Year 11-15	499
28	District 5	WD-WM-000906	CAS	12	1	2	Year 11-15	628
29	District 5	WD-WM-000911	CAS	12	1	2	Year 11-15	143
33	District 5	WD-WM-001042	PVC	8	2	2	Year 11-15	345
65	District 7	WD-WM-001952	PVC	12	1	2	Year 11-15	2483
66	District 7	WD-WM-001982	PVC	16	1	2	Year 11-15	2748
67	District 6	WD-WM-002016	PVC	8	1	3	Year 11-15	5495
68	District 7	WD-WM-002034	PVC	8	1	1	Year 11-15	617
69	District 5	WD-WM-002163	PVC	12	1	2	Year 11-15	870
70	District 7	WD-WM-002205	PVC	16	1	1	Year 11-15	756
71	District 6	WD-WM-002380	PVC	12	1	1	Year 11-15	942
75	District 2	WD-WM-003170	CI	6	1	1	Year 11-15	247
76	District 2	WD-WM-003171	CI	6	1	2	Year 11-15	130
81	District 4	WD-WM-003357	CAS	6	1	3	Year 11-15	309
82	District 4	WD-WM-003359	CAS	6	1	2	Year 11-15	338
83	District 4	WD-WM-003375	CI	12	1	2	Year 11-15	342

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
89	District 4	WD-WM-003473	CI	6	1	2	Year 11-15	690
98	District 4	WD-WM-003558	CI	8	1	2	Year 11-15	290
104	District 4	WD-WM-003681	DIP	16	1	2	Year 11-15	294
114	District 8	WD-WM-003832	CAS	6	4	2	Year 11-15	230
127	District 8	WD-WM-004093	PVC	12	1	2	Year 11-15	330
145	District 8	WD-WM-004565	CAS	20	1	1	Year 11-15	367
146	District 8	WD-WM-004608	CAS	6	1	2	Year 11-15	308
147	District 8	WD-WM-004653	DIP	8	1	2	Year 11-15	254
148	District 8	WD-WM-004654	DIP	8	1	2	Year 11-15	325
149	District 8	WD-WM-004656	DI	8	3	2	Year 11-15	333
162	District 4	WD-WM-004912	CAS	6	1	3	Year 11-15	321
165	District 4	WD-WM-004941	CI	6	1	2	Year 11-15	308
166	District 8	WD-WM-004955	CAS	6	1	2	Year 11-15	327
167	District 8	WD-WM-004973	CAS	6	1	2	Year 11-15	310
168	District 8	WD-WM-004974	CAS	6	2	2	Year 11-15	387
169	District 8	WD-WM-004991	CAS	8	1	2	Year 11-15	342
170	District 8	WD-WM-005005	CI	6	1	2	Year 11-15	323
171	District 8	WD-WM-005060	DIP	6	1	3	Year 11-15	291
172	District 8	WD-WM-005092	CAS	16	1	2	Year 11-15	362
186	District 3	WD-WM-005381	CAS	6	1	3	Year 11-15	332
190	District 4	WD-WM-005445	CI	12	1	2	Year 11-15	307
191	District 4	WD-WM-005455	CI	12	1	2	Year 11-15	327
192	District 8	WD-WM-005510	Cast Iron	6	1	2	Year 11-15	152
193	District 8	WD-WM-005513	CAS	20	1	3	Year 11-15	320
194	District 8	WD-WM-005517	Cast Iron	20	1	3	Year 11-15	350
195	District 8	WD-WM-005525	CAS	6	2	3	Year 11-15	283
196	District 8	WD-WM-005527	Cast Iron	6	1	3	Year 11-15	327
197	District 8	WD-WM-005561	Cast Iron	6	1	3	Year 11-15	295
216	District 2	WD-WM-005862	CI	6	1	2	Year 11-15	334
217	District 2	WD-WM-005872	CAS	6	1	2	Year 11-15	332

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
218	District 2	WD-WM-005891	PVC	8	1	2	Year 11-15	257
226	District 3	WD-WM-006096	CAS	6	1	2	Year 11-15	333
227	District 3	WD-WM-006195	CI	6	1	2	Year 11-15	344
229	District 3	WD-WM-006248	CI	6	1	3	Year 11-15	331
239	District 3	WD-WM-006545	PVC	6	1	3	Year 11-15	229
240	District 3	WD-WM-006547	CAS	12	2	2	Year 11-15	301
241	District 3	WD-WM-006588	CAS	6	1	2	Year 11-15	353
242	District 3	WD-WM-006609	CAS	6	1	2	Year 11-15	338
252	District 8	WD-WM-006724	CAS	6	1	2	Year 11-15	269
253	District 8	WD-WM-006727	CAS	6	2	2	Year 11-15	314
254	District 3	WD-WM-006761	CI	6	2	3	Year 11-15	317
255	District 3	WD-WM-006774	CI	6	1	3	Year 11-15	308
256	District 3	WD-WM-006793	CAS	6	2	3	Year 11-15	304
257	District 3	WD-WM-006824	CI	6	1	2	Year 11-15	332
266	District 3	WD-WM-007008	CAS	12	1	1	Year 11-15	294
267	District 3	WD-WM-007021	CAS	12	1	2	Year 11-15	263
268	District 3	WD-WM-007056	CAS	6	1	2	Year 11-15	339
280	District 3	WD-WM-007671	CAS	6	1	3	Year 11-15	331
281	District 3	WD-WM-007676	CAS	6	2	3	Year 11-15	331
282	District 3	WD-WM-007717	CI	12	1	3	Year 11-15	22
283	District 3	WD-WM-007790	CAS	6	1	3	Year 11-15	30
284	District 8	WD-WM-008092	CAS	6	1	2	Year 11-15	336
286	District 2	WD-WM-008348	PVC	8	1	2	Year 11-15	334
288	District 2	WD-WM-008446	DI	10	2	2	Year 11-15	719
289	District 2	WD-WM-008451	CAS	6	2	2	Year 11-15	341
290	District 2	WD-WM-008472	PVC	10	1	1	Year 11-15	283
294	District 2	WD-WM-008655	CAS	8	2	2	Year 11-15	659
296	District 4	WD-WM-008852	CAS	6	1	2	Year 11-15	327
299	District 2	WD-WM-009501	NULL	16	1	3	Year 11-15	5530
301	District 1	WD-WM-009816	PVC	8	1	1	Year 11-15	440

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
302	District 1	WD-WM-009848	PVC	16	1	1	Year 11-15	747
303	District 1	WD-WM-009874	PVC	8	1	1	Year 11-15	794
306	District 3	WD-WM-010091	PVC	8	1	1	Year 11-15	435
308	District 1	WD-WM-010176	PVC	8	1	1	Year 11-15	419
309	District 1	WD-WM-010457	PVC	18	1	1	Year 11-15	219
310	District 2	WD-WM-010596	PVC	8	1	1	Year 11-15	228
314	District 5	WD-WM-010724	PVC	16	1	1	Year 11-15	1062
315	District 2	WD-WM-010961	PVC	8	1	1	Year 11-15	927
318	District 2	WD-WM-011158	PVC	16	1	1	Year 11-15	448
319	District 8	WD-WM-012047	CAS	8	2	1	Year 11-15	172
323	District 2	WD-WM-013468	PVC	8	1	2	Year 11-15	332
327	District 8	WD-WM-014277	CAS	6	1	3	Year 11-15	338
328	District 8	WD-WM-014285	CAS	6	1	2	Year 11-15	314
329	District 8	WD-WM-014295	CAS	6	1	1	Year 11-15	298
333	District 4	WD-WM-014924	PVC	6	1	3	Year 11-15	35
334	District 4	WD-WM-014929	CAS	12	1	2	Year 11-15	397
352	District 5	WD-WM-015264	CI; DI	8	1	2	Year 11-15	262
353	District 5	WD-WM-015307	CAS	6	1	1	Year 11-15	190
359	District 6	WD-WM-016084	CI	8	1	2	Year 11-15	209
360	District 6	WD-WM-016307	PVC	8	1	2	Year 11-15	1130
366	District 5	WD-WM-016399	CAS	6	2	2	Year 11-15	445
374	District 5	WD-WM-017183	CI	6	1	2	Year 11-15	772
377	District 5	WD-WM-017524	PVC	16	1	2	Year 11-15	2340
378	District 5	WD-WM-017602	PVC	12	1	1	Year 11-15	630
392	District 6	WD-WM-017947	PVC	6	1	2	Year 11-15	397
394	District 5	WD-WM-018026	NULL	8	1	2	Year 11-15	91
395	District 5	WD-WM-018248	CAS	8	1	1	Year 11-15	87
409	District 6	WD-WM-018731	PVC	8	1	1	Year 11-15	392
413	District 6	WD-WM-019224	PVC	8	1	1	Year 11-15	263
414	District 6	WD-WM-019260	PVC	8	1	2	Year 11-15	1133

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
415	District 6	WD-WM-019295	PVC	12	1	3	Year 11-15	277
416	District 6	WD-WM-019296	CI	16	1	2	Year 11-15	262
417	District 6	WD-WM-019297	PVC	6	1	3	Year 11-15	438
418	District 6	WD-WM-019356	PVC	6	1	2	Year 11-15	276
424	District 6	WD-WM-020106	PVC	8	1	1	Year 11-15	462
425	District 7	WD-WM-020214	PVC	12	1	2	Year 11-15	1906
426	District 6	WD-WM-020356	PVC	6	1	3	Year 11-15	409
430	District 7	WD-WM-020743	PVC	16	1	1	Year 11-15	304
433	District 5	WD-WM-021332	PVC	16	1	1	Year 11-15	397
434	District 5	WD-WM-023126	PVC	12	1	3	Year 11-15	7
435	District 4	WD-WM-023134	PVC	12	1	3	Year 11-15	111
436	District 4	WD-WM-023137	PVC	12	1	3	Year 11-15	111
437	District 4	WD-WM-023138	PVC	6	2	2	Year 11-15	25
438	District 4	WD-WM-023139	PVC	12	1	2	Year 11-15	251
439	District 6	WD-WM-023248	PVC	12	1	1	Year 11-15	141
440	District 6	WD-WM-023266	PVC	8	1	1	Year 11-15	937
442	District 8	WD-WM-023506	CAS	6	2	2	Year 11-15	249
445	District 8	WD-WM-024235	PVC	8	1	2	Year 11-15	233
446	District 3	WD-WM-024247	PVC	8	1	1	Year 11-15	885
447	District 4	WD-WM-024279	PVC	12	3	2	Year 11-15	5
453	District 3	WD-WM-024400	PVC	8	1	2	Year 11-15	355
454	District 2	WD-WM-024448	PVC	12	1	2	Year 11-15	6
485	District 8	WD-WM-004655	DIP	8	99	2	Year 11-15	304
486	District 8	WD-WM-005518	CAS	6	99	3	Year 11-15	336
498	District 8	WD-WM-005526	Cast Iron	6	99	3	Year 11-15	315
499	District 8	WD-WM-023632	CAS	6	99	3	Year 11-15	34
500	District 8	WD-WM-023650	CAS	6	99	3	Year 11-15	9
530	District 4	WD-WM-000229	<Null>	6	99	2	Year 11-15	4
531	District 4	WD-WM-000230	<Null>	6	99	2	Year 11-15	3
532	District 4	WD-WM-000231	<Null>	6	99	2	Year 11-15	3

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
562	District 3	WD-WM-024346	PVC	8	99	3	Year 11-15	13
573	District 3	WD-WM-008724	NULL	16	99	3	Year 11-15	503
574	District 3	WD-WM-006546	NULL	12	99	2	Year 11-15	100
594	District 2	WD-WM-004441	CI	6	99	2	Year 11-15	788
619	District 5	WD-WM-001570	CI	6	99	3	Year 11-15	58
620	District 5	WD-WM-001601	CI	6	99	3	Year 11-15	91
621	District 5	WD-WM-001754	CI	8	99	3	Year 11-15	939
626	District 3	WD-WM-006791	CI	6	99	2	Year 11-15	352
627	District 3	WD-WM-006794	CI	6	99	3	Year 11-15	305
628	District 3	WD-WM-007697	CI	6	99	3	Year 11-15	14
629	District 3	WD-WM-007702	CI	6	99	3	Year 11-15	27
630	District 3	WD-WM-006653	NULL	6	99	3	Year 11-15	195
631	District 3	WD-WM-006670	CI	6	99	2	Year 11-15	318
632	District 3	WD-WM-006672	CI	6	99	3	Year 11-15	337
633	District 3	WD-WM-006673	CI	6	99	3	Year 11-15	342
637	District 8	WD-WM-005549	CAS	6	99	3	Year 11-15	313
638	District 8	WD-WM-005960	CAS	16	99	3	Year 11-15	313
641	District 8	WD-WM-000236	CAS	6	99	1	Year 11-15	130
642	District 8	WD-WM-000237	CAS	6	99	1	Year 11-15	30
643	District 8	WD-WM-006399	CAS	6	99	1	Year 11-15	313
644	District 8	WD-WM-006400	CAS	6	99	1	Year 11-15	335
645	District 8	WD-WM-008340	CAS	6	99	1	Year 11-15	199
646	District 8	WD-WM-023387	CAS	6	99	1	Year 11-15	70
647	District 8	WD-WM-006422	CAS	8	99	2	Year 11-15	314
648	District 8	WD-WM-006423	CAS	8	99	1	Year 11-15	310
649	District 8	WD-WM-006386	CAS	8	99	1	Year 11-15	304
650	District 8	WD-WM-006387	CAS	8	99	1	Year 11-15	346
651	District 8	WD-WM-006411	CAS	8	99	2	Year 11-15	317
652	District 8	WD-WM-006412	CAS	8	99	2	Year 11-15	324
653	District 8	WD-WM-006027	NULL	12	99	3	Year 11-15	363

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
654	District 8	WD-WM-014278	CAS	14	99	3	Year 11-15	320
655	District 8	WD-WM-023674	<Null>	6	99	3	Year 11-15	44
656	District 8	WD-WM-005150	CAS	2	2	3	Year 11-15	325
671	District 2	WD-WM-012895	CAS	6	99	3	Year 11-15	30
672	District 3	WD-WM-006782	CI	6	99	3	Year 11-15	311
673	District 8	WD-WM-005531	Cast Iron	8	99	3	Year 11-15	333
674	District 8	WD-WM-005532	Cast Iron	8	99	3	Year 11-15	318
675	District 8	WD-WM-004989	CAS	6	99	2	Year 11-15	549
676	District 8	WD-WM-005025	CI	6	99	2	Year 11-15	298
677	District 8	WD-WM-005029	CI	6	99	2	Year 11-15	313
678	District 8	WD-WM-008097	CAS	6	99	2	Year 11-15	286
679	District 8	WD-WM-008099	CI	6	99	2	Year 11-15	33
680	District 8	WD-WM-008187	CI	6	99	2	Year 11-15	50
681	District 8	WD-WM-005608	CAS	6	99	3	Year 11-15	346
682	District 8	WD-WM-005609	CAS	6	99	3	Year 11-15	317
683	District 8	WD-WM-005550	CAS	6	99	3	Year 11-15	336
684	District 8	WD-WM-005552	CAS	6	99	3	Year 11-15	288
685	District 8	WD-WM-005959	CAS	16	99	3	Year 11-15	336
686	District 8	WD-WM-005961	CAS	16	99	3	Year 11-15	331
687	District 8	WD-WM-022473	CAS	16	99	3	Year 11-15	23
688	District 8	WD-WM-022556	CAS	6	99	3	Year 11-15	66
689	District 8	WD-WM-005984	CAS	6	99	3	Year 11-15	327
690	District 8	WD-WM-005985	CAS	6	99	3	Year 11-15	341
691	District 8	WD-WM-008308	NULL	6	99	3	Year 11-15	158
705	District 4	WD-WM-001769	CI	6	99	3	Year 11-15	342
706	District 5	WD-WM-001771	CAS	6	99	3	Year 11-15	325
707	District 4	WD-WM-001772	CI	6	99	3	Year 11-15	354
708	District 4	WD-WM-001773	CAS	6	99	3	Year 11-15	300
709	District 5	WD-WM-001693	CI	6	99	3	Year 11-15	359
710	District 5	WD-WM-001697	CI	6	99	3	Year 11-15	249

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
711	District 5	WD-WM-001698	CI	6	99	3	Year 11-15	250
724	District 5	WD-WM-017013	CAS	8	99	1	Year 11-15	335
725	District 5	WD-WM-017014	CAS	8	99	1	Year 11-15	92
726	District 5	WD-WM-017015	CAS	8	99	1	Year 11-15	44
727	District 5	WD-WM-017016	CAS	8	99	1	Year 11-15	101
728	District 5	WD-WM-017017	CAS	8	99	1	Year 11-15	66
729	District 5	WD-WM-017018	CAS	8	99	1	Year 11-15	76
730	District 5	WD-WM-017019	CAS	8	99	1	Year 11-15	62
731	District 5	WD-WM-017020	CAS	8	99	1	Year 11-15	51
732	District 5	WD-WM-017021	CAS	8	99	1	Year 11-15	50
733	District 5	WD-WM-017022	CAS	8	99	1	Year 11-15	54
734	District 5	WD-WM-017023	CAS	8	99	1	Year 11-15	48
735	District 5	WD-WM-017024	CAS	8	99	1	Year 11-15	45
736	District 5	WD-WM-017025	CAS	8	99	1	Year 11-15	38
737	District 5	WD-WM-017026	CAS	8	99	1	Year 11-15	39
738	District 5	WD-WM-017027	CAS	8	99	1	Year 11-15	32
739	District 5	WD-WM-017028	CAS	8	99	1	Year 11-15	230
740	District 5	WD-WM-017029	CAS	8	99	1	Year 11-15	19
741	District 5	WD-WM-017030	CAS	8	99	1	Year 11-15	22
742	District 5	WD-WM-017031	CAS	8	99	1	Year 11-15	12
743	District 5	WD-WM-017032	CAS	8	99	1	Year 11-15	86
744	District 5	WD-WM-017033	CAS	8	99	1	Year 11-15	217
745	District 5	WD-WM-017034	CAS	8	99	1	Year 11-15	30
746	District 5	WD-WM-017039	NULL	8	99	1	Year 11-15	2
747	District 5	WD-WM-017072	CAS	8	99	1	Year 11-15	30
748	District 5	WD-WM-018312	CAS	8	99	1	Year 11-15	93
749	District 5	WD-WM-018323	CAS	8	99	1	Year 11-15	90
750	District 5	WD-WM-018324	CAS	8	99	1	Year 11-15	48
751	District 5	WD-WM-018325	CAS	8	99	1	Year 11-15	65
763	District 8	WD-WM-004956	CAS	6	99	2	Year 11-15	301

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
764	District 8	WD-WM-004957	CAS	6	99	2	Year 11-15	320
765	District 8	WD-WM-004958	CAS	6	99	2	Year 11-15	107
766	District 8	WD-WM-004959	CAS	6	99	2	Year 11-15	290
767	District 8	WD-WM-004965	CAS	6	99	2	Year 11-15	361
768	District 8	WD-WM-004966	CAS	6	99	2	Year 11-15	308
769	District 8	WD-WM-004967	CAS	6	99	2	Year 11-15	354
770	District 8	WD-WM-004969	NULL	6	99	2	Year 11-15	333
771	District 8	WD-WM-004970	CAS	6	99	2	Year 11-15	312
772	District 8	WD-WM-004971	CAS	6	99	2	Year 11-15	338
773	District 8	WD-WM-008057	CAS	6	99	2	Year 11-15	18
774	District 8	WD-WM-000475	CI	6	99	1	Year 11-15	634
775	District 8	WD-WM-000518	CI	6	99	1	Year 11-15	57
776	District 8	WD-WM-000519	CI	6	99	1	Year 11-15	325
921	District 8	WD-WM-004669	CAS	8	99	2	Year 11-15	275
922	District 8	WD-WM-004670	CI	8	99	2	Year 11-15	286
923	District 8	WD-WM-004681	CAS	8	99	3	Year 11-15	315
924	District 8	WD-WM-004682	CI	8	99	3	Year 11-15	308
925	District 8	WD-WM-004683	CI	8	99	2	Year 11-15	304
926	District 8	WD-WM-004684	CAS	8	99	2	Year 11-15	244
927	District 8	WD-WM-022142	PVC	8	99	2	Year 11-15	47
928	District 8	WD-WM-023421	CAS	8	99	2	Year 11-15	19
929	District 8	WD-WM-023422	CI	8	99	2	Year 11-15	25
930	District 8	WD-WM-046280	PVC	8	99	2	Year 11-15	3
941	District 8	WD-WM-000609	NULL	6	99	3	Year 11-15	299
942	District 8	WD-WM-000610	CI	6	99	3	Year 11-15	333
943	District 8	WD-WM-000611	CI	6	99	3	Year 11-15	332
944	District 8	WD-WM-000612	CI	6	99	3	Year 11-15	306
945	District 8	WD-WM-003866	PVC	6	99	3	Year 11-15	305
946	District 8	WD-WM-003868	NULL	6	99	3	Year 11-15	335
947	District 8	WD-WM-003869	NULL	6	99	3	Year 11-15	336

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1051	District 8	WD-WM-046143	CI	6	99	3	Year 11-15	82
1052	District 5	WD-WM-001707	CI	6	99	3	Year 11-15	243
1053	District 5	WD-WM-001708	CI	6	99	3	Year 11-15	567
1054	District 5	WD-WM-001710	CI	6	99	3	Year 11-15	249
1055	District 5	WD-WM-001716	CI	6	99	3	Year 11-15	250
1056	District 5	WD-WM-001719	CI	6	99	3	Year 11-15	281
1057	District 5	WD-WM-001721	CI	6	99	2	Year 11-15	270
1058	District 5	WD-WM-001722	CI	6	99	2	Year 11-15	119
1059	District 5	WD-WM-001724	CI	6	99	3	Year 11-15	52
1060	District 5	WD-WM-001568	CI	12	99	3	Year 11-15	500
1061	District 5	WD-WM-001576	CI	6	99	3	Year 11-15	173
1062	District 5	WD-WM-001681	CI	12	99	3	Year 11-15	796
1070	District 8	WD-WM-004688	CAS	8	99	3	Year 11-15	311
1071	District 8	WD-WM-005121	CAS	8	99	3	Year 11-15	354
1072	District 8	WD-WM-005122	CAS	8	99	3	Year 11-15	339
1073	District 8	WD-WM-005123	CAS	8	99	3	Year 11-15	379
1074	District 8	WD-WM-005124	CAS	8	99	3	Year 11-15	313
1075	District 8	WD-WM-023424	CAS	8	99	3	Year 11-15	59
1076	District 8	WD-WM-023446	PVC	8	99	3	Year 11-15	381
1077	District 3	WD-WM-005831	CI	12	99	2	Year 11-15	301
1078	District 3	WD-WM-005832	CI	12	99	2	Year 11-15	306
1079	District 3	WD-WM-005833	CI	12	99	2	Year 11-15	305
1080	District 3	WD-WM-005834	CI	12	99	2	Year 11-15	302
1081	District 3	WD-WM-005835	CI	12	99	2	Year 11-15	331
1082	District 3	WD-WM-006191	CI	12	99	2	Year 11-15	345
1083	District 3	WD-WM-022316	PVC	8	99	2	Year 11-15	39
1108	District 8	WD-WM-005181	CAS	6	99	2	Year 11-15	308
1109	District 8	WD-WM-005182	CAS	6	99	2	Year 11-15	347
1110	District 3	WD-WM-005659	NULL	6	99	2	Year 11-15	326
1111	District 8	WD-WM-005660	NULL	6	99	2	Year 11-15	335

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1113	District 8	WD-WM-005669	NULL	6	99	2	Year 11-15	333
1114	District 8	WD-WM-005673	NULL	6	99	3	Year 11-15	325
1115	District 8	WD-WM-005678	NULL	6	99	3	Year 11-15	292
1116	District 8	WD-WM-005681	NULL	14	99	3	Year 11-15	359
1117	District 8	WD-WM-005684	NULL	6	99	3	Year 11-15	306
1118	District 8	WD-WM-005685	NULL	6	99	3	Year 11-15	336
1119	District 8	WD-WM-005686	NULL	6	99	2	Year 11-15	334
1120	District 8	WD-WM-005687	NULL	6	99	2	Year 11-15	342
1121	District 8	WD-WM-005689	NULL	6	99	2	Year 11-15	327
1122	District 8	WD-WM-006059	NULL	6	99	3	Year 11-15	320
1123	District 8	WD-WM-006060	NULL	6	99	3	Year 11-15	335
1124	District 8	WD-WM-006061	NULL	6	99	3	Year 11-15	332
1125	District 8	WD-WM-009290	NULL	2	99	3	Year 11-15	335
1126	District 8	WD-WM-014287	NULL	2	99	3	Year 11-15	335
1127	District 8	WD-WM-021995	DI	6	99	3	Year 11-15	309
1128	District 8	WD-WM-005551	CAS	6	99	3	Year 11-15	310
1129	District 8	WD-WM-005553	CAS	6	99	3	Year 11-15	308
1130	District 8	WD-WM-005962	CAS	16	99	3	Year 11-15	307
1131	District 8	WD-WM-005963	CAS	16	99	3	Year 11-15	327
1132	District 8	WD-WM-022488	CAS	16	99	3	Year 11-15	41
1133	District 8	WD-WM-022490	CAS	6	99	3	Year 11-15	39
1134	District 8	WD-WM-005094	NULL	8	99	3	Year 11-15	275
1135	District 8	WD-WM-005529	NULL	8	99	3	Year 11-15	346
1136	District 8	WD-WM-005530	Cast Iron	8	99	3	Year 11-15	340
1137	District 8	WD-WM-005533	Cast Iron	8	99	3	Year 11-15	331
1138	District 8	WD-WM-005937	NULL	8	99	2	Year 11-15	208
1139	District 8	WD-WM-005514	Cast Iron	20	99	2	Year 11-15	344
1140	District 8	WD-WM-005515	Cast Iron	20	99	3	Year 11-15	351
1141	District 8	WD-WM-005516	Cast Iron	20	99	3	Year 11-15	332
1142	District 8	WD-WM-005519	NULL	6	99	2	Year 11-15	252

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1143	District 8	WD-WM-005520	CAS	6	99	3	Year 11-15	296
1144	District 8	WD-WM-005521	CAS	6	99	3	Year 11-15	329
1145	District 3	WD-WM-007062	NULL	6	99	1	Year 11-15	350
1146	District 3	WD-WM-007078	CI	6	99	2	Year 11-15	324
1147	District 3	WD-WM-007079	CI	6	99	2	Year 11-15	188
1148	District 3	WD-WM-007082	NULL	6	99	1	Year 11-15	407
1149	District 3	WD-WM-007083	CI	6	99	2	Year 11-15	327
1150	District 2	WD-WM-012220	CAS	6	99	3	Year 11-15	310
1151	District 3	WD-WM-003144	CI	6	99	2	Year 11-15	201
1152	District 3	WD-WM-003145	CI	6	99	2	Year 11-15	31
1153	District 3	WD-WM-003146	CI	6	99	2	Year 11-15	38
1154	District 3	WD-WM-003147	CI	6	99	2	Year 11-15	266
1155	District 3	WD-WM-007032	CI	8	99	2	Year 11-15	318
1156	District 3	WD-WM-007033	CI	8	99	2	Year 11-15	333
1157	District 3	WD-WM-007647	CI	6	99	2	Year 11-15	30
1158	District 3	WD-WM-007648	CI	6	99	2	Year 11-15	13
1159	District 3	WD-WM-007649	CI	6	99	2	Year 11-15	34
1160	District 3	WD-WM-007650	CI	6	99	2	Year 11-15	15
1161	District 3	WD-WM-007662	CI	8	99	2	Year 11-15	18
1162	District 8	WD-WM-006309	Cast Iron	6	99	1	Year 11-15	307
1163	District 8	WD-WM-006310	Cast Iron	6	99	1	Year 11-15	385
1164	District 8	WD-WM-006311	Cast Iron	6	99	1	Year 11-15	310
1165	District 8	WD-WM-006312	Cast Iron	6	99	2	Year 11-15	276
1166	District 8	WD-WM-006331	Cast Iron	6	99	2	Year 11-15	332
1167	District 8	WD-WM-006714	CAS	6	99	1	Year 11-15	245
1168	District 8	WD-WM-006716	CAS	6	99	1	Year 11-15	235
1169	District 8	WD-WM-006717	CAS	6	99	1	Year 11-15	306
1170	District 8	WD-WM-006718	CAS	6	99	1	Year 11-15	335
1171	District 8	WD-WM-006725	CAS	6	99	1	Year 11-15	343
1172	District 8	WD-WM-006726	CAS	6	99	2	Year 11-15	316

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1173	District 8	WD-WM-006728	CAS	6	99	2	Year 11-15	86
1174	District 8	WD-WM-007872	Cast Iron	8	99	1	Year 11-15	277
1175	District 8	WD-WM-010402	CAS	6	99	1	Year 11-15	36
1176	District 8	WD-WM-010403	CAS	6	99	1	Year 11-15	27
1177	District 8	WD-WM-010404	CAS	6	99	2	Year 11-15	316
1178	District 8	WD-WM-010405	CAS	6	99	2	Year 11-15	297
1185	District 3	WD-WM-005845	CI	6	99	2	Year 11-15	327
1186	District 3	WD-WM-005846	CI	6	99	2	Year 11-15	338
1187	District 3	WD-WM-005847	NULL	6	99	2	Year 11-15	346
1188	District 3	WD-WM-005848	NULL	6	99	2	Year 11-15	323
1189	District 3	WD-WM-005849	NULL	6	99	3	Year 11-15	334
1190	District 3	WD-WM-005850	NULL	6	99	3	Year 11-15	329
1191	District 3	WD-WM-005851	NULL	6	99	3	Year 11-15	313
1192	District 3	WD-WM-005869	CI	6	99	2	Year 11-15	341
1193	District 3	WD-WM-005870	CI	6	99	2	Year 11-15	307
1194	District 3	WD-WM-014282	CI; DI	6	99	3	Year 11-15	331
1195	District 3	WD-WM-014283	DI	6	99	3	Year 11-15	335
1196	District 8	WD-WM-000580	NULL	8	99	2	Year 11-15	313
1197	District 8	WD-WM-000581	NULL	8	99	2	Year 11-15	306
1198	District 8	WD-WM-003833	CAS	8	99	2	Year 11-15	254
1199	District 8	WD-WM-003834	NULL	8	99	2	Year 11-15	396
1200	District 8	WD-WM-004076	CI	8	99	2	Year 11-15	290
1201	District 8	WD-WM-004077	CI	8	99	2	Year 11-15	327
1202	District 8	WD-WM-004078	CI	8	99	2	Year 11-15	310
1203	District 8	WD-WM-004079	CAS	8	99	2	Year 11-15	332
1204	District 8	WD-WM-004080	CAS	8	99	2	Year 11-15	344
1205	District 8	WD-WM-004081	Cast Iron	8	99	2	Year 11-15	322
1206	District 8	WD-WM-004082	Cast Iron	8	99	2	Year 11-15	296
1207	District 8	WD-WM-004083	Cast Iron	8	99	2	Year 11-15	334
1208	District 8	WD-WM-008213	PVC	8	99	2	Year 11-15	307

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1209	District 3	WD-WM-006766	CI	12	99	2	Year 11-15	314
1210	District 3	WD-WM-006767	CI	12	99	2	Year 11-15	343
1211	District 3	WD-WM-006768	CI	12	99	2	Year 11-15	308
1212	District 3	WD-WM-006788	CI	6	99	3	Year 11-15	298
1213	District 3	WD-WM-006789	CI	6	99	3	Year 11-15	327
1214	District 3	WD-WM-007019	CI	12	99	2	Year 11-15	303
1215	District 3	WD-WM-007022	CI	8	99	1	Year 11-15	116
1216	District 3	WD-WM-007027	CI	8	99	1	Year 11-15	200
1217	District 3	WD-WM-007296	CI	8	99	2	Year 11-15	323
1218	District 3	WD-WM-007297	CI	8	99	2	Year 11-15	331
1219	District 3	WD-WM-007298	CI	8	99	2	Year 11-15	296
1220	District 3	WD-WM-007610	CI	8	99	1	Year 11-15	330
1221	District 3	WD-WM-007741	CI	6	99	3	Year 11-15	325
1265	District 8	WD-WM-005011	NULL	8	99	2	Year 11-15	318
1266	District 8	WD-WM-005039	NULL	8	99	2	Year 11-15	271
1267	District 8	WD-WM-005044	NULL	8	99	3	Year 11-15	271
1268	District 8	WD-WM-005047	CI	8	99	3	Year 11-15	280
1269	District 8	WD-WM-005048	CI	8	99	3	Year 11-15	321
1270	District 8	WD-WM-005049	CAS	8	99	2	Year 11-15	281
1271	District 8	WD-WM-005053	CI	8	99	3	Year 11-15	311
1272	District 8	WD-WM-005056	CAS	8	99	3	Year 11-15	286
1273	District 8	WD-WM-005057	CAS	8	99	3	Year 11-15	305
1274	District 8	WD-WM-004992	CAS	8	99	2	Year 11-15	347
1275	District 8	WD-WM-004996	CAS	8	99	2	Year 11-15	262
1276	District 8	WD-WM-005458	CAS	6	99	1	Year 11-15	362
1277	District 8	WD-WM-005459	CAS	6	99	1	Year 11-15	81
1278	District 8	WD-WM-005462	CAS	6	99	2	Year 11-15	269
1279	District 8	WD-WM-005463	CAS	8	99	2	Year 11-15	51
1280	District 8	WD-WM-005472	CAS	8	99	2	Year 11-15	337
1281	District 8	WD-WM-005473	CAS	8	99	2	Year 11-15	321

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1282	District 8	WD-WM-008036	CAS	8	99	2	Year 11-15	316
1291	District 3	WD-WM-006087	CAS	6	99	1	Year 11-15	368
1292	District 3	WD-WM-006105	Cast Iron	10	99	1	Year 11-15	333
1293	District 3	WD-WM-006106	Cast Iron	10	99	1	Year 11-15	316
1294	District 3	WD-WM-006144	Cast Iron	6	99	1	Year 11-15	293
1295	District 3	WD-WM-006145	Cast Iron	6	99	1	Year 11-15	330
1296	District 3	WD-WM-006147	Cast Iron	6	99	1	Year 11-15	294
1297	District 3	WD-WM-006148	Cast Iron	6	99	1	Year 11-15	346
1341	District 5	WD-WM-001706	CI	6	99	3	Year 11-15	611
1342	District 5	WD-WM-001717	CI	6	99	3	Year 11-15	607
1343	District 5	WD-WM-001718	CI	6	99	3	Year 11-15	609
1344	District 5	WD-WM-001720	CI	6	99	3	Year 11-15	603
1345	District 5	WD-WM-001723	CI	6	99	3	Year 11-15	237
1346	District 5	WD-WM-001755	CI	6	99	3	Year 11-15	37
1347	District 5	WD-WM-001756	CI	6	99	3	Year 11-15	446
1348	District 5	WD-WM-001757	CI	6	99	3	Year 11-15	411
1349	District 5	WD-WM-001758	CI	6	99	3	Year 11-15	628
1350	District 5	WD-WM-001762	CI	6	99	3	Year 11-15	309
1351	District 5	WD-WM-001763	CI	6	99	3	Year 11-15	220
1352	District 5	WD-WM-001764	CI	6	99	3	Year 11-15	285
1353	District 5	WD-WM-001765	CI	6	99	3	Year 11-15	287
1354	District 5	WD-WM-001766	CI	6	99	3	Year 11-15	263
1355	District 5	WD-WM-001678	CI	8	99	3	Year 11-15	27
1356	District 5	WD-WM-001679	CI	6	99	3	Year 11-15	156
1357	District 5	WD-WM-001680	CI	6	99	3	Year 11-15	293
1358	District 5	WD-WM-001681	CI	12	99	3	Year 11-15	796
1359	District 5	WD-WM-001682	CI	6	99	3	Year 11-15	10
1360	District 5	WD-WM-001685	NULL	6	99	3	Year 11-15	391
1361	District 5	WD-WM-001686	CI	6	99	3	Year 11-15	312
1362	District 5	WD-WM-001687	CI	6	99	3	Year 11-15	325

OBJECTID *	DISTRICT	Asset ID	MATERIAL	DIAMETER	PIPE BREAK FREQUENCY	Heat Map Value	Year 1-15	Shape_Length (FT)
1363	District 5	WD-WM-001688	CI	6	99	3	Year 11-15	319
1364	District 5	WD-WM-001689	CI	6	99	3	Year 11-15	115
1365	District 5	WD-WM-001690	NULL	6	99	3	Year 11-15	53
1366	District 5	WD-WM-001694	CI	6	99	3	Year 11-15	306
1367	District 5	WD-WM-001695	CI	6	99	3	Year 11-15	309
1368	District 5	WD-WM-001696	CI	6	99	3	Year 11-15	311
1369	District 5	WD-WM-001699	CI	6	99	3	Year 11-15	379
1370	District 5	WD-WM-001701	CI	6	99	3	Year 11-15	328
1371	District 5	WD-WM-001702	CI	6	99	3	Year 11-15	328
1372	District 5	WD-WM-001703	CI	6	99	3	Year 11-15	197
1373	District 5	WD-WM-001705	CI	6	99	3	Year 11-15	360
1374	District 5	WD-WM-001767	CI	6	99	3	Year 11-15	53
1375	District 5	WD-WM-001768	CI	6	99	3	Year 11-15	134

14 APPENDIX E
Project Planning Cost Sheets

Project cost elements were compiled from historical project database in Laredo with missing price categories extrapolated from appropriate projects in the Houston area and Central Texas.

Laredo Integrated Water Master Plan

Project ID: **Rio Bravo**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	15%	Insert %
Traffic Control	10%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	5.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	4,224
30-inch PVC Waterline (LF)	4,224
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 1,348,134
30-inch Waterline	LF	$ 1,714,944
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 40,000
30-inch Butterfly Valve	EA	$ 60,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 166,320
Ground Restoration	LS	$ 47,520
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 4,432,000*
Other	LS	$ -
Utility Relocates	LS	$ 665,000
Traffic Control	LS	$ 444,000
Additional Prof. Services	LS	$ 555,000
Testing/Planning/CM	LS	$ 1,109,000
Construction Cost		***$ 7,205,000***
Design	LS	$ 555,000
Land Acquisition	LS	$ 278,000
TOTAL COST (2022)	**$**	**8,038,000**

Laredo Integrated Water Master Plan

Project ID: **36" JWTP-Lyon Replace**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 18,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	2%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ 130,000
Description:	Cathodic Protection
Cost input for unique projects	
Describe first input cost:	
Cathodic Protection	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,250,000	$ 635,000
0.50	$ 1,600,000	$ 750,000
0.75	$ 1,800,000	$ 1,100,000
1.00	$ 2,100,000	$ 1,250,000
1.25	$ 2,350,000	$ 1,500,000
1.50	$ 2,700,000	$ 1,650,000
1.75	$ 3,000,000	$ 1,850,000
2.00	$ 3,300,000	$ 2,000,000
-	$ -	$ -
-	$ -	$ -
-	$ -	$ -
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	85%
% Pipeline Trenchless	15%
% Pipeline in ROW	75%
% Pipeline in Pavement	25%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	13,250
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	12	1 Ton per 1,200 LF waterline

Trench Width	5	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ 7,857,250
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ 175,000
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 216,000
Extra Pavement	LS	$ 157,675
Ground Restoration	LS	$ 135,150
Cathodic Protection	LS	$ 130,000
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 11,273,000*
Other	LS	$ 183,000
Utility Relocates	LS	$ 1,128,000
Traffic Control	LS	$ 564,000
Additional Prof. Services	LS	$ 1,315,000
Testing/Planning/CM	LS	$ 2,630,000
Construction Cost		***$ 17,093,000***
Design	LS	$ 1,710,000
Land Acquisition	LS	$ 1,197,000
TOTAL COST (2022)	**$**	**20,000,000**

Laredo Integrated Water Master Plan

Project ID: **Colonias**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	5%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	15.0%	Insert %

Manual Input Project Cost	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
1,200 gpm	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	8,000
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	7	1 Ton per 1,200 LF waterline

Trench Width	2	FT
Hydrant spacing	none	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ 1,080,000
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	none
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ 26,400
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 28,000
Extra Pavement	LS	$ 50,400
Ground Restoration	LS	$ 14,400
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 1,559,000*
Other	LS	$ 78,000
Utility Relocates	LS	$ 156,000
Traffic Control	LS	$ 78,000
Additional Prof. Services	LS	$ 188,000
Testing/Planning/CM	LS	$ 375,000
Construction Cost		***$ 2,434,000***
Design	LS	$ 188,000
Land Acquisition	LS	$ 281,000
TOTAL COST (2022)	**$**	**2,903,000**

Laredo Integrated Water Master Plan

Project ID: **Hendricks PS**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	0.0%	Insert %

Manual Input Project Cost		Storage Tank Capacity (MG)	Cost EST	Cost GST
1st Lump Sum Cost:	**$ 558,980**			
Description:	**Pump Installation**	0.25	$ 1,500,000	$ 635,000
Cost input for unique projects		0.50	$ 2,000,000	$ 750,000
Describe first input cost:		0.75	$ 2,250,000	$ 1,100,000
10 MGD (firm) booster pumps		1.00	$ 2,500,000	$ 1,250,000
		1.25	$ 2,750,000	$ 1,500,000
		1.50	$ 3,000,000	$ 1,650,000
2nd Lump Sum Cost:		1.75	$ 3,250,000	$ 1,850,000
Description:		2.00	$ 3,500,000	$ 2,000,000
Cost input for unique projects		3.00	$ -	$ 3,250,000
Describe second input cost:		4.00	$ -	$ 5,000,000
		5.00	$ -	$ 6,500,000
		-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	200
30-inch PVC Waterline (LF)	200
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)	2.00	Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	1	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 63,832
30-inch Waterline	LF	$ 81,200
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ 30,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	LS	$ -
Ground Storage Tank	LS	$ 2,000,000
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 4,000
Extra Pavement	LS	$ 7,875
Ground Restoration	LS	$ 2,250
Pump Installation	LS	$ 558,980
$ -	LS	$ -
Contingency	*30%*	
Sub-total		*$ 3,599,000*
Other	LS	$ -
Utility Relocates	LS	$ 360,000
Traffic Control	LS	$ 180,000
Additional Prof. Services	LS	$ 414,000
Testing/Planning/CM	LS	$ 828,000
Construction Cost		***$ 5,381,000***
Design	LS	$ 414,000
Land Acquisition	LS	$ -
TOTAL COST (2022)	**$**	**5,795,000**

Laredo Integrated Water Master Plan

Project ID: **Hendricks-Lyon**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	15%	Insert %
Traffic Control	10%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	0.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	5,900
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	5	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 1,883,047
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 60,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 20,000
Extra Pavement	LS	$ 111,510
Ground Restoration	LS	$ 31,860
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 2,739,000*
Other	LS	$ -
Utility Relocates	LS	$ 411,000
Traffic Control	LS	$ 274,000
Additional Prof. Services	LS	$ 343,000
Testing/Planning/CM	LS	$ 685,000
Construction Cost		***$ 4,452,000***
Design	LS	$ 343,000
Land Acquisition	LS	$ -
TOTAL COST (2022)	**$**	**4,795,000**

Print Date 5/12/2022

Laredo Integrated Water Master Plan

Project ID: **Hwy359-LosBlancas**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Cost	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
1,200 gpm	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	25,000
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	21	1 Ton per 1,200 LF waterline

Trench Width	3	FT
Hydrant spacing	none	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ 4,250,000
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	none
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ 112,500
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 84,000
Extra Pavement	LS	$ 196,875
Ground Restoration	LS	$ 56,250
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 6,110,000*
Other	LS	$ -
Utility Relocates	LS	$ 611,000
Traffic Control	LS	$ 306,000
Additional Prof. Services	LS	$ 703,000
Testing/Planning/CM	LS	$ 1,406,000
Construction Cost		***$ 9,136,000***
Design	LS	$ 703,000
Land Acquisition	LS	$ 211,000
TOTAL COST (2022)	**$**	**10,050,000**

Laredo Integrated Water Master Plan

Project ID: **QL to Hendricks**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	15%	Insert %
Traffic Control	10%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	0.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	13,680
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	12	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ 5,554,080
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ 150,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 48,000
Extra Pavement	LS	$ 280,098
Ground Restoration	LS	$ 80,028
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 7,946,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,192,000
Traffic Control	LS	$ 795,000
Additional Prof. Services	LS	$ 994,000
Testing/Planning/CM	LS	$ 1,987,000
Construction Cost		***$ 12,914,000***
Design	LS	$ 994,000
Land Acquisition	LS	$ -
TOTAL COST (2022)	**$**	**13,908,000**

Laredo Integrated Water Master Plan

Project ID: **LP20-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	211
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	9,269
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 41,145
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 2,958,299
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 6,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 6,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 100,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 177,843
Ground Restoration	LS	$ 50,812
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 4,384,000*
Other	LS	$ -
Utility Relocates	LS	$ 439,000
Traffic Control	LS	$ 220,000
Additional Prof. Services	LS	$ 505,000
Testing/Planning/CM	LS	$ 1,009,000
Construction Cost		***$ 6,557,000***
Design	LS	$ 505,000
Land Acquisition	LS	$ 354,000
TOTAL COST (2022)	**$**	**7,416,000**

Laredo Integrated Water Master Plan

Project ID: **McP EST**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	1,527
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	2	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 297,765
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 24,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 6,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 8,000
Extra Pavement	LS	$ 19,240
Ground Restoration	LS	$ 5,497
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 469,000*
Other	LS	$ -
Utility Relocates	LS	$ 47,000
Traffic Control	LS	$ 24,000
Additional Prof. Services	LS	$ 54,000
Testing/Planning/CM	LS	$ 108,000
Construction Cost		***$ 702,000***
Design	LS	$ 54,000
Land Acquisition	LS	$ 17,000
TOTAL COST (2022)	**$**	**773,000**

Laredo Integrated Water Master Plan

Project ID: **CB PS**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	11.0%	Insert %

Manual Input Project Cost		Storage Tank Capacity (MG)	Cost EST	Cost GST
1st Lump Sum Cost:	**$ 558,980**			
Description:	**Pump Installation**	0.25	$ 1,500,000	$ 635,000
Cost input for unique projects		0.50	$ 2,000,000	$ 750,000
Describe first input cost:		0.75	$ 2,250,000	$ 1,100,000
10 MGD (firm) booster pumps		1.00	$ 2,500,000	$ 1,250,000
		1.25	$ 2,750,000	$ 1,500,000
		1.50	$ 3,000,000	$ 1,650,000
2nd Lump Sum Cost:	**$ 6,500,000**	1.75	$ 3,250,000	$ 1,850,000
Description:	**Second 5MG GST**	2.00	$ 3,500,000	$ 2,000,000
Cost input for unique projects		3.00	$ -	$ 3,250,000
Describe second input cost:		4.00	$ -	$ 5,000,000
		5.00	$ -	$ 6,500,000
Cost for second of two planned 5MG GSTs		-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	481
30-inch PVC Waterline (LF)	621
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	243
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)	5.00	Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	2	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 153,516
30-inch Waterline	LF	$ 252,126
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ 158,072
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ 30,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ 55,000
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	LS	$ -
Ground Storage Tank	LS	$ 6,500,000
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 8,000
Extra Pavement	LS	$ 27,547
Ground Restoration	LS	$ 7,871
Pump Installation	LS	$ 558,980
Second 5MG GST	LS	$ 6,500,000
Contingency	*30%*	
Sub-total		*$ 18,553,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,856,000
Traffic Control	LS	$ 928,000
Additional Prof. Services	LS	$ 2,134,000
Testing/Planning/CM	LS	$ 4,268,000
Construction Cost		***$ 27,739,000***
Design	LS	$ 2,134,000
Land Acquisition	LS	$ 2,348,000
TOTAL COST (2022)	**$**	**32,221,000**

Laredo Integrated Water Master Plan

Project ID: **SV PS**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Cost	
1st Lump Sum Cost:	$ 248,693
Description:	**Pump Installation**
Cost input for unique projects	
Describe first input cost:	
Install P3 7000 gpm (10 MGD)	
2nd Lump Sum Cost:	$ -
Description:	**XXXXXXXXXXX**
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	224
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	1	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 71,492
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 4,000
Extra Pavement	LS	$ 4,234
Ground Restoration	LS	$ 1,210
Pump Installation	LS	$ 248,693
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 455,000*
Other	LS	$ -
Utility Relocates	LS	$ 46,000
Traffic Control	LS	$ 23,000
Additional Prof. Services	LS	$ 53,000
Testing/Planning/CM	LS	$ 105,000
Construction Cost		***$ 682,000***
Design	LS	$ 53,000
Land Acquisition	LS	$ 37,000
TOTAL COST (2022)	$	**772,000**

Laredo Integrated Water Master Plan

Project ID: **CVS Expansion**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ 144,320
Description:	2) 1200 gpm + (1) 1800 gpr
Cost input for unique projects	
Describe first input cost:	
6 MGD Pump Expansion	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	0	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ 2,000,000
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ -
Extra Pavement	LS	$ -
Ground Restoration	LS	$ -
(2) 1200 gpm + (1) 1800 gp	LS	$ 144,320
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 2,788,000*
Other	LS	$ -
Utility Relocates	LS	$ 279,000
Traffic Control	LS	$ 140,000
Additional Prof. Services	LS	$ 321,000
Testing/Planning/CM	LS	$ 642,000
Construction Cost		***$ 4,170,000***
Design	LS	$ 321,000
Land Acquisition	LS	$ 225,000
TOTAL COST (2022)	**$**	**4,716,000**

Laredo Integrated Water Master Plan

Project ID: **LP20-2A**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	7,200
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	6	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 2,297,956
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 80,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 24,000
Extra Pavement	LS	$ 136,080
Ground Restoration	LS	$ 38,880
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 3,350,000*
Other	LS	$ -
Utility Relocates	LS	$ 335,000
Traffic Control	LS	$ 168,000
Additional Prof. Services	LS	$ 386,000
Testing/Planning/CM	LS	$ 771,000
Construction Cost		***$ 5,010,000***
Design	LS	$ 386,000
Land Acquisition	LS	$ 270,000
TOTAL COST (2022)	**$**	**5,666,000**

Laredo Integrated Water Master Plan

Project ID: **LP20-2B**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	1,400
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	8,822
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	9	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 273,000
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 2,815,634
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 18,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 6,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 100,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 36,000
Extra Pavement	LS	$ 184,376
Ground Restoration	LS	$ 52,679
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 4,532,000*
Other	LS	$ -
Utility Relocates	LS	$ 454,000
Traffic Control	LS	$ 227,000
Additional Prof. Services	LS	$ 522,000
Testing/Planning/CM	LS	$ 1,043,000
Construction Cost		***$ 6,778,000***
Design	LS	$ 522,000
Land Acquisition	LS	$ 365,000
TOTAL COST (2022)	**$**	**7,665,000**

Laredo Integrated Water Master Plan

Project ID: **Milmo-SV**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	15,250
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	13	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 4,867,198
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 140,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 52,000
Extra Pavement	LS	$ 288,225
Ground Restoration	LS	$ 82,350
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 7,059,000*
Other	LS	$ -
Utility Relocates	LS	$ 706,000
Traffic Control	LS	$ 353,000
Additional Prof. Services	LS	$ 812,000
Testing/Planning/CM	LS	$ 1,624,000
Construction Cost		***$ 10,554,000***
Design	LS	$ 812,000
Land Acquisition	LS	$ 569,000
TOTAL COST (2022)	**$**	**11,935,000**

Laredo Integrated Water Master Plan

Project ID: **SV Supply**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	9,330
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 2,977,768
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 100,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 176,337
Ground Restoration	LS	$ 50,382
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 4,338,000*
Other	LS	$ -
Utility Relocates	LS	$ 434,000
Traffic Control	LS	$ 217,000
Additional Prof. Services	LS	$ 499,000
Testing/Planning/CM	LS	$ 998,000
Construction Cost		***$ 6,486,000***
Design	LS	$ 499,000
Land Acquisition	LS	$ 350,000
TOTAL COST (2022)	**$**	**7,335,000**

Laredo Integrated Water Master Plan

Project ID: **Milmo Supply**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	17,736
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	15	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 5,660,632
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 180,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 60,000
Extra Pavement	LS	$ 335,210
Ground Restoration	LS	$ 95,774
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 8,232,000*
Other	LS	$ -
Utility Relocates	LS	$ 824,000
Traffic Control	LS	$ 412,000
Additional Prof. Services	LS	$ 947,000
Testing/Planning/CM	LS	$ 1,894,000
Construction Cost		***$ 12,309,000***
Design	LS	$ 947,000
Land Acquisition	LS	$ 663,000
TOTAL COST (2022)	**$**	**13,919,000**

Laredo Integrated Water Master Plan

Project ID: **MHOC PS**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Cost	
1st Lump Sum Cost:	**$ 1,430,747**
Description:	**Upsize Pumps**
Cost input for unique projects	
Describe first input cost:	
Change pumps P3, 6 to 1800 gpm (2.6 mgd)	
Change pumps P1, 2, 4, 5 to 9000 gpm (13	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	0	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ -
Extra Pavement	LS	$ -
Ground Restoration	LS	$ -
Upsize Pumps	LS	$ 1,430,747
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 1,860,000*
Other	LS	$ -
Utility Relocates	LS	$ 186,000
Traffic Control	LS	$ 93,000
Additional Prof. Services	LS	$ 214,000
Testing/Planning/CM	LS	$ 428,000
Construction Cost		***$ 2,781,000***
Design	LS	$ 214,000
Land Acquisition	LS	$ 150,000
TOTAL COST (2022)	$	**3,145,000**

Laredo Integrated Water Master Plan

Project ID: **JWTP**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Plant Work, Coordination, Mater	335%	Insert %
Utility Relocates	0%	Insert %
Traffic Control	0%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	15%	Insert %
Land Acquisition	0.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	30
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	315
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	1	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	none	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 5,850
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ 127,890
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	none
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 6,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ 30,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 4,000
Extra Pavement	LS	$ 6,828
Ground Restoration	LS	$ 1,951
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 238,000*
Plant Work, Coordination, M	LS	$ 798,000
Utility Relocates	LS	$ -
Traffic Control	LS	$ -
Additional Prof. Services	LS	$ 104,000
Testing/Planning/CM	LS	$ 208,000
Construction Cost		***$ 1,348,000***
Design	LS	$ 156,000
Land Acquisition	LS	$ -
TOTAL COST (2022)	**$**	**1,504,000**

Print Date 5/12/2022

Laredo Integrated Water Master Plan

Project ID: **LP20 SV**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	5,413
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	5	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 1,055,535
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 66,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 18,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 20,000
Extra Pavement	LS	$ 68,204
Ground Restoration	LS	$ 19,487
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 1,622,000*
Other	LS	$ -
Utility Relocates	LS	$ 163,000
Traffic Control	LS	$ 82,000
Additional Prof. Services	LS	$ 187,000
Testing/Planning/CM	LS	$ 374,000
Construction Cost		***$ 2,428,000***
Design	LS	$ 187,000
Land Acquisition	LS	$ 57,000
TOTAL COST (2022)	**$**	**2,672,000**

Laredo Integrated Water Master Plan

Project ID: **Airport**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	11%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)	0.50	Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	0	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ 2,000,000
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ -
Extra Pavement	LS	$ -
Ground Restoration	LS	$ -
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 2,600,000*
Other	LS	$ -
Utility Relocates	LS	$ 260,000
Traffic Control	LS	$ 130,000
Additional Prof. Services	LS	$ 299,000
Testing/Planning/CM	LS	$ 598,000
Construction Cost		***$ 3,887,000***
Design	LS	$ 299,000
Land Acquisition	LS	$ 329,000
TOTAL COST (2022)	**$**	**4,515,000**

Laredo Integrated Water Master Plan

Project ID: **NW EST**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	0%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	5%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	0%	Insert %

Manual Input Project Cost	
1st Lump Sum Cost:	$ 1,000,000
Description:	**EST Recoating**
Cost input for unique projects	
Describe first inout cost:	
Exterior coating rehab on existing EST	
2nd Lump Sum Cost:	$ -
Description:	**XXXXXXXXXXX**
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	0	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ -
Extra Pavement	LS	$ -
Ground Restoration	LS	$ -
EST Recoating	LS	$ 1,000,000
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 1,300,000*
Other	LS	$ -
Utility Relocates	LS	$ -
Traffic Control	LS	$ 65,000
Additional Prof. Services	LS	$ 69,000
Testing/Planning/CM	LS	$ 273,000
Construction Cost		***$ 1,707,000***
Design	LS	$ 137,000
Land Acquisition	LS	$ -
TOTAL COST (2022)	**$**	**1,844,000**

Laredo Integrated Water Master Plan

Project ID: **SD Rehab 1-5_B**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	1.5%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	26,842
8-inch PVC Waterline (LF)	26,379
12-inch PVC Waterline (LF)	13,267
16-inch PVC Waterline (LF)	11,803
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	66	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ 3,220,980
8-inch PVC Waterline	LF	$ 3,561,098
12-inch PVC Waterline	LF	$ 2,255,390
16-inch PVC Waterline	LF	$ 2,301,488
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 942,000
6-inch Gate Valve	EA	$ 67,500
8-inch Gate Valve	EA	$ 89,100
12-inch Gate Valve	EA	$ 63,000
16-inch Gate Valve	EA	$ 36,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 264,000
Extra Pavement	LS	$ 986,448
Ground Restoration	LS	$ 281,842
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 18,290,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,829,000
Traffic Control	LS	$ 915,000
Additional Prof. Services	LS	$ 2,104,000
Testing/Planning/CM	LS	$ 4,207,000
Construction Cost		***$ 29,881,000***
Design	LS	$ 2,299,000
Land Acquisition	LS	$ 345,000
TOTAL COST (2022)	**$**	**32,525,000**

Laredo Integrated Water Master Plan

Project ID: **SD Rehab 6-10**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	1.5%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	86,978
8-inch PVC Waterline (LF)	39,976
12-inch PVC Waterline (LF)	15,735
16-inch PVC Waterline (LF)	6,365
20-inch PVC Waterline (LF)	368
24-inch PVC Waterline (LF)	7,661
30-inch PVC Waterline (LF)	993
36-inch PVC Waterline (LF)	332
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	133	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ 10,437,360
8-inch PVC Waterline	LF	$ 5,396,760
12-inch PVC Waterline	LF	$ 2,674,950
16-inch PVC Waterline	LF	$ 1,241,175
20-inch Waterline	LF	$ 82,800
24-inch Waterline	LF	$ 2,445,089
30-inch Waterline	LF	$ 403,158
36-inch Waterline	LF	$ 173,304
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 1,794,000
6-inch Gate Valve	EA	$ 217,500
8-inch Gate Valve	EA	$ 132,000
12-inch Gate Valve	EA	$ 72,000
16-inch Gate Valve	EA	$ 24,000
20-inch Gate Valve	EA	$ 8,000
24-inch Butterfly Valve	EA	$ 80,000
30-inch Butterfly Valve	EA	$ 30,000
36-inch Butterfly Valve	EA	$ 35,000
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 532,000
Extra Pavement	LS	$ 2,055,162
Ground Restoration	LS	$ 587,189
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 36,948,000*
Other	LS	$ -
Utility Relocates	LS	$ 3,695,000
Traffic Control	LS	$ 1,848,000
Additional Prof. Services	LS	$ 4,250,000
Testing/Planning/CM	LS	$ 8,499,000
Construction Cost		***$ 55,240,000***
Design	LS	$ 4,250,000
Land Acquisition	LS	$ 638,000
TOTAL COST (2022)	**$**	**60,128,000**

Print Date 5/12/2022

Laredo Integrated Water Master Plan

Project ID: **SD Rehab 11-15**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	1.5%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	56,932
8-inch PVC Waterline (LF)	45,414
12-inch PVC Waterline (LF)	18,526
16-inch PVC Waterline (LF)	22,971
20-inch PVC Waterline (LF)	2,283
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	122	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ 6,831,840
8-inch PVC Waterline	LF	$ 6,130,890
12-inch PVC Waterline	LF	$ 3,149,420
16-inch PVC Waterline	LF	$ 4,479,345
20-inch Waterline	LF	$ 513,675
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 1,758,000
6-inch Gate Valve	EA	$ 142,500
8-inch Gate Valve	EA	$ 151,800
12-inch Gate Valve	EA	$ 85,500
16-inch Gate Valve	EA	$ 72,000
20-inch Gate Valve	EA	$ 16,000
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 488,000
Extra Pavement	LS	$ 1,841,188
Ground Restoration	LS	$ 526,054
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 34,043,000*
Other	LS	$ -
Utility Relocates	LS	$ 3,405,000
Traffic Control	LS	$ 1,703,000
Additional Prof. Services	LS	$ 3,916,000
Testing/Planning/CM	LS	$ 7,831,000
Construction Cost		***$ 50,898,000***
Design	LS	$ 3,916,000
Land Acquisition	LS	$ 588,000
TOTAL COST (2022)	**$**	**55,402,000**

Laredo Integrated Water Master Plan

Project ID: **SD Rehab Ongoing**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Item	Cost	Unit/Note
Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	1.5%	Insert %

Manual Input Project Costs

1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	65,864
8-inch PVC Waterline (LF)	46,049
12-inch PVC Waterline (LF)	20,265
16-inch PVC Waterline (LF)	17,647
20-inch PVC Waterline (LF)	884
24-inch PVC Waterline (LF)	2,554
30-inch PVC Waterline (LF)	331
36-inch PVC Waterline (LF)	111
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	129	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ 7,903,720
8-inch PVC Waterline	LF	$ 6,216,615
12-inch PVC Waterline	LF	$ 3,445,050
16-inch PVC Waterline	LF	$ 3,441,165
20-inch Waterline	LF	$ 198,825
24-inch Waterline	LF	$ 815,030
30-inch Waterline	LF	$ 134,386
36-inch Waterline	LF	$ 57,768
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 1,812,000
6-inch Gate Valve	EA	$ 165,000
8-inch Gate Valve	EA	$ 155,100
12-inch Gate Valve	EA	$ 94,500
16-inch Gate Valve	EA	$ 54,000
20-inch Gate Valve	EA	$ 8,000
24-inch Butterfly Valve	EA	$ 40,000
30-inch Butterfly Valve	EA	$ 30,000
36-inch Butterfly Valve	EA	$ 35,000
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 516,000
Extra Pavement	LS	$ 1,956,415
Ground Restoration	LS	$ 558,976
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 35,929,000*
Other	LS	$ -
Utility Relocates	LS	$ 3,593,000
Traffic Control	LS	$ 1,797,000
Additional Prof. Services	LS	$ 4,132,000
Testing/Planning/CM	LS	$ 8,264,000
Construction Cost		***$ 53,715,000***
Design	LS	$ 4,132,000
Land Acquisition	LS	$ 620,000
TOTAL COST (2022)	**$**	**58,467,000**

Laredo Integrated Water Master Plan

Project ID: **Bianka**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	696
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	1	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 135,720
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 12,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 6,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 4,000
Extra Pavement	LS	$ 8,770
Ground Restoration	LS	$ 2,506
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 220,000*
Other	LS	$ -
Utility Relocates	LS	$ 22,000
Traffic Control	LS	$ 11,000
Additional Prof. Services	LS	$ 26,000
Testing/Planning/CM	LS	$ 51,000
Construction Cost		***$ 330,000***
Design	LS	$ 26,000
Land Acquisition	LS	$ 8,000
TOTAL COST (2022)	**$**	**364,000**

Laredo Integrated Water Master Plan

Project ID: **Cielito Lindo**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs		Storage Tank Capacity (MG)	Cost EST	Cost GST
1st Lump Sum Cost:	$ -			
Description:	XXXXXXXXXXX	0.25	$ 1,500,000	$ 635,000
Cost input for unique projects		0.50	$ 2,000,000	$ 750,000
Describe first input cost:		0.75	$ 2,250,000	$ 1,100,000
		1.00	$ 2,500,000	$ 1,250,000
		1.25	$ 2,750,000	$ 1,500,000
		1.50	$ 3,000,000	$ 1,650,000
2nd Lump Sum Cost:	$ -	1.75	$ 3,250,000	$ 1,850,000
Description:	XXXXXXXXXXX	2.00	$ 3,500,000	$ 2,000,000
Cost input for unique projects		3.00	$ -	$ 3,250,000
Describe second input cost:		4.00	$ -	$ 5,000,000
		5.00	$ -	$ 6,500,000
		-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	8,894
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 1,734,330
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 108,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 30,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 112,064
Ground Restoration	LS	$ 32,018
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 2,663,000*
Other	LS	$ -
Utility Relocates	LS	$ 267,000
Traffic Control	LS	$ 134,000
Additional Prof. Services	LS	$ 307,000
Testing/Planning/CM	LS	$ 613,000
Construction Cost		***$ 3,984,000***
Design	LS	$ 307,000
Land Acquisition	LS	$ 92,000
TOTAL COST (2022)	**$**	**4,383,000**

Laredo Integrated Water Master Plan

Project ID: **CR-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	2,796
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	6,595
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ 475,320
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ 3,442,590
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 36,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ 13,500
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ 105,000
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 180,649
Ground Restoration	LS	$ 51,614
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 5,638,000*
Other	LS	$ -
Utility Relocates	LS	$ 564,000
Traffic Control	LS	$ 282,000
Additional Prof. Services	LS	$ 649,000
Testing/Planning/CM	LS	$ 1,297,000
Construction Cost		***$ 8,430,000***
Design	LS	$ 649,000
Land Acquisition	LS	$ 454,000
TOTAL COST (2022)	**$**	**9,533,000**

Laredo Integrated Water Master Plan

Project ID: **CV Pipes**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	9,567
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	7,073
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	14	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ 1,626,390
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ 3,692,106
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 120,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ 45,000
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ 105,000
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 56,000
Extra Pavement	LS	$ 276,504
Ground Restoration	LS	$ 79,001
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 7,801,000*
Other	LS	$ -
Utility Relocates	LS	$ 781,000
Traffic Control	LS	$ 391,000
Additional Prof. Services	LS	$ 898,000
Testing/Planning/CM	LS	$ 1,795,000
Construction Cost		***$ 11,666,000***
Design	LS	$ 898,000
Land Acquisition	LS	$ 629,000
TOTAL COST (2022)	**$**	**13,193,000**

Laredo Integrated Water Master Plan

Project ID: **Del Mar**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	5,667
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	5	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 1,808,683
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 60,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 20,000
Extra Pavement	LS	$ 107,106
Ground Restoration	LS	$ 30,602
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 2,635,000*
Other	LS	$ -
Utility Relocates	LS	$ 264,000
Traffic Control	LS	$ 132,000
Additional Prof. Services	LS	$ 304,000
Testing/Planning/CM	LS	$ 607,000
Construction Cost		***$ 3,942,000***
Design	LS	$ 304,000
Land Acquisition	LS	$ 213,000
TOTAL COST (2022)	**$**	**4,459,000**

Laredo Integrated Water Master Plan

Project ID: **Ejido**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	6,289
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	6	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ 1,069,130
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 78,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ 31,500
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 24,000
Extra Pavement	LS	$ 79,241
Ground Restoration	LS	$ 22,640
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 1,696,000*
Other	LS	$ -
Utility Relocates	LS	$ 170,000
Traffic Control	LS	$ 85,000
Additional Prof. Services	LS	$ 196,000
Testing/Planning/CM	LS	$ 391,000
Construction Cost		***$ 2,538,000***
Design	LS	$ 196,000
Land Acquisition	LS	$ 59,000
TOTAL COST (2022)	**$**	**2,793,000**

Laredo Integrated Water Master Plan

Project ID: **FUT-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	5,056
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	5	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 985,920
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 66,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 18,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 20,000
Extra Pavement	LS	$ 63,706
Ground Restoration	LS	$ 18,202
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 1,524,000*
Other	LS	$ -
Utility Relocates	LS	$ 153,000
Traffic Control	LS	$ 77,000
Additional Prof. Services	LS	$ 176,000
Testing/Planning/CM	LS	$ 351,000
Construction Cost		***$ 2,281,000***
Design	LS	$ 176,000
Land Acquisition	LS	$ 53,000
TOTAL COST (2022)	**$**	**2,510,000**

Laredo Integrated Water Master Plan

Project ID: **FUT-2**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	5,365
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	5	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 1,046,175
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 66,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 18,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 20,000
Extra Pavement	LS	$ 67,599
Ground Restoration	LS	$ 19,314
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 1,609,000*
Other	LS	$ -
Utility Relocates	LS	$ 161,000
Traffic Control	LS	$ 81,000
Additional Prof. Services	LS	$ 186,000
Testing/Planning/CM	LS	$ 371,000
Construction Cost		***$ 2,408,000***
Design	LS	$ 186,000
Land Acquisition	LS	$ 56,000
TOTAL COST (2022)	**$**	**2,650,000**

Laredo Integrated Water Master Plan

Project ID: **HU Dist**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	5,671
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	6,977
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	11	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 1,105,845
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 2,226,783
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 72,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 18,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 80,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 44,000
Extra Pavement	LS	$ 203,320
Ground Restoration	LS	$ 58,091
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 4,951,000*
Other	LS	$ -
Utility Relocates	LS	$ 496,000
Traffic Control	LS	$ 248,000
Additional Prof. Services	LS	$ 570,000
Testing/Planning/CM	LS	$ 1,139,000
Construction Cost		***$ 7,404,000***
Design	LS	$ 570,000
Land Acquisition	LS	$ 399,000
TOTAL COST (2022)	**$**	**8,373,000**

Print Date 5/12/2022

Laredo Integrated Water Master Plan

Project ID: **HU Supply**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	7,449
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	7	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 2,377,427
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 80,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 28,000
Extra Pavement	LS	$ 140,786
Ground Restoration	LS	$ 40,225
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 3,467,000*
Other	LS	$ -
Utility Relocates	LS	$ 347,000
Traffic Control	LS	$ 174,000
Additional Prof. Services	LS	$ 399,000
Testing/Planning/CM	LS	$ 798,000
Construction Cost		***$ 5,185,000***
Design	LS	$ 399,000
Land Acquisition	LS	$ 280,000
TOTAL COST (2022)	**$**	**5,864,000**

Laredo Integrated Water Master Plan

Project ID: **Heights**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	668
12-inch PVC Waterline (LF)	408
16-inch PVC Waterline (LF)	828
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	23
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New	3	Insert number of new PRV's
Fittings (ton)	2	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ 90,180
12-inch PVC Waterline	LF	$ 69,360
16-inch PVC Waterline	LF	$ 161,460
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 7,341
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 24,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ 3,300
12-inch Gate Valve	EA	$ 4,500
16-inch Gate Valve	EA	$ 6,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ 1,500,000
Fittings	TON	$ 8,000
Extra Pavement	LS	$ 24,425
Ground Restoration	LS	$ 6,979
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 2,504,000*
Other	LS	$ -
Utility Relocates	LS	$ 251,000
Traffic Control	LS	$ 126,000
Additional Prof. Services	LS	$ 289,000
Testing/Planning/CM	LS	$ 577,000
Construction Cost		***$ 3,747,000***
Design	LS	$ 289,000
Land Acquisition	LS	$ 202,000
TOTAL COST (2022)	**$**	**4,238,000**

Laredo Integrated Water Master Plan

Project ID: **Hwy359**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Cost	
1st Lump Sum Cost:	$ 45,097
Description:	**Pump Installation**
Cost input for unique projects	
Describe first input cost:	
1,200 gpm	
2nd Lump Sum Cost:	$ -
Description:	**XXXXXXXXXXX**
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	550
12-inch PVC Waterline (LF)	2,204
16-inch PVC Waterline (LF)	3,816
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	6	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ 74,250
12-inch PVC Waterline	LF	$ 374,680
16-inch PVC Waterline	LF	$ 744,120
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 84,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ 3,300
12-inch Gate Valve	EA	$ 13,500
16-inch Gate Valve	EA	$ 12,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 24,000
Extra Pavement	LS	$ 82,782
Ground Restoration	LS	$ 23,652
Pump Installation	LS	$ 45,097
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 1,926,000*
Other	LS	$ -
Utility Relocates	LS	$ 193,000
Traffic Control	LS	$ 97,000
Additional Prof. Services	LS	$ 222,000
Testing/Planning/CM	LS	$ 444,000
Construction Cost		***$ 2,882,000***
Design	LS	$ 222,000
Land Acquisition	LS	$ 67,000
TOTAL COST (2022)	**$**	**3,171,000**

Laredo Integrated Water Master Plan

Project ID: **I35-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank: Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	4,122
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	4	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 803,790
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 54,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 18,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 16,000
Extra Pavement	LS	$ 51,937
Ground Restoration	LS	$ 14,839
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 1,247,000*
Other	LS	$ -
Utility Relocates	LS	$ 125,000
Traffic Control	LS	$ 63,000
Additional Prof. Services	LS	$ 144,000
Testing/Planning/CM	LS	$ 287,000
Construction Cost		***$ 1,866,000***
Design	LS	$ 144,000
Land Acquisition	LS	$ 44,000
TOTAL COST (2022)	**$**	**2,054,000**

Laredo Integrated Water Master Plan

Project ID: I35-2

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	9,519
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 1,856,205
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 120,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 30,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 119,939
Ground Restoration	LS	$ 34,268
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 2,851,000*
Other	LS	$ -
Utility Relocates	LS	$ 286,000
Traffic Control	LS	$ 143,000
Additional Prof. Services	LS	$ 328,000
Testing/Planning/CM	LS	$ 656,000
Construction Cost		***$ 4,264,000***
Design	LS	$ 328,000
Land Acquisition	LS	$ 99,000
TOTAL COST (2022)	**$**	**4,691,000**

Laredo Integrated Water Master Plan

Project ID: **I35-3**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs

1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	12,778
16-inch PVC Waterline (LF)	1,121
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	17,350
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	27	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ 2,172,260
16-inch PVC Waterline	LF	$ 218,595
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 5,537,436
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 168,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ 58,500
16-inch Gate Valve	EA	$ 6,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 160,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 108,000
Extra Pavement	LS	$ 503,042
Ground Restoration	LS	$ 143,726
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 11,799,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,180,000
Traffic Control	LS	$ 590,000
Additional Prof. Services	LS	$ 1,357,000
Testing/Planning/CM	LS	$ 2,714,000
Construction Cost		***$ 17,640,000***
Design	LS	$ 1,357,000
Land Acquisition	LS	$ 950,000
TOTAL COST (2022)	**$**	**19,947,000**

Print Date 5/12/2022

Laredo Integrated Water Master Plan

Project ID: **JWTP-QL**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	15%	Insert %
Traffic Control	10%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	0.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	8,200
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	7	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ 3,329,200
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ 90,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 28,000
Extra Pavement	LS	$ 167,895
Ground Restoration	LS	$ 47,970
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 4,762,000*
Other	LS	$ -
Utility Relocates	LS	$ 715,000
Traffic Control	LS	$ 477,000
Additional Prof. Services	LS	$ 596,000
Testing/Planning/CM	LS	$ 1,191,000
Construction Cost		***$ 7,741,000***
Design	LS	$ 596,000
Land Acquisition	LS	$ -
TOTAL COST (2022)	**$**	**8,337,000**

Laredo Integrated Water Master Plan

Project ID: **JWTP-LyonPS_RANGE**

** Upsized to 48" after existing 36" Line Failure

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	5.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	80%
% Pipeline Trenchless	20%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	0	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ -
Extra Pavement	LS	$ -
Ground Restoration	LS	$ -
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		$ -
Other	LS	$ -
Utility Relocates	LS	$ -
Traffic Control	LS	$ -
Additional Prof. Services	LS	$ -
Testing/Planning/CM	LS	$ -
Construction Cost		***$ -***
Design	LS	$ -
Land Acquisition	LS	$ -
TOTAL COST (2022)	**$**	**-**

Laredo Integrated Water Master Plan

Project ID: **36" Slipline**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 76	$ 135	$ 197	$ 250	$ 250	
Cost Per LF (Trenchless)	$ 76	$ 135	$ 197	$ 250	$ 250	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 300	$ 400	$ 600	$ 800	$ 1,000	$ 1,209
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000
Slipline		$ 500				

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	0%	Insert %
Traffic Control	10%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	0.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,250,000	$ 635,000
0.50	$ 1,600,000	$ 750,000
0.75	$ 1,800,000	$ 1,100,000
1.00	$ 2,100,000	$ 1,250,000
1.25	$ 2,350,000	$ 1,500,000
1.50	$ 2,700,000	$ 1,650,000
1.75	$ 3,000,000	$ 1,850,000
2.00	$ 3,300,000	$ 2,000,000
-	$ -	$ -
-	$ -	$ -
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	0%
% Pipeline Trenchless	100%
% Pipeline in ROW	100%
% Pipeline in Pavement	0%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	13,250
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	12	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ 6,625,000
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ 150,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 48,000
Extra Pavement	LS	$ -
Ground Restoration	LS	$ -
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 8,870,000*
Other	LS	$ 33,000
Utility Relocates	LS	$ -
Traffic Control	LS	$ 887,000
Additional Prof. Services	LS	$ 979,000
Testing/Planning/CM	LS	$ 1,958,000
Construction Cost		***$ 12,727,000***
Design	LS	$ 1,273,000
Land Acquisition	LS	$ -
TOTAL COST (2022)	**$**	**14,000,000**

Laredo Integrated Water Master Plan

Project ID: **JWTP-LyonPS**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	X
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	0	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ -
Extra Pavement	LS	$ -
Ground Restoration	LS	$ -
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		$ -
Other	LS	$ -
Utility Relocates	LS	$ -
Traffic Control	LS	$ -
Additional Prof. Services	LS	$ -
Testing/Planning/CM	LS	$ -
Construction Cost		***$ -***
Design	LS	$ -
Land Acquisition	LS	$ -
TOTAL COST (2022)	$	-

Laredo Integrated Water Master Plan

Project ID: **Lomas Del Sur**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	9,683
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	260
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	9	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 1,888,185
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 82,982
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 120,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 30,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 36,000
Extra Pavement	LS	$ 126,920
Ground Restoration	LS	$ 36,263
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 3,043,000*
Other	LS	$ -
Utility Relocates	LS	$ 305,000
Traffic Control	LS	$ 153,000
Additional Prof. Services	LS	$ 351,000
Testing/Planning/CM	LS	$ 701,000
Construction Cost		***$ 4,553,000***
Design	LS	$ 351,000
Land Acquisition	LS	$ 246,000
TOTAL COST (2022)	**$**	**5,150,000**

Laredo Integrated Water Master Plan

Project ID: **LP20 Milmo**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	1,844
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	2	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 588,532
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 8,000
Extra Pavement	LS	$ 34,852
Ground Restoration	LS	$ 9,958
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 860,000*
Other	LS	$ -
Utility Relocates	LS	$ 86,000
Traffic Control	LS	$ 43,000
Additional Prof. Services	LS	$ 99,000
Testing/Planning/CM	LS	$ 198,000
Construction Cost		***$ 1,286,000***
Design	LS	$ 99,000
Land Acquisition	LS	$ 70,000
TOTAL COST (2022)	**$**	**1,455,000**

Laredo Integrated Water Master Plan

Project ID: **SD Rehab 1-5_A**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	1.5%	Insert %

Manual Input Project Costs

1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	26,842
8-inch PVC Waterline (LF)	26,379
12-inch PVC Waterline (LF)	13,267
16-inch PVC Waterline (LF)	11,803
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	66	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ 3,220,980
8-inch PVC Waterline	LF	$ 3,561,098
12-inch PVC Waterline	LF	$ 2,255,390
16-inch PVC Waterline	LF	$ 2,301,488
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 942,000
6-inch Gate Valve	EA	$ 67,500
8-inch Gate Valve	EA	$ 89,100
12-inch Gate Valve	EA	$ 63,000
16-inch Gate Valve	EA	$ 36,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 264,000
Extra Pavement	LS	$ 986,448
Ground Restoration	LS	$ 281,842
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 18,290,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,829,000
Traffic Control	LS	$ 915,000
Additional Prof. Services	LS	$ 2,104,000
Testing/Planning/CM	LS	$ 4,207,000
Construction Cost		***$ 27,345,000***
Design	LS	$ 2,104,000
Land Acquisition	LS	$ 316,000
TOTAL COST (2022)	**$**	**29,765,000**

Print Date 5/12/2022

Laredo Integrated Water Master Plan

Project ID: **LP20-3**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	7,775
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	7	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ 1,321,750
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 96,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ 36,000
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 28,000
Extra Pavement	LS	$ 97,965
Ground Restoration	LS	$ 27,990
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 2,091,000*
Other	LS	$ -
Utility Relocates	LS	$ 210,000
Traffic Control	LS	$ 105,000
Additional Prof. Services	LS	$ 241,000
Testing/Planning/CM	LS	$ 482,000
Construction Cost		***$ 3,129,000***
Design	LS	$ 241,000
Land Acquisition	LS	$ 73,000
TOTAL COST (2022)	**$**	**3,443,000**

Laredo Integrated Water Master Plan

Project ID: **LP20-4**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	10,303
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	9	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 2,009,085
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 126,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 36,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 36,000
Extra Pavement	LS	$ 129,818
Ground Restoration	LS	$ 37,091
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 3,087,000*
Other	LS	$ -
Utility Relocates	LS	$ 309,000
Traffic Control	LS	$ 155,000
Additional Prof. Services	LS	$ 356,000
Testing/Planning/CM	LS	$ 711,000
Construction Cost		***$ 4,618,000***
Design	LS	$ 356,000
Land Acquisition	LS	$ 107,000
TOTAL COST (2022)	**$**	**5,081,000**

Laredo Integrated Water Master Plan

Project ID: **LPM**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs

1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	6,793
30-inch PVC Waterline (LF)	2,307
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 2,168,058
30-inch Waterline	LF	$ 936,642
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 80,000
30-inch Butterfly Valve	EA	$ 30,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 175,624
Ground Restoration	LS	$ 50,178
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 4,515,000*
Other	LS	$ -
Utility Relocates	LS	$ 452,000
Traffic Control	LS	$ 226,000
Additional Prof. Services	LS	$ 520,000
Testing/Planning/CM	LS	$ 1,039,000
Construction Cost		***$ 6,752,000***
Design	LS	$ 520,000
Land Acquisition	LS	$ 364,000
TOTAL COST (2022)	**$**	**7,636,000**

Print Date 5/12/2022

Laredo Integrated Water Master Plan

Project ID: **LPS**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	738
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	1	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ 299,628
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ 30,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 4,000
Extra Pavement	LS	$ 15,111
Ground Restoration	LS	$ 4,317
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 459,000*
Other	LS	$ -
Utility Relocates	LS	$ 46,000
Traffic Control	LS	$ 23,000
Additional Prof. Services	LS	$ 53,000
Testing/Planning/CM	LS	$ 106,000
Construction Cost		***$ 687,000***
Design	LS	$ 53,000
Land Acquisition	LS	$ 37,000
TOTAL COST (2022)	**$**	**777,000**

Print Date 5/12/2022

Laredo Integrated Water Master Plan

Project ID: **Lyon to CB supply**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	35
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	16,151
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	14	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 11,171
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ 8,430,822
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ 210,000
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 56,000
Extra Pavement	LS	$ 356,791
Ground Restoration	LS	$ 101,940
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 11,943,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,195,000
Traffic Control	LS	$ 598,000
Additional Prof. Services	LS	$ 1,374,000
Testing/Planning/CM	LS	$ 2,748,000
Construction Cost		***$ 17,858,000***
Design	LS	$ 1,374,000
Land Acquisition	LS	$ 962,000
TOTAL COST (2022)	**$**	**20,194,000**

Laredo Integrated Water Master Plan

Project ID: **MHOC Cap**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Cost

1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	8,070
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	7	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 2,575,626
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 80,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 28,000
Extra Pavement	LS	$ 152,523
Ground Restoration	LS	$ 43,578
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 3,744,000*
Other	LS	$ -
Utility Relocates	LS	$ 375,000
Traffic Control	LS	$ 188,000
Additional Prof. Services	LS	$ 431,000
Testing/Planning/CM	LS	$ 862,000
Construction Cost		***$ 5,600,000***
Design	LS	$ 431,000
Land Acquisition	LS	$ 302,000
TOTAL COST (2022)	**$**	**6,333,000**

Laredo Integrated Water Master Plan

Project ID: **MHOC Supply**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs

1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	3,619
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	4	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 1,155,042
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 40,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 16,000
Extra Pavement	LS	$ 68,399
Ground Restoration	LS	$ 19,543
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 1,689,000*
Other	LS	$ -
Utility Relocates	LS	$ 169,000
Traffic Control	LS	$ 85,000
Additional Prof. Services	LS	$ 195,000
Testing/Planning/CM	LS	$ 389,000
Construction Cost		***$ 2,527,000***
Design	LS	$ 195,000
Land Acquisition	LS	$ 137,000
TOTAL COST (2022)	**$**	**2,859,000**

Laredo Integrated Water Master Plan

Project ID: **MR-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	17,693
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	15	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 3,450,135
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 216,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 54,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 60,000
Extra Pavement	LS	$ 222,932
Ground Restoration	LS	$ 63,695
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 5,287,000*
Other	LS	$ -
Utility Relocates	LS	$ 529,000
Traffic Control	LS	$ 265,000
Additional Prof. Services	LS	$ 609,000
Testing/Planning/CM	LS	$ 1,217,000
Construction Cost		***$ 7,907,000***
Design	LS	$ 609,000
Land Acquisition	LS	$ 183,000
TOTAL COST (2022)	**$**	**8,699,000**

Laredo Integrated Water Master Plan

Project ID: **MR-2**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	134
12-inch PVC Waterline (LF)	8,666
16-inch PVC Waterline (LF)	91
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ 18,090
12-inch PVC Waterline	LF	$ 1,473,220
16-inch PVC Waterline	LF	$ 17,745
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 108,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ 3,300
12-inch Gate Valve	EA	$ 40,500
16-inch Gate Valve	EA	$ 6,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 112,027
Ground Restoration	LS	$ 32,008
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 2,396,000*
Other	LS	$ -
Utility Relocates	LS	$ 240,000
Traffic Control	LS	$ 120,000
Additional Prof. Services	LS	$ 276,000
Testing/Planning/CM	LS	$ 552,000
Construction Cost		***$ 3,584,000***
Design	LS	$ 276,000
Land Acquisition	LS	$ 83,000
TOTAL COST (2022)	**$**	**3,943,000**

Laredo Integrated Water Master Plan

Project ID: **NL-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	3,629
16-inch PVC Waterline (LF)	42,987
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	11,339
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	49	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ 616,930
16-inch PVC Waterline	LF	$ 8,382,465
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 3,618,962
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 564,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ 18,000
16-inch Gate Valve	EA	$ 132,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 120,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 196,000
Extra Pavement	LS	$ 801,669
Ground Restoration	LS	$ 229,048
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 19,083,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,909,000
Traffic Control	LS	$ 955,000
Additional Prof. Services	LS	$ 2,195,000
Testing/Planning/CM	LS	$ 4,390,000
Construction Cost		***$ 28,532,000***
Design	LS	$ 2,195,000
Land Acquisition	LS	$ 1,537,000
TOTAL COST (2022)	$	**32,264,000**

Laredo Integrated Water Master Plan

Project ID: **NW-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	44,014
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	37	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 8,582,730
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 534,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 138,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 148,000
Extra Pavement	LS	$ 554,576
Ground Restoration	LS	$ 158,450
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 13,151,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,316,000
Traffic Control	LS	$ 658,000
Additional Prof. Services	LS	$ 1,513,000
Testing/Planning/CM	LS	$ 3,025,000
Construction Cost		***$ 19,663,000***
Design	LS	$ 1,513,000
Land Acquisition	LS	$ 454,000
TOTAL COST (2022)	$	**21,630,000**

Laredo Integrated Water Master Plan

Project ID: **OL-1A**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	11.0%	Insert %

Manual Input Project Costs

1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank

Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	28,406

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	24	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ 23,094,078
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ 736,000
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 96,000
Extra Pavement	LS	$ 760,571
Ground Restoration	LS	$ 217,306
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 32,376,000*
Other	LS	$ -
Utility Relocates	LS	$ 3,238,000
Traffic Control	LS	$ 1,619,000
Additional Prof. Services	LS	$ 3,724,000
Testing/Planning/CM	LS	$ 7,447,000
Construction Cost		***$ 48,404,000***
Design	LS	$ 3,724,000
Land Acquisition	LS	$ 4,096,000
TOTAL COST (2022)	**$**	**56,224,000**

Laredo Integrated Water Master Plan

Project ID: **OL-1B**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	11.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	159
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	3,852

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	4	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 31,005
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ 3,131,676
Fire Hydrant	EA	$ 6,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 6,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ 92,000
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 16,000
Extra Pavement	LS	$ 105,141
Ground Restoration	LS	$ 30,040
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 4,444,000*
Other	LS	$ -
Utility Relocates	LS	$ 445,000
Traffic Control	LS	$ 223,000
Additional Prof. Services	LS	$ 512,000
Testing/Planning/CM	LS	$ 1,023,000
Construction Cost		***$ 6,647,000***
Design	LS	$ 512,000
Land Acquisition	LS	$ 563,000
TOTAL COST (2022)	**$**	**7,722,000**

Laredo Integrated Water Master Plan

Project ID: **OL-1C**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	11.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	43
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	8,483

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 13,724
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ 6,896,679
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ 276,000
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 227,945
Ground Restoration	LS	$ 65,127
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 9,791,000*
Other	LS	$ -
Utility Relocates	LS	$ 980,000
Traffic Control	LS	$ 490,000
Additional Prof. Services	LS	$ 1,127,000
Testing/Planning/CM	LS	$ 2,253,000
Construction Cost		***$ 14,641,000***
Design	LS	$ 1,127,000
Land Acquisition	LS	$ 1,239,000
TOTAL COST (2022)	**$**	**17,007,000**

Laredo Integrated Water Master Plan

Project ID: **OL-2**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	11.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	22,267
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	19	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ 16,243,777
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ 450,000
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 76,000
Extra Pavement	LS	$ 561,128
Ground Restoration	LS	$ 160,322
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 22,739,000*
Other	LS	$ -
Utility Relocates	LS	$ 2,274,000
Traffic Control	LS	$ 1,137,000
Additional Prof. Services	LS	$ 2,615,000
Testing/Planning/CM	LS	$ 5,230,000
Construction Cost		***$ 33,995,000***
Design	LS	$ 2,615,000
Land Acquisition	LS	$ 2,877,000
TOTAL COST (2022)	$	**39,487,000**

Laredo Integrated Water Master Plan

Project ID: **OL-3A**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	11.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	366
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	11,272
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	10	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ 148,596
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ 7,332,436
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ 30,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ 220,000
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 40,000
Extra Pavement	LS	$ 273,795
Ground Restoration	LS	$ 78,227
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 10,560,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,056,000
Traffic Control	LS	$ 528,000
Additional Prof. Services	LS	$ 1,215,000
Testing/Planning/CM	LS	$ 2,429,000
Construction Cost		***$ 15,788,000***
Design	LS	$ 1,215,000
Land Acquisition	LS	$ 1,336,000
TOTAL COST (2022)	**$**	**18,339,000**

Laredo Integrated Water Master Plan

Project ID: **OL-3B**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	11.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	84
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	8,623
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 26,809
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ 6,290,479
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ 225,000
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 218,887
Ground Restoration	LS	$ 62,539
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 8,939,000*
Other	LS	$ -
Utility Relocates	LS	$ 894,000
Traffic Control	LS	$ 447,000
Additional Prof. Services	LS	$ 1,028,000
Testing/Planning/CM	LS	$ 2,056,000
Construction Cost		***$ 13,364,000***
Design	LS	$ 1,028,000
Land Acquisition	LS	$ 1,131,000
TOTAL COST (2022)	**$**	**15,523,000**

Laredo Integrated Water Master Plan

Project ID: **OL-4**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	11.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	16
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	10,807
42-inch PVC Waterline (LF)	11,770
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	19	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 5,107
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ 5,641,254
42-inch Waterline	LF	$ 7,656,385
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 20,000
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ 140,000
42-inch Butterfly Valve	EA	$ 220,000
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 76,000
Extra Pavement	LS	$ 516,663
Ground Restoration	LS	$ 147,618
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 18,750,000*
Other	LS	$ -
Utility Relocates	LS	$ 1,875,000
Traffic Control	LS	$ 938,000
Additional Prof. Services	LS	$ 2,157,000
Testing/Planning/CM	LS	$ 4,313,000
Construction Cost		***$ 28,033,000***
Design	LS	$ 2,157,000
Land Acquisition	LS	$ 2,372,000
TOTAL COST (2022)	**$**	**32,562,000**

Laredo Integrated Water Master Plan

Project ID: **OL-5**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	15,324
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	13	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ 6,221,544
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ 180,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 52,000
Extra Pavement	LS	$ 313,759
Ground Restoration	LS	$ 89,645
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 8,915,000*
Other	LS	$ -
Utility Relocates	LS	$ 892,000
Traffic Control	LS	$ 446,000
Additional Prof. Services	LS	$ 1,026,000
Testing/Planning/CM	LS	$ 2,051,000
Construction Cost		***$ 13,330,000***
Design	LS	$ 1,026,000
Land Acquisition	LS	$ 718,000
TOTAL COST (2022)	**$**	**15,074,000**

Laredo Integrated Water Master Plan

Project ID: **SINE**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Item	Value	
Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	1,721
16-inch PVC Waterline (LF)	6,824
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	8	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ 292,570
16-inch PVC Waterline	LF	$ 1,330,680
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 108,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ 9,000
16-inch Gate Valve	EA	$ 24,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 32,000
Extra Pavement	LS	$ 107,667
Ground Restoration	LS	$ 30,762
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 2,516,000*
Other	LS	$ -
Utility Relocates	LS	$ 252,000
Traffic Control	LS	$ 126,000
Additional Prof. Services	LS	$ 290,000
Testing/Planning/CM	LS	$ 579,000
Construction Cost		***$ 3,763,000***
Design	LS	$ 290,000
Land Acquisition	LS	$ 87,000
TOTAL COST (2022)	**$**	**4,140,000**

Laredo Integrated Water Master Plan

Project ID: **SL-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	6,080
30-inch PVC Waterline (LF)	9,197
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	13	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 1,940,496
30-inch Waterline	LF	$ 3,733,982
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ -
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 60,000
30-inch Butterfly Valve	EA	$ 120,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 52,000
Extra Pavement	LS	$ 303,221
Ground Restoration	LS	$ 86,634
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 8,186,000*
Other	LS	$ -
Utility Relocates	LS	$ 819,000
Traffic Control	LS	$ 410,000
Additional Prof. Services	LS	$ 942,000
Testing/Planning/CM	LS	$ 1,883,000
Construction Cost		***$ 12,240,000***
Design	LS	$ 942,000
Land Acquisition	LS	$ 660,000
TOTAL COST (2022)	**$**	**13,842,000**

Laredo Integrated Water Master Plan

Project ID: **SL-2A**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	6,863
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	6	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 1,338,285
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 84,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 24,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 24,000
Extra Pavement	LS	$ 86,474
Ground Restoration	LS	$ 24,707
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 2,056,000*
Other	LS	$ -
Utility Relocates	LS	$ 206,000
Traffic Control	LS	$ 103,000
Additional Prof. Services	LS	$ 237,000
Testing/Planning/CM	LS	$ 473,000
Construction Cost		***$ 3,075,000***
Design	LS	$ 237,000
Land Acquisition	LS	$ 71,000
TOTAL COST (2022)	**$**	**3,383,000**

Laredo Integrated Water Master Plan

Project ID: **SL-2B**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank		
Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	5,245
20-inch PVC Waterline (LF)	4,542
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	9	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 1,022,775
20-inch Waterline	LF	$ 1,021,950
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 120,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 18,000
20-inch Gate Valve	EA	$ 24,000
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 36,000
Extra Pavement	LS	$ 123,316
Ground Restoration	LS	$ 35,233
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 3,122,000*
Other	LS	$ -
Utility Relocates	LS	$ 313,000
Traffic Control	LS	$ 157,000
Additional Prof. Services	LS	$ 360,000
Testing/Planning/CM	LS	$ 719,000
Construction Cost		***$ 4,671,000***
Design	LS	$ 360,000
Land Acquisition	LS	$ 108,000
TOTAL COST (2022)	**$**	**5,139,000**

Laredo Integrated Water Master Plan

Project ID: **SX-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	4,398
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	4	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 857,610
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 54,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 18,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 16,000
Extra Pavement	LS	$ 55,415
Ground Restoration	LS	$ 15,833
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 1,322,000*
Other	LS	$ -
Utility Relocates	LS	$ 133,000
Traffic Control	LS	$ 67,000
Additional Prof. Services	LS	$ 153,000
Testing/Planning/CM	LS	$ 305,000
Construction Cost		***$ 1,980,000***
Design	LS	$ 153,000
Land Acquisition	LS	$ 46,000
TOTAL COST (2022)	**$**	**2,179,000**

Laredo Integrated Water Master Plan

Project ID: **US 59**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	5,518
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	5	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ 1,076,010
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 72,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ 18,000
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 20,000
Extra Pavement	LS	$ 69,527
Ground Restoration	LS	$ 19,865
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 1,659,000*
Other	LS	$ -
Utility Relocates	LS	$ 166,000
Traffic Control	LS	$ 83,000
Additional Prof. Services	LS	$ 191,000
Testing/Planning/CM	LS	$ 382,000
Construction Cost		***$ 2,481,000***
Design	LS	$ 191,000
Land Acquisition	LS	$ 58,000
TOTAL COST (2022)	**$**	**2,730,000**

Laredo Integrated Water Master Plan

Project ID: **UT-1**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	7.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities

% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	2,391
12-inch PVC Waterline (LF)	0
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	5,901
30-inch PVC Waterline (LF)	5,088
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity

EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	12	1 Ton per 1,200 LF waterline
Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

Gate Valve Costs	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
Butterfly Valve Costs	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ 322,785
12-inch PVC Waterline	LF	$ -
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ 1,883,366
30-inch Waterline	LF	$ 2,065,728
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 30,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ 9,900
12-inch Gate Valve	EA	$ -
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ 60,000
30-inch Butterfly Valve	EA	$ 60,000
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 48,000
Extra Pavement	LS	$ 245,832
Ground Restoration	LS	$ 70,238
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency		*30%*
Sub-total		*$ 6,235,000*
Other	LS	$ -
Utility Relocates	LS	$ 624,000
Traffic Control	LS	$ 312,000
Additional Prof. Services	LS	$ 718,000
Testing/Planning/CM	LS	$ 1,435,000
Construction Cost		***$ 9,324,000***
Design	LS	$ 718,000
Land Acquisition	LS	$ 502,000
TOTAL COST (2022)	**$**	**10,544,000**

Laredo Integrated Water Master Plan

Project ID: **Wormser**

PRICING

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

Cost Well (1,000 gpm)	$ 1,500,000	
Cost Well (_____ gpm)	$ -	
Cost PRV Replace Ex. (ea)	$ 50,000	
Cost PRV New (ea)	$ 500,000	
Cost Fittings (per ton)	$ 4,000	
Extra Pavement	$ 7	per SF
Ground Restoration	$ 2	per SF
Other	0%	Insert %
Utility Relocates	10%	Insert %
Traffic Control	5%	Insert %
Additional Prof. Services	10%	Insert % (Survey, Geotech, SUE, Environmental, etc.)
Testing/Planning/CM	20%	Insert % (Testing, Planning, Const. Management)
Design	10%	Insert %
Land Acquisition	3.0%	Insert %

Manual Input Project Costs	
1st Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe first input cost:	
2nd Lump Sum Cost:	$ -
Description:	XXXXXXXXXXX
Cost input for unique projects	
Describe second input cost:	

Storage Tank Capacity (MG)	Cost EST	Cost GST
0.25	$ 1,500,000	$ 635,000
0.50	$ 2,000,000	$ 750,000
0.75	$ 2,250,000	$ 1,100,000
1.00	$ 2,500,000	$ 1,250,000
1.25	$ 2,750,000	$ 1,500,000
1.50	$ 3,000,000	$ 1,650,000
1.75	$ 3,250,000	$ 1,850,000
2.00	$ 3,500,000	$ 2,000,000
3.00	$ -	$ 3,250,000
4.00	$ -	$ 5,000,000
5.00	$ -	$ 6,500,000
-	$ -	$ -

Includes tank/equipment, site irrigation/landscape, electrical, control system, pavement

QUANTITIES

Waterline Quantities	
% Pipeline Open-Cut	90%
% Pipeline Trenchless	10%
% Pipeline in ROW	50%
% Pipeline in Pavement	50%
6-inch PVC Waterline (LF)	0
8-inch PVC Waterline (LF)	0
12-inch PVC Waterline (LF)	264
16-inch PVC Waterline (LF)	0
20-inch PVC Waterline (LF)	0
24-inch PVC Waterline (LF)	0
30-inch PVC Waterline (LF)	0
36-inch PVC Waterline (LF)	0
42-inch PVC Waterline (LF)	0
48-inch PVC Waterline (LF)	0
54-inch PVC Waterline (LF)	0

Water Misc. Quantity		
EST (MG)		Use capacity values shown in table above
GST (MG)		Use capacity values shown in table above
Well (1,000 gpm)		Insert number of wells
Well (____ gpm)		Insert number of wells
PRV Replace Ex.		Insert number of existing PRV's to be replaced
PRV New		Insert number of new PRV's
Fittings (ton)	1	1 Ton per 1,200 LF waterline

Trench Width	4	FT
Hydrant spacing	500	LF
6-12 GV spacing	1,000	LF
16-20 GV spacing	2,000	LF
24 BFV spacing	2,200	LF
30-42 BFV spacing	3,000	LF
48+ BFV spacing	4,000	LF

	6-inch	8-inch	12-inch	16-inch	20-inch	Hydrant
Gate Valve Costs	$ 2,500	$ 3,300	$ 4,500	$ 6,000	$ 8,000	$ 6,000
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Butterfly Valve Costs	$ 20,000	$ 30,000	$ 35,000	$ 55,000	$ 75,000	$ 92,000

Project Planning Level Cost

Item	Unit	Total Item Cost
6-inch PVC Waterline	LF	$ -
8-inch PVC Waterline	LF	$ -
12-inch PVC Waterline	LF	$ 44,880
16-inch PVC Waterline	LF	$ -
20-inch Waterline	LF	$ -
24-inch Waterline	LF	$ -
30-inch Waterline	LF	$ -
36-inch Waterline	LF	$ -
42-inch Waterline	LF	$ -
48-inch Waterline	LF	$ -
54-inch Waterline	LF	$ -
Fire Hydrant	EA	$ 6,000
6-inch Gate Valve	EA	$ -
8-inch Gate Valve	EA	$ -
12-inch Gate Valve	EA	$ 4,500
16-inch Gate Valve	EA	$ -
20-inch Gate Valve	EA	$ -
24-inch Butterfly Valve	EA	$ -
30-inch Butterfly Valve	EA	$ -
36-inch Butterfly Valve	EA	$ -
42-inch Butterfly Valve	EA	$ -
48-inch Butterfly Valve	EA	$ -
54-inch Butterfly Valve	EA	$ -
Elevated Storage Tank	MG	$ -
Ground Storage Tank	MG	$ -
Well	gpm	$ -
PRV	EA	$ -
Fittings	TON	$ 4,000
Extra Pavement	LS	$ 3,326
Ground Restoration	LS	$ 950
XXXXXXXXXXX	LS	$ -
XXXXXXXXXXX	LS	$ -
Contingency	*30%*	
Sub-total		*$ 83,000*
Other	LS	$ -
Utility Relocates	LS	$ 9,000
Traffic Control	LS	$ 5,000
Additional Prof. Services	LS	$ 10,000
Testing/Planning/CM	LS	$ 20,000
Construction Cost		***$ 127,000***
Design	LS	$ 10,000
Land Acquisition	LS	$ 3,000
TOTAL COST (2022)	$	**140,000**

COST ESTIMATE SUMMARY	
LAREDO – SOUTH LAREDO WWTP REUSE PROJECT PHASE I	
Item	**Estimated Costs for Facilities**
CAPITAL COST	
Primary Pump Station	$8,500,000
Transmission Pipeline (24 in. diameter, 8.7 miles)	$11,484,000
TOTAL COST OF FACILITIES	**$19,984,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Issuance, and Contingency	$6,420,200
Environmental and Archaeology Studies and Mitigation	$199,840
Surveying, Site Location, and Misc.	$499,600
Interest During Construction	$699,440
TOTAL COST OF PROJECT	**$27,803,080**
ANNUAL COST	**$1,390,154**

COST ESTIMATE SUMMARY	
LAREDO – SOUTH LAREDO WWTP REUSE PROJECT PHASE II	
Item	**Estimated Costs for Facilities**
CAPITAL COST	
Plant Pump Station Upgrades	$4,100,000
Advanced Water Treatment Facility (3 MGD)	$22,700,000
TOTAL COST OF FACILITIES	**$26,800,000**
Engineering and Feasibility Studies, Legal Assistance, Financing, Bond Issuance, and Contingency	$8,245,000
Environmental and Archaeology Studies and Mitigation	$270,000
Surveying, Site Location, and Misc.	$670,000
Interest During Construction	$940,000
TOTAL COST OF PROJECT	**$36,925,000**
ANNUAL COST	**$1,846,250**

15 APPENDIX F
Unit Costs, Detailed Cost Utilizations, and CIP Model Output

COST ESTIMATE MASTER

PIPELINE	6-inch	8-inch	12-inch	16-inch	20-inch	
Cost Per LF (Open Cut)	$ 120	$ 135	$ 170	$ 195	$ 225	
Cost Per LF (Trenchless)	$ 120	$ 135	$ 170	$ 195	$ 225	
	24-inch	30-inch	36-inch	42-inch	48-inch	54-inch
Cost Per LF (Open Cut)	$ 265	$ 330	$ 380	$ 445	$ 505	$ 570
Cost Per LF (Trenchless)	$ 807	$ 1,090	$ 1,800	$ 2,500	$ 2,750	$ 3,000

STORAGE TANK		
Capacity (MG)	Cost Elevated Storage	Cost Ground Storage
0.25	$ 1,250,000	$ 635,000
0.50	$ 1,600,000	$ 750,000
0.75	$ 1,800,000	$ 1,100,000
1.00	$ 2,100,000	$ 1,250,000
1.25	$ 2,350,000	$ 1,500,000
1.50	$ 2,700,000	$ 1,650,000
1.75	$ 3,000,000	$ 1,850,000
2.00	$ 3,300,000	$ 2,000,000

PUMP STATION	
Capacity (MGD)	Cost
5.00	$ 660,000.00
10.00	$ 690,000.00
20.00	$ 747,500.00
30.00	$ 805,000.00
40.00	$ 862,500.00
50.00	$ 920,000.00

Laredo Integrated Water Master Plan

Pipe Diameter (Inches)	Price Per LF (Open Cut)	Price Per LF (Trenchless)	Total Utilization Length	Length in Open Cut (LF)	Length in Trenchless (LF)	Cost for Open Cut	Cost for Trenchless	Total Elligible Cost	Total Project Costs
1			-	-	-	$ -	$ -	**$ -**	**$ -**
2	$ 80	$ 80	8,143	7,330	813	$ 241,920	$ 65,040	**$ 564,504**	**$ 651,440**
3			-	-	-	$ -	$ -	**$ -**	**$ -**
4	$ 100	$ 100	2,628	2,370	258	$ 72,000	$ 25,800	**$ 119,308**	**$ 262,800**
6	$ 120	$ 120	546,626	491,960	54,666	$ 2,488,320	$ 6,559,920	**$ 38,149,769**	**$ 65,595,120**
8	$ 135	$ 135	1,363,931	1,227,540	136,391	$ 6,304,230	$ 18,412,785	**$ 99,393,498**	**$ 184,130,685**
9	$ 145	$ 145	486	440	46	$ 1,740	$ 6,670	**$ 1,807**	**$ 70,470**
10	$ 155	$ 155	77,258	69,530	7,728	$ 2,980,495	$ 1,197,840	**$ 5,397,568**	**$ 11,974,990**
12	$ 170	$ 170	492,624	443,360	49,264	$ 8,046,780	$ 8,374,880	**$ 44,150,050**	**$ 83,746,080**
14	$ 180	$ 180	7,686	6,920	766	$ 311,040	$ 137,880	**$ 890,852**	**$ 1,383,480**
16	$ 195	$ 195	257,493	231,740	25,753	$ 463,440,120	$ 5,021,835	**$ 21,155,889**	**$ 50,211,135**
18	$ 200	$ 200	38,400	34,560	3,840	$ 13,481,600	$ 768,000	**$ 4,438,165**	**$ 7,680,000**
20	$ 225	$ 225	23,640	21,280	2,360	$ 228,306,375	$ 531,000	**$ 3,403,280**	**$ 5,319,000**
24	$ 265	$ 807	209,696	188,730	20,966	$ 757,056,240	$ 16,911,292	**$ 37,608,284**	**$ 66,921,492**
30	$ 330	$ 1,090	25,346	22,810	2,536	$ 1,263,240	$ 2,764,240	**$ 6,733,041**	**$ 10,291,540**
31	$ 340	$ 1,232	162	150	12	$ 12,262,440	$ 14,784	**$ 40,333**	**$ 69,352**
36	$ 380	$ 1,800	38,117	34,310	3,807	$ 7,752,000	$ 6,852,600	**$ 6,711,244**	**$ 19,891,820**
42	$ 445	$ 2,500	814	730	84	$ 5,292,830	$ 210,000	**$ 197,614**	**$ 528,685**
48	$ 505	$ 2,750	-	-	-	$ 464,600	$ -	**$ -**	**$ -**
54	$ 570	$ 3,000	-	-	-	$ 266,760	$ -	**$ -**	**$ -**
60	$ 650.00	$ 3,500.00	40,037	36,030	4,007	$ 655,200	$ 14,024,500	**$ 5,631,889**	**$ 37,438,300**
69	$ 770.00	$ 4,250.00	189	170	19	$ 936,320	$ 80,750	**$ 102,229**	**$ 211,650**
72	$ 810.00	$ 4,500.00	109	100	9	$ 123,120	$ 40,500	**$ 54,647**	**$ 132,570**
								$ 274,743,970	**$ 546,510,609**

Pump Label	Existing Volume (MG)	2030-2040 Volume (MG)	2060-2070 Volume (MG)	Utilization (%)	Cost Per MG	Utilization Cost
CIP - CBOL P1	(N/A)	(N/A)	7.63	0%	$ 690,000.00	$ -
CIP - CBOL P2	(N/A)	(N/A)	7.63	0%	$ 690,000.00	$ -
CIP - CBOL P3	(N/A)	(N/A)	7.63	0%	$ 690,000.00	$ -
CIP - CBOL P4	(N/A)	(N/A)	7.63	0%	$ 690,000.00	$ -
CIP Hendrick P1	(N/A)	3.92	3.78	100%	$ 660,000.00	$ 660,000.00
CIP Hendrick P2	(N/A)	3.92	3.78	100%	$ 660,000.00	$ 660,000.00
CIP Hendrick P3	(N/A)	3.92	3.78	100%	$ 660,000.00	$ 660,000.00
CV P1	(N/A)	0	3.39	0%	$ 690,000.00	$ -
CV P2	(N/A)	0	6.75	0%	$ 690,000.00	$ -
CV P3	(N/A)	0	6.75	0%	$ 690,000.00	$ -
CV P4	(N/A)	0	6.75	0%	$ 690,000.00	$ -
EL PICO P1	0	9.98	10.43	96%	$ 747,500.00	$ 715,249.28
EL PICO P2	9.72	6.55	11.5	0%	$ 747,500.00	$ -
EL PICO P3	0	0	12.22	0%	$ 747,500.00	$ -
EL PICO P4	(N/A)	(N/A)	10.43	0%	$ 747,500.00	$ -
EL PICO P5	(N/A)	(N/A)	3.31	0%	$ 690,000.00	$ -
El Pico Transfer	9.71	16.77	47.94	15%	$ 920,000.00	$ 135,486.02
H/U P1	(N/A)	(N/A)	1.7	0%	$ 690,000.00	$ -
H/U P2	(N/A)	(N/A)	1.7	0%	$ 690,000.00	$ -
H/U P3	(N/A)	(N/A)	1.7	0%	$ 690,000.00	$ -
H/U P4	(N/A)	(N/A)	1.7	0%	$ 690,000.00	$ -
Hachar P1	0	1.16	0	0%	$ 690,000.00	$ -
Hachar P2	0	1.16	0	0%	$ 690,000.00	$ -
Hachar P3	0	1.16	0	0%	$ 690,000.00	$ -
Hachar P4	0	1.16	0	0%	$ 690,000.00	$ -
Highland P0 (Jockey)	0	0	0	0%	$ 690,000.00	$ -
Highland P1	0	0	0	0%	$ 690,000.00	$ -
Highland P2	1.72	0	0	0%	$ 690,000.00	$ -
Highland P3	1.72	0	0	0%	$ 690,000.00	$ -
Highland P4	0	0	0	0%	$ 690,000.00	$ -
Hwy359 P1	0	0	0	0%	$ 690,000.00	$ -
Hwy359 P2	0	0.8	1.72	47%	$ 660,000.00	$ 306,976.74
Hwy359 P3	0	0	1.05	0%	$ 660,000.00	$ -
Jefferson EP2 (East)	16.05	13.09	18.18	0%	$ 747,500.00	$ -
Jefferson EP4 (East)	0	8.91	9.07	98%	$ 690,000.00	$ 677,828.00
Jefferson EP6 (East)	0	8.91	9.07	98%	$ 690,000.00	$ 677,828.00
Jefferson Transfer	70.16	71.95	92.59	2%	0	$ -
Jefferson WP1 (West)	5.61	13.47	18.64	42%	$ 747,500.00	$ 315,201.18

Pump Label	Existing Volume (MG)	2030-2040 Volume (MG)	2060-2070 Volume (MG)	Utilization (%)	Cost Per MG	Utilization Cost
Jefferson WP3 (West)	0	13.47	18.64	72%	$ 747,500.00	$ 540,173.02
Jefferson WP5 (West)	11.59	13.58	19.13	10%	$ 747,500.00	$ 77,758.76
Lyon P1	5.43	0	0	0%	$ 690,000.00	$ -
Lyon P2	4.13	0	0	0%	$ 690,000.00	$ -
Lyon P3	0	0	5.97	0%	$ 690,000.00	$ -
Lyon P4	0	0.98	1.46	67%	$ 660,000.00	$ 443,013.70
Lyon P5	0	2.24	5.38	42%	$ 690,000.00	$ 287,286.25
MHOC P1	0	5.32	6.51	82%	$ 690,000.00	$ 563,870.97
MHOC P2	0	4.98	1.82	100%	$ 660,000.00	$ 660,000.00
MHOC P3	0	2.03	0.91	100%	$ 660,000.00	$ 660,000.00
MHOC P4	7.42	7.31	1.63	0%	$ 660,000.00	$ -
MHOC P5	7.42	7.31	12.3	0%	$ 747,500.00	$ -
MHOC P6	0	1.3	1.48	88%	$ 660,000.00	$ 579,729.73
Milmo P1	5.81	4.03	0	0%	$ 690,000.00	$ -
Milmo P2	2.55	4.75	4.38	50%	$ 690,000.00	$ 346,575.34
Milmo P3	0	4.06	4.38	93%	$ 690,000.00	$ 639,589.04
Milmo P4	0	4.06	5.44	75%	$ 690,000.00	$ 514,963.24
Sierra Vista P1	(N/A)	2.81	5.61	50%	$ 690,000.00	$ 345,614.97
Sierra Vista P2	1.91	1.02	2.12	0%	$ 690,000.00	$ -
Sierra Vista P3	6.42	6.59	6.58	3%	$ 690,000.00	$ 17,826.75
SINE P1	0	0	0	0%	$ 690,000.00	$ -
SINE P2	0	0	0	0%	$ 690,000.00	$ -
SINE P3	0	0	0	0%	$ 690,000.00	$ -
SINE P4	0	0	0	0%	$ 690,000.00	$ -
Z Laredo_Columbia_1	(N/A)	(N/A)	(N/A)	0%	0	$ -
Z Laredo_Columbia_2	(N/A)	(N/A)	(N/A)	0%	0	$ -
Z Laredo_Columbia_3	(N/A)	(N/A)	(N/A)	0%	0	$ -
Z Pinto_Valle_1	(N/A)	(N/A)	(N/A)	0%	0	$ -
Z Pinto_Valle_2	(N/A)	(N/A)	(N/A)	0%	0	$ -
					Total Elligible Cost	**$ 10,484,970.99**
					Total Project Cost	**$ 15,400,000.00**

Tank Label	Tank Type	Existing Volume (MG)_	2030-2040 Volume (MG)	2060-2070 Volume (MG)	Utilization (%)	Cost Per MG	Utilization Cost
Airport EST	EST	(N/A)	0.57	0.59	97%	$ 1,800,000.00	$1,738,983
Bartlett EST	EST	2.83	2.6	2.39	0%	$ 3,300,000.00	$0
CIP - CBOL GST	GST	(N/A)	0	1.8	0%	$ 3,300,000.00	$0
Columbia HPT	HPT	(N/A)	(N/A)	(N/A)	0%	$ 2,000,000.00	$0
Cuatro Vientos EST	EST	1.92	1.43	1	0%	$ 2,350,000.00	$0
CV GST	GST	(N/A)	0	2.64	0%	$ 3,300,000.00	$0
Del Mar EST	EST	(N/A)	(N/A)	(N/A)	0%	0	$0
El Pico Clearwell	EST	0.19	2.85	4.44	60%	$ 3,300,000.00	$1,977,027
H/U EST	EST	(N/A)	0.41	1.53	27%	$ 1,250,000.00	$334,967
H/U GST	GST	(N/A)	(N/A)	2.58	0%	$ 3,300,000.00	$0
Hachar GST	EST	0	0.11	0	0%	0	$0
Hachar HPT	HPT	0	(N/A)	(N/A)	0%	$ 2,000,000.00	$0
Hendrick GST	EST	(N/A)	1.36	0.86	100%	$ 1,500,000.00	$1,500,000
Highland HPT	HPT	0	0	0	0%	$ 2,000,000.00	$0
Hwy 359 GST	EST	0	0.55	0.36	100%	$ 750,000.00	$750,000
JWTP Upper Clearwells	EST	36.91	1.99	2.54	0%	$ 3,000,000.00	$0
Killam EST	EST	0.26	2.5	3.36	67%	$ 3,300,000.00	$2,200,000
Las Blancas EST	EST	0.09	0.54	0.65	69%	$ 1,600,000.00	$1,107,692
Lyon St GST	EST	6.44	4.24	8.07	0%	$ 3,300,000.00	$0
McPherson EST	EST	0.06	0.01	0.78	0%	0	$0
MHOC GST	EST	5.03	2.15	6.63	0%	$ 3,300,000.00	$0
Milmo GST	EST	4.58	3.13	4.17	0%	$ 3,300,000.00	$0
Northwest EST	EST	1.05	1.08	1.17	3%	$ 2,100,000.00	$53,846
Pinto Valle GST	GST	(N/A)	(N/A)	(N/A)	0%	$ 3,300,000.00	$0
Pinto Valle HPT	HPT	(N/A)	(N/A)	(N/A)	0%	$ 2,000,000.00	$0
SE EST	EST	(N/A)	1.68	3.39	50%	$ 2,700,000.00	$1,338,053
Sierra Vista GST	EST	1.9	4.76	3.49	82%	$ 2,000,000.00	$1,638,968
SINE EST	EST	1.59	6.76	3.6	100%	$ 3,300,000.00	$3,300,000
SINE GST	GST	0	0	0	0%	$ 3,300,000.00	$0
SINE HPT	HPT	0	0	0	0%	$ 2,000,000.00	$0
South Laredo EST	EST	1.75	1.58	0.65	0%	$ 2,700,000.00	$0
SV HPT	HPT	(N/A)	(N/A)	(N/A)	0%	$ 2,000,000.00	$0
						Total Eligible Costs	**$15,939,537**
						Total Project Costs	**$ 23,600,000**

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
359-P-913	0
359-P-914	0
359-P-930	0
359-PMP-1-A	0
359-PMP-1-B	0
359-PMP-2-A	0
359-PMP-2-B	0
359-PSV-359-A(1)(2)	0
359-PSV-359-B	0
359-Unused 359	0
58732(1)	0
58732(2)	0
CIP 22043	(N/A)
CIP 22047	(N/A)
CIP Bartlett(1)	(N/A)
CIP Bartlett(2)	(N/A)
CIP Bianka 1	(N/A)
CIP Bianka 2	(N/A)
CIP CB PS 01	(N/A)
CIP CB PS 02	(N/A)
CIP CB PS 03	(N/A)
CIP CB PS 04	(N/A)
CIP CB PS 05	(N/A)
CIP CB PS 06	(N/A)
CIP CB PS 07	(N/A)
CIP CB PS 08	(N/A)
CIP CB PS 09	(N/A)
CIP CB PS 10	(N/A)
CIP CB PS 11	(N/A)
CIP CB PS 12	(N/A)
CIP CB PS 13	(N/A)
CIP CB PS 14	(N/A)
CIP CB PS 15	(N/A)
CIP CB PS 16	(N/A)
CIP CB PS 17	(N/A)
CIP CB PS 18	(N/A)
CIP CB PS 19	(N/A)
CIP Cielito Lindo	(N/A)
CIP Colonias 00	(N/A)
CIP Colonias 01	(N/A)
CIP Colonias 02	(N/A)
CIP Colonias 03	(N/A)
CIP Colonias 04	(N/A)
CIP Colonias 05	(N/A)
CIP Colonias 06	(N/A)
CIP Colonias 07	(N/A)
CIP Colonias 08	(N/A)
CIP Colonias 09	(N/A)
CIP Colonias 10	(N/A)
CIP Colonias 11	(N/A)
CIP Colonias 12	(N/A)
CIP CR-1 1	(N/A)
CIP CR-1 2	(N/A)
CIP CR-1 3	(N/A)
CIP CR-1 4	(N/A)
CIP CR-1 5	(N/A)
CIP CR-1 6	(N/A)
CIP CR-1 7	(N/A)
CIP CR-1 8	(N/A)
CIP CR-1 9	(N/A)
CIP CV BPS 01 (16-WAT-017)	(N/A)
CIP CV BPS 02 (16-WAT-017)	(N/A)
CIP CV BPS 03 (16-WAT-017)	(N/A)
CIP CV BPS 04 (16-WAT-017)	(N/A)
CIP CV BPS 05 (16-WAT-017)	(N/A)
CIP CV BPS 06 (16-WAT-017)	(N/A)
CIP CV BPS 07 (16-WAT-017)	(N/A)
CIP CV BPS 08 (16-WAT-017)	(N/A)
CIP CV BPS 09 (16-WAT-017)	(N/A)
CIP CV BPS 10 (16-WAT-017)	(N/A)
CIP CV BPS 11 (16-WAT-017)	(N/A)

2030 SYSTEM	
Pipe Label	Total Volume (MG)
359-P-913	0
359-P-914	0.8
359-P-930	0.8
359-PMP-1-A	0.8
359-PMP-1-B	0.8
359-PMP-2-A	0
359-PMP-2-B	0
359-PSV-359-A(1)(2)	0.75
359-PSV-359-B	0.75
359-Unused 359	0.8
58732(1)	0.42
58732(2)	0.42
CIP 22043	0
CIP 22047	0
CIP Bartlett(1)	2.26
CIP Bartlett(2)	2.26
CIP Bianka 1	(N/A)
CIP Bianka 2	(N/A)
CIP CB PS 01	(N/A)
CIP CB PS 02	(N/A)
CIP CB PS 03	(N/A)
CIP CB PS 04	(N/A)
CIP CB PS 05	(N/A)
CIP CB PS 06	(N/A)
CIP CB PS 07	(N/A)
CIP CB PS 08	(N/A)
CIP CB PS 09	(N/A)
CIP CB PS 10	(N/A)
CIP CB PS 11	(N/A)
CIP CB PS 12	(N/A)
CIP CB PS 13	(N/A)
CIP CB PS 14	(N/A)
CIP CB PS 15	(N/A)
CIP CB PS 16	(N/A)
CIP CB PS 17	(N/A)
CIP CB PS 18	(N/A)
CIP CB PS 19	(N/A)
CIP Cielito Lindo	(N/A)
CIP Colonias 00	0
CIP Colonias 01	0
CIP Colonias 02	0
CIP Colonias 03	0
CIP Colonias 04	0
CIP Colonias 05	0
CIP Colonias 06	0
CIP Colonias 07	0
CIP Colonias 08	0
CIP Colonias 09	0
CIP Colonias 10	0
CIP Colonias 11	0
CIP Colonias 12	0
CIP CR-1 1	(N/A)
CIP CR-1 2	(N/A)
CIP CR-1 3	(N/A)
CIP CR-1 4	(N/A)
CIP CR-1 5	(N/A)
CIP CR-1 6	(N/A)
CIP CR-1 7	(N/A)
CIP CR-1 8	(N/A)
CIP CR-1 9	(N/A)
CIP CV BPS 01 (16-WAT-017)	0
CIP CV BPS 02 (16-WAT-017)	0
CIP CV BPS 03 (16-WAT-017)	0
CIP CV BPS 04 (16-WAT-017)	0
CIP CV BPS 05 (16-WAT-017)	0
CIP CV BPS 06 (16-WAT-017)	0
CIP CV BPS 07 (16-WAT-017)	0.84
CIP CV BPS 08 (16-WAT-017)	0.84
CIP CV BPS 09 (16-WAT-017)	0
CIP CV BPS 10 (16-WAT-017)	0
CIP CV BPS 11 (16-WAT-017)	0.84

2070 SYSTEM	
Pipe Label	Total Volume (MG)
359-P-913	1.05
359-P-914	2.77
359-P-930	2.77
359-PMP-1-A	1.72
359-PMP-1-B	1.72
359-PMP-2-A	0
359-PMP-2-B	0
359-PSV-359-A(1)(2)	2.74
359-PSV-359-B	2.74
359-Unused 359	2.77
58732(1)	1.08
58732(2)	1.08
CIP 22043	1.83
CIP 22047	1.83
CIP Bartlett(1)	3.24
CIP Bartlett(2)	3.24
CIP Bianka 1	0
CIP Bianka 2	0
CIP CB PS 01	15.31
CIP CB PS 02	7.63
CIP CB PS 03	7.63
CIP CB PS 04	6.99
CIP CB PS 05	0.64
CIP CB PS 06	8.27
CIP CB PS 07	15.9
CIP CB PS 08	15.21
CIP CB PS 09	7.63
CIP CB PS 10	7.63
CIP CB PS 11	7.67
CIP CB PS 12	0.05
CIP CB PS 13	7.58
CIP CB PS 14	7.63
CIP CB PS 15	7.63
CIP CB PS 16	7.63
CIP CB PS 17	7.63
CIP CB PS 18	14.62
CIP CB PS 19	14.62
CIP Cielito Lindo	1.27
CIP Colonias 00	0
CIP Colonias 01	0.01
CIP Colonias 02	0.02
CIP Colonias 03	0.02
CIP Colonias 04	0.03
CIP Colonias 05	0.03
CIP Colonias 06	0.02
CIP Colonias 07	0
CIP Colonias 08	0.01
CIP Colonias 09	0.02
CIP Colonias 10	0.02
CIP Colonias 11	0.03
CIP Colonias 12	0.02
CIP CR-1 1	27.54
CIP CR-1 2	3.47
CIP CR-1 3	3.47
CIP CR-1 4	27.31
CIP CR-1 5	26.31
CIP CR-1 6	27.09
CIP CR-1 7	26.72
CIP CR-1 8	25.79
CIP CR-1 9	25.79
CIP CV BPS 01 (16-WAT-017)	11.4
CIP CV BPS 02 (16-WAT-017)	3.39
CIP CV BPS 03 (16-WAT-017)	3.39
CIP CV BPS 04 (16-WAT-017)	6.75
CIP CV BPS 05 (16-WAT-017)	6.75
CIP CV BPS 06 (16-WAT-017)	24.11
CIP CV BPS 07 (16-WAT-017)	9.89
CIP CV BPS 08 (16-WAT-017)	3.14
CIP CV BPS 09 (16-WAT-017)	1.26
CIP CV BPS 10 (16-WAT-017)	8.01
CIP CV BPS 11 (16-WAT-017)	3.64

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
CIP CV BPS 12 (16-WAT-017)	(N/A)	CIP CV BPS 12 (16-WAT-017)	0	CIP CV BPS 12 (16-WAT-017)	12.24
CIP CV BPS 13 (16-WAT-017)	(N/A)	CIP CV BPS 13 (16-WAT-017)	0	CIP CV BPS 13 (16-WAT-017)	5.49
CIP CV BPS 14 (16-WAT-017)	(N/A)	CIP CV BPS 14 (16-WAT-017)	0	CIP CV BPS 14 (16-WAT-017)	6.75
CIP CV BPS 15 (16-WAT-017)	(N/A)	CIP CV BPS 15 (16-WAT-017)	0	CIP CV BPS 15 (16-WAT-017)	6.75
CIP CV BPS 16 (16-WAT-017)	(N/A)	CIP CV BPS 16 (16-WAT-017)	0	CIP CV BPS 16 (16-WAT-017)	6.75
CIP CV BPS 17 (16-WAT-017)	(N/A)	CIP CV BPS 17 (16-WAT-017)	0	CIP CV BPS 17 (16-WAT-017)	6.75
CIP CV BPS 18 (16-WAT-017)	(N/A)	CIP CV BPS 18 (16-WAT-017)	0	CIP CV BPS 18 (16-WAT-017)	24.11
CIP CV BPS 19	(N/A)	CIP CV BPS 19	1.68	CIP CV BPS 19	3.39
CIP CV BPS 20 (16-WAT-017)	(N/A)	CIP CV BPS 20 (16-WAT-017)	0.84	CIP CV BPS 20 (16-WAT-017)	10.36
CIP CV BPS 21 (16-WAT-017)	(N/A)	CIP CV BPS 21 (16-WAT-017)	0.84	CIP CV BPS 21 (16-WAT-017)	10.29
CIP CV BPS 22	(N/A)	CIP CV BPS 22	0.84	CIP CV BPS 22	13.28
CIP CV Pipes 1	(N/A)	CIP CV Pipes 1	0	CIP CV Pipes 1	1.76
CIP CV Pipes 2	(N/A)	CIP CV Pipes 2	(N/A)	CIP CV Pipes 2	22.35
CIP Del Mar	(N/A)	CIP Del Mar	(N/A)	CIP Del Mar	1.53
CIP Ejido 1	(N/A)	CIP Ejido 1	(N/A)	CIP Ejido 1	2.5
CIP Ejido 2	(N/A)	CIP Ejido 2	(N/A)	CIP Ejido 2	2.37
CIP Ejido 3	(N/A)	CIP Ejido 3	(N/A)	CIP Ejido 3	2.14
CIP FUT-1 1	(N/A)	CIP FUT-1 1	(N/A)	CIP FUT-1 1	1.64
CIP FUT-1 2	(N/A)	CIP FUT-1 2	(N/A)	CIP FUT-1 2	1.84
CIP FUT-2 1	(N/A)	CIP FUT-2 1	(N/A)	CIP FUT-2 1	0.4
CIP FUT-2 2	(N/A)	CIP FUT-2 2	(N/A)	CIP FUT-2 2	0.32
CIP H/U PS 01	(N/A)	CIP H/U PS 01	(N/A)	CIP H/U PS 01	3.46
CIP H/U PS 02	(N/A)	CIP H/U PS 02	(N/A)	CIP H/U PS 02	3.33
CIP H/U PS 03	(N/A)	CIP H/U PS 03	(N/A)	CIP H/U PS 03	1.7
CIP H/U PS 04	(N/A)	CIP H/U PS 04	(N/A)	CIP H/U PS 04	1.7
CIP H/U PS 05	(N/A)	CIP H/U PS 05	(N/A)	CIP H/U PS 05	1.7
CIP H/U PS 06	(N/A)	CIP H/U PS 06	(N/A)	CIP H/U PS 06	1.7
CIP H/U PS 07	(N/A)	CIP H/U PS 07	(N/A)	CIP H/U PS 07	1.7
CIP H/U PS 08	(N/A)	CIP H/U PS 08	(N/A)	CIP H/U PS 08	1.7
CIP H/U PS 09	(N/A)	CIP H/U PS 09	(N/A)	CIP H/U PS 09	1.7
CIP H/U PS 10	(N/A)	CIP H/U PS 10	(N/A)	CIP H/U PS 10	1.7
CIP H/U PS 11	(N/A)	CIP H/U PS 11	(N/A)	CIP H/U PS 11	1.76
CIP H/U PS 12	(N/A)	CIP H/U PS 12	(N/A)	CIP H/U PS 12	0.06
CIP H/U PS 13	(N/A)	CIP H/U PS 13	(N/A)	CIP H/U PS 13	1.64
CIP H/U PS 14	(N/A)	CIP H/U PS 14	(N/A)	CIP H/U PS 14	1.2
CIP H/U PS 15	(N/A)	CIP H/U PS 15	(N/A)	CIP H/U PS 15	0.71
CIP H/U PS 16	(N/A)	CIP H/U PS 16	(N/A)	CIP H/U PS 16	2.21
CIP H/U PS 17	(N/A)	CIP H/U PS 17	(N/A)	CIP H/U PS 17	1.53
CIP H/U PS 18	(N/A)	CIP H/U PS 18	(N/A)	CIP H/U PS 18	3.05
CIP H/U PS 19	(N/A)	CIP H/U PS 19	(N/A)	CIP H/U PS 19	2.88
CIP H/U PS 21	(N/A)	CIP H/U PS 21	(N/A)	CIP H/U PS 21	3.91
CIP H/U PS 22	(N/A)	CIP H/U PS 22	(N/A)	CIP H/U PS 22	7.12
CIP Heights 01	(N/A)	CIP Heights 01	2.24	CIP Heights 01	2.97
CIP Heights 02	(N/A)	CIP Heights 02	2.24	CIP Heights 02	2.97
CIP Heights 03	(N/A)	CIP Heights 03	5.36	CIP Heights 03	5.49
CIP Heights 04	(N/A)	CIP Heights 04	5.36	CIP Heights 04	5.49
CIP Heights 05	(N/A)	CIP Heights 05	(N/A)	CIP Heights 05	0.41
CIP Heights 06	(N/A)	CIP Heights 06	(N/A)	CIP Heights 06	0.41
CIP Heights 07	(N/A)	CIP Heights 07	(N/A)	CIP Heights 07	0.23
CIP Heights 08	(N/A)	CIP Heights 08	(N/A)	CIP Heights 08	0.65
CIP Heights 09	(N/A)	CIP Heights 09	(N/A)	CIP Heights 09	0.95
CIP Heights 10	(N/A)	CIP Heights 10	(N/A)	CIP Heights 10	2.25
CIP Hendricks PS 01	(N/A)	CIP Hendricks PS 01	11.72	CIP Hendricks PS 01	11.31
CIP Hendricks PS 02	(N/A)	CIP Hendricks PS 02	11.76	CIP Hendricks PS 02	11.33
CIP Hendricks PS 03	(N/A)	CIP Hendricks PS 03	7.84	CIP Hendricks PS 03	7.55
CIP Hendricks PS 04	(N/A)	CIP Hendricks PS 04	3.92	CIP Hendricks PS 04	3.78
CIP Hendricks PS 05	(N/A)	CIP Hendricks PS 05	1.16	CIP Hendricks PS 05	0.81
CIP Hendricks PS 06	(N/A)	CIP Hendricks PS 06	3.03	CIP Hendricks PS 06	3.28
CIP Hendricks PS 07	(N/A)	CIP Hendricks PS 07	3.92	CIP Hendricks PS 07	3.78
CIP Hendricks PS 08	(N/A)	CIP Hendricks PS 08	3.92	CIP Hendricks PS 08	3.78
CIP Hendricks PS 09	(N/A)	CIP Hendricks PS 09	3.92	CIP Hendricks PS 09	3.78
CIP Hendricks PS 10	(N/A)	CIP Hendricks PS 10	3.92	CIP Hendricks PS 10	3.78
CIP Hendricks PS 11	(N/A)	CIP Hendricks PS 11	3.92	CIP Hendricks PS 11	3.78
CIP Hendricks PS 12	(N/A)	CIP Hendricks PS 12	3.92	CIP Hendricks PS 12	3.78
CIP Hendricks PS 13	(N/A)	CIP Hendricks PS 13	11.72	CIP Hendricks PS 13	11.31
CIP Hendricks PS 14	(N/A)	CIP Hendricks PS 14	3.22	CIP Hendricks PS 14	0.98
CIP Hendricks PS 15	(N/A)	CIP Hendricks PS 15	8.7	CIP Hendricks PS 15	10.34
CIP Hendricks PS 16	(N/A)	CIP Hendricks PS 16	0.08	CIP Hendricks PS 16	0
CIP Hendricks-Lyon	(N/A)	CIP Hendricks-Lyon	4.83	CIP Hendricks-Lyon	4.28
CIP HU Dist 1	(N/A)	CIP HU Dist 1	0.1	CIP HU Dist 1	0.04
CIP HU Dist 2(1)	(N/A)	CIP HU Dist 2(1)	0.1	CIP HU Dist 2(1)	3.74

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
CIP HU Dist 2(2)	(N/A)
CIP HU Dist 3	(N/A)
CIP HU PS 20	(N/A)
CIP HU Supply(1)	(N/A)
CIP HU Supply(2)	(N/A)
CIP Hwy359 1	(N/A)
CIP Hwy359 2	(N/A)
CIP Hwy359 3	(N/A)
CIP Hwy359 4	(N/A)
CIP Hwy359-LosBlancas	(N/A)
CIP I35-1	(N/A)
CIP I35-2 1	(N/A)
CIP I35-2 2	(N/A)
CIP I35-3 1	(N/A)
CIP I35-3 2	(N/A)
CIP I35-3 3	(N/A)
CIP I35-3 4	(N/A)
CIP I35-3 5	(N/A)
CIP I35-3 6	(N/A)
CIP I35-3 7	(N/A)
CIP JWTP 1	(N/A)
CIP JWTP 2	(N/A)
CIP JWTP 3	(N/A)
CIP JWTP 4	(N/A)
CIP JWTP-LyonPS (1)	(N/A)
CIP JWTP-LyonPS (2)	(N/A)
CIP JWTP-QL	(N/A)
CIP Lomas Del Sur 1	(N/A)
CIP Lomas Del Sur 2	(N/A)
CIP Lomas Del Sur 3	(N/A)
CIP Lomas Del Sur 4	(N/A)
CIP Lomas Del Sur 7	(N/A)
CIP LP20 Milmo	(N/A)
CIP LP20 SV 1	(N/A)
CIP LP20 SV 2	(N/A)
CIP LP20 SV 3	(N/A)
CIP LP20 SV 4	(N/A)
CIP LP20-1 1	(N/A)
CIP LP20-1 2	(N/A)
CIP LP20-1 3	(N/A)
CIP LP20-1 4	(N/A)
CIP LP20-1 5	(N/A)
CIP LP20-1 6	(N/A)
CIP LP20-1 7	(N/A)
CIP LP20-1 8	(N/A)
CIP LP20-1 9	(N/A)
CIP LP20-2A 1	(N/A)
CIP LP20-2A 2	(N/A)
CIP LP20-2B 1	(N/A)
CIP LP20-2B 2	(N/A)
CIP LP20-2B 3	(N/A)
CIP LP20-2B 4	(N/A)
CIP LP20-2B 5	(N/A)
CIP LP20-2B 6	(N/A)
CIP LP20-2B 7	(N/A)
CIP LP20-2B 8	(N/A)
CIP LP20-2B 9	(N/A)
CIP LP20-3 1	(N/A)
CIP LP20-3 2	(N/A)
CIP LP20-3 3	(N/A)
CIP LP20-4 1	(N/A)
CIP LP20-4 2	(N/A)
CIP LP20-4 3	(N/A)
CIP LP20-4 4	(N/A)
CIP LPM 1	(N/A)
CIP LPM 2	(N/A)
CIP LPM 3	(N/A)
CIP LPM 4	(N/A)
CIP LPS 1	(N/A)
CIP LPS 2	(N/A)
CIP LPS 3	(N/A)

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
CIP HU Dist 2(2)	0.1
CIP HU Dist 3	(N/A)
CIP HU PS 20	(N/A)
CIP HU Supply(1)	(N/A)
CIP HU Supply(2)	0.41
CIP Hwy359 1	(N/A)
CIP Hwy359 2	(N/A)
CIP Hwy359 3	(N/A)
CIP Hwy359 4	(N/A)
CIP Hwy359-LosBlancas	0
CIP I35-1	(N/A)
CIP I35-2 1	(N/A)
CIP I35-2 2	(N/A)
CIP I35-3 1	(N/A)
CIP I35-3 2	(N/A)
CIP I35-3 3	(N/A)
CIP I35-3 4	(N/A)
CIP I35-3 5	(N/A)
CIP I35-3 6	(N/A)
CIP I35-3 7	(N/A)
CIP JWTP 1	13.09
CIP JWTP 2	4
CIP JWTP 3	0
CIP JWTP 4	15.92
CIP JWTP-LyonPS (1)	9.41
CIP JWTP-LyonPS (2)	9.41
CIP JWTP-QL	(N/A)
CIP Lomas Del Sur 1	(N/A)
CIP Lomas Del Sur 2	(N/A)
CIP Lomas Del Sur 3	(N/A)
CIP Lomas Del Sur 4	(N/A)
CIP Lomas Del Sur 7	(N/A)
CIP LP20 Milmo	0.6
CIP LP20 SV 1	0.23
CIP LP20 SV 2	0.23
CIP LP20 SV 3	0
CIP LP20 SV 4	0.23
CIP LP20-1 1	1.83
CIP LP20-1 2	2.13
CIP LP20-1 3	2.49
CIP LP20-1 4	0.37
CIP LP20-1 5	0.66
CIP LP20-1 6	1.83
CIP LP20-1 7	0.59
CIP LP20-1 8	2.24
CIP LP20-1 9	0
CIP LP20-2A 1	0.59
CIP LP20-2A 2	0.59
CIP LP20-2B 1	0.42
CIP LP20-2B 2	0.43
CIP LP20-2B 3	0.44
CIP LP20-2B 4	0.98
CIP LP20-2B 5	0.71
CIP LP20-2B 6	0.6
CIP LP20-2B 7	0.63
CIP LP20-2B 8	1.62
CIP LP20-2B 9	0.75
CIP LP20-3 1	(N/A)
CIP LP20-3 2	(N/A)
CIP LP20-3 3	(N/A)
CIP LP20-4 1	(N/A)
CIP LP20-4 2	(N/A)
CIP LP20-4 3	(N/A)
CIP LP20-4 4	(N/A)
CIP LPM 1	1.68
CIP LPM 2	(N/A)
CIP LPM 3	1.68
CIP LPM 4	0.84
CIP LPS 1	3.34
CIP LPS 2	3.34
CIP LPS 3	3.34

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
CIP HU Dist 2(2)	2.18
CIP HU Dist 3	3.76
CIP HU PS 20	0.8
CIP HU Supply(1)	7.12
CIP HU Supply(2)	7.12
CIP Hwy359 1	(N/A)
CIP Hwy359 2	(N/A)
CIP Hwy359 3	(N/A)
CIP Hwy359 4	2.47
CIP Hwy359-LosBlancas	0
CIP I35-1	1.16
CIP I35-2 1	0
CIP I35-2 2	0
CIP I35-3 1	0.32
CIP I35-3 2	0.08
CIP I35-3 3	0.5
CIP I35-3 4	0.03
CIP I35-3 5	0.09
CIP I35-3 6	0.06
CIP I35-3 7	0.01
CIP JWTP 1	18.18
CIP JWTP 2	9.93
CIP JWTP 3	0
CIP JWTP 4	18.28
CIP JWTP-LyonPS (1)	28.11
CIP JWTP-LyonPS (2)	24.3
CIP JWTP-QL	4.11
CIP Lomas Del Sur 1	2.91
CIP Lomas Del Sur 2	2.25
CIP Lomas Del Sur 3	1.58
CIP Lomas Del Sur 4	1.58
CIP Lomas Del Sur 7	3.44
CIP LP20 Milmo	10.8
CIP LP20 SV 1	0.11
CIP LP20 SV 2	0.11
CIP LP20 SV 3	1.76
CIP LP20 SV 4	0.93
CIP LP20-1 1	1.64
CIP LP20-1 2	2.05
CIP LP20-1 3	2.33
CIP LP20-1 4	0.28
CIP LP20-1 5	0.69
CIP LP20-1 6	1.64
CIP LP20-1 7	2.03
CIP LP20-1 8	0.16
CIP LP20-1 9	0
CIP LP20-2A 1	2.03
CIP LP20-2A 2	2.03
CIP LP20-2B 1	1.45
CIP LP20-2B 2	1.69
CIP LP20-2B 3	2
CIP LP20-2B 4	2.57
CIP LP20-2B 5	0
CIP LP20-2B 6	10.8
CIP LP20-2B 7	0
CIP LP20-2B 8	2.57
CIP LP20-2B 9	11.59
CIP LP20-3 1	0.65
CIP LP20-3 2	0.93
CIP LP20-3 3	1.46
CIP LP20-4 1	0.73
CIP LP20-4 2	0.32
CIP LP20-4 3	0.38
CIP LP20-4 4	0.7
CIP LPM 1	14.12
CIP LPM 2	9.46
CIP LPM 3	14.12
CIP LPM 4	1.7
CIP LPS 1	12.76
CIP LPS 2	12.76
CIP LPS 3	7.12

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
CIP LPS 4	(N/A)	CIP LPS 4	4.69	CIP LPS 4	7.28
CIP Lyon to CB supply 1	(N/A)	CIP Lyon to CB supply 1	(N/A)	CIP Lyon to CB supply 1	24.3
CIP Lyon to CB supply 2	(N/A)	CIP Lyon to CB supply 2	(N/A)	CIP Lyon to CB supply 2	24.3
CIP Lyon to CB supply 3	(N/A)	CIP Lyon to CB supply 3	9.41	CIP Lyon to CB supply 3	0
CIP McP EST	(N/A)	CIP McP EST	(N/A)	CIP McP EST	0.78
CIP MHOC Cap	(N/A)	CIP MHOC Cap	(N/A)	CIP MHOC Cap	10.77
CIP MHOC Supply(1)	(N/A)	CIP MHOC Supply(1)	(N/A)	CIP MHOC Supply(1)	23
CIP MHOC Supply(2)	(N/A)	CIP MHOC Supply(2)	(N/A)	CIP MHOC Supply(2)	23
CIP Milmo Supply	(N/A)	CIP Milmo Supply	8.3	CIP Milmo Supply	6.44
CIP Milmo-SV	(N/A)	CIP Milmo-SV	1.93	CIP Milmo-SV	3.38
CIP MR-1 1	(N/A)	CIP MR-1 1	(N/A)	CIP MR-1 1	0.17
CIP MR-1 2	(N/A)	CIP MR-1 2	(N/A)	CIP MR-1 2	0.29
CIP MR-1 3	(N/A)	CIP MR-1 3	(N/A)	CIP MR-1 3	0.67
CIP MR-1 4	(N/A)	CIP MR-1 4	(N/A)	CIP MR-1 4	0.81
CIP MR-2 01	0.11	CIP MR-2 01	(N/A)	CIP MR-2 01	0.61
CIP MR-2 02	0	CIP MR-2 02	(N/A)	CIP MR-2 02	0.57
CIP MR-2 03	0.11	CIP MR-2 03	(N/A)	CIP MR-2 03	0.48
CIP MR-2 04	0	CIP MR-2 04	(N/A)	CIP MR-2 04	0.15
CIP MR-2 05	0	CIP MR-2 05	(N/A)	CIP MR-2 05	0.57
CIP MR-2 06	0	CIP MR-2 06	0.01	CIP MR-2 06	0.19
CIP MR-2 07	(N/A)	CIP MR-2 07	(N/A)	CIP MR-2 07	1.71
CIP MR-2 08	(N/A)	CIP MR-2 08	(N/A)	CIP MR-2 08	1
CIP MR-2 09	0	CIP MR-2 09	(N/A)	CIP MR-2 09	0.18
CIP MR-2 10	0.11	CIP MR-2 10	(N/A)	CIP MR-2 10	0.23
CIP MR-2 11	0.36	CIP MR-2 11	0.78	CIP MR-2 11	0.28
CIP MR-2 12	(N/A)	CIP MR-2 12	(N/A)	CIP MR-2 12	1
CIP MR-2 13	0.36	CIP MR-2 13	0.78	CIP MR-2 13	0.72
CIP NL-1 1	(N/A)	CIP NL-1 1	(N/A)	CIP NL-1 1	1.27
CIP NL-1 2	(N/A)	CIP NL-1 2	(N/A)	CIP NL-1 2	3.2
CIP NL-1 3	(N/A)	CIP NL-1 3	(N/A)	CIP NL-1 3	3.25
CIP NW-1 1	(N/A)	CIP NW-1 1	(N/A)	CIP NW-1 1	1.82
CIP NW-1 2	(N/A)	CIP NW-1 2	(N/A)	CIP NW-1 2	1.93
CIP OL-1A 1	(N/A)	CIP OL-1A 1	(N/A)	CIP OL-1A 1	21.1
CIP OL-1A 2	(N/A)	CIP OL-1A 2	(N/A)	CIP OL-1A 2	22.74
CIP OL-1B 1	(N/A)	CIP OL-1B 1	(N/A)	CIP OL-1B 1	22.03
CIP OL-1B 2	(N/A)	CIP OL-1B 2	(N/A)	CIP OL-1B 2	21.31
CIP OL-1B 3	(N/A)	CIP OL-1B 3	(N/A)	CIP OL-1B 3	20.8
CIP OL-1B 4	(N/A)	CIP OL-1B 4	(N/A)	CIP OL-1B 4	0
CIP OL-1B 5	(N/A)	CIP OL-1B 5	(N/A)	CIP OL-1B 5	0
CIP OL-1C 1	(N/A)	CIP OL-1C 1	(N/A)	CIP OL-1C 1	18.28
CIP OL-1C 2	(N/A)	CIP OL-1C 2	(N/A)	CIP OL-1C 2	19.52
CIP OL-1C 3	(N/A)	CIP OL-1C 3	(N/A)	CIP OL-1C 3	18.6
CIP OL-1C 4	(N/A)	CIP OL-1C 4	(N/A)	CIP OL-1C 4	17.9
CIP OL-1C 5	(N/A)	CIP OL-1C 5	(N/A)	CIP OL-1C 5	17.37
CIP OL-1C 6	(N/A)	CIP OL-1C 6	(N/A)	CIP OL-1C 6	20.19
CIP OL-1C 7	(N/A)	CIP OL-1C 7	(N/A)	CIP OL-1C 7	20.19
CIP OL-1C 8	(N/A)	CIP OL-1C 8	(N/A)	CIP OL-1C 8	0
CIP OL-1C 9	(N/A)	CIP OL-1C 9	(N/A)	CIP OL-1C 9	0
CIP OL-2 1	(N/A)	CIP OL-2 1	(N/A)	CIP OL-2 1	17.28
CIP OL-2 2	(N/A)	CIP OL-2 2	(N/A)	CIP OL-2 2	15.36
CIP OL-2 3	(N/A)	CIP OL-2 3	(N/A)	CIP OL-2 3	14.35
CIP OL-2 4	(N/A)	CIP OL-2 4	(N/A)	CIP OL-2 4	12.4
CIP OL-2 5	(N/A)	CIP OL-2 5	(N/A)	CIP OL-2 5	11.05
CIP OL-3A 01	(N/A)	CIP OL-3A 01	(N/A)	CIP OL-3A 01	6.79
CIP OL-3A 02	(N/A)	CIP OL-3A 02	(N/A)	CIP OL-3A 02	4.38
CIP OL-3A 03	(N/A)	CIP OL-3A 03	(N/A)	CIP OL-3A 03	4.68
CIP OL-3A 04	(N/A)	CIP OL-3A 04	(N/A)	CIP OL-3A 04	6.52
CIP OL-3A 05	(N/A)	CIP OL-3A 05	(N/A)	CIP OL-3A 05	5.41
CIP OL-3A 06	(N/A)	CIP OL-3A 06	(N/A)	CIP OL-3A 06	3.85
CIP OL-3A 07	(N/A)	CIP OL-3A 07	(N/A)	CIP OL-3A 07	3.85
CIP OL-3A 08	(N/A)	CIP OL-3A 08	(N/A)	CIP OL-3A 08	3.85
CIP OL-3A 09	(N/A)	CIP OL-3A 09	(N/A)	CIP OL-3A 09	0
CIP OL-3A 10	(N/A)	CIP OL-3A 10	(N/A)	CIP OL-3A 10	0
CIP OL-3B 1	(N/A)	CIP OL-3B 1	(N/A)	CIP OL-3B 1	29.73
CIP OL-3B 2	(N/A)	CIP OL-3B 2	(N/A)	CIP OL-3B 2	28.81
CIP OL-3B 3	(N/A)	CIP OL-3B 3	(N/A)	CIP OL-3B 3	28.22
CIP OL-3B 4	(N/A)	CIP OL-3B 4	(N/A)	CIP OL-3B 4	2.52
CIP OL-3B 5	(N/A)	CIP OL-3B 5	(N/A)	CIP OL-3B 5	2.52
CIP OL-3B 6	(N/A)	CIP OL-3B 6	(N/A)	CIP OL-3B 6	0.05
CIP OL-4 1	(N/A)	CIP OL-4 1	(N/A)	CIP OL-4 1	0
CIP OL-4 10	(N/A)	CIP OL-4 10	(N/A)	CIP OL-4 10	6.02

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
CIP OL-4 2	(N/A)
CIP OL-4 3	(N/A)
CIP OL-4 4	(N/A)
CIP OL-4 5	(N/A)
CIP OL-4 6	(N/A)
CIP OL-4 7	(N/A)
CIP OL-4 8	(N/A)
CIP OL-4 9	(N/A)
CIP OL-5 1	(N/A)
CIP OL-5 2	(N/A)
CIP OL-5 3	(N/A)
CIP OL-5 4	(N/A)
CIP OL-5 5	(N/A)
CIP OL-5 6	(N/A)
CIP OL-5 7	(N/A)
CIP OL-5 8	(N/A)
CIP OL-5 9	(N/A)
CIP QL to Hendricks	(N/A)
CIP QL to Hendricks 00	(N/A)
CIP QL to Hendricks 01	(N/A)
CIP SINE 1	(N/A)
CIP SINE 2	(N/A)
CIP SINE 3	(N/A)
CIP SL-1 1	(N/A)
CIP SL-1 2	(N/A)
CIP SL-1 3	(N/A)
CIP SL-1 4	(N/A)
CIP SL-1 5	(N/A)
CIP SL-1 6	(N/A)
CIP SL-1 7	(N/A)
CIP SL-1 8	(N/A)
CIP SL-2A 1	(N/A)
CIP SL-2A 2	(N/A)
CIP SL-2B 1	(N/A)
CIP SL-2B 2	(N/A)
CIP SL-2B 3	(N/A)
CIP SL-2B 4	(N/A)
CIP SL-2B 5	(N/A)
CIP SL-2B 6	(N/A)
CIP SL-2B 7	(N/A)
CIP SL-2B 8	(N/A)
CIP SL-2B 9	(N/A)
CIP SV PS	(N/A)
CIP SV Supply	(N/A)
CIP SX-1 1	(N/A)
CIP SX-1 2	(N/A)
CIP US 59 1	(N/A)
CIP US 59 2	(N/A)
CIP US 59 3	(N/A)
CIP US 59 4	(N/A)
CIP US 59 5	(N/A)
CIP UT-1 1	(N/A)
CIP UT-1 2	(N/A)
CIP UT-1 3	(N/A)
CIP UT-1 4	(N/A)
CIP Wormser 1	(N/A)
CIP Wormser 2	(N/A)
CIP XSTG 36 S/L to 3010057 (1)	11.04
CIP XSTG 36 S/L to 3010060 (1)	11.05
CIP XSTG 36 S/L to 3010605	11.03
CIP XSTG 36 S/L to 3011173	9.34
CIP XSTG 36 S/L to 3011174 (1)	9.35
CIP XSTG 36 S/L to 3011175	9.35
CIP XSTG 36 S/L to 3011176 (1)	9.35
CIP XSTG 36 S/L to 3011177	9.35
CIP XSTG 36 S/L to 3011178	9.35
CIP XSTG 36 S/L to 3011255 (1)	9.33
CIP XSTG 36 S/L to 3011256	9.33
CIP XSTG 36 S/L to 3011257 (1)	9.33
CIP XSTG 36 S/L to 3011258 (1)	9.34
CIP XSTG 36 S/L to 3011259	9.34

2030 SYSTEM	
Pipe Label	Total Volume (MG)
CIP OL-4 2	(N/A)
CIP OL-4 3	(N/A)
CIP OL-4 4	(N/A)
CIP OL-4 5	(N/A)
CIP OL-4 6	(N/A)
CIP OL-4 7	(N/A)
CIP OL-4 8	(N/A)
CIP OL-4 9	(N/A)
CIP OL-5 1	(N/A)
CIP OL-5 2	(N/A)
CIP OL-5 3	(N/A)
CIP OL-5 4	(N/A)
CIP OL-5 5	(N/A)
CIP OL-5 6	(N/A)
CIP OL-5 7	(N/A)
CIP OL-5 8	(N/A)
CIP OL-5 9	(N/A)
CIP QL to Hendricks	5.52
CIP QL to Hendricks 00	3.25
CIP QL to Hendricks 01	8.78
CIP SINE 1	(N/A)
CIP SINE 2	(N/A)
CIP SINE 3	(N/A)
CIP SL-1 1	(N/A)
CIP SL-1 2	(N/A)
CIP SL-1 3	(N/A)
CIP SL-1 4	(N/A)
CIP SL-1 5	(N/A)
CIP SL-1 6	(N/A)
CIP SL-1 7	(N/A)
CIP SL-1 8	(N/A)
CIP SL-2A 1	(N/A)
CIP SL-2A 2	(N/A)
CIP SL-2B 1	(N/A)
CIP SL-2B 2	(N/A)
CIP SL-2B 3	(N/A)
CIP SL-2B 4	(N/A)
CIP SL-2B 5	(N/A)
CIP SL-2B 6	(N/A)
CIP SL-2B 7	(N/A)
CIP SL-2B 8	(N/A)
CIP SL-2B 9	(N/A)
CIP SV PS	(N/A)
CIP SV Supply	7.94
CIP SX-1 1	(N/A)
CIP SX-1 2	(N/A)
CIP US 59 1	(N/A)
CIP US 59 2	(N/A)
CIP US 59 3	(N/A)
CIP US 59 4	(N/A)
CIP US 59 5	(N/A)
CIP UT-1 1	(N/A)
CIP UT-1 2	(N/A)
CIP UT-1 3	(N/A)
CIP UT-1 4	(N/A)
CIP Wormser 1	(N/A)
CIP Wormser 2	(N/A)
CIP XSTG 36 S/L to 3010057 (1)	7.18
CIP XSTG 36 S/L to 3010060 (1)	7.21
CIP XSTG 36 S/L to 3010605	7.16
CIP XSTG 36 S/L to 3011173	10.51
CIP XSTG 36 S/L to 3011174 (1)	10.52
CIP XSTG 36 S/L to 3011175	10.52
CIP XSTG 36 S/L to 3011176 (1)	10.52
CIP XSTG 36 S/L to 3011177	10.52
CIP XSTG 36 S/L to 3011178	10.52
CIP XSTG 36 S/L to 3011255 (1)	10.47
CIP XSTG 36 S/L to 3011256	10.48
CIP XSTG 36 S/L to 3011257 (1)	10.49
CIP XSTG 36 S/L to 3011258 (1)	10.49
CIP XSTG 36 S/L to 3011259	10.5

2070 SYSTEM	
Pipe Label	Total Volume (MG)
CIP OL-4 2	23.23
CIP OL-4 3	24.76
CIP OL-4 4	22.76
CIP OL-4 5	22.35
CIP OL-4 6	6.02
CIP OL-4 7	6.02
CIP OL-4 8	0.05
CIP OL-4 9	3.44
CIP OL-5 1	4.94
CIP OL-5 2	4.94
CIP OL-5 3	5.27
CIP OL-5 4	5.5
CIP OL-5 5	5.87
CIP OL-5 6	5.89
CIP OL-5 7	5.89
CIP OL-5 8	5.89
CIP OL-5 9	6.27
CIP QL to Hendricks	6.74
CIP QL to Hendricks 00	3.59
CIP QL to Hendricks 01	10.34
CIP SINE 1	0.73
CIP SINE 2	0.73
CIP SINE 3	0
CIP SL-1 1	2.95
CIP SL-1 2	3.97
CIP SL-1 3	4.19
CIP SL-1 4	3.19
CIP SL-1 5	3.37
CIP SL-1 6	3.57
CIP SL-1 7	3.77
CIP SL-1 8	4.93
CIP SL-2A 1	0
CIP SL-2A 2	0.62
CIP SL-2B 1	1.02
CIP SL-2B 2	0.87
CIP SL-2B 3	0.62
CIP SL-2B 4	0.31
CIP SL-2B 5	0.8
CIP SL-2B 6	1.34
CIP SL-2B 7	1.88
CIP SL-2B 8	2.22
CIP SL-2B 9	2.72
CIP SV PS	7.11
CIP SV Supply	11.83
CIP SX-1 1	0.41
CIP SX-1 2	0
CIP US 59 1	3.55
CIP US 59 2	3.55
CIP US 59 3	3.55
CIP US 59 4	3.55
CIP US 59 5	3.55
CIP UT-1 1	0.11
CIP UT-1 2	5.35
CIP UT-1 3	5.35
CIP UT-1 4	5.35
CIP Wormser 1	1.14
CIP Wormser 2	0.1
CIP XSTG 36 S/L to 3010057 (1)	13.7
CIP XSTG 36 S/L to 3010060 (1)	13.72
CIP XSTG 36 S/L to 3010605	13.68
CIP XSTG 36 S/L to 3011173	13.25
CIP XSTG 36 S/L to 3011174 (1)	13.26
CIP XSTG 36 S/L to 3011175	13.26
CIP XSTG 36 S/L to 3011176 (1)	13.26
CIP XSTG 36 S/L to 3011177	13.26
CIP XSTG 36 S/L to 3011178	13.26
CIP XSTG 36 S/L to 3011255 (1)	13.21
CIP XSTG 36 S/L to 3011256	13.22
CIP XSTG 36 S/L to 3011257 (1)	13.23
CIP XSTG 36 S/L to 3011258 (1)	13.23
CIP XSTG 36 S/L to 3011259	13.24

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
CIP XSTG 36 S/L to 3011260 (1)	9.34	CIP XSTG 36 S/L to 3011260 (1)	10.51	CIP XSTG 36 S/L to 3011260 (1)	13.25
CIP XSTG 36 S/L to 3011272 (1)	11.09	CIP XSTG 36 S/L to 3011272 (1)	7.32	CIP XSTG 36 S/L to 3011272 (1)	13.82
CIP XSTG 36 S/L to 3011273 (1)	11.1	CIP XSTG 36 S/L to 3011273 (1)	7.33	CIP XSTG 36 S/L to 3011273 (1)	13.83
CIP XSTG 36 S/L to 3011274 (1)	11.1	CIP XSTG 36 S/L to 3011274 (1)	7.34	CIP XSTG 36 S/L to 3011274 (1)	13.83
CIP XSTG 36 S/L to 3011275 (1)	11.1	CIP XSTG 36 S/L to 3011275 (1)	7.34	CIP XSTG 36 S/L to 3011275 (1)	13.84
CIP XSTG 36 S/L to 3011294 (1)	11.09	CIP XSTG 36 S/L to 3011294 (1)	7.31	CIP XSTG 36 S/L to 3011294 (1)	13.81
CIP XSTG 36 S/L to 3011298 (1)	11.08	CIP XSTG 36 S/L to 3011298 (1)	7.29	CIP XSTG 36 S/L to 3011298 (1)	13.79
CIP XSTG 36 S/L to 3011299 (1)	11.09	CIP XSTG 36 S/L to 3011299 (1)	7.31	CIP XSTG 36 S/L to 3011299 (1)	13.81
CIP XSTG 36 S/L to 3011300 (1)	11.09	CIP XSTG 36 S/L to 3011300 (1)	7.31	CIP XSTG 36 S/L to 3011300 (1)	13.81
CIP XSTG 36 S/L to 3011321 (1)	11.07	CIP XSTG 36 S/L to 3011321 (1)	7.26	CIP XSTG 36 S/L to 3011321 (1)	13.77
CIP XSTG 36 S/L to 3011322	11.08	CIP XSTG 36 S/L to 3011322	7.27	CIP XSTG 36 S/L to 3011322	13.78
CIP XSTG 36 S/L to 3011343 (1)	11.06	CIP XSTG 36 S/L to 3011343 (1)	7.23	CIP XSTG 36 S/L to 3011343 (1)	13.74
CIP XSTG 36 S/L to 3011344 (1)	11.06	CIP XSTG 36 S/L to 3011344 (1)	7.24	CIP XSTG 36 S/L to 3011344 (1)	13.75
CIP XSTG 36 S/L to 3011345 (1)	11.07	CIP XSTG 36 S/L to 3011345 (1)	7.25	CIP XSTG 36 S/L to 3011345 (1)	13.76
CIP XSTG 36 S/L to 3014261	11.05	CIP XSTG 36 S/L to 3014261	7.21	CIP XSTG 36 S/L to 3014261	13.73
CIP XSTG 36 S/L to 3014803	11.05	CIP XSTG 36 S/L to 3014803	7.2	CIP XSTG 36 S/L to 3014803	13.71
CIP XSTG 36 S/L to 3014823	11.09	CIP XSTG 36 S/L to 3014823	7.31	CIP XSTG 36 S/L to 3014823	13.81
CIP XSTG 36 S/L to 3014825	11.09	CIP XSTG 36 S/L to 3014825	7.31	CIP XSTG 36 S/L to 3014825	13.81
CIP XSTG 36 S/L to 309515	11.06	CIP XSTG 36 S/L to 309515	7.22	CIP XSTG 36 S/L to 309515	13.73
CIP XSTG 36 S/L to 309516	11.06	CIP XSTG 36 S/L to 309516	7.23	CIP XSTG 36 S/L to 309516	13.74
CIP XSTG MHOC SPLY RETIRE 01	(N/A)	CIP XSTG MHOC SPLY RETIRE 01	(N/A)	CIP XSTG MHOC SPLY RETIRE 01	18.13
CIP XSTG MHOC SPLY RETIRE 02	(N/A)	CIP XSTG MHOC SPLY RETIRE 02	(N/A)	CIP XSTG MHOC SPLY RETIRE 02	18.12
CIP XSTG MHOC SPLY RETIRE 03	(N/A)	CIP XSTG MHOC SPLY RETIRE 03	(N/A)	CIP XSTG MHOC SPLY RETIRE 03	18.12
CIP XSTG MHOC SPLY RETIRE 04	(N/A)	CIP XSTG MHOC SPLY RETIRE 04	(N/A)	CIP XSTG MHOC SPLY RETIRE 04	18.11
CIP XSTG MHOC SPLY RETIRE 05	(N/A)	CIP XSTG MHOC SPLY RETIRE 05	(N/A)	CIP XSTG MHOC SPLY RETIRE 05	18.08
CIP XSTG MHOC SPLY RETIRE 06	(N/A)	CIP XSTG MHOC SPLY RETIRE 06	(N/A)	CIP XSTG MHOC SPLY RETIRE 06	18.09
CIP XSTG MHOC SPLY RETIRE 07	(N/A)	CIP XSTG MHOC SPLY RETIRE 07	(N/A)	CIP XSTG MHOC SPLY RETIRE 07	18.08
CIP XSTG MHOC SPLY RETIRE 08	(N/A)	CIP XSTG MHOC SPLY RETIRE 08	(N/A)	CIP XSTG MHOC SPLY RETIRE 08	18.08
CIP-22061	(N/A)	CIP-22061	0.41	CIP-22061	0
Col-Laredo_Columbia_1-A	(N/A)	Col-Laredo_Columbia_1-A	(N/A)	Col-Laredo_Columbia_1-A	(N/A)
Col-Laredo_Columbia_1-B	(N/A)	Col-Laredo_Columbia_1-B	(N/A)	Col-Laredo_Columbia_1-B	(N/A)
Col-Laredo_Columbia_2-A	(N/A)	Col-Laredo_Columbia_2-A	(N/A)	Col-Laredo_Columbia_2-A	(N/A)
Col-Laredo_Columbia_2-B	(N/A)	Col-Laredo_Columbia_2-B	(N/A)	Col-Laredo_Columbia_2-B	(N/A)
Col-Laredo_Columbia_3-A	(N/A)	Col-Laredo_Columbia_3-A	(N/A)	Col-Laredo_Columbia_3-A	(N/A)
Col-Laredo_Columbia_3-B	(N/A)	Col-Laredo_Columbia_3-B	(N/A)	Col-Laredo_Columbia_3-B	(N/A)
Col-P-1069	(N/A)	Col-P-1069	(N/A)	Col-P-1069	(N/A)
Col-P-1070	0	Col-P-1070	(N/A)	Col-P-1070	(N/A)
Col-P-1075	(N/A)	Col-P-1075	(N/A)	Col-P-1075	(N/A)
Col-P-1076	0	Col-P-1076	(N/A)	Col-P-1076	(N/A)
El Pico HSPS Suction	9.72	El Pico HSPS Suction	16.53	El Pico HSPS Suction	47.9
El Pico WTP Finished Water(1)(2)	9.71	El Pico WTP Finished Water(1)(2)	16.77	El Pico WTP Finished Water(1)(2)	47.94
El Pico WTP Finished Water(2)	9.71	El Pico WTP Finished Water(2)	16.77	El Pico WTP Finished Water(2)	47.94
Hachar Discharge	0	Hachar Discharge	4.64	Hachar Discharge	0
Hwy 359 Station Q	0	Hwy 359 Station Q	0.8	Hwy 359 Station Q	2.77
IF P-21643	(N/A)	IF P-21643	0	IF P-21643	0.08
IF P-21645	0	IF P-21645	0	IF P-21645	0.07
IF P-21647	0	IF P-21647	0	IF P-21647	0.08
IF? P-19747	0.05	IF? P-19747	0.26	IF? P-19747	2.4
IF? P-19749	0.03	IF? P-19749	0.14	IF? P-19749	4.27
Jefferson WTP	16.05	Jefferson WTP	30.9	Jefferson WTP	36.31
JeffNew_HS_2-A	0	JeffNew_HS_2-A	8.91	JeffNew_HS_2-A	9.07
JeffNew_HS_2-B	0	JeffNew_HS_2-B	8.91	JeffNew_HS_2-B	9.07
JeffNew_HS-A	16.05	JeffNew_HS-A	13.09	JeffNew_HS-A	18.18
JeffNew_HS-B	16.05	JeffNew_HS-B	13.09	JeffNew_HS-B	18.18
JeffP-367	13.07	JeffP-367	14.62	JeffP-367	9.35
JeffP-368a	2.98	JeffP-368a	2.04	JeffP-368a	6.99
JeffP-388	9.35	JeffP-388	10.53	JeffP-388	13.26
JeffP-785a	15.46	JeffP-785a	13.43	JeffP-785a	16.34
JeffP-786a	16.05	JeffP-786a	0	JeffP-786a	0
JeffUpper_1-A	5.61	JeffUpper_1-A	13.47	JeffUpper_1-A	18.64
JeffUpper_1-B(1)	5.61	JeffUpper_1-B(1)	13.47	JeffUpper_1-B(1)	18.64
JeffUpper_1-B(2)	4.18	JeffUpper_1-B(2)	13.67	JeffUpper_1-B(2)	18.85
JeffUpper_2-A	0	JeffUpper_2-A	13.47	JeffUpper_2-A	18.64
JeffUpper_2-B(1)	0	JeffUpper_2-B(1)	13.47	JeffUpper_2-B(1)	18.64
JeffUpper_2-B(2)	2.96	JeffUpper_2-B(2)	0.2	JeffUpper_2-B(2)	0.21
JeffUpper_3-A	11.59	JeffUpper_3-A	13.58	JeffUpper_3-A	19.13
JeffUpper_3-B(1)	11.59	JeffUpper_3-B(1)	13.58	JeffUpper_3-B(1)	19.13
JeffUpper_3-B(2)	2.96	JeffUpper_3-B(2)	13.27	JeffUpper_3-B(2)	18.43
Lyn-Lyon_1-A	5.43	Lyn-Lyon_1-A	0	Lyn-Lyon_1-A	0
Lyn-Lyon_1-B	5.43	Lyn-Lyon_1-B	0	Lyn-Lyon_1-B	0
Lyn-Lyon_2-A	4.13	Lyn-Lyon_2-A	0	Lyn-Lyon_2-A	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
Lyn-Lyon_2-B	4.13
Lyn-Lyon_3-A	0
Lyn-Lyon_3-B	0
Lyn-Lyon_4-A	0
Lyn-Lyon_4-B	0
Lyn-Lyon_5-A	0
Lyn-Lyon_5-B	0
Lyn-P-380a	3.09
Lyn-P-385a	5.25
Lyn-P-387a	3.09
Lyn-P-390a	5.25
Lyn-P-392a	3.09
Lyn-P-395	5.25
Lyn-P-397	3.09
Lyn-P-400	1.11
Lyn-P-402a	2.28
Lyon GST Supply(2)(1)	1.49
Lyon GST Supply(2)(2)(1)	1.93
Lyon GST Supply(2)(2)(2)	3.79
Lyon PS Production	4.44
Mc-highland_1-A	0
Mc-highland_1-B	0
Mc-highland_2-A	1.72
Mc-highland_2-B	1.72
Mc-highland_3-A	1.72
Mc-highland_3-B	1.72
Mc-highland_4-A	0
Mc-highland_4-B	0
Mc-Highland_Jockey-A	0
Mc-Highland_Jockey-B	0
Mc-P-834a	0
Mc-P-835	0
Mc-P-838	3.45
Mc-P-839	1.72
Mc-P-840a	1.72
Mc-P-841	3.45
MH-MHOC_1-A	7.42
MH-MHOC_1-B	7.42
MH-MHOC_2-A	7.42
MH-MHOC_2-B	7.42
MH-MHOC_3-A	0
MH-MHOC_3-B	0
MH-MHOC_Fill-A	13.9
MH-MHOC_Fill-B	13.9
MH-P-18919	0
MH-P-18921	0
MH-P-18923	0
MH-P-18925	0
MH-P-18927	0
MH-P-18929	0
MH-P-400220	13.9
MH-P-482	1.44
MH-P-483	3.78
MH-P-487	5.98
MH-P-488(1)	3.63
MH-P-488(2)	0
MH-P-737	7.48
MH-P-738	5.98
Mlmo-milmo_1-A	5.81
Mlmo-milmo_1-B	5.81
Mlmo-Milmo_2-A	2.55
Mlmo-Milmo_2-B	2.55
Mlmo-Milmo_3-A	0
Mlmo-Milmo_3-B	0
Mlmo-Milmo_4-A	0
Mlmo-Milmo_4-B	0
Mlmo-Milmo_Fill-A(1)	8.37
Mlmo-Milmo_Fill-B	8.37
Mlmo-P-400230	8.37
Mlmo-P-441	4.34
Mlmo-P-444	1.66

2030 SYSTEM	
Pipe Label	Total Volume (MG)
Lyn-Lyon_2-B	0
Lyn-Lyon_3-A	0
Lyn-Lyon_3-B	0
Lyn-Lyon_4-A	0.98
Lyn-Lyon_4-B	0.98
Lyn-Lyon_5-A	2.24
Lyn-Lyon_5-B	2.24
Lyn-P-380a	2.07
Lyn-P-385a	0.63
Lyn-P-387a	1.36
Lyn-P-390a	1.14
Lyn-P-392a	2.11
Lyn-P-395	1.14
Lyn-P-397	2.11
Lyn-P-400	1.14
Lyn-P-402a	2.11
Lyon GST Supply(2)(1)	0.72
Lyon GST Supply(2)(2)(1)	0.43
Lyon GST Supply(2)(2)(2)	0.43
Lyon PS Production	1.14
Mc-highland_1-A	0
Mc-highland_1-B	0
Mc-highland_2-A	0
Mc-highland_2-B	0
Mc-highland_3-A	0
Mc-highland_3-B	0
Mc-highland_4-A	0
Mc-highland_4-B	0
Mc-Highland_Jockey-A	0
Mc-Highland_Jockey-B	0
Mc-P-834a	0
Mc-P-835	0
Mc-P-838	0
Mc-P-839	0
Mc-P-840a	0
Mc-P-841	0
MH-MHOC_1-A	7.31
MH-MHOC_1-B	7.31
MH-MHOC_2-A	7.31
MH-MHOC_2-B	7.31
MH-MHOC_3-A	1.3
MH-MHOC_3-B	1.3
MH-MHOC_Fill-A	28.82
MH-MHOC_Fill-B	28.82
MH-P-18919	5.32
MH-P-18921	5.32
MH-P-18923	4.98
MH-P-18925	4.98
MH-P-18927	2.03
MH-P-18929	2.03
MH-P-400220	28.82
MH-P-482	0.85
MH-P-483	12.29
MH-P-487	7.53
MH-P-488(1)	0
MH-P-488(2)	3.33
MH-P-737	16.91
MH-P-738	8.83
Mlmo-milmo_1-A	4.03
Mlmo-milmo_1-B	4.03
Mlmo-Milmo_2-A	4.75
Mlmo-Milmo_2-B	4.75
Mlmo-Milmo_3-A	4.06
Mlmo-Milmo_3-B	4.06
Mlmo-Milmo_4-A	4.06
Mlmo-Milmo_4-B	4.06
Mlmo-Milmo_Fill-A(1)	17.14
Mlmo-Milmo_Fill-B	17.14
Mlmo-P-400230	17.14
Mlmo-P-441	8.68
Mlmo-P-444	4.65

2070 SYSTEM	
Pipe Label	Total Volume (MG)
Lyn-Lyon_2-B	0
Lyn-Lyon_3-A	5.97
Lyn-Lyon_3-B	5.97
Lyn-Lyon_4-A	1.46
Lyn-Lyon_4-B	1.46
Lyn-Lyon_5-A	5.38
Lyn-Lyon_5-B	5.38
Lyn-P-380a	6.15
Lyn-P-385a	2.71
Lyn-P-387a	2.17
Lyn-P-390a	1.85
Lyn-P-392a	2.64
Lyn-P-395	4.72
Lyn-P-397	6.66
Lyn-P-400	4.72
Lyn-P-402a	6.66
Lyon GST Supply(2)(1)	2.82
Lyon GST Supply(2)(2)(1)	1.53
Lyon GST Supply(2)(2)(2)	1.53
Lyon PS Production	4.72
Mc-highland_1-A	0
Mc-highland_1-B	0
Mc-highland_2-A	0
Mc-highland_2-B	0
Mc-highland_3-A	0
Mc-highland_3-B	0
Mc-highland_4-A	0
Mc-highland_4-B	0
Mc-Highland_Jockey-A	0
Mc-Highland_Jockey-B	0
Mc-P-834a	0
Mc-P-835	0
Mc-P-838	0
Mc-P-839	0
Mc-P-840a	0
Mc-P-841	0
MH-MHOC_1-A	1.63
MH-MHOC_1-B	1.63
MH-MHOC_2-A	12.3
MH-MHOC_2-B	12.3
MH-MHOC_3-A	1.48
MH-MHOC_3-B	1.48
MH-MHOC_Fill-A	23
MH-MHOC_Fill-B	23
MH-P-18919	6.51
MH-P-18921	6.51
MH-P-18923	1.82
MH-P-18925	1.82
MH-P-18927	0.91
MH-P-18929	0.91
MH-P-400220	23
MH-P-482	5.12
MH-P-483	14.11
MH-P-487	7.62
MH-P-488(1)	0
MH-P-488(2)	2.4
MH-P-737	14.8
MH-P-738	9.1
Mlmo-milmo_1-A	0
Mlmo-milmo_1-B	0
Mlmo-Milmo_2-A	4.38
Mlmo-Milmo_2-B	4.38
Mlmo-Milmo_3-A	4.38
Mlmo-Milmo_3-B	4.38
Mlmo-Milmo_4-A	5.44
Mlmo-Milmo_4-B	5.44
Mlmo-Milmo_Fill-A(1)	15.08
Mlmo-Milmo_Fill-B	15.08
Mlmo-P-400230	15.08
Mlmo-P-441	7.25
Mlmo-P-444	7.25

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
Mlmo-P-446	2.44	Mlmo-P-446	11.24	Mlmo-P-446	12.59
Mlmo-P-449	4.02	Mlmo-P-449	1.26	Mlmo-P-449	2.87
Mlmo-P-451	0.89	Mlmo-P-451	6.49	Mlmo-P-451	8.21
Mlmo-P-454	4.02	Mlmo-P-454	4.16	Mlmo-P-454	1.51
Mlmo-P-456	0.89	Mlmo-P-456	2.42	Mlmo-P-456	3.83
MP-21109	(N/A)	MP-21109	(N/A)	MP-21109	0
MP-21229	(N/A)	MP-21229	0.01	MP-21229	0.39
MP-21239	(N/A)	MP-21239	(N/A)	MP-21239	0.55
MP-21243	(N/A)	MP-21243	(N/A)	MP-21243	0
MP-21247	(N/A)	MP-21247	(N/A)	MP-21247	0.14
MP-21329	(N/A)	MP-21329	(N/A)	MP-21329	0.26
MP-21331	(N/A)	MP-21331	(N/A)	MP-21331	0.33
MP-21337	(N/A)	MP-21337	(N/A)	MP-21337	0.26
MP-21359	(N/A)	MP-21359	(N/A)	MP-21359	1.84
MP-21361	(N/A)	MP-21361	(N/A)	MP-21361	1.45
MP-21363	(N/A)	MP-21363	(N/A)	MP-21363	0.79
MP-21429(2)(1)	(N/A)	MP-21429(2)(1)	(N/A)	MP-21429(2)(1)	0.03
MP-21429(2)(2)	(N/A)	MP-21429(2)(2)	(N/A)	MP-21429(2)(2)	0
MP-21431(1)(2)	(N/A)	MP-21431(1)(2)	(N/A)	MP-21431(1)(2)	0
MP-21431(2)	(N/A)	MP-21431(2)	(N/A)	MP-21431(2)	0
MP-21433	(N/A)	MP-21433	(N/A)	MP-21433	0
MP-21437	(N/A)	MP-21437	(N/A)	MP-21437	0
MP-21439	(N/A)	MP-21439	(N/A)	MP-21439	0
MP-21529	(N/A)	MP-21529	(N/A)	MP-21529	0.29
MP-528	(N/A)	MP-528	(N/A)	MP-528	(N/A)
MP-66293	(N/A)	MP-66293	0.01	MP-66293	0.01
MP-66295	(N/A)	MP-66295	0.02	MP-66295	0.02
NW EST from N	2.62	NW EST from N	2.46	NW EST from N	2.25
NW EST from S	2.61	NW EST from S	2.47	NW EST from S	2.36
NW EST Q	1.05	NW EST Q	1.08	NW EST Q	1.17
OPTION-16093	1.75	OPTION-16093	1.58	OPTION-16093	0.65
OPTION-21659	(N/A)	OPTION-21659	(N/A)	OPTION-21659	2.43
OPTION-21661	(N/A)	OPTION-21661	0	OPTION-21661	0
OPTION-21719	(N/A)	OPTION-21719	(N/A)	OPTION-21719	(N/A)
OPTION-21729(2)	(N/A)	OPTION-21729(2)	0	OPTION-21729(2)	0
OPTION-21867	(N/A)	OPTION-21867	(N/A)	OPTION-21867	(N/A)
OPTION-7825	2.5	OPTION-7825	3.81	OPTION-7825	2.31
P-100	0.01	P-100	0.01	P-100	0.01
P-10000 (1)	0.01	P-10000 (1)	0.02	P-10000 (1)	0.03
P-10000 (2)	0.05	P-10000 (2)	0.02	P-10000 (2)	0.01
P-10001 (1)	0.01	P-10001 (1)	0.01	P-10001 (1)	0.01
P-10001 (2)	0.17	P-10001 (2)	0.05	P-10001 (2)	0.12
P-10002	0.11	P-10002	0.02	P-10002	0.06
P-10003	0.13	P-10003	0.21	P-10003	0.25
P-10004	0.06	P-10004	0.11	P-10004	0.11
P-10005(1)	0.07	P-10005(1)	0.13	P-10005(1)	0.23
P-10005(2)	0.01	P-10005(2)	0.01	P-10005(2)	0.01
P-10007	0.07	P-10007	0.03	P-10007	0.02
P-10008	0.06	P-10008	0.04	P-10008	0.03
P-10009	0.26	P-10009	0.8	P-10009	1.01
P-1001	0.02	P-1001	0.03	P-1001	0.03
P-10010	0.55	P-10010	0.77	P-10010	1.07
P-10012	0.03	P-10012	0.04	P-10012	0.04
P-10013	0.01	P-10013	0.03	P-10013	0.04
P-10014	0.01	P-10014	0.03	P-10014	0.04
P-10016	0.02	P-10016	0.01	P-10016	0.01
P-10018	0.01	P-10018	0.03	P-10018	0.03
P-1002	0.02	P-1002	0.01	P-1002	0.01
P-10020(1)	0.03	P-10020(1)	0.56	P-10020(1)	0.27
P-10020(2)	0.19	P-10020(2)	0.4	P-10020(2)	0.13
P-10023	0.26	P-10023	0.14	P-10023	0.2
P-10025	0.3	P-10025	1.19	P-10025	1.1
P-10026	0.09	P-10026	0.86	P-10026	0.81
P-10027	0.23	P-10027	0.61	P-10027	0.5
P-10028 (1)	0.11	P-10028 (1)	0.07	P-10028 (1)	0.06
P-10028 (2)	0.9	P-10028 (2)	0.94	P-10028 (2)	0.83
P-10029	8.03	P-10029	3.51	P-10029	4.6
P-10030	8.03	P-10030	3.51	P-10030	4.61
P-10032	0.1	P-10032	0.1	P-10032	0.17
P-10034	0.05	P-10034	0.13	P-10034	0.15
P-10035	4.56	P-10035	10.95	P-10035	9.71

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-10036	4.56	P-10036	10.95	P-10036	9.71
P-10037	0.2	P-10037	0.18	P-10037	0.06
P-10038	0.31	P-10038	0.29	P-10038	0.16
P-10039	0	P-10039	0	P-10039	0
P-1004	0.3	P-1004	0.43	P-1004	0.28
P-10040	0	P-10040	0.01	P-10040	0.42
P-10041	0.04	P-10041	0.02	P-10041	0
P-10043	0.17	P-10043	0.14	P-10043	0.1
P-10045	0.02	P-10045	0.03	P-10045	0.03
P-10046	0	P-10046	0	P-10046	0
P-10047	0.01	P-10047	0.02	P-10047	0.02
P-10048	0.03	P-10048	0.12	P-10048	0.08
P-10050	0.15	P-10050	0.23	P-10050	0.53
P-10051	0.01	P-10051	0.05	P-10051	0.08
P-10052	0.01	P-10052	0.03	P-10052	0.05
P-10053	0.08	P-10053	0.26	P-10053	0.12
P-10054	0.04	P-10054	0.1	P-10054	0.06
P-10055	0.07	P-10055	0.09	P-10055	0.1
P-10057 (2)	0.02	P-10057 (2)	0.04	P-10057 (2)	0.04
P-10058	0.02	P-10058	0.03	P-10058	0.03
P-1006	0.01	P-1006	0.01	P-1006	0.01
P-10060 (2)	0.01	P-10060 (2)	0.03	P-10060 (2)	0.02
P-10061	0	P-10061	0.01	P-10061	0.01
P-10062	0	P-10062	0.01	P-10062	0.01
P-10063	0.05	P-10063	0.19	P-10063	0.14
P-10064	0.09	P-10064	0.35	P-10064	0.25
P-10068 (1)	0.18	P-10068 (1)	0.06	P-10068 (1)	0.17
P-10068 (2)	0.14	P-10068 (2)	0.21	P-10068 (2)	0.16
P-10069	0.4	P-10069	0.26	P-10069	0.33
P-1007	0.02	P-1007	0.04	P-1007	0.05
P-10070	1.18	P-10070	0.93	P-10070	1.08
P-10071(1)	0.56	P-10071(1)	0.45	P-10071(1)	0.28
P-10071(2)	0.47	P-10071(2)	0.38	P-10071(2)	0.24
P-10073(1)	0.18	P-10073(1)	0.57	P-10073(1)	2.46
P-10073(2)	0.18	P-10073(2)	0.57	P-10073(2)	2.46
P-10074	0.24	P-10074	0.61	P-10074	2.5
P-10076	0.2	P-10076	0.03	P-10076	0.06
P-10077	0.18	P-10077	0.04	P-10077	0.1
P-10078 (1)	0.19	P-10078 (1)	0.04	P-10078 (1)	0.12
P-10078 (2)	0.06	P-10078 (2)	0.05	P-10078 (2)	0.05
P-10079	0.02	P-10079	0.02	P-10079	0.05
P-10081	0.03	P-10081	0.12	P-10081	0.26
P-10082	0.03	P-10082	0.11	P-10082	0.25
P-10083	0.02	P-10083	0.04	P-10083	0.03
P-10084	0	P-10084	0	P-10084	0
P-10085	0	P-10085	0	P-10085	0
P-10088	0.25	P-10088	0.38	P-10088	0.17
P-10089	0.05	P-10089	0.12	P-10089	0.05
P-1009	0	P-1009	0.01	P-1009	0.01
P-10090	0.05	P-10090	0.04	P-10090	0.15
P-10091	0.01	P-10091	0.02	P-10091	0.03
P-10092	0.01	P-10092	0.02	P-10092	0.03
P-10093	0.01	P-10093	0.09	P-10093	0.04
P-10094	0.03	P-10094	0.07	P-10094	0.03
P-10095	0.53	P-10095	0.21	P-10095	0.31
P-101	0.86	P-101	0.38	P-101	0.31
P-10100	0.07	P-10100	0.07	P-10100	0.07
P-10102	0.07	P-10102	0.05	P-10102	0.1
P-10104	0.06	P-10104	0.22	P-10104	0.08
P-10106	0.08	P-10106	0.06	P-10106	0.05
P-10107	0.03	P-10107	0.06	P-10107	0.08
P-10108	0.11	P-10108	0.05	P-10108	0.09
P-10109 (1)	0.07	P-10109 (1)	0.05	P-10109 (1)	0.05
P-10109 (2)	0.33	P-10109 (2)	0.16	P-10109 (2)	0.24
P-1011	0.01	P-1011	0.06	P-1011	0.07
P-10110	0.12	P-10110	0.07	P-10110	0.09
P-10111 (1)	0.1	P-10111 (1)	0.06	P-10111 (1)	0.08
P-10111 (2)	0.04	P-10111 (2)	0.08	P-10111 (2)	0.09
P-10113	0.17	P-10113	0.22	P-10113	0.06
P-10114	0.33	P-10114	0.44	P-10114	0.12
P-10115	0.01	P-10115	0.06	P-10115	0.43

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-10116	0	P-10116	0.05	P-10116	0.24
P-10121	0.18	P-10121	0.11	P-10121	0.14
P-10123	0.23	P-10123	0.66	P-10123	0.78
P-10124	0.23	P-10124	0.68	P-10124	0.8
P-10126	0.01	P-10126	0.02	P-10126	0.01
P-10127	0.01	P-10127	0.02	P-10127	0.01
P-10128	0.14	P-10128	0.04	P-10128	0.04
P-10129	0.01	P-10129	0.01	P-10129	0.02
P-1013	0.01	P-1013	0.02	P-1013	0.02
P-10130	0.04	P-10130	0.05	P-10130	0.37
P-10133	0.03	P-10133	0.03	P-10133	0.08
P-10134	0.1	P-10134	0.12	P-10134	0.15
P-10135	0.1	P-10135	0.13	P-10135	0.15
P-10136 (1)	0.76	P-10136 (1)	0.58	P-10136 (1)	1.37
P-10136 (2)	0.14	P-10136 (2)	0.21	P-10136 (2)	0.24
P-10137	2.15	P-10137	9.76	P-10137	6.25
P-10138 (1)	0.01	P-10138 (1)	0.03	P-10138 (1)	0.02
P-10138 (2)	2.03	P-10138 (2)	9.32	P-10138 (2)	5.89
P-10139	0.41	P-10139	0.25	P-10139	0.31
P-1014	0	P-1014	0.01	P-1014	0.01
P-10140	0.41	P-10140	0.26	P-10140	0.32
P-10141 (1)	0	P-10141 (1)	0.01	P-10141 (1)	0.01
P-10141 (2)	0.33	P-10141 (2)	0.43	P-10141 (2)	0.54
P-10142 (1)	0.01	P-10142 (1)	0.02	P-10142 (1)	0.01
P-10142 (2)	0.34	P-10142 (2)	0.44	P-10142 (2)	0.68
P-10144	0.09	P-10144	0.04	P-10144	0.01
P-10145	0.08	P-10145	0.12	P-10145	0.1
P-10146	1.92	P-10146	2.96	P-10146	1.44
P-10147	0.05	P-10147	0.02	P-10147	0.01
P-10148 (1)	0.83	P-10148 (1)	0.99	P-10148 (1)	1
P-10148 (2)	0.02	P-10148 (2)	0.06	P-10148 (2)	0.09
P-10149 (1)	3.09	P-10149 (1)	2.07	P-10149 (1)	6.15
P-10149 (2)	0.06	P-10149 (2)	0.08	P-10149 (2)	0.1
P-10150 (1)	6.75	P-10150 (1)	2.11	P-10150 (1)	6.66
P-10150 (2)	0.1	P-10150 (2)	0.08	P-10150 (2)	0.18
P-10151 (1)	2.75	P-10151 (1)	2.45	P-10151 (1)	1.09
P-10151 (2)	1.21	P-10151 (2)	9.21	P-10151 (2)	5.32
P-10152	0.02	P-10152	0.04	P-10152	0.03
P-10152(1)	1.23	P-10152(1)	9.5	P-10152(1)	5.41
P-10152(2)	0.53	P-10152(2)	8.31	P-10152(2)	3.47
P-10153	0.11	P-10153	0.07	P-10153	0.06
P-10154 (1)	2.09	P-10154 (1)	1.32	P-10154 (1)	3.11
P-10154 (2)	0.21	P-10154 (2)	0.11	P-10154 (2)	0.11
P-10155	1.02	P-10155	0.79	P-10155	1.53
P-10155(1)	0	P-10155(1)	0	P-10155(1)	0
P-10155(2)	0	P-10155(2)	0	P-10155(2)	0
P-10156 (1)	1.02	P-10156 (1)	0.79	P-10156 (1)	1.53
P-10156 (2)	0.02	P-10156 (2)	0.03	P-10156 (2)	0.03
P-10157 (1)	1.14	P-10157 (1)	0.88	P-10157 (1)	2.19
P-10157 (2)	0.04	P-10157 (2)	0.09	P-10157 (2)	0.11
P-10158	0.04	P-10158	0.08	P-10158	0.09
P-10159	0.04	P-10159	0.02	P-10159	0.02
P-10160	0.16	P-10160	0.07	P-10160	0.11
P-10162	0.02	P-10162	0.19	P-10162	0.51
P-10164(2)	0.17	P-10164(2)	0.04	P-10164(2)	0.11
P-10165 (1)	0.16	P-10165 (1)	0.07	P-10165 (1)	0.14
P-10165 (2)	0	P-10165 (2)	0	P-10165 (2)	0
P-10166	0.02	P-10166	0.02	P-10166	0.04
P-10167 (1)	2.88	P-10167 (1)	1.59	P-10167 (1)	1.8
P-10167 (2)	0.16	P-10167 (2)	0.22	P-10167 (2)	0.14
P-10168	2.89	P-10168	1.59	P-10168	1.81
P-10169 (1)	2.89	P-10169 (1)	1.6	P-10169 (1)	4.24
P-10169 (2)	0.99	P-10169 (2)	2.41	P-10169 (2)	0.54
P-10170	0.99	P-10170	2.41	P-10170	0.54
P-10175	0.01	P-10175	0.02	P-10175	1.78
P-10176	0.15	P-10176	0.06	P-10176	0.09
P-10179	0.06	P-10179	0.13	P-10179	0.14
P-10180	0.18	P-10180	0.41	P-10180	0.38
P-10183 (1)	0.15	P-10183 (1)	0.04	P-10183 (1)	0.05
P-10183 (2)	0.98	P-10183 (2)	0.79	P-10183 (2)	0.8
P-10184	0.27	P-10184	0.07	P-10184	0.09

EXISTING SYSTEM			2030 SYSTEM			2070 SYSTEM	
Pipe Label	Total Volume (MG)		Pipe Label	Total Volume (MG)		Pipe Label	Total Volume (MG)
P-10187	0.09		P-10187	0.09		P-10187	0.1
P-10188	0.06		P-10188	0.1		P-10188	0.1
P-10189	0.2		P-10189	0.16		P-10189	0.13
P-1019	0.07		P-1019	0.02		P-1019	0.02
P-10190	0.22		P-10190	0.17		P-10190	0.13
P-10191	0.1		P-10191	0.05		P-10191	0.04
P-10192	0.1		P-10192	0.14		P-10192	0.15
P-10193	0.11		P-10193	0.06		P-10193	0.02
P-10194	0.11		P-10194	0.07		P-10194	0.02
P-10195	3.67		P-10195	1.06		P-10195	0.46
P-10196	3.67		P-10196	1.8		P-10196	3.1
P-10197	0.06		P-10197	0.09		P-10197	0.1
P-10197(1)	0.36		P-10197(1)	0.16		P-10197(1)	0.17
P-10197(2)	0.36		P-10197(2)	0.16		P-10197(2)	0.17
P-10198	0.22		P-10198	0.32		P-10198	0.33
P-10199	0.3		P-10199	0.16		P-10199	0.21
P-102	0.17		P-102	0.15		P-102	0.12
P-1020	0.02		P-1020	0.05		P-1020	0.06
P-10201	0.01		P-10201	0.02		P-10201	0.02
P-10203	0.1		P-10203	0.03		P-10203	0.02
P-10204 (1)	0.11		P-10204 (1)	0.08		P-10204 (1)	0.08
P-10204 (2)	0.09		P-10204 (2)	0.06		P-10204 (2)	0.07
P-10207 (1)	0.09		P-10207 (1)	0.06		P-10207 (1)	0.07
P-10207 (2)	1.83		P-10207 (2)	1.87		P-10207 (2)	0.22
P-10208 (1)	0.08		P-10208 (1)	0.06		P-10208 (1)	0.06
P-10208 (2)	2.16		P-10208 (2)	2.3		P-10208 (2)	0.11
P-10209 (1)	0.02		P-10209 (1)	0.04		P-10209 (1)	0.04
P-10209 (2)	0.1		P-10209 (2)	0.1		P-10209 (2)	0.12
P-10210	0.11		P-10210	0.12		P-10210	0.14
P-10212 (1)	0.07		P-10212 (1)	0.05		P-10212 (1)	0.05
P-10212 (2)	4.42		P-10212 (2)	5.47		P-10212 (2)	7.36
P-10213	0.07		P-10213	0.05		P-10213	0.05
P-10214	0.07		P-10214	0.03		P-10214	0.04
P-10215	0.02		P-10215	0.02		P-10215	0.02
P-10216 (1)	0.01		P-10216 (1)	0.01		P-10216 (1)	0.01
P-10216 (2)	0.1		P-10216 (2)	0.13		P-10216 (2)	0.23
P-10217	0		P-10217	0.01		P-10217	0.01
P-10219 (1)	0.08		P-10219 (1)	0.03		P-10219 (1)	0.03
P-10219 (2)	0.11		P-10219 (2)	0.11		P-10219 (2)	0.09
P-10220 (1)	0.08		P-10220 (1)	0.03		P-10220 (1)	0.04
P-10220 (2)	0.12		P-10220 (2)	0.07		P-10220 (2)	0.05
P-10221 (1)	0.07		P-10221 (1)	0.03		P-10221 (1)	0.03
P-10221 (2)	0.06		P-10221 (2)	0.07		P-10221 (2)	0.08
P-10223	0.13		P-10223	0.07		P-10223	0.21
P-10224	0.11		P-10224	0.1		P-10224	0.14
P-10226	0.01		P-10226	0.02		P-10226	0.02
P-10227	0.41		P-10227	0.23		P-10227	0.28
P-10228 (1)	0.08		P-10228 (1)	0.03		P-10228 (1)	0.03
P-10228 (2)	0.42		P-10228 (2)	0.25		P-10228 (2)	0.3
P-10229 (1)	0.09		P-10229 (1)	0.04		P-10229 (1)	0.04
P-10229 (2)	4.63		P-10229 (2)	5.64		P-10229 (2)	7.42
P-10232	0.42		P-10232	0.4		P-10232	0.36
P-10233 (1)	0.1		P-10233 (1)	0.04		P-10233 (1)	0.04
P-10233 (2)	0.18		P-10233 (2)	0.43		P-10233 (2)	0.49
P-10234	0.24		P-10234	0.57		P-10234	0.66
P-10235	0.05		P-10235	0.1		P-10235	0.14
P-10238	0.02		P-10238	0.02		P-10238	0.04
P-10239	2.9		P-10239	1.61		P-10239	4.25
P-10240	3.92		P-10240	2.37		P-10240	5.79
P-10241 (1)	0.06		P-10241 (1)	0.04		P-10241 (1)	0.09
P-10241 (2)	0.01		P-10241 (2)	0.62		P-10241 (2)	0.6
P-10245	0.9		P-10245	0.73		P-10245	0.69
P-10246	0.45		P-10246	1.48		P-10246	0.36
P-10248	4.55		P-10248	10.94		P-10248	9.7
P-10249	0.52		P-10249	0.04		P-10249	0.05
P-1025	0		P-1025	0.01		P-1025	0.01
P-10250	0.75		P-10250	0.06		P-10250	0.07
P-10252 (1)	0.21		P-10252 (1)	0.09		P-10252 (1)	0.34
P-10252 (2)	0.11		P-10252 (2)	0.12		P-10252 (2)	0.08
P-10253 (1)	0.15		P-10253 (1)	0.18		P-10253 (1)	0.2
P-10253 (2)	0.14		P-10253 (2)	0.2		P-10253 (2)	0.35

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-10254	0.06
P-10255	0.18
P-10256	0.21
P-10257	0.22
P-10258	0.22
P-10259	0.69
P-10260 (1)	0.07
P-10260 (2)	0.7
P-10263	0.42
P-10265 (1)	0.05
P-10265 (2)	0.55
P-10266	0
P-10267	0.23
P-10268	0.23
P-10269	0.17
P-1027	0.28
P-10271 (1)	0.06
P-10271 (2)	1.5
P-10272 (1)	0.04
P-10272 (2)	1.56
P-10273	0.06
P-10273(1)	0
P-10273(2)	0
P-10274	0.12
P-10275	0.03
P-10276	0.24
P-10277	0.01
P-10278	0
P-1028	0.24
P-10281	0.05
P-10283	0.98
P-10286	0.44
P-10287	0.29
P-10289	0.01
P-10291	1.78
P-10292(1)	2.42
P-10292(2)	4.05
P-10293	0.02
P-10294	0.01
P-10295	0.14
P-10296	0.66
P-10297	0.04
P-10298 (1)	0.02
P-10298 (2)	0.04
P-10299	0.04
P-103	0.01
P-1030	0.01
P-10301	0.23
P-10302(1)	0.02
P-10302(2)	0.03
P-10303	0.02
P-10304	0.18
P-10307	0.13
P-10308	0.06
P-10309	0.05
P-10312	0.13
P-10314	0.17
P-10315 (1)	0.09
P-10315 (2)	0.04
P-10316	0.04
P-10317	0.04
P-10321	0.04
P-10322 (1)	0.05
P-10322 (2)	0.09
P-10323	0.01
P-10324	0
P-10325 (1)	0.02
P-10325 (2)	0.01
P-10326	0
P-10327 (1)	0.09
P-10327 (2)	0.04

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-10254	0.09
P-10255	0.37
P-10256	0.44
P-10257	0.19
P-10258	0.2
P-10259	0.34
P-10260 (1)	0.1
P-10260 (2)	0.35
P-10263	0.4
P-10265 (1)	0.15
P-10265 (2)	0.36
P-10266	0
P-10267	0.16
P-10268	0.15
P-10269	0.37
P-1027	0.74
P-10271 (1)	0.1
P-10271 (2)	1.44
P-10272 (1)	0.11
P-10272 (2)	1.49
P-10273	0.13
P-10273(1)	0
P-10273(2)	0
P-10274	0.01
P-10275	0.14
P-10276	0.37
P-10277	0.18
P-10278	0.14
P-1028	0.68
P-10281	0.07
P-10283	0.73
P-10286	0.42
P-10287	0.12
P-10289	0.01
P-10291	4.2
P-10292(1)	9.87
P-10292(2)	14.85
P-10293	0.06
P-10294	0.02
P-10295	1.43
P-10296	0.23
P-10297	0.02
P-10298 (1)	0.06
P-10298 (2)	0.02
P-10299	0.11
P-103	0.01
P-1030	0.02
P-10301	0.06
P-10302(1)	0.03
P-10302(2)	0.03
P-10303	0.06
P-10304	0.52
P-10307	0.07
P-10308	0.07
P-10309	0.15
P-10312	0.08
P-10314	0.14
P-10315 (1)	0.23
P-10315 (2)	0.08
P-10316	0.09
P-10317	0.11
P-10321	0.11
P-10322 (1)	0.12
P-10322 (2)	0.05
P-10323	0.02
P-10324	0.01
P-10325 (1)	0.04
P-10325 (2)	0
P-10326	0
P-10327 (1)	0.19
P-10327 (2)	0.05

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-10254	0.16
P-10255	0.68
P-10256	0.47
P-10257	0.17
P-10258	0.18
P-10259	0.34
P-10260 (1)	0.09
P-10260 (2)	0.34
P-10263	0.36
P-10265 (1)	0.05
P-10265 (2)	0.48
P-10266	0
P-10267	0.13
P-10268	0.12
P-10269	0.38
P-1027	0.84
P-10271 (1)	0.13
P-10271 (2)	1.47
P-10272 (1)	0.07
P-10272 (2)	1.52
P-10273	0.04
P-10273(1)	0
P-10273(2)	0
P-10274	0.04
P-10275	0.07
P-10276	0.3
P-10277	0.2
P-10278	0.24
P-1028	0.77
P-10281	0.06
P-10283	1.5
P-10286	0.42
P-10287	0.18
P-10289	0.02
P-10291	3.59
P-10292(1)	8.4
P-10292(2)	11.85
P-10293	0.07
P-10294	0.02
P-10295	1.49
P-10296	0.65
P-10297	0.02
P-10298 (1)	0.01
P-10298 (2)	0.02
P-10299	0.06
P-103	0.01
P-1030	0.02
P-10301	0.13
P-10302(1)	0.05
P-10302(2)	0.06
P-10303	0.02
P-10304	0.31
P-10307	0.08
P-10308	0.06
P-10309	0.11
P-10312	0.08
P-10314	0.29
P-10315 (1)	0.15
P-10315 (2)	0.1
P-10316	0.08
P-10317	0.06
P-10321	0.08
P-10322 (1)	0.13
P-10322 (2)	0.06
P-10323	0.01
P-10324	0.01
P-10325 (1)	0.03
P-10325 (2)	0.02
P-10326	0
P-10327 (1)	0.12
P-10327 (2)	0.02

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-10328	0.11
P-10329 (1)	0.08
P-10329 (2)	0.01
P-1033	0.14
P-10330	0
P-10331	0
P-10332	0
P-10334	0.04
P-10335	0
P-10338 (1)	0.02
P-10338 (2)	0.06
P-10340	0.03
P-10341 (1)	0.03
P-10341 (2)	0.02
P-10342 (1)	0.02
P-10342 (2)	0.01
P-10346	0.3
P-10347	0.01
P-10348	0
P-10349	0.01
P-10350	0.01
P-10360	0.16
P-10364	0.01
P-10365 (1)	0.04
P-10365 (2)	0.02
P-10367	0.42
P-10368	0.36
P-10370	0.29
P-10371	0.02
P-10372	0.12
P-10373 (1)	0.36
P-10373 (2)	0.02
P-10374	0.03
P-10379	0.15
P-10380	0.09
P-10381	0.32
P-10382	0.29
P-10385(1)	0.3
P-10385(2)	0.48
P-10386	0.1
P-10390	0.01
P-10391	0
P-10397	0.01
P-104	0.33
P-1040	0.02
P-10400	0.01
P-10403	0.01
P-10404 (1)	0.04
P-10404 (2)	0.01
P-10405 (1)	0.03
P-10405 (2)	0.03
P-10406 (1)	0.04
P-10406 (2)	0.03
P-10407	0.24
P-10408	0.24
P-10410	0.02
P-10414	0.04
P-10415 (1)	0.03
P-10415 (2)	0.16
P-10416 (1)	0.01
P-10416 (2)	0.22
P-10418	0
P-10419	0.02
P-10421	0
P-10422	0.01
P-10424	0.95
P-10425	0.08
P-10426	0.09
P-10428	0.01
P-10429	0
P-10430	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-10328	0.21
P-10329 (1)	0.15
P-10329 (2)	0.32
P-1033	0.52
P-10330	0.3
P-10331	0.01
P-10332	0.01
P-10334	0.12
P-10335	0
P-10338 (1)	0.02
P-10338 (2)	0.17
P-10340	0.03
P-10341 (1)	0.07
P-10341 (2)	0.02
P-10342 (1)	0.05
P-10342 (2)	0.01
P-10346	0.07
P-10347	0.27
P-10348	0.25
P-10349	0
P-10350	0.02
P-10360	0.24
P-10364	0.03
P-10365 (1)	0.15
P-10365 (2)	0.04
P-10367	0.27
P-10368	0.25
P-10370	0.4
P-10371	0.04
P-10372	0.1
P-10373 (1)	0.36
P-10373 (2)	0.08
P-10374	0.09
P-10379	0.22
P-10380	0.13
P-10381	0.63
P-10382	0.55
P-10385(1)	0.19
P-10385(2)	0.78
P-10386	0.24
P-10390	0
P-10391	0
P-10397	0.01
P-104	0.23
P-1040	0.05
P-10400	0.01
P-10403	0.04
P-10404 (1)	0.03
P-10404 (2)	0
P-10405 (1)	0.03
P-10405 (2)	0.21
P-10406 (1)	0.03
P-10406 (2)	0.12
P-10407	0.43
P-10408	0.43
P-10410	0.04
P-10414	0.03
P-10415 (1)	0.04
P-10415 (2)	0.21
P-10416 (1)	0.01
P-10416 (2)	0.29
P-10418	0.01
P-10419	0.02
P-10421	0.01
P-10422	0.01
P-10424	0.27
P-10425	0.08
P-10426	0.08
P-10428	0.02
P-10429	0.01
P-10430	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-10328	0.14
P-10329 (1)	0.12
P-10329 (2)	0.71
P-1033	0.41
P-10330	0.69
P-10331	0.01
P-10332	0.01
P-10334	0.03
P-10335	0
P-10338 (1)	0.05
P-10338 (2)	0.1
P-10340	0.05
P-10341 (1)	0.04
P-10341 (2)	0.02
P-10342 (1)	0.02
P-10342 (2)	0.01
P-10346	0.15
P-10347	0.32
P-10348	0.31
P-10349	0.01
P-10350	0.01
P-10360	0.29
P-10364	0.03
P-10365 (1)	0.02
P-10365 (2)	0.05
P-10367	0.67
P-10368	0.66
P-10370	0.41
P-10371	0.06
P-10372	0.27
P-10373 (1)	0.2
P-10373 (2)	0.2
P-10374	0.22
P-10379	0.39
P-10380	0.22
P-10381	0.86
P-10382	0.76
P-10385(1)	0.19
P-10385(2)	0.75
P-10386	0.28
P-10390	0
P-10391	0
P-10397	0.01
P-104	0.16
P-1040	0.06
P-10400	0.03
P-10403	0.06
P-10404 (1)	0.05
P-10404 (2)	0.03
P-10405 (1)	0.05
P-10405 (2)	0.08
P-10406 (1)	0.06
P-10406 (2)	0.05
P-10407	2.44
P-10408	2.44
P-10410	0.05
P-10414	0.06
P-10415 (1)	0.06
P-10415 (2)	0.11
P-10416 (1)	0.01
P-10416 (2)	0.15
P-10418	0.01
P-10419	0.01
P-10421	0.01
P-10422	0.02
P-10424	0.48
P-10425	0.13
P-10426	0.14
P-10428	0.01
P-10429	0.01
P-10430	0

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
P-10432	0.02
P-10433	0.05
P-10434 (1)	0.01
P-10434 (2)	0.01
P-10435	0.03
P-10436	0
P-10437(1)	0.36
P-10437(2)	0.34
P-10438 (1)	0.02
P-10438 (2)	0.57
P-10439 (1)	0.03
P-10439 (2)	0.02
P-1044	0.01
P-10440 (1)	0.03
P-10440 (2)	0.01
P-10441 (1)	0.02
P-10441 (2)	0.01
P-10442	0.02
P-10444	0.01
P-10445	0.74
P-10446	0.37
P-10449	2.03
P-1045	0
P-10450	1.21
P-10451	0.12
P-10452(1)(1)	0.14
P-10452(1)(2)	0.13
P-10452(2)	0.24
P-10454	0.14
P-10456	0.66
P-10457	0.01
P-10458	0
P-10459	0.98
P-1046	0.02
P-10460	0.53
P-10462	0
P-10463	0.32
P-10464	0.29
P-10465	0.36
P-10466	0.37
P-10467	1.25
P-10469(1)	0.19
P-10469(2)	0.19
P-10470	0.19
P-10471	0.02
P-10472	0.02
P-10475	0.41
P-10476	0.31
P-10478	0
P-10480	0.03
P-10481	0.25
P-10483(1)	2.64
P-10483(2)	2.73
P-10485	0.06
P-10486(1)	0.06
P-10486(2)	0.06
P-10487(1)(1)	1.16
P-10487(2)	0.38
P-10488	0.51
P-10489	0.14
P-10490	0.16
P-10491 (1)	0.96
P-10491 (2)	0.01
P-10492 (1)	0.98
P-10492 (2)	0.01
P-10493	0.01
P-10494	0.98
P-10497 (1)	16.05
P-10497 (2)	0.16
P-10499	0
P-105	0.1

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-10432	0.03
P-10433	0.07
P-10434 (1)	0.02
P-10434 (2)	0.03
P-10435	0.02
P-10436	0.01
P-10437(1)	0.27
P-10437(2)	0.28
P-10438 (1)	0.03
P-10438 (2)	0.28
P-10439 (1)	0.03
P-10439 (2)	0.03
P-1044	0.01
P-10440 (1)	0.06
P-10440 (2)	0.02
P-10441 (1)	0.07
P-10441 (2)	0
P-10442	0.03
P-10444	0.03
P-10445	1.07
P-10446	0.54
P-10449	9.32
P-1045	0.01
P-10450	9.21
P-10451	0.34
P-10452(1)(1)	0.28
P-10452(1)(2)	0.29
P-10452(2)	0.25
P-10454	0.04
P-10456	1.08
P-10457	0.02
P-10458	0.01
P-10459	0.27
P-1046	0.05
P-10460	0.22
P-10462	0
P-10463	0.06
P-10464	0.01
P-10465	0.26
P-10466	0.27
P-10467	4.22
P-10469(1)	0.26
P-10469(2)	0.26
P-10470	0.26
P-10471	0.03
P-10472	0.03
P-10475	0.17
P-10476	0.14
P-10478	0
P-10480	0.08
P-10481	0.29
P-10483(1)	2.61
P-10483(2)	2.58
P-10485	0.04
P-10486(1)	0.1
P-10486(2)	0.03
P-10487(1)(1)	1.64
P-10487(2)	0.92
P-10488	0.71
P-10489	0.47
P-10490	0.43
P-10491 (1)	1.48
P-10491 (2)	0.01
P-10492 (1)	1.46
P-10492 (2)	0
P-10493	0.01
P-10494	1.46
P-10497 (1)	17.81
P-10497 (2)	0.06
P-10499	0.01
P-105	0.12

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-10432	0.09
P-10433	0.08
P-10434 (1)	0.03
P-10434 (2)	0.14
P-10435	0.01
P-10436	0.01
P-10437(1)	0.21
P-10437(2)	0.24
P-10438 (1)	0.03
P-10438 (2)	0.12
P-10439 (1)	0.03
P-10439 (2)	0.04
P-1044	0.01
P-10440 (1)	0.11
P-10440 (2)	0.02
P-10441 (1)	0.11
P-10441 (2)	0.03
P-10442	0.02
P-10444	0.03
P-10445	0.36
P-10446	0.18
P-10449	5.88
P-1045	0.01
P-10450	5.32
P-10451	0.44
P-10452(1)(1)	0.53
P-10452(1)(2)	0.45
P-10452(2)	0.87
P-10454	0.07
P-10456	1.51
P-10457	0.02
P-10458	0.01
P-10459	0.2
P-1046	0.07
P-10460	0.96
P-10462	0
P-10463	0.16
P-10464	0.08
P-10465	0.4
P-10466	0.41
P-10467	1.99
P-10469(1)	0.32
P-10469(2)	0.32
P-10470	0.32
P-10471	0.03
P-10472	0.03
P-10475	0.13
P-10476	0.08
P-10478	0
P-10480	0.1
P-10481	0.06
P-10483(1)	1.87
P-10483(2)	1.57
P-10485	0.05
P-10486(1)	0.1
P-10486(2)	0.04
P-10487(1)(1)	1.43
P-10487(2)	0.82
P-10488	0.79
P-10489	0.35
P-10490	0.4
P-10491 (1)	0.95
P-10491 (2)	0.02
P-10492 (1)	0.94
P-10492 (2)	0.02
P-10493	0.01
P-10494	0.93
P-10497 (1)	(N/A)
P-10497 (2)	0.08
P-10499	0.01
P-105	0.1

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**
P-1050	0	P-1050	0	P-1050	0
P-10501	0	P-10501	0.1	P-10501	0.15
P-10502	0	P-10502	0.01	P-10502	0.01
P-10503	0.01	P-10503	0.02	P-10503	0.01
P-10504	0.06	P-10504	0.16	P-10504	0.11
P-10508	0	P-10508	0	P-10508	0
P-10509	0.14	P-10509	0.41	P-10509	0.91
P-10510 (1)	0.04	P-10510 (1)	0.03	P-10510 (1)	0.09
P-10510 (2)	0.07	P-10510 (2)	0.21	P-10510 (2)	0.46
P-10512	0.21	P-10512	0.06	P-10512	0.07
P-10515	0.05	P-10515	0.11	P-10515	0.08
P-10516	0.01	P-10516	0.01	P-10516	0.01
P-10517	0.88	P-10517	0.87	P-10517	0.95
P-1052	0.01	P-1052	0.01	P-1052	0.01
P-10520	0.02	P-10520	0.05	P-10520	0.06
P-10521 (1)	1.89	P-10521 (1)	4.98	P-10521 (1)	3.45
P-10521 (2)	0.15	P-10521 (2)	0.11	P-10521 (2)	0.11
P-10522	1.88	P-10522	4.98	P-10522	3.45
P-10523 (1)	1.88	P-10523 (1)	4.98	P-10523 (1)	3.45
P-10523 (2)	0.88	P-10523 (2)	0.87	P-10523 (2)	0.95
P-10524	1.88	P-10524	4.98	P-10524	3.45
P-10525 (1)	1.78	P-10525 (1)	4.21	P-10525 (1)	3.59
P-10525 (2)	0.11	P-10525 (2)	0.05	P-10525 (2)	0.03
P-10526 (1)	1.78	P-10526 (1)	4.21	P-10526 (1)	3.59
P-10526 (2)	0.03	P-10526 (2)	0.06	P-10526 (2)	0.05
P-10528	0.07	P-10528	0.11	P-10528	0.1
P-10530	1.95	P-10530	0.92	P-10530	0.02
P-10531	0.05	P-10531	0.09	P-10531	0.05
P-10532	0.07	P-10532	0.11	P-10532	0.1
P-10533	0.43	P-10533	0.83	P-10533	0.57
P-10534	0.06	P-10534	0.19	P-10534	0.18
P-10535 (1)	0.01	P-10535 (1)	0.02	P-10535 (1)	0.02
P-10535 (2)	0.16	P-10535 (2)	0.06	P-10535 (2)	0.13
P-10536	0.16	P-10536	0.05	P-10536	0.13
P-10537	0.03	P-10537	0.13	P-10537	0.09
P-10538 (1)	0.05	P-10538 (1)	0.18	P-10538 (1)	0.04
P-10538 (2)	0.07	P-10538 (2)	0.27	P-10538 (2)	0.19
P-10540	0.09	P-10540	0.02	P-10540	0.03
P-10541	0.13	P-10541	0.21	P-10541	0.16
P-10542	0.26	P-10542	0.12	P-10542	0.08
P-10543	0.03	P-10543	0.06	P-10543	0.07
P-10545	0.12	P-10545	0.05	P-10545	0.13
P-10546	0.02	P-10546	0.01	P-10546	0.01
P-10547	0.31	P-10547	0.28	P-10547	0.42
P-10548	0.16	P-10548	0.09	P-10548	0.14
P-10549	0.72	P-10549	1.69	P-10549	0.88
P-1055	0.06	P-1055	0.1	P-1055	0.11
P-10552	0.04	P-10552	0.25	P-10552	0.29
P-10553	0.01	P-10553	0.01	P-10553	0.01
P-10554 (1)	0.08	P-10554 (1)	0.2	P-10554 (1)	0.27
P-10554 (2)	0.01	P-10554 (2)	0.02	P-10554 (2)	0.02
P-10555	0.01	P-10555	0.02	P-10555	0.02
P-10557 (1)	0.03	P-10557 (1)	0.01	P-10557 (1)	0.08
P-10557 (2)	0.11	P-10557 (2)	0.22	P-10557 (2)	0.22
P-10558 (1)	0.03	P-10558 (1)	0.12	P-10558 (1)	0.03
P-10558 (2)	0.06	P-10558 (2)	0.13	P-10558 (2)	0.13
P-10559	0.02	P-10559	0.01	P-10559	0.01
P-10561	0.07	P-10561	0.26	P-10561	0.19
P-10562 (1)	0.05	P-10562 (1)	0.15	P-10562 (1)	0.11
P-10562 (2)	0.03	P-10562 (2)	0.13	P-10562 (2)	0.09
P-10563	0.09	P-10563	0.17	P-10563	0.3
P-10564	0.05	P-10564	0.01	P-10564	0.02
P-10565	0.02	P-10565	0.04	P-10565	0.05
P-10566	0.05	P-10566	0.09	P-10566	0.11
P-10567	0.32	P-10567	0.48	P-10567	0.82
P-10568	0.32	P-10568	0.48	P-10568	0.82
P-10569 (1)	0.06	P-10569 (1)	0.17	P-10569 (1)	0.17
P-10569 (2)	0.01	P-10569 (2)	0.02	P-10569 (2)	0.01
P-10570	0.01	P-10570	0.02	P-10570	0.01
P-10572	0.01	P-10572	0.02	P-10572	0.01
P-10574 (1)	0.04	P-10574 (1)	0.13	P-10574 (1)	0.08

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-10574 (2)	0.01
P-10575	0.08
P-10576 (1)	0.01
P-10576 (2)	0.13
P-10578	0.12
P-10579	0.17
P-10580	0.12
P-10581	0.13
P-10583	0.54
P-10585	0.24
P-10587	0.08
P-10588	0.01
P-10590	0.04
P-10593	0.13
P-10596	0.02
P-10597	0.02
P-10598	0
P-10599	0.01
P-106	0.16
P-10600	0.02
P-10601	0.03
P-10602	0.01
P-10603	0.01
P-10604	0.23
P-10606 (1)	0.01
P-10606 (2)	11.04
P-10607 (1)	0.03
P-10607 (2)	0.77
P-10608	0.22
P-10609 (1)	0.1
P-10609 (2)	0.54
P-1061	0
P-10610	0.04
P-10612	0.01
P-10615	0.01
P-10616	0.05
P-10619	2.85
P-10621	1.52
P-10624	0.03
P-10629	0.03
P-1063 (1)	0
P-1063 (2)	0.05
P-10632(1)	0.04
P-10632(2)	0.04
P-10633	0.08
P-10636	0.05
P-10637	0.04
P-10641	0.02
P-10642	0.08
P-10643	3.79
P-10646	0.04
P-10647	0.01
P-10649	0.04
P-1065	0.02
P-10651	0.3
P-10652	0.35
P-10653	0.16
P-10655	0.12
P-10656	0.27
P-10657	0.01
P-10658	0.04
P-10659	0.29
P-10660 (1)	0.03
P-10660 (2)	0.25
P-10661 (1)	0.05
P-10661 (2)	0.01
P-10662 (1)	0.05
P-10662 (2)	0.01
P-10663	0.05
P-10664	0.04
P-10665 (1)	0.05

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-10574 (2)	0.01
P-10575	0.04
P-10576 (1)	0.02
P-10576 (2)	0.11
P-10578	0.03
P-10579	0.08
P-10580	0.05
P-10581	0.11
P-10583	0.53
P-10585	0.37
P-10587	0.06
P-10588	0.01
P-10590	0.08
P-10593	0.1
P-10596	0.04
P-10597	0.04
P-10598	0.01
P-10599	0.04
P-106	0.13
P-10600	0.03
P-10601	0.06
P-10602	0.03
P-10603	0.02
P-10604	0.05
P-10606 (1)	0.02
P-10606 (2)	7.17
P-10607 (1)	0.02
P-10607 (2)	0.62
P-10608	0.33
P-10609 (1)	0.13
P-10609 (2)	1.59
P-1061	0.01
P-10610	0.03
P-10612	0.01
P-10615	0.03
P-10616	0.08
P-10619	1.42
P-10621	1.52
P-10624	0.01
P-10629	0.01
P-1063 (1)	0.01
P-1063 (2)	0.05
P-10632(1)	0.09
P-10632(2)	0.09
P-10633	0.11
P-10636	0.03
P-10637	0.01
P-10641	0.07
P-10642	0.11
P-10643	1.65
P-10646	0.01
P-10647	0.01
P-10649	0.01
P-1065	0.04
P-10651	0.36
P-10652	0.34
P-10653	0.11
P-10655	0.15
P-10656	0.34
P-10657	0.02
P-10658	0.01
P-10659	0.12
P-10660 (1)	0.01
P-10660 (2)	0.1
P-10661 (1)	0.01
P-10661 (2)	0.58
P-10662 (1)	0.01
P-10662 (2)	0.58
P-10663	0.02
P-10664	0.02
P-10665 (1)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-10574 (2)	0.01
P-10575	0.04
P-10576 (1)	0.01
P-10576 (2)	0.11
P-10578	0.02
P-10579	0.08
P-10580	0.06
P-10581	0.11
P-10583	0.55
P-10585	0.83
P-10587	0.06
P-10588	0.01
P-10590	0.1
P-10593	0.14
P-10596	0.01
P-10597	0.03
P-10598	0.01
P-10599	0.01
P-106	0.1
P-10600	0.03
P-10601	0.2
P-10602	0.07
P-10603	0.02
P-10604	0.1
P-10606 (1)	0.02
P-10606 (2)	13.69
P-10607 (1)	0.01
P-10607 (2)	0.65
P-10608	0.18
P-10609 (1)	0.06
P-10609 (2)	0.92
P-1061	0.01
P-10610	0.04
P-10612	0.01
P-10615	0.02
P-10616	0.08
P-10619	1.7
P-10621	1.1
P-10624	0.01
P-10629	0.01
P-1063 (1)	0.01
P-1063 (2)	0.04
P-10632(1)	0.11
P-10632(2)	0.11
P-10633	0.1
P-10636	0.02
P-10637	0.01
P-10641	0.19
P-10642	0.1
P-10643	2.45
P-10646	0.01
P-10647	0.02
P-10649	0.01
P-1065	0.05
P-10651	0.47
P-10652	0.24
P-10653	0.1
P-10655	0.21
P-10656	0.47
P-10657	0.02
P-10658	0.1
P-10659	0.63
P-10660 (1)	0.01
P-10660 (2)	0.56
P-10661 (1)	0.02
P-10661 (2)	2.09
P-10662 (1)	0.03
P-10662 (2)	1.71
P-10663	0.03
P-10664	0.04
P-10665 (1)	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-10665 (2)	0.25	P-10665 (2)	1.59	P-10665 (2)	1.48
P-10666	0.25	P-10666	1.59	P-10666	1.49
P-10668	0	P-10668	0.02	P-10668	0.02
P-10670	0.01	P-10670	0.1	P-10670	0.11
P-10671	0.98	P-10671	1.6	P-10671	1.77
P-10672	1.15	P-10672	1.91	P-10672	1.89
P-10675 (1)	0	P-10675 (1)	0	P-10675 (1)	0
P-10675 (2)	0.71	P-10675 (2)	0.22	P-10675 (2)	0.2
P-10676	0.07	P-10676	0.06	P-10676	0.1
P-10676(1)	0.1	P-10676(1)	0.24	P-10676(1)	0.19
P-10676(2)	0.77	P-10676(2)	0.54	P-10676(2)	0.43
P-10677	0.16	P-10677	0.4	P-10677	0.36
P-10679	0.01	P-10679	0.03	P-10679	0.03
P-10681	0.85	P-10681	0.25	P-10681	0.45
P-10682	0.45	P-10682	0.14	P-10682	0.23
P-10683	0.18	P-10683	0.97	P-10683	1.29
P-10685	1.29	P-10685	0.38	P-10685	0.52
P-10686	1.29	P-10686	0.38	P-10686	0.52
P-10688	0.02	P-10688	0.03	P-10688	0.04
P-10689	0.01	P-10689	0.01	P-10689	0.03
P-10692	0.02	P-10692	0.03	P-10692	0.04
P-10693 (1)	0.02	P-10693 (1)	0.04	P-10693 (1)	0.05
P-10693 (2)	0.15	P-10693 (2)	0.19	P-10693 (2)	0.26
P-10694	0.26	P-10694	0.32	P-10694	0.44
P-10695	0.02	P-10695	0.02	P-10695	0.03
P-10696	0.02	P-10696	0.02	P-10696	0.02
P-10697	0	P-10697	0.01	P-10697	0.01
P-10699	0.79	P-10699	0.44	P-10699	0.63
P-107	0.04	P-107	0.14	P-107	0.13
P-10700	1.56	P-10700	0.86	P-10700	1.22
P-10703	4.55	P-10703	10.93	P-10703	9.69
P-10706	0.42	P-10706	0.92	P-10706	0.38
P-10707 (1)	0.13	P-10707 (1)	0.09	P-10707 (1)	0.18
P-10707 (2)	0	P-10707 (2)	0	P-10707 (2)	0
P-10708	0.13	P-10708	0.1	P-10708	0.19
P-10709 (1)	0.1	P-10709 (1)	0.13	P-10709 (1)	0.24
P-10709 (2)	0.14	P-10709 (2)	0.03	P-10709 (2)	0.06
P-10712	0.14	P-10712	0.03	P-10712	0.06
P-10713	0.79	P-10713	0.44	P-10713	0.63
P-10715	0.08	P-10715	0.1	P-10715	0.25
P-10716 (1)	0.09	P-10716 (1)	0.08	P-10716 (1)	0.09
P-10716 (2)	0.08	P-10716 (2)	0.09	P-10716 (2)	0.26
P-10717	1.71	P-10717	2.47	P-10717	0.02
P-10718	1.71	P-10718	2.47	P-10718	0.02
P-10720	0	P-10720	0.01	P-10720	0.03
P-10721	1.72	P-10721	2.48	P-10721	0.03
P-10723	0.03	P-10723	0.13	P-10723	0.21
P-10724	0.36	P-10724	0.22	P-10724	0.3
P-10725	0.03	P-10725	0.03	P-10725	0.03
P-10726(1)	0.03	P-10726(1)	0.04	P-10726(1)	0.06
P-10726(2)	0.03	P-10726(2)	0.04	P-10726(2)	0.06
P-10728	0.03	P-10728	0.02	P-10728	0
P-1073	0.12	P-1073	0.14	P-1073	0.13
P-10732	2.2	P-10732	0.98	P-10732	1.32
P-10733	0.02	P-10733	0.04	P-10733	0.05
P-10734	0.01	P-10734	0.02	P-10734	0.07
P-10735	1.77	P-10735	1.58	P-10735	1.56
P-10736	1.83	P-10736	1.68	P-10736	1.61
P-10740	0	P-10740	0.01	P-10740	0
P-10748	0.1	P-10748	0.02	P-10748	0.06
P-10751	0	P-10751	0	P-10751	0
P-10752	0	P-10752	0	P-10752	0
P-10753	0.01	P-10753	0.02	P-10753	0.01
P-10754	0.09	P-10754	0.01	P-10754	0.02
P-10755	0.04	P-10755	0.14	P-10755	0.22
P-10756	0	P-10756	0.02	P-10756	0.02
P-10759	0.01	P-10759	0.02	P-10759	0.02
P-10761	0.06	P-10761	0.14	P-10761	0.16
P-10762	0.01	P-10762	0.01	P-10762	0.01
P-10765	0.04	P-10765	0.04	P-10765	0.04
P-10767	0.03	P-10767	0.07	P-10767	0.07

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-10768	0.03
P-10769	1.89
P-1077	0.1
P-10770	0
P-10772	0.01
P-10774(1)	0.36
P-10774(2)	0.17
P-10775	2.9
P-10777	0.02
P-10778	0.02
P-10783	2.16
P-10784	2.46
P-10787	0.98
P-10788	0.98
P-10790	0.02
P-10791	0.06
P-10792	0.01
P-10794	0.04
P-10795	0.37
P-10797	0.04
P-10798	0.01
P-10801	2.47
P-10803	0.25
P-10804(1)	0.35
P-10804(2)	0.25
P-10807	0.28
P-10808	0.24
P-10810	0.04
P-10811	0.07
P-10812	0.05
P-10813	0.02
P-10814	0.04
P-10815	1.08
P-10818	0.73
P-10820	0.27
P-10822	0.23
P-10824	0.01
P-10825	0.05
P-10826	0.04
P-10829	0.19
P-10830	0.13
P-10832	0.1
P-10834	1.72
P-10835	0.1
P-10838	0.05
P-10840	0.1
P-10841	0.03
P-10842	0.09
P-10843	0.03
P-10844	0.02
P-10846	0.02
P-10848	0.01
P-10851	0.04
P-10855	0.02
P-10856	0.02
P-10860	2.27
P-10861	0.04
P-10862	0.05
P-10863	0.14
P-10864(2)	0.1
P-10865	0.76
P-10866	0.26
P-10867	0
P-10870	0.01
P-10875	0.03
P-10879	0.03
P-1088	0.02
P-10880	0
P-10883(1)	0.09
P-10883(2)	0.09
P-10884	0.08

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-10768	0.08
P-10769	1.5
P-1077	0.33
P-10770	0
P-10772	0.02
P-10774(1)	0.03
P-10774(2)	0.01
P-10775	1.07
P-10777	0.04
P-10778	0.06
P-10783	2.3
P-10784	2.69
P-10787	1.54
P-10788	0.17
P-10790	0.04
P-10791	0.07
P-10792	0.01
P-10794	0.02
P-10795	0.03
P-10797	0.04
P-10798	0.01
P-10801	4.33
P-10803	2.33
P-10804(1)	0.9
P-10804(2)	1.12
P-10807	0.13
P-10808	0.05
P-10810	0.05
P-10811	0.06
P-10812	0.04
P-10813	0.01
P-10814	0.03
P-10815	1.02
P-10818	1.71
P-10820	0.33
P-10822	0.21
P-10824	0
P-10825	0.01
P-10826	0.02
P-10829	0.36
P-10830	0.14
P-10832	0.09
P-10834	2.49
P-10835	0.02
P-10838	0.09
P-10840	0.07
P-10841	0.01
P-10842	0.02
P-10843	0.07
P-10844	0.04
P-10846	0.01
P-10848	0.01
P-10851	0.09
P-10855	0.01
P-10856	0.02
P-10860	0.64
P-10861	0.05
P-10862	0.07
P-10863	0.24
P-10864(2)	0.17
P-10865	0.21
P-10866	0.06
P-10867	1.56
P-10870	0.01
P-10875	0.05
P-10879	0.06
P-1088	0.07
P-10880	0
P-10883(1)	0.08
P-10883(2)	0.08
P-10884	0.07

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-10768	0.08
P-10769	1.53
P-1077	0.31
P-10770	0
P-10772	0.02
P-10774(1)	0.02
P-10774(2)	0.01
P-10775	2.14
P-10777	0.04
P-10778	0.06
P-10783	0.11
P-10784	0
P-10787	1.91
P-10788	0.58
P-10790	0.05
P-10791	0.09
P-10792	0.01
P-10794	0.05
P-10795	0.04
P-10797	0.03
P-10798	0.01
P-10801	5.77
P-10803	2
P-10804(1)	1.21
P-10804(2)	1.27
P-10807	0.16
P-10808	0.07
P-10810	0.04
P-10811	0.13
P-10812	0.09
P-10813	0.03
P-10814	0.08
P-10815	1.54
P-10818	0.9
P-10820	0.41
P-10822	0.13
P-10824	0.03
P-10825	0.02
P-10826	0.01
P-10829	0.41
P-10830	0.15
P-10832	0.1
P-10834	0.04
P-10835	0.06
P-10838	0.1
P-10840	0.16
P-10841	0.03
P-10842	0.06
P-10843	0.07
P-10844	0.04
P-10846	0.05
P-10848	0.01
P-10851	0.19
P-10855	0.03
P-10856	0.04
P-10860	0.63
P-10861	0.07
P-10862	0.09
P-10863	0.08
P-10864(2)	0.06
P-10865	0.38
P-10866	0.12
P-10867	1.69
P-10870	0.01
P-10875	0.07
P-10879	0.06
P-1088	0.19
P-10880	0
P-10883(1)	0.03
P-10883(2)	0.03
P-10884	0.02

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-10892	0.01	P-10892	0.01	P-10892	0.01
P-10895	0.11	P-10895	0.17	P-10895	0.07
P-10898	0.09	P-10898	0.04	P-10898	0.06
P-10900	0.4	P-10900	0.6	P-10900	0.97
P-10901	0	P-10901	0	P-10901	0
P-10902	0.03	P-10902	0.03	P-10902	0.05
P-10905	0.03	P-10905	0.05	P-10905	0.04
P-10908	0.12	P-10908	0.34	P-10908	0.43
P-10909	0.1	P-10909	0.13	P-10909	0.11
P-1091	(N/A)	P-1091	(N/A)	P-1091	(N/A)
P-10910	3.44	P-10910	5.93	P-10910	7.16
P-10911	0.61	P-10911	0.15	P-10911	0.19
P-10912	0.62	P-10912	0.15	P-10912	0.18
P-10913	0.07	P-10913	0.03	P-10913	0.01
P-10916	0.66	P-10916	0.33	P-10916	0.15
P-10917	0.11	P-10917	0.11	P-10917	0.13
P-10919	0.01	P-10919	0.73	P-10919	1.01
P-1092	0.12	P-1092	0.19	P-1092	0.22
P-10920	0	P-10920	0.75	P-10920	1.02
P-10921	0.08	P-10921	0.01	P-10921	0.01
P-10922	0.04	P-10922	0.03	P-10922	0.03
P-10923	0.08	P-10923	0.06	P-10923	0.04
P-10927	0.61	P-10927	0.19	P-10927	0.05
P-10928	0.6	P-10928	0.19	P-10928	0.05
P-10929	0.05	P-10929	0.15	P-10929	0.05
P-10930	0.11	P-10930	0.44	P-10930	0.16
P-10934	0	P-10934	0	P-10934	0
P-10935	0	P-10935	0	P-10935	0
P-10937	0.01	P-10937	0.01	P-10937	0.01
P-10939	0.24	P-10939	0.15	P-10939	0.18
P-1094	0.01	P-1094	0.05	P-1094	0.05
P-10940	0.52	P-10940	0.25	P-10940	0.36
P-10941 (1)	0.01	P-10941 (1)	0.01	P-10941 (1)	0.01
P-10941 (2)	13.9	P-10941 (2)	28.82	P-10941 (2)	(N/A)
P-10942	0.01	P-10942	0.01	P-10942	0.01
P-10943	0.01	P-10943	0.01	P-10943	0.01
P-10944	0.01	P-10944	0.01	P-10944	0.01
P-10945	0.01	P-10945	1.03	P-10945	1.33
P-10946	0.2	P-10946	0.13	P-10946	0.16
P-10947	0.12	P-10947	0.26	P-10947	0.19
P-10948	0.25	P-10948	0.07	P-10948	0.17
P-10949 (1)	0.02	P-10949 (1)	0.07	P-10949 (1)	0.03
P-10949 (2)	2.85	P-10949 (2)	2.26	P-10949 (2)	3.33
P-10950	0	P-10950	0	P-10950	0
P-10954	0.09	P-10954	0.12	P-10954	0.13
P-10955	1.25	P-10955	0.57	P-10955	0.7
P-10956	1.25	P-10956	0.56	P-10956	0.7
P-10959	0	P-10959	0.01	P-10959	0.01
P-10960	0.02	P-10960	0.03	P-10960	0.03
P-10962	0.01	P-10962	0.01	P-10962	0.01
P-10964	0.24	P-10964	0.46	P-10964	0.54
P-10966	0.37	P-10966	0.03	P-10966	0.02
P-10967	0.01	P-10967	0.58	P-10967	0.58
P-10968	0.02	P-10968	0.83	P-10968	0.83
P-10969 (1)	0	P-10969 (1)	0.01	P-10969 (1)	0.01
P-10969 (2)	0.58	P-10969 (2)	0.1	P-10969 (2)	0.41
P-10971	0.18	P-10971	0.13	P-10971	0.14
P-10975	0.01	P-10975	0.02	P-10975	0.04
P-10979	0.17	P-10979	0.22	P-10979	0.17
P-1098 (1)	0.01	P-1098 (1)	0.07	P-1098 (1)	0.12
P-1098 (2)	0.1	P-1098 (2)	0.15	P-1098 (2)	0.15
P-10981 (1)	0.26	P-10981 (1)	0.4	P-10981 (1)	0.42
P-10981 (2)	0	P-10981 (2)	0.01	P-10981 (2)	1.07
P-10983	0.15	P-10983	0.22	P-10983	0.27
P-10984	0.09	P-10984	0.17	P-10984	0.24
P-10986	0.05	P-10986	0.07	P-10986	0.06
P-10987	0.45	P-10987	0.23	P-10987	0.31
P-10988	0.6	P-10988	0.31	P-10988	0.42
P-1099	0	P-1099	0.01	P-1099	0.01
P-10991	0.02	P-10991	0.1	P-10991	0.1
P-10992	0.1	P-10992	0.06	P-10992	0.05

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-10993	0
P-10994	0
P-10995	0.48
P-10997	0
P-10998	0
P-10999	0
P-11	0.01
P-110	0.29
P-11000	0
P-11004	0.31
P-11006	0.03
P-11007 (1)	0.04
P-11007 (2)	0.02
P-11008 (1)	0.07
P-11008 (2)	0.02
P-11010	0.01
P-11011	0.38
P-11013 (1)	0.29
P-11013 (2)	0.03
P-11014	0.03
P-11015	0.15
P-11016	0
P-11017	0
P-11018	0.08
P-11019	0
P-1102	0.07
P-11021	0.54
P-11022	0.57
P-11024	3.45
P-11025	0.23
P-11026	0.49
P-11028	0.02
P-11029	0.02
P-11031	0.07
P-11032	0.07
P-11033(1)	0.01
P-11035	1.14
P-11036	1.25
P-11037	0.37
P-11038	0.37
P-11039	0
P-1104	0.01
P-11040	0.01
P-11042	0.02
P-11044	0.01
P-11045 (1)	0.04
P-11045 (2)	0.02
P-11046	0.04
P-11047	0.11
P-11048	0.06
P-11049	0.45
P-1105	0.39
P-11050	0.45
P-11051	0.13
P-11052	0.18
P-11054	0.36
P-11055	0.01
P-11056	0.02
P-11057	0.09
P-11058 (1)	0.01
P-11058 (2)	0.09
P-11059	0
P-11060 (1)	0.04
P-11060 (2)	0
P-11062(1)	0.55
P-11062(2)	0.55
P-11063	0.02
P-11064	0.01
P-11065	0
P-11066	0.02
P-11067 (1)	0.05

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-10993	0.28
P-10994	0.28
P-10995	0.08
P-10997	0
P-10998	0
P-10999	0
P-11	0.04
P-110	0.37
P-11000	0
P-11004	0.04
P-11006	0.27
P-11007 (1)	0.05
P-11007 (2)	0.01
P-11008 (1)	0.08
P-11008 (2)	0.01
P-11010	0.01
P-11011	0.15
P-11013 (1)	0.17
P-11013 (2)	0.03
P-11014	0.03
P-11015	0.13
P-11016	0.01
P-11017	0
P-11018	0.06
P-11019	0
P-1102	0.02
P-11021	0.71
P-11022	0.73
P-11024	0
P-11025	0.23
P-11026	0.32
P-11028	0.04
P-11029	0.03
P-11031	0.16
P-11032	0.16
P-11033(1)	0
P-11035	0.61
P-11036	0.57
P-11037	0.33
P-11038	0.33
P-11039	0.01
P-1104	0.01
P-11040	0.03
P-11042	0.01
P-11044	0.02
P-11045 (1)	0.02
P-11045 (2)	0.03
P-11046	0.07
P-11047	0.25
P-11048	0.1
P-11049	0.26
P-1105	0.11
P-11050	0.26
P-11051	0.24
P-11052	0.35
P-11054	0.18
P-11055	0.02
P-11056	0.03
P-11057	0.19
P-11058 (1)	0.02
P-11058 (2)	0.19
P-11059	0
P-11060 (1)	0.03
P-11060 (2)	0
P-11062(1)	0.07
P-11062(2)	0.64
P-11063	0.05
P-11064	0.01
P-11065	0.01
P-11066	0.06
P-11067 (1)	0.13

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-10993	0.34
P-10994	0.34
P-10995	0.11
P-10997	0.04
P-10998	0.02
P-10999	0
P-11	0.1
P-110	0.31
P-11000	0
P-11004	0.09
P-11006	0.17
P-11007 (1)	0.01
P-11007 (2)	0.02
P-11008 (1)	0.06
P-11008 (2)	0.02
P-11010	0.01
P-11011	0.14
P-11013 (1)	0.21
P-11013 (2)	0.04
P-11014	0.04
P-11015	0.13
P-11016	0.01
P-11017	0
P-11018	0.05
P-11019	0
P-1102	0.03
P-11021	1.19
P-11022	1.24
P-11024	0
P-11025	0.2
P-11026	0.21
P-11028	0.06
P-11029	0.04
P-11031	0.15
P-11032	0.15
P-11033(1)	0
P-11035	0.68
P-11036	0.7
P-11037	0.52
P-11038	0.55
P-11039	0.01
P-1104	0.03
P-11040	0.02
P-11042	0.01
P-11044	0.03
P-11045 (1)	0.06
P-11045 (2)	0.14
P-11046	0.34
P-11047	0.23
P-11048	0.07
P-11049	0.11
P-1105	0.19
P-11050	0.11
P-11051	0.26
P-11052	0.37
P-11054	0.77
P-11055	0.01
P-11056	0.03
P-11057	0.15
P-11058 (1)	0.04
P-11058 (2)	0.15
P-11059	0
P-11060 (1)	0.08
P-11060 (2)	0
P-11062(1)	0.26
P-11062(2)	0.26
P-11063	0.06
P-11064	0.02
P-11065	0.01
P-11066	0.03
P-11067 (1)	0.1

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-11067 (2)	0.03
P-11068	0.04
P-11069	0.08
P-11070	0.09
P-11074	0.01
P-11075	0.07
P-11076	0.01
P-11077	0.04
P-11078	0.05
P-11080	0.02
P-11081	0.31
P-11082	0.35
P-11083(1)	0
P-11083(2)	0
P-11084 (1)	0
P-11084 (2)	0.02
P-11086	0.05
P-11087	0.09
P-11088	0.24
P-11092	0.09
P-11095	0.07
P-11098	0
P-11099	0.01
P-111	0.33
P-11100	0.01
P-11101	0.02
P-11102	0.01
P-11103	0.04
P-11106	0.03
P-11107	0.32
P-11108	0.42
P-11111	0.01
P-11114	0.01
P-1112	0
P-11121 (1)	0.05
P-11121 (2)	0.38
P-11122	0.39
P-11123	0.03
P-11124	0.1
P-11126	0.08
P-11127	0.03
P-11128	0.04
P-11130	0.02
P-11131	0.08
P-11132	0.14
P-11133	0.14
P-11135	0.01
P-11136	0.01
P-11138	0.07
P-11139	0.05
P-1114	0.1
P-11140	0.04
P-11141	0.11
P-11142	0.13
P-11143	0.03
P-11144(1)	0.07
P-11144(2)	0.05
P-11145	0.04
P-11146	0.04
P-11148	0.13
P-11149	0.03
P-11150	0.03
P-11151	0.37
P-11156 (1)	1.4
P-11156 (2)	0.3
P-11157 (1)	1.46
P-11157 (2)	0.78
P-11158 (1)	1.46
P-11158 (2)	0.66
P-11159 (1)	1.46
P-11159 (2)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-11067 (2)	0.1
P-11068	0.17
P-11069	0.07
P-11070	0.08
P-11074	0.05
P-11075	0.08
P-11076	0.03
P-11077	0.02
P-11078	0.03
P-11080	0.03
P-11081	0.56
P-11082	0.38
P-11083(1)	0.18
P-11083(2)	0.18
P-11084 (1)	0.01
P-11084 (2)	0.13
P-11086	0.07
P-11087	0.08
P-11088	0.21
P-11092	0.08
P-11095	0.07
P-11098	0.03
P-11099	0.02
P-111	1.1
P-11100	0.01
P-11101	0.03
P-11102	0.01
P-11103	0.1
P-11106	0.04
P-11107	0.64
P-11108	0.83
P-11111	0.03
P-11114	0.02
P-1112	0
P-11121 (1)	0.06
P-11121 (2)	0.46
P-11122	0.48
P-11123	0.32
P-11124	0.24
P-11126	0.07
P-11127	0.02
P-11128	0.03
P-11130	0.44
P-11131	0.19
P-11132	0.18
P-11133	0.44
P-11135	0.01
P-11136	0.01
P-11138	0.06
P-11139	0.26
P-1114	0.21
P-11140	0.19
P-11141	0.04
P-11142	0.36
P-11143	0.33
P-11144(1)	0.59
P-11144(2)	0.41
P-11145	0.07
P-11146	0.07
P-11148	0.19
P-11149	0.03
P-11150	0.03
P-11151	0.1
P-11156 (1)	4.24
P-11156 (2)	0.16
P-11157 (1)	4.39
P-11157 (2)	0.56
P-11158 (1)	4.39
P-11158 (2)	0.58
P-11159 (1)	4.39
P-11159 (2)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-11067 (2)	0.12
P-11068	0.07
P-11069	0.06
P-11070	0.07
P-11074	0.02
P-11075	0.13
P-11076	0.02
P-11077	0.07
P-11078	0.06
P-11080	0.04
P-11081	0.15
P-11082	0.03
P-11083(1)	0.13
P-11083(2)	0.13
P-11084 (1)	0.01
P-11084 (2)	0.1
P-11086	0.07
P-11087	0.07
P-11088	0.19
P-11092	0.19
P-11095	0.03
P-11098	0.02
P-11099	0.02
P-111	1.01
P-11100	0.01
P-11101	0.03
P-11102	0.01
P-11103	0.11
P-11106	0.07
P-11107	0.87
P-11108	1.13
P-11111	0.03
P-11114	0.02
P-1112	0
P-11121 (1)	0.13
P-11121 (2)	0.46
P-11122	0.48
P-11123	0.41
P-11124	0.32
P-11126	0.06
P-11127	0.02
P-11128	0.03
P-11130	0.44
P-11131	0.08
P-11132	0.04
P-11133	0.26
P-11135	0.07
P-11136	0.07
P-11138	0.1
P-11139	0.32
P-1114	0.24
P-11140	0.22
P-11141	0.06
P-11142	0.22
P-11143	0.37
P-11144(1)	0.6
P-11144(2)	0.42
P-11145	0.14
P-11146	0.14
P-11148	0.27
P-11149	0.04
P-11150	0.04
P-11151	0.07
P-11156 (1)	4.78
P-11156 (2)	0.17
P-11157 (1)	4.94
P-11157 (2)	0.39
P-11158 (1)	4.95
P-11158 (2)	0.25
P-11159 (1)	4.95
P-11159 (2)	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-11160 (1)	1.46	P-11160 (1)	4.39	P-11160 (1)	4.95
P-11160 (2)	0	P-11160 (2)	0	P-11160 (2)	0
P-11161	16.05	P-11161	17.81	P-11161	18.13
P-11163	0.02	P-11163	0.05	P-11163	0.05
P-11164	0.03	P-11164	0.1	P-11164	0.1
P-11168	0	P-11168	0	P-11168	0
P-11169	0.05	P-11169	0.6	P-11169	0.65
P-11170	9.35	P-11170	10.52	P-11170	13.26
P-11171	0.18	P-11171	0.11	P-11171	0.24
P-11172	0	P-11172	0	P-11172	0
P-11172(1)	0.1	P-11172(1)	0.07	P-11172(1)	0.14
P-11172(2)	0.1	P-11172(2)	0.07	P-11172(2)	0.14
P-11174 (2)	0.01	P-11174 (2)	0.16	P-11174 (2)	0.12
P-11176 (2)	0.13	P-11176 (2)	0.17	P-11176 (2)	0.09
P-11179	0.72	P-11179	0.49	P-11179	0.44
P-11182 (1)	3.44	P-11182 (1)	8.73	P-11182 (1)	9.91
P-11182 (2)	0.4	P-11182 (2)	1.04	P-11182 (2)	1.36
P-11183	0.25	P-11183	0.14	P-11183	0.13
P-11185	0.02	P-11185	0.02	P-11185	0.03
P-11186	0	P-11186	0.04	P-11186	0.04
P-11188 (1)	4.82	P-11188 (1)	14.43	P-11188 (1)	16.41
P-11188 (2)	0.1	P-11188 (2)	0.31	P-11188 (2)	0.3
P-11189 (1)	0.02	P-11189 (1)	0.08	P-11189 (1)	0.09
P-11189 (2)	0.26	P-11189 (2)	0.07	P-11189 (2)	0.08
P-11190	0.26	P-11190	0.07	P-11190	0.08
P-11191	0	P-11191	0.01	P-11191	0.01
P-11193	0.53	P-11193	0.01	P-11193	0.01
P-11194	0.26	P-11194	0.27	P-11194	0.45
P-11197	0.38	P-11197	0.14	P-11197	0.21
P-11198	0.41	P-11198	0.19	P-11198	0.28
P-11199	0.06	P-11199	0.14	P-11199	0.11
P-112	0.17	P-112	0.05	P-112	0.1
P-11202	0.03	P-11202	0.04	P-11202	0.04
P-11203	0.22	P-11203	0.08	P-11203	0.12
P-11205	0	P-11205	0.01	P-11205	0.01
P-11207	0.59	P-11207	0.24	P-11207	0.44
P-11209	0	P-11209	0	P-11209	0
P-11210	0.01	P-11210	0.01	P-11210	0.01
P-11212	0.01	P-11212	0.01	P-11212	0.01
P-11214	0.56	P-11214	1.19	P-11214	0.93
P-11215	0.07	P-11215	0.02	P-11215	0.02
P-11216	0.35	P-11216	0.08	P-11216	0.1
P-11217	0	P-11217	0.2	P-11217	0.03
P-11218	0	P-11218	0	P-11218	0
P-11219	1.27	P-11219	0.36	P-11219	0.48
P-11221 (1)	1.33	P-11221 (1)	3.45	P-11221 (1)	4.02
P-11221 (2)	0.03	P-11221 (2)	0.22	P-11221 (2)	0.25
P-11222 (1)	1.33	P-11222 (1)	3.46	P-11222 (1)	4.03
P-11222 (2)	0	P-11222 (2)	0.06	P-11222 (2)	0.08
P-11223	8.32	P-11223	10.42	P-11223	7.19
P-11224	8.32	P-11224	10.42	P-11224	7.19
P-11225 (1)	0	P-11225 (1)	0.01	P-11225 (1)	0.01
P-11225 (2)	0.01	P-11225 (2)	0.01	P-11225 (2)	0.01
P-11226 (1)	1.32	P-11226 (1)	3.45	P-11226 (1)	4.02
P-11226 (2)	0.05	P-11226 (2)	0.02	P-11226 (2)	0.04
P-11227 (1)	1.34	P-11227 (1)	3.02	P-11227 (1)	3.52
P-11227 (2)	0.12	P-11227 (2)	0.03	P-11227 (2)	0.13
P-11228 (1)	1.34	P-11228 (1)	3.03	P-11228 (1)	3.53
P-11228 (2)	0.12	P-11228 (2)	0.03	P-11228 (2)	0.13
P-11229 (1)	1.34	P-11229 (1)	3.04	P-11229 (1)	3.53
P-11229 (2)	0.28	P-11229 (2)	0.18	P-11229 (2)	0.27
P-11230	0.02	P-11230	0.14	P-11230	0.24
P-11231	0.04	P-11231	0.35	P-11231	0.38
P-11232	0.03	P-11232	0.34	P-11232	0.38
P-11233	0.34	P-11233	0.97	P-11233	0.52
P-11234 (1)	0.03	P-11234 (1)	0.06	P-11234 (1)	0.13
P-11234 (2)	0.24	P-11234 (2)	0.67	P-11234 (2)	0.36
P-11235	0.02	P-11235	0.01	P-11235	0.01
P-11236 (1)	0.05	P-11236 (1)	0.09	P-11236 (1)	0.08
P-11236 (2)	0.02	P-11236 (2)	0.01	P-11236 (2)	0.01
P-11237	0.14	P-11237	0.41	P-11237	0.91

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-11238	0.07
P-11239	0.21
P-11240 (1)	0.2
P-11240 (2)	0.12
P-11241	0.01
P-11242	0.01
P-11243	0
P-11244	0.02
P-11247	0.03
P-11248	0.05
P-11251	0.29
P-11252	0.35
P-11254	0.12
P-11255 (2)	0.01
P-11257 (2)	0.11
P-11258 (2)	0.12
P-1126	0.01
P-11260 (2)	0.13
P-11261	0.97
P-11262(1)	0.07
P-11262(2)	0.07
P-11263 (1)	1.35
P-11263 (2)	0.16
P-11264	1.35
P-11265	0.24
P-11267	0
P-11268	0
P-11269	0.71
P-11270 (1)	0.09
P-11270 (2)	0.93
P-11272 (2)	0.02
P-11273 (2)	0.05
P-11274 (2)	0.06
P-11275 (2)	0.23
P-11276	0.24
P-11277	0
P-11278	0.09
P-11279	0.04
P-1128	0.34
P-11280	0.02
P-11281	1.29
P-11282 (1)	0
P-11282 (2)	0.92
P-11283	0.09
P-11284	0.08
P-11286	0.32
P-11287	0.37
P-11288	0.08
P-11289	0.05
P-11290	0.05
P-11291	0.01
P-11292	0.01
P-11293	0.04
P-11294 (2)	0.08
P-11295	0.02
P-11296	0.02
P-11297	0.13
P-11298 (2)	0.12
P-11299 (2)	1.71
P-11300 (2)	0.85
P-11301	0.34
P-11304	0.15
P-11305 (1)	0.01
P-11305 (2)	0.56
P-11306	0.38
P-11307	0.08
P-11308	0.14
P-1131	0
P-11312	1.46
P-11313	0.02
P-11314	0.02

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-11238	0.21
P-11239	0.22
P-11240 (1)	0.5
P-11240 (2)	0.13
P-11241	0.2
P-11242	0.2
P-11243	0.02
P-11244	0.03
P-11247	0.05
P-11248	0.15
P-11251	0.19
P-11252	0.24
P-11254	0.23
P-11255 (2)	0.02
P-11257 (2)	0.09
P-11258 (2)	0.12
P-1126	0.01
P-11260 (2)	0.36
P-11261	1.6
P-11262(1)	0.13
P-11262(2)	0.13
P-11263 (1)	2.07
P-11263 (2)	0.09
P-11264	2.07
P-11265	0.31
P-11267	0.68
P-11268	0.68
P-11269	0.77
P-11270 (1)	0.44
P-11270 (2)	1
P-11272 (2)	0.04
P-11273 (2)	0.08
P-11274 (2)	0.1
P-11275 (2)	0.19
P-11276	0.21
P-11277	0
P-11278	0.1
P-11279	0.06
P-1128	0.45
P-11280	0.03
P-11281	1.65
P-11282 (1)	0.01
P-11282 (2)	1.16
P-11283	0.09
P-11284	0.08
P-11286	0.29
P-11287	0.74
P-11288	0.25
P-11289	0.06
P-11290	0.06
P-11291	0.04
P-11292	0.05
P-11293	0.03
P-11294 (2)	0.07
P-11295	0.04
P-11296	0.05
P-11297	0.38
P-11298 (2)	0.29
P-11299 (2)	3.16
P-11300 (2)	1.57
P-11301	0.27
P-11304	0.22
P-11305 (1)	0.02
P-11305 (2)	0.27
P-11306	0.18
P-11307	0.1
P-11308	0.18
P-1131	0
P-11312	0.72
P-11313	0.06
P-11314	0.06

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-11238	0.46
P-11239	0.19
P-11240 (1)	0.19
P-11240 (2)	0.12
P-11241	0.02
P-11242	0.02
P-11243	0.04
P-11244	0.04
P-11247	0.02
P-11248	0.09
P-11251	0.18
P-11252	0.22
P-11254	0.2
P-11255 (2)	0.02
P-11257 (2)	0.07
P-11258 (2)	0.09
P-1126	0.02
P-11260 (2)	1.49
P-11261	1.77
P-11262(1)	0.14
P-11262(2)	0.14
P-11263 (1)	2.17
P-11263 (2)	0.1
P-11264	2.17
P-11265	0.52
P-11267	0.63
P-11268	0.64
P-11269	0.47
P-11270 (1)	0.25
P-11270 (2)	0.6
P-11272 (2)	0.03
P-11273 (2)	0.05
P-11274 (2)	0.06
P-11275 (2)	0.25
P-11276	0.26
P-11277	0
P-11278	0.22
P-11279	0.05
P-1128	0.31
P-11280	0.03
P-11281	0.38
P-11282 (1)	0.01
P-11282 (2)	0.24
P-11283	0.08
P-11284	0.07
P-11286	0.28
P-11287	0.33
P-11288	0.11
P-11289	0.08
P-11290	0.08
P-11291	0.08
P-11292	0.09
P-11293	0.03
P-11294 (2)	0.06
P-11295	0.04
P-11296	0.04
P-11297	0.23
P-11298 (2)	0.22
P-11299 (2)	2.98
P-11300 (2)	1.44
P-11301	0.41
P-11304	0.23
P-11305 (1)	0.02
P-11305 (2)	0.39
P-11306	0.26
P-11307	0.08
P-11308	0.14
P-1131	0
P-11312	0.26
P-11313	0.15
P-11314	0.2

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-11315	0.28	P-11315	0.58	P-11315	0.45
P-11316	0.03	P-11316	0.06	P-11316	0.06
P-11317	0.1	P-11317	0.29	P-11317	0.17
P-11319	0.3	P-11319	0.23	P-11319	0.35
P-11320	0.37	P-11320	0.28	P-11320	0.42
P-11321 (2)	0.08	P-11321 (2)	0.16	P-11321 (2)	0.05
P-11323	0.1	P-11323	0.15	P-11323	0.15
P-11324	0.09	P-11324	0.13	P-11324	0.14
P-11325	0.47	P-11325	0.15	P-11325	0.22
P-11327 (1)	0.08	P-11327 (1)	0.12	P-11327 (1)	0.12
P-11327 (2)	0.58	P-11327 (2)	0.72	P-11327 (2)	0.52
P-11328 (1)	0.04	P-11328 (1)	0.05	P-11328 (1)	0.06
P-11328 (2)	0.58	P-11328 (2)	0.72	P-11328 (2)	0.52
P-11329 (1)	0.03	P-11329 (1)	0.05	P-11329 (1)	0.05
P-11329 (2)	0.08	P-11329 (2)	0.09	P-11329 (2)	0.01
P-11330	0.09	P-11330	0.11	P-11330	0.03
P-11331	0	P-11331	0	P-11331	0
P-11332	0	P-11332	0	P-11332	0.18
P-11333 (1)	0.02	P-11333 (1)	0.03	P-11333 (1)	0.03
P-11333 (2)	0.12	P-11333 (2)	0.07	P-11333 (2)	0.48
P-11334 (1)	0.01	P-11334 (1)	0.01	P-11334 (1)	0.01
P-11334 (2)	0.76	P-11334 (2)	0.35	P-11334 (2)	0.23
P-11335	0.28	P-11335	0.23	P-11335	0.26
P-11336	0.08	P-11336	0.06	P-11336	0.05
P-11337 (1)	0.05	P-11337 (1)	0.07	P-11337 (1)	0.07
P-11337 (2)	0.05	P-11337 (2)	0.08	P-11337 (2)	0.09
P-11338	0.05	P-11338	0.05	P-11338	0.05
P-11339 (1)	0.03	P-11339 (1)	0.03	P-11339 (1)	0.03
P-11339 (2)	0.01	P-11339 (2)	0.01	P-11339 (2)	0.01
P-1134	0.03	P-1134	0.11	P-1134	0.09
P-11340	0.01	P-11340	0.02	P-11340	0.02
P-11341	0.1	P-11341	0.05	P-11341	0.06
P-11343 (2)	0.04	P-11343 (2)	0.13	P-11343 (2)	0.14
P-11344 (2)	0.02	P-11344 (2)	0.06	P-11344 (2)	0.07
P-11345 (2)	0.11	P-11345 (2)	0.21	P-11345 (2)	0.18
P-11346	0.09	P-11346	0.17	P-11346	0.15
P-11347	0.06	P-11347	0.07	P-11347	0.1
P-11348	0.1	P-11348	0.11	P-11348	0.19
P-11349	0	P-11349	0	P-11349	0.73
P-11350	2.23	P-11350	1.09	P-11350	1.25
P-11351	0.41	P-11351	0.52	P-11351	0.42
P-11354 (1)	0.01	P-11354 (1)	0.01	P-11354 (1)	0.01
P-11354 (2)	0.03	P-11354 (2)	0.05	P-11354 (2)	0.06
P-11355	0.44	P-11355	0.19	P-11355	0.4
P-11357	1.03	P-11357	2.02	P-11357	0.7
P-11358	0.66	P-11358	1.29	P-11358	0.45
P-1136	0.05	P-1136	0.13	P-1136	0.13
P-11361	0.08	P-11361	0.14	P-11361	0.15
P-11362	0.09	P-11362	0.16	P-11362	0.17
P-11366	0.06	P-11366	0.03	P-11366	0.08
P-11367	0.06	P-11367	0.07	P-11367	0.03
P-11368	1.01	P-11368	0.24	P-11368	0.41
P-11370	0.01	P-11370	0.06	P-11370	0.07
P-11372 (1)	0.04	P-11372 (1)	0.05	P-11372 (1)	0.1
P-11372 (2)	0.01	P-11372 (2)	0.2	P-11372 (2)	0.27
P-11374	0.06	P-11374	0.03	P-11374	0.02
P-11375	0.07	P-11375	0.01	P-11375	0.03
P-11376	0.31	P-11376	0.23	P-11376	0.25
P-11379	0.03	P-11379	0.01	P-11379	0.01
P-11380	0.01	P-11380	0	P-11380	0
P-11382	0	P-11382	0	P-11382	0.19
P-11383	0.11	P-11383	0.27	P-11383	0.23
P-11384	0.16	P-11384	0.08	P-11384	0.22
P-11385	0.09	P-11385	0.47	P-11385	0.45
P-11386	0.07	P-11386	0.41	P-11386	0.39
P-11387	0	P-11387	0	P-11387	0.32
P-11388	0.01	P-11388	0.02	P-11388	0.02
P-11389	0.22	P-11389	0.2	P-11389	0.18
P-11390	0.2	P-11390	0.19	P-11390	0.23
P-11391	0.09	P-11391	0.08	P-11391	0.21
P-11392	0.03	P-11392	0.03	P-11392	0.11

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-11393 (1)	0.17	P-11393 (1)	0.07	P-11393 (1)	0.18
P-11393 (2)	0.03	P-11393 (2)	0.05	P-11393 (2)	0.03
P-11394	0.08	P-11394	0.07	P-11394	0.05
P-11395	0.41	P-11395	0.19	P-11395	0.28
P-11397	0.17	P-11397	0.09	P-11397	0.03
P-11399	0.19	P-11399	0.26	P-11399	0.3
P-114	0.02	P-114	0.1	P-114	0.09
P-11400	0.1	P-11400	0.13	P-11400	0.15
P-11402	0	P-11402	0	P-11402	0.21
P-11403	0.65	P-11403	0.33	P-11403	0.45
P-11405 (1)	0.55	P-11405 (1)	0.13	P-11405 (1)	0.21
P-11405 (2)	0	P-11405 (2)	0	P-11405 (2)	0
P-11406	0.25	P-11406	0.06	P-11406	0.1
P-11407	0.24	P-11407	0.15	P-11407	0.18
P-11409	0.17	P-11409	0.19	P-11409	0.29
P-1141	0.01	P-1141	0.02	P-1141	0.01
P-11410	0.23	P-11410	0.24	P-11410	0.34
P-11411 (1)	0.16	P-11411 (1)	0.05	P-11411 (1)	0.12
P-11411 (2)	0.06	P-11411 (2)	0.34	P-11411 (2)	0.33
P-11413	0.85	P-11413	0.73	P-11413	0.72
P-11414	0.48	P-11414	0.39	P-11414	0.39
P-11415	0.08	P-11415	0.06	P-11415	0.05
P-11417 (1)	0.16	P-11417 (1)	0.04	P-11417 (1)	0.1
P-11417 (2)(1)(1)	0	P-11417 (2)(1)(1)	0	P-11417 (2)(1)(1)	0
P-11417 (2)(1)(2)	0	P-11417 (2)(1)(2)	0	P-11417 (2)(1)(2)	0
P-11417 (2)(2)	0	P-11417 (2)(2)	0.01	P-11417 (2)(2)	0.01
P-11418	0	P-11418	0	P-11418	0
P-11419	0.24	P-11419	0.03	P-11419	0.01
P-11420	0.21	P-11420	0.08	P-11420	0.16
P-11421	0.01	P-11421	0.01	P-11421	0.01
P-11422	0	P-11422	0	P-11422	0
P-11423	0.01	P-11423	0.02	P-11423	0.02
P-11425	0.24	P-11425	0.2	P-11425	0.03
P-11426	0.13	P-11426	0.11	P-11426	0.02
P-11427	0.04	P-11427	0.05	P-11427	0.07
P-11428	0.08	P-11428	0.1	P-11428	0.14
P-11429	0.09	P-11429	0.07	P-11429	0.16
P-11430	0.07	P-11430	0.06	P-11430	0.13
P-11431	0.03	P-11431	0.04	P-11431	0.04
P-11433	0.25	P-11433	0.2	P-11433	0.15
P-11434	0.2	P-11434	0.21	P-11434	0.21
P-11435	0.14	P-11435	0.09	P-11435	0.19
P-11436	0.13	P-11436	0.07	P-11436	0.17
P-11438	0.1	P-11438	0.09	P-11438	0.11
P-11439	0.02	P-11439	0.03	P-11439	0.03
P-11440	0.01	P-11440	0.01	P-11440	0.01
P-11441	0	P-11441	0	P-11441	0
P-11443	0.07	P-11443	0.12	P-11443	1.93
P-11444	0.14	P-11444	0.25	P-11444	3.81
P-11445	0.29	P-11445	0.07	P-11445	0.22
P-11446	0.05	P-11446	0.2	P-11446	0.32
P-11447	0.14	P-11447	0.08	P-11447	0.17
P-11448	0.11	P-11448	0.07	P-11448	0.14
P-11449	0	P-11449	0	P-11449	0
P-11451	0	P-11451	0	P-11451	0
P-11452	0.08	P-11452	0.23	P-11452	0.21
P-11453	0.06	P-11453	0.07	P-11453	0.08
P-11455 (1)	0.14	P-11455 (1)	0.05	P-11455 (1)	0.11
P-11455 (2)	0.09	P-11455 (2)	0.15	P-11455 (2)	0.13
P-11456	0.09	P-11456	0.14	P-11456	0.12
P-11457	0.82	P-11457	0.89	P-11457	1.19
P-11460 (1)	0.25	P-11460 (1)	0.09	P-11460 (1)	0.23
P-11460 (2)	0.05	P-11460 (2)	0.05	P-11460 (2)	0.02
P-11462	8.27	P-11462	7.87	P-11462	6.22
P-11463	0.01	P-11463	0.01	P-11463	0.01
P-11464	0.07	P-11464	0.2	P-11464	0.19
P-11465	0.04	P-11465	0.07	P-11465	0.07
P-11466	0.01	P-11466	0.03	P-11466	0.03
P-11469	0.16	P-11469	0.23	P-11469	0.14
P-1147	0.01	P-1147	0.05	P-1147	0.05
P-11470	0.16	P-11470	0.22	P-11470	0.12

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-11471	0	P-11471	0.01	P-11471	0.01
P-11472	0.01	P-11472	0.02	P-11472	0.02
P-11473	0.03	P-11473	0.05	P-11473	0.04
P-11474	0.04	P-11474	0.07	P-11474	0.06
P-11476(1)	1.68	P-11476(1)	0.5	P-11476(1)	0.63
P-11476(2)	1.99	P-11476(2)	0.51	P-11476(2)	0.48
P-11479	0.09	P-11479	0.17	P-11479	1.12
P-11480	0.05	P-11480	0.1	P-11480	0.72
P-11481	0.04	P-11481	0.12	P-11481	0.08
P-11482	0.14	P-11482	0.35	P-11482	0.27
P-11483	0.01	P-11483	0.02	P-11483	0.01
P-11484	0.01	P-11484	0.01	P-11484	0.02
P-11487	0.44	P-11487	0.42	P-11487	0.42
P-11489	0.08	P-11489	0.12	P-11489	0.1
P-11491	0.38	P-11491	0.44	P-11491	0.04
P-11492(1)	0.43	P-11492(1)	0.83	P-11492(1)	0.27
P-11492(2)	0.43	P-11492(2)	0.83	P-11492(2)	0.27
P-11494 (1)	0	P-11494 (1)	0	P-11494 (1)	0
P-11494 (2)	0.01	P-11494 (2)	0.01	P-11494 (2)	0.02
P-11495	0	P-11495	0	P-11495	0
P-11496	0	P-11496	0.01	P-11496	0.01
P-11497 (1)	0.01	P-11497 (1)	0.02	P-11497 (1)	0.01
P-11497 (2)	0.34	P-11497 (2)	0.19	P-11497 (2)	0.11
P-11498 (1)	5.52	P-11498 (1)	4.67	P-11498 (1)	7.29
P-11498 (2)	0.06	P-11498 (2)	0.03	P-11498 (2)	0.08
P-11499	0.18	P-11499	0.15	P-11499	0.09
P-115	0.01	P-115	0.09	P-115	0.08
P-11500	0.04	P-11500	0.1	P-11500	0.04
P-11501	5.52	P-11501	4.65	P-11501	7.29
P-11502 (1)	5.53	P-11502 (1)	4.64	P-11502 (1)	7.29
P-11502 (2)	0.18	P-11502 (2)	0.11	P-11502 (2)	0.14
P-11503	0.02	P-11503	0.03	P-11503	0.03
P-11504	0.02	P-11504	0.06	P-11504	0.07
P-11505	0.78	P-11505	0.18	P-11505	0.16
P-11507	0.02	P-11507	0.02	P-11507	0.02
P-11508	0.01	P-11508	0.04	P-11508	0.04
P-11509 (1)	5.4	P-11509 (1)	9.23	P-11509 (1)	6.53
P-11509 (2)	1.25	P-11509 (2)	0.56	P-11509 (2)	0.7
P-11510	5.51	P-11510	4.68	P-11510	7.29
P-11511	0.28	P-11511	0.18	P-11511	0.33
P-11513	0.06	P-11513	0.11	P-11513	0.11
P-11515	1.94	P-11515	2.19	P-11515	2.15
P-11518	0.03	P-11518	0.09	P-11518	0.08
P-11519	0.78	P-11519	0.8	P-11519	0.76
P-1152	0.04	P-1152	0.07	P-1152	0.09
P-11520	0	P-11520	0.78	P-11520	0
P-11522	0.08	P-11522	0.12	P-11522	0.06
P-11524	0.24	P-11524	0.36	P-11524	0.28
P-11526	0.01	P-11526	0.02	P-11526	0.02
P-11527	0.01	P-11527	0.04	P-11527	0.03
P-11528	0.25	P-11528	0.17	P-11528	0.06
P-11530	0.99	P-11530	2.41	P-11530	0.54
P-11531 (1)	0.02	P-11531 (1)	0.04	P-11531 (1)	0.03
P-11531 (2)	0.02	P-11531 (2)	0.04	P-11531 (2)	0.05
P-11532	0	P-11532	0.01	P-11532	0.01
P-11533	0.03	P-11533	0	P-11533	0.02
P-11534(1)	0.02	P-11534(1)	0.01	P-11534(1)	0.02
P-11534(2)	0.01	P-11534(2)	0.02	P-11534(2)	0.02
P-11535	2.22	P-11535	0.99	P-11535	1.36
P-11538	0.01	P-11538	0.02	P-11538	0.05
P-11539	0.08	P-11539	0.11	P-11539	0.12
P-11541	0	P-11541	0.01	P-11541	0.01
P-11542	0.01	P-11542	0.01	P-11542	0.01
P-11544	0.03	P-11544	0.05	P-11544	0.06
P-11545	0.11	P-11545	0.12	P-11545	0.38
P-11546	0.07	P-11546	0.08	P-11546	0.16
P-11547	0.62	P-11547	0.55	P-11547	0.71
P-11548	0.36	P-11548	0.27	P-11548	0.79
P-11549	2.89	P-11549	1.05	P-11549	2.11
P-1155	0	P-1155	0.01	P-1155	0.01
P-11552	0.36	P-11552	0.82	P-11552	0.4

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-11553	0
P-11557	0.28
P-11558(2)(2)(2)(1)(1)(1)	0.28
P-11558(2)(2)(2)(1)(1)(2)	0.23
P-11558(2)(2)(2)(1)(2)	0.26
P-11558(2)(2)(2)(2)	0.28
P-11561	0.01
P-11562	0.01
P-11565	0.11
P-11566	0.21
P-11567	0.01
P-11568	0.03
P-11569	0.01
P-1157	0.01
P-11570	0.03
P-11572	1.05
P-11574	0.04
P-11575	0.22
P-11577	0.18
P-11578	0.35
P-11579	0.38
P-1158	0.01
P-11580 (1)	0.38
P-11580 (2)	0
P-11581 (1)	0.37
P-11581 (2)	1.16
P-11582	0.84
P-11584	0.15
P-11585 (1)	0.08
P-11585 (2)	0.01
P-11586	0.03
P-11587	0.12
P-11589	2
P-11590 (1)	0.01
P-11590 (2)	2.26
P-11591 (1)	0.01
P-11591 (2)	0.17
P-11592	0.02
P-11593	0.15
P-11595	0.01
P-11596	0.1
P-11597 (1)	0.03
P-11597 (2)	0.05
P-11599	0.01
P-11600	0.01
P-11602	0.18
P-11605 (1)	0.01
P-11605 (2)	0
P-11606 (1)	0.02
P-11606 (2)	0.07
P-11608	0.02
P-11610 (1)	0.01
P-11610 (2)	0.54
P-11611	0.12
P-11614	0.03
P-11615	0.25
P-11616	0.3
P-11617	0.03
P-11618	0.03
P-11622	0.16
P-11623	0.01
P-11624	0.01
P-11625 (1)	0.06
P-11625 (2)	0.09
P-11626	0.05
P-11627	0.93
P-11630	0.03
P-11631	0.12
P-11632	0
P-11633	3.66
P-11634	3.64

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-11553	0
P-11557	0.32
P-11558(2)(2)(2)(1)(1)(1)	0.37
P-11558(2)(2)(2)(1)(1)(2)	0.34
P-11558(2)(2)(2)(1)(2)	0.45
P-11558(2)(2)(2)(2)	0.53
P-11561	0.21
P-11562	0.21
P-11565	0.16
P-11566	0.32
P-11567	0.02
P-11568	0.05
P-11569	0.03
P-1157	0.01
P-11570	0.06
P-11572	0.25
P-11574	0.08
P-11575	0.01
P-11577	0.06
P-11578	0.6
P-11579	0.59
P-1158	0.01
P-11580 (1)	0.49
P-11580 (2)	0.01
P-11581 (1)	0.47
P-11581 (2)	0.31
P-11582	0.22
P-11584	0.15
P-11585 (1)	0.04
P-11585 (2)	0.77
P-11586	1.15
P-11587	0.09
P-11589	0.44
P-11590 (1)	0.02
P-11590 (2)	1.19
P-11591 (1)	0.02
P-11591 (2)	0.4
P-11592	0.03
P-11593	0.09
P-11595	0.01
P-11596	0.6
P-11597 (1)	0.05
P-11597 (2)	0.09
P-11599	0.01
P-11600	0.02
P-11602	0.06
P-11605 (1)	0.03
P-11605 (2)	0.03
P-11606 (1)	0.02
P-11606 (2)	0.01
P-11608	0
P-11610 (1)	0.02
P-11610 (2)	0.53
P-11611	0.03
P-11614	0.05
P-11615	0.22
P-11616	0.28
P-11617	0.02
P-11618	0.01
P-11622	0.07
P-11623	0.02
P-11624	0.01
P-11625 (1)	0.15
P-11625 (2)	0.14
P-11626	0.07
P-11627	0.77
P-11630	0.05
P-11631	0.19
P-11632	0
P-11633	1.07
P-11634	1.16

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-11553	0
P-11557	1.38
P-11558(2)(2)(2)(1)(1)(1)	1.27
P-11558(2)(2)(2)(1)(1)(2)	0.88
P-11558(2)(2)(2)(1)(2)	0.71
P-11558(2)(2)(2)(2)	0.6
P-11561	0.02
P-11562	0.02
P-11565	0.1
P-11566	0.19
P-11567	0.02
P-11568	0.05
P-11569	0.04
P-1157	0.02
P-11570	0.07
P-11572	0.29
P-11574	0.1
P-11575	0.02
P-11577	0.09
P-11578	0.58
P-11579	0.58
P-1158	0.02
P-11580 (1)	0.48
P-11580 (2)	0.01
P-11581 (1)	0.47
P-11581 (2)	0.58
P-11582	0.41
P-11584	0.24
P-11585 (1)	0.05
P-11585 (2)	1.1
P-11586	1.61
P-11587	0.13
P-11589	0.43
P-11590 (1)	0.03
P-11590 (2)	1.42
P-11591 (1)	0.02
P-11591 (2)	0.31
P-11592	0.06
P-11593	0.09
P-11595	0.01
P-11596	0.59
P-11597 (1)	0.06
P-11597 (2)	0.09
P-11599	0.01
P-11600	0.02
P-11602	0.55
P-11605 (1)	0.03
P-11605 (2)	0.03
P-11606 (1)	0.03
P-11606 (2)	0.06
P-11608	0.02
P-11610 (1)	0.02
P-11610 (2)	0.55
P-11611	0.04
P-11614	0.06
P-11615	0.22
P-11616	0.26
P-11617	0.01
P-11618	0
P-11622	0.11
P-11623	0.02
P-11624	0.01
P-11625 (1)	0.18
P-11625 (2)	0.11
P-11626	0.06
P-11627	0.37
P-11630	0.05
P-11631	0.42
P-11632	0.01
P-11633	0.46
P-11634	0.46

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-11636 (1)	0.01	P-11636 (1)	0.02	P-11636 (1)	0.02
P-11636 (2)	0.04	P-11636 (2)	0.01	P-11636 (2)	0.01
P-11639	0.01	P-11639	0	P-11639	0.01
P-1164	0.03	P-1164	0.06	P-1164	0.05
P-11640	0	P-11640	0	P-11640	0.01
P-11641	0.33	P-11641	0.12	P-11641	0.05
P-11642	0.36	P-11642	0.13	P-11642	0.04
P-11643 (1)	0.04	P-11643 (1)	0.09	P-11643 (1)	0.11
P-11643 (2)	0.01	P-11643 (2)	0	P-11643 (2)	0.01
P-11644 (1)	0.03	P-11644 (1)	0.07	P-11644 (1)	0.08
P-11644 (2)	0.13	P-11644 (2)	0.4	P-11644 (2)	0.26
P-11645	0	P-11645	0.02	P-11645	0.02
P-11647	0.42	P-11647	0.11	P-11647	0.16
P-11649	0.09	P-11649	0.01	P-11649	0.08
P-11650	0.1	P-11650	0.01	P-11650	0.08
P-11653	3.44	P-11653	6.39	P-11653	7.55
P-11654	3.44	P-11654	7.49	P-11654	8.84
P-11656 (1)	0	P-11656 (1)	0	P-11656 (1)	0
P-11656 (2)	0.02	P-11656 (2)	0.03	P-11656 (2)	0.01
P-11657 (1)	0	P-11657 (1)	0	P-11657 (1)	0
P-11657 (2)	0	P-11657 (2)	0	P-11657 (2)	0
P-11658	0	P-11658	0	P-11658	0
P-11659	0.07	P-11659	0.05	P-11659	0.04
P-11660	0.05	P-11660	0.05	P-11660	0.03
P-11662	0.01	P-11662	0.02	P-11662	0.01
P-11663	0.02	P-11663	0.01	P-11663	0.01
P-11664	0.01	P-11664	0.01	P-11664	0.01
P-11665	0.04	P-11665	0.05	P-11665	0.07
P-11666	0.07	P-11666	0.07	P-11666	0.05
P-11667	0.07	P-11667	0.23	P-11667	0.28
P-11672	0	P-11672	0.02	P-11672	0.02
P-11673	0.05	P-11673	0.1	P-11673	0.07
P-11674	0.04	P-11674	0.05	P-11674	0.09
P-11675	0.13	P-11675	0.13	P-11675	0.12
P-11676	0.21	P-11676	0.1	P-11676	0.11
P-11677	0.02	P-11677	0.04	P-11677	0.03
P-11678	0.03	P-11678	0.06	P-11678	0.05
P-11680	0.01	P-11680	0.08	P-11680	0.13
P-11683(1)(1)	0.01	P-11683(1)(1)	0.02	P-11683(1)(1)	0.02
P-11683(1)(2)	0.01	P-11683(1)(2)	0.02	P-11683(1)(2)	0.02
P-11683(2)	0.01	P-11683(2)	0.02	P-11683(2)	0.02
P-11684	0	P-11684	0.01	P-11684	0.01
P-11685	0.03	P-11685	0.27	P-11685	0.28
P-11686 (1)	0.05	P-11686 (1)	0.09	P-11686 (1)	0.14
P-11686 (2)	0	P-11686 (2)	0.01	P-11686 (2)	0.01
P-11687	0.07	P-11687	0.19	P-11687	0.17
P-11688	0.1	P-11688	0.25	P-11688	0.23
P-11689	0.12	P-11689	0.23	P-11689	0.4
P-11690	0.11	P-11690	0.19	P-11690	0.34
P-11691	0.07	P-11691	0.07	P-11691	0.05
P-11692	1.68	P-11692	2.09	P-11692	2.07
P-11693	0.18	P-11693	0.17	P-11693	0.27
P-11695(1)	0.18	P-11695(1)	0.58	P-11695(1)	2.45
P-11695(2)	0.38	P-11695(2)	0.74	P-11695(2)	1.93
P-11696	0.56	P-11696	0.86	P-11696	1.57
P-11698	0	P-11698	0	P-11698	0
P-11699	0.07	P-11699	0.1	P-11699	0.16
P-117	0.06	P-117	0.73	P-117	0.78
P-1170	0.03	P-1170	0.02	P-1170	0.02
P-11704	0	P-11704	0	P-11704	0
P-11704(1)	0.36	P-11704(1)	0.12	P-11704(1)	0.28
P-11704(2)	0.36	P-11704(2)	0.12	P-11704(2)	0.28
P-11705	0.14	P-11705	0.1	P-11705	0.1
P-11706 (1)	0.03	P-11706 (1)	0.05	P-11706 (1)	0.08
P-11706 (2)	0.2	P-11706 (2)	0.12	P-11706 (2)	0.16
P-11709	0.01	P-11709	0.01	P-11709	0.01
P-1171	0.06	P-1171	0.09	P-1171	0.06
P-11712 (1)	1.32	P-11712 (1)	2.97	P-11712 (1)	3.48
P-11712 (2)	0.04	P-11712 (2)	0.03	P-11712 (2)	0.06
P-11713 (1)	1.32	P-11713 (1)	2.98	P-11713 (1)	3.48
P-11713 (2)	0.29	P-11713 (2)	0.11	P-11713 (2)	0.13

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-11714	1.32	P-11714	2.99	P-11714	3.49
P-11715 (1)	1.33	P-11715 (1)	3	P-11715 (1)	3.5
P-11715 (2)	2.44	P-11715 (2)	0.65	P-11715 (2)	0.63
P-11716 (1)	1.33	P-11716 (1)	3.01	P-11716 (1)	3.51
P-11716 (2)	2.44	P-11716 (2)	0.67	P-11716 (2)	0.65
P-11721	0.05	P-11721	0	P-11721	0
P-11723	0.08	P-11723	0.17	P-11723	0.29
P-11726	0.02	P-11726	0.03	P-11726	0.03
P-11727	0.02	P-11727	0.13	P-11727	1.02
P-11728	0.08	P-11728	0.07	P-11728	0.93
P-11729	1.01	P-11729	1.55	P-11729	1.87
P-11730 (1)	0.95	P-11730 (1)	1.54	P-11730 (1)	1.71
P-11730 (2)	0.05	P-11730 (2)	0.12	P-11730 (2)	0.11
P-11731	0.95	P-11731	1.55	P-11731	1.71
P-11732 (1)	0.97	P-11732 (1)	1.59	P-11732 (1)	1.76
P-11732 (2)	0.01	P-11732 (2)	0.02	P-11732 (2)	0.01
P-11733	0.97	P-11733	1.59	P-11733	1.76
P-11733(1)	0.6	P-11733(1)	0.2	P-11733(1)	0.06
P-11733(2)	0.66	P-11733(2)	0.19	P-11733(2)	0.05
P-11735	0.79	P-11735	0.52	P-11735	0.27
P-11736	0.79	P-11736	0.15	P-11736	0.33
P-11739	0.01	P-11739	0.01	P-11739	0.01
P-11740	0.01	P-11740	0.03	P-11740	0.03
P-11741 (1)	1	P-11741 (1)	1.52	P-11741 (1)	1.85
P-11741 (2)	0.52	P-11741 (2)	0.24	P-11741 (2)	0.1
P-11742	1	P-11742	1.53	P-11742	1.86
P-11742(1)	0.53	P-11742(1)	0.26	P-11742(1)	0.11
P-11742(2)	0.57	P-11742(2)	0.28	P-11742(2)	0.12
P-11745	0.07	P-11745	0.07	P-11745	0.07
P-11746	0.05	P-11746	0.05	P-11746	0.05
P-11747 (1)	0.04	P-11747 (1)	0.08	P-11747 (1)	0.08
P-11747 (2)	0.11	P-11747 (2)	0.05	P-11747 (2)	0.02
P-11749 (1)	0.95	P-11749 (1)	1.43	P-11749 (1)	1.76
P-11749 (2)	0.03	P-11749 (2)	0.81	P-11749 (2)	0.62
P-11750	0.96	P-11750	0.86	P-11750	1.27
P-11751	0.96	P-11751	0.87	P-11751	1.28
P-11753	0.03	P-11753	0.04	P-11753	0.07
P-11755	0.06	P-11755	0.09	P-11755	0.1
P-11756	0	P-11756	0.01	P-11756	0.01
P-11757(1)	0	P-11757(1)	0	P-11757(1)	0
P-11757(2)	0	P-11757(2)	0	P-11757(2)	0
P-11758 (1)	0.03	P-11758 (1)	0.04	P-11758 (1)	0.06
P-11758 (2)	0	P-11758 (2)	0	P-11758 (2)	0
P-11759 (1)	0.03	P-11759 (1)	0.01	P-11759 (1)	0.05
P-11759 (2)	0	P-11759 (2)	0	P-11759 (2)	0
P-1176	0.96	P-1176	0.22	P-1176	0.29
P-11761	0.01	P-11761	0.04	P-11761	0.03
P-11762	0.02	P-11762	0.05	P-11762	0.04
P-11764	0.21	P-11764	0.11	P-11764	0.14
P-11766	0	P-11766	0.01	P-11766	0.01
P-11769	0.04	P-11769	0.09	P-11769	0.11
P-11771	0.08	P-11771	0.65	P-11771	0.66
P-11772	0.07	P-11772	0.06	P-11772	0.08
P-11773	0.07	P-11773	0.08	P-11773	0.1
P-11774	0.01	P-11774	0	P-11774	0.01
P-11774(1)(2)	0	P-11774(1)(2)	0.8	P-11774(1)(2)	2.77
P-11774(2)	0	P-11774(2)	0.8	P-11774(2)	2.77
P-11775	0.47	P-11775	0.2	P-11775	0.19
P-11776	0.24	P-11776	0.45	P-11776	0.53
P-11777	0.07	P-11777	0.08	P-11777	0.13
P-11778	0.07	P-11778	0.08	P-11778	0.13
P-11779	0	P-11779	0.05	P-11779	0.06
P-11780	0	P-11780	0.02	P-11780	0.11
P-11781	0.01	P-11781	0.02	P-11781	0.04
P-11782 (1)	0.02	P-11782 (1)	0.04	P-11782 (1)	0.04
P-11782 (2)	0	P-11782 (2)	0	P-11782 (2)	0
P-11783 (1)	0.06	P-11783 (1)	0.21	P-11783 (1)	0.1
P-11783 (2)	0.05	P-11783 (2)	0.06	P-11783 (2)	0.07
P-11784	0.01	P-11784	0.01	P-11784	0.01
P-11786	0.09	P-11786	0.44	P-11786	0.37
P-11789	0.37	P-11789	0.18	P-11789	0.25

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-1179	0.01	P-1179	0.02	P-1179	0.02
P-11790	0.64	P-11790	0.27	P-11790	0.43
P-11791	0.56	P-11791	0.59	P-11791	0.24
P-11792 (1)	0	P-11792 (1)	0.01	P-11792 (1)	0
P-11792 (2)	0.83	P-11792 (2)	0.4	P-11792 (2)	0.54
P-11793	0.11	P-11793	0.03	P-11793	0.04
P-11795	0.07	P-11795	0.07	P-11795	0.07
P-11796	0.05	P-11796	0.06	P-11796	0.07
P-11797	0.11	P-11797	0.31	P-11797	0.21
P-11798 (1)	0.02	P-11798 (1)	0.02	P-11798 (1)	0.03
P-11798 (2)	0.11	P-11798 (2)	0.35	P-11798 (2)	0.15
P-11799	0.79	P-11799	0.02	P-11799	0.04
P-11801	0.1	P-11801	0.09	P-11801	0.09
P-11803	0.01	P-11803	0.03	P-11803	0.03
P-11804	0.01	P-11804	0.02	P-11804	0.03
P-11805	0.06	P-11805	0.02	P-11805	0.03
P-11806 (1)	0.16	P-11806 (1)	0.14	P-11806 (1)	0.14
P-11806 (2)	0.39	P-11806 (2)	0.18	P-11806 (2)	0.3
P-11808	0	P-11808	0	P-11808	0
P-11809	0.91	P-11809	0.54	P-11809	0.72
P-11810	0.92	P-11810	0.56	P-11810	0.73
P-11812	0.01	P-11812	0.04	P-11812	0.07
P-11813	0.02	P-11813	0.01	P-11813	0.01
P-11814	0.02	P-11814	0.01	P-11814	0.01
P-11815 (1)	0	P-11815 (1)	0.01	P-11815 (1)	0.01
P-11815 (2)	0.1	P-11815 (2)	0.24	P-11815 (2)	0.32
P-11816 (1)	0.13	P-11816 (1)	0.03	P-11816 (1)	0.01
P-11816 (2)	0.12	P-11816 (2)	0.2	P-11816 (2)	0.29
P-11817	0.06	P-11817	0.04	P-11817	0.08
P-11818	0.05	P-11818	0.04	P-11818	0.07
P-11819 (1)	0.15	P-11819 (1)	0.03	P-11819 (1)	0.05
P-11819 (2)	0.01	P-11819 (2)	0.02	P-11819 (2)	0.02
P-11820	0.11	P-11820	0.03	P-11820	0.04
P-11821	0.22	P-11821	0.11	P-11821	0.13
P-11822	0.1	P-11822	0.04	P-11822	0.05
P-11823	0.01	P-11823	0.02	P-11823	0.02
P-11824	0.01	P-11824	0.01	P-11824	0.02
P-11825	0.02	P-11825	0.02	P-11825	0.02
P-11826	0.04	P-11826	0.03	P-11826	0.03
P-11827	0.2	P-11827	0.48	P-11827	0.38
P-11828	0.22	P-11828	0.49	P-11828	0.39
P-11829	0.34	P-11829	0.24	P-11829	0.21
P-11831	2.9	P-11831	8.02	P-11831	8.93
P-11832	0.08	P-11832	0.05	P-11832	0.1
P-11834	0.05	P-11834	0.09	P-11834	0.03
P-11836	0.12	P-11836	0.03	P-11836	0.03
P-11837	0.08	P-11837	0.07	P-11837	0.04
P-11838	0.04	P-11838	0.05	P-11838	0.08
P-11840	0.03	P-11840	0.05	P-11840	0.11
P-11841 (1)	0.08	P-11841 (1)	0.02	P-11841 (1)	0.02
P-11841 (2)	0.07	P-11841 (2)	0.13	P-11841 (2)	0.11
P-11842 (1)	0.01	P-11842 (1)	0.02	P-11842 (1)	0.02
P-11842 (2)	0.08	P-11842 (2)	0.15	P-11842 (2)	0.12
P-11843	0.08	P-11843	0.05	P-11843	0.09
P-11844	0.86	P-11844	0.57	P-11844	0.52
P-11848 (1)	0.26	P-11848 (1)	0.15	P-11848 (1)	0.2
P-11848 (2)	0.03	P-11848 (2)	0.05	P-11848 (2)	0.05
P-11849 (1)	0.32	P-11849 (1)	0.17	P-11849 (1)	0.25
P-11849 (2)	1.27	P-11849 (2)	0.37	P-11849 (2)	0.48
P-11850 (1)	0.26	P-11850 (1)	0.11	P-11850 (1)	0.19
P-11850 (2)	1.27	P-11850 (2)	0.37	P-11850 (2)	0.48
P-11851	0.05	P-11851	0.12	P-11851	0.34
P-11852 (1)	0.1	P-11852 (1)	0.03	P-11852 (1)	0.05
P-11852 (2)	0.12	P-11852 (2)	0.05	P-11852 (2)	0.12
P-11853	0.14	P-11853	0.11	P-11853	0.09
P-11855	0.49	P-11855	1.06	P-11855	0.85
P-11856	0.65	P-11856	1.38	P-11856	1.08
P-11857	0.09	P-11857	0.05	P-11857	0.05
P-11858	0.01	P-11858	0.01	P-11858	0.01
P-11859 (1)	0.49	P-11859 (1)	0.12	P-11859 (1)	0.13
P-11859 (2)	0	P-11859 (2)	0	P-11859 (2)	1.16

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-1186	0.07
P-11860	0.61
P-11861 (1)	0.53
P-11861 (2)	0.03
P-11863	0.3
P-11865 (1)	0.18
P-11865 (2)	0.58
P-11866	0.2
P-11867 (1)	0.18
P-11867 (2)	0.38
P-11870	0.18
P-11871 (1)	0.13
P-11871 (2)	0.08
P-11872 (1)	0.18
P-11872 (2)	0.08
P-11873	0.01
P-11874	0.01
P-11875	0.19
P-11876 (1)	0.12
P-11876 (2)	0.15
P-11878 (1)	0.01
P-11878 (2)	0.07
P-11879	0.02
P-1188	0.01
P-11880	0.03
P-11881	0.03
P-11882	0.02
P-11885	0.41
P-11886 (1)	0.29
P-11886 (2)	0.06
P-11887	0.2
P-11888	1.05
P-11889	0.02
P-1189	0
P-11890	0.04
P-11891	0.34
P-11892	0.49
P-11893	0.9
P-11894	0.29
P-11895	0.83
P-11896	0.82
P-11897	0.01
P-11900 (1)	0.18
P-11900 (2)	0
P-11903 (1)	0.07
P-11903 (2)	0.24
P-11905	0.4
P-11906	0.39
P-11907	0.07
P-11909	0.21
P-11910	0.15
P-11911	0
P-11915	0.01
P-11916(1)	0.06
P-11916(2)	0.06
P-11917	0.01
P-11919	0.04
P-1192	0.07
P-11920 (1)	0.03
P-11920 (2)	0.12
P-11921	0.02
P-11923 (1)	0.01
P-11923 (2)	0.01
P-11924	0.01
P-11925	0.61
P-11926	0.42
P-11927	0.11
P-11928	0.24
P-1193	0.02
P-11930	2.62
P-11931	0.03

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-1186	0.07
P-11860	0.12
P-11861 (1)	0.09
P-11861 (2)	0.04
P-11863	0.17
P-11865 (1)	0.03
P-11865 (2)	0.1
P-11866	0.03
P-11867 (1)	0.05
P-11867 (2)	0.42
P-11870	0.04
P-11871 (1)	0.04
P-11871 (2)	0.07
P-11872 (1)	0.05
P-11872 (2)	0.07
P-11873	0.2
P-11874	0.2
P-11875	0.03
P-11876 (1)	0.06
P-11876 (2)	0.09
P-11878 (1)	0.04
P-11878 (2)	0.08
P-11879	0.04
P-1188	0.06
P-11880	0.08
P-11881	0.05
P-11882	0.04
P-11885	0.25
P-11886 (1)	0.2
P-11886 (2)	0.1
P-11887	0.21
P-11888	1.28
P-11889	0.04
P-1189	0.03
P-11890	0.06
P-11891	0.27
P-11892	0.41
P-11893	0.63
P-11894	0.19
P-11895	0.45
P-11896	0.44
P-11897	0.18
P-11900 (1)	0.04
P-11900 (2)	0
P-11903 (1)	0.02
P-11903 (2)	0.13
P-11905	0.37
P-11906	0.39
P-11907	0.07
P-11909	0.27
P-11910	0.19
P-11911	0
P-11915	0.01
P-11916(1)	0.06
P-11916(2)	0.06
P-11917	0.02
P-11919	0.07
P-1192	0.07
P-11920 (1)	0.05
P-11920 (2)	0.23
P-11921	0.04
P-11923 (1)	0.03
P-11923 (2)	0.03
P-11924	0.02
P-11925	0.07
P-11926	0.04
P-11927	0.16
P-11928	0.35
P-1193	0.06
P-11930	0.71
P-11931	0.05

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-1186	0.06
P-11860	0.14
P-11861 (1)	0.12
P-11861 (2)	0.03
P-11863	0.22
P-11865 (1)	0.06
P-11865 (2)	0.41
P-11866	0.05
P-11867 (1)	0.11
P-11867 (2)	0.51
P-11870	0.09
P-11871 (1)	0.06
P-11871 (2)	0.06
P-11872 (1)	0.11
P-11872 (2)	0.06
P-11873	0.27
P-11874	0.27
P-11875	0.06
P-11876 (1)	0.1
P-11876 (2)	0.23
P-11878 (1)	0.11
P-11878 (2)	0.14
P-11879	0.03
P-1188	0.05
P-11880	0.07
P-11881	0.38
P-11882	0.23
P-11885	0.49
P-11886 (1)	0.3
P-11886 (2)	0.07
P-11887	0.31
P-11888	1.56
P-11889	0.03
P-1189	0.03
P-11890	0.04
P-11891	0.4
P-11892	0.53
P-11893	0.55
P-11894	0.18
P-11895	0.58
P-11896	0.57
P-11897	0.24
P-11900 (1)	0.06
P-11900 (2)	0
P-11903 (1)	0.06
P-11903 (2)	0.16
P-11905	0.51
P-11906	0.51
P-11907	0.06
P-11909	0.2
P-11910	0.25
P-11911	0
P-11915	0.01
P-11916(1)	0.04
P-11916(2)	0.04
P-11917	0.03
P-11919	0.06
P-1192	0.05
P-11920 (1)	0.04
P-11920 (2)	0.71
P-11921	0.03
P-11923 (1)	0.02
P-11923 (2)	0.03
P-11924	0.01
P-11925	0.03
P-11926	0.02
P-11927	0.1
P-11928	0.27
P-1193	0.05
P-11930	1.64
P-11931	0.07

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-11932	0.04	P-11932	0.07	P-11932	0.09
P-11933	1.31	P-11933	0.6	P-11933	0.77
P-11935(1)	0.54	P-11935(1)	1.23	P-11935(1)	0.59
P-11935(2)	0.54	P-11935(2)	1.23	P-11935(2)	0.59
P-11936	0.54	P-11936	1.23	P-11936	0.59
P-11937	0.12	P-11937	0.03	P-11937	0.02
P-1194	0.01	P-1194	0.01	P-1194	0.01
P-11940	0.02	P-11940	0.03	P-11940	0.02
P-11941	0	P-11941	0.01	P-11941	0.01
P-11942	0.01	P-11942	0.45	P-11942	0.46
P-11943	0	P-11943	0	P-11943	0
P-11944(1)	0	P-11944(1)	0	P-11944(1)	0
P-11944(2)	0	P-11944(2)	0	P-11944(2)	0
P-11946	0.12	P-11946	0.3	P-11946	0.13
P-11949	0.04	P-11949	0.1	P-11949	0.12
P-1195	0.03	P-1195	0.06	P-1195	0.05
P-11950	0.04	P-11950	0.11	P-11950	0.13
P-11951	0.16	P-11951	0.24	P-11951	0.52
P-11952	0.56	P-11952	0.24	P-11952	0.67
P-11953	0.09	P-11953	0.32	P-11953	0.06
P-11955	0.02	P-11955	0.03	P-11955	0.04
P-11956	0.01	P-11956	0.03	P-11956	0.03
P-11957	0	P-11957	0	P-11957	0
P-11958	0	P-11958	0	P-11958	0
P-11959	0.02	P-11959	0.03	P-11959	0.04
P-1196	0	P-1196	0	P-1196	0
P-11960	0	P-11960	0	P-11960	0
P-11962	0.11	P-11962	0.25	P-11962	0.45
P-11963	0.03	P-11963	0.02	P-11963	0
P-11966	0.04	P-11966	0.07	P-11966	0.07
P-11967	0.03	P-11967	0.06	P-11967	0.06
P-11968	0	P-11968	0.01	P-11968	0.01
P-11969	0.02	P-11969	0.02	P-11969	0.01
P-11970	0.02	P-11970	0.06	P-11970	0.05
P-11972	0.11	P-11972	0.1	P-11972	0.11
P-11973	0.11	P-11973	0.29	P-11973	0.13
P-11974	0.1	P-11974	0.27	P-11974	0.13
P-11977	0	P-11977	0	P-11977	0
P-11978	0	P-11978	0	P-11978	0
P-11979	0.01	P-11979	0.09	P-11979	0.22
P-11981	0.14	P-11981	0.3	P-11981	0.46
P-11982	0.1	P-11982	0.23	P-11982	0.39
P-11984	0.09	P-11984	0.02	P-11984	0.01
P-11985 (1)	0.26	P-11985 (1)	0.11	P-11985 (1)	0.15
P-11985 (2)	3.45	P-11985 (2)	0	P-11985 (2)	0
P-11986	0.38	P-11986	0.65	P-11986	0.61
P-11987	0.04	P-11987	0.07	P-11987	0.07
P-11988	0.04	P-11988	0.09	P-11988	0.09
P-11989	0.9	P-11989	0.95	P-11989	0.84
P-1199	0.02	P-1199	0.03	P-1199	0.03
P-11990 (1)	0.91	P-11990 (1)	0.96	P-11990 (1)	0.85
P-11990 (2)	0.88	P-11990 (2)	0.46	P-11990 (2)	0.61
P-11991	0.91	P-11991	0.97	P-11991	0.86
P-11992 (1)	0.92	P-11992 (1)	0.98	P-11992 (1)	0.86
P-11992 (2)	0	P-11992 (2)	0.02	P-11992 (2)	0.04
P-11993	1.01	P-11993	0.89	P-11993	0.82
P-11994 (1)	1.01	P-11994 (1)	0.9	P-11994 (1)	0.83
P-11994 (2)	0.02	P-11994 (2)	0.04	P-11994 (2)	0.02
P-11996	1.99	P-11996	2.37	P-11996	2.1
P-11998	0.04	P-11998	0.07	P-11998	0.06
P-11999	0.04	P-11999	0.01	P-11999	0.01
P-120	0.22	P-120	0.45	P-120	0.6
P-1200	0.05	P-1200	0.06	P-1200	0.05
P-12000 (1)	1.43	P-12000 (1)	0.2	P-12000 (1)	0.17
P-12000 (2)	0.04	P-12000 (2)	0.93	P-12000 (2)	0.7
P-12002 (1)	1.5	P-12002 (1)	0.48	P-12002 (1)	0.69
P-12002 (2)	0.5	P-12002 (2)	0.71	P-12002 (2)	0.79
P-12003 (1)	1.51	P-12003 (1)	0.49	P-12003 (1)	0.7
P-12003 (2)	0.03	P-12003 (2)	0.12	P-12003 (2)	0.41
P-12004	0.01	P-12004	0.15	P-12004	0.38
P-12005	2.53	P-12005	1.37	P-12005	1.54

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-12005(1)	2.29
P-12005(2)	2.29
P-12006	2.26
P-12007	0.83
P-12008	0.68
P-12009	0.6
P-1201	0.48
P-12011	1
P-12012	0.8
P-12013	0
P-12014	0
P-12017	0.1
P-12017(1)	0
P-12017(2)	0
P-12018 (1)	0.1
P-12018 (2)	0
P-12019	0.05
P-1202	0.05
P-12020	0.06
P-12022	0.02
P-12025	0
P-12026(2)(1)	0
P-12026(2)(2)	0
P-12027	0.57
P-12028	0.23
P-12031	0.18
P-12032	0
P-12037	0
P-12039	2.27
P-1204	0.05
P-12043	0
P-12044	0
P-12045	0.66
P-12046(1)	0.53
P-12046(2)	0.72
P-12047	0.02
P-12049	1.31
P-12050	0.19
P-12052	0.03
P-12053	0.04
P-12054	0.37
P-12055 (1)	0.36
P-12055 (2)	0.53
P-12056	0.56
P-12058	0.02
P-12059	0.13
P-12060	0.19
P-12061(1)	2.11
P-12062 (1)	0.02
P-12062 (2)	2.02
P-12063	0.12
P-12064	0.11
P-12068	1.03
P-1207	0.08
P-12071	0.09
P-12072	0.5
P-12073	2.15
P-12075	0.01
P-12076 (1)	0.28
P-12076 (2)	0.02
P-12077	0.02
P-12088	0.01
P-12091	0.07
P-121	0.05
P-12100	0.26
P-12105	0.01
P-12106	0.15
P-12107	0.01
P-12113	0
P-12115(1)	0
P-12115(2)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-12005(1)	5.76
P-12005(2)	5.75
P-12006	5.66
P-12007	0.45
P-12008	0.32
P-12009	0.22
P-1201	0.18
P-12011	0.05
P-12012	0.03
P-12013	0
P-12014	0
P-12017	0.05
P-12017(1)	0
P-12017(2)	0.8
P-12018 (1)	0.04
P-12018 (2)	0.8
P-12019	0.1
P-1202	0.02
P-12020	0.11
P-12022	0.04
P-12025	3.57
P-12026(2)(1)	3.57
P-12026(2)(2)	3.92
P-12027	0.03
P-12028	0.01
P-12031	0.15
P-12032	0
P-12037	0
P-12039	2.11
P-1204	0.05
P-12043	0
P-12044	0
P-12045	0.44
P-12046(1)	0.35
P-12046(2)	0.48
P-12047	0.03
P-12049	0.6
P-12050	0.6
P-12052	0.05
P-12053	0.07
P-12054	0.63
P-12055 (1)	0.62
P-12055 (2)	0.2
P-12056	0.25
P-12058	0.04
P-12059	0.51
P-12060	0.54
P-12061(1)	0.21
P-12062 (1)	0.02
P-12062 (2)	2.46
P-12063	0.04
P-12064	0.02
P-12068	0.52
P-1207	0.17
P-12071	0.09
P-12072	0.71
P-12073	1.97
P-12075	0.02
P-12076 (1)	0.23
P-12076 (2)	0.04
P-12077	0.04
P-12088	0.01
P-12091	0.05
P-121	0.84
P-12100	0.13
P-12105	0.05
P-12106	0.08
P-12107	0.05
P-12113	0
P-12115(1)	0
P-12115(2)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-12005(1)	5.92
P-12005(2)	5.9
P-12006	5.7
P-12007	0.58
P-12008	0.46
P-12009	0.07
P-1201	0.1
P-12011	0.08
P-12012	0.03
P-12013	0
P-12014	0
P-12017	0.06
P-12017(1)	0
P-12017(2)	2.77
P-12018 (1)	0.04
P-12018 (2)	2.77
P-12019	0.08
P-1202	0.02
P-12020	0.09
P-12022	0.04
P-12025	3.17
P-12026(2)(1)	3.17
P-12026(2)(2)	3.48
P-12027	0.04
P-12028	0.02
P-12031	0.17
P-12032	0
P-12037	0
P-12039	2.04
P-1204	0.05
P-12043	0
P-12044	0
P-12045	0.41
P-12046(1)	0.33
P-12046(2)	0.44
P-12047	0.03
P-12049	0.77
P-12050	0.78
P-12052	0.04
P-12053	0.04
P-12054	0.6
P-12055 (1)	0.59
P-12055 (2)	0.06
P-12056	0.1
P-12058	0.04
P-12059	0.54
P-12060	0.61
P-12061(1)	0
P-12062 (1)	0.01
P-12062 (2)	2.3
P-12063	0.05
P-12064	0.03
P-12068	0.71
P-1207	0.21
P-12071	0.03
P-12072	0.78
P-12073	1.9
P-12075	0.01
P-12076 (1)	0.24
P-12076 (2)	0.03
P-12077	0.04
P-12088	0.01
P-12091	0.06
P-121	0.88
P-12100	0.14
P-12105	0.09
P-12106	0.09
P-12107	0.09
P-12113	0.25
P-12115(1)	0.1
P-12115(2)	0.1

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-12117	0
P-12118	0.91
P-12119 (1)	0.93
P-12119 (2)	0.01
P-12121	0.01
P-12125	0.01
P-12129	0.36
P-1213	0.26
P-12131	2.86
P-12133	0.44
P-12135	1.21
P-12137	1.21
P-12139	0
P-12141	2.16
P-12145	0.12
P-12149	0.04
P-12151 (1)	0.09
P-12151 (2)	0
P-12153	0
P-12155	0
P-12157 (1)	0.08
P-12157 (2)	0
P-1216	0.28
P-12161	0.05
P-12163	0.09
P-12167	0.46
P-12169	0.49
P-12171	0.03
P-12172	0.05
P-12175	2.78
P-12177	2.95
P-12178(1)	0.01
P-12178(2)	0.03
P-12179	0.05
P-12180	0.02
P-12181	0.09
P-12185 (1)	1.32
P-12185 (2)	0.1
P-12186	0.19
P-12187	0.18
P-12188	0.18
P-12189	0.02
P-12191	0.01
P-12194	0.02
P-12199	0.01
P-12201	0.22
P-12205	0.04
P-12211	1.82
P-12213	0.61
P-12214	0.02
P-12215	0.61
P-12217 (1)	0.03
P-12217 (2)	1.82
P-12218	0.04
P-12219 (1)	0.03
P-12219 (2)	0.86
P-1222	0.01
P-12221	1.03
P-12222	0.03
P-12223	0.04
P-12225	0.93
P-12226	0.07
P-12229	0.12
P-12230	0.05
P-12231 (1)	0.01
P-12231 (2)	0.01
P-12232	0.04
P-12235 (1)	0.04
P-12235 (2)	0
P-12239	0.05
P-1224	0.04

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-12117	0.01
P-12118	0.52
P-12119 (1)	0.5
P-12119 (2)	0.02
P-12121	0.04
P-12125	0.02
P-12129	1.01
P-1213	0.3
P-12131	2.32
P-12133	0.15
P-12135	2.33
P-12137	2.34
P-12139	0
P-12141	2.12
P-12145	0.08
P-12149	0.03
P-12151 (1)	0.03
P-12151 (2)	0
P-12153	0
P-12155	0
P-12157 (1)	0.03
P-12157 (2)	0.01
P-1216	0.31
P-12161	0.03
P-12163	0.04
P-12167	0.2
P-12169	0.13
P-12171	0.12
P-12172	0.16
P-12175	1.26
P-12177	1.5
P-12178(1)	0.04
P-12178(2)	0.06
P-12179	0.04
P-12180	0.06
P-12181	0.23
P-12185 (1)	2.97
P-12185 (2)	0.08
P-12186	0.96
P-12187	0.96
P-12188	0.97
P-12189	0.02
P-12191	0.02
P-12194	0.05
P-12199	0.01
P-12201	0.19
P-12205	0.13
P-12211	1.92
P-12213	0.64
P-12214	0.03
P-12215	0.64
P-12217 (1)	0.02
P-12217 (2)	1.91
P-12218	0.03
P-12219 (1)	0.04
P-12219 (2)	0.23
P-1222	0.01
P-12221	0.29
P-12222	0.01
P-12223	0.02
P-12225	0.75
P-12226	0.04
P-12229	0.07
P-12230	0.04
P-12231 (1)	0.01
P-12231 (2)	0.23
P-12232	0.04
P-12235 (1)	0.05
P-12235 (2)	0
P-12239	0.16
P-1224	0.03

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-12117	0.01
P-12118	0.58
P-12119 (1)	0.56
P-12119 (2)	0.02
P-12121	0.34
P-12125	0.02
P-12129	1.6
P-1213	0.18
P-12131	3.6
P-12133	1
P-12135	4.08
P-12137	4.08
P-12139	0
P-12141	2.22
P-12145	0.02
P-12149	0.03
P-12151 (1)	0.03
P-12151 (2)	0
P-12153	0
P-12155	0
P-12157 (1)	0.03
P-12157 (2)	0.01
P-1216	0.32
P-12161	0.05
P-12163	0.08
P-12167	0.25
P-12169	0.49
P-12171	0.12
P-12172	0.16
P-12175	1.86
P-12177	2.14
P-12178(1)	0.04
P-12178(2)	0.07
P-12179	0.02
P-12180	0.05
P-12181	0.28
P-12185 (1)	3.48
P-12185 (2)	0.05
P-12186	1.27
P-12187	1.28
P-12188	1.28
P-12189	0.01
P-12191	0.01
P-12194	0.05
P-12199	0.01
P-12201	0.22
P-12205	0.12
P-12211	2.19
P-12213	0.73
P-12214	0.04
P-12215	0.73
P-12217 (1)	0.04
P-12217 (2)	2.18
P-12218	0.06
P-12219 (1)	0.04
P-12219 (2)	0.42
P-1222	0.01
P-12221	0.52
P-12222	0.03
P-12223	0.04
P-12225	0.76
P-12226	0.08
P-12229	0.16
P-12230	0.09
P-12231 (1)	0.01
P-12231 (2)	0.57
P-12232	0.07
P-12235 (1)	0.08
P-12235 (2)	0
P-12239	0.17
P-1224	0.02

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-12241	0.2	P-12241	0.32	P-12241	0.43
P-12243	0.02	P-12243	0.04	P-12243	0.07
P-12245	0.08	P-12245	0.15	P-12245	0.25
P-12247	0.02	P-12247	0.04	P-12247	0.07
P-12249	0.1	P-12249	0.18	P-12249	0.39
P-1225	0.03	P-1225	0.03	P-1225	0.02
P-12251 (1)	0.66	P-12251 (1)	0.86	P-12251 (1)	1.42
P-12251 (2)	0.29	P-12251 (2)	0.13	P-12251 (2)	0.2
P-12253	1.01	P-12253	0.39	P-12253	0.59
P-12255	0.01	P-12255	0.08	P-12255	0.08
P-12257 (1)	6.85	P-12257 (1)	5.81	P-12257 (1)	11.14
P-12257 (2)	0.03	P-12257 (2)	0.05	P-12257 (2)	0.05
P-1226	0.03	P-1226	0.02	P-1226	0.01
P-12261	2.51	P-12261	0.2	P-12261	0.28
P-12263	4.88	P-12263	5.15	P-12263	9.12
P-12264	3.43	P-12264	3.18	P-12264	6.95
P-12269	0.04	P-12269	0.04	P-12269	0.02
P-1227 (1)	0.02	P-1227 (1)	0.01	P-1227 (1)	0.01
P-1227 (2)	0.19	P-1227 (2)	0.32	P-1227 (2)	0.58
P-12271 (1)	0.01	P-12271 (1)	0.04	P-12271 (1)	0.03
P-12271 (2)	0	P-12271 (2)	0.01	P-12271 (2)	0.01
P-12273	0.01	P-12273	0.02	P-12273	0.02
P-12275	1.7	P-12275	2.84	P-12275	0.88
P-12277	1.66	P-12277	2.75	P-12277	0.79
P-1228	0.03	P-1228	0.02	P-1228	0.01
P-12280	0.02	P-12280	0.04	P-12280	0.04
P-12281	0.99	P-12281	2.41	P-12281	0.54
P-12282	0.01	P-12282	0.02	P-12282	0.02
P-12285(1)	0.02	P-12285(1)	0.02	P-12285(1)	0.02
P-12285(2)	0.02	P-12285(2)	0.04	P-12285(2)	0.04
P-12289	0.18	P-12289	0.06	P-12289	0.09
P-1229 (1)	0.02	P-1229 (1)	0.01	P-1229 (1)	0.01
P-1229 (2)	0.12	P-1229 (2)	0.07	P-1229 (2)	0.17
P-12291 (1)	0.04	P-12291 (1)	0.08	P-12291 (1)	0.06
P-12291 (2)	0.08	P-12291 (2)	0.23	P-12291 (2)	0.22
P-12293	0.08	P-12293	0.23	P-12293	0.21
P-12295	2.2	P-12295	2.92	P-12295	2.99
P-12296	6.85	P-12296	5.8	P-12296	11.13
P-12297	0.06	P-12297	0.04	P-12297	0.07
P-12299	0.16	P-12299	0.09	P-12299	0.14
P-123	0.15	P-123	0.64	P-123	0.77
P-12301	0.35	P-12301	0.19	P-12301	0.3
P-12304	0.05	P-12304	0.03	P-12304	0.04
P-12305	2.47	P-12305	1.17	P-12305	0
P-1231	0.01	P-1231	0.01	P-1231	0.01
P-12312	0.28	P-12312	0.4	P-12312	0.63
P-12313 (1)	0.3	P-12313 (1)	0.43	P-12313 (1)	0.67
P-12313 (2)	0.06	P-12313 (2)	0.02	P-12313 (2)	0.04
P-12314	0.23	P-12314	0.46	P-12314	0.62
P-12315	0.06	P-12315	0.02	P-12315	0.04
P-12317	0.11	P-12317	0.02	P-12317	0.05
P-1232	0.02	P-1232	0.01	P-1232	0.01
P-12323	0	P-12323	0	P-12323	0
P-12327	0.14	P-12327	0.05	P-12327	0.02
P-1233	0.04	P-1233	0.05	P-1233	0.04
P-12330	0.01	P-12330	0.01	P-12330	0.01
P-12331	0	P-12331	0	P-12331	0.17
P-12333	0	P-12333	0	P-12333	0.09
P-12335	0.01	P-12335	0.02	P-12335	0.02
P-12337	0.01	P-12337	0.02	P-12337	0.02
P-12339 (1)	0	P-12339 (1)	0.01	P-12339 (1)	0.01
P-12339 (2)	0.01	P-12339 (2)	0.03	P-12339 (2)	0.06
P-1234	0.03	P-1234	0.02	P-1234	0.01
P-12341	0.07	P-12341	0.08	P-12341	0.06
P-12344	8.08	P-12344	6.38	P-12344	12.94
P-12345	16.05	P-12345	17.81	P-12345	(N/A)
P-12349	0.15	P-12349	0.05	P-12349	0.1
P-1235	0.06	P-1235	0.07	P-1235	0.05
P-12350	0.17	P-12350	0.06	P-12350	0.02
P-12351	0.08	P-12351	0.08	P-12351	0.11
P-12352	0.01	P-12352	0.02	P-12352	0.02

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-12353	0.22	P-12353	0.25	P-12353	0.63
P-12355	2.5	P-12355	0.62	P-12355	0.59
P-12357	2.5	P-12357	0.62	P-12357	0.59
P-1236	0.03	P-1236	0.01	P-1236	0.01
P-12361	0.37	P-12361	0.13	P-12361	0.02
P-12363	0	P-12363	0.12	P-12363	0.02
P-12367 (1)	0.03	P-12367 (1)	0.04	P-12367 (1)	0.02
P-12367 (2)	0.1	P-12367 (2)	0.1	P-12367 (2)	0.1
P-12369	0.15	P-12369	0.12	P-12369	0.1
P-12371	0.08	P-12371	0.1	P-12371	0.13
P-12373	0	P-12373	0	P-12373	0
P-12375	0.12	P-12375	0.23	P-12375	0.71
P-12377	0.47	P-12377	0.92	P-12377	2.85
P-12378	0.01	P-12378	0.03	P-12378	0.03
P-12379	0.21	P-12379	0.1	P-12379	0.15
P-12381	0.1	P-12381	0.03	P-12381	0.03
P-12382	0.08	P-12382	0.02	P-12382	0.03
P-12383 (1)	0.11	P-12383 (1)	0.11	P-12383 (1)	0.09
P-12383 (2)	3.37	P-12383 (2)	1.65	P-12383 (2)	2.84
P-12385	3.37	P-12385	1.65	P-12385	2.84
P-12386	0.53	P-12386	0.42	P-12386	0.36
P-12389 (1)	0.08	P-12389 (1)	0.12	P-12389 (1)	0.11
P-12389 (2)	0	P-12389 (2)	0.01	P-12389 (2)	0.01
P-12395	0	P-12395	0.01	P-12395	0.03
P-12399	0	P-12399	0.02	P-12399	0.02
P-12401	0.01	P-12401	0.09	P-12401	0.08
P-12403	0	P-12403	0.01	P-12403	0.01
P-12405(1)	0.05	P-12405(1)	0.09	P-12405(1)	0.1
P-12405(2)	0.05	P-12405(2)	0.09	P-12405(2)	0.1
P-1241	0.02	P-1241	0.01	P-1241	0.01
P-12411	0.23	P-12411	0.25	P-12411	0.12
P-12415	0.11	P-12415	0.11	P-12415	0.12
P-12417	0.34	P-12417	0.3	P-12417	0.27
P-12419 (1)	0.29	P-12419 (1)	0.49	P-12419 (1)	0.22
P-12419 (2)	0.9	P-12419 (2)	2.97	P-12419 (2)	0.72
P-1242	0.01	P-1242	0.01	P-1242	0.01
P-12421	0.45	P-12421	1.48	P-12421	0.36
P-12425	0.77	P-12425	0.3	P-12425	0.39
P-12429	0.05	P-12429	0.1	P-12429	0.07
P-1243	0.04	P-1243	0.02	P-1243	0.01
P-12431	0.07	P-12431	0.13	P-12431	0.15
P-12433	0.08	P-12433	0.08	P-12433	0.08
P-12435	8.07	P-12435	6.35	P-12435	12.91
P-12436	8.07	P-12436	6.36	P-12436	12.92
P-12437	0.72	P-12437	0.44	P-12437	0.53
P-1244	0.07	P-1244	0.06	P-1244	0.01
P-12441	0.26	P-12441	0.24	P-12441	0.23
P-12443	0.47	P-12443	0.92	P-12443	2.85
P-12445	0.12	P-12445	0.23	P-12445	0.71
P-12447	0.12	P-12447	0.09	P-12447	0.2
P-12449	0.09	P-12449	0.06	P-12449	0.14
P-1245	0.04	P-1245	0.03	P-1245	0.03
P-12451	1.68	P-12451	1.58	P-12451	1.42
P-12453	1.84	P-12453	1.68	P-12453	1.41
P-12457	0.47	P-12457	0.36	P-12457	1.49
P-12458	8.07	P-12458	6.34	P-12458	12.91
P-12459	0.08	P-12459	0.12	P-12459	0.04
P-12461	0.52	P-12461	0.16	P-12461	0.19
P-12463 (1)	8.3	P-12463 (1)	11.13	P-12463 (1)	7.31
P-12463 (2)	0.13	P-12463 (2)	0.17	P-12463 (2)	0.19
P-12465	0	P-12465	0	P-12465	0
P-12467	0.15	P-12467	0.18	P-12467	0.23
P-12475	0	P-12475	0.04	P-12475	0.12
P-12477	0	P-12477	0	P-12477	0.01
P-12479 (1)	0.11	P-12479 (1)	0.18	P-12479 (1)	0.61
P-12479 (2)	0	P-12479 (2)	0	P-12479 (2)	0.09
P-12481 (1)	0.08	P-12481 (1)	0.13	P-12481 (1)	0.22
P-12481 (2)	0	P-12481 (2)	0	P-12481 (2)	0.03
P-12489	0.01	P-12489	0.08	P-12489	0.21
P-12491	0.1	P-12491	0.14	P-12491	0.02
P-12492	0.12	P-12492	0.24	P-12492	0.41

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-12493	0.48
P-12497	8.3
P-12498(1)	8.3
P-12498(2)	8.3
P-12501	0.46
P-12503	0.03
P-12505	0.06
P-12514	0.46
P-12515	0
P-12517	0
P-1252	0.65
P-12521	0.01
P-12527	0.29
P-12529	0.2
P-1253	0.25
P-12531	0.35
P-12533	0.03
P-12535	0.05
P-12537 (1)	0.1
P-12537 (2)	0.01
P-12538	0
P-12539	0.03
P-1254 (1)	0.12
P-1254 (2)	0.08
P-12541	0.22
P-12543	0.1
P-12546	0.61
P-12547 (1)	1
P-12547 (2)	0
P-12548	1.42
P-12549	0
P-1255 (1)	0.03
P-1255 (2)	0.01
P-12555	0.01
P-12557	0.05
P-12559	0.06
P-1256	0.1
P-12560	0.07
P-12561	0.01
P-12563	0.29
P-12565	0.07
P-12567	0.29
P-12569	0.07
P-1257	0.08
P-12571	0.04
P-12573	0.17
P-12575	0.24
P-12577	0.04
P-12579	0.08
P-1258	0.04
P-12583	0.07
P-12585	0.03
P-12587	0.09
P-12589	0.21
P-1259	0
P-12591	0.21
P-12593	0.26
P-12599	0.42
P-1260 (1)	0
P-1260 (2)	0.11
P-12601	0.94
P-12603	0.03
P-12608	0.04
P-12609 (1)	0.05
P-12609 (2)	0.07
P-1261	0
P-12610	0.04
P-12611 (1)	0.08
P-12611 (2)	0.09
P-12612	0.12
P-12613	0.09

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-12493	0.92
P-12497	8.1
P-12498(1)	8.1
P-12498(2)	11.13
P-12501	2.72
P-12503	0.05
P-12505	0.08
P-12514	2.71
P-12515	0
P-12517	0
P-1252	0.71
P-12521	0.04
P-12527	0.53
P-12529	0.08
P-1253	0.28
P-12531	0.37
P-12533	0.01
P-12535	0.02
P-12537 (1)	0.72
P-12537 (2)	0
P-12538	0
P-12539	0.03
P-1254 (1)	0.13
P-1254 (2)	0.15
P-12541	0.02
P-12543	0.07
P-12546	0.08
P-12547 (1)	0.12
P-12547 (2)	0.2
P-12548	0.2
P-12549	0.04
P-1255 (1)	0.05
P-1255 (2)	0.03
P-12555	0.01
P-12557	0.06
P-12559	0.04
P-1256	0.09
P-12560	0.01
P-12561	0.01
P-12563	0.42
P-12565	0.11
P-12567	0.43
P-12569	0.11
P-1257	0.06
P-12571	0.08
P-12573	0.3
P-12575	0.35
P-12577	0.08
P-12579	0.14
P-1258	0.03
P-12583	0.1
P-12585	0.05
P-12587	0.03
P-12589	0.07
P-1259	0.01
P-12591	0.38
P-12593	0.04
P-12599	0.13
P-1260 (1)	0.01
P-1260 (2)	0.15
P-12601	0.29
P-12603	0.02
P-12608	0.01
P-12609 (1)	0.01
P-12609 (2)	0.05
P-1261	0.01
P-12610	0.02
P-12611 (1)	0.01
P-12611 (2)	0.19
P-12612	0.02
P-12613	0.01

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-12493	0.81
P-12497	6.33
P-12498(1)	6.33
P-12498(2)	7.31
P-12501	3.73
P-12503	0.05
P-12505	0.08
P-12514	3.73
P-12515	0.2
P-12517	0.21
P-1252	0.42
P-12521	0.04
P-12527	2.37
P-12529	0.07
P-1253	0.17
P-12531	0.58
P-12533	0.05
P-12535	0.1
P-12537 (1)	0.85
P-12537 (2)	0.03
P-12538	0
P-12539	0.05
P-1254 (1)	0.08
P-1254 (2)	0.14
P-12541	0.02
P-12543	0.08
P-12546	0.07
P-12547 (1)	0.11
P-12547 (2)	0.16
P-12548	0.17
P-12549	0.14
P-1255 (1)	0.03
P-1255 (2)	0.03
P-12555	0.01
P-12557	0.07
P-12559	0.04
P-1256	0.04
P-12560	0.01
P-12561	0.01
P-12563	0.39
P-12565	0.1
P-12567	0.38
P-12569	0.1
P-1257	0.03
P-12571	0.1
P-12573	0.38
P-12575	0.48
P-12577	0.1
P-12579	0.19
P-1258	0.01
P-12583	0.08
P-12585	0.04
P-12587	0.03
P-12589	0.08
P-1259	0
P-12591	0.36
P-12593	0.05
P-12599	0.15
P-1260 (1)	0
P-1260 (2)	0.14
P-12601	0.34
P-12603	0.02
P-12608	0.01
P-12609 (1)	0.01
P-12609 (2)	0.04
P-1261	0
P-12610	0.02
P-12611 (1)	0.01
P-12611 (2)	0.25
P-12612	0.02
P-12613	0.02

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-12615	0.09	P-12615	0.18	P-12615	0.23
P-12616	0.1	P-12616	0.02	P-12616	0.02
P-12617	0.04	P-12617	0.01	P-12617	0.01
P-12619	1.89	P-12619	1.5	P-12619	1.53
P-1262	0	P-1262	0.01	P-1262	0
P-12621 (1)	0.05	P-12621 (1)	0.02	P-12621 (1)	0.01
P-12621 (2)	1.87	P-12621 (2)	1.45	P-12621 (2)	1.5
P-12622	0.06	P-12622	0.01	P-12622	0.01
P-12623 (1)	0.07	P-12623 (1)	0.01	P-12623 (1)	0.01
P-12623 (2)	0.47	P-12623 (2)	0.36	P-12623 (2)	1.49
P-12624	0.1	P-12624	0.08	P-12624	0.08
P-12627	0.54	P-12627	0.53	P-12627	0.55
P-12628	0.06	P-12628	0.06	P-12628	0.06
P-12629 (1)	0	P-12629 (1)	0.03	P-12629 (1)	0.03
P-12629 (2)	2.15	P-12629 (2)	2.11	P-12629 (2)	2.21
P-1263	0	P-1263	0.01	P-1263	0
P-12631	2.14	P-12631	2.1	P-12631	2.2
P-12633	0.54	P-12633	0.53	P-12633	0.55
P-12634	0.05	P-12634	0.01	P-12634	0
P-12635 (1)	0.05	P-12635 (1)	0.05	P-12635 (1)	0.05
P-12635 (2)	0.28	P-12635 (2)	0.03	P-12635 (2)	0.04
P-12637 (1)	0.01	P-12637 (1)	0.04	P-12637 (1)	0.04
P-12637 (2)	0.28	P-12637 (2)	0.02	P-12637 (2)	0.03
P-12638	0.08	P-12638	0.01	P-12638	0.01
P-1264	0	P-1264	0.01	P-1264	0
P-12641 (1)	0.29	P-12641 (1)	0.04	P-12641 (1)	0.02
P-12641 (2)	0.01	P-12641 (2)	0.75	P-12641 (2)	0.33
P-12642	0.13	P-12642	0.19	P-12642	0.18
P-12643	0.35	P-12643	0.11	P-12643	0.07
P-12647 (1)	0.15	P-12647 (1)	0.04	P-12647 (1)	0.05
P-12647 (2)	0.03	P-12647 (2)	0.03	P-12647 (2)	0.04
P-12648	0.07	P-12648	0.05	P-12648	0.06
P-12649 (1)	0.12	P-12649 (1)	0.07	P-12649 (1)	0.08
P-12649 (2)	0.01	P-12649 (2)	0.01	P-12649 (2)	0.01
P-1265	0	P-1265	0.01	P-1265	0
P-12651 (1)	0.35	P-12651 (1)	0.28	P-12651 (1)	0.34
P-12651 (2)	0.01	P-12651 (2)	0.01	P-12651 (2)	0.01
P-12652	0.22	P-12652	0.09	P-12652	0.11
P-12653	0.18	P-12653	0.11	P-12653	0.12
P-12653(1)	0.02	P-12653(1)	0.01	P-12653(1)	0.02
P-12653(2)	0.02	P-12653(2)	0.01	P-12653(2)	0.02
P-12654	0.11	P-12654	0.12	P-12654	0.13
P-12655 (1)	0.22	P-12655 (1)	0.1	P-12655 (1)	0.12
P-12655 (2)	0.01	P-12655 (2)	0.01	P-12655 (2)	0.01
P-12657 (1)	0.22	P-12657 (1)	0.13	P-12657 (1)	0.14
P-12657 (2)	0.84	P-12657 (2)	0.3	P-12657 (2)	0.4
P-12658	0.25	P-12658	0.16	P-12658	0.17
P-12659	0.3	P-12659	0.18	P-12659	0.2
P-1266 (1)	0.01	P-1266 (1)	0.01	P-1266 (1)	0.01
P-1266 (2)	0	P-1266 (2)	0.01	P-1266 (2)	0.01
P-12661	0	P-12661	0	P-12661	0
P-12662	0.15	P-12662	0.09	P-12662	0.1
P-12663 (1)	0.14	P-12663 (1)	0.08	P-12663 (1)	0.09
P-12663 (2)	0.02	P-12663 (2)	0.04	P-12663 (2)	0.04
P-12664	0.12	P-12664	0.07	P-12664	0.08
P-12665 (1)	0.12	P-12665 (1)	0.06	P-12665 (1)	0.07
P-12665 (2)	0.04	P-12665 (2)	0.06	P-12665 (2)	0.06
P-12666	0.13	P-12666	0.08	P-12666	0.09
P-12667 (1)	0.15	P-12667 (1)	0.09	P-12667 (1)	0.1
P-12667 (2)	0.01	P-12667 (2)	0.02	P-12667 (2)	0.02
P-12669 (1)	0.5	P-12669 (1)	0.28	P-12669 (1)	0.33
P-12669 (2)	0.01	P-12669 (2)	0.01	P-12669 (2)	0.01
P-1267	0.08	P-1267	0.09	P-1267	0.05
P-12670	0.58	P-12670	0.33	P-12670	0.38
P-12671 (1)	0.65	P-12671 (1)	0.39	P-12671 (1)	0.43
P-12671 (2)	0.63	P-12671 (2)	0.85	P-12671 (2)	1.39
P-12672	0.8	P-12672	0.46	P-12672	0.51
P-12673	0.85	P-12673	0.48	P-12673	0.53
P-12674	0.08	P-12674	0.03	P-12674	0.04
P-12675	0.07	P-12675	0.04	P-12675	0.05
P-12676	0.09	P-12676	0.06	P-12676	0.06

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-12677 (1)	0.01	P-12677 (1)	0.01	P-12677 (1)	0.01
P-12677 (2)	0.66	P-12677 (2)	0.86	P-12677 (2)	1.42
P-1268	0.08	P-1268	0.08	P-1268	0.04
P-12681 (1)	0.03	P-12681 (1)	0.05	P-12681 (1)	0.05
P-12681 (2)	0.01	P-12681 (2)	0	P-12681 (2)	0
P-12682	0.01	P-12682	0.04	P-12682	0.03
P-12683	0.01	P-12683	0	P-12683	0
P-12685	0.04	P-12685	0.02	P-12685	0.01
P-12687	0.07	P-12687	0.04	P-12687	0.04
P-12689	0	P-12689	0.01	P-12689	0.01
P-1269	0.01	P-1269	0.02	P-1269	0.02
P-12691	0.03	P-12691	0.06	P-12691	0.05
P-12693 (1)	0	P-12693 (1)	0	P-12693 (1)	0
P-12693 (2)	0.02	P-12693 (2)	0.04	P-12693 (2)	0.03
P-12695	0.03	P-12695	0.01	P-12695	0.03
P-12697	0.08	P-12697	0.03	P-12697	0.08
P-12699	0.04	P-12699	0.07	P-12699	0.07
P-127	0.01	P-127	0.02	P-127	0.02
P-1270	0.01	P-1270	0.01	P-1270	0.01
P-12701 (1)	0	P-12701 (1)	0	P-12701 (1)	0
P-12701 (2)	0.02	P-12701 (2)	0.03	P-12701 (2)	0.03
P-12702	0	P-12702	0.02	P-12702	0.02
P-12707	0.02	P-12707	0.03	P-12707	0.02
P-12709 (1)	0.16	P-12709 (1)	0.23	P-12709 (1)	0.21
P-12709 (2)	0.04	P-12709 (2)	0.07	P-12709 (2)	0.06
P-1271	0.01	P-1271	0.03	P-1271	0.02
P-12711	0	P-12711	0	P-12711	0
P-12713	0.02	P-12713	0.08	P-12713	0.06
P-12714	0	P-12714	0	P-12714	0
P-12715	0.1	P-12715	0.02	P-12715	0.06
P-12716	0.03	P-12716	0.05	P-12716	0.07
P-12717	0.39	P-12717	0.1	P-12717	0.23
P-12719	0.38	P-12719	0.09	P-12719	0.24
P-12721	0.1	P-12721	0.02	P-12721	0.06
P-12723 (1)	0.04	P-12723 (1)	0.03	P-12723 (1)	0.04
P-12723 (2)	0.73	P-12723 (2)	0.44	P-12723 (2)	0.59
P-12725	0.18	P-12725	0.11	P-12725	0.14
P-12727	0.18	P-12727	0.11	P-12727	0.14
P-12729	0.72	P-12729	0.43	P-12729	0.58
P-1273	0.09	P-1273	0.1	P-1273	0.06
P-12733	0.02	P-12733	0.01	P-12733	0.01
P-12735	0.02	P-12735	0.01	P-12735	0.01
P-12736	0.01	P-12736	0.02	P-12736	0.02
P-12737 (1)	0.04	P-12737 (1)	0.2	P-12737 (1)	0.15
P-12737 (2)	0.09	P-12737 (2)	0.07	P-12737 (2)	0.06
P-12738	0.13	P-12738	0.25	P-12738	0.17
P-12739 (1)	0.12	P-12739 (1)	0.27	P-12739 (1)	0.19
P-12739 (2)	0.19	P-12739 (2)	0.24	P-12739 (2)	0.07
P-1274	0.1	P-1274	0.11	P-1274	0.07
P-12740	0.81	P-12740	0.43	P-12740	0.63
P-12741 (1)	0.8	P-12741 (1)	0.44	P-12741 (1)	0.62
P-12741 (2)	0.35	P-12741 (2)	0.44	P-12741 (2)	0.06
P-12742	0.88	P-12742	0.49	P-12742	0.71
P-12743	0.14	P-12743	0.05	P-12743	0.14
P-12743(1)	0.88	P-12743(1)	0.5	P-12743(1)	0.7
P-12743(2)	1.08	P-12743(2)	0.56	P-12743(2)	0.93
P-12744	0.95	P-12744	0.84	P-12744	1.25
P-12745 (1)	0.95	P-12745 (1)	0.85	P-12745 (1)	1.26
P-12745 (2)	0.19	P-12745 (2)	0.07	P-12745 (2)	0.19
P-12747	0.19	P-12747	0.07	P-12747	0.19
P-12749 (1)	0.22	P-12749 (1)	0.1	P-12749 (1)	0.12
P-12749 (2)	0.05	P-12749 (2)	0.02	P-12749 (2)	0.05
P-12750	0.19	P-12750	0.09	P-12750	0.1
P-12751	0.07	P-12751	0.09	P-12751	0.1
P-12753	0.04	P-12753	0.06	P-12753	0.06
P-12757	0.23	P-12757	0.14	P-12757	0.17
P-1276 (1)	0.4	P-1276 (1)	0.43	P-1276 (1)	0.25
P-1276 (2)	0.04	P-1276 (2)	0.03	P-1276 (2)	0.03
P-12761	0.26	P-12761	0.14	P-12761	0.14
P-12762	0.24	P-12762	0.07	P-12762	0.18
P-12763	0.33	P-12763	0.22	P-12763	0.22

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-12764	0.19	P-12764	0.05	P-12764	0.13
P-12767	0.14	P-12767	0.03	P-12767	0.08
P-12768	0.06	P-12768	0.03	P-12768	0.02
P-12769	0.32	P-12769	0.22	P-12769	0.2
P-1277	0.27	P-1277	0.28	P-1277	0.16
P-12771	1.37	P-12771	1.38	P-12771	1.45
P-12773	0.34	P-12773	0.35	P-12773	0.36
P-12775	0.34	P-12775	0.35	P-12775	0.36
P-12777	1.37	P-12777	1.38	P-12777	1.44
P-1278	0.23	P-1278	0.23	P-1278	0.12
P-12781	0.08	P-12781	0.07	P-12781	0.05
P-12783	0.13	P-12783	0.11	P-12783	0.14
P-12784	0.41	P-12784	0.23	P-12784	0.1
P-12785	0.08	P-12785	0.02	P-12785	0.02
P-12789	0.21	P-12789	0.16	P-12789	0.17
P-1279	0.05	P-1279	0.06	P-1279	0.03
P-12791	0.21	P-12791	0.16	P-12791	0.17
P-12793	0.24	P-12793	0.23	P-12793	0.21
P-12795	0.01	P-12795	0.01	P-12795	0.01
P-12797	0.02	P-12797	0.03	P-12797	0.03
P-12799	0.02	P-12799	0.04	P-12799	0.01
P-1280	0.12	P-1280	0.11	P-1280	0.05
P-12801 (1)	0.21	P-12801 (1)	0.05	P-12801 (1)	0.13
P-12801 (2)	0.09	P-12801 (2)	0.22	P-12801 (2)	0.31
P-12803	0.09	P-12803	0.17	P-12803	0.06
P-12805 (1)	0.96	P-12805 (1)	0.29	P-12805 (1)	0.73
P-12805 (2)	0.02	P-12805 (2)	0.04	P-12805 (2)	0.01
P-12807	0.01	P-12807	0.02	P-12807	0.02
P-1281	0.15	P-1281	0.13	P-1281	0.05
P-12810	0.01	P-12810	0.02	P-12810	0.02
P-12811	0.14	P-12811	0.03	P-12811	0.06
P-12813	0.1	P-12813	0.03	P-12813	0.06
P-12817	0.14	P-12817	0.03	P-12817	0.06
P-12818	0.04	P-12818	0.01	P-12818	0.02
P-1282	0.2	P-1282	0.17	P-1282	0.06
P-12821	0.63	P-12821	0.83	P-12821	1.38
P-12823	0.15	P-12823	0.09	P-12823	0.02
P-12825	0.15	P-12825	0.06	P-12825	0.02
P-12828	0.03	P-12828	0.02	P-12828	0.02
P-12829	0.29	P-12829	0.53	P-12829	2.37
P-1283	0.1	P-1283	0.09	P-1283	0.04
P-12831	0.05	P-12831	0.03	P-12831	0.04
P-12835	0.15	P-12835	0.18	P-12835	0.23
P-12839 (1)	0.14	P-12839 (1)	0.13	P-12839 (1)	0.1
P-12839 (2)	0.61	P-12839 (2)	0.8	P-12839 (2)	1.33
P-1284 (1)	0.13	P-1284 (1)	0.12	P-1284 (1)	0.06
P-1284 (2)	0.82	P-1284 (2)	0.15	P-1284 (2)	0.56
P-12841	0.61	P-12841	0.81	P-12841	1.34
P-12844	0.53	P-12844	0.48	P-12844	0.45
P-12845 (1)	0.56	P-12845 (1)	0.51	P-12845 (1)	0.4
P-12845 (2)	2.65	P-12845 (2)	1.8	P-12845 (2)	2.25
P-12846	0.71	P-12846	0.63	P-12846	0.53
P-12847 (1)	0.52	P-12847 (1)	0.41	P-12847 (1)	0.35
P-12847 (2)	0	P-12847 (2)	0.95	P-12847 (2)	0.73
P-12854	0.15	P-12854	0.15	P-12854	0.12
P-12855 (1)	0.09	P-12855 (1)	0.12	P-12855 (1)	0.1
P-12855 (2)	0.67	P-12855 (2)	0.59	P-12855 (2)	0.84
P-12856	0.22	P-12856	0.23	P-12856	0.16
P-12857	1.58	P-12857	0.89	P-12857	1.25
P-12859	1.58	P-12859	0.89	P-12859	1.25
P-12861	0.08	P-12861	0.1	P-12861	0.08
P-12863	0.52	P-12863	1.08	P-12863	1.01
P-12865	0.84	P-12865	1.08	P-12865	1
P-12866	1.55	P-12866	1.37	P-12866	1.42
P-12867	0.04	P-12867	0.08	P-12867	0.03
P-12869	0.01	P-12869	0.01	P-12869	0.02
P-1287	0.06	P-1287	0.05	P-1287	0.02
P-12871	0	P-12871	0	P-12871	0
P-12873	0	P-12873	0.01	P-12873	0.01
P-12874	0.03	P-12874	0.04	P-12874	0.12
P-12875	0.01	P-12875	0.01	P-12875	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-12877	0	P-12877	0	P-12877	0
P-12879	0.25	P-12879	0.24	P-12879	0.24
P-12880	0.24	P-12880	0.21	P-12880	0.19
P-12881	0.02	P-12881	0.64	P-12881	0.63
P-12885 (1)	0.08	P-12885 (1)	0.14	P-12885 (1)	0.12
P-12885 (2)	0.03	P-12885 (2)	0.65	P-12885 (2)	0.63
P-12886	0.13	P-12886	0.17	P-12886	0.05
P-12887 (1)	0.14	P-12887 (1)	0.23	P-12887 (1)	0.27
P-12887 (2)	0.02	P-12887 (2)	0.01	P-12887 (2)	0.01
P-12888	0.09	P-12888	0.12	P-12888	0.05
P-12889	0.06	P-12889	0.02	P-12889	0.03
P-1289	0.14	P-1289	0.14	P-1289	0.08
P-12891 (1)	0.14	P-12891 (1)	0.19	P-12891 (1)	0.23
P-12891 (2)	0	P-12891 (2)	0	P-12891 (2)	0
P-12899	0.29	P-12899	0.41	P-12899	0.4
P-1290	0.18	P-1290	0.18	P-1290	0.1
P-12902	0	P-12902	0.01	P-12902	0.15
P-12903	0.21	P-12903	0.08	P-12903	0.1
P-12905	0.83	P-12905	0.31	P-12905	0.42
P-12907	0.82	P-12907	0.31	P-12907	0.43
P-12909 (1)	8.29	P-12909 (1)	8.07	P-12909 (1)	6.3
P-12909 (2)	0.21	P-12909 (2)	0.08	P-12909 (2)	0.1
P-1291	0.07	P-1291	0.08	P-1291	0.05
P-12910	8.3	P-12910	8.08	P-12910	6.31
P-12911 (1)	8.3	P-12911 (1)	8.09	P-12911 (1)	6.32
P-12911 (2)	1.55	P-12911 (2)	1.49	P-12911 (2)	1.52
P-12912	8.3	P-12912	8.1	P-12912	6.33
P-12915	0	P-12915	0	P-12915	0
P-12917	0.1	P-12917	0.3	P-12917	0.38
P-12918	0.09	P-12918	0.21	P-12918	0.28
P-12919 (1)	0.08	P-12919 (1)	0.16	P-12919 (1)	0.21
P-12919 (2)	0	P-12919 (2)	0.02	P-12919 (2)	0.02
P-1292 (1)	0.18	P-1292 (1)	0.17	P-1292 (1)	0.09
P-1292 (2)	0.02	P-1292 (2)	0.07	P-1292 (2)	0.05
P-12921	0.05	P-12921	0.05	P-12921	0.09
P-12925	0.04	P-12925	0.01	P-12925	0.01
P-12927	0.21	P-12927	0.18	P-12927	0.3
P-12929	0.07	P-12929	0.16	P-12929	0.18
P-1293	0.03	P-1293	0.04	P-1293	0.03
P-12931	0.03	P-12931	0.01	P-12931	0.02
P-12932	0.17	P-12932	0.27	P-12932	0.44
P-12933	0.1	P-12933	0.03	P-12933	0.05
P-12935	0.01	P-12935	0.01	P-12935	0.01
P-12937	0.02	P-12937	0.03	P-12937	0.03
P-12939	0.01	P-12939	0.01	P-12939	0.01
P-1294 (1)	0.12	P-1294 (1)	0.11	P-1294 (1)	0.05
P-1294 (2)	0.02	P-1294 (2)	0.02	P-1294 (2)	0.03
P-12943 (1)	0.19	P-12943 (1)	0.11	P-12943 (1)	0.04
P-12943 (2)	0	P-12943 (2)	0.01	P-12943 (2)	0.01
P-12945	0	P-12945	0	P-12945	0
P-12949	0.06	P-12949	0.04	P-12949	0.04
P-1295	0.05	P-1295	0.04	P-1295	0.01
P-12951	0.16	P-12951	0.21	P-12951	0.27
P-12952	0.09	P-12952	0.16	P-12952	0.2
P-12953	0.11	P-12953	0.16	P-12953	0.2
P-12954	0.1	P-12954	0.13	P-12954	0.17
P-12955 (1)	0.07	P-12955 (1)	0.09	P-12955 (1)	0.11
P-12955 (2)	0.02	P-12955 (2)	0.15	P-12955 (2)	0.18
P-12956	0.08	P-12956	0.1	P-12956	0.14
P-12957	0.3	P-12957	0.34	P-12957	0.42
P-12958	0.28	P-12958	0.28	P-12958	0.34
P-12959 (1)	0.32	P-12959 (1)	0.33	P-12959 (1)	0.4
P-12959 (2)	2.29	P-12959 (2)	4.04	P-12959 (2)	5.43
P-1296	0.03	P-1296	0.03	P-1296	0.02
P-12960	0.3	P-12960	0.28	P-12960	0.34
P-12962	0.23	P-12962	0.31	P-12962	0.35
P-12963	0.28	P-12963	0.31	P-12963	0.38
P-12964	0.08	P-12964	0.06	P-12964	0.07
P-12965 (1)	0.01	P-12965 (1)	0.01	P-12965 (1)	0.01
P-12965 (2)	0.03	P-12965 (2)	0.03	P-12965 (2)	0.05
P-12966	0.3	P-12966	0.31	P-12966	0.36

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-12967 (1)	0.34
P-12967 (2)	0.09
P-12968	0.37
P-12969 (1)	0.38
P-12969 (2)	0.07
P-1297	0
P-12970	0.43
P-12971	0.11
P-12972	0.11
P-12973	0.28
P-12974	0.1
P-12975	0.1
P-12977	0.08
P-12979(1)	0.42
P-12979(2)	0.12
P-12980	0.06
P-12981 (1)	0.01
P-12981 (2)	0.03
P-12983	0.49
P-12985	0.12
P-12987	0.12
P-12989 (1)	0.12
P-12989 (2)	0.49
P-12990	0.03
P-12991	0.01
P-12993	0.05
P-12997	2.8
P-12999	0.03
P-1300	0.01
P-13000	0.04
P-13001	0.12
P-13003	0.03
P-13007	0.02
P-13009	0.01
P-13011	0.01
P-13013 (1)	0.13
P-13013 (2)	0.02
P-13023	0.14
P-13028	0.02
P-13029 (1)	0.08
P-13029 (2)	0.01
P-13031	0.1
P-13033	0.03
P-13035	0.03
P-13039	0.04
P-13040	0.01
P-13041 (1)	0.01
P-13041 (2)	0.01
P-13042	0.03
P-13043 (1)	0.1
P-13043 (2)	0.05
P-13044	0.1
P-13045 (1)	0.16
P-13045 (2)	0.01
P-13049 (1)	0.02
P-13049 (2)	0.08
P-1305	0.02
P-13052	0.13
P-13053	0.13
P-13057 (1)	0.23
P-13057 (2)	2.11
P-13058	0.15
P-13059 (1)	0.14
P-13059 (2)	0.02
P-1306	0.06
P-13062	0.14
P-13063	0.15
P-13063(1)	0.15
P-13063(2)	0.1
P-13065	0.02
P-13069	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-12967 (1)	0.32
P-12967 (2)	0.09
P-12968	0.34
P-12969 (1)	0.32
P-12969 (2)	0.11
P-1297	0
P-12970	0.36
P-12971	0.1
P-12972	0.11
P-12973	0.06
P-12974	0.09
P-12975	0.27
P-12977	0.24
P-12979(1)	0.08
P-12979(2)	0.08
P-12980	0.12
P-12981 (1)	0.01
P-12981 (2)	0.01
P-12983	0.12
P-12985	0.03
P-12987	0.03
P-12989 (1)	0.06
P-12989 (2)	0.13
P-12990	0.14
P-12991	0.07
P-12993	0.02
P-12997	2.17
P-12999	0.05
P-1300	0.36
P-13000	0.12
P-13001	0.08
P-13003	0.03
P-13007	0.04
P-13009	0.01
P-13011	0.01
P-13013 (1)	0.04
P-13013 (2)	0.04
P-13023	0.29
P-13028	0.13
P-13029 (1)	0.04
P-13029 (2)	0.04
P-13031	0.08
P-13033	0.02
P-13035	0.02
P-13039	0.08
P-13040	0.01
P-13041 (1)	0.01
P-13041 (2)	0.03
P-13042	0.01
P-13043 (1)	0.09
P-13043 (2)	0.11
P-13044	0.1
P-13045 (1)	0.14
P-13045 (2)	0.03
P-13049 (1)	0.05
P-13049 (2)	0.06
P-1305	0.06
P-13052	0.15
P-13053	0.12
P-13057 (1)	0.17
P-13057 (2)	1.12
P-13058	0.1
P-13059 (1)	0.07
P-13059 (2)	0.01
P-1306	0.05
P-13062	0.11
P-13063	0.07
P-13063(1)	0.06
P-13063(2)	0.04
P-13065	0.01
P-13069	0.01

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-12967 (1)	0.38
P-12967 (2)	0.16
P-12968	0.4
P-12969 (1)	0.38
P-12969 (2)	0.31
P-1297	0
P-12970	0.42
P-12971	0.12
P-12972	0.13
P-12973	0.14
P-12974	0.11
P-12975	0.14
P-12977	0.07
P-12979(1)	0.06
P-12979(2)	0.07
P-12980	0.15
P-12981 (1)	0.01
P-12981 (2)	0.01
P-12983	0.07
P-12985	0.02
P-12987	0.02
P-12989 (1)	0.07
P-12989 (2)	0.06
P-12990	0.16
P-12991	0.12
P-12993	0.01
P-12997	3.24
P-12999	0.04
P-1300	0.41
P-13000	0.14
P-13001	0.07
P-13003	0.05
P-13007	0.12
P-13009	0.03
P-13011	0.03
P-13013 (1)	0.03
P-13013 (2)	0.11
P-13023	0.31
P-13028	0.14
P-13029 (1)	0.03
P-13029 (2)	0.03
P-13031	0.02
P-13033	0
P-13035	0
P-13039	0.1
P-13040	0.01
P-13041 (1)	0.01
P-13041 (2)	0.03
P-13042	0.02
P-13043 (1)	0.1
P-13043 (2)	0.13
P-13044	0.12
P-13045 (1)	0.17
P-13045 (2)	0.03
P-13049 (1)	0.05
P-13049 (2)	0.05
P-1305	0.07
P-13052	0.18
P-13053	0.15
P-13057 (1)	0.21
P-13057 (2)	1.16
P-13058	0.13
P-13059 (1)	0.1
P-13059 (2)	0.01
P-1306	0.04
P-13062	0.14
P-13063	0.09
P-13063(1)	0.11
P-13063(2)	0.02
P-13065	0.01
P-13069	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-13071	1	P-13071	0.65	P-13071	0.82
P-13073	0.4	P-13073	0.26	P-13073	0.33
P-13075	0.23	P-13075	0.28	P-13075	0.26
P-13077 (1)	0.1	P-13077 (1)	0.03	P-13077 (1)	0.09
P-13077 (2)	0.19	P-13077 (2)	0.12	P-13077 (2)	0.16
P-13079	2.83	P-13079	0.15	P-13079	0.15
P-1308	0.13	P-1308	0.3	P-1308	0.28
P-13086	0.01	P-13086	0.01	P-13086	0.01
P-13087 (1)	0.04	P-13087 (1)	0.2	P-13087 (1)	0.29
P-13087 (2)	0.43	P-13087 (2)	0.16	P-13087 (2)	0.16
P-13089	0.04	P-13089	0.01	P-13089	0.02
P-13093	0.61	P-13093	0.12	P-13093	0.16
P-1310 (1)	0.02	P-1310 (1)	0.02	P-1310 (1)	0.01
P-1310 (2)	0.02	P-1310 (2)	0.05	P-1310 (2)	0.05
P-13105 (1)	0.03	P-13105 (1)	0.04	P-13105 (1)	0.03
P-13105 (2)	0.91	P-13105 (2)	0.31	P-13105 (2)	0.33
P-13107	0.94	P-13107	0.75	P-13107	0.37
P-13108	0.01	P-13108	0.01	P-13108	0.01
P-13109	0.91	P-13109	0.32	P-13109	0.32
P-13115	0.02	P-13115	0.09	P-13115	0.09
P-13116	0.02	P-13116	0.11	P-13116	0.11
P-13118	0.03	P-13118	0.03	P-13118	0.04
P-13119	1.45	P-13119	0.37	P-13119	0.67
P-13123	0.1	P-13123	0.23	P-13123	0.18
P-13125	0.1	P-13125	0.22	P-13125	0.17
P-13129	2.04	P-13129	1.68	P-13129	2.08
P-1313 (1)	0.01	P-1313 (1)	0.02	P-1313 (1)	0
P-1313 (2)	0.08	P-1313 (2)	0.11	P-1313 (2)	0.11
P-13131	0.01	P-13131	0.01	P-13131	0.08
P-13133	0.01	P-13133	0.03	P-13133	0.09
P-13135	0.03	P-13135	0.05	P-13135	0.05
P-13136	0.02	P-13136	0.04	P-13136	0.04
P-13137	0.03	P-13137	0.12	P-13137	0.16
P-13139	0.01	P-13139	0.01	P-13139	0.01
P-1314	0	P-1314	0	P-1314	0
P-13141	0.01	P-13141	0.03	P-13141	0.03
P-13143	1.46	P-13143	1.42	P-13143	1.07
P-13147	0.03	P-13147	0.01	P-13147	0.01
P-1315 (1)	0.04	P-1315 (1)	0.06	P-1315 (1)	0.03
P-1315 (2)	0.14	P-1315 (2)	0.21	P-1315 (2)	0.19
P-13151	0.08	P-13151	0.03	P-13151	0.05
P-13154	0.01	P-13154	0.01	P-13154	0.01
P-13155	0.04	P-13155	0.09	P-13155	0.11
P-13157	0.02	P-13157	0.01	P-13157	0.02
P-13159	0	P-13159	0	P-13159	0
P-1316	0.08	P-1316	0.1	P-1316	0.03
P-13161	0	P-13161	0	P-13161	0
P-13163	0	P-13163	0	P-13163	0
P-13165 (1)	0	P-13165 (1)	0.01	P-13165 (1)	0.01
P-13165 (2)	0	P-13165 (2)	0.01	P-13165 (2)	0.01
P-13167	0.01	P-13167	0.01	P-13167	0.01
P-13169	0	P-13169	0	P-13169	0
P-13170	0.09	P-13170	0.12	P-13170	0.12
P-13171	0.07	P-13171	0.09	P-13171	0.08
P-13175	0	P-13175	0	P-13175	0
P-13177	0.28	P-13177	0.69	P-13177	0.8
P-13184	0.27	P-13184	0.69	P-13184	0.82
P-13185	0.18	P-13185	0.4	P-13185	0.48
P-13186	0.17	P-13186	0.36	P-13186	0.44
P-13187 (1)	0.18	P-13187 (1)	0.36	P-13187 (1)	0.44
P-13187 (2)	0.06	P-13187 (2)	0.08	P-13187 (2)	0.09
P-13188	0.13	P-13188	0.17	P-13188	0.2
P-13189 (1)	0.09	P-13189 (1)	0.06	P-13189 (1)	0.06
P-13189 (2)	0.14	P-13189 (2)	0.21	P-13189 (2)	0.23
P-13193	0.42	P-13193	0.4	P-13193	0.36
P-13195	0.9	P-13195	0.57	P-13195	0.67
P-13197	1.05	P-13197	0.7	P-13197	0.8
P-1320	0.04	P-1320	0.03	P-1320	0.03
P-13202	0	P-13202	0	P-13202	0
P-13203	0.06	P-13203	0.07	P-13203	0.08
P-13207	0.04	P-13207	0.03	P-13207	0.14

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-13209	0.01	P-13209	0	P-13209	0.03
P-13211	0.01	P-13211	0	P-13211	0.03
P-13213	0.03	P-13213	0.03	P-13213	0.09
P-13216	0.01	P-13216	0.02	P-13216	0.02
P-13217	0.02	P-13217	0.05	P-13217	0.05
P-13219 (1)	0	P-13219 (1)	0.01	P-13219 (1)	0.01
P-13219 (2)	0.01	P-13219 (2)	0.04	P-13219 (2)	0.04
P-13222	0.01	P-13222	0.01	P-13222	0.01
P-13223	1.05	P-13223	0.25	P-13223	0.29
P-13225	1.07	P-13225	0.26	P-13225	0.28
P-13227 (1)	0.26	P-13227 (1)	0.24	P-13227 (1)	0.3
P-13227 (2)	0.02	P-13227 (2)	0.07	P-13227 (2)	0.02
P-13229	0.08	P-13229	0.16	P-13229	0.05
P-1323	0	P-1323	0	P-1323	0
P-13231	0.07	P-13231	0.02	P-13231	0.07
P-13232	0.09	P-13232	0.08	P-13232	0.09
P-13233	0.02	P-13233	0.07	P-13233	0.02
P-13239	0.67	P-13239	0.87	P-13239	1.43
P-13241	0.67	P-13241	0.87	P-13241	1.43
P-13249	1.52	P-13249	1.52	P-13249	1.09
P-13251	0.02	P-13251	0.04	P-13251	0.04
P-13252	0.12	P-13252	0.04	P-13252	0.03
P-13253	0.03	P-13253	0.04	P-13253	0.04
P-13255	0.01	P-13255	0.02	P-13255	0.02
P-13257	0	P-13257	0	P-13257	0
P-13261	0.19	P-13261	0.46	P-13261	0.36
P-13263	0.82	P-13263	0.72	P-13263	0.97
P-13264	0.05	P-13264	0.07	P-13264	0.05
P-13265 (1)	0.21	P-13265 (1)	0.11	P-13265 (1)	0.07
P-13265 (2)	0.01	P-13265 (2)	0.17	P-13265 (2)	0.23
P-13268	0.23	P-13268	0.13	P-13268	0.09
P-13269	2.51	P-13269	1.19	P-13269	1.5
P-13273	0.01	P-13273	0.02	P-13273	0.02
P-13275	0.03	P-13275	0.04	P-13275	0.05
P-13277	0.01	P-13277	0.02	P-13277	0.02
P-13279 (1)	0.24	P-13279 (1)	0.06	P-13279 (1)	0.12
P-13279 (2)	0	P-13279 (2)	0.01	P-13279 (2)	0.01
P-13280	0.05	P-13280	0.03	P-13280	0.04
P-13281 (1)	0.09	P-13281 (1)	0.05	P-13281 (1)	0.06
P-13281 (2)	0.02	P-13281 (2)	0.01	P-13281 (2)	0.01
P-13282	0.07	P-13282	0.03	P-13282	0.02
P-13288	0.24	P-13288	0.15	P-13288	0.09
P-1329	0.01	P-1329	0.01	P-1329	0.01
P-13291 (1)	0.14	P-13291 (1)	0.03	P-13291 (1)	0.06
P-13291 (2)	1.32	P-13291 (2)	1.28	P-13291 (2)	1
P-13292	0.11	P-13292	0.03	P-13292	0.04
P-13293	0.09	P-13293	0.02	P-13293	0.04
P-13294	0.88	P-13294	0.23	P-13294	0.42
P-13295	0.08	P-13295	0.12	P-13295	0.1
P-13297	0.33	P-13297	0.5	P-13297	0.41
P-13299	0.08	P-13299	0.12	P-13299	0.1
P-13301	0.33	P-13301	0.5	P-13301	0.42
P-13307	11.03	P-13307	7.14	P-13307	13.67
P-13308	0	P-13308	0	P-13308	0
P-13309	11.03	P-13309	7.14	P-13309	13.67
P-1331	0.92	P-1331	0.33	P-1331	0.6
P-13311	0.14	P-13311	0.03	P-13311	0.03
P-13313	0.03	P-13313	0.01	P-13313	0.01
P-13315	0.03	P-13315	0.01	P-13315	0.01
P-13317	0.13	P-13317	0.03	P-13317	0.03
P-13320	0.44	P-13320	0.11	P-13320	0.21
P-13323	0.04	P-13323	0.13	P-13323	0.14
P-13325	0.04	P-13325	0.12	P-13325	0.13
P-13328	0.4	P-13328	0.1	P-13328	0.19
P-13332	0.79	P-13332	0.21	P-13332	0.37
P-13333	0.01	P-13333	0.01	P-13333	0.01
P-13334	0.32	P-13334	0.09	P-13334	0.16
P-13337	0.06	P-13337	0.03	P-13337	0.03
P-13339	0.06	P-13339	0.03	P-13339	0.03
P-13341	0.07	P-13341	0.01	P-13341	0.01
P-13343	4.47	P-13343	5.46	P-13343	7.21

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-13345	0.17
P-13347	1.63
P-13349	2.47
P-1335	0.02
P-13353	0.63
P-13354	0.46
P-13355	0.02
P-13357	0.84
P-13359 (1)	0.39
P-13359 (2)	0.17
P-13360	0.05
P-13361	0.34
P-13365	0.17
P-13367	0
P-13369	0
P-13371	0
P-13373	0
P-13377	0.23
P-13380	0.55
P-13383 (1)	0.86
P-13383 (2)	0.01
P-13384	0.47
P-13385	0.27
P-13387 (1)	0.29
P-13387 (2)	0.21
P-13391	0.65
P-13393	0.21
P-13395	0.1
P-13397	0.19
P-13399	0.1
P-13401	0.04
P-13403	0.17
P-13405	0.35
P-13406	8.29
P-13409 (1)	8.29
P-13409 (2)	1.31
P-13411 (1)	0.31
P-13411 (2)	0.86
P-13415	0
P-13417	0.01
P-13419	0.13
P-13422	0.16
P-13425	0.1
P-13427	0.1
P-13429	0.16
P-1343	0.02
P-13431	0.16
P-13433	0.05
P-13437	0.07
P-13441	0
P-13443	0.02
P-13445	0.01
P-13447	0.02
P-13448	0.12
P-13451	0.01
P-13453	0.01
P-13455	0.01
P-13457	0.04
P-13459	0.02
P-13461	0.02
P-13463	0.01
P-13465	0.11
P-13469	0.29
P-13470	0.3
P-13471	0.01
P-13473	0.01
P-13476	0.07
P-13477 (1)	0.02
P-13477 (2)	0.01
P-13479	2.27
P-13481	2.12

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-13345	0.19
P-13347	5.53
P-13349	4.34
P-1335	0.01
P-13353	0.21
P-13354	0.11
P-13355	0.02
P-13357	0.22
P-13359 (1)	0.75
P-13359 (2)	0.08
P-13360	0.94
P-13361	0.15
P-13365	0.07
P-13367	0
P-13369	0.01
P-13371	0
P-13373	0
P-13377	0.69
P-13380	0.29
P-13383 (1)	0.7
P-13383 (2)	0.02
P-13384	0.11
P-13385	0.17
P-13387 (1)	0.44
P-13387 (2)	0.11
P-13391	0.33
P-13393	0.11
P-13395	0.04
P-13397	0.06
P-13399	0.04
P-13401	0.03
P-13403	0.08
P-13405	0.17
P-13406	8.04
P-13409 (1)	8.06
P-13409 (2)	2.97
P-13411 (1)	0.48
P-13411 (2)	0.37
P-13415	0.34
P-13417	0.33
P-13419	0.07
P-13422	0.1
P-13425	0.12
P-13427	0.11
P-13429	0.08
P-1343	0.05
P-13431	0.08
P-13433	0.04
P-13437	0.24
P-13441	0
P-13443	0.07
P-13445	0.02
P-13447	0.08
P-13448	0.14
P-13451	0.06
P-13453	0.02
P-13455	0.02
P-13457	0.1
P-13459	0.04
P-13461	0.05
P-13463	0.01
P-13465	0.18
P-13469	0.34
P-13470	0.34
P-13471	0.18
P-13473	0.34
P-13476	0.03
P-13477 (1)	0.15
P-13477 (2)	0.06
P-13479	2.68
P-13481	2.5

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-13345	0.22
P-13347	2.62
P-13349	5.78
P-1335	0.02
P-13353	0.34
P-13354	0.22
P-13355	0.07
P-13357	0.41
P-13359 (1)	0.52
P-13359 (2)	0.37
P-13360	0.81
P-13361	0.73
P-13365	0.1
P-13367	0
P-13369	0.01
P-13371	0
P-13373	0
P-13377	0.66
P-13380	0.16
P-13383 (1)	0.34
P-13383 (2)	0.02
P-13384	0.23
P-13385	0.31
P-13387 (1)	0.29
P-13387 (2)	0.14
P-13391	0.44
P-13393	0.14
P-13395	0.05
P-13397	0.08
P-13399	0.05
P-13401	0.02
P-13403	0.37
P-13405	0.76
P-13406	6.28
P-13409 (1)	6.29
P-13409 (2)	3.47
P-13411 (1)	0.34
P-13411 (2)	0.3
P-13415	0.39
P-13417	0.38
P-13419	0.02
P-13422	0.05
P-13425	0.05
P-13427	0.09
P-13429	0.11
P-1343	0.04
P-13431	0.11
P-13433	0.04
P-13437	0.34
P-13441	0
P-13443	0.07
P-13445	0.02
P-13447	0.07
P-13448	0.16
P-13451	0.08
P-13453	0.02
P-13455	0.02
P-13457	0.11
P-13459	0.04
P-13461	0.05
P-13463	0.01
P-13465	0.18
P-13469	0.39
P-13470	0.39
P-13471	0.24
P-13473	0.47
P-13476	0.01
P-13477 (1)	0.14
P-13477 (2)	0.08
P-13479	0.74
P-13481	0.7

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-13483	0.18	P-13483	0.24	P-13483	0.03
P-13485	0.15	P-13485	0.17	P-13485	0.05
P-13487	0.11	P-13487	0.06	P-13487	0.09
P-13489	0.01	P-13489	0.02	P-13489	0.02
P-13491	0.02	P-13491	0.03	P-13491	0.04
P-13493	0.03	P-13493	0.03	P-13493	0.03
P-13495	0.25	P-13495	0.53	P-13495	0.48
P-13497	0.26	P-13497	0.54	P-13497	0.5
P-13499	0.14	P-13499	0.43	P-13499	0.27
P-1350	0.01	P-1350	0.01	P-1350	0.01
P-13501	0.01	P-13501	0	P-13501	0.01
P-13502	0.47	P-13502	0.62	P-13502	0.63
P-13505	0.17	P-13505	0.22	P-13505	0.15
P-13507 (1)	0.08	P-13507 (1)	0.08	P-13507 (1)	0.06
P-13507 (2)	0.04	P-13507 (2)	0.04	P-13507 (2)	0.05
P-13511	0.01	P-13511	0.02	P-13511	0.02
P-13514	0.16	P-13514	0.03	P-13514	0.14
P-13515	0	P-13515	0	P-13515	0
P-13517 (1)	0.15	P-13517 (1)	0.04	P-13517 (1)	0.04
P-13517 (2)	0.04	P-13517 (2)	0.05	P-13517 (2)	0.07
P-1352	0	P-1352	0	P-1352	0
P-13520	0.13	P-13520	0.09	P-13520	0.19
P-13523	0	P-13523	0.21	P-13523	0.44
P-13525 (1)	0.07	P-13525 (1)	0.02	P-13525 (1)	0.07
P-13525 (2)	0	P-13525 (2)	0.06	P-13525 (2)	0.11
P-13527	0.15	P-13527	0.39	P-13527	0.25
P-13529 (1)	0.05	P-13529 (1)	0.01	P-13529 (1)	0.05
P-13529 (2)	0.14	P-13529 (2)	0.37	P-13529 (2)	0.24
P-13530	0.01	P-13530	0.01	P-13530	0.01
P-13531 (1)	0.06	P-13531 (1)	0.02	P-13531 (1)	0.04
P-13531 (2)	0.01	P-13531 (2)	0.02	P-13531 (2)	0.02
P-13532	0.03	P-13532	0.02	P-13532	0.04
P-13533 (1)	0.04	P-13533 (1)	0.02	P-13533 (1)	0.06
P-13533 (2)	0.02	P-13533 (2)	0.03	P-13533 (2)	0.03
P-13534	0.02	P-13534	0.03	P-13534	0.02
P-13535	0.01	P-13535	0.01	P-13535	0.01
P-13537 (1)	0.16	P-13537 (1)	0.05	P-13537 (1)	0.17
P-13537 (2)	0.14	P-13537 (2)	0.08	P-13537 (2)	0.16
P-13538	0.17	P-13538	0.05	P-13538	0.15
P-13539 (1)	0.12	P-13539 (1)	0.03	P-13539 (1)	0.11
P-13539 (2)	0.66	P-13539 (2)	1.08	P-13539 (2)	1.51
P-13541 (1)	0.01	P-13541 (1)	0.02	P-13541 (1)	0.01
P-13541 (2)	0.33	P-13541 (2)	0.54	P-13541 (2)	0.75
P-13543	0.33	P-13543	0.54	P-13543	0.75
P-13545	0.66	P-13545	1.07	P-13545	1.5
P-13546	0.24	P-13546	0.3	P-13546	0.36
P-13553	0.14	P-13553	1.79	P-13553	0
P-13557	0.02	P-13557	0.04	P-13557	0.16
P-13561	0.03	P-13561	0.01	P-13561	0.02
P-13562	0.03	P-13562	0.06	P-13562	0.07
P-13563 (1)	0.03	P-13563 (1)	0.05	P-13563 (1)	0.06
P-13563 (2)	0.83	P-13563 (2)	0.17	P-13563 (2)	0.17
P-13565	0.56	P-13565	0.1	P-13565	0.12
P-13569	0.01	P-13569	0.03	P-13569	0.01
P-13571	4.54	P-13571	10.91	P-13571	9.68
P-13577	2.39	P-13577	1.34	P-13577	3.42
P-13578	0	P-13578	0.01	P-13578	0.01
P-13579	0.06	P-13579	0.19	P-13579	0.2
P-13581	0.01	P-13581	0.02	P-13581	0.02
P-1359	0.08	P-1359	0.1	P-1359	0.08
P-13593	0.09	P-13593	0.08	P-13593	0.11
P-13595 (1)	0.15	P-13595 (1)	0.04	P-13595 (1)	0.04
P-13595 (2)	2.23	P-13595 (2)	0	P-13595 (2)	0
P-13596	0.02	P-13596	0.01	P-13596	0.01
P-13597	0.01	P-13597	0.02	P-13597	0.01
P-13598	0.03	P-13598	0.02	P-13598	0.01
P-13599 (1)	0.1	P-13599 (1)	0.03	P-13599 (1)	0.03
P-13599 (2)	0.13	P-13599 (2)	0.11	P-13599 (2)	0.11
P-13600	0.14	P-13600	0.03	P-13600	0.05
P-13601 (1)	0.15	P-13601 (1)	0.04	P-13601 (1)	0.05
P-13601 (2)	0.06	P-13601 (2)	0.06	P-13601 (2)	0.06

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-13602	0	P-13602	0	P-13602	0
P-13603 (1)	0.01	P-13603 (1)	0.02	P-13603 (1)	0.02
P-13603 (2)	0	P-13603 (2)	0.01	P-13603 (2)	0.01
P-13605	0.01	P-13605	0.01	P-13605	0.02
P-13606	0	P-13606	0	P-13606	0
P-13609	0.44	P-13609	0.42	P-13609	0.42
P-13611	0	P-13611	0	P-13611	0.01
P-13613(1)	0	P-13613(1)	0.01	P-13613(1)	0.01
P-13613(2)	0	P-13613(2)	0.01	P-13613(2)	0.01
P-13615	0.37	P-13615	0.12	P-13615	0.02
P-13619	0.07	P-13619	0.09	P-13619	0.06
P-1362	0.05	P-1362	0.06	P-1362	0.03
P-13623 (1)	0.44	P-13623 (1)	0.57	P-13623 (1)	0.38
P-13623 (2)	0.51	P-13623 (2)	0.74	P-13623 (2)	0.08
P-13625	0.21	P-13625	0.3	P-13625	0.03
P-13627	0	P-13627	0	P-13627	0
P-13629	0	P-13629	0	P-13629	0
P-13631	0.01	P-13631	0.01	P-13631	0.01
P-13635	0.02	P-13635	0.01	P-13635	0.03
P-13636	0.07	P-13636	0.04	P-13636	0.03
P-13637	0.14	P-13637	0.07	P-13637	0.19
P-13639	0.06	P-13639	0.03	P-13639	0.08
P-13643 (1)	0.09	P-13643 (1)	0.02	P-13643 (1)	0.03
P-13643 (2)	0.05	P-13643 (2)	0.05	P-13643 (2)	0.07
P-13645	0.01	P-13645	0.01	P-13645	0.02
P-13647	0.01	P-13647	0.01	P-13647	0.02
P-13648	0.06	P-13648	0.02	P-13648	0.02
P-13649	0.05	P-13649	0.05	P-13649	0.07
P-1365	0.17	P-1365	0.22	P-1365	0.17
P-13653	0.15	P-13653	0.09	P-13653	0.1
P-13657	0.03	P-13657	0.01	P-13657	0.02
P-13659	0.08	P-13659	0.06	P-13659	0.05
P-1366	0.07	P-1366	0.04	P-1366	0.02
P-13663	0.39	P-13663	0.31	P-13663	0.23
P-13665 (1)	0.15	P-13665 (1)	0.19	P-13665 (1)	0.17
P-13665 (2)	0.28	P-13665 (2)	0.22	P-13665 (2)	0.17
P-13667	0	P-13667	0	P-13667	0
P-13668	0.16	P-13668	0.31	P-13668	0.3
P-13669 (1)	0.16	P-13669 (1)	0.28	P-13669 (1)	0.27
P-13669 (2)	0	P-13669 (2)	0	P-13669 (2)	0
P-13671	0.01	P-13671	0.01	P-13671	0.01
P-13673	0.03	P-13673	0.05	P-13673	0.04
P-13676	0.34	P-13676	0.4	P-13676	0.29
P-13677	0.01	P-13677	0.01	P-13677	0.01
P-13679	0.29	P-13679	0.13	P-13679	0.2
P-1368	0.01	P-1368	0.01	P-1368	0.01
P-13681	0.6	P-13681	0.27	P-13681	0.42
P-13685	0.13	P-13685	0.03	P-13685	0.04
P-13687 (1)	0.27	P-13687 (1)	0.4	P-13687 (1)	0.3
P-13687 (2)	0.03	P-13687 (2)	0.03	P-13687 (2)	0.03
P-13688	0.31	P-13688	0.35	P-13688	0.26
P-13689 (1)	0.35	P-13689 (1)	0.3	P-13689 (1)	0.22
P-13689 (2)	0.04	P-13689 (2)	0.06	P-13689 (2)	0.05
P-1369	0.03	P-1369	0.06	P-1369	0.06
P-13691 (1)	0.05	P-13691 (1)	0.06	P-13691 (1)	0.05
P-13691 (2)	2.07	P-13691 (2)	2.22	P-13691 (2)	0.19
P-13692	0.03	P-13692	0.05	P-13692	0.04
P-13693 (1)	0.05	P-13693 (1)	0.05	P-13693 (1)	0.05
P-13693 (2)	0.58	P-13693 (2)	0.61	P-13693 (2)	0.08
P-13697 (1)	0.13	P-13697 (1)	0.09	P-13697 (1)	0.07
P-13697 (2)	1.95	P-13697 (2)	0.92	P-13697 (2)	0.02
P-13699	0.58	P-13699	0.61	P-13699	0.08
P-1370	0.01	P-1370	0.02	P-1370	0.02
P-13701 (1)	0.1	P-13701 (1)	0.08	P-13701 (1)	0.13
P-13701 (2)	1.02	P-13701 (2)	0.89	P-13701 (2)	1.02
P-13702	0.02	P-13702	0.08	P-13702	0.08
P-13703	0.04	P-13703	0.02	P-13703	0.02
P-13705	0.16	P-13705	0.09	P-13705	0.1
P-13707	0.01	P-13707	0.01	P-13707	0.01
P-13709	0.04	P-13709	0.02	P-13709	0.02
P-13711	0.42	P-13711	0.2	P-13711	0.02

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-13713	0.42	P-13713	0.2	P-13713	0.02
P-13715	1.41	P-13715	1.4	P-13715	1.44
P-13717	0.14	P-13717	0.12	P-13717	0.09
P-13723 (1)	0.01	P-13723 (1)	0.03	P-13723 (1)	0.02
P-13723 (2)	0.92	P-13723 (2)	0.3	P-13723 (2)	0.33
P-13724	0.02	P-13724	0.06	P-13724	0.04
P-13725	0	P-13725	0.01	P-13725	0.01
P-13727 (1)	0.02	P-13727 (1)	0.04	P-13727 (1)	0.04
P-13727 (2)	0.91	P-13727 (2)	0.31	P-13727 (2)	0.33
P-13728	0.03	P-13728	0.07	P-13728	0.06
P-13729	0.92	P-13729	0.31	P-13729	0.33
P-1373 (1)	0.17	P-1373 (1)	0.38	P-1373 (1)	0.38
P-1373 (2)	0.01	P-1373 (2)	0.01	P-1373 (2)	0.01
P-13731	0.39	P-13731	0.08	P-13731	0.06
P-13732	0.01	P-13732	0.02	P-13732	0.02
P-13734	0	P-13734	0.01	P-13734	0.01
P-13735	0	P-13735	0.02	P-13735	0.01
P-13736	0	P-13736	0	P-13736	0
P-13737 (1)	0.01	P-13737 (1)	0.02	P-13737 (1)	0.02
P-13737 (2)	0.18	P-13737 (2)	0.08	P-13737 (2)	0.03
P-13739 (1)	0.01	P-13739 (1)	0.02	P-13739 (1)	0.01
P-13739 (2)	0.16	P-13739 (2)	0.14	P-13739 (2)	0.13
P-13740	0	P-13740	0.02	P-13740	0.01
P-13741	0.33	P-13741	0.3	P-13741	0.27
P-13741(1)	0	P-13741(1)	0.01	P-13741(1)	0.01
P-13741(2)	0	P-13741(2)	0.01	P-13741(2)	0.01
P-13742	0	P-13742	0	P-13742	0
P-13745	0	P-13745	0.01	P-13745	0.02
P-13747	0	P-13747	0.01	P-13747	0.02
P-13748	0.01	P-13748	0.01	P-13748	0.01
P-13749 (1)	0	P-13749 (1)	0	P-13749 (1)	0
P-13749 (2)	0.02	P-13749 (2)	0.04	P-13749 (2)	0.06
P-1375	0.04	P-1375	0.44	P-1375	0.31
P-13750	0	P-13750	0	P-13750	0
P-13751	0	P-13751	0	P-13751	0
P-13754	0	P-13754	0.01	P-13754	0.01
P-13755	0	P-13755	0.01	P-13755	0.01
P-13756	0	P-13756	0.01	P-13756	0.01
P-13757	0.01	P-13757	0.01	P-13757	0.02
P-13758	0	P-13758	0	P-13758	0
P-13759	0.04	P-13759	0.02	P-13759	0.07
P-1376	0.06	P-1376	0.36	P-1376	0.23
P-13761 (1)	0.01	P-13761 (1)	0.03	P-13761 (1)	0.03
P-13761 (2)	0.02	P-13761 (2)	0.02	P-13761 (2)	0.06
P-13763	0.04	P-13763	0.04	P-13763	0.05
P-13764	0	P-13764	0	P-13764	0
P-13767	0	P-13767	0	P-13767	0.01
P-13768	0	P-13768	0.01	P-13768	0.01
P-13769	0	P-13769	0	P-13769	0
P-1377	0.01	P-1377	0.01	P-1377	0.01
P-13770	0	P-13770	0.01	P-13770	0.01
P-13771	0.1	P-13771	0.15	P-13771	0.09
P-13772	0.03	P-13772	0.04	P-13772	0.05
P-13773	0.17	P-13773	0.17	P-13773	0.19
P-13775	0.06	P-13775	0.07	P-13775	0.08
P-13777	0.26	P-13777	0.28	P-13777	0.31
P-1378	0.03	P-1378	0.06	P-1378	0.08
P-13783	1.77	P-13783	1.69	P-13783	1.69
P-13784	0.01	P-13784	0.02	P-13784	0.02
P-13785	0.42	P-13785	0.4	P-13785	0.36
P-1379	0	P-1379	0	P-1379	0
P-13791	0.05	P-13791	0.06	P-13791	0.06
P-13793(2)	0.08	P-13793(2)	0.06	P-13793(2)	0.04
P-13795	1.78	P-13795	1.7	P-13795	1.7
P-13797	0.44	P-13797	0.42	P-13797	0.42
P-13799	0.66	P-13799	0.45	P-13799	0.59
P-13800	0	P-13800	0	P-13800	0
P-13801	0.05	P-13801	0.05	P-13801	0.05
P-13811	0.08	P-13811	0.14	P-13811	0.19
P-13813	0.16	P-13813	0.28	P-13813	0.37
P-13821	0.04	P-13821	0.01	P-13821	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-13823	0	P-13823	0.02	P-13823	0.02
P-13827	0.02	P-13827	0.09	P-13827	0.14
P-1383	0	P-1383	0	P-1383	0
P-13832(1)	0.12	P-13832(1)	0.07	P-13832(1)	0.22
P-13832(2)	0.1	P-13832(2)	0.07	P-13832(2)	0.22
P-13833 (1)	0.12	P-13833 (1)	0.08	P-13833 (1)	0.26
P-13833 (2)	0.42	P-13833 (2)	0.11	P-13833 (2)	0.17
P-13837	0	P-13837	0	P-13837	0
P-13839	0.01	P-13839	0.01	P-13839	0.01
P-13841	0.04	P-13841	0.05	P-13841	0.04
P-13843	0.29	P-13843	0.53	P-13843	2.37
P-13845	0.27	P-13845	0.49	P-13845	2.21
P-13847	0.29	P-13847	0.41	P-13847	0.4
P-13848	0.03	P-13848	0.02	P-13848	0.02
P-13855	0.08	P-13855	0.03	P-13855	0.05
P-13856	0.01	P-13856	0.03	P-13856	0.05
P-13857	0.16	P-13857	0.06	P-13857	0.09
P-13861	0.43	P-13861	0.19	P-13861	0.07
P-13865	0.19	P-13865	0.48	P-13865	0.38
P-13867	0.01	P-13867	0.04	P-13867	0.04
P-13875	0.08	P-13875	0.06	P-13875	0.05
P-13877	0.16	P-13877	0.14	P-13877	0.11
P-13879	0.29	P-13879	0.53	P-13879	2.37
P-1388	0.01	P-1388	0.01	P-1388	0.01
P-13883	0.82	P-13883	0.12	P-13883	0.26
P-13885	0.75	P-13885	0.11	P-13885	0.26
P-13889	1.15	P-13889	1.22	P-13889	1.32
P-13891	0.05	P-13891	0.16	P-13891	0.16
P-13893	0.23	P-13893	0.71	P-13893	0.61
P-13895	0.08	P-13895	0.05	P-13895	0.05
P-13898	0.07	P-13898	0.11	P-13898	0.11
P-1390	0	P-1390	0	P-1390	0
P-13901	0.42	P-13901	0.68	P-13901	0.5
P-13903	0.32	P-13903	0.28	P-13903	0.26
P-13905 (1)	0.03	P-13905 (1)	0.02	P-13905 (1)	0.02
P-13905 (2)	0.16	P-13905 (2)	0.14	P-13905 (2)	0.13
P-13913 (1)	0	P-13913 (1)	0.08	P-13913 (1)	0.06
P-13913 (2)	0.04	P-13913 (2)	0.01	P-13913 (2)	0.01
P-13915 (1)	0.11	P-13915 (1)	0.15	P-13915 (1)	0.14
P-13915 (2)	0.04	P-13915 (2)	0.01	P-13915 (2)	0.01
P-13917	0.15	P-13917	0.04	P-13917	0.03
P-13919	0	P-13919	0.06	P-13919	0.26
P-13921	0	P-13921	0.06	P-13921	0.26
P-13923	0	P-13923	0.06	P-13923	0.26
P-13925 (1)	0.04	P-13925 (1)	0.1	P-13925 (1)	0.08
P-13925 (2)	0	P-13925 (2)	0.04	P-13925 (2)	0.64
P-13926	0	P-13926	0.01	P-13926	0.01
P-13927	0.38	P-13927	0.02	P-13927	0.03
P-13928	8.28	P-13928	8	P-13928	6.24
P-13929	0.42	P-13929	0.03	P-13929	0.03
P-13931	2.7	P-13931	0.79	P-13931	0.91
P-13933	1.93	P-13933	0.69	P-13933	0.91
P-13935	0	P-13935	0	P-13935	0
P-13937	0	P-13937	0	P-13937	0
P-13939 (1)	8.28	P-13939 (1)	8	P-13939 (1)	6.24
P-13939 (2)	0	P-13939 (2)	0.78	P-13939 (2)	0.01
P-13941	0.01	P-13941	0.79	P-13941	0.01
P-13943 (1)	0.01	P-13943 (1)	0.02	P-13943 (1)	0.02
P-13943 (2)	0.04	P-13943 (2)	0.17	P-13943 (2)	0.42
P-13945(1)	0.03	P-13945(1)	0.07	P-13945(1)	0.06
P-13945(2)	0	P-13945(2)	0.04	P-13945(2)	0.05
P-13947	0.01	P-13947	0.03	P-13947	0.06
P-13948	0	P-13948	0.01	P-13948	0.01
P-13949	0.07	P-13949	0.17	P-13949	0.33
P-1395 (1)	0.03	P-1395 (1)	0.07	P-1395 (1)	0.06
P-1395 (2)	0.16	P-1395 (2)	0.21	P-1395 (2)	0.17
P-13950	0.01	P-13950	0.01	P-13950	0.01
P-13951	0.12	P-13951	0.38	P-13951	0.86
P-13953	0.04	P-13953	0.17	P-13953	0.47
P-13957	0.53	P-13957	0.51	P-13957	0.49
P-13959	0.53	P-13959	0.51	P-13959	0.5

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-1396 (1)	0.01
P-1396 (2)	0
P-13963	0.56
P-13965	0.78
P-13966	0
P-13967	0.33
P-13969	0.18
P-13970	0.01
P-13974	0.01
P-13975	0.02
P-13979	0
P-13983	0.19
P-13985	0.21
P-13987	0.01
P-13989	0.01
P-13991	0.01
P-13993	0.01
P-13995	0.19
P-13997(1)(1)(1)	0.22
P-13997(1)(1)(2)	0.22
P-13997(1)(2)	0.22
P-13997(2)	0.22
P-13999	0.02
P-14	0.04
P-14001	0.08
P-14003	0.03
P-14005 (1)	8.28
P-14005 (2)	0.01
P-14006	8.28
P-14007	0.01
P-14009	0.06
P-14011	0.31
P-14013(1)(1)	0.28
P-14013(1)(2)	0.16
P-14013(2)(1)	0.37
P-14013(2)(2)	0.37
P-14017	0.01
P-14020	0.01
P-14023	0.01
P-14024	0.01
P-14025	0.04
P-14026	0.03
P-14027 (1)	0.02
P-14027 (2)	0.08
P-14030	0.01
P-14031	0
P-14033	0
P-14035 (1)	0.02
P-14035 (2)	0
P-14036	0.01
P-14037	0
P-14041	0.79
P-14043	0.76
P-14045	0.77
P-14047	0.02
P-14049	0.85
P-14051	0.84
P-14053 (1)	0.01
P-14053 (2)	0.15
P-14055	0.14
P-14057	0.02
P-14059	0.12
P-14061	0.03
P-14063	0.01
P-14065 (1)	0.01
P-14065 (2)	0.32
P-14067	0.36
P-14071(1)	0.01
P-14071(2)(1)	0.01
P-14071(2)(2)	0.01
P-14073(1)	0.04

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-1396 (1)	0.01
P-1396 (2)	0.01
P-13963	0.57
P-13965	0.8
P-13966	0
P-13967	0.4
P-13969	0.25
P-13970	0.1
P-13974	0.02
P-13975	0.04
P-13979	0.01
P-13983	0.23
P-13985	0.27
P-13987	0.01
P-13989	0.03
P-13991	0.01
P-13993	0.03
P-13995	0.43
P-13997(1)(1)(1)	0.32
P-13997(1)(1)(2)	0.32
P-13997(1)(2)	0.32
P-13997(2)	0.32
P-13999	0.04
P-14	0.07
P-14001	0.08
P-14003	0.05
P-14005 (1)	7.9
P-14005 (2)	0.01
P-14006	7.9
P-14007	0.01
P-14009	0.16
P-14011	0.28
P-14013(1)(1)	0.32
P-14013(1)(2)	0.17
P-14013(2)(1)	0.52
P-14013(2)(2)	0.43
P-14017	0.01
P-14020	0.01
P-14023	0.01
P-14024	0.05
P-14025	0.03
P-14026	0.06
P-14027 (1)	0.03
P-14027 (2)	0.06
P-14030	0.01
P-14031	0.01
P-14033	0.01
P-14035 (1)	0.04
P-14035 (2)	0
P-14036	0.03
P-14037	0
P-14041	1.07
P-14043	0.53
P-14045	0.71
P-14047	0.02
P-14049	0.4
P-14051	0.42
P-14053 (1)	0.01
P-14053 (2)	2.02
P-14055	2
P-14057	0.42
P-14059	0.31
P-14061	0.05
P-14063	0.02
P-14065 (1)	0.04
P-14065 (2)	0.24
P-14067	0.27
P-14071(1)	0.02
P-14071(2)(1)	0.02
P-14071(2)(2)	0.02
P-14073(1)	0.06

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-1396 (1)	0.01
P-1396 (2)	0.01
P-13963	0.55
P-13965	0.75
P-13966	0
P-13967	0.37
P-13969	0.23
P-13970	0.1
P-13974	0.01
P-13975	0.67
P-13979	0.2
P-13983	0.18
P-13985	0.21
P-13987	0.01
P-13989	0.02
P-13991	0.01
P-13993	0.02
P-13995	0.39
P-13997(1)(1)(1)	0.27
P-13997(1)(1)(2)	0.27
P-13997(1)(2)	0.27
P-13997(2)	0.27
P-13999	0.04
P-14	0.11
P-14001	0.07
P-14003	0.04
P-14005 (1)	6.24
P-14005 (2)	0.01
P-14006	6.24
P-14007	0.01
P-14009	0.12
P-14011	0.25
P-14013(1)(1)	0.22
P-14013(1)(2)	0.11
P-14013(2)(1)	0.49
P-14013(2)(2)	0.37
P-14017	0.01
P-14020	0.01
P-14023	0.01
P-14024	0.07
P-14025	0.03
P-14026	0.02
P-14027 (1)	0.06
P-14027 (2)	0.07
P-14030	0.01
P-14031	0.01
P-14033	0.01
P-14035 (1)	0.08
P-14035 (2)	0
P-14036	0.07
P-14037	0
P-14041	0.75
P-14043	0.44
P-14045	0.57
P-14047	0.05
P-14049	0.32
P-14051	0.34
P-14053 (1)	0.01
P-14053 (2)	2.17
P-14055	2.15
P-14057	0.42
P-14059	0.12
P-14061	0.05
P-14063	0.02
P-14065 (1)	0.03
P-14065 (2)	0.51
P-14067	0.55
P-14071(1)	0.03
P-14071(2)(1)	0.03
P-14071(2)(2)	0.03
P-14073(1)	0.1

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-14073(2)(1)	0.04	P-14073(2)(1)	0.06	P-14073(2)(1)	0.1
P-14073(2)(2)	0.04	P-14073(2)(2)	0.06	P-14073(2)(2)	0.1
P-14075	0	P-14075	0	P-14075	0
P-14077	0.01	P-14077	0.02	P-14077	0.03
P-14079	0.37	P-14079	0.67	P-14079	0.62
P-14081	0.02	P-14081	0.07	P-14081	0.2
P-14083	0.51	P-14083	1.28	P-14083	0.84
P-14085	0.47	P-14085	1.04	P-14085	0.54
P-14087	0.05	P-14087	0.11	P-14087	0.16
P-14088	0.02	P-14088	0.03	P-14088	0.03
P-14089	0.02	P-14089	0.05	P-14089	0.07
P-14091	0.11	P-14091	0.01	P-14091	0.05
P-14093	0.1	P-14093	0.01	P-14093	0.06
P-14095	0	P-14095	0	P-14095	0
P-14099	0.16	P-14099	0.4	P-14099	2.73
P-14101	0.04	P-14101	0.08	P-14101	3.05
P-14103 (1)	0.03	P-14103 (1)	0.03	P-14103 (1)	0.05
P-14103 (2)	0.07	P-14103 (2)	0.16	P-14103 (2)	0.13
P-14105	0.05	P-14105	0.12	P-14105	0.09
P-14107 (1)	0.02	P-14107 (1)	0.02	P-14107 (1)	0.05
P-14107 (2)	0.08	P-14107 (2)	0.17	P-14107 (2)	0.13
P-14109	0.07	P-14109	0.16	P-14109	0.12
P-1411 (1)	0	P-1411 (1)	0.01	P-1411 (1)	0.01
P-1411 (2)	0.03	P-1411 (2)	0.05	P-1411 (2)	0.04
P-14115	0.15	P-14115	0.11	P-14115	0.2
P-14117	0.07	P-14117	0.08	P-14117	0.1
P-14118	0.01	P-14118	0.01	P-14118	0.01
P-14119	0.06	P-14119	0.07	P-14119	0.07
P-14121	0.07	P-14121	0.05	P-14121	0.09
P-14122	0.01	P-14122	0.03	P-14122	0.05
P-14123	0.01	P-14123	0.01	P-14123	0.01
P-14125	0.01	P-14125	0.01	P-14125	0.01
P-14126	0.01	P-14126	0.03	P-14126	0.05
P-14127 (1)	0.01	P-14127 (1)	0.02	P-14127 (1)	0.03
P-14127 (2)	0	P-14127 (2)	0.01	P-14127 (2)	0.01
P-14128	0.01	P-14128	0.01	P-14128	0.01
P-14129	0.02	P-14129	0.04	P-14129	0.03
P-14130	0.08	P-14130	0.11	P-14130	0.28
P-14131(1)	0	P-14131(1)	0.01	P-14131(1)	0.01
P-14131(2)	0	P-14131(2)	0.01	P-14131(2)	0.01
P-14133	0.01	P-14133	0.02	P-14133	0.02
P-14135	0.11	P-14135	0.05	P-14135	0.02
P-14137	0.08	P-14137	0.04	P-14137	0.02
P-14139	0.39	P-14139	0.31	P-14139	0.23
P-14143	0.06	P-14143	0.07	P-14143	0.03
P-14148	0.01	P-14148	0.01	P-14148	0.04
P-14149	0.01	P-14149	0.01	P-14149	0.03
P-14151	0.02	P-14151	0.05	P-14151	0.02
P-14155 (1)	0.1	P-14155 (1)	0.1	P-14155 (1)	0.26
P-14155 (2)	0.01	P-14155 (2)	0.02	P-14155 (2)	0.01
P-14156	0.1	P-14156	0.09	P-14156	0.23
P-14159	0.03	P-14159	0.04	P-14159	0.03
P-14162	0.01	P-14162	0.04	P-14162	0.16
P-14163	0.03	P-14163	0.18	P-14163	0.06
P-14165	0.05	P-14165	0.1	P-14165	0.1
P-14167	0.01	P-14167	0.02	P-14167	0.02
P-14168	0	P-14168	0.01	P-14168	0.01
P-14171(1)	0.17	P-14171(1)	0.42	P-14171(1)	0.4
P-14171(2)	0.1	P-14171(2)	0.32	P-14171(2)	0.3
P-14173	0.17	P-14173	0.28	P-14173	0.27
P-14177(1)	0.05	P-14177(1)	0.04	P-14177(1)	0.06
P-14177(2)	0.05	P-14177(2)	0.04	P-14177(2)	0.06
P-14179	0.13	P-14179	0.14	P-14179	0.35
P-1418	0.07	P-1418	0.04	P-1418	0.04
P-14181	0.35	P-14181	0.27	P-14181	0.78
P-14183 (1)	0.08	P-14183 (1)	0.11	P-14183 (1)	0.15
P-14183 (2)	0.09	P-14183 (2)	0.08	P-14183 (2)	0.24
P-14185	0.21	P-14185	0.14	P-14185	0.41
P-14187	0	P-14187	6.84	P-14187	10.46
P-14189	0.63	P-14189	8.12	P-14189	12.9
P-1419	0.01	P-1419	0.01	P-1419	0.01

Laredo Integrated Water Master Plan

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-14193(1)	0.48	P-14193(1)	0.45	P-14193(1)	0.7
P-14193(2)	0	P-14193(2)	0	P-14193(2)	0.01
P-14195	0.36	P-14195	0.22	P-14195	9.42
P-14197	0.06	P-14197	0.04	P-14197	0.04
P-14201	0.34	P-14201	0.23	P-14201	0.22
P-14203	0.1	P-14203	0.13	P-14203	0.09
P-14205	0.02	P-14205	0.06	P-14205	0.36
P-14207	0.03	P-14207	0.08	P-14207	0.35
P-14209	0.12	P-14209	0.22	P-14209	0.59
P-14211	0.09	P-14211	0.16	P-14211	0.56
P-14213	6.47	P-14213	7.83	P-14213	10.24
P-14215	6.47	P-14215	7.82	P-14215	10.23
P-14217	0.12	P-14217	0.1	P-14217	0.03
P-14219	0	P-14219	0.1	P-14219	0.75
P-1422 (1)	0.13	P-1422 (1)	0.05	P-1422 (1)	0.2
P-1422 (2)	0.01	P-1422 (2)	0.01	P-1422 (2)	0.01
P-14221	0	P-14221	0.1	P-14221	0.72
P-14223	0	P-14223	0.01	P-14223	0.09
P-14225	0	P-14225	0	P-14225	0
P-14227	8.29	P-14227	8.05	P-14227	6.28
P-14229	8.29	P-14229	8.03	P-14229	6.27
P-14231	8.29	P-14231	8.02	P-14231	6.26
P-14233	8.28	P-14233	8.02	P-14233	6.26
P-14235	8.28	P-14235	8	P-14235	6.24
P-14237	8.28	P-14237	8	P-14237	6.24
P-14239	8.28	P-14239	7.89	P-14239	6.24
P-14241	8.28	P-14241	7.89	P-14241	6.23
P-14243	8.28	P-14243	7.88	P-14243	6.23
P-14245	8.27	P-14245	7.87	P-14245	6.22
P-14247(1)	0.16	P-14247(1)	0.11	P-14247(1)	0.13
P-14247(2)	0.16	P-14247(2)	0.11	P-14247(2)	0.13
P-14249	1.66	P-14249	2.75	P-14249	0.79
P-1425	0.19	P-1425	0.24	P-1425	0.12
P-14251 (1)	0.05	P-14251 (1)	0.3	P-14251 (1)	0.25
P-14251 (2)	1.66	P-14251 (2)	2.75	P-14251 (2)	0.79
P-14253	1.66	P-14253	2.75	P-14253	0.78
P-14259	0	P-14259	0	P-14259	0
P-14265	0.27	P-14265	0.13	P-14265	0.29
P-14267	1.78	P-14267	4.2	P-14267	3.59
P-14269	1.78	P-14269	4.19	P-14269	3.57
P-14271	0.08	P-14271	0.12	P-14271	0.12
P-14273	0.08	P-14273	0.12	P-14273	0.14
P-14275	1.87	P-14275	4.11	P-14275	3.64
P-14277	1.87	P-14277	4.1	P-14277	3.64
P-14279	1.87	P-14279	4.1	P-14279	3.64
P-1428	0.04	P-1428	0.1	P-1428	0.09
P-14281	1.87	P-14281	4.1	P-14281	3.64
P-14285	0.35	P-14285	0.72	P-14285	0.55
P-14287	2.82	P-14287	5.86	P-14287	4.93
P-14289	2.29	P-14289	4.04	P-14289	5.43
P-14291	2.28	P-14291	4	P-14291	5.41
P-14295	0.03	P-14295	0.05	P-14295	0.04
P-14299	0.01	P-14299	0.03	P-14299	0.02
P-1430	0.01	P-1430	0.01	P-1430	0.01
P-14301	0.05	P-14301	0.08	P-14301	0.07
P-14302	0.04	P-14302	0.05	P-14302	0.06
P-14303	16.04	P-14303	17.8	P-14303	(N/A)
P-14305(1)	16.04	P-14305(1)	17.79	P-14305(1)	(N/A)
P-14305(2)	13.44	P-14305(2)	23.02	P-14305(2)	(N/A)
P-14307	13.43	P-14307	23.01	P-14307	(N/A)
P-14311	13.43	P-14311	22.99	P-14311	(N/A)
P-14313	13.43	P-14313	22.99	P-14313	(N/A)
P-14315	13.43	P-14315	22.99	P-14315	(N/A)
P-14317	13.43	P-14317	22.98	P-14317	(N/A)
P-14319	13.43	P-14319	22.98	P-14319	(N/A)
P-14323	3.44	P-14323	8.72	P-14323	9.9
P-14325	3.43	P-14325	8.71	P-14325	9.89
P-14327	4.91	P-14327	5.17	P-14327	9.07
P-14329	6.84	P-14329	5.78	P-14329	11.12
P-14331	8.09	P-14331	6.39	P-14331	12.95
P-14332	0.44	P-14332	0.22	P-14332	0.3

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-14333 (1)	0.73
P-14333 (2)	8.08
P-14335	0.17
P-14341	0.06
P-14342	0.1
P-14345 (1)	0.04
P-14345 (2)	0.11
P-14347	0.11
P-14349 (1)	0.06
P-14349 (2)	0.11
P-14351	0.11
P-14353	0.11
P-14355 (1)	0.74
P-14355 (2)	0.11
P-14357	0.28
P-14357(1)(1)	0.11
P-14357(1)(2)	0.11
P-14357(2)	0.11
P-14359 (1)	0
P-14359 (2)	0.11
P-1436	0.06
P-14360	0
P-14361(1)	0
P-14361(2)	0
P-14362	0.27
P-14363	0.25
P-14365(1)	4.23
P-14365(2)	3.76
P-14366	0.08
P-14367	0.22
P-1437	0.03
P-14373	0.88
P-14380	0.02
P-14381	0.88
P-14383 (1)	0.02
P-14383 (2)	0.4
P-14384	0.07
P-14385	1.04
P-14389	0.09
P-14391	0.07
P-14393	0.12
P-14394	0.06
P-14397	3.76
P-14399	0.88
P-14401	2.83
P-14403(1)	2.55
P-14403(2)	1.8
P-14405 (1)	0
P-14405 (2)	1.8
P-14407	1.48
P-14409	1.29
P-14411	0.63
P-14417(1)	0.75
P-14417(2)	0.75
P-14419 (1)	0.09
P-14419 (2)	1.45
P-14423	0.33
P-14425	0.37
P-14427	0.29
P-14429	0.05
P-14431	0.25
P-14433	0.06
P-14435	0.14
P-14437	0.2
P-14439	0
P-14441	0
P-14443	0.06
P-1445	0
P-14451	0.42
P-14453(1)	0.42
P-14453(2)	0.32

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-14333 (1)	0.33
P-14333 (2)	6.37
P-14335	0.06
P-14341	0.04
P-14342	0.07
P-14345 (1)	0.03
P-14345 (2)	0.1
P-14347	0
P-14349 (1)	0.05
P-14349 (2)	0
P-14351	0
P-14353	0
P-14355 (1)	0.92
P-14355 (2)	0
P-14357	0.25
P-14357(1)(1)	0
P-14357(1)(2)	1.54
P-14357(2)	4.61
P-14359 (1)	0.01
P-14359 (2)	4.61
P-1436	0.05
P-14360	0.01
P-14361(1)	4.61
P-14361(2)	4.61
P-14362	0.23
P-14363	0.24
P-14365(1)	3.61
P-14365(2)	4.05
P-14366	0.1
P-14367	0.07
P-1437	0.05
P-14373	4.42
P-14380	0.01
P-14381	4.42
P-14383 (1)	0.01
P-14383 (2)	0.52
P-14384	0.05
P-14385	3.91
P-14389	0.15
P-14391	0.32
P-14393	0.47
P-14394	0.04
P-14397	4.05
P-14399	4.42
P-14401	2.07
P-14403(1)	1.44
P-14403(2)	1.68
P-14405 (1)	0
P-14405 (2)	1.68
P-14407	1.79
P-14409	2.02
P-14411	2.76
P-14417(1)	2.92
P-14417(2)	0.94
P-14419 (1)	0.13
P-14419 (2)	0.76
P-14423	0.2
P-14425	0.13
P-14427	0.18
P-14429	0.07
P-14431	0.25
P-14433	0.05
P-14435	0.11
P-14437	0.16
P-14439	0
P-14441	0
P-14443	0.05
P-1445	0.01
P-14451	0.53
P-14453(1)	0.53
P-14453(2)	0.4

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-14333 (1)	0.45
P-14333 (2)	12.93
P-14335	0.1
P-14341	0.04
P-14342	0.03
P-14345 (1)	0.09
P-14345 (2)	0.14
P-14347	0
P-14349 (1)	0.01
P-14349 (2)	0
P-14351	0
P-14353	0
P-14355 (1)	1.36
P-14355 (2)	0
P-14357	0.16
P-14357(1)(1)	0
P-14357(1)(2)	0
P-14357(2)	0
P-14359 (1)	0.01
P-14359 (2)	0
P-1436	0.04
P-14360	0.01
P-14361(1)	0
P-14361(2)	0
P-14362	0.15
P-14363	0.24
P-14365(1)	7.7
P-14365(2)	7.64
P-14366	0.14
P-14367	0.09
P-1437	0.06
P-14373	7.58
P-14380	0.03
P-14381	7.58
P-14383 (1)	0.03
P-14383 (2)	1.2
P-14384	0.11
P-14385	6.38
P-14389	0.33
P-14391	0.64
P-14393	0.97
P-14394	0.1
P-14397	7.64
P-14399	7.58
P-14401	1.54
P-14403(1)	0.86
P-14403(2)	0.62
P-14405 (1)	0.01
P-14405 (2)	0.62
P-14407	0.46
P-14409	0.36
P-14411	1.01
P-14417(1)	1.14
P-14417(2)	2.09
P-14419 (1)	0.04
P-14419 (2)	1.22
P-14423	0.2
P-14425	0.21
P-14427	0.18
P-14429	0.01
P-14431	0.17
P-14433	0.04
P-14435	0.09
P-14437	0.13
P-14439	0
P-14441	0
P-14443	0.04
P-1445	0.01
P-14451	1.13
P-14453(1)	1.13
P-14453(2)	0.91

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-14455	0	P-14455	0	P-14455	0
P-14457	1.51	P-14457	0.49	P-14457	0.71
P-14459	2.53	P-14459	1.36	P-14459	1.53
P-14462	0.04	P-14462	0.03	P-14462	0.08
P-14467	0.01	P-14467	0.75	P-14467	0.33
P-14469(1)	0	P-14469(1)	0	P-14469(1)	0
P-14471(1)	0.01	P-14471(1)	0.75	P-14471(1)	0.33
P-14471(2)	0.01	P-14471(2)	0.75	P-14471(2)	0.33
P-14477	0.75	P-14477	0.2	P-14477	0.48
P-14479	1.01	P-14479	0.64	P-14479	0.84
P-14481	0.25	P-14481	0.84	P-14481	1.34
P-14483 (1)	0.01	P-14483 (1)	0.01	P-14483 (1)	0.02
P-14483 (2)	0.01	P-14483 (2)	0.02	P-14483 (2)	0.03
P-14485	6.17	P-14485	2.2	P-14485	3.15
P-14487 (1)	0	P-14487 (1)	0	P-14487 (1)	0
P-14487 (2)	1.18	P-14487 (2)	2.29	P-14487 (2)	4.05
P-14488	0.01	P-14488	0.01	P-14488	0.01
P-14493	0.03	P-14493	0.05	P-14493	0.06
P-14495	8.03	P-14495	3.52	P-14495	4.61
P-14497	0.01	P-14497	0.03	P-14497	0.03
P-14497(1)	8.01	P-14497(1)	3.48	P-14497(1)	4.57
P-14497(2)	8.01	P-14497(2)	11.42	P-14497(2)	16.4
P-14499 (1)	0	P-14499 (1)	0.01	P-14499 (1)	0.01
P-14499 (2)	0.2	P-14499 (2)	0.28	P-14499 (2)	0.39
P-1450	0.06	P-1450	0.06	P-1450	0.16
P-14501	0.4	P-14501	0.61	P-14501	0.97
P-14507	0.78	P-14507	0.71	P-14507	0.64
P-14510	0	P-14510	0	P-14510	0
P-14511 (1)	0.13	P-14511 (1)	0.12	P-14511 (1)	0.11
P-14511 (2)	0	P-14511 (2)	0	P-14511 (2)	0
P-14513(1)	0.07	P-14513(1)	0.16	P-14513(1)	0.23
P-14513(2)	0.05	P-14513(2)	0.08	P-14513(2)	0.12
P-14514	0.13	P-14514	0.11	P-14514	0.1
P-14515	1.71	P-14515	3.09	P-14515	2.85
P-14517	0.13	P-14517	0.14	P-14517	0.15
P-14517(1)	1.82	P-14517(1)	3.37	P-14517(1)	3.38
P-14517(2)	1.97	P-14517(2)	3.24	P-14517(2)	3.03
P-14521	6.69	P-14521	9.7	P-14521	9.02
P-14524	0.23	P-14524	0.24	P-14524	0.27
P-14525	0.22	P-14525	0.05	P-14525	0.06
P-14527	0.23	P-14527	0.02	P-14527	0.03
P-14529	0.63	P-14529	0.09	P-14529	0.09
P-14531	0.61	P-14531	0.05	P-14531	0.05
P-14533	2.63	P-14533	1.34	P-14533	1.44
P-14535	0	P-14535	2.33	P-14535	2.78
P-14538	0.06	P-14538	0.06	P-14538	0.06
P-14541(1)	0	P-14541(1)	0.91	P-14541(1)	0.28
P-14543	0.09	P-14543	1.12	P-14543	0.12
P-14547	3.65	P-14547	1.22	P-14547	1.26
P-14549	3.08	P-14549	0.92	P-14549	0.92
P-14551	2.5	P-14551	0.76	P-14551	0.76
P-14553	13.91	P-14553	28.83	P-14553	(N/A)
P-14555	13.9	P-14555	28.82	P-14555	(N/A)
P-14557	0.19	P-14557	0.17	P-14557	0.11
P-14559	0.02	P-14559	0.03	P-14559	0.02
P-1456	0.29	P-1456	0.24	P-1456	0.13
P-14561	0.09	P-14561	0.86	P-14561	0.81
P-14563	0.41	P-14563	0.86	P-14563	0.81
P-14565	0.32	P-14565	0	P-14565	0
P-14567	1.43	P-14567	1.17	P-14567	1.2
P-14569(1)	1.43	P-14569(1)	1.17	P-14569(1)	1.21
P-14569(2)	1.43	P-14569(2)	1.17	P-14569(2)	1.21
P-14573	0.19	P-14573	0.14	P-14573	0.12
P-14575	0.09	P-14575	0.08	P-14575	0.21
P-14581	0.22	P-14581	0.05	P-14581	0.04
P-14585	0.05	P-14585	0.06	P-14585	0.15
P-14587	0.14	P-14587	0.05	P-14587	0.1
P-14589	0.18	P-14589	0.06	P-14589	0.12
P-14593	0.38	P-14593	0.07	P-14593	0.11
P-14595	0.02	P-14595	0.04	P-14595	0.03
P-14599	0.22	P-14599	0.1	P-14599	0.21

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-14601	0.42	P-14601	0.06	P-14601	0.09
P-14605	0.4	P-14605	0.16	P-14605	0.04
P-14609	0.01	P-14609	0.01	P-14609	0.01
P-1461	0.07	P-1461	0.08	P-1461	0.13
P-14611	0.03	P-14611	0.41	P-14611	0.24
P-14615	0.01	P-14615	0.02	P-14615	1.73
P-14616	0.07	P-14616	0.12	P-14616	1.87
P-14617	0.02	P-14617	0.04	P-14617	3.51
P-14618	0.01	P-14618	0.01	P-14618	0.01
P-1462	0.03	P-1462	0	P-1462	0.01
P-14625(1)	0.29	P-14625(1)	0.81	P-14625(1)	0.5
P-14625(2)	0	P-14625(2)	0.34	P-14625(2)	0.3
P-14627	0	P-14627	0	P-14627	0
P-14629	0.17	P-14629	0.65	P-14629	0.43
P-14631	0.02	P-14631	0.04	P-14631	0.03
P-14631(1)	0.06	P-14631(1)	0.17	P-14631(1)	0.18
P-14631(2)	0.06	P-14631(2)	0.17	P-14631(2)	0.18
P-14632	0.01	P-14632	0.01	P-14632	0.01
P-14633	0.01	P-14633	0.01	P-14633	0.01
P-14635 (1)	0.01	P-14635 (1)	0.29	P-14635 (1)	0.37
P-14635 (2)	0.1	P-14635 (2)	0.17	P-14635 (2)	0.6
P-14637	2.19	P-14637	13.1	P-14637	7.12
P-14639 (1)	0.02	P-14639 (1)	0.24	P-14639 (1)	0.32
P-14639 (2)	8.3	P-14639 (2)	11.13	P-14639 (2)	7.31
P-14641	0.09	P-14641	0.19	P-14641	0.26
P-14643	0	P-14643	0.04	P-14643	0.03
P-14647	0.06	P-14647	0.4	P-14647	0.51
P-14648	0.02	P-14648	0.1	P-14648	0.12
P-14650	0.01	P-14650	0.05	P-14650	0.06
P-14652	0.08	P-14652	0.15	P-14652	0.17
P-14653	0	P-14653	0.19	P-14653	0.15
P-14661	0	P-14661	0	P-14661	0
P-14666	0.01	P-14666	0.01	P-14666	0.01
P-14669	0.02	P-14669	0.05	P-14669	0.25
P-1467	0.04	P-1467	0.04	P-1467	0.04
P-14671	0.01	P-14671	0.04	P-14671	0.3
P-14673	0	P-14673	0	P-14673	0
P-14679	0.91	P-14679	0.31	P-14679	0.57
P-14683	0.82	P-14683	0.07	P-14683	0.72
P-14685	0.67	P-14685	0.64	P-14685	0.26
P-14687	0.27	P-14687	0.23	P-14687	0.1
P-14691	0.05	P-14691	0.02	P-14691	0.02
P-14693	0.04	P-14693	0.02	P-14693	0.01
P-14695	0.06	P-14695	0.04	P-14695	0.02
P-14697	0.15	P-14697	0.08	P-14697	0.03
P-14699	0.1	P-14699	0.1	P-14699	0.07
P-14701	0.11	P-14701	0.09	P-14701	0.02
P-14703	0.08	P-14703	0.03	P-14703	0.08
P-14707	0.06	P-14707	0.16	P-14707	0.12
P-14709	0.1	P-14709	0.17	P-14709	0.16
P-14713	0.04	P-14713	0.06	P-14713	0.05
P-14715	0.18	P-14715	0.06	P-14715	0.17
P-14717	0.31	P-14717	0.28	P-14717	0.27
P-14719	0.18	P-14719	0.09	P-14719	0.09
P-14721	0.35	P-14721	0.28	P-14721	0.26
P-14723	0.16	P-14723	0.15	P-14723	0.13
P-14725	0.22	P-14725	0.17	P-14725	0.15
P-14727	0.13	P-14727	0.04	P-14727	0.12
P-1473	0.08	P-1473	0.13	P-1473	0.16
P-14736	0.04	P-14736	0.03	P-14736	0.02
P-14737	0.04	P-14737	0.3	P-14737	0.17
P-14739	0	P-14739	0.01	P-14739	0.01
P-14741	0.23	P-14741	0.72	P-14741	0.93
P-14742	0.04	P-14742	0.04	P-14742	0.04
P-14743	0.02	P-14743	0.08	P-14743	0.1
P-14745	0.03	P-14745	0.06	P-14745	0.09
P-14747	0.08	P-14747	0.01	P-14747	0.05
P-14749	0.01	P-14749	0.09	P-14749	0.09
P-14751	0.14	P-14751	0.32	P-14751	0.4
P-14753	0.05	P-14753	0.16	P-14753	0.19
P-14757	0.19	P-14757	0.38	P-14757	0.51

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-14759	0.04	P-14759	0.15	P-14759	0.18
P-14761	0.11	P-14761	0.23	P-14761	0.3
P-14763	0.06	P-14763	0.03	P-14763	0.06
P-14765	0.23	P-14765	0.13	P-14765	0.24
P-14767(1)	0.05	P-14767(1)	0.03	P-14767(1)	0.05
P-14767(2)(1)	0.03	P-14767(2)(1)	0.02	P-14767(2)(1)	0.03
P-14767(2)(2)	0.05	P-14767(2)(2)	0.04	P-14767(2)(2)	0.06
P-14769	0.12	P-14769	0.06	P-14769	0.12
P-14781	2.19	P-14781	13.11	P-14781	7.12
P-14783	2.19	P-14783	13.1	P-14783	7.12
P-14785	5.52	P-14785	4.66	P-14785	7.29
P-14787	8.3	P-14787	8.1	P-14787	6.33
P-14789	0	P-14789	7	P-14789	7.05
P-1479	0.07	P-1479	0.07	P-1479	0.04
P-14791	0.44	P-14791	3.45	P-14791	4.84
P-14793	0	P-14793	0.23	P-14793	0.58
P-14795	5.51	P-14795	4.69	P-14795	7.28
P-14797	0.14	P-14797	0.05	P-14797	0.11
P-14799	0.08	P-14799	0.05	P-14799	0.13
P-1480	0.12	P-1480	0.1	P-1480	0.21
P-14801	0.01	P-14801	0.01	P-14801	0.01
P-14809	0.64	P-14809	1.88	P-14809	1.26
P-1481 (1)	0.01	P-1481 (1)	0.01	P-1481 (1)	0.01
P-1481 (2)	0.01	P-1481 (2)	0.01	P-1481 (2)	0.01
P-14811	1.14	P-14811	1.93	P-14811	3.23
P-14813	0.95	P-14813	1.5	P-14813	0.97
P-14814	0.04	P-14814	0.14	P-14814	0.14
P-14817	0	P-14817	0	P-14817	0
P-1482	0.05	P-1482	0.02	P-1482	0.02
P-14821	0.08	P-14821	0.16	P-14821	0.05
P-14827	0.04	P-14827	0.06	P-14827	0.04
P-1483	0.08	P-1483	0.11	P-1483	0.18
P-14831	1.6	P-14831	1.4	P-14831	1.45
P-14835	0.48	P-14835	0.44	P-14835	0.42
P-14839	0	P-14839	0	P-14839	0
P-14843	0.7	P-14843	0.28	P-14843	0.41
P-14845	0.34	P-14845	0.46	P-14845	0.32
P-14847	0.87	P-14847	0.73	P-14847	0.36
P-1485	0.11	P-1485	0.24	P-1485	0.18
P-14851	0.15	P-14851	0.1	P-14851	0.2
P-14853	0.68	P-14853	0.18	P-14853	0.33
P-14859	1.47	P-14859	0.39	P-14859	0.71
P-14861	1.67	P-14861	0.43	P-14861	0.79
P-14863	0	P-14863	0	P-14863	0
P-14865	0.75	P-14865	0.27	P-14865	0.35
P-14867(1)(1)	0.2	P-14867(1)(1)	0.22	P-14867(1)(1)	0.38
P-14867(1)(2)	0.11	P-14867(1)(2)	0.2	P-14867(1)(2)	0.21
P-14867(2)	0.14	P-14867(2)	0.3	P-14867(2)	0.25
P-14869(1)	0.13	P-14869(1)	0.31	P-14869(1)	0.24
P-14869(2)	0.07	P-14869(2)	0.29	P-14869(2)	0.12
P-14873	1.02	P-14873	0.28	P-14873	0.51
P-14879	0.61	P-14879	0.89	P-14879	1.13
P-14881	0.15	P-14881	0.11	P-14881	0.05
P-14883	0.42	P-14883	0.26	P-14883	0.45
P-14885	0.15	P-14885	0.1	P-14885	0.05
P-14887	0.21	P-14887	0.2	P-14887	0.21
P-14889	1.24	P-14889	3.42	P-14889	1.29
P-1489	0.05	P-1489	0.08	P-1489	0.04
P-14891(1)	1.59	P-14891(1)	4.21	P-14891(1)	1.12
P-14891(2)	1.22	P-14891(2)	1.03	P-14891(2)	1.12
P-14893	1.16	P-14893	3.52	P-14893	1.51
P-14895	1.24	P-14895	3.44	P-14895	1.3
P-14897	1.22	P-14897	1.03	P-14897	1.12
P-14901	0.42	P-14901	0.87	P-14901	0.11
P-14903	0.21	P-14903	0.71	P-14903	0.36
P-14905(1)	0.23	P-14905(1)	0.2	P-14905(1)	0.54
P-14905(2)	0.25	P-14905(2)	0.98	P-14905(2)	0.4
P-14907	0.31	P-14907	0.39	P-14907	0.59
P-14909	0.39	P-14909	0.16	P-14909	0.48
P-14911	1.4	P-14911	0.75	P-14911	1.92
P-14915	1	P-14915	0.58	P-14915	1.5

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-14919	0.1	P-14919	0.58	P-14919	0.2
P-1492	0.39	P-1492	0.96	P-1492	0.75
P-14921	0.25	P-14921	0.63	P-14921	0.7
P-14923(1)	0.31	P-14923(1)	0.15	P-14923(1)	0.23
P-14923(2)	0.31	P-14923(2)	0.15	P-14923(2)	0.23
P-14925	0.96	P-14925	0.44	P-14925	0.58
P-14927 (1)	0.28	P-14927 (1)	0.26	P-14927 (1)	0.14
P-14927 (2)	0.15	P-14927 (2)	0.09	P-14927 (2)	0.14
P-1493	0.38	P-1493	0.93	P-1493	0.73
P-14931	0.63	P-14931	0.2	P-14931	0.56
P-14933	2.85	P-14933	2.26	P-14933	3.33
P-14935	2.45	P-14935	1.93	P-14935	2.86
P-14939	0.01	P-14939	1.21	P-14939	1.39
P-1494	0.07	P-1494	0.05	P-1494	0.02
P-14941	2.83	P-14941	2.6	P-14941	2.39
P-14945	7.47	P-14945	15.27	P-14945	12.59
P-14949	0.02	P-14949	0.03	P-14949	0.04
P-14951	11.2	P-14951	24.92	P-14951	22.25
P-14953	0.06	P-14953	0.01	P-14953	0.78
P-14955	3.45	P-14955	0	P-14955	0
P-14957	3.45	P-14957	0	P-14957	0
P-14959	0	P-14959	0	P-14959	0
P-14961	3.45	P-14961	0	P-14961	0
P-14963	0.15	P-14963	0.03	P-14963	0.1
P-14965	0.11	P-14965	0.13	P-14965	0.2
P-14967	0.06	P-14967	0.06	P-14967	0.06
P-14969	0.09	P-14969	0.07	P-14969	0.14
P-1497	0	P-1497	0.02	P-1497	0.01
P-14975	0.42	P-14975	0.46	P-14975	0.47
P-14977	0.14	P-14977	0.15	P-14977	0.16
P-14979	0.56	P-14979	0.62	P-14979	0.63
P-1498	0.16	P-1498	0.4	P-1498	0.31
P-14981	3.63	P-14981	3.33	P-14981	2.4
P-14995(1)	(N/A)	P-14995(1)	0.99	P-14995(1)	0.01
P-14995(2)(1)	(N/A)	P-14995(2)(1)	0.97	P-14995(2)(1)	0.12
P-14995(2)(2)	(N/A)	P-14995(2)(2)	0.97	P-14995(2)(2)	0.12
P-1500	0.16	P-1500	0.39	P-1500	0.32
P-15003	0.23	P-15003	0.02	P-15003	0.03
P-15007	0.11	P-15007	0	P-15007	0
P-15009(1)	0.11	P-15009(1)	4.64	P-15009(1)	0
P-15009(2)	0.11	P-15009(2)	0.1	P-15009(2)	0.17
P-1501	0.03	P-1501	0.05	P-1501	0.02
P-15011	0	P-15011	4.64	P-15011	0
P-15019	6.42	P-15019	12.91	P-15019	42.12
P-1502	0.06	P-1502	0.15	P-1502	0.12
P-15029	(N/A)	P-15029	(N/A)	P-15029	(N/A)
P-15031	(N/A)	P-15031	(N/A)	P-15031	(N/A)
P-15033	0	P-15033	(N/A)	P-15033	(N/A)
P-15039	0.01	P-15039	0.02	P-15039	0.02
P-15041	0	P-15041	0.03	P-15041	0.01
P-15043	0.01	P-15043	0.04	P-15043	0.04
P-15045	0	P-15045	0	P-15045	0
P-15047	0.01	P-15047	0.04	P-15047	0.03
P-15049	0	P-15049	0.01	P-15049	0.01
P-15053	0.03	P-15053	0.02	P-15053	0.03
P-15055	0.07	P-15055	0.05	P-15055	0.07
P-15057	0.11	P-15057	0.08	P-15057	0.1
P-15061	0.25	P-15061	0.2	P-15061	0.23
P-15063	0.18	P-15063	0.12	P-15063	0.17
P-15065	0.09	P-15065	0.15	P-15065	0.1
P-15067(1)	0.01	P-15067(1)	0.17	P-15067(1)	0.16
P-15067(2)	0.42	P-15067(2)	0.31	P-15067(2)	0.39
P-15069	0.1	P-15069	0.05	P-15069	0.09
P-15071	0.4	P-15071	0.2	P-15071	0.2
P-15073	0.61	P-15073	0.34	P-15073	0.33
P-15077	0.02	P-15077	0.06	P-15077	0.04
P-15079	0.18	P-15079	0.12	P-15079	0.2
P-15081	0.03	P-15081	0.02	P-15081	0.08
P-15083	0.02	P-15083	0.06	P-15083	0.03
P-15084	0	P-15084	0	P-15084	0
P-15085	0.04	P-15085	0.12	P-15085	0.07

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-15086	0
P-15087	0.07
P-15088	0
P-15089	0.17
P-15090	0
P-15091	0.15
P-15092	0
P-15093	0.29
P-15094	0
P-15095	0.39
P-15096	0
P-15097	0.06
P-15098	0
P-15099	0.05
P-15101	0.03
P-15103	0.06
P-15105	0.08
P-15107	0.06
P-15111	0.05
P-15113	0.09
P-15115 (1)	0
P-15115 (2)	0.11
P-15117	0.05
P-15121	0.01
P-15123 (1)	0
P-15123 (2)	0.21
P-15127 (1)	0
P-15127 (2)	0.11
P-15129	0.45
P-15131	0.26
P-15133	0.19
P-15135	0.16
P-15139	0.18
P-15141	0.28
P-15149	0.06
P-15153	0.13
P-15155	0.11
P-15161	0.08
P-15163	0.14
P-15169	0.13
P-15173	0.09
P-15179	0.12
P-15181	0.07
P-15183	0.07
P-15187	0.06
P-15189	0.07
P-15191	0.07
P-15195	0.01
P-15199	0.01
P-15203	0.01
P-15204	0.05
P-15205	0.01
P-15209	0.01
P-15213	0.01
P-15215	0
P-15217	0.01
P-15219	0
P-15225	0.01
P-15227	0.01
P-15229	0.01
P-1523	0.03
P-15239	0.01
P-1524	0.01
P-15241	0.02
P-15245	0.04
P-15247	0.11
P-15249	0.01
P-1525	0.06
P-15251	0.02
P-15253	0.05
P-15255	0.05

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-15086	0
P-15087	0.18
P-15088	0
P-15089	0.09
P-15090	0
P-15091	0.42
P-15092	0
P-15093	0.97
P-15094	0
P-15095	1.31
P-15096	0
P-15097	0.08
P-15098	0
P-15099	0.04
P-15101	0.02
P-15103	0.04
P-15105	0.05
P-15107	0.09
P-15111	0.03
P-15113	0.04
P-15115 (1)	0.01
P-15115 (2)	0.05
P-15117	0.19
P-15121	0.08
P-15123 (1)	0
P-15123 (2)	0.12
P-15127 (1)	0.01
P-15127 (2)	0.06
P-15129	0.48
P-15131	0.06
P-15133	0.44
P-15135	0.18
P-15139	0.03
P-15141	0.05
P-15149	0.14
P-15153	0.11
P-15155	0.08
P-15161	0.06
P-15163	0.1
P-15169	0.13
P-15173	0.17
P-15179	0.19
P-15181	0.03
P-15183	0.02
P-15187	0.02
P-15189	0.07
P-15191	0.08
P-15195	0.02
P-15199	0.01
P-15203	0.01
P-15204	0.09
P-15205	0.02
P-15209	0.02
P-15213	0.02
P-15215	0.01
P-15217	0.02
P-15219	0.01
P-15225	0.04
P-15227	0.02
P-15229	0.02
P-1523	0.1
P-15239	0.06
P-1524	0.04
P-15241	0.04
P-15245	0.04
P-15247	0.07
P-15249	0.03
P-1525	0.04
P-15251	0.04
P-15253	0.03
P-15255	0.03

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-15086	0
P-15087	0.13
P-15088	0
P-15089	0.21
P-15090	0
P-15091	0.41
P-15092	0
P-15093	0.44
P-15094	0
P-15095	0.63
P-15096	0
P-15097	0.25
P-15098	0
P-15099	0.08
P-15101	0.06
P-15103	0.13
P-15105	0.14
P-15107	0.17
P-15111	0.1
P-15113	0.08
P-15115 (1)	0.01
P-15115 (2)	0.09
P-15117	0.45
P-15121	0.08
P-15123 (1)	0
P-15123 (2)	0.11
P-15127 (1)	0.01
P-15127 (2)	0.07
P-15129	0.68
P-15131	0.13
P-15133	0.56
P-15135	0.11
P-15139	0.08
P-15141	0.04
P-15149	0.1
P-15153	0.01
P-15155	0.06
P-15161	0.13
P-15163	0.21
P-15169	0.13
P-15173	0.15
P-15179	0.18
P-15181	0.03
P-15183	0.03
P-15187	0.02
P-15189	0.07
P-15191	0.07
P-15195	0.03
P-15199	0.01
P-15203	0.01
P-15204	0.1
P-15205	0.02
P-15209	0.02
P-15213	0.02
P-15215	0.01
P-15217	0.01
P-15219	0.02
P-15225	0.1
P-15227	0.08
P-15229	0.07
P-1523	0.05
P-15239	0.08
P-1524	0.02
P-15241	0.04
P-15245	0.03
P-15247	0.12
P-15249	0.08
P-1525	0.03
P-15251	0.08
P-15253	0.12
P-15255	0.13

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**
P-15259	0.02	P-15259	0.1	P-15259	0.16
P-15265	0.04	P-15265	0.06	P-15265	0.02
P-15267	0.03	P-15267	0.06	P-15267	0.1
P-15269	0.06	P-15269	0.12	P-15269	0.33
P-1527	0.02	P-1527	0.05	P-1527	0.07
P-15271	0.05	P-15271	0.11	P-15271	0.35
P-15275	0.02	P-15275	0.03	P-15275	0.09
P-15279	0.01	P-15279	0.03	P-15279	0.07
P-15281	0.04	P-15281	0.05	P-15281	0.13
P-15283	0.03	P-15283	0.04	P-15283	0.11
P-15285(1)	0.03	P-15285(1)	0.03	P-15285(1)	0.02
P-15285(2)	0.03	P-15285(2)	0.03	P-15285(2)	0.02
P-15287	0.01	P-15287	0.02	P-15287	0.03
P-15289	0.03	P-15289	0.03	P-15289	0.08
P-15293	0.01	P-15293	0.02	P-15293	0.03
P-15299 (1)	0.01	P-15299 (1)	0.02	P-15299 (1)	0.03
P-15299 (2)	0.11	P-15299 (2)	0.09	P-15299 (2)	0.22
P-1530	0.12	P-1530	0.07	P-1530	0.17
P-15301	0.05	P-15301	0.05	P-15301	0.14
P-15303	0.06	P-15303	0.05	P-15303	0.15
P-15305	0.09	P-15305	0.08	P-15305	0.21
P-15307	0.1	P-15307	0.1	P-15307	0.28
P-15311	0.01	P-15311	0.06	P-15311	0.03
P-15313	0.01	P-15313	0.02	P-15313	0.05
P-15317	0.82	P-15317	0.53	P-15317	1.38
P-15321	0.17	P-15321	0.09	P-15321	0.16
P-15322	3.43	P-15322	3.17	P-15322	6.94
P-15323	0.15	P-15323	0.1	P-15323	0.2
P-15325	0.72	P-15325	0.53	P-15325	1.43
P-15327	0.4	P-15327	0.35	P-15327	1.07
P-15329	0.09	P-15329	0.08	P-15329	0.19
P-15333	0.12	P-15333	0.11	P-15333	0.26
P-15335	0.21	P-15335	0.15	P-15335	0.32
P-15337	0.08	P-15337	0.05	P-15337	0.09
P-15339	0.16	P-15339	0.08	P-15339	0.16
P-15341	0.01	P-15341	0.02	P-15341	0.02
P-15343	0.43	P-15343	0.27	P-15343	0.32
P-15345	0.04	P-15345	0.05	P-15345	0.03
P-15347	0.04	P-15347	0.03	P-15347	0.02
P-15349	0.01	P-15349	0.02	P-15349	0.01
P-1535	0.1	P-1535	0.24	P-1535	0.22
P-15351	0	P-15351	0.01	P-15351	0.01
P-15357	6.75	P-15357	24.9	P-15357	11.46
P-15359	6.75	P-15359	22.15	P-15359	11.46
P-1536	0.12	P-1536	0.28	P-1536	0.25
P-15365	0	P-15365	2.75	P-15365	0
P-15367	0	P-15367	2.75	P-15367	0
P-15369	0	P-15369	1.99	P-15369	1.65
P-15371	0	P-15371	1.99	P-15371	1.65
P-15373	0	P-15373	1.9	P-15373	1.35
P-15375	0	P-15375	1.9	P-15375	1.35
P-15377	4.82	P-15377	14.43	P-15377	16.41
P-15378	0	P-15378	0	P-15378	0
P-15379 (1)	0	P-15379 (1)	0.01	P-15379 (1)	0.01
P-15379 (2)	0.01	P-15379 (2)	1.67	P-15379 (2)	1.34
P-15380	4.81	P-15380	14.42	P-15380	16.4
P-15383	0	P-15383	1.25	P-15383	1.15
P-15385	0	P-15385	1.25	P-15385	1.15
P-15387	0	P-15387	3.93	P-15387	3.49
P-15389	0	P-15389	3.93	P-15389	3.49
P-15390	0.03	P-15390	0.03	P-15390	0.03
P-15391	0.75	P-15391	(N/A)	P-15391	(N/A)
P-15393	0.75	P-15393	(N/A)	P-15393	(N/A)
P-15399	0.1	P-15399	0.59	P-15399	0.58
P-15401	0.1	P-15401	0.59	P-15401	0.58
P-15405	0	P-15405	0.05	P-15405	0.04
P-15407	0	P-15407	0.05	P-15407	0.04
P-15409	0.81	P-15409	1.02	P-15409	0.99
P-15411	0.81	P-15411	1.02	P-15411	0.99
P-15413	0	P-15413	1.05	P-15413	1.35
P-15415	0	P-15415	1.05	P-15415	1.35

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-15417	1.01	P-15417	1.56	P-15417	1.88
P-15418	0.95	P-15418	1.54	P-15418	1.7
P-15419	0.01	P-15419	0.01	P-15419	0.01
P-15421	0.01	P-15421	0.03	P-15421	0.04
P-15423	0.01	P-15423	0.03	P-15423	0.05
P-15425	0.04	P-15425	0.05	P-15425	0.12
P-15426	0.15	P-15426	0.59	P-15426	0.48
P-15427	0.03	P-15427	0.05	P-15427	0.11
P-15428	0.15	P-15428	0.59	P-15428	0.48
P-15429 (1)	0.96	P-15429 (1)	0.87	P-15429 (1)	1.28
P-15429 (2)	0.02	P-15429 (2)	0.03	P-15429 (2)	0.04
P-15431	0.02	P-15431	0.03	P-15431	0.07
P-15435	0.04	P-15435	0.06	P-15435	0.17
P-15437	0.02	P-15437	0.03	P-15437	0.05
P-15439	0.03	P-15439	0.02	P-15439	0.06
P-15443	0.04	P-15443	0.05	P-15443	0.14
P-15445	0	P-15445	0	P-15445	0
P-15447	0.01	P-15447	0.01	P-15447	0.01
P-15451	0.02	P-15451	0.02	P-15451	0.03
P-15453	0.01	P-15453	0.01	P-15453	0.01
P-15454	0.36	P-15454	0.19	P-15454	0.18
P-15455	0.01	P-15455	0.01	P-15455	0.02
P-15457	0.01	P-15457	0.02	P-15457	0.02
P-15458	0.02	P-15458	0.03	P-15458	0.02
P-15459 (1)	0.08	P-15459 (1)	0.02	P-15459 (1)	0.06
P-15459 (2)	0.01	P-15459 (2)	0.02	P-15459 (2)	0.02
P-1546	0.07	P-1546	0.18	P-1546	0.12
P-15461	0.01	P-15461	0.01	P-15461	0.01
P-15463	0	P-15463	0	P-15463	0
P-15467	0.07	P-15467	0.07	P-15467	0.13
P-15469	0.11	P-15469	0.03	P-15469	0.13
P-1547	0.01	P-1547	0.04	P-1547	0.04
P-15471	0.07	P-15471	0.06	P-15471	0.12
P-15475	0.13	P-15475	0.17	P-15475	0.03
P-15477 (1)	0.04	P-15477 (1)	0.03	P-15477 (1)	0.05
P-15477 (2)	0.09	P-15477 (2)	0.07	P-15477 (2)	0.07
P-15478	0.03	P-15478	0.02	P-15478	0.03
P-15479	0.06	P-15479	0.02	P-15479	0.02
P-15480	0.24	P-15480	0.43	P-15480	0.6
P-15481 (1)	0.17	P-15481 (1)	0.05	P-15481 (1)	0.12
P-15481 (2)	0.13	P-15481 (2)	0.11	P-15481 (2)	0.09
P-15485	0.01	P-15485	0.01	P-15485	0.01
P-15487	0.04	P-15487	0.03	P-15487	0.04
P-15489	0.11	P-15489	0.08	P-15489	0.09
P-1549	0.05	P-1549	0.13	P-1549	0.1
P-15490	0.04	P-15490	0.06	P-15490	0.06
P-15491	0.06	P-15491	0.04	P-15491	0.05
P-15493	0.21	P-15493	0.26	P-15493	0.3
P-15494	0.01	P-15494	0.01	P-15494	0.01
P-15495	0.21	P-15495	0.18	P-15495	0.22
P-15498	0	P-15498	0	P-15498	0
P-15499	0.08	P-15499	0.25	P-15499	0.34
P-1550 (1)	0.07	P-1550 (1)	0.15	P-1550 (1)	0.07
P-1550 (2)	0	P-1550 (2)	0.01	P-1550 (2)	0.01
P-15501	0.03	P-15501	0.05	P-15501	0.13
P-15503	0.02	P-15503	0.03	P-15503	0.07
P-15507	0.01	P-15507	0.02	P-15507	0.04
P-15509	0	P-15509	0.04	P-15509	0.03
P-15511	0.02	P-15511	0.03	P-15511	0.05
P-15513	0.03	P-15513	0.04	P-15513	0.01
P-15515	0	P-15515	0.03	P-15515	0.02
P-15517	0.68	P-15517	0.24	P-15517	0.19
P-15519	0.16	P-15519	0.04	P-15519	0.03
P-15523	1.97	P-15523	0.49	P-15523	0.39
P-15525 (1)	0	P-15525 (1)	0	P-15525 (1)	0
P-15525 (2)	1.42	P-15525 (2)	1.35	P-15525 (2)	1.27
P-15526	0.02	P-15526	0.05	P-15526	0.06
P-15527 (1)	0.01	P-15527 (1)	0.01	P-15527 (1)	0.01
P-15527 (2)	1.27	P-15527 (2)	1.24	P-15527 (2)	1.15
P-15528	0.03	P-15528	0.07	P-15528	0.09
P-15531	0.11	P-15531	0.09	P-15531	0.09

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-15533	0.15	P-15533	0.08	P-15533	0.12
P-15535	0.02	P-15535	0.04	P-15535	0.05
P-15537	0.11	P-15537	0.19	P-15537	0.44
P-15539	0.02	P-15539	0.19	P-15539	0.51
P-15541	0.2	P-15541	0.12	P-15541	0.06
P-15549 (1)	0.6	P-15549 (1)	0.26	P-15549 (1)	0.4
P-15549 (2)	0.18	P-15549 (2)	0.08	P-15549 (2)	0.06
P-1555	0.26	P-1555	0.35	P-1555	0.21
P-15551(1)	0.2	P-15551(1)	0.03	P-15551(1)	0.05
P-15551(2)	0.2	P-15551(2)	0.03	P-15551(2)	0.05
P-15555	0.19	P-15555	0.04	P-15555	0.14
P-15557	0.15	P-15557	0.07	P-15557	0.04
P-15559	0.13	P-15559	0.07	P-15559	0.04
P-1556(1)	0	P-1556(1)	0	P-1556(1)	0
P-1556(2)	0	P-1556(2)	0	P-1556(2)	0
P-15561	0.34	P-15561	0.08	P-15561	0.28
P-15563	0.16	P-15563	0.02	P-15563	0.04
P-15565	0.55	P-15565	0.13	P-15565	0.24
P-15567	0.24	P-15567	0.07	P-15567	0.05
P-15569	0.91	P-15569	0.22	P-15569	0.47
P-15573	0.05	P-15573	0.06	P-15573	0.06
P-15575	0.05	P-15575	0.06	P-15575	0.06
P-15577	0.1	P-15577	0.05	P-15577	0.06
P-15583	0.01	P-15583	0.32	P-15583	0.7
P-15585	0.19	P-15585	0.12	P-15585	0.05
P-15587	0.17	P-15587	0.05	P-15587	0.04
P-15589	0.01	P-15589	0.23	P-15589	0.57
P-15591	0.03	P-15591	0.29	P-15591	0.7
P-15593	0.36	P-15593	0.33	P-15593	0.19
P-15595	0.4	P-15595	0.07	P-15595	0.04
P-15597	0.04	P-15597	0.02	P-15597	0.02
P-15599	0.1	P-15599	0.1	P-15599	0.1
P-156	0.02	P-156	0.03	P-156	0.08
P-15601	0.87	P-15601	0.44	P-15601	0.48
P-15605	0.09	P-15605	0.1	P-15605	0.05
P-15607	0.26	P-15607	0.12	P-15607	0.11
P-15609	0.17	P-15609	0.53	P-15609	0.54
P-15611	0.35	P-15611	0.55	P-15611	0.67
P-15612	0.13	P-15612	0.1	P-15612	0.08
P-15613 (1)	0.04	P-15613 (1)	0.01	P-15613 (1)	0.01
P-15613 (2)	0.02	P-15613 (2)	0.06	P-15613 (2)	0.07
P-15614	0	P-15614	0	P-15614	0
P-15615	0.03	P-15615	0.05	P-15615	0.04
P-15617	0.02	P-15617	0.05	P-15617	0.05
P-15618	0.07	P-15618	0.02	P-15618	0.02
P-15619 (1)	0.01	P-15619 (1)	0.01	P-15619 (1)	0.01
P-15619 (2)	0.03	P-15619 (2)	0.04	P-15619 (2)	0.04
P-15621	0	P-15621	0.04	P-15621	0.01
P-15623	0.05	P-15623	0.07	P-15623	0.02
P-15625 (1)	0.06	P-15625 (1)	0.11	P-15625 (1)	0.11
P-15625 (2)	0.03	P-15625 (2)	0.02	P-15625 (2)	0.03
P-15629	0.11	P-15629	0.15	P-15629	0.23
P-15631	0.17	P-15631	0.25	P-15631	0.5
P-15633	0.13	P-15633	0.04	P-15633	0.05
P-15634	0.01	P-15634	0.01	P-15634	0.01
P-15635	0	P-15635	0	P-15635	0
P-15636	0	P-15636	0	P-15636	0
P-15637	0.55	P-15637	0.24	P-15637	0.35
P-15639 (1)	0.01	P-15639 (1)	0.01	P-15639 (1)	0.01
P-15639 (2)	0.19	P-15639 (2)	0.08	P-15639 (2)	0.12
P-15640	0.01	P-15640	0.01	P-15640	0.01
P-15641	0.47	P-15641	0.18	P-15641	0.26
P-15643	0.84	P-15643	0.33	P-15643	0.48
P-15645	0.22	P-15645	0.16	P-15645	0.17
P-15647	0.17	P-15647	0.13	P-15647	0.13
P-15649 (1)	0.15	P-15649 (1)	0.09	P-15649 (1)	0.3
P-15649 (2)	0.08	P-15649 (2)	0.08	P-15649 (2)	0.08
P-15651	0.04	P-15651	0.05	P-15651	0.05
P-15653	0.27	P-15653	0.14	P-15653	0.15
P-15655	0.23	P-15655	0.13	P-15655	0.14
P-15657 (1)	0	P-15657 (1)	0	P-15657 (1)	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-15657 (2)	0.04	P-15657 (2)	0.01	P-15657 (2)	0.01
P-15659 (1)	0.08	P-15659 (1)	0.09	P-15659 (1)	0.1
P-15659 (2)	0	P-15659 (2)	0	P-15659 (2)	0
P-15661	0.03	P-15661	0.12	P-15661	0.06
P-15662	0.01	P-15662	0.01	P-15662	0.01
P-15663 (1)	0.15	P-15663 (1)	0.15	P-15663 (1)	0.2
P-15663 (2)	0.02	P-15663 (2)	0.13	P-15663 (2)	0.15
P-15667	0.05	P-15667	0.22	P-15667	0.23
P-15668	0	P-15668	0	P-15668	0
P-15669(1)	0.09	P-15669(1)	0.21	P-15669(1)	0.07
P-15669(2)	0.09	P-15669(2)	0.21	P-15669(2)	0.07
P-15671(1)(1)	0.13	P-15671(1)(1)	0.36	P-15671(1)(1)	0.14
P-15671(1)(2)	0.13	P-15671(1)(2)	0.36	P-15671(1)(2)	0.14
P-15671(2)	0.13	P-15671(2)	0.36	P-15671(2)	0.15
P-15673	0.29	P-15673	0.09	P-15673	0.14
P-15675	0.04	P-15675	0.04	P-15675	0.03
P-15676	0.26	P-15676	0.09	P-15676	0.12
P-15677 (1)	0.24	P-15677 (1)	0.09	P-15677 (1)	0.1
P-15677 (2)	0.05	P-15677 (2)	0.1	P-15677 (2)	0.1
P-15679 (1)	0.23	P-15679 (1)	0.08	P-15679 (1)	0.09
P-15679 (2)	0.08	P-15679 (2)	0.05	P-15679 (2)	0.05
P-1568	0.1	P-1568	0.07	P-1568	0.03
P-15684	0.41	P-15684	0.12	P-15684	0.21
P-15685	0.01	P-15685	0.03	P-15685	0.03
P-15687	0.01	P-15687	0.01	P-15687	0.01
P-15689	0.01	P-15689	0.01	P-15689	0.01
P-15693	0.27	P-15693	0.16	P-15693	0.15
P-15695	0.27	P-15695	0.16	P-15695	0.15
P-15697	0.01	P-15697	0.01	P-15697	0.01
P-15699 (1)	0.01	P-15699 (1)	0.01	P-15699 (1)	0.01
P-15699 (2)	0.05	P-15699 (2)	0.04	P-15699 (2)	0.04
P-15701	0.36	P-15701	0.72	P-15701	0.92
P-15702	0	P-15702	0	P-15702	0
P-15703	0.3	P-15703	0.8	P-15703	0.98
P-15705	0.07	P-15705	0.05	P-15705	0.02
P-15707	0.02	P-15707	0.03	P-15707	0.08
P-15709 (1)	0.17	P-15709 (1)	0.04	P-15709 (1)	0.15
P-15709 (2)	0.08	P-15709 (2)	0.17	P-15709 (2)	0.2
P-1571	0	P-1571	0.01	P-1571	0.01
P-15711 (1)	0.13	P-15711 (1)	0.03	P-15711 (1)	0.12
P-15711 (2)	0.06	P-15711 (2)	0.12	P-15711 (2)	0.13
P-15712	0.03	P-15712	0.01	P-15712	0.02
P-15713(1) (1)	0.32	P-15713(1) (1)	0.57	P-15713(1) (1)	0.78
P-15713(1) (2)	0.1	P-15713(1) (2)	0.03	P-15713(1) (2)	0.09
P-15713(2) (1)	0.37	P-15713(2) (1)	0.9	P-15713(2) (1)	1.21
P-15713(2) (2)	0.36	P-15713(2) (2)	0.09	P-15713(2) (2)	0.21
P-15715 (1)	0.44	P-15715 (1)	0.12	P-15715 (1)	0.25
P-15715 (2)	0.35	P-15715 (2)	0.95	P-15715 (2)	1.27
P-15717	0.02	P-15717	0.14	P-15717	0.06
P-15719 (1)	0.37	P-15719 (1)	0.1	P-15719 (1)	0.2
P-15719 (2)	0.09	P-15719 (2)	0.56	P-15719 (2)	0.34
P-15720	0.45	P-15720	0.13	P-15720	0.24
P-15721 (1)	0.85	P-15721 (1)	0.25	P-15721 (1)	0.46
P-15721 (2)	0.04	P-15721 (2)	0.05	P-15721 (2)	0.04
P-15723	0.11	P-15723	0.47	P-15723	0.44
P-15724	0.14	P-15724	0.04	P-15724	0.09
P-15725	0.02	P-15725	0.01	P-15725	0.01
P-15727	0.01	P-15727	0.02	P-15727	0.02
P-1573	0.14	P-1573	0.06	P-1573	0.19
P-15731	0.01	P-15731	0.01	P-15731	0.01
P-15733	0.29	P-15733	0.2	P-15733	0.17
P-15735	0.13	P-15735	0.09	P-15735	0.08
P-15736	0.17	P-15736	0.03	P-15736	0.12
P-15737	0.16	P-15737	0.11	P-15737	0.1
P-15738	0.01	P-15738	0.01	P-15738	0.01
P-15739	0	P-15739	0	P-15739	0
P-15741	0	P-15741	0	P-15741	0
P-15743	0.04	P-15743	0.06	P-15743	0.04
P-15744	0.06	P-15744	0.02	P-15744	0.02
P-15745	0.04	P-15745	0.06	P-15745	0.05
P-15747	0.08	P-15747	0.12	P-15747	0.09

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-15749(1)	0.04	P-15749(1)	0.07	P-15749(1)	0.15
P-15749(2)	0.04	P-15749(2)	0.07	P-15749(2)	0.15
P-1575	0.02	P-1575	0.01	P-1575	0.01
P-15750	0.09	P-15750	0.05	P-15750	0.04
P-15755	0.21	P-15755	0.29	P-15755	0.26
P-15757	0.06	P-15757	0.07	P-15757	0.13
P-15759	0.04	P-15759	0.09	P-15759	0.14
P-15761	0.09	P-15761	0.06	P-15761	0.12
P-15763	0.07	P-15763	0.08	P-15763	0.14
P-15765	0	P-15765	0	P-15765	0
P-15767	0.31	P-15767	0.47	P-15767	0.58
P-15768	0.01	P-15768	0.01	P-15768	0.02
P-15769	0.03	P-15769	0.31	P-15769	0.11
P-15772	0	P-15772	0.01	P-15772	0.01
P-15773 (1)	0.02	P-15773 (1)	0.03	P-15773 (1)	0.03
P-15773 (2)	0.05	P-15773 (2)	0.05	P-15773 (2)	0.17
P-15775	0.09	P-15775	0.02	P-15775	0.13
P-15777	0.12	P-15777	0.19	P-15777	0.04
P-15779	0.17	P-15779	0.23	P-15779	0.03
P-15781 (1)	0.01	P-15781 (1)	0.01	P-15781 (1)	0.01
P-15781 (2)	0.01	P-15781 (2)	0.03	P-15781 (2)	0.03
P-15783	0.01	P-15783	0.02	P-15783	0.02
P-15785	0.04	P-15785	0.03	P-15785	0.06
P-15787	0.03	P-15787	0.03	P-15787	0.02
P-15788	0	P-15788	0	P-15788	0
P-15789	0.35	P-15789	0.06	P-15789	0.12
P-15791	0.18	P-15791	0.08	P-15791	0.15
P-15793	0.2	P-15793	0.06	P-15793	0.05
P-15795	0.02	P-15795	0.04	P-15795	0.05
P-15796	0.03	P-15796	0.06	P-15796	0.06
P-15797	0.02	P-15797	0.05	P-15797	0.04
P-15799(1)	0.06	P-15799(1)	0.04	P-15799(1)	0.03
P-15799(2)	0.05	P-15799(2)	0.04	P-15799(2)	0.03
P-15801	0.24	P-15801	0.1	P-15801	0.16
P-15803	0.2	P-15803	0.08	P-15803	0.13
P-15805(1)	0.22	P-15805(1)	0.05	P-15805(1)	0.12
P-15805(2)	0.22	P-15805(2)	0.05	P-15805(2)	0.12
P-15806	0.01	P-15806	0.12	P-15806	0.06
P-15807 (1)	0	P-15807 (1)	0	P-15807 (1)	0
P-15807 (2)	0.18	P-15807 (2)	0.07	P-15807 (2)	0.14
P-15809	0.02	P-15809	0.02	P-15809	0.03
P-1581	0	P-1581	0.01	P-1581	0
P-15810	0.03	P-15810	0.15	P-15810	0.04
P-15811 (1)	0.02	P-15811 (1)	0.04	P-15811 (1)	0.03
P-15811 (2)	0.05	P-15811 (2)	0.04	P-15811 (2)	0.05
P-15813	0.02	P-15813	0.04	P-15813	0.05
P-15814	0.01	P-15814	0.02	P-15814	0.02
P-15815 (1)	0.01	P-15815 (1)	0.01	P-15815 (1)	0.01
P-15815 (2)	0.03	P-15815 (2)	0.06	P-15815 (2)	0.07
P-15816	0	P-15816	0.01	P-15816	0.01
P-15817 (1)	0.02	P-15817 (1)	0.03	P-15817 (1)	0.03
P-15817 (2)	0.06	P-15817 (2)	0.14	P-15817 (2)	0.16
P-15819 (1)	0.05	P-15819 (1)	0.39	P-15819 (1)	0.2
P-15819 (2)	0.02	P-15819 (2)	0.04	P-15819 (2)	0.04
P-1582	0.08	P-1582	0.03	P-1582	0.03
P-15820	0.13	P-15820	1.29	P-15820	0.62
P-15821 (1)	0.13	P-15821 (1)	0.44	P-15821 (1)	0.22
P-15821 (2)	0.02	P-15821 (2)	0.04	P-15821 (2)	0.05
P-15823	0.04	P-15823	0.08	P-15823	0.08
P-15825	0.01	P-15825	0.01	P-15825	0.01
P-15827	0.03	P-15827	0.14	P-15827	0.15
P-15829	0.01	P-15829	0.01	P-15829	0.01
P-1583 (1)	0	P-1583 (1)	0.01	P-1583 (1)	0.01
P-1583 (2)	0.03	P-1583 (2)	0.24	P-1583 (2)	0.22
P-15831	0.18	P-15831	0.31	P-15831	0.36
P-15833	0.01	P-15833	0.05	P-15833	0.05
P-15834	0	P-15834	0	P-15834	0
P-15835(1)	0.32	P-15835(1)	0.32	P-15835(1)	0.42
P-15835(2)	0.32	P-15835(2)	0.32	P-15835(2)	0.42
P-15837	0.1	P-15837	0.07	P-15837	0.05
P-15839	0.12	P-15839	0.08	P-15839	0.05

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-15840	0	P-15840	0.01	P-15840	0.01
P-15841 (1)	0	P-15841 (1)	0.01	P-15841 (1)	0.01
P-15841 (2)	0.02	P-15841 (2)	0.05	P-15841 (2)	0.08
P-15842	0	P-15842	0.01	P-15842	0.01
P-15843 (1)	0	P-15843 (1)	0.01	P-15843 (1)	0.01
P-15843 (2)	0.04	P-15843 (2)	0.06	P-15843 (2)	0.09
P-15844	0	P-15844	0.01	P-15844	0.01
P-15845 (1)	0	P-15845 (1)	0.01	P-15845 (1)	0.01
P-15845 (2)	0.03	P-15845 (2)	0.02	P-15845 (2)	0.02
P-15846(1)	0.01	P-15846(1)	0.01	P-15846(1)	0.01
P-15846(2)	0.27	P-15846(2)	0.1	P-15846(2)	0.19
P-15847 (1)	0.21	P-15847 (1)	0.19	P-15847 (1)	0.18
P-15847 (2)	0.04	P-15847 (2)	0.03	P-15847 (2)	0.04
P-15848	0.19	P-15848	0.1	P-15848	0.13
P-15849	0.09	P-15849	0.07	P-15849	0.08
P-15851(1)	0.09	P-15851(1)	0.18	P-15851(1)	0.22
P-15851(2)	0.09	P-15851(2)	0.18	P-15851(2)	0.22
P-15852	0.01	P-15852	0.02	P-15852	0.15
P-15853	0.58	P-15853	1.15	P-15853	0.95
P-15855	0.22	P-15855	0.43	P-15855	0.34
P-15857	0.15	P-15857	0.26	P-15857	0.21
P-15859(1)	0.21	P-15859(1)	0.47	P-15859(1)	0.4
P-15859(2)	0.3	P-15859(2)	0.63	P-15859(2)	0.53
P-15861	0	P-15861	0	P-15861	0
P-15863	0.27	P-15863	0.21	P-15863	0.31
P-15865	0.12	P-15865	0.1	P-15865	0.14
P-15867	0.39	P-15867	0.3	P-15867	0.45
P-15869	0.16	P-15869	0.08	P-15869	0.02
P-15871 (1)	0	P-15871 (1)	0.01	P-15871 (1)	0.01
P-15871 (2)	0.26	P-15871 (2)	0.11	P-15871 (2)	0.03
P-15873	0	P-15873	0	P-15873	0
P-15874	0.29	P-15874	0.25	P-15874	0.25
P-15875 (1)	0.28	P-15875 (1)	0.27	P-15875 (1)	0.26
P-15875 (2)	0.11	P-15875 (2)	0.04	P-15875 (2)	0.01
P-15877	0.22	P-15877	0.14	P-15877	0.09
P-15878	0.06	P-15878	0.08	P-15878	0.07
P-15879 (1)	0.04	P-15879 (1)	0.06	P-15879 (1)	0.05
P-15879 (2)	0.11	P-15879 (2)	0.04	P-15879 (2)	0.14
P-1588	0.05	P-1588	0.03	P-1588	0.04
P-15880	0.04	P-15880	0.03	P-15880	0.04
P-15881 (1)	0.05	P-15881 (1)	0.06	P-15881 (1)	0.05
P-15881 (2)	0.12	P-15881 (2)	0.19	P-15881 (2)	0.3
P-15885	0.21	P-15885	1.78	P-15885	1.66
P-15887	0.09	P-15887	4.98	P-15887	4.16
P-15889	0	P-15889	0.01	P-15889	0.01
P-15889(1)	0.3	P-15889(1)	0.69	P-15889(1)	0.55
P-15889(2)	0.3	P-15889(2)	0.85	P-15889(2)	0.54
P-15891	0.27	P-15891	2.34	P-15891	2.5
P-15893 (1)	1.51	P-15893 (1)	0.82	P-15893 (1)	1.05
P-15893 (2)	0.04	P-15893 (2)	0.02	P-15893 (2)	0.04
P-15895(1)	0.02	P-15895(1)	0.02	P-15895(1)	0.02
P-15895(2)	0.02	P-15895(2)	0.02	P-15895(2)	0.02
P-15897 (1)	0.05	P-15897 (1)	0.02	P-15897 (1)	0.02
P-15897 (2)	0.01	P-15897 (2)	0.01	P-15897 (2)	0.01
P-15898	0.01	P-15898	0.01	P-15898	0.01
P-15901 (1)	1.14	P-15901 (1)	0.55	P-15901 (1)	0.75
P-15901 (2)	0.29	P-15901 (2)	0.17	P-15901 (2)	0.14
P-15903 (1)	0.53	P-15903 (1)	0.28	P-15903 (1)	0.36
P-15903 (2)	0.32	P-15903 (2)	0.07	P-15903 (2)	0.05
P-15905	0.2	P-15905	0.16	P-15905	0.16
P-15906	0.2	P-15906	0.11	P-15906	0.14
P-15907	0.17	P-15907	0.06	P-15907	0.08
P-15909	0.08	P-15909	0.1	P-15909	0.22
P-15912	0.34	P-15912	0.19	P-15912	0.24
P-15913(1)	0.13	P-15913(1)	0.09	P-15913(1)	0.1
P-15913(2)	0.14	P-15913(2)	0.06	P-15913(2)	0.05
P-15917	0.04	P-15917	0.05	P-15917	0.1
P-15919	0.01	P-15919	0.01	P-15919	0.01
P-15921(1)	0.27	P-15921(1)	0.06	P-15921(1)	0.11
P-15921(2)	0.26	P-15921(2)	0.1	P-15921(2)	0.16
P-15925	0.26	P-15925	0.12	P-15925	0.15

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-15927	0.15	P-15927	0.19	P-15927	0.21
P-15928	0.08	P-15928	0.16	P-15928	0.18
P-15929	0.97	P-15929	0.82	P-15929	0.94
P-15933	0.04	P-15933	1.68	P-15933	0.93
P-15935	0.03	P-15935	0.68	P-15935	0.41
P-15937	0.88	P-15937	0.57	P-15937	1.01
P-15939	0.93	P-15939	1.57	P-15939	1.52
P-1594	0.16	P-1594	0.05	P-1594	0.16
P-15943 (1)	0.01	P-15943 (1)	0.03	P-15943 (1)	0.04
P-15943 (2)	0.01	P-15943 (2)	0.02	P-15943 (2)	0.03
P-15945(1)	0	P-15945(1)	0	P-15945(1)	0
P-15945(2)	0	P-15945(2)	0	P-15945(2)	0
P-15947	0.5	P-15947	0.71	P-15947	0.79
P-15948	0.01	P-15948	0.02	P-15948	0.03
P-15949	0.01	P-15949	0.03	P-15949	0.2
P-15950	0	P-15950	0.01	P-15950	0.01
P-15951	0	P-15951	0	P-15951	0
P-15953 (1)	0.01	P-15953 (1)	0.01	P-15953 (1)	0.02
P-15953 (2)	0	P-15953 (2)	0.05	P-15953 (2)	0.36
P-15955 (1)	0	P-15955 (1)	0.01	P-15955 (1)	0.01
P-15955 (2)	0.01	P-15955 (2)	0.03	P-15955 (2)	0.16
P-15956	0.04	P-15956	0.07	P-15956	0.07
P-15957	0	P-15957	0	P-15957	0
P-15959	0.01	P-15959	0.02	P-15959	0.12
P-15961	0.01	P-15961	0.02	P-15961	0.12
P-15963 (1)	0	P-15963 (1)	0.01	P-15963 (1)	0.01
P-15963 (2)	0	P-15963 (2)	0	P-15963 (2)	0
P-15965	0.25	P-15965	0.13	P-15965	0.13
P-15967 (1)	0.03	P-15967 (1)	0.06	P-15967 (1)	0.07
P-15967 (2)	0.21	P-15967 (2)	0.1	P-15967 (2)	0.09
P-15969	0.01	P-15969	0.01	P-15969	0.01
P-15971	0.03	P-15971	0	P-15971	0.01
P-15973	0.01	P-15973	0.01	P-15973	0.01
P-15975 (1)	0.03	P-15975 (1)	0.05	P-15975 (1)	0.05
P-15975 (2)	0.02	P-15975 (2)	0.01	P-15975 (2)	0.01
P-15977	0.01	P-15977	0.02	P-15977	0.02
P-15978	0.48	P-15978	0.24	P-15978	0.36
P-15979	0	P-15979	0	P-15979	0
P-1598	0.01	P-1598	0.01	P-1598	0.01
P-15981 (1)	0.01	P-15981 (1)	0.02	P-15981 (1)	0.02
P-15981 (2)	0.42	P-15981 (2)	0.22	P-15981 (2)	0.3
P-15982	1.79	P-15982	0.79	P-15982	1.05
P-15983 (1)	1.42	P-15983 (1)	2.66	P-15983 (1)	4.51
P-15983 (2)	0.16	P-15983 (2)	0.05	P-15983 (2)	0.11
P-15985	0.49	P-15985	0.95	P-15985	2.87
P-15987	1.27	P-15987	0.36	P-15987	0.48
P-15989	0.03	P-15989	0.02	P-15989	0.01
P-15990	0	P-15990	0	P-15990	0
P-15991	0.01	P-15991	0	P-15991	0
P-15993	0.01	P-15993	0.02	P-15993	0.02
P-15995	0.03	P-15995	0.03	P-15995	0.01
P-15997	0.04	P-15997	0.06	P-15997	0.05
P-15999	0	P-15999	0.04	P-15999	0.04
P-1600	0.04	P-1600	0.1	P-1600	0.18
P-16003	0.17	P-16003	0.31	P-16003	0.27
P-16005 (1)	0	P-16005 (1)	0.01	P-16005 (1)	0.01
P-16005 (2)	0.31	P-16005 (2)	0.1	P-16005 (2)	0.19
P-16007	0.05	P-16007	0.05	P-16007	0.05
P-16007(1)	0.73	P-16007(1)	0.4	P-16007(1)	0.52
P-16007(2)	0.5	P-16007(2)	0.2	P-16007(2)	0.33
P-16008	0.02	P-16008	0.02	P-16008	0.02
P-16009 (1)	0.01	P-16009 (1)	0.01	P-16009 (1)	0.01
P-16009 (2)	0.23	P-16009 (2)	0.2	P-16009 (2)	0.19
P-1601 (1)	0.06	P-1601 (1)	0.12	P-1601 (1)	0.18
P-1601 (2)	0	P-1601 (2)	0	P-1601 (2)	0
P-16011	0.42	P-16011	0.3	P-16011	0.33
P-16013 (1)	1.19	P-16013 (1)	2.31	P-16013 (1)	4.07
P-16013 (2)	0.39	P-16013 (2)	0.27	P-16013 (2)	0.12
P-16015(1)	0	P-16015(1)	0	P-16015(1)	0
P-16015(2)	0.09	P-16015(2)	0.09	P-16015(2)	0.09
P-16017	0.36	P-16017	0.08	P-16017	0.3

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
P-1602(1)	0.02
P-1602(2)	0.04
P-16020(1)	0
P-16020(2)	0.14
P-16021 (1)	0.14
P-16021 (2)	0.21
P-16025	0.08
P-16026	0
P-16027	0.27
P-16029	0.02
P-16031	0.04
P-16033	0.13
P-16035	0.11
P-16037	0.05
P-16039	0.17
P-16041	0.01
P-16045 (1)	0.18
P-16045 (2)	0
P-16047	0.11
P-16049	0.55
P-16051	0.44
P-16053	0.11
P-16054	0
P-16055	0.14
P-16056	0.03
P-16059	0.91
P-16061	0.01
P-16062	0.01
P-16063	0.01
P-16065	0.01
P-16067	0.02
P-16069	0.84
P-16071	0.23
P-16073 (1)	0.06
P-16073 (2)	0.93
P-16074	0.01
P-16075	0.33
P-16076	1.66
P-16077	1.66
P-16079	0.27
P-16081(1)	0.11
P-16081(2)	0.11
P-16083	0.06
P-16085	0.12
P-16087	0.14
P-1609	0.03
P-16091	0.03
P-16093	0.01
P-16095	0.22
P-16096	0
P-16097	0.02
P-16099	0.1
P-1610	0.49
P-16101	0.12
P-16103	0.11
P-16105	0.18
P-16109	0.09
P-1611	0.05
P-16111	0.01
P-16113(1)	0.21
P-16113(2)	0.29
P-16115	0.21
P-16117	0.07
P-16119	0.01
P-16121	0.07
P-16123	0.01
P-16127	0.21
P-16129	0.06
P-16131	0.08
P-16133	0.09
P-16135	0.07

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-1602(1)	0.16
P-1602(2)	0.19
P-16020(1)	0
P-16020(2)	0.1
P-16021 (1)	0.17
P-16021 (2)	0.16
P-16025	0.05
P-16026	0
P-16027	0.12
P-16029	0.4
P-16031	0.16
P-16033	0.21
P-16035	0.12
P-16037	0.05
P-16039	0.17
P-16041	0.03
P-16045 (1)	0.27
P-16045 (2)	0
P-16047	0.07
P-16049	0.2
P-16051	0.15
P-16053	0.02
P-16054	0.01
P-16055	0.02
P-16056	0.06
P-16059	0.77
P-16061	0.08
P-16062	0.01
P-16063	0.08
P-16065	0.26
P-16067	0.27
P-16069	0.38
P-16071	0.15
P-16073 (1)	0.06
P-16073 (2)	1.06
P-16074	0.01
P-16075	0.85
P-16076	2.74
P-16077	2.74
P-16079	0.45
P-16081(1)	0.1
P-16081(2)	0.11
P-16083	0.04
P-16085	0.25
P-16087	0.33
P-1609	0.04
P-16091	0.02
P-16093	0.01
P-16095	0
P-16096	0
P-16097	0.04
P-16099	0.06
P-1610	0.18
P-16101	0.03
P-16103	0.01
P-16105	0.02
P-16109	0.29
P-1611	0.06
P-16111	0.02
P-16113(1)	0.24
P-16113(2)	0.35
P-16115	0.56
P-16117	0.08
P-16119	0.08
P-16121	0.01
P-16123	0.01
P-16127	0.24
P-16129	0.05
P-16131	0.11
P-16133	0.09
P-16135	0.09

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-1602(1)	0.16
P-1602(2)	0.18
P-16020(1)	0
P-16020(2)	0.05
P-16021 (1)	0.2
P-16021 (2)	0.07
P-16025	0.14
P-16026	0
P-16027	0.15
P-16029	0.23
P-16031	0.07
P-16033	0.08
P-16035	0.09
P-16037	0.04
P-16039	0.12
P-16041	0.04
P-16045 (1)	0.28
P-16045 (2)	0
P-16047	0.13
P-16049	0.72
P-16051	0.59
P-16053	0.02
P-16054	0.01
P-16055	0.02
P-16056	0.05
P-16059	0.91
P-16061	0.03
P-16062	0.01
P-16063	0.01
P-16065	0.13
P-16067	0.17
P-16069	0.57
P-16071	0.18
P-16073 (1)	0.12
P-16073 (2)	0.91
P-16074	0.01
P-16075	0.53
P-16076	0.78
P-16077	0.78
P-16079	0.55
P-16081(1)	0.21
P-16081(2)	0.22
P-16083	0.1
P-16085	0.25
P-16087	0.4
P-1609	0.07
P-16091	0.05
P-16093	0.01
P-16095	0
P-16096	0
P-16097	0.04
P-16099	0.06
P-1610	0.09
P-16101	0.03
P-16103	0.01
P-16105	0.02
P-16109	0.19
P-1611	0.05
P-16111	0.02
P-16113(1)	0.32
P-16113(2)	0.54
P-16115	0.68
P-16117	0.08
P-16119	0.06
P-16121	0.03
P-16123	0.01
P-16127	0.19
P-16129	0.04
P-16131	0.09
P-16133	0.07
P-16135	0.07

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-16137 (1)	0.13
P-16137 (2)	0.11
P-16139 (1)	0.1
P-16139 (2)	0.1
P-16140	0.15
P-16141	0.19
P-16143	0.15
P-16144	0.03
P-16147 (1)	0.02
P-16147 (2)	0.1
P-16149	0.14
P-16151	0.07
P-16153	0.31
P-16157	0.09
P-16159	0.06
P-16163	0.32
P-16165	0.19
P-16166	0.52
P-16167	0.2
P-16169	0.46
P-16171	0.47
P-16172	0.27
P-16173 (1)	2.62
P-16173 (2)	0.03
P-16174	0.16
P-16175 (1)	0.16
P-16175 (2)	0.06
P-16176	0.16
P-16177	0.16
P-16179	0.29
P-16181	0.14
P-16183	0.23
P-16185	0.19
P-16187	0.27
P-16191	0.19
P-16195	0.09
P-16197	0.08
P-16199	0.11
P-16201	0.03
P-16203	0.01
P-16205	0.1
P-16207	0.1
P-16209	0.01
P-16211	0.23
P-16213	0.26
P-16215	0.22
P-16217	0.06
P-16219	0.06
P-16221	0.06
P-16223	0.06
P-16225(1)	0.11
P-16225(2)	0.06
P-16227	0.13
P-16228	2.05
P-16229 (1)	2.05
P-16229 (2)	0.03
P-16231 (1)	2.05
P-16231 (2)	0.1
P-16232	2.05
P-16233 (1)	2.19
P-16233 (2)	0.01
P-16236	2.03
P-16237 (1)	2.19
P-16237 (2)	0.75
P-16238	2.18
P-16239 (1)	2.18
P-16239 (2)	0.66
P-1624	0.04
P-16240	2.05
P-16241	0.09
P-16243	0.02

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-16137 (1)	0.14
P-16137 (2)	0.21
P-16139 (1)	0.15
P-16139 (2)	0.22
P-16140	0.22
P-16141	0.26
P-16143	0.29
P-16144	0.04
P-16147 (1)	0.04
P-16147 (2)	0.11
P-16149	0.36
P-16151	0.22
P-16153	0.29
P-16157	0.07
P-16159	0.1
P-16163	0.1
P-16165	0.23
P-16166	0.09
P-16167	0.3
P-16169	0.2
P-16171	0.13
P-16172	0.1
P-16173 (1)	1.91
P-16173 (2)	0.05
P-16174	0.4
P-16175 (1)	0.42
P-16175 (2)	0.01
P-16176	0.42
P-16177	0.42
P-16179	0.07
P-16181	0.15
P-16183	0.18
P-16185	0.66
P-16187	0.33
P-16191	0.29
P-16195	0.07
P-16197	0.08
P-16199	0.14
P-16201	0.04
P-16203	0.06
P-16205	0.12
P-16207	0.12
P-16209	0.02
P-16211	0.06
P-16213	0
P-16215	0.03
P-16217	0.03
P-16219	0.04
P-16221	0.08
P-16223	0.08
P-16225(1)	0.05
P-16225(2)	0.12
P-16227	0.16
P-16228	1.06
P-16229 (1)	1.06
P-16229 (2)	0.09
P-16231 (1)	1.06
P-16231 (2)	0.05
P-16232	1.06
P-16233 (1)	0.94
P-16233 (2)	0.03
P-16236	0.87
P-16237 (1)	0.94
P-16237 (2)	0.38
P-16238	0.93
P-16239 (1)	0.93
P-16239 (2)	0.32
P-1624	0.04
P-16240	1.06
P-16241	0.1
P-16243	0.05

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-16137 (1)	0.12
P-16137 (2)	0.18
P-16139 (1)	0.15
P-16139 (2)	0.2
P-16140	0.22
P-16141	0.22
P-16143	0.27
P-16144	0.03
P-16147 (1)	0.03
P-16147 (2)	0.08
P-16149	0.25
P-16151	0.21
P-16153	0.51
P-16157	0.07
P-16159	0.1
P-16163	0.1
P-16165	0.24
P-16166	0.07
P-16167	0.32
P-16169	0.22
P-16171	0.14
P-16172	0.46
P-16173 (1)	0.93
P-16173 (2)	0.05
P-16174	2.73
P-16175 (1)	2.71
P-16175 (2)	0.01
P-16176	2.71
P-16177	2.71
P-16179	0.1
P-16181	0.19
P-16183	0.25
P-16185	0.86
P-16187	0.42
P-16191	0.69
P-16195	0.11
P-16197	0.19
P-16199	0.34
P-16201	0.07
P-16203	0.09
P-16205	0.3
P-16207	0.3
P-16209	0.02
P-16211	0.06
P-16213	0
P-16215	0.04
P-16217	0.02
P-16219	0.02
P-16221	0.08
P-16223	0.08
P-16225(1)	0.04
P-16225(2)	0.13
P-16227	0.18
P-16228	0.64
P-16229 (1)	0.64
P-16229 (2)	0.1
P-16231 (1)	0.63
P-16231 (2)	0.04
P-16232	0.63
P-16233 (1)	2.58
P-16233 (2)	0.03
P-16236	2.39
P-16237 (1)	2.58
P-16237 (2)	0.41
P-16238	2.58
P-16239 (1)	2.58
P-16239 (2)	0.32
P-1624	0.02
P-16240	0.64
P-16241	0.11
P-16243	0.05

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-16245	0.71	P-16245	0.48	P-16245	0.65
P-16247	0.79	P-16247	0.59	P-16247	0.8
P-1625 (1)	0.09	P-1625 (1)	0.07	P-1625 (1)	0.03
P-1625 (2)	0.03	P-1625 (2)	0.07	P-1625 (2)	0.05
P-16250	0	P-16250	0	P-16250	0
P-16251	0.05	P-16251	0.05	P-16251	0.05
P-16253	0.18	P-16253	0.05	P-16253	0.06
P-16257	0.08	P-16257	0.06	P-16257	0.06
P-16259 (1)	0.01	P-16259 (1)	0.01	P-16259 (1)	0.01
P-16259 (2)	0.06	P-16259 (2)	0.05	P-16259 (2)	0.05
P-1626	0.14	P-1626	0.1	P-1626	0.04
P-16260	0.14	P-16260	0.06	P-16260	0.49
P-16261	0.1	P-16261	0.03	P-16261	0.03
P-16263 (1)	0.04	P-16263 (1)	0.04	P-16263 (1)	0.43
P-16263 (2)	0.08	P-16263 (2)	0.02	P-16263 (2)	0.02
P-16267	0.01	P-16267	0.01	P-16267	0.01
P-16268	0.15	P-16268	0.07	P-16268	1.12
P-16269	0.63	P-16269	0.85	P-16269	1.39
P-16270	0.15	P-16270	0.06	P-16270	0.53
P-16271	0.66	P-16271	0.85	P-16271	1.41
P-16273(1)	0.01	P-16273(1)	0.03	P-16273(1)	0.04
P-16273(2)	0.01	P-16273(2)	0.03	P-16273(2)	0.04
P-16275	0.03	P-16275	0.01	P-16275	0.03
P-16279	0.04	P-16279	0.03	P-16279	0.05
P-16281	0.07	P-16281	0.07	P-16281	0.07
P-16283	0.02	P-16283	0.07	P-16283	0.07
P-16286	0.01	P-16286	0.01	P-16286	0.01
P-16287	1	P-16287	0.5	P-16287	0.56
P-16288	0.05	P-16288	0.08	P-16288	0.17
P-16289	0.47	P-16289	0.36	P-16289	0.38
P-16291	0.25	P-16291	0.38	P-16291	0.36
P-16295	0.19	P-16295	0.1	P-16295	0.12
P-16297(1)	0.21	P-16297(1)	0.07	P-16297(1)	0.1
P-16297(2)	0.21	P-16297(2)	0.04	P-16297(2)	0.08
P-16299 (1)	1.77	P-16299 (1)	1.3	P-16299 (1)	1.4
P-16299 (2)	0.19	P-16299 (2)	0.22	P-16299 (2)	0.23
P-16301	0.91	P-16301	0.75	P-16301	0.87
P-16303	0.9	P-16303	0.5	P-16303	0.57
P-16307	0	P-16307	0	P-16307	0
P-16308	0.13	P-16308	0.25	P-16308	0.34
P-16309 (1)	0.13	P-16309 (1)	0.25	P-16309 (1)	0.34
P-16309 (2)	0.01	P-16309 (2)	0.09	P-16309 (2)	0.08
P-16310	0	P-16310	0	P-16310	0
P-16311 (1)	0	P-16311 (1)	0	P-16311 (1)	0
P-16311 (2)	0.15	P-16311 (2)	0.04	P-16311 (2)	0.03
P-16313	0.15	P-16313	0.03	P-16313	0.02
P-16315	0.2	P-16315	0.05	P-16315	0.07
P-16317	0.03	P-16317	0.07	P-16317	0.07
P-16319	0.32	P-16319	0.15	P-16319	0.14
P-1632	0.45	P-1632	0.55	P-1632	0.37
P-16321	0.05	P-16321	0.01	P-16321	0.04
P-16323	0.05	P-16323	0.01	P-16323	0.04
P-16325	0.1	P-16325	0.1	P-16325	0.1
P-16327	0.03	P-16327	0.07	P-16327	0.06
P-16329	1.13	P-16329	0.55	P-16329	0.62
P-16331	1.25	P-16331	0.58	P-16331	0.65
P-16333	0.04	P-16333	0.04	P-16333	0.05
P-16337	0.17	P-16337	0.09	P-16337	0.1
P-1634 (1)	0.03	P-1634 (1)	0.01	P-1634 (1)	0.03
P-1634 (2)	0.02	P-1634 (2)	0.02	P-1634 (2)	0.04
P-16345	0.07	P-16345	0.02	P-16345	0.03
P-16347	0.03	P-16347	0.06	P-16347	0.06
P-16349 (1)	2.13	P-16349 (1)	1.45	P-16349 (1)	1.02
P-16349 (2)	0.13	P-16349 (2)	0.18	P-16349 (2)	0.17
P-1635	0.01	P-1635	0.01	P-1635	0.02
P-16350	2.13	P-16350	1.45	P-16350	1.01
P-16351	2.13	P-16351	1.44	P-16351	1
P-16357	0.2	P-16357	0.31	P-16357	0.32
P-16359	0.2	P-16359	0.26	P-16359	0.28
P-16360	1.2	P-16360	0.96	P-16360	1.11
P-16363	0.08	P-16363	0.02	P-16363	0.03

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-16364	0	P-16364	0	P-16364	0
P-16365	0.05	P-16365	0.06	P-16365	0.06
P-16369	0.25	P-16369	0.07	P-16369	0.1
P-16371	0.34	P-16371	0.09	P-16371	0.1
P-16373(1)	0.05	P-16373(1)	0.04	P-16373(1)	0.05
P-16373(2)	0.04	P-16373(2)	0.04	P-16373(2)	0.04
P-16375	0.08	P-16375	0.03	P-16375	0.08
P-16377	0.07	P-16377	0.01	P-16377	0.01
P-16379	0.12	P-16379	0.04	P-16379	0.03
P-16383	0.6	P-16383	0.29	P-16383	0.13
P-16385	0.03	P-16385	0.02	P-16385	0.05
P-16386	0.23	P-16386	1.87	P-16386	0.82
P-16387 (1)	0.24	P-16387 (1)	1.88	P-16387 (1)	0.81
P-16387 (2)	0.16	P-16387 (2)	0.04	P-16387 (2)	0.12
P-16389	0.77	P-16389	0.19	P-16389	0.22
P-1639	0.01	P-1639	0.01	P-1639	0.01
P-16391 (1)	0.66	P-16391 (1)	1.07	P-16391 (1)	1.5
P-16391 (2)	0.74	P-16391 (2)	0.3	P-16391 (2)	0.16
P-16392	0.66	P-16392	1.07	P-16392	1.5
P-16393	0.21	P-16393	0.15	P-16393	0.08
P-16394	0.18	P-16394	0.92	P-16394	0.33
P-16395 (1)	0.12	P-16395 (1)	0.34	P-16395 (1)	0.44
P-16395 (2)	0.24	P-16395 (2)	0.06	P-16395 (2)	0.15
P-16396	0.12	P-16396	0.34	P-16396	0.44
P-16397	0.03	P-16397	0.03	P-16397	0.05
P-16398	0.03	P-16398	0.61	P-16398	0.13
P-16399 (1)	0.04	P-16399 (1)	0.62	P-16399 (1)	0.13
P-16399 (2)	0.05	P-16399 (2)	0.04	P-16399 (2)	0.05
P-16401 (1)	0.07	P-16401 (1)	0.57	P-16401 (1)	0.64
P-16401 (2)	0.06	P-16401 (2)	0.2	P-16401 (2)	0.22
P-16403	0.13	P-16403	0.27	P-16403	0.31
P-16409	0.01	P-16409	0.02	P-16409	0.04
P-16411	0.01	P-16411	0.04	P-16411	0.08
P-16413	0.01	P-16413	0.04	P-16413	0.08
P-16415	0	P-16415	0.02	P-16415	0.04
P-16417	0.02	P-16417	0.03	P-16417	0.04
P-16419	0.02	P-16419	0.05	P-16419	0.07
P-16419(1)	0.14	P-16419(1)	0.29	P-16419(1)	0.26
P-16419(2)	0.22	P-16419(2)	0.49	P-16419(2)	0.46
P-16425	0.01	P-16425	0.01	P-16425	0.01
P-16427	0.06	P-16427	0.03	P-16427	0.03
P-16428	0.13	P-16428	0.3	P-16428	0.28
P-16431	0.09	P-16431	0.03	P-16431	0.03
P-16433	0.01	P-16433	0.03	P-16433	0.02
P-16435	0.08	P-16435	0.09	P-16435	0.08
P-16437	0.26	P-16437	0.34	P-16437	0.27
P-16438	0.01	P-16438	0.04	P-16438	0.04
P-16439	0.19	P-16439	0.31	P-16439	0.26
P-16441	0.31	P-16441	0.73	P-16441	0.59
P-16447 (1)	0.06	P-16447 (1)	0.16	P-16447 (1)	0.14
P-16447 (2)	0.06	P-16447 (2)	0.15	P-16447 (2)	0.12
P-16448	0.01	P-16448	0.03	P-16448	0.03
P-16449	0.43	P-16449	1.03	P-16449	0.81
P-1645	0.02	P-1645	0.03	P-1645	0.07
P-16451	0.33	P-16451	0.77	P-16451	0.62
P-16453	0.01	P-16453	0.01	P-16453	0.02
P-16455	0.1	P-16455	0.24	P-16455	0.2
P-16457(1)	0.01	P-16457(1)	0.01	P-16457(1)	0.01
P-16457(2)	0.01	P-16457(2)	0.01	P-16457(2)	0.01
P-16459(1)	0.02	P-16459(1)	0.03	P-16459(1)	0.01
P-16459(2)	0.02	P-16459(2)	0.03	P-16459(2)	0.01
P-16461	0.06	P-16461	0.08	P-16461	0.1
P-16463	0.04	P-16463	0.06	P-16463	0.07
P-16465	0	P-16465	0	P-16465	0
P-16466	0.02	P-16466	0.08	P-16466	0.11
P-16467	0	P-16467	0	P-16467	0
P-16469	0	P-16469	0	P-16469	0
P-16471	0	P-16471	0	P-16471	0
P-16473	0.03	P-16473	0.07	P-16473	0.08
P-16475	0.13	P-16475	0.07	P-16475	0.07
P-16476	0	P-16476	0.01	P-16476	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-16477	0.11	P-16477	0.11	P-16477	0.13
P-16479	0.01	P-16479	0.02	P-16479	0.02
P-16485	0.47	P-16485	0.45	P-16485	0.1
P-16487	0	P-16487	0	P-16487	0
P-16488	0	P-16488	0	P-16488	0.01
P-16493	0.16	P-16493	0.15	P-16493	0.14
P-16497	0.08	P-16497	0.06	P-16497	0.07
P-16499 (1)	0.01	P-16499 (1)	0.01	P-16499 (1)	0.01
P-16499 (2)	0.06	P-16499 (2)	0.05	P-16499 (2)	0.06
P-16501	0.11	P-16501	0.1	P-16501	0.1
P-16503	0.09	P-16503	0.09	P-16503	0.08
P-16505	0.04	P-16505	0.04	P-16505	0.04
P-16507	0.08	P-16507	0.07	P-16507	0.07
P-16509	0.04	P-16509	0.03	P-16509	0.03
P-16511	0.07	P-16511	0.06	P-16511	0.06
P-16512	0.06	P-16512	0.15	P-16512	0.18
P-16513 (1)	0.06	P-16513 (1)	0.16	P-16513 (1)	0.19
P-16513 (2)	0.13	P-16513 (2)	0.5	P-16513 (2)	0.27
P-16515	0.01	P-16515	0.01	P-16515	0.01
P-16517	0.43	P-16517	0.92	P-16517	0.65
P-16519	0.31	P-16519	0.41	P-16519	0.37
P-16521	0.01	P-16521	0.02	P-16521	0.02
P-16523	0.02	P-16523	0.01	P-16523	0.01
P-16525	0.02	P-16525	0.03	P-16525	0.03
P-16527	0	P-16527	0.01	P-16527	0.01
P-16529	0.05	P-16529	0.05	P-16529	0.14
P-16533	0.01	P-16533	0.03	P-16533	0.06
P-16535	0.01	P-16535	0.04	P-16535	0.04
P-16537	0.05	P-16537	0.04	P-16537	0.12
P-16539 (1)	0	P-16539 (1)	0.01	P-16539 (1)	0.01
P-16539 (2)	0.04	P-16539 (2)	0.03	P-16539 (2)	0.09
P-16541 (1)	0.02	P-16541 (1)	0.04	P-16541 (1)	0.04
P-16541 (2)	0.04	P-16541 (2)	0.04	P-16541 (2)	0.11
P-16543	0.03	P-16543	0.04	P-16543	0.08
P-16548	0	P-16548	0.01	P-16548	0.01
P-16549 (1)	0	P-16549 (1)	0.01	P-16549 (1)	0.01
P-16549 (2)	0.01	P-16549 (2)	0.02	P-16549 (2)	0.02
P-16551	0.02	P-16551	0.05	P-16551	0.08
P-16553	0.13	P-16553	0.14	P-16553	0.34
P-16555	0.11	P-16555	0.11	P-16555	0.29
P-16557	0.02	P-16557	0.02	P-16557	0.04
P-16559	0.03	P-16559	0.04	P-16559	0.06
P-16561	0.05	P-16561	0.03	P-16561	0.08
P-16563	0.06	P-16563	0.04	P-16563	0.09
P-16565	0.15	P-16565	0.24	P-16565	0.52
P-16566	0.15	P-16566	0.24	P-16566	0.51
P-16567 (1)	0.15	P-16567 (1)	0.25	P-16567 (1)	0.51
P-16567 (2)	0.07	P-16567 (2)	0.07	P-16567 (2)	0.17
P-16568	0.15	P-16568	0.25	P-16568	0.5
P-16569(1)	0.01	P-16569(1)	0.05	P-16569(1)	0.05
P-16569(2)	0.01	P-16569(2)	0.05	P-16569(2)	0.05
P-16571	0.03	P-16571	0.07	P-16571	0.09
P-16573	0.05	P-16573	0.05	P-16573	0.11
P-16575	0.09	P-16575	0.09	P-16575	0.22
P-16577	0.02	P-16577	0.1	P-16577	0.04
P-16579	0.05	P-16579	0.08	P-16579	0.09
P-16581	0.27	P-16581	0.36	P-16581	0.28
P-16583	0.18	P-16583	0.24	P-16583	0.19
P-16585	0.03	P-16585	0.04	P-16585	0.03
P-16587	0.06	P-16587	0.08	P-16587	0.06
P-16589	0.01	P-16589	0.02	P-16589	0.02
P-16591	0.01	P-16591	0.01	P-16591	0
P-16593	0.07	P-16593	0.07	P-16593	0.07
P-16597	0.12	P-16597	0.04	P-16597	0.06
P-16598	0.01	P-16598	0.01	P-16598	0.01
P-16599 (1)	0	P-16599 (1)	0	P-16599 (1)	0
P-16599 (2)	0.16	P-16599 (2)	0.05	P-16599 (2)	0.08
P-166	0.01	P-166	0.02	P-166	0.02
P-16601	0.41	P-16601	0.13	P-16601	0.21
P-16603	0.45	P-16603	0.14	P-16603	0.23
P-16605	0.25	P-16605	0.21	P-16605	0.23

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-16607	0.06	P-16607	0.12	P-16607	0.12
P-16609	0.39	P-16609	0.09	P-16609	0.24
P-16611	0.09	P-16611	0.16	P-16611	0.16
P-16612	0.01	P-16612	0.01	P-16612	0.01
P-16613	0.01	P-16613	0.01	P-16613	0.01
P-16614	0.15	P-16614	0.42	P-16614	0.28
P-16615	0	P-16615	0	P-16615	0
P-16617	0.03	P-16617	0.04	P-16617	0.07
P-16619 (1)	13.44	P-16619 (1)	23.01	P-16619 (1)	18.11
P-16619 (2)	0.05	P-16619 (2)	0.07	P-16619 (2)	0.15
P-16621 (1)	0.01	P-16621 (1)	0.01	P-16621 (1)	0.01
P-16621 (2)	0.05	P-16621 (2)	0.05	P-16621 (2)	0.11
P-16622	0.01	P-16622	0.01	P-16622	0.01
P-16623	0.02	P-16623	0.04	P-16623	0.08
P-16625 (1)	0.21	P-16625 (1)	0.73	P-16625 (1)	0.38
P-16625 (2)	0.03	P-16625 (2)	0.04	P-16625 (2)	0.06
P-16626	0.21	P-16626	0.75	P-16626	0.39
P-16627	0.07	P-16627	0.05	P-16627	0.08
P-16628	0.01	P-16628	0.01	P-16628	0.01
P-16629 (1)	0.29	P-16629 (1)	0.96	P-16629 (1)	0.43
P-16629 (2)	0.02	P-16629 (2)	0.03	P-16629 (2)	0.02
P-16631	0.07	P-16631	0.08	P-16631	0.06
P-16633	0.13	P-16633	0.15	P-16633	0.11
P-16635	0.04	P-16635	0.05	P-16635	0.04
P-16636	0.31	P-16636	0.58	P-16636	0.2
P-16637	0	P-16637	0.01	P-16637	0.01
P-16639 (1)	0.22	P-16639 (1)	0.79	P-16639 (1)	0.34
P-16639 (2)	0.12	P-16639 (2)	0.09	P-16639 (2)	0.2
P-16640	0.22	P-16640	0.37	P-16640	0.07
P-16641 (1)	0.01	P-16641 (1)	0.01	P-16641 (1)	0.01
P-16641 (2)	0.28	P-16641 (2)	0.22	P-16641 (2)	0.47
P-16642	0.01	P-16642	0.01	P-16642	0.01
P-16643	0.16	P-16643	0.13	P-16643	0.27
P-16645 (1)	0	P-16645 (1)	0	P-16645 (1)	0
P-16645 (2)	0.45	P-16645 (2)	0.11	P-16645 (2)	0.12
P-16646	0	P-16646	0	P-16646	0
P-16647	0.01	P-16647	0.01	P-16647	0.01
P-16649(1)	0.57	P-16649(1)	0.13	P-16649(1)	0.16
P-16649(2)	0.59	P-16649(2)	0.14	P-16649(2)	0.17
P-16651	1.04	P-16651	0.25	P-16651	0.29
P-16653	0.02	P-16653	0.06	P-16653	0.05
P-16655	0.04	P-16655	0.06	P-16655	0.04
P-16657	0.09	P-16657	0.1	P-16657	0.08
P-16659	0.11	P-16659	0.12	P-16659	0.1
P-16661	0.01	P-16661	0.01	P-16661	0.01
P-16663	0	P-16663	0.01	P-16663	0.01
P-16665	0.03	P-16665	0.04	P-16665	0.05
P-16667	0.01	P-16667	0.02	P-16667	0.02
P-16669	0.09	P-16669	0.13	P-16669	0.09
P-16674	0.26	P-16674	0.34	P-16674	0.38
P-16675	0.09	P-16675	0.13	P-16675	0.09
P-16677	0.05	P-16677	0.04	P-16677	0.09
P-16679 (1)	0.03	P-16679 (1)	0.02	P-16679 (1)	0.05
P-16679 (2)	0.02	P-16679 (2)	0.02	P-16679 (2)	0.03
P-1668	0.04	P-1668	0.04	P-1668	0.09
P-16681	0.09	P-16681	0.08	P-16681	0.16
P-16683 (1)	0.2	P-16683 (1)	0.14	P-16683 (1)	0.14
P-16683 (2)	0.03	P-16683 (2)	0.02	P-16683 (2)	0.04
P-16685	0	P-16685	0.01	P-16685	0
P-16687	0	P-16687	0.01	P-16687	0.01
P-16689	0.07	P-16689	0.07	P-16689	0.12
P-16691	0.07	P-16691	0.08	P-16691	0.11
P-16693	0.08	P-16693	0.1	P-16693	0.13
P-16697	0.23	P-16697	0.32	P-16697	0.32
P-16699	0.23	P-16699	0.32	P-16699	0.4
P-167	0.01	P-167	0.02	P-167	0.02
P-1670 (1)	0.03	P-1670 (1)	0.03	P-1670 (1)	0.03
P-1670 (2)	0.02	P-1670 (2)	0.04	P-1670 (2)	0.03
P-16701	0.09	P-16701	0.12	P-16701	0.21
P-16702	0.44	P-16702	0.21	P-16702	0.29
P-16703	0.06	P-16703	0.08	P-16703	0.13

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
P-16704	0
P-16705	0.24
P-16706	0.01
P-16707	0.24
P-16708	0.45
P-16709	0.36
P-16711	0.47
P-16713(1)	0.12
P-16713(2)(1)	0.05
P-16713(2)(2)	0.02
P-16715	0.1
P-16719	0.19
P-16721	0.2
P-16723(1)(1)(1)	0.39
P-16723(1)(1)(2)	0.38
P-16723(1)(2)	0.38
P-16723(2)	0.38
P-16725	0.06
P-16727	0.03
P-16729 (1)	0.36
P-16729 (2)	0.03
P-1673	0.04
P-16731 (1)	0.01
P-16731 (2)	0.01
P-16732	0.01
P-16733	0.32
P-16735	0.11
P-16737	0.06
P-16739	0.15
P-1674	0.02
P-16741	0.13
P-16743	0.14
P-16745 (1)	0.3
P-16745 (2)	0.11
P-16746	0.12
P-16747	0.35
P-16749	0.12
P-1675 (1)	0.02
P-1675 (2)	0.05
P-16751	0.14
P-16753	0.03
P-16755 (1)	0.15
P-16755 (2)	0.05
P-16759	0.05
P-16761	0.21
P-16765 (1)	0
P-16765 (2)	0.01
P-16767 (1)	0.09
P-16767 (2)	0.04
P-16768	0.09
P-16769	0.05
P-16773	0.07
P-16774	0
P-16775	0
P-16775(1)	0.11
P-16775(2)	0.11
P-16777	0.06
P-16779	0.03
P-16781	0.06
P-16783	0.06
P-16784	0
P-16786	0
P-16787	0.1
P-16790	0
P-16791 (1)	0.01
P-16791 (2)	0.02
P-16793	0.11
P-16795(1)	0.11
P-16795(2)	0.1
P-16797 (1)	0.04
P-16797 (2)	0.09

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-16704	0.01
P-16705	0.31
P-16706	0.01
P-16707	0.33
P-16708	0.33
P-16709	0.82
P-16711	1.02
P-16713(1)	0.26
P-16713(2)(1)	0.11
P-16713(2)(2)	0.02
P-16715	0.21
P-16719	0.07
P-16721	0.31
P-16723(1)(1)(1)	0.24
P-16723(1)(1)(2)	0.26
P-16723(1)(2)	0.26
P-16723(2)	0.23
P-16725	0.11
P-16727	0.06
P-16729 (1)	0.05
P-16729 (2)	0.06
P-1673	0.05
P-16731 (1)	0.01
P-16731 (2)	0.01
P-16732	0.01
P-16733	0.38
P-16735	0.13
P-16737	0.06
P-16739	0.19
P-1674	0.02
P-16741	0.3
P-16743	0.41
P-16745 (1)	5.24
P-16745 (2)	0.25
P-16746	0.19
P-16747	0.37
P-16749	0.06
P-1675 (1)	0.04
P-1675 (2)	0.04
P-16751	0.09
P-16753	0.01
P-16755 (1)	0.2
P-16755 (2)	0.03
P-16759	0.04
P-16761	0.12
P-16765 (1)	0
P-16765 (2)	0.01
P-16767 (1)	0.23
P-16767 (2)	0.03
P-16768	0.23
P-16769	0.17
P-16773	0.19
P-16774	0.01
P-16775	0.01
P-16775(1)	0.29
P-16775(2)	0.29
P-16777	0.2
P-16779	0.1
P-16781	0.08
P-16783	0.09
P-16784	0
P-16786	0
P-16787	0.03
P-16790	0
P-16791 (1)	0.01
P-16791 (2)	0.05
P-16793	0.06
P-16795(1)	0.09
P-16795(2)	0.09
P-16797 (1)	0.03
P-16797 (2)	0.08

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-16704	0.01
P-16705	0.52
P-16706	0.01
P-16707	0.43
P-16708	0.77
P-16709	0.67
P-16711	0.81
P-16713(1)	0.21
P-16713(2)(1)	0.1
P-16713(2)(2)	0.03
P-16715	0.17
P-16719	0.09
P-16721	0.32
P-16723(1)(1)(1)	0.23
P-16723(1)(1)(2)	0.25
P-16723(1)(2)	0.25
P-16723(2)	0.23
P-16725	0.09
P-16727	0.05
P-16729 (1)	0.1
P-16729 (2)	0.05
P-1673	0.09
P-16731 (1)	0.01
P-16731 (2)	0.01
P-16732	0.01
P-16733	0.03
P-16735	0.01
P-16737	0.05
P-16739	0.03
P-1674	0.08
P-16741	0.16
P-16743	0.26
P-16745 (1)	4.84
P-16745 (2)	0.08
P-16746	0.14
P-16747	0.2
P-16749	0.06
P-1675 (1)	0.08
P-1675 (2)	0.09
P-16751	0.08
P-16753	0.02
P-16755 (1)	0.03
P-16755 (2)	0.04
P-16759	0.04
P-16761	0.13
P-16765 (1)	0
P-16765 (2)	0.01
P-16767 (1)	0.37
P-16767 (2)	0.03
P-16768	0.37
P-16769	0.17
P-16773	0.08
P-16774	0.01
P-16775	0.01
P-16775(1)	0.13
P-16775(2)	0.12
P-16777	0.15
P-16779	0.09
P-16781	0.08
P-16783	0.11
P-16784	0
P-16786	0.01
P-16787	0.02
P-16790	0
P-16791 (1)	0.01
P-16791 (2)	0.05
P-16793	0.19
P-16795(1)	0.2
P-16795(2)	0.2
P-16797 (1)	0.08
P-16797 (2)	0.19

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-16798	0.01	P-16798	0.01	P-16798	0.01
P-16799	0.02	P-16799	0.08	P-16799	0.06
P-1680	0	P-1680	0.01	P-1680	0.01
P-16801	0.12	P-16801	0.05	P-16801	0.19
P-16803 (1)	0.35	P-16803 (1)	0.36	P-16803 (1)	0.59
P-16803 (2)	0.2	P-16803 (2)	0.06	P-16803 (2)	0.33
P-16804	0.35	P-16804	0.35	P-16804	0.6
P-16805	0.06	P-16805	0.08	P-16805	0.08
P-16805(1)	0.35	P-16805(1)	0.35	P-16805(1)	0.61
P-16809	0.3	P-16809	0.08	P-16809	0.07
P-16811 (1)	0.09	P-16811 (1)	0.16	P-16811 (1)	0.2
P-16811 (2)	0.27	P-16811 (2)	0.11	P-16811 (2)	0.06
P-16813	0.09	P-16813	0.14	P-16813	0.14
P-16814	0.07	P-16814	0.05	P-16814	0.14
P-16815 (1)	0.11	P-16815 (1)	0.07	P-16815 (1)	0.21
P-16815 (2)	0.08	P-16815 (2)	0.11	P-16815 (2)	0.12
P-16816	0.29	P-16816	0.13	P-16816	0.62
P-16817 (1)	0.29	P-16817 (1)	0.13	P-16817 (1)	0.63
P-16817 (2)	0.08	P-16817 (2)	0.07	P-16817 (2)	0.04
P-16818	0	P-16818	0.01	P-16818	0.01
P-16819	0.09	P-16819	0.05	P-16819	0.02
P-16821 (1)	0	P-16821 (1)	0.01	P-16821 (1)	0.01
P-16821 (2)	0.08	P-16821 (2)	0.06	P-16821 (2)	0.06
P-16823	0.2	P-16823	0.1	P-16823	0.1
P-16824	0.01	P-16824	0.02	P-16824	0.02
P-16825	0.22	P-16825	0.07	P-16825	0.09
P-16827	0.1	P-16827	0.05	P-16827	0.05
P-16829	0.04	P-16829	0.11	P-16829	0.08
P-16830	0.29	P-16830	0.13	P-16830	0.61
P-16831	0.01	P-16831	0.02	P-16831	0.02
P-16833	0.02	P-16833	0.06	P-16833	0.03
P-16835	0.06	P-16835	0.15	P-16835	0.09
P-16839	0.01	P-16839	0.01	P-16839	0.01
P-16841	0.68	P-16841	0.35	P-16841	0.34
P-16843	0.64	P-16843	0.32	P-16843	0.3
P-16845	0.02	P-16845	0.02	P-16845	0.02
P-16847 (1)	0	P-16847 (1)	0.01	P-16847 (1)	0.01
P-16847 (2)	0.02	P-16847 (2)	0.02	P-16847 (2)	0.02
P-1685	0.02	P-1685	0.03	P-1685	0.04
P-16851	0.02	P-16851	0.02	P-16851	0.05
P-16853	0.02	P-16853	0.02	P-16853	0.02
P-16855	0.02	P-16855	0.02	P-16855	0.02
P-16859	0.12	P-16859	0.13	P-16859	0.13
P-1686	0.04	P-1686	0.05	P-1686	0.08
P-16861 (1)	0.29	P-16861 (1)	0.43	P-16861 (1)	0.38
P-16861 (2)	0.14	P-16861 (2)	0.06	P-16861 (2)	0.29
P-16863	0.01	P-16863	0.01	P-16863	0.01
P-16865	0.1	P-16865	0.18	P-16865	0.25
P-16867	0.08	P-16867	0.2	P-16867	0.16
P-16869	0.04	P-16869	0.05	P-16869	0.06
P-1687	0.03	P-1687	0.04	P-1687	0.07
P-16871	0.2	P-16871	0.09	P-16871	0.3
P-16872	0.01	P-16872	0.01	P-16872	0.02
P-16875	0.05	P-16875	0.03	P-16875	0.04
P-16877	0.06	P-16877	0.05	P-16877	0.1
P-16879	0.05	P-16879	0.04	P-16879	0.09
P-16881	0.03	P-16881	0.02	P-16881	0.01
P-16883	0.05	P-16883	0.03	P-16883	0.05
P-16885	0.02	P-16885	0.05	P-16885	0.04
P-16889	0.01	P-16889	0.02	P-16889	0.02
P-16891	0.09	P-16891	0.02	P-16891	0.02
P-16892	0	P-16892	0.01	P-16892	0.01
P-16893	0.75	P-16893	0.79	P-16893	0.88
P-16895	0.86	P-16895	0.8	P-16895	0.9
P-16897	0.09	P-16897	0.06	P-16897	0.07
P-16899	0.1	P-16899	0.06	P-16899	0.07
P-16901	0.86	P-16901	0.75	P-16901	0.88
P-16903	0.87	P-16903	0.75	P-16903	0.88
P-16907 (1)	0.05	P-16907 (1)	0.02	P-16907 (1)	0.12
P-16907 (2)	0.09	P-16907 (2)	0.07	P-16907 (2)	0.07
P-16909	0.1	P-16909	0.05	P-16909	0.05

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-16911	0.1	P-16911	0.05	P-16911	0.05
P-16913	0.04	P-16913	0.04	P-16913	0.04
P-16915	0.09	P-16915	0.07	P-16915	0.07
P-16917	0.09	P-16917	0.05	P-16917	0.05
P-16918	0.44	P-16918	0.15	P-16918	1
P-16919 (1)	0.39	P-16919 (1)	0.14	P-16919 (1)	0.88
P-16919 (2)	0.14	P-16919 (2)	0.08	P-16919 (2)	0.08
P-16920	0.44	P-16920	0.15	P-16920	1
P-16921 (1)	0.39	P-16921 (1)	0.14	P-16921 (1)	0.88
P-16921 (2)	0.01	P-16921 (2)	0.02	P-16921 (2)	0.01
P-16923	0.05	P-16923	0.05	P-16923	0.05
P-16925	0.1	P-16925	0.07	P-16925	0.07
P-16927	0.07	P-16927	0.03	P-16927	0.03
P-1693	0.04	P-1693	0.12	P-1693	0.07
P-16931	0	P-16931	0.02	P-16931	0.03
P-16933	0.02	P-16933	0.02	P-16933	0.01
P-16934	0.01	P-16934	0.01	P-16934	0.04
P-16935	0.03	P-16935	0.04	P-16935	0.04
P-16937	0.02	P-16937	0.02	P-16937	0.04
P-16938	0	P-16938	0.01	P-16938	0.01
P-16939	0.01	P-16939	0.04	P-16939	0.06
P-16940	0	P-16940	0.01	P-16940	0.01
P-16941	0.03	P-16941	0.04	P-16941	0.04
P-16943	0.05	P-16943	0.02	P-16943	0.11
P-16943(1)	0.05	P-16943(1)	0.06	P-16943(1)	0.05
P-16943(2)	0.05	P-16943(2)	0.06	P-16943(2)	0.05
P-16944	0.44	P-16944	0.15	P-16944	0.99
P-16945	0.06	P-16945	0.14	P-16945	0.14
P-16947 (1)	0.38	P-16947 (1)	0.14	P-16947 (1)	0.87
P-16947 (2)	0.06	P-16947 (2)	0.16	P-16947 (2)	0.14
P-16949	0.03	P-16949	0.02	P-16949	0.05
P-16953 (1)	0.3	P-16953 (1)	0.14	P-16953 (1)	0.42
P-16953 (2)	0.06	P-16953 (2)	0.16	P-16953 (2)	0.2
P-16955	0.16	P-16955	0.07	P-16955	0.03
P-16957	0.13	P-16957	0.09	P-16957	0.17
P-16959	0.23	P-16959	0.19	P-16959	0.38
P-16961	0.05	P-16961	0.03	P-16961	0.05
P-16963 (1)	0	P-16963 (1)	0.01	P-16963 (1)	0.01
P-16963 (2)	0.02	P-16963 (2)	0.01	P-16963 (2)	0.01
P-16967	0.08	P-16967	0.12	P-16967	0.45
P-16969 (1)	0.89	P-16969 (1)	0.4	P-16969 (1)	0.58
P-16969 (2)	0.01	P-16969 (2)	0.01	P-16969 (2)	0.01
P-16975	0.29	P-16975	0.06	P-16975	0.15
P-16977	0.13	P-16977	0.03	P-16977	0.05
P-16979	0.17	P-16979	0.04	P-16979	0.07
P-16981	0.13	P-16981	0.04	P-16981	0.1
P-16983	0.18	P-16983	0.05	P-16983	0.12
P-16985	0.02	P-16985	0.06	P-16985	0.07
P-16988	0	P-16988	0.71	P-16988	2.46
P-16989 (1)	0	P-16989 (1)	0.71	P-16989 (1)	2.46
P-16989 (2)	0.26	P-16989 (2)	0.14	P-16989 (2)	0.14
P-16990	0.01	P-16990	0.79	P-16990	2.76
P-16991 (1)	0.01	P-16991 (1)	0.79	P-16991 (1)	2.76
P-16991 (2)	0.3	P-16991 (2)	0.12	P-16991 (2)	0.18
P-16992	0.01	P-16992	0.79	P-16992	2.76
P-16993 (1)	0.01	P-16993 (1)	0.79	P-16993 (1)	2.76
P-16993 (2)	0.06	P-16993 (2)	0.04	P-16993 (2)	0.08
P-16994	0.01	P-16994	0.79	P-16994	2.76
P-16995 (1)	0.01	P-16995 (1)	0.7	P-16995 (1)	2.43
P-16995 (2)	0.04	P-16995 (2)	0.02	P-16995 (2)	0.05
P-16996	0.01	P-16996	0.7	P-16996	2.43
P-16997	0.01	P-16997	0.61	P-16997	2.14
P-16998	0.01	P-16998	0.61	P-16998	2.14
P-16999 (1)	0.01	P-16999 (1)	0.53	P-16999 (1)	1.87
P-16999 (2)	0.09	P-16999 (2)	0.15	P-16999 (2)	0.5
P-1700	0.05	P-1700	0.03	P-1700	0.1
P-17000	0.01	P-17000	0.53	P-17000	1.87
P-17001	0.01	P-17001	0.58	P-17001	2.09
P-17002	0.01	P-17002	0.58	P-17002	2.09
P-17003	0.01	P-17003	0.01	P-17003	0.01
P-17004	0.01	P-17004	0.58	P-17004	1.71

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-17005 (1)	0.01
P-17005 (2)	0.29
P-17006	0.01
P-17007	0.02
P-17008	0.02
P-17009 (1)	0.02
P-17009 (2)	0.29
P-17010	0.02
P-17011 (1)	0.02
P-17011 (2)	0.13
P-17012	0.02
P-17013 (1)	0.02
P-17013 (2)	0.89
P-17014	0.02
P-17015 (1)	0.02
P-17015 (2)	0.73
P-17016	0.02
P-17017 (1)	0.02
P-17017 (2)	0
P-17018	0.02
P-17019 (1)	0.02
P-17019 (2)	0.01
P-17020	0.02
P-17021	0.03
P-17022	0.03
P-17023 (1)	0.03
P-17023 (2)	0.02
P-17024	0.03
P-17025 (1)	0.03
P-17025 (2)	0
P-17026	0.03
P-17027(1)	0.03
P-17027(2)	0.05
P-17028	0.06
P-17029	0.06
P-1703	0.05
P-17030	0.06
P-17031 (1)	0.06
P-17031 (2)	0.21
P-17032	0.06
P-17033 (1)	0.06
P-17033 (2)	0.05
P-17034	0.08
P-17035 (1)	0.09
P-17035 (2)	0.05
P-17036	0.09
P-17037 (1)	0.09
P-17037 (2)	0.09
P-17038	0
P-17039	0
P-1704	0.03
P-17040	0
P-17041	0.07
P-17043(1)	0.1
P-17043(2)	0.09
P-17045	0.08
P-17047	0.1
P-17049	0.15
P-17053	0.02
P-17055	0.06
P-17057	0.17
P-17059	0.08
P-17061	0.01
P-17063	0.1
P-17065	0.18
P-17067	0.24
P-17069	0.15
P-1707	0.14
P-17070	1.79
P-17071 (1)	0.64
P-17071 (2)	0.39

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-17005 (1)	0.58
P-17005 (2)	0.11
P-17006	0.58
P-17007	0.63
P-17008	0.63
P-17009 (1)	0.63
P-17009 (2)	0.15
P-17010	0.63
P-17011 (1)	0.63
P-17011 (2)	0.1
P-17012	0.57
P-17013 (1)	0.59
P-17013 (2)	0.4
P-17014	0.59
P-17015 (1)	0.59
P-17015 (2)	0.35
P-17016	0.55
P-17017 (1)	0.55
P-17017 (2)	0
P-17018	0.57
P-17019 (1)	0.57
P-17019 (2)	0.01
P-17020	0.57
P-17021	0.62
P-17022	0.62
P-17023 (1)	0.62
P-17023 (2)	0.03
P-17024	0.62
P-17025 (1)	0.62
P-17025 (2)	0
P-17026	0.62
P-17027(1)	0.62
P-17027(2)	0.6
P-17028	0.6
P-17029	0.6
P-1703	0.04
P-17030	0.6
P-17031 (1)	0.6
P-17031 (2)	0.22
P-17032	0.6
P-17033 (1)	0.6
P-17033 (2)	0.06
P-17034	0.58
P-17035 (1)	0.57
P-17035 (2)	0.05
P-17036	0.57
P-17037 (1)	0.57
P-17037 (2)	0.08
P-17038	0.1
P-17039	0.1
P-1704	0.03
P-17040	0.1
P-17041	0.05
P-17043(1)	0.08
P-17043(2)	0.07
P-17045	0.14
P-17047	0.17
P-17049	0.14
P-17053	0.03
P-17055	0.05
P-17057	0.26
P-17059	0.14
P-17061	0.1
P-17063	0.22
P-17065	0.04
P-17067	0.04
P-17069	0.03
P-1707	0.14
P-17070	0.79
P-17071 (1)	0.28
P-17071 (2)	0.07

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-17005 (1)	1.71
P-17005 (2)	0.14
P-17006	1.71
P-17007	1.91
P-17008	1.91
P-17009 (1)	1.91
P-17009 (2)	0.3
P-17010	1.91
P-17011 (1)	1.45
P-17011 (2)	0.23
P-17012	1.32
P-17013 (1)	1.39
P-17013 (2)	0.67
P-17014	1.39
P-17015 (1)	1.39
P-17015 (2)	0.6
P-17016	1.28
P-17017 (1)	1.28
P-17017 (2)	0
P-17018	1.3
P-17019 (1)	1.3
P-17019 (2)	0.01
P-17020	1.3
P-17021	1.42
P-17022	1.42
P-17023 (1)	1.41
P-17023 (2)	0.04
P-17024	1.41
P-17025 (1)	1.41
P-17025 (2)	0
P-17026	1.41
P-17027(1)	1.41
P-17027(2)	1.18
P-17028	1.17
P-17029	1.17
P-1703	0.03
P-17030	1.17
P-17031 (1)	1.17
P-17031 (2)	0.25
P-17032	1.17
P-17033 (1)	1.16
P-17033 (2)	0.08
P-17034	0.99
P-17035 (1)	0.99
P-17035 (2)	0.06
P-17036	0.98
P-17037 (1)	0.98
P-17037 (2)	0.06
P-17038	0.75
P-17039	0.75
P-1704	0.03
P-17040	0.75
P-17041	0.11
P-17043(1)	0.19
P-17043(2)	0.17
P-17045	0.45
P-17047	0.53
P-17049	0.08
P-17053	0.11
P-17055	0.02
P-17057	0.42
P-17059	0.22
P-17061	0.08
P-17063	0.27
P-17065	0.07
P-17067	0.04
P-17069	0.07
P-1707	0.04
P-17070	1.06
P-17071 (1)	0.35
P-17071 (2)	0.08

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-17072	1.07	P-17072	0.47	P-17072	0.62
P-17075	0.05	P-17075	0.03	P-17075	0.03
P-17077	0.44	P-17077	0.09	P-17077	0.12
P-17081	0.04	P-17081	0.03	P-17081	0.03
P-17083 (1)	0	P-17083 (1)	0	P-17083 (1)	0
P-17083 (2)	0.02	P-17083 (2)	0.03	P-17083 (2)	0.03
P-17084	0.02	P-17084	0.05	P-17084	0.08
P-17085 (1)	0.02	P-17085 (1)	0.05	P-17085 (1)	0.08
P-17085 (2)	0.18	P-17085 (2)	0.03	P-17085 (2)	0.04
P-17089	0.13	P-17089	0.18	P-17089	0.18
P-17091	0.13	P-17091	0.18	P-17091	0.18
P-17092	0	P-17092	0	P-17092	0
P-17096	0.56	P-17096	0.86	P-17096	1.57
P-17099	0.03	P-17099	0.02	P-17099	0.02
P-171	0.07	P-171	0.08	P-171	0.06
P-17101(1)(1)	0.03	P-17101(1)(1)	0.04	P-17101(1)(1)	0.03
P-17101(1)(2)	0.03	P-17101(1)(2)	0.04	P-17101(1)(2)	0.03
P-17103	0.02	P-17103	0.01	P-17103	0.01
P-17105(1)	0.14	P-17105(1)	0.03	P-17105(1)	0.05
P-17105(2)	0.03	P-17105(2)	0.03	P-17105(2)	0.04
P-17107	0.07	P-17107	0.02	P-17107	0.05
P-17108	0.05	P-17108	0.09	P-17108	0.11
P-17109	1.23	P-17109	0.3	P-17109	0.66
P-17111	1.32	P-17111	0.31	P-17111	0.68
P-17112	0.01	P-17112	0.01	P-17112	0.01
P-17113	0	P-17113	0	P-17113	0
P-17114	0.07	P-17114	0.14	P-17114	0.32
P-17115	0.01	P-17115	0.03	P-17115	0.03
P-17117	0.04	P-17117	0.03	P-17117	0.05
P-17119	0.01	P-17119	0.01	P-17119	0.01
P-17119(1)	0.05	P-17119(1)	0.01	P-17119(1)	0.02
P-17119(2)	0.05	P-17119(2)	0.01	P-17119(2)	0.02
P-17120	0	P-17120	0	P-17120	0.04
P-17121	0.02	P-17121	0.04	P-17121	0.03
P-17123 (1)	0.01	P-17123 (1)	0.02	P-17123 (1)	0.01
P-17123 (2)	0.06	P-17123 (2)	0.05	P-17123 (2)	0.03
P-17127	0.42	P-17127	0.18	P-17127	0.21
P-17129 (1)	0.15	P-17129 (1)	0.4	P-17129 (1)	0.67
P-17129 (2)	0.08	P-17129 (2)	0.05	P-17129 (2)	0.09
P-17131	0.04	P-17131	0.06	P-17131	0.07
P-17132	0.3	P-17132	0.55	P-17132	0.28
P-17133	0.13	P-17133	0.03	P-17133	0.09
P-17135 (1)	0.02	P-17135 (1)	0.04	P-17135 (1)	0.07
P-17135 (2)	0.08	P-17135 (2)	0.02	P-17135 (2)	0.06
P-17137	0.01	P-17137	0.01	P-17137	0.01
P-17138	0.05	P-17138	0.1	P-17138	0.2
P-17139 (1)	0	P-17139 (1)	0	P-17139 (1)	0
P-17139 (2)	0.01	P-17139 (2)	0.01	P-17139 (2)	0.01
P-17141	0.09	P-17141	0.04	P-17141	0.04
P-17142(1)	0.1	P-17142(1)	0.19	P-17142(1)	0.16
P-17142(2)	0.05	P-17142(2)	0.09	P-17142(2)	0.37
P-17143	0.08	P-17143	0.04	P-17143	0.04
P-17144	0	P-17144	0.01	P-17144	0.01
P-17145 (1)	0.04	P-17145 (1)	0.07	P-17145 (1)	0.11
P-17145 (2)	0.28	P-17145 (2)	0.6	P-17145 (2)	0.55
P-17147	0.07	P-17147	0.13	P-17147	0.23
P-17148	0	P-17148	0.01	P-17148	0.01
P-17149 (1)	0	P-17149 (1)	0	P-17149 (1)	0
P-17149 (2)	0.13	P-17149 (2)	0.07	P-17149 (2)	0.08
P-17151 (1)	0	P-17151 (1)	0	P-17151 (1)	2.51
P-17151 (2)	0.1	P-17151 (2)	0.05	P-17151 (2)	0.05
P-17153	0.31	P-17153	0.61	P-17153	0.53
P-17155	0.31	P-17155	0.64	P-17155	0.56
P-17156	0.08	P-17156	0.13	P-17156	0.58
P-17157 (1)	0.04	P-17157 (1)	0.06	P-17157 (1)	0.33
P-17157 (2)	0.04	P-17157 (2)	0.05	P-17157 (2)	0.03
P-17158	0.05	P-17158	0.09	P-17158	0.12
P-17159	0.04	P-17159	0.01	P-17159	0.02
P-17160	0.01	P-17160	0.01	P-17160	0.01
P-17162	0.01	P-17162	0.01	P-17162	0.02
P-17163 (1)	0.03	P-17163 (1)	0.04	P-17163 (1)	0.21

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-17163 (2)	0.06
P-17165(1)	0.5
P-17165(2)	0.49
P-17167 (1)	0.04
P-17167 (2)	0.42
P-17169	0.33
P-1717	0.39
P-17173(1)	0.35
P-17173(2)	0.36
P-17175	0.17
P-17175(1)	0.66
P-17175(2)(1)	0.68
P-17175(2)(2)	0.68
P-17177	0.03
P-17178	0.17
P-17179	0
P-1718	0.01
P-17180	0.01
P-17181 (1)	0
P-17181 (2)	0.21
P-17182	0.01
P-17183(1)	0.24
P-17183(2)	0.25
P-17184	0.01
P-17185 (1)	0
P-17185 (2)	0.04
P-17187	0.02
P-1719 (1)	0.04
P-1719 (2)	0.08
P-17190	0.01
P-17191 (1)	0.02
P-17191 (2)	0.04
P-17193	0.77
P-17194	0.07
P-17195	0.01
P-17197	0.54
P-17198	0.07
P-17199 (1)	0.11
P-17199 (2)	1.31
P-17200	0.11
P-17201 (1)	0.12
P-17201 (2)	0.1
P-17202	0.12
P-17203 (1)	0.07
P-17203 (2)	0.06
P-17204	0.04
P-17205 (1)	0
P-17205 (2)	0.11
P-17206	0.11
P-17207 (1)	0
P-17207 (2)	0.14
P-17210	0
P-17211(1)	0.42
P-17211(2)	0.36
P-17213	0.3
P-17215 (1)	0.76
P-17215 (2)	0.13
P-17216	0.25
P-17217 (1)	0.02
P-17217 (2)	0.16
P-17218	0.05
P-17219 (1)	0.09
P-17219 (2)	0.25
P-17220	0
P-17221 (1)	0.12
P-17221 (2)	0.26
P-17222	0.07
P-17223 (1)	0.12
P-17223 (2)	0.17
P-17224	0.02
P-17225 (1)	0.11

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-17163 (2)	0.11
P-17165(1)	1.48
P-17165(2)	1.43
P-17167 (1)	0.06
P-17167 (2)	1.18
P-17169	0.39
P-1717	0.68
P-17173(1)	0.34
P-17173(2)	0.35
P-17175	0.37
P-17175(1)	0.18
P-17175(2)(1)	0.18
P-17175(2)(2)	0.18
P-17177	0.11
P-17178	0.36
P-17179	0.05
P-1718	0.01
P-17180	0.01
P-17181 (1)	0
P-17181 (2)	0.19
P-17182	0.01
P-17183(1)	0.07
P-17183(2)	0.07
P-17184	0.02
P-17185 (1)	0.01
P-17185 (2)	0.08
P-17187	0.03
P-1719 (1)	0.04
P-1719 (2)	0.09
P-17190	0.03
P-17191 (1)	0.03
P-17191 (2)	0.08
P-17193	0.09
P-17194	0.1
P-17195	0.01
P-17197	0.65
P-17198	0.1
P-17199 (1)	0.17
P-17199 (2)	0.73
P-17200	0.16
P-17201 (1)	0.18
P-17201 (2)	0.12
P-17202	0.18
P-17203 (1)	0.11
P-17203 (2)	0.1
P-17204	0.08
P-17205 (1)	0
P-17205 (2)	0.11
P-17206	0.17
P-17207 (1)	0
P-17207 (2)	0.14
P-17210	0.01
P-17211(1)	0.19
P-17211(2)	0.17
P-17213	0.07
P-17215 (1)	1.13
P-17215 (2)	0.07
P-17216	0.38
P-17217 (1)	0.05
P-17217 (2)	0.08
P-17218	0.07
P-17219 (1)	0.13
P-17219 (2)	0.09
P-17220	0
P-17221 (1)	0.19
P-17221 (2)	0.06
P-17222	0.1
P-17223 (1)	0.16
P-17223 (2)	0.04
P-17224	0.06
P-17225 (1)	0.16

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-17163 (2)	0.19
P-17165(1)	0.91
P-17165(2)	0.91
P-17167 (1)	0.23
P-17167 (2)	0.73
P-17169	0.23
P-1717	0.29
P-17173(1)	0.24
P-17173(2)	0.25
P-17175	0.86
P-17175(1)	0.22
P-17175(2)(1)	0.22
P-17175(2)(2)	0.22
P-17177	0.09
P-17178	0.87
P-17179	0.03
P-1718	0.03
P-17180	0.01
P-17181 (1)	0.01
P-17181 (2)	0.13
P-17182	0.02
P-17183(1)	0.08
P-17183(2)	0.08
P-17184	0.03
P-17185 (1)	0.01
P-17185 (2)	0.1
P-17187	0.04
P-1719 (1)	0.02
P-1719 (2)	0.24
P-17190	0.03
P-17191 (1)	0.04
P-17191 (2)	0.1
P-17193	0.14
P-17194	0.24
P-17195	0.02
P-17197	0.79
P-17198	0.22
P-17199 (1)	0.38
P-17199 (2)	0.91
P-17200	0.36
P-17201 (1)	0.4
P-17201 (2)	0.09
P-17202	0.4
P-17203 (1)	0.24
P-17203 (2)	0.08
P-17204	0.17
P-17205 (1)	0.01
P-17205 (2)	0.09
P-17206	0.39
P-17207 (1)	0.01
P-17207 (2)	0.11
P-17210	0.01
P-17211(1)	0.14
P-17211(2)	0.12
P-17213	0.11
P-17215 (1)	1.98
P-17215 (2)	0.09
P-17216	0.68
P-17217 (1)	0.11
P-17217 (2)	0.06
P-17218	0.11
P-17219 (1)	0.22
P-17219 (2)	0.09
P-17220	0.01
P-17221 (1)	0.34
P-17221 (2)	0.11
P-17222	0.15
P-17223 (1)	0.25
P-17223 (2)	0.07
P-17224	0.13
P-17225 (1)	0.26

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-17225 (2)	0.01	P-17225 (2)	0.01	P-17225 (2)	0.01
P-17226	0.08	P-17226	0.15	P-17226	0.29
P-17227 (1)	0	P-17227 (1)	0	P-17227 (1)	0.01
P-17227 (2)	0.09	P-17227 (2)	0.03	P-17227 (2)	0.03
P-17228	0	P-17228	0	P-17228	0.01
P-17229	0.26	P-17229	0.08	P-17229	0.06
P-17230	0	P-17230	0	P-17230	0.01
P-17231 (1)	0.1	P-17231 (1)	0.16	P-17231 (1)	0.32
P-17231 (2)	0.16	P-17231 (2)	0.05	P-17231 (2)	0.04
P-17232	0	P-17232	0	P-17232	0.01
P-17233 (1)	0.16	P-17233 (1)	0.24	P-17233 (1)	0.45
P-17233 (2)	0.25	P-17233 (2)	0.09	P-17233 (2)	0.12
P-17234	0.09	P-17234	0.12	P-17234	0.21
P-17235	0.07	P-17235	0.05	P-17235	0.03
P-17236	1.34	P-17236	1.99	P-17236	3.49
P-17237 (1)	0.57	P-17237 (1)	0.84	P-17237 (1)	1.47
P-17237 (2)	0.08	P-17237 (2)	0.07	P-17237 (2)	0.02
P-17239	0.1	P-17239	0.04	P-17239	0.11
P-17240	0.18	P-17240	0.23	P-17240	0.27
P-17241 (1)	0.15	P-17241 (1)	0.2	P-17241 (1)	0.27
P-17241 (2)	0.02	P-17241 (2)	0.03	P-17241 (2)	0.03
P-17242	0.07	P-17242	0.11	P-17242	0.17
P-17243 (1)	0.03	P-17243 (1)	0.02	P-17243 (1)	0.03
P-17243 (2)	0	P-17243 (2)	0	P-17243 (2)	0
P-17244	0.11	P-17244	0.08	P-17244	0.09
P-17245	0.03	P-17245	0.09	P-17245	0.09
P-17247	0.02	P-17247	0.07	P-17247	0.07
P-17248	0.12	P-17248	0.18	P-17248	0.29
P-17250	0.07	P-17250	0.15	P-17250	0.29
P-17251 (1)	0.1	P-17251 (1)	0.12	P-17251 (1)	0.14
P-17251 (2)	0	P-17251 (2)	0.01	P-17251 (2)	0.01
P-17253	0	P-17253	0.01	P-17253	0.01
P-17255	0.01	P-17255	0.01	P-17255	0.02
P-17257	0.08	P-17257	0.06	P-17257	0.02
P-17258	1.17	P-17258	1.7	P-17258	2.83
P-17259	0.01	P-17259	0.01	P-17259	0.01
P-17261 (1)	0	P-17261 (1)	0	P-17261 (1)	0
P-17261 (2)	0.05	P-17261 (2)	0.07	P-17261 (2)	0.12
P-17263	0.04	P-17263	0.03	P-17263	0.09
P-17265	0.01	P-17265	0.01	P-17265	0.01
P-17267	0.01	P-17267	0.01	P-17267	0.01
P-17269	0.01	P-17269	0.02	P-17269	0.01
P-17270	0.33	P-17270	0.17	P-17270	0.13
P-17273	0.02	P-17273	0.03	P-17273	0.03
P-17274	0.07	P-17274	0.09	P-17274	0.13
P-17275	0.03	P-17275	0.05	P-17275	0.05
P-17277	0.01	P-17277	0.02	P-17277	0.02
P-17279	0	P-17279	0	P-17279	0
P-17281	0	P-17281	0	P-17281	0
P-17282	0.42	P-17282	0.46	P-17282	1.11
P-17283	0.01	P-17283	0.01	P-17283	0.01
P-17285 (1)	0.28	P-17285 (1)	0.31	P-17285 (1)	0.75
P-17285 (2)	0.01	P-17285 (2)	0.01	P-17285 (2)	0.01
P-17287 (1)	0.16	P-17287 (1)	0.21	P-17287 (1)	0.63
P-17287 (2)	0	P-17287 (2)	0	P-17287 (2)	0
P-17289	0	P-17289	0.01	P-17289	0.01
P-17291	0.02	P-17291	0.13	P-17291	0.11
P-17293	0.07	P-17293	0.4	P-17293	0.34
P-17294	0.2	P-17294	0.28	P-17294	0.93
P-17295	0.05	P-17295	0.27	P-17295	0.23
P-17297	0.14	P-17297	0.15	P-17297	0.09
P-17299	0.11	P-17299	0.12	P-17299	0.16
P-17301	0.1	P-17301	0.12	P-17301	0.08
P-17303 (1)	0.01	P-17303 (1)	0.02	P-17303 (1)	0.02
P-17303 (2)	0.13	P-17303 (2)	0.16	P-17303 (2)	0.16
P-17305	0.04	P-17305	0.17	P-17305	0.13
P-17307	0.1	P-17307	0.32	P-17307	0.24
P-17309	0.07	P-17309	0.15	P-17309	0.11
P-17311	0	P-17311	0.01	P-17311	0.01
P-17313	0.06	P-17313	0.07	P-17313	0.13
P-17315	0.27	P-17315	0.09	P-17315	0.16

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-17317	0.01
P-17318	1.85
P-17319 (1)	1.85
P-17319 (2)	0.2
P-1732	0.09
P-17321	0.01
P-17323	0.01
P-17325	0.01
P-17327	0.03
P-17329	0.2
P-1733 (1)	0.05
P-1733 (2)	0
P-17331	0.01
P-17333	0.03
P-17335	0.22
P-17336	0.22
P-17337	0.01
P-17339	0.01
P-1734 (1)	1.84
P-1734 (2)	0
P-17341	0
P-17343 (1)	0.11
P-17343 (2)	0.01
P-17344	0.24
P-17345	0.1
P-17347	0.07
P-17349 (1)	0.61
P-17349 (2)	0.25
P-17353	0
P-17355	0.01
P-17356	0
P-17357 (1)	0
P-17357 (2)	0.01
P-17358	0.1
P-17359 (1)	0.1
P-17359 (2)	0
P-17360	0.11
P-17361	0.19
P-17361(1)	0
P-17361(2)	0
P-17362	0.14
P-17363	0.05
P-17365	1.42
P-17367	1.19
P-17368	6.93
P-17369 (1)	4.33
P-17369 (2)	0.03
P-1737 (1)	0.16
P-1737 (2)	0
P-17371	0.05
P-17373	4.63
P-17373(1)	0.03
P-17373(2)	0.06
P-17374	3.42
P-17375	0.08
P-17376	(N/A)
P-17377 (1)	2.05
P-17377 (2)	0.02
P-17379	0.09
P-1738	0.07
P-17382	0.97
P-17383 (1)	0
P-17383 (2)	0.28
P-17386	0
P-17387	0.01
P-17388	0
P-17389	0.66
P-17390	0.02
P-17391	0.12
P-17393 (1)	1.18
P-17393 (2)	0.43

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-17317	0.03
P-17318	2.59
P-17319 (1)	2.58
P-17319 (2)	0.03
P-1732	0.1
P-17321	0.01
P-17323	0.02
P-17325	0.01
P-17327	0.04
P-17329	0.06
P-1733 (1)	0.05
P-1733 (2)	0.01
P-17331	0.02
P-17333	0.06
P-17335	0.02
P-17336	0.23
P-17337	0.01
P-17339	0.01
P-1734 (1)	1.92
P-1734 (2)	0.01
P-17341	0.02
P-17343 (1)	0.12
P-17343 (2)	0.01
P-17344	0.27
P-17345	0.03
P-17347	0
P-17349 (1)	0.64
P-17349 (2)	0.06
P-17353	0.02
P-17355	0.01
P-17356	0.01
P-17357 (1)	0.01
P-17357 (2)	0.01
P-17358	0.08
P-17359 (1)	0.08
P-17359 (2)	0
P-17360	0.08
P-17361	0.09
P-17361(1)	0
P-17361(2)	0
P-17362	0.18
P-17363	0.15
P-17365	1.47
P-17367	1.23
P-17368	3.02
P-17369 (1)	5.37
P-17369 (2)	0.04
P-1737 (1)	0.13
P-1737 (2)	0
P-17371	0.06
P-17373	5.63
P-17373(1)	0.02
P-17373(2)	0.06
P-17374	3.3
P-17375	0.14
P-17376	(N/A)
P-17377 (1)	2.35
P-17377 (2)	0.01
P-17379	0.06
P-1738	0.05
P-17382	1.41
P-17383 (1)	0
P-17383 (2)	0.15
P-17386	0
P-17387	0.01
P-17388	0
P-17389	0.33
P-17390	0.07
P-17391	0.23
P-17393 (1)	2.29
P-17393 (2)	0.22

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-17317	0.06
P-17318	4.06
P-17319 (1)	4.05
P-17319 (2)	0.09
P-1732	0.03
P-17321	0.01
P-17323	0.01
P-17325	0.01
P-17327	0.03
P-17329	0.09
P-1733 (1)	0.01
P-1733 (2)	0.01
P-17331	0.02
P-17333	0.09
P-17335	0.02
P-17336	0.76
P-17337	0.01
P-17339	0.01
P-1734 (1)	1
P-1734 (2)	0.01
P-17341	0.02
P-17343 (1)	0.14
P-17343 (2)	0.01
P-17344	0.29
P-17345	0.03
P-17347	0.01
P-17349 (1)	0.73
P-17349 (2)	0.07
P-17353	0.02
P-17355	0.01
P-17356	0.01
P-17357 (1)	0.01
P-17357 (2)	0.01
P-17358	0.11
P-17359 (1)	0.11
P-17359 (2)	0
P-17360	0.1
P-17361	0.13
P-17361(1)	0
P-17361(2)	0
P-17362	0.21
P-17363	0.1
P-17365	1.32
P-17367	1.1
P-17368	3.96
P-17369 (1)	7.22
P-17369 (2)	0.06
P-1737 (1)	0.1
P-1737 (2)	0
P-17371	0.11
P-17373	7.41
P-17373(1)	0.06
P-17373(2)	0.13
P-17374	3.33
P-17375	0.18
P-17376	(N/A)
P-17377 (1)	2.87
P-17377 (2)	0.02
P-17379	0.05
P-1738	0.11
P-17382	2.42
P-17383 (1)	0.01
P-17383 (2)	0.09
P-17386	0
P-17387	0.01
P-17388	0
P-17389	0.44
P-17390	0.2
P-17391	0.71
P-17393 (1)	4.05
P-17393 (2)	0.29

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-17397 (1)	0
P-17397 (2)	1.14
P-17399	1.58
P-17401	0.43
P-17403 (1)	0.14
P-17403 (2)	0
P-17404	0.19
P-17405	0.74
P-17407	0.65
P-17409	0.09
P-17411	0.01
P-17413	0.02
P-17415	0.05
P-17417	0.43
P-17419	0.46
P-17421	0.02
P-17423	0.07
P-17425(1)	0.01
P-17425(2)	0.02
P-17427	0.05
P-17428	1.97
P-17429	0
P-1743	0.01
P-17430	0.89
P-17431	0.34
P-17433	0.34
P-17435	0
P-17437 (1)	0.06
P-17437 (2)	0.02
P-17438	0.24
P-17439	0.01
P-17441 (1)	0.84
P-17441 (2)	0.09
P-17442	1.12
P-17443	0.11
P-17444	0.05
P-17445	0.02
P-17447	0.01
P-17449	0.06
P-1745	0.01
P-17451 (1)	2.45
P-17451 (2)	0.06
P-17453 (1)	0.01
P-17453 (2)	0.11
P-17454	0.03
P-17455 (1)	0.01
P-17455 (2)	0.26
P-17456	0.01
P-17457 (1)	0.01
P-17457 (2)	0.55
P-17458	0.04
P-17459 (1)	0.07
P-17459 (2)	0.41
P-1746	0.05
P-17461	0.03
P-17462	0.07
P-17463	0.05
P-17465	0.09
P-17467 (1)	0.13
P-17467 (2)	0.05
P-17469	0.01
P-17471	0.01
P-17473	0.06
P-17475(1)	0.06
P-17475(2)	0.06
P-17477	0.11
P-17479	0.14
P-17481	0.05
P-17483	0.04
P-17484	0.08
P-17485 (1)	2.26

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-17397 (1)	0.01
P-17397 (2)	0.56
P-17399	0.78
P-17401	0.22
P-17403 (1)	0.14
P-17403 (2)	0.02
P-17404	0.21
P-17405	0.33
P-17407	0.32
P-17409	0.03
P-17411	0.01
P-17413	0.01
P-17415	0.02
P-17417	0.15
P-17419	0.16
P-17421	0.03
P-17423	0.13
P-17425(1)	0.02
P-17425(2)	0.03
P-17427	0.09
P-17428	1.65
P-17429	0.01
P-1743	0.02
P-17430	0.76
P-17431	0.62
P-17433	0.63
P-17435	0.01
P-17437 (1)	0.05
P-17437 (2)	0.03
P-17438	0.19
P-17439	0.01
P-17441 (1)	0.73
P-17441 (2)	0.09
P-17442	0.96
P-17443	0.13
P-17444	0.04
P-17445	0.04
P-17447	0.02
P-17449	0.14
P-1745	0.02
P-17451 (1)	1.26
P-17451 (2)	0.15
P-17453 (1)	0.03
P-17453 (2)	0.13
P-17454	0.04
P-17455 (1)	0.03
P-17455 (2)	0.24
P-17456	0.03
P-17457 (1)	0.03
P-17457 (2)	0.47
P-17458	0.11
P-17459 (1)	0.15
P-17459 (2)	0.36
P-1746	0.05
P-17461	0.04
P-17462	0.1
P-17463	0.03
P-17465	0.03
P-17467 (1)	0.08
P-17467 (2)	0.04
P-17469	0.08
P-17471	0.12
P-17473	0.05
P-17475(1)	0.02
P-17475(2)	0.02
P-17477	0.04
P-17479	0.06
P-17481	0.16
P-17483	0.14
P-17484	0.36
P-17485 (1)	1.2

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-17397 (1)	0.01
P-17397 (2)	0.76
P-17399	1.05
P-17401	0.29
P-17403 (1)	0.09
P-17403 (2)	0.01
P-17404	0.1
P-17405	0.45
P-17407	0.44
P-17409	0.03
P-17411	0.01
P-17413	0.01
P-17415	0.03
P-17417	0.18
P-17419	0.2
P-17421	0.06
P-17423	0.2
P-17425(1)	0.05
P-17425(2)	0.07
P-17427	0.07
P-17428	1.69
P-17429	0.01
P-1743	0.03
P-17430	0.77
P-17431	0.28
P-17433	0.29
P-17435	0.01
P-17437 (1)	0.06
P-17437 (2)	0.04
P-17438	0.19
P-17439	0.01
P-17441 (1)	0.73
P-17441 (2)	0.09
P-17442	0.97
P-17443	0.13
P-17444	0.02
P-17445	0.04
P-17447	0.02
P-17449	0.07
P-1745	0.02
P-17451 (1)	1.4
P-17451 (2)	0.07
P-17453 (1)	0.06
P-17453 (2)	0.13
P-17454	0.08
P-17455 (1)	0.06
P-17455 (2)	0.23
P-17456	0.06
P-17457 (1)	0.06
P-17457 (2)	0.45
P-17458	0.2
P-17459 (1)	0.28
P-17459 (2)	0.35
P-1746	0.01
P-17461	0.04
P-17462	0.17
P-17463	0.05
P-17465	0.05
P-17467 (1)	0.06
P-17467 (2)	0.01
P-17469	0.09
P-17471	0.15
P-17473	0.04
P-17475(1)	0.02
P-17475(2)	0.02
P-17477	0.17
P-17479	0.24
P-17481	0.08
P-17483	0.02
P-17484	0.66
P-17485 (1)	1.15

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-17485 (2)	0.02	P-17485 (2)	0.05	P-17485 (2)	0.05
P-17487	0.03	P-17487	0.08	P-17487	0.08
P-17489	0.04	P-17489	0.12	P-17489	0.11
P-17490	0.21	P-17490	0.21	P-17490	0.39
P-17491	0.11	P-17491	0.24	P-17491	0.45
P-17493	0.38	P-17493	0.41	P-17493	0.14
P-17494	1.92	P-17494	1.43	P-17494	1
P-17495	0.14	P-17495	0.16	P-17495	0.04
P-17497(1)	0.05	P-17497(1)	0.07	P-17497(1)	0.14
P-17497(2)	0.23	P-17497(2)	0.25	P-17497(2)	0.1
P-17499	0	P-17499	0	P-17499	0
P-1750	0	P-1750	0	P-1750	0
P-17501	0.24	P-17501	0.07	P-17501	0.06
P-17503	0.17	P-17503	0.14	P-17503	0.11
P-17505	0.08	P-17505	0.02	P-17505	0.01
P-17507	0.02	P-17507	0.08	P-17507	0.09
P-17509 (1)	0.01	P-17509 (1)	0.03	P-17509 (1)	0.06
P-17509 (2)	0.02	P-17509 (2)	0.1	P-17509 (2)	0.1
P-17510	0	P-17510	0	P-17510	0
P-17511	0.01	P-17511	0.02	P-17511	0.02
P-17512	0.01	P-17512	0.03	P-17512	0.06
P-17513	0.02	P-17513	0.06	P-17513	0.05
P-17515	0.06	P-17515	0.18	P-17515	0.17
P-17517 (1)	0.05	P-17517 (1)	0.17	P-17517 (1)	0.31
P-17517 (2)	0.01	P-17517 (2)	0.04	P-17517 (2)	0.03
P-17519 (1)	0.01	P-17519 (1)	0.03	P-17519 (1)	0.06
P-17519 (2)	0.02	P-17519 (2)	0.11	P-17519 (2)	0.06
P-1752	0	P-1752	0	P-1752	0
P-17521 (1)	0.01	P-17521 (1)	0.03	P-17521 (1)	0.06
P-17521 (2)	0	P-17521 (2)	0.05	P-17521 (2)	0.02
P-17523	0.01	P-17523	0.02	P-17523	0.01
P-17525	0.02	P-17525	0.05	P-17525	0.02
P-17527 (1)	0.05	P-17527 (1)	0.1	P-17527 (1)	0.17
P-17527 (2)	0.02	P-17527 (2)	0.03	P-17527 (2)	0.02
P-17528	0.13	P-17528	0.29	P-17528	0.46
P-17529	0.01	P-17529	0.09	P-17529	0.05
P-17531(1)	0	P-17531(1)	0.07	P-17531(1)	0.05
P-17531(2)	0.01	P-17531(2)	0.05	P-17531(2)	0.02
P-17535	0.25	P-17535	0.57	P-17535	0.33
P-17537	1.78	P-17537	3.12	P-17537	1.76
P-17539 (1)	0	P-17539 (1)	0.01	P-17539 (1)	0.01
P-17539 (2)	1.35	P-17539 (2)	1.57	P-17539 (2)	1.25
P-17540	0.05	P-17540	0.11	P-17540	0.18
P-17541	0.23	P-17541	0.92	P-17541	0.41
P-17543	0.3	P-17543	1.12	P-17543	0.45
P-17545 (1)	0	P-17545 (1)	0.01	P-17545 (1)	0.02
P-17545 (2)	0.07	P-17545 (2)	0.2	P-17545 (2)	0.09
P-17546	0.03	P-17546	0.06	P-17546	0.1
P-17547 (1)	0.16	P-17547 (1)	0.35	P-17547 (1)	0.56
P-17547 (2)	0	P-17547 (2)	0.01	P-17547 (2)	0.01
P-17548	0.08	P-17548	0.19	P-17548	0.29
P-17549	0.04	P-17549	0.09	P-17549	0.08
P-17550	0.06	P-17550	0.14	P-17550	0.22
P-17551	0.16	P-17551	0.14	P-17551	0.12
P-17553	0.2	P-17553	0.71	P-17553	0.67
P-17555	0	P-17555	0.68	P-17555	0.63
P-17556	0.01	P-17556	0.02	P-17556	0.03
P-17557	0.04	P-17557	0.05	P-17557	0.04
P-17559	0.04	P-17559	0.05	P-17559	0.04
P-17560	0.05	P-17560	0.2	P-17560	0.3
P-17561	0.12	P-17561	0.22	P-17561	0.19
P-17563	0.13	P-17563	0.22	P-17563	0.19
P-17565	0.16	P-17565	0.08	P-17565	0.04
P-17567	0.58	P-17567	0.19	P-17567	0.15
P-17569	0.4	P-17569	0.34	P-17569	0.12
P-17571	0.04	P-17571	0.22	P-17571	0.05
P-17573	0	P-17573	0	P-17573	0
P-17575	0.03	P-17575	0.02	P-17575	0.03
P-17576	0.01	P-17576	0.01	P-17576	0.01
P-17577 (1)	0.01	P-17577 (1)	0.01	P-17577 (1)	0.01
P-17577 (2)	0.03	P-17577 (2)	0.05	P-17577 (2)	0.06

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-17579	0.06	P-17579	0.06	P-17579	0.08
P-1758	1.08	P-1758	1.11	P-1758	0.95
P-17581	0.08	P-17581	0.02	P-17581	0.06
P-17583	0.01	P-17583	0.01	P-17583	0.01
P-17584	0.08	P-17584	0.02	P-17584	0.02
P-17585	0.19	P-17585	0.04	P-17585	0.13
P-17587	0.28	P-17587	0.06	P-17587	0.18
P-17589	0.02	P-17589	0.01	P-17589	0.05
P-1759	1.09	P-1759	1.12	P-1759	0.94
P-17591	0.02	P-17591	0.02	P-17591	0.05
P-17595	0.01	P-17595	0.03	P-17595	0.06
P-17597	0.05	P-17597	0.02	P-17597	0.02
P-17599	0.08	P-17599	0.04	P-17599	0.04
P-17601	0.17	P-17601	0.09	P-17601	0.11
P-17603	0.2	P-17603	0.11	P-17603	0.12
P-17605	0.04	P-17605	0.02	P-17605	0.04
P-17607	0.04	P-17607	0.01	P-17607	0.04
P-17609	0.04	P-17609	0.05	P-17609	0.08
P-1761	1.31	P-1761	1.36	P-1761	0.86
P-17611	0.04	P-17611	0.05	P-17611	0.08
P-17613	0.01	P-17613	0.01	P-17613	0.01
P-17615	0.03	P-17615	0.03	P-17615	0.03
P-17617	0.2	P-17617	0.12	P-17617	0.13
P-17619	0.22	P-17619	0.14	P-17619	0.14
P-1762	1.31	P-1762	1.36	P-1762	0.86
P-17621	0.06	P-17621	0.01	P-17621	0.02
P-17623 (1)	0.05	P-17623 (1)	0.06	P-17623 (1)	0.06
P-17623 (2)	0.06	P-17623 (2)	0.01	P-17623 (2)	0.03
P-17625	0.01	P-17625	0.01	P-17625	0.01
P-17627	0.01	P-17627	0.02	P-17627	0.02
P-17629	0.09	P-17629	0.01	P-17629	0.01
P-17630	0	P-17630	0	P-17630	0
P-17631 (1)	0	P-17631 (1)	0	P-17631 (1)	0
P-17631 (2)	0.18	P-17631 (2)	0.04	P-17631 (2)	0.02
P-17633	0.09	P-17633	0.1	P-17633	0.14
P-17635	0.02	P-17635	0.07	P-17635	0.12
P-17637 (1)	0.03	P-17637 (1)	0.01	P-17637 (1)	0.02
P-17637 (2)	0.06	P-17637 (2)	0.04	P-17637 (2)	0.04
P-17638	0.2	P-17638	0.25	P-17638	0.27
P-17639	0.08	P-17639	0.09	P-17639	0.08
P-17640	0.02	P-17640	0.02	P-17640	0.02
P-17641(1)	0.03	P-17641(1)	0.15	P-17641(1)	0.12
P-17641(2)	0.04	P-17641(2)	0.1	P-17641(2)	0.09
P-17643	0.04	P-17643	0.07	P-17643	0.06
P-17645 (1)	0.07	P-17645 (1)	0.38	P-17645 (1)	0.38
P-17645 (2)	0.05	P-17645 (2)	0.04	P-17645 (2)	0.04
P-17647	0.04	P-17647	0.03	P-17647	0.03
P-17648	0.01	P-17648	0.02	P-17648	0.02
P-17649	0.11	P-17649	0.06	P-17649	0.06
P-17651	0.1	P-17651	0.05	P-17651	0.05
P-17652	0.01	P-17652	0.01	P-17652	0.01
P-17653	0.07	P-17653	0.06	P-17653	0.06
P-17655	0.14	P-17655	0.13	P-17655	0.1
P-17656	0.01	P-17656	0.01	P-17656	0.01
P-17657	0.02	P-17657	0.01	P-17657	0.01
P-17659	0.05	P-17659	0.06	P-17659	0.05
P-17661	0.01	P-17661	0.01	P-17661	0.01
P-17662	0.01	P-17662	0.01	P-17662	0.01
P-17663	0.47	P-17663	0.48	P-17663	1.23
P-17665	0	P-17665	0	P-17665	0
P-17667	0.29	P-17667	0.11	P-17667	0.14
P-17669	0.98	P-17669	0.27	P-17669	0.2
P-17670	0.01	P-17670	0.01	P-17670	0.01
P-17671	0.03	P-17671	0.06	P-17671	0.07
P-17671(1)	0.8	P-17671(1)	0.3	P-17671(1)	0.07
P-17671(2)	0.77	P-17671(2)	0.28	P-17671(2)	0.07
P-17672	0.01	P-17672	0.01	P-17672	0.01
P-17673	0.03	P-17673	0.01	P-17673	0.03
P-17675	0.12	P-17675	0.25	P-17675	0.26
P-17677	0.02	P-17677	0.11	P-17677	0.07
P-17679	0.06	P-17679	0.27	P-17679	0.17

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-17681	0.02	P-17681	0.01	P-17681	0.07
P-17683 (1)	1.27	P-17683 (1)	0.36	P-17683 (1)	0.48
P-17683 (2)	0.02	P-17683 (2)	0.01	P-17683 (2)	0.06
P-17685	0.01	P-17685	0.02	P-17685	0.06
P-17686	0.06	P-17686	0.05	P-17686	0.11
P-17687	0.01	P-17687	0.03	P-17687	0.06
P-17688	0.01	P-17688	0.01	P-17688	0.02
P-17689 (1)	0	P-17689 (1)	0.01	P-17689 (1)	0.01
P-17689 (2)	0.01	P-17689 (2)	0.02	P-17689 (2)	0.03
P-1769	0.27	P-1769	0.36	P-1769	0.42
P-17690	0	P-17690	0.01	P-17690	0.01
P-17691 (1)	0	P-17691 (1)	0.01	P-17691 (1)	0.01
P-17691 (2)	0.01	P-17691 (2)	0.02	P-17691 (2)	0.03
P-17693	0.04	P-17693	0	P-17693	0.02
P-17694	0.07	P-17694	0.06	P-17694	0.11
P-17695	0.04	P-17695	0.01	P-17695	0.02
P-17697	0.02	P-17697	0.07	P-17697	0.16
P-17699 (1)	0	P-17699 (1)	0.01	P-17699 (1)	0.01
P-17699 (2)	0.12	P-17699 (2)	0.07	P-17699 (2)	0.19
P-17701	0.16	P-17701	0.12	P-17701	0.13
P-17702	0.04	P-17702	0.04	P-17702	0.06
P-17703 (1)	0.04	P-17703 (1)	0.03	P-17703 (1)	0.08
P-17703 (2)	0.05	P-17703 (2)	0.05	P-17703 (2)	0.14
P-17705 (1)	0.06	P-17705 (1)	0.06	P-17705 (1)	0.09
P-17705 (2)	0.1	P-17705 (2)	0.07	P-17705 (2)	0.07
P-17706	0.07	P-17706	0.05	P-17706	0.12
P-17707	0.09	P-17707	0.07	P-17707	0.07
P-17709	0.19	P-17709	0.07	P-17709	0.07
P-1771	0.35	P-1771	0.48	P-1771	0.72
P-17711	0.19	P-17711	0.07	P-17711	0.07
P-17713	0.06	P-17713	0.04	P-17713	0.04
P-17715	0.07	P-17715	0.05	P-17715	0.05
P-17717	0.17	P-17717	0.05	P-17717	0.06
P-17719	0.18	P-17719	0.05	P-17719	0.06
P-17721(1)	0.11	P-17721(1)	0.25	P-17721(1)	0.21
P-17721(2)	0.11	P-17721(2)	0.25	P-17721(2)	0.21
P-17723 (1)	0.03	P-17723 (1)	0.03	P-17723 (1)	0.03
P-17723 (2)	0.07	P-17723 (2)	0.15	P-17723 (2)	0.19
P-17725	0.17	P-17725	0.13	P-17725	0.19
P-17726	0.06	P-17726	0.04	P-17726	0.02
P-17727 (1)	0.18	P-17727 (1)	0.15	P-17727 (1)	0.19
P-17727 (2)	0.13	P-17727 (2)	0.06	P-17727 (2)	0.21
P-17729	0.08	P-17729	0.05	P-17729	0.05
P-17731	0.13	P-17731	0.07	P-17731	0.08
P-17733 (1)	0	P-17733 (1)	0.01	P-17733 (1)	0.01
P-17733 (2)	0.01	P-17733 (2)	0.02	P-17733 (2)	0.02
P-17734	0	P-17734	0.01	P-17734	0.01
P-17735 (1)	0	P-17735 (1)	0.01	P-17735 (1)	0.01
P-17735 (2)	0.05	P-17735 (2)	0.01	P-17735 (2)	0.01
P-17737	0.03	P-17737	0.01	P-17737	0.02
P-17738	0	P-17738	0	P-17738	0
P-17739	0.02	P-17739	0.02	P-17739	0.03
P-1774	0.01	P-1774	0.01	P-1774	0.01
P-17740	5.57	P-17740	2.42	P-17740	3.49
P-17741	0.04	P-17741	0.04	P-17741	0.05
P-17742	0.15	P-17742	0.06	P-17742	0.09
P-17743	0.05	P-17743	0.05	P-17743	0.06
P-17745	0.34	P-17745	0.2	P-17745	0.22
P-17747	0.38	P-17747	0.2	P-17747	0.22
P-17748	0.17	P-17748	0.24	P-17748	0.28
P-17749	0.01	P-17749	0.03	P-17749	0.03
P-1775	0.07	P-1775	0.07	P-1775	0.09
P-17753	0.04	P-17753	0.02	P-17753	0.03
P-17755	0.04	P-17755	0.01	P-17755	0.01
P-17756	0.73	P-17756	0.16	P-17756	0.41
P-17757 (1)	0.68	P-17757 (1)	0.05	P-17757 (1)	0.2
P-17757 (2)	0.05	P-17757 (2)	0.09	P-17757 (2)	0.1
P-17758	0.01	P-17758	0.02	P-17758	0.03
P-17759	0.05	P-17759	0.06	P-17759	0.06
P-1776	0.47	P-1776	0.68	P-1776	1.08
P-17760	0.01	P-17760	0.02	P-17760	0.03

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
P-17761 (1)	0.01
P-17761 (2)	0.02
P-17762	0.72
P-17763	0.01
P-17765	0
P-17767	0.01
P-17769	0.09
P-1777	0.44
P-17771 (1)	0.01
P-17771 (2)	0.09
P-17773	0.01
P-17775	0.01
P-17779	0.03
P-17781(1)	0.04
P-17781(2)	0.04
P-17783	0.03
P-17785	0.01
P-17787	0.04
P-17789	0.02
P-17791	0.01
P-17792	0
P-17793	0.03
P-17795	0.05
P-17797 (1)	0.27
P-17797 (2)	0.04
P-17798	0.11
P-17799	0.06
P-17801	0.01
P-17803	0
P-17805	0.02
P-17807	0.04
P-17809	0.03
P-17811	0.03
P-17813	0.1
P-17815	0.1
P-17817	0.1
P-17819	0.17
P-17821	0.18
P-17823	0.26
P-17829	0.08
P-17831	0.08
P-17833	0.02
P-17835	0.02
P-17837	0
P-17839	0
P-17841	0.02
P-17843	0.03
P-17845	0.03
P-17847	0.04
P-17849	0.12
P-17851	0.12
P-17853	0.17
P-17855	0.17
P-17857 (1)	0
P-17857 (2)	0.3
P-17859	0.46
P-17861	0.4
P-17863	0.56
P-17865	0.39
P-17871	1.47
P-17873	0.09
P-17875	0.11
P-17876	0
P-17877 (1)	0.02
P-17877 (2)	0.08
P-17878	0.01
P-17879	0.1
P-1788	0.04
P-17881	0.08
P-17883	0.05
P-17885	0.09

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-17761 (1)	0.02
P-17761 (2)	0.01
P-17762	0.12
P-17763	0.01
P-17765	0.01
P-17767	0.01
P-17769	0.05
P-1777	0.63
P-17771 (1)	0.03
P-17771 (2)	0.04
P-17773	0.04
P-17775	0.04
P-17779	0.01
P-17781(1)	0.05
P-17781(2)	0.05
P-17783	0.04
P-17785	0.01
P-17787	0.02
P-17789	0.03
P-17791	0.03
P-17792	0
P-17793	0.04
P-17795	0.05
P-17797 (1)	0.29
P-17797 (2)	0.03
P-17798	0.56
P-17799	0.04
P-17801	0.01
P-17803	0.01
P-17805	0.02
P-17807	0.03
P-17809	0.03
P-17811	0.11
P-17813	0.06
P-17815	0.03
P-17817	0.04
P-17819	0.04
P-17821	0.05
P-17823	0.07
P-17829	0.05
P-17831	0.05
P-17833	0.12
P-17835	0.06
P-17837	0.01
P-17839	0.06
P-17841	0.03
P-17843	0.03
P-17845	0
P-17847	0
P-17849	0.02
P-17851	0.02
P-17853	0.04
P-17855	0.05
P-17857 (1)	0
P-17857 (2)	0.26
P-17859	0.19
P-17861	0.4
P-17863	0.48
P-17865	0.1
P-17871	0.39
P-17873	0.18
P-17875	0.16
P-17876	0
P-17877 (1)	0.04
P-17877 (2)	0.07
P-17878	0.01
P-17879	0.08
P-1788	0.07
P-17881	0.04
P-17883	0.02
P-17885	0.02

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-17761 (1)	0.03
P-17761 (2)	0.01
P-17762	0.35
P-17763	0.02
P-17765	0.02
P-17767	0.02
P-17769	0.05
P-1777	1.04
P-17771 (1)	0.04
P-17771 (2)	0.04
P-17773	0.05
P-17775	0.04
P-17779	0.01
P-17781(1)	0.05
P-17781(2)	0.05
P-17783	0.04
P-17785	0.01
P-17787	0.02
P-17789	0.01
P-17791	0.03
P-17792	0
P-17793	0.06
P-17795	0.01
P-17797 (1)	0.46
P-17797 (2)	0.02
P-17798	0.74
P-17799	0.03
P-17801	0.02
P-17803	0.01
P-17805	0.01
P-17807	0.01
P-17809	0.01
P-17811	0.05
P-17813	0.06
P-17815	0.03
P-17817	0.1
P-17819	0.09
P-17821	0.09
P-17823	0.11
P-17829	0.12
P-17831	0.12
P-17833	0.12
P-17835	0.06
P-17837	0.01
P-17839	0.05
P-17841	0.03
P-17843	0.04
P-17845	0
P-17847	0.01
P-17849	0.02
P-17851	0.03
P-17853	0.1
P-17855	0.11
P-17857 (1)	0
P-17857 (2)	0.3
P-17859	0.19
P-17861	0.44
P-17863	0.56
P-17865	0.19
P-17871	0.71
P-17873	0.18
P-17875	0.17
P-17876	0
P-17877 (1)	0.04
P-17877 (2)	0.03
P-17878	0.01
P-17879	0.04
P-1788	0.03
P-17881	0.01
P-17883	0.01
P-17885	0.01

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-17887	0.11
P-17889	0.05
P-17891	0.08
P-17893(1)	0.54
P-17893(2)	0.44
P-17894	0
P-17895	0.47
P-17897 (1)	0
P-17897 (2)	0.06
P-17898	0
P-17899 (1)	0
P-17899 (2)	0.06
P-17900	0.01
P-17901	0.13
P-17903	0.13
P-17905	0
P-17907(1)	0
P-17907(2)	0.02
P-17909	0.04
P-17911	0.04
P-17913	0.16
P-17915	0.02
P-17916	0.01
P-17917 (1)	0.03
P-17917 (2)	0.03
P-17919	0.16
P-17921	0.38
P-17923	0.33
P-17925	0.16
P-17926	0
P-17929 (1)	0.02
P-17929 (2)	1.13
P-17931	0.78
P-17933	0.17
P-17935 (1)	0.01
P-17935 (2)	0.18
P-17937	1.08
P-17939	0
P-1794	0.01
P-17940	0
P-17941	0.25
P-17943	1.08
P-17945	0.02
P-17947	0.02
P-17949(1)	0.06
P-17949(2)	0.05
P-17951 (1)	0.08
P-17951 (2)	0.01
P-17953	0.03
P-17954	0
P-17955 (1)	0.01
P-17955 (2)	0.04
P-17957	0.04
P-17959	0.03
P-17961	0.05
P-17963 (1)	0
P-17963 (2)	0.03
P-17964	0
P-17965	0
P-17967 (1)	0.22
P-17967 (2)	0.01
P-17969	0.13
P-17971	0.12
P-17973	0.08
P-17975	0.07
P-17977	0.12
P-17979	0.01
P-17981	0.13
P-17983	0
P-17984	0
P-17985 (1)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-17887	0.04
P-17889	0.02
P-17891	0.03
P-17893(1)	0.44
P-17893(2)	0.47
P-17894	0
P-17895	0.5
P-17897 (1)	0
P-17897 (2)	0.25
P-17898	0
P-17899 (1)	0
P-17899 (2)	0.17
P-17900	0.02
P-17901	0.03
P-17903	0.09
P-17905	0.02
P-17907(1)	0.03
P-17907(2)	0.01
P-17909	0.02
P-17911	0.02
P-17913	0.17
P-17915	0.12
P-17916	0.02
P-17917 (1)	0.08
P-17917 (2)	0.41
P-17919	0.64
P-17921	0.08
P-17923	0.07
P-17925	0.07
P-17926	0.02
P-17929 (1)	0.1
P-17929 (2)	0.79
P-17931	0.61
P-17933	0.05
P-17935 (1)	0.01
P-17935 (2)	0.16
P-17937	0.29
P-17939	0
P-1794	0.05
P-17940	0
P-17941	0.22
P-17943	0.29
P-17945	0.14
P-17947	0.24
P-17949(1)	0.55
P-17949(2)	0.58
P-17951 (1)	0.06
P-17951 (2)	0.91
P-17953	0.07
P-17954	0
P-17955 (1)	0.02
P-17955 (2)	0.1
P-17957	0.14
P-17959	0.11
P-17961	0.04
P-17963 (1)	0
P-17963 (2)	0.04
P-17964	0
P-17965	0.04
P-17967 (1)	0.33
P-17967 (2)	0.03
P-17969	0.08
P-17971	0.05
P-17973	0.05
P-17975	0.02
P-17977	0.02
P-17979	0.02
P-17981	0.11
P-17983	0.11
P-17984	0
P-17985 (1)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-17887	0.01
P-17889	0.03
P-17891	0.02
P-17893(1)	0.35
P-17893(2)	0.42
P-17894	0
P-17895	0.47
P-17897 (1)	0
P-17897 (2)	0.15
P-17898	0
P-17899 (1)	0
P-17899 (2)	0.11
P-17900	0.03
P-17901	0.07
P-17903	0.04
P-17905	0.03
P-17907(1)	0.04
P-17907(2)	0.05
P-17909	0.08
P-17911	0.07
P-17913	0.13
P-17915	0.06
P-17916	0.03
P-17917 (1)	0.07
P-17917 (2)	0.24
P-17919	0.42
P-17921	0.19
P-17923	0.19
P-17925	0.17
P-17926	0.02
P-17929 (1)	0.1
P-17929 (2)	1.72
P-17931	1.41
P-17933	0.08
P-17935 (1)	0.01
P-17935 (2)	0.39
P-17937	0.52
P-17939	0
P-1794	0.02
P-17940	0
P-17941	0.61
P-17943	0.52
P-17945	0.09
P-17947	0.24
P-17949(1)	0.35
P-17949(2)	0.38
P-17951 (1)	0.12
P-17951 (2)	0.69
P-17953	0.08
P-17954	0
P-17955 (1)	0.03
P-17955 (2)	0.08
P-17957	0.02
P-17959	0.01
P-17961	0.05
P-17963 (1)	0
P-17963 (2)	0.05
P-17964	0
P-17965	0.04
P-17967 (1)	0.76
P-17967 (2)	0.03
P-17969	0.18
P-17971	0.15
P-17973	0.1
P-17975	0.07
P-17977	0.02
P-17979	0.02
P-17981	0.05
P-17983	0.02
P-17984	0
P-17985 (1)	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-17985 (2)	0.04	P-17985 (2)	0.03	P-17985 (2)	0.09
P-17986	0.11	P-17986	0.17	P-17986	0.38
P-17987	0.05	P-17987	0.04	P-17987	0.11
P-17989	0.1	P-17989	0.07	P-17989	0.18
P-17993	0.02	P-17993	0.01	P-17993	0.02
P-17995	0.04	P-17995	0.03	P-17995	0.03
P-17997	0.02	P-17997	0.01	P-17997	0.02
P-17999	0.01	P-17999	0.02	P-17999	0.01
P-18	0.04	P-18	0.11	P-18	0.11
P-18001	0.34	P-18001	0.07	P-18001	0.07
P-18003	0.26	P-18003	0.05	P-18003	0.07
P-18005	0.09	P-18005	0.04	P-18005	0.09
P-18007	0.01	P-18007	0.01	P-18007	0.01
P-18009	0.02	P-18009	0.03	P-18009	0.05
P-18011	0.04	P-18011	0.09	P-18011	0.1
P-18012	0.23	P-18012	0.22	P-18012	0.73
P-18013 (1)	0.26	P-18013 (1)	0.64	P-18013 (1)	2.12
P-18013 (2)	0.1	P-18013 (2)	0.25	P-18013 (2)	0.19
P-18014	0.26	P-18014	0.64	P-18014	2.12
P-18015	0.08	P-18015	0.18	P-18015	0.14
P-18016	0.37	P-18016	0.83	P-18016	2.57
P-18017 (1)	0.41	P-18017 (1)	0.88	P-18017 (1)	2.78
P-18017 (2)	0.04	P-18017 (2)	0.06	P-18017 (2)	0.06
P-18018	0.41	P-18018	0.88	P-18018	2.78
P-18019 (1)	0.41	P-18019 (1)	0.88	P-18019 (1)	2.78
P-18019 (2)	0.02	P-18019 (2)	0.03	P-18019 (2)	0.03
P-18021	0.02	P-18021	0.03	P-18021	0.03
P-18022	0.41	P-18022	0.88	P-18022	2.78
P-18023	0.41	P-18023	0.88	P-18023	2.78
P-18024	0.41	P-18024	0.88	P-18024	2.78
P-18025 (1)	0.41	P-18025 (1)	0.88	P-18025 (1)	2.78
P-18025 (2)	0.06	P-18025 (2)	0.05	P-18025 (2)	0.07
P-18026	0.41	P-18026	0.88	P-18026	2.78
P-18027	0.05	P-18027	0.04	P-18027	0.09
P-18029	0.09	P-18029	0.07	P-18029	0.04
P-18031	0.09	P-18031	0.09	P-18031	0.06
P-18033	0.2	P-18033	0.11	P-18033	0.26
P-18035	0.19	P-18035	0.11	P-18035	0.24
P-18036	0.01	P-18036	0.02	P-18036	0.01
P-18037	0.06	P-18037	0.03	P-18037	0.01
P-18039	0.07	P-18039	0.04	P-18039	0.03
P-18041	0.06	P-18041	0.04	P-18041	0.03
P-18043	0.06	P-18043	0.04	P-18043	0.03
P-18045	0.53	P-18045	0.18	P-18045	0.28
P-18047	0.51	P-18047	0.19	P-18047	0.27
P-18049	0.08	P-18049	0.06	P-18049	0.17
P-18051 (1)	0	P-18051 (1)	0.02	P-18051 (1)	0.02
P-18051 (2)	0.06	P-18051 (2)	0.05	P-18051 (2)	0.13
P-18053	0.1	P-18053	0.07	P-18053	0.19
P-18055	0.08	P-18055	0.05	P-18055	0.15
P-18057	0.27	P-18057	0.41	P-18057	0.72
P-18059	0	P-18059	0.01	P-18059	0.01
P-18061	0.37	P-18061	0.59	P-18061	1.07
P-18063	0.11	P-18063	0.19	P-18063	0.35
P-18064	0	P-18064	0.01	P-18064	0.01
P-18065	0.05	P-18065	0.05	P-18065	0.07
P-18067	0.04	P-18067	0.04	P-18067	0.07
P-18068	0	P-18068	0.01	P-18068	0.01
P-18069	0.13	P-18069	0.31	P-18069	0.28
P-18071	0.77	P-18071	0.3	P-18071	0.39
P-18072	0.77	P-18072	0.3	P-18072	0.39
P-18073	0.01	P-18073	0.01	P-18073	0.02
P-18074	0.01	P-18074	0.03	P-18074	0.04
P-18075	0.98	P-18075	0.19	P-18075	0.28
P-18077	1.33	P-18077	0.69	P-18077	0.87
P-18079(1)	2.32	P-18079(1)	0.87	P-18079(1)	1.14
P-18079(2)	2.32	P-18079(2)	0.87	P-18079(2)	1.17
P-18081	0.05	P-18081	0.13	P-18081	0.03
P-18082	0.19	P-18082	0.95	P-18082	1.27
P-18083	0.04	P-18083	0.09	P-18083	0.06
P-18085	0.1	P-18085	0.26	P-18085	0.21

Pipe Label	EXISTING SYSTEM Total Volume (MG)	Pipe Label	2030 SYSTEM Total Volume (MG)	Pipe Label	2070 SYSTEM Total Volume (MG)
P-18087	0.09	P-18087	0.22	P-18087	0.18
P-18089	0.07	P-18089	0.33	P-18089	0.28
P-18091	0.08	P-18091	0.42	P-18091	0.37
P-18093	0.03	P-18093	0.08	P-18093	0.09
P-18095	0.01	P-18095	0.01	P-18095	0.01
P-18097	0.03	P-18097	0.06	P-18097	0.08
P-18099	0.03	P-18099	0.08	P-18099	0.09
P-181	0.11	P-181	0.12	P-181	0.17
P-18101	0.03	P-18101	0.07	P-18101	0.06
P-18103	0.04	P-18103	0.09	P-18103	0.07
P-18105	0.02	P-18105	0.06	P-18105	0.06
P-18107 (1)	0.03	P-18107 (1)	0.04	P-18107 (1)	0.05
P-18107 (2)	0.03	P-18107 (2)	0.08	P-18107 (2)	0.03
P-18111	0.41	P-18111	1.02	P-18111	0.78
P-18113	0.27	P-18113	0.18	P-18113	0.16
P-18115	0.22	P-18115	0.14	P-18115	0.13
P-18117	0.2	P-18117	0.13	P-18117	0.12
P-18119	0.15	P-18119	0.1	P-18119	0.09
P-1812	0.03	P-1812	0.04	P-1812	0.08
P-18121	0.04	P-18121	0.09	P-18121	0.08
P-18123	0.03	P-18123	0.06	P-18123	0.05
P-18125	0.08	P-18125	0.2	P-18125	0.15
P-18127	0.15	P-18127	0.36	P-18127	0.27
P-18129	0.14	P-18129	0.17	P-18129	0.34
P-18131	0.14	P-18131	0.27	P-18131	0.54
P-18133	0.07	P-18133	0.07	P-18133	0.15
P-18135	0.02	P-18135	0.05	P-18135	0.07
P-18137	0.01	P-18137	0.01	P-18137	0.02
P-18139	0.03	P-18139	0.04	P-18139	0.06
P-18145	0.05	P-18145	0.03	P-18145	0.03
P-18147	0.01	P-18147	0.02	P-18147	0.02
P-18149	0.61	P-18149	0.36	P-18149	0.33
P-18151 (1)	0	P-18151 (1)	0	P-18151 (1)	0
P-18151 (2)	0.57	P-18151 (2)	0.35	P-18151 (2)	0.32
P-18153	0.01	P-18153	0.01	P-18153	0.01
P-18155 (1)	0.01	P-18155 (1)	0	P-18155 (1)	0
P-18155 (2)	0.01	P-18155 (2)	0.01	P-18155 (2)	0.01
P-18157	0.04	P-18157	0.06	P-18157	0.06
P-18159	0.05	P-18159	0.06	P-18159	0.07
P-18161	0.03	P-18161	0.06	P-18161	0.07
P-18163	0.06	P-18163	0.04	P-18163	0.05
P-18165	0.59	P-18165	0.19	P-18165	0.28
P-18167	0.56	P-18167	0.2	P-18167	0.29
P-18169	0.02	P-18169	0.02	P-18169	0.01
P-18171	0.02	P-18171	0.02	P-18171	0.02
P-18173	0.01	P-18173	0.09	P-18173	0.08
P-18175	0.01	P-18175	0.06	P-18175	0.06
P-18177	0.07	P-18177	0.06	P-18177	0.12
P-18178	0.55	P-18178	0.36	P-18178	0.48
P-18179	0.06	P-18179	0.06	P-18179	0.11
P-1818(1)(1)	0.23	P-1818(1)(1)	0.3	P-1818(1)(1)	0.39
P-1818(1)(2)	0.23	P-1818(1)(2)	0.3	P-1818(1)(2)	0.39
P-1818(2)	0.3	P-1818(2)	0.42	P-1818(2)	0.46
P-18181	0.01	P-18181	0.03	P-18181	0.01
P-18183 (1)	0.55	P-18183 (1)	0.36	P-18183 (1)	0.49
P-18183 (2)	0	P-18183 (2)	0.03	P-18183 (2)	0.01
P-18185	0.04	P-18185	0.07	P-18185	0.08
P-18187	0.08	P-18187	0.15	P-18187	0.16
P-18189	0.04	P-18189	0.07	P-18189	0.08
P-18191	0	P-18191	0	P-18191	0
P-18193	1.28	P-18193	0.69	P-18193	0.98
P-18195	1.08	P-18195	0.52	P-18195	0.75
P-18197	0.04	P-18197	0.09	P-18197	0.11
P-18199	0.16	P-18199	0.08	P-18199	0.12
P-18202	0.99	P-18202	2.41	P-18202	0.53
P-18203 (1)	0.99	P-18203 (1)	2.41	P-18203 (1)	0.53
P-18203 (2)	0.03	P-18203 (2)	0.03	P-18203 (2)	0.04
P-18205	0	P-18205	0	P-18205	0
P-18206	0.56	P-18206	2.4	P-18206	0.53
P-18207 (1)	0.59	P-18207 (1)	2.21	P-18207 (1)	0
P-18207 (2)	0.03	P-18207 (2)	0.03	P-18207 (2)	0.04

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-18208	0.59	P-18208	2.21	P-18208	0
P-18209	0	P-18209	0	P-18209	0
P-1821	0.14	P-1821	0.19	P-1821	0.27
P-18211	0.14	P-18211	0.04	P-18211	0.07
P-18213 (1)	0.59	P-18213 (1)	1.89	P-18213 (1)	2.03
P-18213 (2)	0.26	P-18213 (2)	0.1	P-18213 (2)	0.19
P-18214	0.59	P-18214	1.89	P-18214	2.03
P-18215 (1)	0.59	P-18215 (1)	1.89	P-18215 (1)	2.03
P-18215 (2)	0.12	P-18215 (2)	0.08	P-18215 (2)	0.12
P-18217	0.2	P-18217	0.05	P-18217	0.1
P-18219	0.31	P-18219	0.08	P-18219	0.16
P-18220	0.59	P-18220	1.89	P-18220	2.03
P-18221 (1)	0.59	P-18221 (1)	1.89	P-18221 (1)	2.03
P-18221 (2)	0.68	P-18221 (2)	0.18	P-18221 (2)	0.33
P-18222	0.59	P-18222	1.89	P-18222	2.03
P-18223 (1)	0.28	P-18223 (1)	1.27	P-18223 (1)	1.42
P-18223 (2)	0.58	P-18223 (2)	0.15	P-18223 (2)	0.27
P-18224	0.28	P-18224	1.27	P-18224	1.42
P-18225 (1)	0.28	P-18225 (1)	1.27	P-18225 (1)	1.42
P-18225 (2)	0.1	P-18225 (2)	0.15	P-18225 (2)	0.15
P-18226	0.28	P-18226	1.27	P-18226	1.42
P-18227	0.09	P-18227	0.14	P-18227	0.13
P-18229	0.01	P-18229	0.02	P-18229	0.02
P-1823	0.32	P-1823	0.43	P-1823	0.64
P-18231 (1)	0.99	P-18231 (1)	2.41	P-18231 (1)	0.54
P-18231 (2)	0.01	P-18231 (2)	0.03	P-18231 (2)	0.03
P-18232	0.99	P-18232	2.41	P-18232	0.53
P-18233 (1)	0.99	P-18233 (1)	2.41	P-18233 (1)	0.53
P-18233 (2)	0	P-18233 (2)	0	P-18233 (2)	0.01
P-18234	0.98	P-18234	2.4	P-18234	0.53
P-18235	0.01	P-18235	0.02	P-18235	0.03
P-18237	0.02	P-18237	0.04	P-18237	0.04
P-18239	0.04	P-18239	0.06	P-18239	0.08
P-18241	0.01	P-18241	0.03	P-18241	0.03
P-18244	0.01	P-18244	0	P-18244	0
P-18246	0.28	P-18246	0.53	P-18246	0.6
P-18247	0	P-18247	0	P-18247	0
P-18249	0.05	P-18249	0.03	P-18249	0.03
P-18251	0.02	P-18251	0.03	P-18251	0.03
P-18253	0.09	P-18253	0.08	P-18253	0.09
P-18254	0.08	P-18254	0.03	P-18254	0.04
P-18255	0.13	P-18255	0.13	P-18255	0.15
P-18257	0.26	P-18257	0.23	P-18257	0.25
P-18259(1)	0.33	P-18259(1)	0.28	P-18259(1)	0.3
P-18259(2)	0.16	P-18259(2)	0.18	P-18259(2)	0.23
P-18261	0.17	P-18261	0.11	P-18261	0.07
P-18263	0.07	P-18263	0.05	P-18263	0.05
P-18265	0	P-18265	0	P-18265	0
P-18267	0.26	P-18267	0.28	P-18267	0.31
P-18269	0.26	P-18269	0.28	P-18269	0.31
P-18270	0.01	P-18270	0.03	P-18270	0.03
P-18273	0.09	P-18273	0.04	P-18273	0.06
P-18275	0.26	P-18275	0.09	P-18275	0.14
P-18277	0.05	P-18277	0.03	P-18277	0.04
P-18278	0	P-18278	0	P-18278	0
P-18279 (1)	0	P-18279 (1)	0	P-18279 (1)	0
P-18279 (2)	0.12	P-18279 (2)	0.02	P-18279 (2)	0.05
P-18281	0.02	P-18281	0.01	P-18281	0.01
P-18283 (1)	0	P-18283 (1)	0	P-18283 (1)	0
P-18283 (2)	0.02	P-18283 (2)	0.02	P-18283 (2)	0.02
P-18285	0.03	P-18285	0.06	P-18285	0.06
P-18287	0.03	P-18287	0.05	P-18287	0.05
P-18289 (1)	0	P-18289 (1)	0.01	P-18289 (1)	0.01
P-18289 (2)	0	P-18289 (2)	0	P-18289 (2)	0
P-1829	0	P-1829	0	P-1829	0
P-18291	0.12	P-18291	0.05	P-18291	0.15
P-18293	0.29	P-18293	0.11	P-18293	0.4
P-18295	0.17	P-18295	0.08	P-18295	0.25
P-18297	0.15	P-18297	0.41	P-18297	0.45
P-18298	0	P-18298	0.01	P-18298	0.01
P-18299	0.07	P-18299	0.12	P-18299	0.07

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-1830	0
P-18300	0.02
P-18301	0.01
P-18303	0.08
P-18305	0.03
P-18306	0.03
P-18307	0.01
P-18309	0.08
P-1831	0.07
P-18310	0.06
P-18311	0.08
P-18313	0
P-18315	0.01
P-18317	0.01
P-18319	0.02
P-1832	0.01
P-18321	0
P-18323 (1)	0.01
P-18323 (2)	0.42
P-18325 (1)	0.04
P-18325 (2)	0.94
P-18326	0.04
P-18327 (1)	0.08
P-18327 (2)	1.25
P-18329	0.31
P-1833	0.07
P-18331	0.01
P-18333	0.18
P-18335	0.48
P-18337	0
P-18338	0.07
P-18339	0.01
P-18339(1)	0.05
P-18339(2)	0.01
P-1834(1)	0.03
P-1834(2)	0.07
P-18341	0.32
P-18345	0.12
P-18347	0.01
P-18349	0.19
P-1835	0.18
P-18351	0.32
P-18352	0.01
P-18353	0.01
P-18355	0.12
P-18357	0.11
P-18359	0.21
P-18361	0
P-18363	0.02
P-18365	0.03
P-18367	0.05
P-18369 (1)	0
P-18369 (2)	0.01
P-1837	0.04
P-18370	0
P-18371 (1)	0
P-18371 (2)	0.03
P-18373	0.01
P-18375	0.01
P-18376	0
P-18377 (1)	0
P-18377 (2)	0.08
P-18379	0.03
P-18381	0.11
P-18382	0
P-18383	0.03
P-18385	0.01
P-18389	0.09
P-1839	0.07
P-18391	0.1
P-18393	0.24

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-1830	0
P-18300	0.03
P-18301	0.03
P-18303	0.26
P-18305	0.05
P-18306	0.04
P-18307	0.01
P-18309	0.1
P-1831	0.11
P-18310	0.07
P-18311	0.15
P-18313	0.01
P-18315	0.03
P-18317	0.01
P-18319	0.03
P-1832	0.02
P-18321	0.13
P-18323 (1)	0.01
P-18323 (2)	0.46
P-18325 (1)	0.06
P-18325 (2)	0.29
P-18326	0.14
P-18327 (1)	0.21
P-18327 (2)	0.72
P-18329	0.07
P-1833	0.1
P-18331	0.01
P-18333	0.06
P-18335	0.12
P-18337	0.01
P-18338	0.03
P-18339	0.01
P-18339(1)	0.08
P-18339(2)	0.02
P-1834(1)	0.04
P-1834(2)	0.1
P-18341	0.5
P-18345	0.19
P-18347	0.01
P-18349	0.22
P-1835	0.25
P-18351	0.07
P-18352	0.02
P-18353	0.02
P-18355	0.03
P-18357	0.07
P-18359	0.04
P-18361	0.01
P-18363	0.01
P-18365	0.04
P-18367	0.06
P-18369 (1)	0.01
P-18369 (2)	0.04
P-1837	0.03
P-18370	0.01
P-18371 (1)	0
P-18371 (2)	0.1
P-18373	0.03
P-18375	0.04
P-18376	0.01
P-18377 (1)	0.01
P-18377 (2)	0.2
P-18379	0.05
P-18381	0.22
P-18382	0.01
P-18383	0.07
P-18385	0.04
P-18389	0.08
P-1839	0.03
P-18391	0.12
P-18393	0.2

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-1830	0
P-18300	0.02
P-18301	0.03
P-18303	0.36
P-18305	0.05
P-18306	0.02
P-18307	0.01
P-18309	0.15
P-1831	0.21
P-18310	0.02
P-18311	0.21
P-18313	0
P-18315	0.01
P-18317	0.01
P-18319	0.02
P-1832	0.02
P-18321	0.03
P-18323 (1)	0.01
P-18323 (2)	0.92
P-18325 (1)	0.02
P-18325 (2)	0.72
P-18326	0.06
P-18327 (1)	0.1
P-18327 (2)	1.62
P-18329	0.11
P-1833	0.12
P-18331	0.01
P-18333	0.13
P-18335	0.22
P-18337	0.01
P-18338	0.02
P-18339	0.01
P-18339(1)	0.06
P-18339(2)	0.05
P-1834(1)	0.12
P-1834(2)	0.11
P-18341	0.55
P-18345	0.19
P-18347	0.01
P-18349	0.16
P-1835	0.08
P-18351	0.07
P-18352	0.01
P-18353	0.02
P-18355	0.08
P-18357	0.17
P-18359	0.07
P-18361	0.01
P-18363	0.03
P-18365	0.06
P-18367	0.08
P-18369 (1)	0.01
P-18369 (2)	0.07
P-1837	0.03
P-18370	0.01
P-18371 (1)	0
P-18371 (2)	0.19
P-18373	0.05
P-18375	0.07
P-18376	0.01
P-18377 (1)	0.01
P-18377 (2)	0.17
P-18379	0.05
P-18381	0.18
P-18382	0.43
P-18383	0.06
P-18385	0.04
P-18389	0.21
P-1839	0.16
P-18391	0.26
P-18393	0.22

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-18395	0.13
P-18397	0.17
P-18399	0.07
P-1840	0.22
P-18401 (1)	0
P-18401 (2)	0.01
P-18403	0.01
P-18404	0
P-18405	0.02
P-18407(1)(1)	0.01
P-18407(1)(2)	0.01
P-18407(2)	0.01
P-18409	0.15
P-18411	0.15
P-18413	0.31
P-18415 (1)	0.01
P-18415 (2)	0.48
P-18417 (1)	0.01
P-18417 (2)	0
P-18418	0.02
P-18419 (1)	0.03
P-18419 (2)	0
P-1842	0
P-18421	0
P-18423	0
P-18425	0.23
P-18427	0.32
P-18431	0.1
P-18432	0.02
P-18433	0.13
P-18435	0.22
P-18437	0.09
P-18439	0.01
P-18441	0
P-18443	0.04
P-18445	0.06
P-18447	0.08
P-18449	0
P-18451	0.03
P-18453 (1)	0
P-18453 (2)	0.02
P-18455(1)	0.05
P-18455(2)	0.05
P-18457	0.04
P-18459	0.01
P-1846	0.11
P-18461	0.03
P-18463	0.01
P-18464	0
P-18465	0.01
P-18467	0.01
P-18469	0.06
P-18471	0.06
P-18473	0
P-18475	0.03
P-18477	0
P-18479	0.02
P-1848	0.01
P-18481	0.15
P-18483	0
P-18485(1)	0.01
P-18485(2)	0.01
P-18487	0.14
P-18489	0.07
P-18491	0.01
P-18493	0.05
P-18495	0.01
P-18497	0
P-18498	2.15
P-18499 (1)	2.15
P-18499 (2)	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-18395	0.22
P-18397	0.28
P-18399	0.26
P-1840	0.28
P-18401 (1)	0.01
P-18401 (2)	0.01
P-18403	0.03
P-18404	0
P-18405	0.04
P-18407(1)(1)	0.03
P-18407(1)(2)	0.01
P-18407(2)	0.03
P-18409	0.2
P-18411	0.2
P-18413	0.28
P-18415 (1)	0.01
P-18415 (2)	0.36
P-18417 (1)	0.03
P-18417 (2)	0
P-18418	0.04
P-18419 (1)	0.07
P-18419 (2)	0
P-1842	0.01
P-18421	0
P-18423	0.01
P-18425	0.24
P-18427	0.29
P-18431	0.08
P-18432	0.03
P-18433	0.15
P-18435	0.26
P-18437	0.1
P-18439	0.01
P-18441	0.02
P-18443	0.14
P-18445	0.33
P-18447	0.49
P-18449	0
P-18451	0.06
P-18453 (1)	0
P-18453 (2)	0.03
P-18455(1)	0.1
P-18455(2)	0.1
P-18457	0.04
P-18459	0.01
P-1846	0.08
P-18461	0.05
P-18463	0.05
P-18464	0
P-18465	0.01
P-18467	0.02
P-18469	0.05
P-18471	0.06
P-18473	0.01
P-18475	0.05
P-18477	0.01
P-18479	0.04
P-1848	0.01
P-18481	0.19
P-18483	0
P-18485(1)	0.02
P-18485(2)	0.02
P-18487	0.21
P-18489	0.04
P-18491	0.01
P-18493	0.02
P-18495	0.01
P-18497	0.01
P-18498	9.77
P-18499 (1)	9.76
P-18499 (2)	0.05

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-18395	0.01
P-18397	0.37
P-18399	0.16
P-1840	0.53
P-18401 (1)	0.01
P-18401 (2)	0.02
P-18403	0.03
P-18404	0
P-18405	0.04
P-18407(1)(1)	0.03
P-18407(1)(2)	0.02
P-18407(2)	0.03
P-18409	0.34
P-18411	0.34
P-18413	0.27
P-18415 (1)	0.01
P-18415 (2)	0.35
P-18417 (1)	0.03
P-18417 (2)	0
P-18418	0.04
P-18419 (1)	0.08
P-18419 (2)	0.01
P-1842	0.01
P-18421	0
P-18423	0
P-18425	0.22
P-18427	0.29
P-18431	0.07
P-18432	0.04
P-18433	0.12
P-18435	0.2
P-18437	0.07
P-18439	0.01
P-18441	0.02
P-18443	0.14
P-18445	0.32
P-18447	0.47
P-18449	0
P-18451	0.04
P-18453 (1)	0
P-18453 (2)	0.01
P-18455(1)	0.05
P-18455(2)	0.05
P-18457	0.03
P-18459	0.01
P-1846	0.23
P-18461	0.07
P-18463	0.06
P-18464	0
P-18465	0.01
P-18467	0.03
P-18469	0.13
P-18471	0.16
P-18473	0.01
P-18475	0.06
P-18477	0.01
P-18479	0.05
P-1848	0.01
P-18481	0.25
P-18483	0
P-18485(1)	0.02
P-18485(2)	0.02
P-18487	0.27
P-18489	0.04
P-18491	0.01
P-18493	0.02
P-18495	0.01
P-18497	0.01
P-18498	6.26
P-18499 (1)	6.25
P-18499 (2)	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-1850	0.04	P-1850	0.09	P-1850	0.07
P-18501	0.02	P-18501	0.02	P-18501	0.02
P-18503 (1)	2.23	P-18503 (1)	0	P-18503 (1)	0
P-18503 (2)	0.04	P-18503 (2)	0.04	P-18503 (2)	0.04
P-18504(1)	0.09	P-18504(1)	0.08	P-18504(1)	0.11
P-18504(2)	0	P-18504(2)	0.09	P-18504(2)	0.14
P-18505 (1)	4.56	P-18505 (1)	10.95	P-18505 (1)	9.71
P-18505 (2)	0	P-18505 (2)	0	P-18505 (2)	0
P-18506	4.56	P-18506	10.95	P-18506	9.71
P-18507	0.02	P-18507	0.03	P-18507	0.03
P-18509	0.03	P-18509	0.05	P-18509	0.05
P-18510	0.12	P-18510	0.45	P-18510	0.36
P-18511	0.01	P-18511	0.02	P-18511	0.02
P-18513	0	P-18513	0	P-18513	0
P-18515 (1)	0.03	P-18515 (1)	0.28	P-18515 (1)	0.09
P-18515 (2)	0.11	P-18515 (2)	0.05	P-18515 (2)	0.13
P-18516	2.03	P-18516	9.32	P-18516	5.89
P-18517	0.8	P-18517	0.3	P-18517	1.01
P-18519	0.68	P-18519	0.26	P-18519	0.87
P-18521	0.01	P-18521	0.01	P-18521	0.01
P-18523	0.07	P-18523	0.08	P-18523	0.01
P-18525	0.06	P-18525	0.06	P-18525	0.03
P-18527	0.04	P-18527	0.04	P-18527	0.03
P-18528	0.76	P-18528	0.54	P-18528	0.59
P-18529	0.04	P-18529	0.03	P-18529	0.08
P-18531	0	P-18531	0	P-18531	0
P-18532	0.93	P-18532	0.29	P-18532	0.34
P-18533 (1)	0	P-18533 (1)	0.01	P-18533 (1)	0.01
P-18533 (2)	0.04	P-18533 (2)	0.04	P-18533 (2)	0.09
P-18535	0	P-18535	0	P-18535	0
P-18537	0.07	P-18537	0.17	P-18537	0.22
P-18539	0.03	P-18539	0.07	P-18539	0.1
P-18541	0.01	P-18541	0.02	P-18541	0.03
P-18543(1)	0.05	P-18543(1)	0.12	P-18543(1)	0.14
P-18543(2)	0.06	P-18543(2)	0.13	P-18543(2)	0.16
P-18545	0.12	P-18545	0.12	P-18545	0.02
P-18547	0.24	P-18547	0.17	P-18547	0.14
P-18549	0.12	P-18549	0.12	P-18549	0.02
P-1855	0.06	P-1855	0.08	P-1855	0.07
P-18551	0.01	P-18551	0.08	P-18551	0.11
P-18553	0.02	P-18553	0.02	P-18553	0
P-18555	0.05	P-18555	0.06	P-18555	0.01
P-18557	0.01	P-18557	0.02	P-18557	0.03
P-18559	0.03	P-18559	0.03	P-18559	0.03
P-1856	0.12	P-1856	0.17	P-1856	0.07
P-18561	0	P-18561	0	P-18561	0
P-18563	0.03	P-18563	0.04	P-18563	0.03
P-18565	0.04	P-18565	0.07	P-18565	0.06
P-18567	0.02	P-18567	0.03	P-18567	0.03
P-18569 (1)	0.01	P-18569 (1)	0.02	P-18569 (1)	0.03
P-18569 (2)	0.12	P-18569 (2)	0.14	P-18569 (2)	0.33
P-18573	0.18	P-18573	0.08	P-18573	0.16
P-18575	0.18	P-18575	0.05	P-18575	0.12
P-18577	0.09	P-18577	0.1	P-18577	0.22
P-18579	0.02	P-18579	0.13	P-18579	0.09
P-18581	0.31	P-18581	0.12	P-18581	0.27
P-18583	0.4	P-18583	0.17	P-18583	0.41
P-18585	0.04	P-18585	0.11	P-18585	0.14
P-18587	0.04	P-18587	0.11	P-18587	0.14
P-18589	0.05	P-18589	0.03	P-18589	0.03
P-1859	0.07	P-1859	0.07	P-1859	0.03
P-18590	0.12	P-18590	0.07	P-18590	0.17
P-18591	0.07	P-18591	0.04	P-18591	0.05
P-18593 (1)	0	P-18593 (1)	6.84	P-18593 (1)	10.46
P-18593 (2)	0.09	P-18593 (2)	0.03	P-18593 (2)	0.03
P-18594	1.07	P-18594	6.79	P-18594	10.27
P-18595 (1)	2.4	P-18595 (1)	7.96	P-18595 (1)	11.86
P-18595 (2)	0.07	P-18595 (2)	0.01	P-18595 (2)	0.02
P-18596(1)	2.32	P-18596(1)	7.94	P-18596(1)	11.83
P-18596(2)	2.23	P-18596(2)	7.94	P-18596(2)	11.83
P-18597	0.01	P-18597	0.02	P-18597	3.13

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-18599	0	P-18599	0	P-18599	3.55
P-18601 (1)	0.22	P-18601 (1)	0.14	P-18601 (1)	0.17
P-18601 (2)	0	P-18601 (2)	0	P-18601 (2)	0
P-18603	0.01	P-18603	0.02	P-18603	0.42
P-18605 (1)	0	P-18605 (1)	0.11	P-18605 (1)	0.16
P-18605 (2)	0	P-18605 (2)	0	P-18605 (2)	0
P-18607	0	P-18607	0	P-18607	0
P-18608	0.9	P-18608	0.73	P-18608	0.69
P-18609 (1)	0.9	P-18609 (1)	0.73	P-18609 (1)	0.69
P-18609 (2)	0	P-18609 (2)	0.01	P-18609 (2)	0.01
P-1861	0.44	P-1861	0.39	P-1861	0.27
P-18610	0.9	P-18610	0.73	P-18610	0.69
P-18611	0	P-18611	0	P-18611	0
P-18612	0.9	P-18612	0.73	P-18612	0.69
P-18613 (1)	0.99	P-18613 (1)	0.64	P-18613 (1)	0.8
P-18613 (2)	0.01	P-18613 (2)	0.01	P-18613 (2)	0.04
P-18615	0.99	P-18615	0.64	P-18615	0.81
P-18616	0.99	P-18616	0.65	P-18616	0.81
P-18617	0	P-18617	0.01	P-18617	0.04
P-18619 (1)	0.99	P-18619 (1)	0.65	P-18619 (1)	0.81
P-18619 (2)	0.01	P-18619 (2)	0.01	P-18619 (2)	0.05
P-18620	0	P-18620	0.01	P-18620	0.01
P-18621	0.06	P-18621	0.1	P-18621	0.08
P-18622	0.99	P-18622	0.65	P-18622	0.81
P-18623	0.04	P-18623	0.1	P-18623	0.07
P-18625	0.24	P-18625	0.19	P-18625	0.19
P-18627	0.26	P-18627	0.19	P-18627	0.2
P-18629	0.01	P-18629	0.03	P-18629	0.03
P-1863 (1)	0.02	P-1863 (1)	0.03	P-1863 (1)	0.11
P-1863 (2)	0.04	P-1863 (2)	0.02	P-1863 (2)	0.05
P-18631	0.01	P-18631	0.03	P-18631	0.02
P-18632	0.67	P-18632	1.09	P-18632	1.52
P-18633 (1)	0.67	P-18633 (1)	1.09	P-18633 (1)	1.52
P-18633 (2)	0.01	P-18633 (2)	0.02	P-18633 (2)	0.01
P-18635	0.02	P-18635	0.02	P-18635	0
P-18636	0.67	P-18636	1.09	P-18636	1.52
P-18637	1.63	P-18637	2.07	P-18637	2.12
P-18639	1.94	P-18639	2.51	P-18639	2.56
P-18641 (1)	0.67	P-18641 (1)	1.09	P-18641 (1)	1.52
P-18641 (2)	0.04	P-18641 (2)	0.05	P-18641 (2)	0.05
P-18643	0.27	P-18643	0.38	P-18643	0.39
P-18645	0.41	P-18645	0.38	P-18645	0.36
P-18647	0.2	P-18647	0.18	P-18647	0.17
P-18648	0	P-18648	0	P-18648	0
P-18649	0	P-18649	0	P-18649	0
P-18650	0	P-18650	0	P-18650	0
P-18651	0.21	P-18651	0.2	P-18651	0.18
P-18655 (1)	0.01	P-18655 (1)	0.01	P-18655 (1)	0.02
P-18655 (2)	0.04	P-18655 (2)	0.05	P-18655 (2)	0.03
P-18657	0.05	P-18657	0.15	P-18657	0.14
P-18659	0.07	P-18659	0.14	P-18659	0.14
P-18661	0	P-18661	0.01	P-18661	0.01
P-18663	0.02	P-18663	0.04	P-18663	0.02
P-18665	0.07	P-18665	0.11	P-18665	0.13
P-18667	0.05	P-18667	0.14	P-18667	0.14
P-18668	0.01	P-18668	0.01	P-18668	0.02
P-18669	0	P-18669	0.01	P-18669	0.01
P-18671	0.02	P-18671	0.04	P-18671	0.04
P-18675	0	P-18675	0	P-18675	0.02
P-18677	0.01	P-18677	0.02	P-18677	0.01
P-18679	0.01	P-18679	0.01	P-18679	0.01
P-1868	0	P-1868	0	P-1868	0
P-18681	0.04	P-18681	0.07	P-18681	0.04
P-18683	0.02	P-18683	0.04	P-18683	0.02
P-18687	1.98	P-18687	1.04	P-18687	1.12
P-18689 (1)	0	P-18689 (1)	0	P-18689 (1)	0
P-18689 (2)	0.46	P-18689 (2)	0.23	P-18689 (2)	0.28
P-18690	0.05	P-18690	0.07	P-18690	0.08
P-18691	0	P-18691	0.01	P-18691	0.01
P-18693	0	P-18693	0.01	P-18693	0.01
P-18695	0.01	P-18695	0.02	P-18695	0.01

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
P-18698	0
P-18699	0.24
P-18701	0.01
P-18703	0.12
P-18705	0.1
P-18707	0.01
P-18708	0.28
P-18709 (1)	0.28
P-18709 (2)	0.25
P-18711	0.25
P-18713 (1)	0.28
P-18713 (2)	1.21
P-18714	0.28
P-18715	0.72
P-18717	0.01
P-18718	0.28
P-18719	0.46
P-1872	0.05
P-18720	0.28
P-18721 (1)	0.28
P-18721 (2)	0.46
P-18722	0.28
P-18723 (1)	0.28
P-18723 (2)	0
P-18725 (1)	0.04
P-18725 (2)	0.03
P-18727 (1)	1.66
P-18727 (2)	0
P-18729	0.05
P-1873	0.01
P-18731	0.05
P-18733	0.19
P-18735	0
P-18737	0.19
P-18739	0
P-18741	0.08
P-18743	0.03
P-18745	0.02
P-18747 (1)	2.28
P-18747 (2)	0.03
P-18749 (1)	0
P-18749 (2)	1.43
P-18750	2.29
P-18751	1.5
P-18753	0.05
P-18755	0.05
P-18757	0.11
P-18759	0.11
P-1876	0.15
P-18763	0.4
P-18765	0.07
P-18767	0.07
P-18769	0.05
P-18771(1)	0.04
P-18771(2)	0.15
P-18773	0.01
P-18775	0.02
P-18777	0.04
P-18779	0.05
P-1878	0.52
P-18783	0
P-18785	0.01
P-18787	0
P-18791	0.04
P-18793	0.12
P-18797	1.09
P-18799	1.3
P-18801	0.11
P-18803	0.1
P-18805	0.19
P-18809	0.18

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-18698	0
P-18699	0.38
P-18701	0
P-18703	0.07
P-18705	0.06
P-18707	0.01
P-18708	0.84
P-18709 (1)	0.82
P-18709 (2)	0.41
P-18711	0.36
P-18713 (1)	0.8
P-18713 (2)	1.83
P-18714	0.78
P-18715	1.06
P-18717	0.02
P-18718	0.76
P-18719	0.22
P-1872	0.05
P-18720	0.74
P-18721 (1)	0.72
P-18721 (2)	0.21
P-18722	0.69
P-18723 (1)	0.66
P-18723 (2)	0
P-18725 (1)	0.05
P-18725 (2)	0.04
P-18727 (1)	2.75
P-18727 (2)	0
P-18729	0.11
P-1873	0.01
P-18731	0.08
P-18733	0.11
P-18735	0.01
P-18737	0.13
P-18739	0.01
P-18741	0.16
P-18743	0.08
P-18745	0.01
P-18747 (1)	4
P-18747 (2)	0.08
P-18749 (1)	0.01
P-18749 (2)	0.2
P-18750	4.02
P-18751	0.47
P-18753	0.31
P-18755	0.19
P-18757	0.09
P-18759	0.09
P-1876	0.19
P-18763	0.35
P-18765	0.1
P-18767	0.1
P-18769	0.03
P-18771(1)	0.06
P-18771(2)	0.12
P-18773	0.05
P-18775	0.05
P-18777	0.05
P-18779	0.06
P-1878	0.76
P-18783	0.01
P-18785	0.01
P-18787	0
P-18791	0.07
P-18793	0.13
P-18797	1.13
P-18799	1.35
P-18801	0.1
P-18803	0.11
P-18805	0.06
P-18809	0.06

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-18698	0
P-18699	0.48
P-18701	0
P-18703	0.07
P-18705	0.06
P-18707	0.01
P-18708	1.62
P-18709 (1)	1.57
P-18709 (2)	0.49
P-18711	0.38
P-18713 (1)	1.53
P-18713 (2)	1.97
P-18714	1.48
P-18715	1.1
P-18717	0.03
P-18718	1.45
P-18719	0.35
P-1872	0.11
P-18720	1.4
P-18721 (1)	1.35
P-18721 (2)	0.32
P-18722	1.3
P-18723 (1)	1.26
P-18723 (2)	0
P-18725 (1)	0.1
P-18725 (2)	0.13
P-18727 (1)	0.78
P-18727 (2)	0
P-18729	0.27
P-1873	0.01
P-18731	0.14
P-18733	0.13
P-18735	0.01
P-18737	0.11
P-18739	0.01
P-18741	0.19
P-18743	0.13
P-18745	0.08
P-18747 (1)	5.41
P-18747 (2)	0.13
P-18749 (1)	0.01
P-18749 (2)	0.17
P-18750	5.42
P-18751	0.68
P-18753	0.17
P-18755	0.45
P-18757	0.2
P-18759	0.2
P-1876	0.18
P-18763	1.07
P-18765	0.09
P-18767	0.09
P-18769	0.03
P-18771(1)	0.05
P-18771(2)	0.12
P-18773	0.04
P-18775	0.03
P-18777	0.08
P-18779	0.1
P-1878	0.07
P-18783	0.01
P-18785	0.01
P-18787	0
P-18791	0.11
P-18793	0.14
P-18797	0.93
P-18799	0.87
P-18801	0.03
P-18803	0.03
P-18805	0.08
P-18809	0.07

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-18811	0
P-18813	0.03
P-18815	0.18
P-18817(1)	0.1
P-18817(2)	0.1
P-18819	0.06
P-18823	0.05
P-18825	0.02
P-18827	0.03
P-18829	0.03
P-18831	0.03
P-18833(1)	0.06
P-18833(2)	0.03
P-18835	0.03
P-18837	1.36
P-18839	0.01
P-18841(2)	1.45
P-18843	2.81
P-18847	0.01
P-18849	0
P-18851	0.01
P-18853	0.71
P-18857	0
P-18859	0.71
P-18863	0.17
P-18865	2.27
P-18867	0.14
P-18869	0.32
P-18871	0.05
P-18873	1.06
P-18875	0.69
P-18877	0.2
P-18879	0.01
P-18881	0.66
P-18883	0.48
P-18885	0.06
P-18887	0.21
P-18889	0.43
P-18891	0.27
P-18893	1.89
P-18897(1)	16.05
P-18897(2)	16.05
P-1890	0.05
P-18903	1.75
P-18905	1.47
P-18907	1.47
P-18909	1.28
P-18911	1.5
P-18913	1.5
P-18915	1.5
P-18917	1.5
P-18931	6.76
P-18937	0
P-18939	0
P-18941	0
P-18943	0
P-18945	0
P-18947	0
P-1895	0
P-18951	0
P-18953	0
P-18955	1.59
P-18957	1.59
P-1896	0.12
P-18961	0
P-18963	0
P-18967	0.06
P-18969	0.05
P-18971	0.01
P-18973	0.01
P-18975	0.05

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-18811	0
P-18813	0.05
P-18815	0.31
P-18817(1)	0.18
P-18817(2)	0.18
P-18819	0.08
P-18823	0.04
P-18825	0.02
P-18827	0.05
P-18829	0.28
P-18831	0.27
P-18833(1)	0.58
P-18833(2)	0.31
P-18835	0.29
P-18837	0
P-18839	0.01
P-18841(2)	0.3
P-18843	0.29
P-18847	0.03
P-18849	0.02
P-18851	0.01
P-18853	0.62
P-18857	0.01
P-18859	0.16
P-18863	0.59
P-18865	1.12
P-18867	2.21
P-18869	0.19
P-18871	0.02
P-18873	0.51
P-18875	0.33
P-18877	0.1
P-18879	0.02
P-18881	0.32
P-18883	0.24
P-18885	0.01
P-18887	0.12
P-18889	0.2
P-18891	0.12
P-18893	4.98
P-18897(1)	8.91
P-18897(2)	17.82
P-1890	0.02
P-18903	1.74
P-18905	1.48
P-18907	1.48
P-18909	1.31
P-18911	8.08
P-18913	8.08
P-18915	6.05
P-18917	1.07
P-18931	24.92
P-18937	3.33
P-18939	3.33
P-18941	0
P-18943	0
P-18945	0
P-18947	0
P-1895	0
P-18951	0
P-18953	0
P-18955	6.76
P-18957	6.76
P-1896	0.21
P-18961	2.86
P-18963	2.86
P-18967	0.16
P-18969	0.15
P-18971	0.02
P-18973	0
P-18975	0.08

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-18811	0
P-18813	0.05
P-18815	0.12
P-18817(1)	0.18
P-18817(2)	0.17
P-18819	0.03
P-18823	0.1
P-18825	0.04
P-18827	0.06
P-18829	0.29
P-18831	0.27
P-18833(1)	0.59
P-18833(2)	0.31
P-18835	0.3
P-18837	0
P-18839	0.01
P-18841(2)	0.24
P-18843	0.23
P-18847	0.07
P-18849	0.04
P-18851	0.04
P-18853	0.32
P-18857	0.01
P-18859	0.33
P-18863	0.8
P-18865	1.38
P-18867	2.66
P-18869	0.23
P-18871	0.01
P-18873	0.7
P-18875	0.46
P-18877	0.14
P-18879	0.02
P-18881	0.44
P-18883	0.32
P-18885	0.02
P-18887	0.15
P-18889	0.28
P-18891	0.18
P-18893	3.45
P-18897(1)	9.07
P-18897(2)	18.13
P-1890	0.03
P-18903	1.9
P-18905	1.66
P-18907	1.66
P-18909	1.46
P-18911	5.7
P-18913	5.7
P-18915	4.79
P-18917	2.97
P-18931	11.48
P-18937	2.4
P-18939	2.4
P-18941	1.05
P-18943	1.05
P-18945	1.05
P-18947	0
P-1895	0
P-18951	0
P-18953	0
P-18955	3.6
P-18957	3.6
P-1896	0.1
P-18961	1.86
P-18963	1.86
P-18967	0.32
P-18969	0.31
P-18971	0.06
P-18973	0.04
P-18975	0.09

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-18977	0.04	P-18977	0.12	P-18977	0.24
P-18979	0	P-18979	0.02	P-18979	0.1
P-18981	0.01	P-18981	0.02	P-18981	0.09
P-18985	0	P-18985	0	P-18985	0
P-18987	0	P-18987	0.01	P-18987	0.01
P-18989	0.02	P-18989	0.04	P-18989	0.04
P-18991	0.01	P-18991	0.01	P-18991	0.01
P-18993	0.01	P-18993	0.02	P-18993	0.02
P-19005(1)	0.13	P-19005(1)	0.32	P-19005(1)	0.56
P-19005(2)	0.2	P-19005(2)	0.48	P-19005(2)	0.76
P-19017	0.36	P-19017	0.78	P-19017	0.99
P-19023	0.36	P-19023	0.78	P-19023	1.99
P-19025	0.36	P-19025	0.78	P-19025	0.28
P-19027(2)	0	P-19027(2)	0.01	P-19027(2)	0.81
P-19029	0.33	P-19029	0.58	P-19029	0.75
P-19033	0.33	P-19033	0.58	P-19033	0.75
P-19037	0.33	P-19037	0.58	P-19037	0.75
P-19039	0.33	P-19039	0.58	P-19039	0.75
P-19041	0	P-19041	0	P-19041	0.25
P-19043	0	P-19043	0.01	P-19043	1.07
P-19045	0	P-19045	0.01	P-19045	1.07
P-19047	(N/A)	P-19047	(N/A)	P-19047	(N/A)
P-19051	(N/A)	P-19051	(N/A)	P-19051	(N/A)
P-19053	(N/A)	P-19053	(N/A)	P-19053	(N/A)
P-19055	(N/A)	P-19055	(N/A)	P-19055	(N/A)
P-19057	(N/A)	P-19057	(N/A)	P-19057	(N/A)
P-19059	1.99	P-19059	2.87	P-19059	0.01
P-1906	0.01	P-1906	0.02	P-1906	0.01
P-19061	1.71	P-19061	2.47	P-19061	0.02
P-19063	1.03	P-19063	0.78	P-19063	0.26
P-19065	0.16	P-19065	0.42	P-19065	0.32
P-19067	0.13	P-19067	0.25	P-19067	0.34
P-19069	0.13	P-19069	0.25	P-19069	0.34
P-19071	0	P-19071	0	P-19071	0
P-19073	0.01	P-19073	0.01	P-19073	0.01
P-19077	0.01	P-19077	0.02	P-19077	0.02
P-19079	0.01	P-19079	0.02	P-19079	0.03
P-19081	0	P-19081	0.08	P-19081	0.04
P-19085	0.16	P-19085	0.16	P-19085	0.14
P-19087	0.26	P-19087	0.28	P-19087	0.24
P-19089	0.1	P-19089	0.1	P-19089	0.09
P-19091	0.01	P-19091	0.02	P-19091	0.46
P-19093	0	P-19093	0.01	P-19093	0.43
P-19095	0	P-19095	0.01	P-19095	0.01
P-19097(1)	0	P-19097(1)	0.01	P-19097(1)	0.01
P-19097(2)	0	P-19097(2)	0.01	P-19097(2)	0.01
P-19099	0.11	P-19099	0.2	P-19099	0.2
P-19101	0.07	P-19101	0.14	P-19101	0.14
P-19103	0.05	P-19103	0.09	P-19103	0.09
P-19105	0.03	P-19105	0.05	P-19105	0.05
P-19107	0.01	P-19107	0.02	P-19107	0.02
P-19109	0.02	P-19109	0.04	P-19109	0.04
P-19111	0.01	P-19111	0.02	P-19111	0.02
P-19113	0	P-19113	0.01	P-19113	0.01
P-19115	0.01	P-19115	0.01	P-19115	0.01
P-19117	0.01	P-19117	0.01	P-19117	0.01
P-19119	0	P-19119	0	P-19119	0
P-19121	0.01	P-19121	0.01	P-19121	0.01
P-19123	0.02	P-19123	0.05	P-19123	0.05
P-19125	0.01	P-19125	0.01	P-19125	0.01
P-19127	0	P-19127	0.01	P-19127	0.01
P-19129	0	P-19129	0.01	P-19129	0.01
P-19131	0.01	P-19131	0.02	P-19131	0.02
P-19133	0.01	P-19133	0.02	P-19133	0.02
P-19135	0.02	P-19135	0.03	P-19135	0.03
P-19137	0.01	P-19137	0.02	P-19137	0.01
P-19139	0.02	P-19139	0.03	P-19139	0.03
P-19141	0.03	P-19141	0.05	P-19141	0.04
P-19143	0.02	P-19143	0.03	P-19143	0.03
P-19145	0.01	P-19145	0.01	P-19145	0.01
P-19147	0	P-19147	0	P-19147	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-19149	0.02
P-1915	0.02
P-19151	0
P-19153	0.02
P-19155	0
P-19157	0.01
P-19159	0.04
P-19161	0.09
P-19163	0.02
P-19165	0.02
P-19167	0.04
P-19169	0.02
P-19171	0.02
P-19173	0.07
P-19175	0.28
P-19177	0.59
P-19179(1)(1)	(N/A)
P-19179(1)(2)	(N/A)
P-19179(2)	0.59
P-19185	0.01
P-19187	0.01
P-19189	0.01
P-19191	0
P-19193	0
P-19199(1)	0
P-19199(2)	0
P-192	0.01
P-19201	0
P-19207	0
P-19209	0.39
P-19211	0.44
P-19213	0.05
P-19215	0.47
P-19217(1)	0.8
P-19217(2)	0.91
P-19219	0.91
P-19221	0.29
P-19223	0.21
P-19225	0.56
P19227	2.62
P-19231	0.01
P-19233	0
P-19235	1.6
P-19239	2.16
P-19241	1.03
P-19243	0.83
P-19245	0.43
P-19247	0.05
P-19249	0.04
P-19251	1.64
P-19253	0.71
P-19271(1)	0.03
P-19271(2)	0.02
P-19275	0
P-19277	0.17
P-19279	0.1
P-19281	0.17
P-19283(1)	0.23
P-19283(2)	0.23
P-19285	0.24
P-19287	0.04
P-19289	0.05
P-19291	0.17
P-19293	0.06
P-19295	0.06
P-19297	0.17
P-19299	0.15
P-19301	0.13
P-19303	0.13
P-19305	0.04
P-19307	0.04

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-19149	0.03
P-1915	0.01
P-19151	0
P-19153	0.04
P-19155	0.01
P-19157	0.02
P-19159	0.02
P-19161	0.05
P-19163	0.01
P-19165	0.01
P-19167	0.04
P-19169	0.02
P-19171	0.01
P-19173	0.13
P-19175	1.27
P-19177	2.21
P-19179(1)(1)	(N/A)
P-19179(1)(2)	(N/A)
P-19179(2)	2.21
P-19185	0.01
P-19187	0.01
P-19189	0.01
P-19191	0
P-19193	0.01
P-19199(1)	0.01
P-19199(2)	0.01
P-192	0.02
P-19201	0.01
P-19207	0.02
P-19209	2.05
P-19211	0.73
P-19213	2.78
P-19215	0.66
P-19217(1)	0.65
P-19217(2)	0.51
P-19219	0.5
P-19221	0.28
P-19223	0.18
P-19225	0.86
P19227	1.91
P-19231	0.01
P-19233	0.06
P-19235	0.37
P-19239	3.24
P-19241	2.01
P-19243	1.23
P-19245	1.02
P-19247	0.05
P-19249	0.03
P-19251	1.18
P-19253	0.47
P-19271(1)	0.04
P-19271(2)	0.04
P-19275	0.01
P-19277	0.44
P-19279	0.13
P-19281	0.56
P-19283(1)	0.75
P-19283(2)	0.75
P-19285	0.8
P-19287	0.12
P-19289	0.13
P-19291	0.46
P-19293	0.12
P-19295	0.03
P-19297	0.47
P-19299	0.38
P-19301	0.3
P-19303	0.34
P-19305	0.02
P-19307	0.05

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-19149	0.03
P-1915	0
P-19151	0
P-19153	0.04
P-19155	0.01
P-19157	0.02
P-19159	0.03
P-19161	0.07
P-19163	0.02
P-19165	0.02
P-19167	0.06
P-19169	0.04
P-19171	0.03
P-19173	0.08
P-19175	1.42
P-19177	0
P-19179(1)(1)	(N/A)
P-19179(1)(2)	(N/A)
P-19179(2)	0
P-19185	0.74
P-19187	0.94
P-19189	0.68
P-19191	0
P-19193	0.2
P-19199(1)	0.12
P-19199(2)	0.26
P-192	0.02
P-19201	0.2
P-19207	0.32
P-19209	1.91
P-19211	0.31
P-19213	1.78
P-19215	0.98
P-19217(1)	0.97
P-19217(2)	0.51
P-19219	0.49
P-19221	0.42
P-19223	0.34
P-19225	1.57
P19227	0.93
P-19231	0.01
P-19233	0.09
P-19235	1.23
P-19239	0.23
P-19241	0.7
P-19243	0.36
P-19245	0.45
P-19247	0.06
P-19249	0.06
P-19251	1.68
P-19253	0.73
P-19271(1)	0.8
P-19271(2)	0.66
P-19275	0.01
P-19277	0.55
P-19279	0.09
P-19281	0.46
P-19283(1)	0.53
P-19283(2)	0.53
P-19285	0.47
P-19287	0.04
P-19289	0.03
P-19291	0.33
P-19293	0.07
P-19295	0.12
P-19297	0.32
P-19299	0.27
P-19301	0.28
P-19303	0.27
P-19305	0.06
P-19307	0.07

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-19309	0.11	P-19309	0.29	P-19309	0.23
P-19311	0.11	P-19311	0.3	P-19311	0.2
P-19313	0.03	P-19313	0.08	P-19313	0.07
P-19315	0.04	P-19315	0.07	P-19315	0.1
P-19317	0.21	P-19317	0.48	P-19317	0.19
P-19319	0.02	P-19319	0.07	P-19319	0.04
P-19321	0.04	P-19321	0.08	P-19321	0.02
P-19323	0.19	P-19323	0.64	P-19323	0.32
P-19325	0.03	P-19325	0.14	P-19325	0.05
P-19327	0.04	P-19327	0.09	P-19327	0.02
P-19329	0.21	P-19329	0.66	P-19329	0.38
P-19331	0.07	P-19331	0.26	P-19331	0.06
P-19333	0.04	P-19333	0.14	P-19333	0.03
P-19335(1)	0.2	P-19335(1)	0.61	P-19335(1)	0.39
P-19335(2)	0.22	P-19335(2)	0.66	P-19335(2)	0.39
P-19337	0.18	P-19337	0.54	P-19337	0.33
P-19339	0.18	P-19339	0.44	P-19339	0.35
P-19341	0.07	P-19341	0.19	P-19341	0.11
P-19343	0.07	P-19343	0.19	P-19343	0.13
P-19345	0.09	P-19345	0.22	P-19345	0.13
P-19347	0.08	P-19347	0.22	P-19347	0.11
P-19349	0.41	P-19349	1.16	P-19349	0.71
P-19351	0.39	P-19351	1	P-19351	0.74
P-19353	0.06	P-19353	0.22	P-19353	0.05
P-19355	0.09	P-19355	0.26	P-19355	0.14
P-19357	0.08	P-19357	0.2	P-19357	0.15
P-19359	0.02	P-19359	0.07	P-19359	0.01
P-19361	0.09	P-19361	0.08	P-19361	0.07
P-19363	0.19	P-19363	0.18	P-19363	0.17
P-19365	0.1	P-19365	0.07	P-19365	0.02
P-19367	0.12	P-19367	0.11	P-19367	0.1
P-19369	0.11	P-19369	0.09	P-19369	0.07
P-19371	0.02	P-19371	0.04	P-19371	0.12
P-19373	0.2	P-19373	0.19	P-19373	0.18
P-19375	0.21	P-19375	0.17	P-19375	0.09
P-19377	0.01	P-19377	0.03	P-19377	0.09
P-19379	0.1	P-19379	0.1	P-19379	0.06
P-19381	0.16	P-19381	0.16	P-19381	0.16
P-19383	0.05	P-19383	0.06	P-19383	0.1
P-19385	0.14	P-19385	0.21	P-19385	0.02
P-19387	0.02	P-19387	0.02	P-19387	0.02
P-19389	0.02	P-19389	0.02	P-19389	0.03
P-19391	0.01	P-19391	0.02	P-19391	0.02
P-19393	0.01	P-19393	0.03	P-19393	0.03
P-19395	0.01	P-19395	0.01	P-19395	0.01
P-19397	0.42	P-19397	0.14	P-19397	0.22
P-19399	0.6	P-19399	0.23	P-19399	0.36
P-19401(1)	0.09	P-19401(1)	0.07	P-19401(1)	0.16
P-19401(2)	0.08	P-19401(2)	0.07	P-19401(2)	0.16
P-19403	0.12	P-19403	0.04	P-19403	0.04
P-19405	0.2	P-19405	0.08	P-19405	0.19
P-19407	0.06	P-19407	0.06	P-19407	0.09
P-19409	0.06	P-19409	0.06	P-19409	0.09
P-19411(1)(1)	0.18	P-19411(1)(1)	0.69	P-19411(1)(1)	0.47
P-19411(1)(2)	0.18	P-19411(1)(2)	0.68	P-19411(1)(2)	0.46
P-19411(2)(1)	0.31	P-19411(2)(1)	0.3	P-19411(2)(1)	0.52
P-19411(2)(2)	0.31	P-19411(2)(2)	0.3	P-19411(2)(2)	0.52
P-19413	0.12	P-19413	0.08	P-19413	0.05
P-19415	0.17	P-19415	0.12	P-19415	0.29
P-19417	0.13	P-19417	0.08	P-19417	0.09
P-19419	0.18	P-19419	0.09	P-19419	0.11
P-1942	0	P-1942	0	P-1942	0
P-19421	0.05	P-19421	0.03	P-19421	0.03
P-19423	0.1	P-19423	0.02	P-19423	0.01
P-19425	0.07	P-19425	0.06	P-19425	0.06
P-19427	0.03	P-19427	0.08	P-19427	0.08
P-19429	0.1	P-19429	0.02	P-19429	0.02
P-1943	0.23	P-1943	0.31	P-1943	0.15
P-19431	0.09	P-19431	0.16	P-19431	0.14
P-19433(1)	0.5	P-19433(1)	0.46	P-19433(1)	0.57
P-19433(2)	0.5	P-19433(2)	0.46	P-19433(2)	0.56

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-19435	0.04
P-19437	0.04
P-19439	0.44
P-1944	0.13
P-19441	0.17
P-19445	0.17
P-19447	0.17
P-19449	0
P-19451	0
P-19453	1.53
P-19455	0.16
P-19457	0.04
P-19461	0.01
P-19463	1.22
P-19467	0.11
P-19469	0
P-19471(1)	0.44
P-19471(2)	0.44
P-19473	0.43
P-19475	0.01
P-19479	0.13
P-19481(1)	0.14
P-19481(2)	0.14
P-19483	0.12
P-19487	0
P-19489	(N/A)
P-19491	0
P-19493	0.11
P-19495	0.1
P-19497	0.21
P-19499	1.94
P-19501	0.94
P-19505	0.01
P-19507	0.04
P-19509	0.23
P-19511	0.68
P-19513	0.05
P-19521	0.07
P-19523	0.24
P-19525	0.24
P-19527	0.04
P-19529	0.01
P-19531	0.01
P-19533	0.08
P-19535	0.06
P-19537	0.07
P-19539	0.17
P-19541(1)	0.1
P-19541(2)	0.02
P-19543	0.09
P-19545	0
P-19547	0.01
P-19549	0
P-19551	0
P-19553	0.01
P-19555	0.24
P-19557	0
P-19559	0
P-19563	0.08
P-19565	0.15
P-19567	0.09
P-19569	0.08
P-19571	0.17
P-19573(1)(1)	0.04
P-19573(1)(2)	0.15
P-19573(2)	0.18
P-19575	0.04
P-19577	0.14
P-19579	0.1
P-19581	0.59
P-19583	0.59

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-19435	1.69
P-19437	1.69
P-19439	0.7
P-1944	0.19
P-19441	0.16
P-19445	0.16
P-19447	0.16
P-19449	0
P-19451	0
P-19453	0.72
P-19455	0.58
P-19457	0.05
P-19461	0.34
P-19463	1.59
P-19467	0.12
P-19469	0
P-19471(1)	1.07
P-19471(2)	1.07
P-19473	0.88
P-19475	0.13
P-19479	0.19
P-19481(1)	0.11
P-19481(2)	0.11
P-19483	0.2
P-19487	0
P-19489	(N/A)
P-19491	0
P-19493	0.34
P-19495	0.13
P-19497	0.47
P-19499	1.58
P-19501	0.77
P-19505	0.02
P-19507	0.07
P-19509	0.14
P-19511	0.22
P-19513	0.03
P-19521	0.02
P-19523	0.65
P-19525	0.65
P-19527	0.08
P-19529	0.15
P-19531	0.15
P-19533	0.03
P-19535	0.03
P-19537	0.15
P-19539	0.1
P-19541(1)	0.18
P-19541(2)	0.14
P-19543	0.19
P-19545	0
P-19547	0.03
P-19549	0.01
P-19551	0
P-19553	0.01
P-19555	0.32
P-19557	0.06
P-19559	0
P-19563	0.12
P-19565	0.21
P-19567	0.12
P-19569	0.12
P-19571	0.24
P-19573(1)(1)	0.06
P-19573(1)(2)	0.21
P-19573(2)	0.26
P-19575	0.06
P-19577	0.21
P-19579	0.13
P-19581	0.31
P-19583	0.29

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-19435	1.97
P-19437	1.97
P-19439	0.42
P-1944	0.17
P-19441	0.15
P-19445	0.15
P-19447	0.15
P-19449	0
P-19451	0
P-19453	0.04
P-19455	0.48
P-19457	0.05
P-19461	0.47
P-19463	0
P-19467	0.16
P-19469	0
P-19471(1)	1.22
P-19471(2)	1.22
P-19473	0.73
P-19475	0.33
P-19479	0.27
P-19481(1)	0.2
P-19481(2)	0.2
P-19483	0.4
P-19487	0
P-19489	(N/A)
P-19491	0.01
P-19493	0.42
P-19495	0.19
P-19497	0.61
P-19499	1.59
P-19501	0.78
P-19505	0.02
P-19507	0.07
P-19509	0.02
P-19511	0.06
P-19513	0.02
P-19521	0.01
P-19523	0.76
P-19525	0.76
P-19527	0.11
P-19529	0.01
P-19531	0.01
P-19533	0.01
P-19535	0.02
P-19537	0.12
P-19539	0.06
P-19541(1)	0.19
P-19541(2)	0.16
P-19543	0.23
P-19545	0
P-19547	0.02
P-19549	0.01
P-19551	0
P-19553	0.01
P-19555	0.15
P-19557	0.16
P-19559	0
P-19563	0.2
P-19565	0.37
P-19567	0.22
P-19569	0.21
P-19571	0.44
P-19573(1)(1)	0.09
P-19573(1)(2)	0.37
P-19573(2)	0.47
P-19575	0.11
P-19577	0.36
P-19579	0.23
P-19581	1.05
P-19583	1.3

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-19585	0
P-19587	0.01
P-19591	0.01
P-19593	0.05
P-19595	0.02
P-19597	0.39
P-19599	0.46
P-196	0
P-1960 (1)	0
P-1960 (2)	0
P-19601	0.22
P-19603	0.22
P-19609(1)	0.31
P-19609(2)	0.2
P-19611	0.2
P-19619(1)	6.24
P-19619(2)	6.24
P-19627	0
P-19629	0
P-19633	0
P-19635	0
P-19637	0
P-19639	0.01
P-19641	0.01
P-19643	0.01
P-19645	0
P-19647	0.07
P-19649	0.08
P-19651	0.01
P-19653	0.02
P-19655	0.02
P-19657	0.03
P-19659(1)	0.36
P-19659(2)	0.22
P-19663	0
P-19665	2.93
P-19667	9.35
P-19669	7.76
P-19675	1.35
P-19677	1.35
P-19679(1)	0.55
P-19679(2)	0.27
P-1968	0.06
P-19689	6.42
P-1969 (1)	0.04
P-1969 (2)	0
P-19691	6.42
P-19693(1)(1)	6.11
P-19693(1)(2)	6.11
P-19693(2)	6.11
P-19695(1)	6.11
P-19695(2)	6.11
P-19697	0
P-19699(1)(1)	0
P-19699(1)(2)	0
P-19699(2)	0
P-1970	0.02
P-19709	0.88
P-1971	0.04
P-19711	0.88
P-19713	0.37
P-19715	0.35
P-19719	0.17
P-1972	0.02
P-19721	0.14
P-19723	0.08
P-19727	0.05
P-19729	0.04
P-1973	0.01
P-19733	0.05
P-1974	0.03

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-19585	0
P-19587	0.04
P-19591	0.02
P-19593	0.09
P-19595	0.04
P-19597	0.31
P-19599	0.49
P-196	0
P-1960 (1)	0
P-1960 (2)	0
P-19601	1.04
P-19603	1.05
P-19609(1)	0.58
P-19609(2)	0.58
P-19611	0.58
P-19619(1)	2.9
P-19619(2)	18.82
P-19627	0.07
P-19629	0
P-19633	0
P-19635	0
P-19637	0
P-19639	0.02
P-19641	0.02
P-19643	0.02
P-19645	0.01
P-19647	0.26
P-19649	0.24
P-19651	0.02
P-19653	0.04
P-19655	0.03
P-19657	0.05
P-19659(1)	1.05
P-19659(2)	1.05
P-19663	0
P-19665	2.58
P-19667	15.48
P-19669	13.61
P-19675	0.71
P-19677	0.71
P-19679(1)	1.06
P-19679(2)	0.52
P-1968	0.05
P-19689	12.87
P-1969 (1)	0.03
P-1969 (2)	0
P-19691	12.87
P-19693(1)(1)	12.23
P-19693(1)(2)	12.26
P-19693(2)	12.29
P-19695(1)	12.23
P-19695(2)	12.2
P-19697	0
P-19699(1)(1)	0
P-19699(1)(2)	0
P-19699(2)	0
P-1970	0.02
P-19709	4.42
P-1971	0.03
P-19711	4.42
P-19713	0.09
P-19715	0.08
P-19719	0.04
P-1972	0.02
P-19721	0.04
P-19723	0.05
P-19727	0.05
P-19729	0.03
P-1973	0.01
P-19733	0.09
P-1974	0.02

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-19585	0
P-19587	0.03
P-19591	0.02
P-19593	0.08
P-19595	0.03
P-19597	0.28
P-19599	0.45
P-196	0
P-1960 (1)	0
P-1960 (2)	0
P-19601	1.62
P-19603	1.62
P-19609(1)	1.03
P-19609(2)	1.03
P-19611	1.03
P-19619(1)	3.08
P-19619(2)	21.36
P-19627	0.11
P-19629	0
P-19633	0
P-19635	0
P-19637	0
P-19639	0.02
P-19641	0.03
P-19643	0.02
P-19645	0.01
P-19647	0.25
P-19649	0.23
P-19651	0.01
P-19653	0.04
P-19655	0.03
P-19657	0.05
P-19659(1)	1.62
P-19659(2)	1.62
P-19663	0
P-19665	4.16
P-19667	46.27
P-19669	43.26
P-19675	1.14
P-19677	1.14
P-19679(1)	1.34
P-19679(2)	0.67
P-1968	0.05
P-19689	42.09
P-1969 (1)	0.03
P-1969 (2)	0
P-19691	42.09
P-19693(1)(1)	41.02
P-19693(1)(2)	41.04
P-19693(2)	41.06
P-19695(1)	41.02
P-19695(2)	14.55
P-19697	0.67
P-19699(1)(1)	0
P-19699(1)(2)	0.67
P-19699(2)	0.41
P-1970	0.01
P-19709	7.58
P-1971	0.04
P-19711	7.58
P-19713	0.11
P-19715	0.09
P-19719	0.04
P-1972	0.01
P-19721	0.04
P-19723	0.05
P-19727	0.05
P-19729	0.03
P-1973	0
P-19733	0.07
P-1974	0.06

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-19741	0	P-19741	0.1	P-19741	0.27
P-19743	0.11	P-19743	0.1	P-19743	0.27
P-19745	0.11	P-19745	0	P-19745	0
P-19751	0.33	P-19751	0.35	P-19751	0.36
P-19753	0.33	P-19753	0.35	P-19753	0.36
P-19759	5.7	P-19759	3.34	P-19759	7.12
P-19761(1)	5.7	P-19761(1)	3.34	P-19761(1)	7.12
P-19761(2)	5.7	P-19761(2)	0	P-19761(2)	0
P-19763	0	P-19763	0	P-19763	0
P-19765	0	P-19765	0.02	P-19765	0.17
P-19767	0	P-19767	0.04	P-19767	0.09
P-19779	0.29	P-19779	0.21	P-19779	0.61
P-19785	0.51	P-19785	0.23	P-19785	0.11
P-19787	0.01	P-19787	0.01	P-19787	0.01
P-19789	0.51	P-19789	0	P-19789	0
P-1979	0.59	P-1979	1.05	P-1979	0.72
P-19793	0.7	P-19793	1.2	P-19793	1.94
P-19795	0	P-19795	0	P-19795	0
P-19797	0	P-19797	0	P-19797	0
P-19801	4.81	P-19801	14.41	P-19801	16.39
P-19803	3.45	P-19803	8.74	P-19803	9.92
P-19805	1.41	P-19805	5.67	P-19805	6.47
P-19807	1.41	P-19807	5.56	P-19807	6.36
P-19809	1.26	P-19809	5.23	P-19809	6.01
P-1981	0.01	P-1981	0.02	P-1981	0.02
P-19811(1)	1.26	P-19811(1)	5.23	P-19811(1)	6.01
P-19811(2)	1.17	P-19811(2)	5	P-19811(2)	5.75
P-19813	0.71	P-19813	4.36	P-19813	4.96
P-19817	0	P-19817	0	P-19817	0
P-19819	0.03	P-19819	0.1	P-19819	0.11
P-19821	0	P-19821	0	P-19821	0
P-19823	0.16	P-19823	0.33	P-19823	0.39
P-19825	0.06	P-19825	0.05	P-19825	0.07
P-19831	0.48	P-19831	0.64	P-19831	0.77
P-19833	0.04	P-19833	0.06	P-19833	0.08
P-19835	0.01	P-19835	0.01	P-19835	0.01
P-19837	0.01	P-19837	0.01	P-19837	0.01
P-19839	1.92	P-19839	0.62	P-19839	0.76
P-19841(1)	0	P-19841(1)	0	P-19841(1)	0
P-19841(2)	0.71	P-19841(2)	0.31	P-19841(2)	0.42
P-19843	0.06	P-19843	0.2	P-19843	0.05
P-19845	0.73	P-19845	1.71	P-19845	0.89
P-19847(1)	0.55	P-19847(1)	1.24	P-19847(1)	0.61
P-19847(2)	0.59	P-19847(2)	1.41	P-19847(2)	0.77
P-1985	0	P-1985	0.01	P-1985	0.01
P-19853	0.01	P-19853	0.01	P-19853	0.01
P-19855	0.01	P-19855	0.01	P-19855	0.01
P-19857	0	P-19857	0	P-19857	0
P-19867	0.02	P-19867	0.03	P-19867	0.03
P-19869	1.39	P-19869	1.06	P-19869	1.38
P-19871	0.58	P-19871	0.21	P-19871	0.4
P-19873(1)	6.69	P-19873(1)	9.7	P-19873(1)	11.28
P-19873(2)	6.69	P-19873(2)	9.7	P-19873(2)	9.02
P-19877	6.69	P-19877	9.7	P-19877	9.02
P-19879	6.69	P-19879	9.7	P-19879	9.02
P-19881	0.3	P-19881	0.07	P-19881	0.82
P-19883	1.33	P-19883	2.03	P-19883	0.15
P-19885	0	P-19885	0	P-19885	0
P-19887	0	P-19887	0.03	P-19887	0.04
P-19889	0	P-19889	0.03	P-19889	0.04
P-1989	1.01	P-1989	0.94	P-1989	0.88
P-19891(1)	0.43	P-19891(1)	1.02	P-19891(1)	0.45
P-19891(2)	0.39	P-19891(2)	0.86	P-19891(2)	0.29
P-19895	0	P-19895	0	P-19895	0
P-19897	0	P-19897	0	P-19897	0
P-19901	0.41	P-19901	0.35	P-19901	0.19
P-19903	0.28	P-19903	0.25	P-19903	0.1
P-19905(1)	0.13	P-19905(1)	0.1	P-19905(1)	0.09
P-19905(2)	0.13	P-19905(2)	0.1	P-19905(2)	0.09
P-19907	0.16	P-19907	0.24	P-19907	0.52
P-19909	0.14	P-19909	0.18	P-19909	0.15

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-1991	0.01	P-1991	0.02	P-1991	0.02
P-19915	0	P-19915	0	P-19915	0
P-19917(1)	0.33	P-19917(1)	0.42	P-19917(1)	0.96
P-19917(2)	0.33	P-19917(2)	0.42	P-19917(2)	0.96
P-19919	0.33	P-19919	0.41	P-19919	0.96
P-19921	0	P-19921	0	P-19921	0
P-19925	0.11	P-19925	0.15	P-19925	0.23
P-19927	0	P-19927	0	P-19927	0
P-19939	0.23	P-19939	0.31	P-19939	0.41
P-19941	0.26	P-19941	0.34	P-19941	0.52
P-19945	0	P-19945	0	P-19945	0
P-19947(1)	0.12	P-19947(1)	0.23	P-19947(1)	0.39
P-19947(2)	0.12	P-19947(2)	0.23	P-19947(2)	0.39
P-19949	0.08	P-19949	0.38	P-19949	0.45
P-19951	0.26	P-19951	0.33	P-19951	0.18
P-19953(1)	0.06	P-19953(1)	0.08	P-19953(1)	0.17
P-19953(2)	0.06	P-19953(2)	0.08	P-19953(2)	0.17
P-19955	0.1	P-19955	0.11	P-19955	0.19
P-19959	0.2	P-19959	0.27	P-19959	0.27
P-19961	0.1	P-19961	0.13	P-19961	0.1
P-19963	0.11	P-19963	0.15	P-19963	0.19
P-19967	0.04	P-19967	0.08	P-19967	0.09
P-19969	0.03	P-19969	0.05	P-19969	0.03
P-19973	0.43	P-19973	0.62	P-19973	1.06
P-19975	0.16	P-19975	0.28	P-19975	0.55
P-19977	0.01	P-19977	0.02	P-19977	0.02
P-19981	0.74	P-19981	0.91	P-19981	0.61
P-19985	0.7	P-19985	0.95	P-19985	0.83
P-19987	0.55	P-19987	0.8	P-19987	1.1
P-19989	0	P-19989	0	P-19989	0
P-19991	0.23	P-19991	0.31	P-19991	0.39
P-19993	0.23	P-19993	0.31	P-19993	0.39
P-19995	0.17	P-19995	0.22	P-19995	0.12
P-19999	0.17	P-19999	0.22	P-19999	0.18
P-2	0.67	P-2	2.07	P-2	1.85
P-20 (1)	0.23	P-20 (1)	0.25	P-20 (1)	0.03
P-20 (2)	0.07	P-20 (2)	0.26	P-20 (2)	0.25
P-2000	2.82	P-2000	5.86	P-2000	4.93
P-20005	0.12	P-20005	0.16	P-20005	0.02
P-20007	0.08	P-20007	0.1	P-20007	0.1
P-20009	0.12	P-20009	0.14	P-20009	0.07
P-2001	2.82	P-2001	5.86	P-2001	4.93
P-20011	0.12	P-20011	0.14	P-20011	0.07
P-20013	0.05	P-20013	0.05	P-20013	0.05
P-20015	0.17	P-20015	0.22	P-20015	0.12
P-20017	0.01	P-20017	0.02	P-20017	0.13
P-20019	0.92	P-20019	1.18	P-20019	0.13
P-2002	2.82	P-2002	5.85	P-2002	4.93
P-20021	0.24	P-20021	0.32	P-20021	0.24
P-20023	0.18	P-20023	0.25	P-20023	0.37
P-20025	0.07	P-20025	0.11	P-20025	0.07
P-20029	0	P-20029	0	P-20029	0
P-2003	2.82	P-2003	5.85	P-2003	4.93
P-20030	0.26	P-20030	2.5	P-20030	3.36
P-20031	0	P-20031	0	P-20031	0
P-20033	0.03	P-20033	0.03	P-20033	0.03
P-20035	0.02	P-20035	0.02	P-20035	0.01
P-20037	0.04	P-20037	0.04	P-20037	0.04
P-20039	0.01	P-20039	0	P-20039	0
P-2004 (1)	2.81	P-2004 (1)	5.85	P-2004 (1)	4.93
P-2004 (2)	0.21	P-2004 (2)	0.18	P-2004 (2)	0.06
P-20041	0.07	P-20041	0.05	P-20041	0.04
P-20043	0.07	P-20043	0.06	P-20043	0.05
P-20048	1.92	P-20048	1.43	P-20048	1
P-2005	2.81	P-2005	5.85	P-2005	4.92
P-20059	0.04	P-20059	0.03	P-20059	0.03
P-2006	2.81	P-2006	5.85	P-2006	4.92
P-20061	0.04	P-20061	0.03	P-20061	0.03
P-20065	0.73	P-20065	0.2	P-20065	0.36
P-20069	0.34	P-20069	0.13	P-20069	0.17
P-2007	2.81	P-2007	5.85	P-2007	4.92

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-20071	0.33
P-20073	0.04
P-20075	0.05
P-20077	0.11
P-20079	1.17
P-2008	2.81
P-20083	1.17
P-20085	1.17
P-20087	0.62
P-20089	0.4
P-2009	2.81
P-20099	1.3
P-20101(1)(1)	0.62
P-20101(1)(2)	1.85
P-20101(2)	1.23
P-20105	1.49
P-20109	0
P-20111	0
P-20113	0
P-20117	1.5
P-20119	1.5
P-2012	0.14
P-20125	0
P-20131	0
P-20133	0.01
P-20137	1.05
P-20139	0.19
P-2014(1)	1.87
P-2014(2)	2.08
P-20141	1.09
P-20145	1.53
P-20149	2.58
P-20151	2.14
P-20159	2.5
P-2016	1.6
P-20161	2.45
P-20163	0.05
P-20165	0
P-20167	0
P-20169	0
P-20171	0
P-20173	0
P-20175	0.05
P-20177	0.02
P-20181	0
P-20183	0
P-20185	0.14
P-20187	0.11
P-20189	0.11
P-20191	0.05
P-20193	0.16
P-20195	0
P-20199	0
P-20211	0.84
P-2022	1.87
P-20221(1)	0.26
P-20221(2)(1)	0.27
P-20221(2)(2)	0.27
P-20223	0
P-20225	0.27
P-20227	0
P-20229	0
P-2023	0.2
P-20239	0.14
P-2024	0.36
P-20241	0.1
P-20243	0.1
P-20249	0.59
P-20251	0.59
P-20257	0.16
P-20259	0.16

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-20071	0.08
P-20073	0.02
P-20075	0.15
P-20077	0.14
P-20079	1.85
P-2008	5.85
P-20083	1.85
P-20085	1.85
P-20087	1.49
P-20089	0.2
P-2009	5.85
P-20099	1.66
P-20101(1)(1)	1.48
P-20101(1)(2)	2.16
P-20101(2)	1.41
P-20105	0.72
P-20109	0.01
P-20111	0
P-20113	0
P-20117	0.73
P-20119	0.73
P-2012	0.27
P-20125	0
P-20131	0
P-20133	0
P-20137	0.25
P-20139	0.26
P-2014(1)	4.1
P-2014(2)	4.49
P-20141	3.45
P-20145	1.5
P-20149	3.19
P-20151	1.46
P-20159	4.94
P-2016	0.38
P-20161	2.94
P-20163	2
P-20165	1.83
P-20167	0
P-20169	0
P-20171	0
P-20173	0
P-20175	0.15
P-20177	0.09
P-20181	0.06
P-20183	0
P-20185	0.13
P-20187	0.09
P-20189	0.09
P-20191	0.03
P-20193	0.08
P-20195	0
P-20199	0
P-20211	0.17
P-2022	4.11
P-20221(1)	0.31
P-20221(2)(1)	0.31
P-20221(2)(2)	0.31
P-20223	0
P-20225	0.31
P-20227	0
P-20229	0
P-2023	0.08
P-20239	1.79
P-2024	0.33
P-20241	0.93
P-20243	0.93
P-20249	0.63
P-20251	0.63
P-20257	0.07
P-20259	0.07

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-20071	0.12
P-20073	0.04
P-20075	0.1
P-20077	0.1
P-20079	0.47
P-2008	4.92
P-20083	0.47
P-20085	0.47
P-20087	1.13
P-20089	0.1
P-2009	4.92
P-20099	0.4
P-20101(1)(1)	1.13
P-20101(1)(2)	0.73
P-20101(2)	0.42
P-20105	0.45
P-20109	0.01
P-20111	0
P-20113	0
P-20117	0.44
P-20119	0.44
P-2012	0.32
P-20125	0
P-20131	0
P-20133	0.01
P-20137	0.29
P-20139	0.19
P-2014(1)	3.64
P-2014(2)	3.88
P-20141	5.41
P-20145	0.79
P-20149	2.93
P-20151	1.02
P-20159	4.62
P-2016	1.24
P-20161	2.6
P-20163	2.02
P-20165	1.64
P-20167	0
P-20169	0
P-20171	0
P-20173	0
P-20175	0.33
P-20177	0.22
P-20181	0.16
P-20183	0
P-20185	0.36
P-20187	0.25
P-20189	0.25
P-20191	0.03
P-20193	0.28
P-20195	0
P-20199	0
P-20211	0.17
P-2022	3.64
P-20221(1)	1.01
P-20221(2)(1)	1.04
P-20221(2)(2)	1.49
P-20223	0
P-20225	1.49
P-20227	0
P-20229	0
P-2023	0.06
P-20239	0
P-2024	0.29
P-20241	1.44
P-20243	1.44
P-20249	0.78
P-20251	0.78
P-20257	0.19
P-20259	0.19

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-20261	0.16
P-20263	2.19
P-20265	2.03
P-20267	0.16
P-20269	0
P-2027	1.87
P-20291	0
P-20295	0
P-20297	8.04
P-20299	6.17
P-20313	0.02
P-20315	0
P-20317	0
P-20325	0
P-20327	0
P-20331	0
P-20335	0.39
P-20337	0.31
P-20339	0.07
P-20341	0
P-20347	0
P-20349	0.07
P-2035	0
P-20351	0.06
P-20353	0.11
P-20355	0.07
P-20357	0.07
P-20359	0.14
P-20361	0.07
P-20365	0.09
P-20367(1)	0.11
P-20367(2)	0.11
P-20371	0
P-20383	0
P-20387	0.04
P-20389	0.04
P-20391	0.25
P-20393	0.01
P-20395	0.01
P-20403	0.48
P-20405	0.43
P-2041	0.04
P-20413	0.04
P-20415	0.05
P-20417	0.02
P-20419(1)	0.02
P-20419(2)	0.02
P-20421	0.24
P-20423	0
P-20429	0
P-20437	0
P-20439	0.05
P-2044	0.06
P-20443	0.04
P-20445	0.04
P-20453	0
P-20455	0
P-20457	0
P-20459	0
P-2046	0.18
P-20461	0
P-20463	0
P-20465	0
P-20467	0
P-20469	0
P-2047	0
P-20471	0
P-20473	0
P-20475	0
P-20477	0
P-20481	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-20261	0.07
P-20263	0.94
P-20265	0.87
P-20267	0.07
P-20269	0.27
P-2027	4.11
P-20291	0.1
P-20295	0.17
P-20297	3.53
P-20299	2.2
P-20313	0.03
P-20315	0.1
P-20317	0
P-20325	0
P-20327	0
P-20331	0.17
P-20335	0.28
P-20337	0.16
P-20339	0.13
P-20341	0
P-20347	0
P-20349	0.05
P-2035	0
P-20351	0.05
P-20353	0.57
P-20355	0.06
P-20357	0.07
P-20359	0.14
P-20361	0.06
P-20365	0.1
P-20367(1)	0.23
P-20367(2)	0.23
P-20371	0
P-20383	0
P-20387	0.08
P-20389	0.08
P-20391	0.1
P-20393	0.02
P-20395	0.02
P-20403	1.19
P-20405	1.06
P-2041	0.1
P-20413	0.13
P-20415	0.11
P-20417	0.01
P-20419(1)	0.03
P-20419(2)	0.03
P-20421	0.63
P-20423	0
P-20429	0
P-20437	0
P-20439	0.05
P-2044	0.14
P-20443	0.06
P-20445	0.06
P-20453	0.34
P-20455	0.34
P-20457	0
P-20459	0
P-2046	0.12
P-20461	0
P-20463	0
P-20465	0
P-20467	0
P-20469	0
P-2047	0.01
P-20471	0
P-20473	0
P-20475	0
P-20477	0
P-20481	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-20261	0.19
P-20263	2.58
P-20265	2.39
P-20267	0.19
P-20269	0.26
P-2027	3.65
P-20291	0.1
P-20295	0.17
P-20297	4.62
P-20299	3.15
P-20313	0.03
P-20315	0.02
P-20317	0
P-20325	0
P-20327	0
P-20331	0.02
P-20335	0.26
P-20337	0.38
P-20339	0.12
P-20341	0
P-20347	0
P-20349	0.04
P-2035	0
P-20351	0.04
P-20353	0.77
P-20355	0.01
P-20357	0.01
P-20359	0.02
P-20361	0.01
P-20365	0.12
P-20367(1)	0.26
P-20367(2)	0.26
P-20371	0
P-20383	0
P-20387	0.09
P-20389	0.09
P-20391	0.16
P-20393	0.03
P-20395	0.03
P-20403	1.34
P-20405	1.2
P-2041	0.18
P-20413	0.16
P-20415	0.13
P-20417	0.01
P-20419(1)	0.04
P-20419(2)	0.04
P-20421	0.74
P-20423	0
P-20429	0
P-20437	0
P-20439	0.06
P-2044	0.11
P-20443	0.06
P-20445	0.06
P-20453	0.28
P-20455	0.28
P-20457	0
P-20459	0
P-2046	0.12
P-20461	0
P-20463	0
P-20465	0
P-20467	0
P-20469	0
P-2047	0.01
P-20471	0
P-20473	0
P-20475	0
P-20477	0
P-20481	0

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
P-20483	0
P-20485	0
P-20487	0
P-20489	0
P-20491	0
P-20493	0
P-20495	0
P-20497	0
P-20499	0
P-20501	0
P-20503	0
P-20507(1)	0
P-20507(2)	0
P-20509	0
P-20511	0
P-20515	0
P-20517	0
P-2052	0.09
P-20523	0
P-20527	0.14
P-20529	0.01
P-2053	0.07
P-20531	0.01
P-20533	0
P-2054	0.1
P-20543	0
P-20545	0
P-20549(1)(1)	3.04
P-20549(1)(2)	2.32
P-20549(2)	3.14
P-20559	0
P-20561	0
P-20563	0
P-20565	0.05
P-20567	0
P-20569	0.05
P-20573	0
P-20577	0
P-20581	0
P-20585	0
P-20587	0
P-2059	0
P-20591	0.03
P-20593	0.03
P-20595(1)	3.49
P-20595(2)	3.49
P-20597	3.49
P-20599	3.38
P-20601	3.38
P-20603	3.38
P-20613	3.38
P-20615	3.38
P-20617	3.38
P-20619	3.38
P-20621	3.38
P-20623	3.38
P-20625	3.38
P-20627	3.38
P-20629	3.38
P-20631	3.38
P-20633	3.38
P-20635	2.84
P-20637	2.84
P-20639	2.84
P-20641	2.84
P-20643	2.84
P-20645	2.84
P-20647	2.84
P-20651	2.84
P-20653	2.84
P-20655	2.84

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-20483	0
P-20485	0
P-20487	0
P-20489	0
P-20491	0.08
P-20493	0
P-20495	0.08
P-20497	0.12
P-20499	0.01
P-20501	0.12
P-20503	0
P-20507(1)	0
P-20507(2)	0
P-20509	0
P-20511	0
P-20515	0
P-20517	0
P-2052	0.27
P-20523	0
P-20527	0.25
P-20529	0.02
P-2053	0.21
P-20531	0.02
P-20533	0
P-2054	0.29
P-20543	0
P-20545	0
P-20549(1)(1)	2.68
P-20549(1)(2)	2.07
P-20549(2)	2.84
P-20559	0
P-20561	0
P-20563	0
P-20565	0.09
P-20567	0
P-20569	0.09
P-20573	0
P-20577	0
P-20581	0
P-20585	0
P-20587	0
P-2059	0
P-20591	0.26
P-20593	0.26
P-20595(1)	5.4
P-20595(2)	5.53
P-20597	5.53
P-20599	5.46
P-20601	5.46
P-20603	5.46
P-20613	5.46
P-20615	5.46
P-20617	5.46
P-20619	5.46
P-20621	5.46
P-20623	5.46
P-20625	5.46
P-20627	5.46
P-20629	5.46
P-20631	5.46
P-20633	5.46
P-20635	5.29
P-20637	5.29
P-20639	5.29
P-20641	5.29
P-20643	5.29
P-20645	5.29
P-20647	5.29
P-20651	5.29
P-20653	5.29
P-20655	5.29

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-20483	0
P-20485	0
P-20487	0
P-20489	0
P-20491	0.04
P-20493	0
P-20495	0.04
P-20497	0.06
P-20499	0.01
P-20501	0.06
P-20503	0
P-20507(1)	0
P-20507(2)	0
P-20509	0
P-20511	0
P-20515	0
P-20517	0
P-2052	0.15
P-20523	0
P-20527	0.27
P-20529	0.02
P-2053	0.11
P-20531	0.02
P-20533	0
P-2054	0.16
P-20543	0
P-20545	0
P-20549(1)(1)	0.32
P-20549(1)(2)	0.14
P-20549(2)	0
P-20559	0
P-20561	0
P-20563	0
P-20565	0.08
P-20567	0
P-20569	0.08
P-20573	0
P-20577	0
P-20581	0
P-20585	0
P-20587	0
P-2059	0
P-20591	0.56
P-20593	0.56
P-20595(1)	4.43
P-20595(2)	4.62
P-20597	4.62
P-20599	4.65
P-20601	4.65
P-20603	4.65
P-20613	4.65
P-20615	4.65
P-20617	4.65
P-20619	4.65
P-20621	4.65
P-20623	4.65
P-20625	4.65
P-20627	4.65
P-20629	4.65
P-20631	4.65
P-20633	4.65
P-20635	4.91
P-20637	4.91
P-20639	4.91
P-20641	4.91
P-20643	4.91
P-20645	4.91
P-20647	4.91
P-20651	4.91
P-20653	4.91
P-20655	4.91

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-20657	2.84
P-20659	2.84
P-20661	2.84
P-20663	2.84
P-20665	2.84
P-20667	2.84
P-20669	2.84
P-20671	2.84
P-20673	2.84
P-20675	3.14
P-20677	0.31
P-20679	2.84
P-20681	3.44
P-20683	0.53
P-20685	1.28
P-20687	1.28
P-20689	0.03
P-20691	0.03
P-20693	0.03
P-20695	0.03
P-20697	0.03
P-20699	0.03
P-20701	0.03
P-20703	0.03
P-20705	0.08
P-20707	0.11
P-20709(1)	0.02
P-20709(2)	0.02
P-20713	0.02
P-20717	0.01
P-20719	0.01
P-20721	0.01
P-20723	0.01
P-20725	0.01
P-20727	0.01
P-20731	0.01
P-20733	0.01
P-20735	0.01
P-20737	0.01
P-20739	0.02
P-20741	0.01
P-20743	0.01
P-20745	0.01
P-20749	0.01
P-20751	0.01
P-20753	0.02
P-20755	0.02
P-20757	0
P-20761	0.01
P-20763	0
P-20765	0.01
P-20779	0.03
P-20781	0.03
P-20783	0
P-20785	0.03
P-20787	0.03
P-20789	0
P-2079	0.02
P-20791	0
P-20793	0
P-20795	0
P-20797	0
P-20799	0.03
P-20801	0.03
P-20803	0
P-20807(1)(1)	0.36
P-20807(1)(2)	0.36
P-20807(2)(1)	0.36
P-20807(2)(2)	0.36
P-20811(1)	0.36
P-20811(2)	0.36

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-20657	5.29
P-20659	5.29
P-20661	5.29
P-20663	5.29
P-20665	5.29
P-20667	5.29
P-20669	5.29
P-20671	5.29
P-20673	5.29
P-20675	2.84
P-20677	0.28
P-20679	5.29
P-20681	5.9
P-20683	1.15
P-20685	0.32
P-20687	0.32
P-20689	1.15
P-20691	1.15
P-20693	1.15
P-20695	1.15
P-20697	1.15
P-20699	1.15
P-20701	1.15
P-20703	1.15
P-20705	0.08
P-20707	0.11
P-20709(1)	0.05
P-20709(2)	0.04
P-20713	0.28
P-20717	0.29
P-20719	0.29
P-20721	0.29
P-20723	0.29
P-20725	0.29
P-20727	0.29
P-20731	0.04
P-20733	0.04
P-20735	0.04
P-20737	0.04
P-20739	0.05
P-20741	0.04
P-20743	0.02
P-20745	0.05
P-20749	0.05
P-20751	0.05
P-20753	0.28
P-20755	0.28
P-20757	0
P-20761	0.34
P-20763	0.56
P-20765	0.22
P-20779	0.09
P-20781	0.24
P-20783	0.33
P-20785	0.05
P-20787	0.05
P-20789	0
P-2079	0.39
P-20791	0.09
P-20793	0.19
P-20795	0.28
P-20797	0.18
P-20799	0.11
P-20801	0.07
P-20803	0.18
P-20807(1)(1)	0.22
P-20807(1)(2)	0.17
P-20807(2)(1)	0.17
P-20807(2)(2)	0.14
P-20811(1)	0
P-20811(2)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-20657	4.91
P-20659	4.91
P-20661	4.91
P-20663	4.91
P-20665	4.91
P-20667	4.91
P-20669	4.91
P-20671	4.91
P-20673	4.91
P-20675	0
P-20677	1.67
P-20679	4.91
P-20681	6.71
P-20683	2.64
P-20685	0.53
P-20687	0.53
P-20689	1.61
P-20691	1.61
P-20693	1.61
P-20695	1.61
P-20697	1.61
P-20699	1.61
P-20701	1.61
P-20703	1.61
P-20705	0.99
P-20707	0.17
P-20709(1)	0.82
P-20709(2)	0.73
P-20713	6.54
P-20717	6.46
P-20719	6.46
P-20721	6.46
P-20723	6.46
P-20725	6.46
P-20727	6.46
P-20731	0.84
P-20733	0.84
P-20735	0.84
P-20737	0.84
P-20739	0.82
P-20741	0.84
P-20743	0.08
P-20745	0.78
P-20749	0.78
P-20751	0.78
P-20753	6.54
P-20755	6.54
P-20757	0
P-20761	0.47
P-20763	0.65
P-20765	0.19
P-20779	0.05
P-20781	0.14
P-20783	0.16
P-20785	0.11
P-20787	0.11
P-20789	0
P-2079	0.45
P-20791	0.15
P-20793	0.3
P-20795	0.46
P-20797	0.24
P-20799	0.13
P-20801	0.11
P-20803	0.24
P-20807(1)(1)	9.42
P-20807(1)(2)	9.42
P-20807(2)(1)	9.55
P-20807(2)(2)	9.55
P-20811(1)	11.44
P-20811(2)	11.44

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-20811(3)	0.36	P-20811(3)	0.23	P-20811(3)	10.51
P-20813(1)(1)	0.36	P-20813(1)(1)	0.33	P-20813(1)(1)	1.78
P-20813(1)(2)	0.36	P-20813(1)(2)	0.33	P-20813(1)(2)	0.64
P-20813(2)(1)(1)(1)	0.37	P-20813(2)(1)(1)(1)	0	P-20813(2)(1)(1)(1)	0
P-20813(2)(1)(1)(2)	0.37	P-20813(2)(1)(1)(2)	0	P-20813(2)(1)(1)(2)	0
P-20813(2)(1)(2)	0.37	P-20813(2)(1)(2)	0	P-20813(2)(1)(2)	0
P-20813(2)(2)	0.38	P-20813(2)(2)	0.19	P-20813(2)(2)	0.46
P-20841(2)(2)	0	P-20841(2)(2)	8.91	P-20841(2)(2)	9.07
P-20843	0	P-20843	8.91	P-20843	9.07
P-20845	6.42	P-20845	6.59	P-20845	6.58
P-20847	6.42	P-20847	6.59	P-20847	6.58
P-20849(1)	0	P-20849(1)	1.16	P-20849(1)	0
P-20849(2)	0	P-20849(2)	1.16	P-20849(2)	0
P-2085	0.07	P-2085	0.52	P-2085	0.45
P-20853	0	P-20853	3.48	P-20853	0
P-20855	0	P-20855	2.32	P-20855	0
P-20857	0	P-20857	1.16	P-20857	0
P-20859	0	P-20859	1.16	P-20859	0
P-2086	0.13	P-2086	0.17	P-2086	0.19
P-20861	0	P-20861	2.32	P-20861	0
P-20863	0	P-20863	3.48	P-20863	0
P-20867(1)	0	P-20867(1)	1.16	P-20867(1)	0
P-20867(2)	0	P-20867(2)	1.16	P-20867(2)	0
P-20869(1)	0	P-20869(1)	1.16	P-20869(1)	0
P-20869(2)	0	P-20869(2)	1.16	P-20869(2)	0
P-20871(1)	0	P-20871(1)	1.16	P-20871(1)	0
P-20871(2)	0	P-20871(2)	1.16	P-20871(2)	0
P-20873	0	P-20873	4.64	P-20873	0
P-20875	0	P-20875	(N/A)	P-20875	(N/A)
P-20881(1)	0	P-20881(1)	4.61	P-20881(1)	0
P-20881(2)	0	P-20881(2)	4.61	P-20881(2)	0
P-20885	0	P-20885	0	P-20885	0
P-20887	0.06	P-20887	0.08	P-20887	0.26
P-20889	0	P-20889	0	P-20889	0
P-2089	0.06	P-2089	0.14	P-2089	0.24
P-20891	0.05	P-20891	0.03	P-20891	0.19
P-20893	0.04	P-20893	0.02	P-20893	0.11
P-20895	0.07	P-20895	0.05	P-20895	0.28
P-20897	0.12	P-20897	0.05	P-20897	0.04
P-20899	1.23	P-20899	0.68	P-20899	0.4
P-20901	0.03	P-20901	0.1	P-20901	0.2
P-20903	0.04	P-20903	0.03	P-20903	0.03
P-20905	0.19	P-20905	0.05	P-20905	0.06
P-20907	0.08	P-20907	0.17	P-20907	0.29
P-20909(1)	0.03	P-20909(1)	0.05	P-20909(1)	0.07
P-20909(2)	0.03	P-20909(2)	0.05	P-20909(2)	0.07
P-20911(1)	0.11	P-20911(1)	0.07	P-20911(1)	0.11
P-20911(2)	0.06	P-20911(2)	0.13	P-20911(2)	0.19
P-20913	0.16	P-20913	0.2	P-20913	0.17
P-20915	0.01	P-20915	0.03	P-20915	0.16
P-20917	0.01	P-20917	0.02	P-20917	0.1
P-20919	0.67	P-20919	0.3	P-20919	0.24
P-20921	0.49	P-20921	0.42	P-20921	0.58
P-20923	0.18	P-20923	0.23	P-20923	0.13
P-20925	0.04	P-20925	0.11	P-20925	0.1
P-20927	5.25	P-20927	2.08	P-20927	8.09
P-20929	4.02	P-20929	8.23	P-20929	6.95
P-2093	0.1	P-2093	0.22	P-2093	0.17
P-20931(1)	0.89	P-20931(1)	1.64	P-20931(1)	1.61
P-20931(2)	0	P-20931(2)	0	P-20931(2)	0
P-20933	13.07	P-20933	26.85	P-20933	37.55
P-20935	0.89	P-20935	1.64	P-20935	1.61
P-20937	0.64	P-20937	0.51	P-20937	0.16
P-20943	2.81	P-20943	1.66	P-20943	6.55
P-20945(1)	3.13	P-20945(1)	0.29	P-20945(1)	1.28
P-20945(2)	1.68	P-20945(2)	0.85	P-20945(2)	3.44
P-20949	1.68	P-20949	0.85	P-20949	3.44
P-2095 (1)	0.04	P-2095 (1)	0.08	P-2095 (1)	0.06
P-2095 (2)	0.08	P-2095 (2)	0.31	P-2095 (2)	0.3
P-20951	4.56	P-20951	0.72	P-20951	2.82
P-20953	4.72	P-20953	1.56	P-20953	6.26

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-20955	0.78
P-20957	2.16
P-20959(1)	0.01
P-20959(2)	0.01
P-20961	0.01
P-20963	0.01
P-20965	0.02
P-20967	0.17
P-20969	0.09
P-20971(1)	0
P-20971(2)	0
P-20973	7.36
P-20975	0.08
P-20979	1.08
P-20981	0.09
P-20983	0.14
P-20985	0.62
P-20987	0.16
P-20989	0.03
P-2099 (1)	0.02
P-2099 (2)	0.12
P-20991	1.11
P-20993	0.4
P-20995	0.13
P-20997	0.03
P-20999	0.02
P-21	0.46
P-21001	0
P-21029	0
P-21031	8.32
P-21033	8.32
P-21035	6.42
P-21037	0
P-21039	1.91
P-21041	8.32
P-2107	0.19
P-2108	0.16
P-21083	(N/A)
P-21103(1)	0.11
P-21103(2)	0.11
P-2118	0.22
P-21249(1)	0.37
P-21251	0.37
P-21253	(N/A)
P-21255(1)	(N/A)
P-21255(2)	(N/A)
P-21257	0.47
P-21259	0.85
P-21261	0.08
P-21263	0.01
P-21265	0.04
P-21267	0.01
P-21269	0.59
P-21271	(N/A)
P-21273	0
P-2130	0.06
P-21317	(N/A)
P-21319	(N/A)
P-21321	(N/A)
P-2136	0.16
P-2137	0.01
P-21435	(N/A)
P-2144	0
P-2145	0
P-2151	0
P-21571	(N/A)
P-21573	(N/A)
P-21581	(N/A)
P-21583	(N/A)
P-21585	0.16
P-21587	(N/A)

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-20955	0.73
P-20957	3.79
P-20959(1)	0.01
P-20959(2)	0.01
P-20961	0.01
P-20963	0.01
P-20965	0.05
P-20967	0.06
P-20969	0.2
P-20971(1)	0
P-20971(2)	0
P-20973	11.34
P-20975	0.11
P-20979	0.47
P-20981	0.09
P-20983	0.1
P-20985	0.21
P-20987	0.06
P-20989	0.3
P-2099 (1)	0.04
P-2099 (2)	0.15
P-20991	0.86
P-20993	0.21
P-20995	0.05
P-20997	0.19
P-20999	0.06
P-21	0.35
P-21001	0.08
P-21029	0
P-21031	10.42
P-21033	7.61
P-21035	6.59
P-21037	2.81
P-21039	3.83
P-21041	10.42
P-2107	0.23
P-2108	0.15
P-21083	0
P-21103(1)	0.03
P-21103(2)	0.04
P-2118	0.54
P-21249(1)	0.2
P-21251	0.2
P-21253	0.08
P-21255(1)	(N/A)
P-21255(2)	(N/A)
P-21257	0.66
P-21259	1.26
P-21261	0.14
P-21263	0.13
P-21265	0.18
P-21267	0.07
P-21269	2.21
P-21271	0.21
P-21273	0.35
P-2130	0.06
P-21317	0.26
P-21319	0.05
P-21321	0.05
P-2136	0.23
P-2137	0.01
P-21435	0.08
P-2144	0.01
P-2145	0.01
P-2151	0.01
P-21571	0.15
P-21573	1.11
P-21581	1.73
P-21583	0.1
P-21585	0.33
P-21587	0.25

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-20955	0.61
P-20957	2.27
P-20959(1)	0.03
P-20959(2)	0.03
P-20961	0.03
P-20963	0.03
P-20965	0.13
P-20967	0.66
P-20969	0.21
P-20971(1)	0
P-20971(2)	0
P-20973	9.85
P-20975	0.14
P-20979	0.62
P-20981	0.09
P-20983	0.05
P-20985	0.25
P-20987	0.08
P-20989	0.1
P-2099 (1)	0.03
P-2099 (2)	0.15
P-20991	1.73
P-20993	0.31
P-20995	0.06
P-20997	0.16
P-20999	0.05
P-21	0.15
P-21001	0.02
P-21029	0
P-21031	14.31
P-21033	8.7
P-21035	6.58
P-21037	5.61
P-21039	7.73
P-21041	14.31
P-2107	0.1
P-2108	0.15
P-21083	0
P-21103(1)	0.03
P-21103(2)	0.03
P-2118	0.28
P-21249(1)	0.14
P-21251	0.14
P-21253	0.15
P-21255(1)	(N/A)
P-21255(2)	(N/A)
P-21257	0.98
P-21259	1.85
P-21261	0.31
P-21263	0.28
P-21265	0.34
P-21267	0.16
P-21269	0
P-21271	0.61
P-21273	0.31
P-2130	0.05
P-21317	0.01
P-21319	0.36
P-21321	0.36
P-2136	0.41
P-2137	0.01
P-21435	0.36
P-2144	0.01
P-2145	0.01
P-2151	0.01
P-21571	0.16
P-21573	1.29
P-21581	0.84
P-21583	0.02
P-21585	0.14
P-21587	0.08

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-2159	0
P-21605	(N/A)
P-21613	(N/A)
P-21615	(N/A)
P-21617	(N/A)
P-21619	0.03
P-21621	0.01
P-21623	0.01
P-21629	1.7
P-21641	0.24
P-2165 (1)	0.07
P-2165 (2)	0.58
P-21665	(N/A)
P-21667	(N/A)
P-21669	(N/A)
P-21693	9.72
P-21695	9.72
P-21697	9.72
P-21699	0
P-21701	(N/A)
P-21703	(N/A)
P-21705	0
P-21707	9.72
P-21709(1)	(N/A)
P-21709(2)	(N/A)
P-21711(1)	(N/A)
P-21711(2)	(N/A)
P-21713(1)	9.72
P-21713(2)	9.57
P-21715	(N/A)
P-21717	(N/A)
P-2173	0.01
P-21731	0
P-21733	0.01
P-21735	0.03
P-21741	0
P-21745	0.03
P-21747	0.05
P-21749	0
P-21751	0.47
P-21753	0.08
P-21755	0.08
P-21757	0.01
P-21759	0
P-2176	0.93
P-21761	0
P-21763	0
P-21765	0
P-21767	0
P-21769	0
P-21771	0
P-21773	0.52
P-21775	0.12
P-21777	0.05
P-21779	0
P-21781	0
P-21783	0.27
P-21785	0
P-21787	0
P-21789	0.12
P-21791	0.12
P-21793	0.04
P-21795	0
P-21797	0
P-21801	0.14
P-21803	0.02
P-21805	0.03
P-21807	0
P-21809	0.17
P-21811	0.12
P-21813	0.08

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-2159	0.68
P-21605	0.37
P-21613	0.01
P-21615	0.07
P-21617	0.02
P-21619	0.04
P-21621	0.01
P-21623	0.02
P-21629	3.09
P-21641	0.72
P-2165 (1)	0.16
P-2165 (2)	0.72
P-21665	0.02
P-21667	0.16
P-21669	0.14
P-21693	16.53
P-21695	16.53
P-21697	16.53
P-21699	9.98
P-21701	(N/A)
P-21703	(N/A)
P-21705	0
P-21707	6.55
P-21709(1)	(N/A)
P-21709(2)	(N/A)
P-21711(1)	(N/A)
P-21711(2)	(N/A)
P-21713(1)	16.53
P-21713(2)	16.53
P-21715	(N/A)
P-21717	(N/A)
P-2173	0.01
P-21731	0
P-21733	0.01
P-21735	0.06
P-21741	0
P-21745	0.05
P-21747	0.05
P-21749	0.01
P-21751	0.45
P-21753	0.06
P-21755	0.06
P-21757	0.01
P-21759	0
P-2176	2.43
P-21761	0
P-21763	0
P-21765	0
P-21767	0
P-21769	0.01
P-21771	0
P-21773	0.57
P-21775	0.06
P-21777	0.02
P-21779	0
P-21781	0
P-21783	1.79
P-21785	0
P-21787	0
P-21789	0.02
P-21791	0.02
P-21793	0.01
P-21795	0
P-21797	0
P-21801	0.03
P-21803	0.07
P-21805	0.02
P-21807	0
P-21809	0.2
P-21811	0.14
P-21813	0.08

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-2159	0.63
P-21605	0.38
P-21613	0.01
P-21615	0.06
P-21617	0.02
P-21619	0.03
P-21621	0.01
P-21623	0.02
P-21629	2.84
P-21641	1.18
P-2165 (1)	0.15
P-2165 (2)	0.52
P-21665	0.93
P-21667	0.49
P-21669	0.44
P-21693	44.58
P-21695	34.15
P-21697	21.93
P-21699	10.43
P-21701	3.31
P-21703	13.74
P-21705	25.97
P-21707	37.47
P-21709(1)	10.43
P-21709(2)	10.43
P-21711(1)	3.31
P-21711(2)	3.31
P-21713(1)	47.9
P-21713(2)	47.9
P-21715	(N/A)
P-21717	(N/A)
P-2173	0.01
P-21731	0
P-21733	0.01
P-21735	0.06
P-21741	0.08
P-21745	0.05
P-21747	0.11
P-21749	0.01
P-21751	0.1
P-21753	0.02
P-21755	0.02
P-21757	0.01
P-21759	0
P-2176	0.3
P-21761	0
P-21763	0
P-21765	0
P-21767	0.41
P-21769	0.01
P-21771	0
P-21773	0.31
P-21775	0.07
P-21777	0.05
P-21779	0
P-21781	0
P-21783	0.36
P-21785	0
P-21787	0
P-21789	0.03
P-21791	0.03
P-21793	0.01
P-21795	0
P-21797	0
P-21801	0.04
P-21803	0.2
P-21805	0.04
P-21807	0
P-21809	0.14
P-21811	0.1
P-21813	0.13

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-21815	0.05	P-21815	0.09	P-21815	0.02
P-21817	0.08	P-21817	0.12	P-21817	0.18
P-21819	0.55	P-21819	0.18	P-21819	0.36
P-21821	0.09	P-21821	0.22	P-21821	0.23
P-21823	0	P-21823	0.08	P-21823	0.27
P-21825	0	P-21825	0.08	P-21825	0.27
P-21827	0.9	P-21827	1.21	P-21827	0.03
P-21829	0.09	P-21829	0.17	P-21829	0.13
P-2183	0.11	P-2183	0.16	P-2183	0.37
P-21831	0.21	P-21831	0.39	P-21831	0.26
P-21833	0.12	P-21833	0.25	P-21833	0.2
P-21835	0	P-21835	0	P-21835	0
P-21837	0.39	P-21837	0.5	P-21837	0.4
P-21839	0.04	P-21839	0.06	P-21839	0.06
P-21841	0	P-21841	0	P-21841	0
P-21843	0.3	P-21843	0.26	P-21843	0.15
P-21857	8.86	P-21857	7.09	P-21857	6.31
P-21859	1.5	P-21859	5.18	P-21859	4.23
P-21863	(N/A)	P-21863	(N/A)	P-21863	(N/A)
P-21865	(N/A)	P-21865	0.09	P-21865	1.76
P-2188	0	P-2188	0.01	P-2188	0.01
P-2189	0.05	P-2189	0.12	P-2189	0.11
P-2192	0.01	P-2192	0.05	P-2192	0.04
P-2194	0.14	P-2194	0.24	P-2194	0.1
P-21941(1)	70.16	P-21941(1)	71.95	P-21941(1)	92.59
P-21941(2)	70.16	P-21941(2)	71.95	P-21941(2)	92.59
P-220	0.07	P-220	0.21	P-220	0.12
P-2200	0.04	P-2200	0.05	P-2200	0.13
P-22035(1)	0.14	P-22035(1)	0	P-22035(1)	0
P-22035(2)	0.14	P-22035(2)	0	P-22035(2)	0
P-22037	0.14	P-22037	0	P-22037	0
P-22039	0.14	P-22039	0	P-22039	0
P-22051	0.05	P-22051	0.03	P-22051	0.39
P-22053	0.04	P-22053	0.1	P-22053	0.17
P-22055	0.02	P-22055	0.09	P-22055	0.14
P-2206	0.11	P-2206	0.09	P-2206	0.04
P-2209	0.01	P-2209	0.05	P-2209	0.04
P-2211	0.03	P-2211	0.13	P-2211	0.12
P-2217	0.03	P-2217	0.07	P-2217	0.12
P-2220	0.02	P-2220	0.06	P-2220	0.05
P-2221	0	P-2221	0	P-2221	0
P-2224	0	P-2224	0.01	P-2224	0.01
P-223	0.12	P-223	0.09	P-223	0.09
P-2230	0	P-2230	0.05	P-2230	0.07
P-2253	0.02	P-2253	0.03	P-2253	0.03
P-2263	0	P-2263	0	P-2263	0
P-2265	0	P-2265	0	P-2265	0
P-227	0.03	P-227	0.02	P-227	0.02
P-2270 (1)	0	P-2270 (1)	0	P-2270 (1)	0
P-2270 (2)	0.38	P-2270 (2)	0.14	P-2270 (2)	0.32
P-2274	0	P-2274	0.1	P-2274	0.01
P-2275	0	P-2275	0	P-2275	0
P-2276	0.11	P-2276	0.1	P-2276	0.04
P-2277 (1)	0.01	P-2277 (1)	0.1	P-2277 (1)	0
P-2277 (2)	0.19	P-2277 (2)	0.03	P-2277 (2)	0.04
P-2282	0	P-2282	0.01	P-2282	0.41
P-2285	0.73	P-2285	1.28	P-2285	0.88
P-2286	0.01	P-2286	0.03	P-2286	0.67
P-2288	0.01	P-2288	0.03	P-2288	0.67
P-2295(1)	0.1	P-2295(1)	0.18	P-2295(1)	0.16
P-2295(2)	0.03	P-2295(2)	0.06	P-2295(2)	0.05
P-2296	0.05	P-2296	0.04	P-2296	0.04
P-2315	0.09	P-2315	0.11	P-2315	0.24
P-2323	0.3	P-2323	0.5	P-2323	0.46
P-2325	0.01	P-2325	0.02	P-2325	0.02
P-2328	0	P-2328	0	P-2328	0
P-2329	0	P-2329	0	P-2329	0
P-2335	0	P-2335	0	P-2335	0
P-2339	0.11	P-2339	0.07	P-2339	0.06
P-2340	0	P-2340	0	P-2340	0
P-2348	0.1	P-2348	0.05	P-2348	0.05

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-2349	0.17
P-236	0
P-2360	0.1
P-2378	0.1
P-2380	0.04
P-2382	0.14
P-2385	0.01
P-2386	0.02
P-2387	0
P-2394	0.03
P-2400	0
P-2401	0.23
P-2405	0.04
P-2407	0.01
P-2414	0.02
P-2415	0.06
P-2418	0
P-2427	0.16
P-2428	0.1
P-243	0.09
P-2430	0.09
P-2442	0.01
P-2444	0.13
P-2448	0.21
P-2449	0.12
P-2453	0.04
P-2458	0.05
P-2460	0.07
P-2475	0
P-2478	0.01
P-248	0.01
P-2486 (1)	0.01
P-2486 (2)	0.01
P-2489	0.04
P-2490 (1)	0.03
P-2490 (2)	0.01
P-2491	0.02
P-2494	0
P-2499	0.03
P-250	0.1
P-2505	0.26
P-2511	0.06
P-2514	0
P-2515	0
P-2522	0.72
P-2525	0.17
P-2528	0.02
P-2529	0
P-253	0.02
P-2535	3.37
P-2536	3.18
P-2537 (1)	3.18
P-2537 (2)	0.08
P-2539	3.18
P-2542	0
P-2543	3.37
P-2546	3.67
P-2548 (1)	3.65
P-2548 (2)	0.07
P-255	0.73
P-2556	0
P-2558 (1)	6.76
P-2558 (2)	0.07
P-256	0.08
P-2562	0
P-257	0.03
P-2573	0.02
P-2588	0.01
P-2596	0.1
P-2613	0.23
P-2614 (1)	0.03

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-2349	0.07
P-236	0
P-2360	0.02
P-2378	0.18
P-2380	0.09
P-2382	0.28
P-2385	0.01
P-2386	0.02
P-2387	0.01
P-2394	0.05
P-2400	0
P-2401	0.34
P-2405	0.14
P-2407	0.02
P-2414	0.03
P-2415	0.04
P-2418	0
P-2427	0.17
P-2428	0.2
P-243	0.21
P-2430	0.17
P-2442	0.02
P-2444	0.41
P-2448	0.45
P-2449	0.14
P-2453	0.03
P-2458	0.06
P-2460	0.13
P-2475	0
P-2478	0.02
P-248	0.01
P-2486 (1)	0.01
P-2486 (2)	0.01
P-2489	0.05
P-2490 (1)	0.04
P-2490 (2)	0.01
P-2491	0.03
P-2494	0
P-2499	0.06
P-250	0.06
P-2505	0.23
P-2511	0.17
P-2514	0.01
P-2515	0
P-2522	0.96
P-2525	0.08
P-2528	0.04
P-2529	0.01
P-253	0.03
P-2535	1.66
P-2536	1.58
P-2537 (1)	1.58
P-2537 (2)	0.15
P-2539	1.59
P-2542	0
P-2543	1.65
P-2546	1.06
P-2548 (1)	1.22
P-2548 (2)	0.06
P-255	1.7
P-2556	0
P-2558 (1)	24.91
P-2558 (2)	0.04
P-256	0.04
P-2562	0
P-257	0.06
P-2573	0.05
P-2588	0.01
P-2596	0.11
P-2613	0.69
P-2614 (1)	0.14

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-2349	0.23
P-236	0
P-2360	0.11
P-2378	0.16
P-2380	0.08
P-2382	0.26
P-2385	0.01
P-2386	0.03
P-2387	0.01
P-2394	0.04
P-2400	0
P-2401	0.15
P-2405	0.16
P-2407	0.03
P-2414	0.03
P-2415	0.08
P-2418	0
P-2427	0.12
P-2428	0.17
P-243	0.11
P-2430	0.14
P-2442	0.02
P-2444	0.37
P-2448	0.72
P-2449	0.1
P-2453	0.04
P-2458	0.05
P-2460	0.12
P-2475	0
P-2478	0.02
P-248	0.01
P-2486 (1)	0.01
P-2486 (2)	0.01
P-2489	0.06
P-2490 (1)	0.03
P-2490 (2)	0.01
P-2491	0.02
P-2494	0
P-2499	0.07
P-250	0.17
P-2505	0.09
P-2511	0.17
P-2514	0.01
P-2515	0
P-2522	0.79
P-2525	0.25
P-2528	0.04
P-2529	0.01
P-253	0.07
P-2535	2.85
P-2536	2.72
P-2537 (1)	2.72
P-2537 (2)	0.19
P-2539	2.72
P-2542	1.16
P-2543	2.84
P-2546	0.46
P-2548 (1)	1.26
P-2548 (2)	0.14
P-255	0.89
P-2556	0
P-2558 (1)	11.47
P-2558 (2)	0.05
P-256	0.04
P-2562	0
P-257	0.05
P-2573	0.08
P-2588	0.02
P-2596	0.07
P-2613	0.65
P-2614 (1)	0.14

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-2614 (2)	0.06	P-2614 (2)	0.19	P-2614 (2)	0.12
P-2615	0.01	P-2615	0.01	P-2615	0.01
P-2616	0.01	P-2616	0.08	P-2616	0.07
P-2617 (1)	1.61	P-2617 (1)	1.42	P-2617 (1)	1.42
P-2617 (2)	0.09	P-2617 (2)	0.16	P-2617 (2)	0.08
P-2619	0.09	P-2619	0.16	P-2619	0.18
P-262	0.13	P-262	0.16	P-262	0.19
P-2624	0.08	P-2624	0.1	P-2624	0.08
P-264 (1)	0.03	P-264 (1)	0.05	P-264 (1)	0.04
P-264 (2)	0.01	P-264 (2)	0.01	P-264 (2)	0.01
P-2646 (1)	0.03	P-2646 (1)	0.06	P-2646 (1)	0.05
P-2646 (2)	0.02	P-2646 (2)	0	P-2646 (2)	0.01
P-265	0.24	P-265	0.08	P-265	0.16
P-2653	0.11	P-2653	0.13	P-2653	0.1
P-2654	0.01	P-2654	0.01	P-2654	0.01
P-2655	0.06	P-2655	0.04	P-2655	0.11
P-266	0.04	P-266	0.04	P-266	0.09
P-2660(1)	0.61	P-2660(1)	0.57	P-2660(1)	0.56
P-2660(2)	1.26	P-2660(2)	1.18	P-2660(2)	1.15
P-2662	0.01	P-2662	0.01	P-2662	0.01
P-2663	0.09	P-2663	0.13	P-2663	0.12
P-2670	0.04	P-2670	0.02	P-2670	0.03
P-2674	0.15	P-2674	0.24	P-2674	3.21
P-2675	0.11	P-2675	0.14	P-2675	0.21
P-2678	0.06	P-2678	0.02	P-2678	0.02
P-2686	0.03	P-2686	0.14	P-2686	0.2
P-269	0.01	P-269	0.02	P-269	0.02
P-2695	0.19	P-2695	0.07	P-2695	0.08
P-2697	0.01	P-2697	0.01	P-2697	0.01
P-2698	0.02	P-2698	0.02	P-2698	0.02
P-2700	0	P-2700	0.01	P-2700	0.01
P-2704	0.01	P-2704	0.03	P-2704	0.04
P-2706	0.04	P-2706	0.04	P-2706	0.09
P-2707 (1)	0.01	P-2707 (1)	0.01	P-2707 (1)	0.01
P-2707 (2)	0.3	P-2707 (2)	0.33	P-2707 (2)	0.33
P-2708	0.01	P-2708	0.01	P-2708	0.01
P-2714	0.22	P-2714	0.26	P-2714	0.2
P-2715 (1)	0.01	P-2715 (1)	0.01	P-2715 (1)	0.01
P-2715 (2)	0.04	P-2715 (2)	0.3	P-2715 (2)	0.4
P-272	0.02	P-272	0.04	P-272	0.04
P-2733	0.01	P-2733	0.01	P-2733	0.01
P-2734	0.01	P-2734	0.01	P-2734	0.01
P-2736	0.06	P-2736	0.13	P-2736	0.17
P-274	0.01	P-274	0.02	P-274	0.02
P-2740	0.01	P-2740	0.01	P-2740	0.01
P-2745	0.23	P-2745	0.27	P-2745	0.21
P-2746	0.02	P-2746	0.03	P-2746	0.04
P-2749	0.01	P-2749	0.02	P-2749	0.02
P-2752	0.02	P-2752	0.01	P-2752	0
P-2755	0.76	P-2755	0.59	P-2755	0.39
P-2757	0	P-2757	0.01	P-2757	0.01
P-2758	0.01	P-2758	0.04	P-2758	0.11
P-2759	0	P-2759	0.01	P-2759	0.01
P-276	0.05	P-276	0.06	P-276	0.15
P-277	0	P-277	0.01	P-277	0.01
P-2775	0.01	P-2775	0.01	P-2775	0.02
P-2777	0.23	P-2777	0.2	P-2777	0.01
P-2781	0	P-2781	0.01	P-2781	0.01
P-2794	0.02	P-2794	0.06	P-2794	0.09
P-2797	0.01	P-2797	0.01	P-2797	0.01
P-2809	0.06	P-2809	0.04	P-2809	0.04
P-2810(1)	0.14	P-2810(1)	0.12	P-2810(1)	0.12
P-2810(2)	0	P-2810(2)	0	P-2810(2)	0
P-2818	0.03	P-2818	0.02	P-2818	0.04
P-2822	0	P-2822	0	P-2822	0
P-2824	0	P-2824	0	P-2824	0
P-2825 (1)	0.08	P-2825 (1)	0.07	P-2825 (1)	0.06
P-2825 (2)	0.03	P-2825 (2)	0.05	P-2825 (2)	0.05
P-2828	0.33	P-2828	0.4	P-2828	0.37
P-2835	0.01	P-2835	0.03	P-2835	0.02
P-2836	0.11	P-2836	0.2	P-2836	0.42

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-2837	0.03	P-2837	0.06	P-2837	0.05
P-284	0.1	P-284	0.11	P-284	0.29
P-2840	1.33	P-2840	0.51	P-2840	0.53
P-2841	0.18	P-2841	0.17	P-2841	0.15
P-285	0.01	P-285	0.01	P-285	0.01
P-2854	0	P-2854	0	P-2854	0
P-2856	0.01	P-2856	0.02	P-2856	0.02
P-2864	0.05	P-2864	0.1	P-2864	0.11
P-2868	0.42	P-2868	0.46	P-2868	1.1
P-287 (1)	0	P-287 (1)	0.01	P-287 (1)	0.01
P-287 (2)	0.63	P-287 (2)	0.28	P-287 (2)	0.16
P-2873 (1)	0	P-2873 (1)	0	P-2873 (1)	0
P-2873 (2)	0.89	P-2873 (2)	0.92	P-2873 (2)	0.52
P-2874	0	P-2874	0	P-2874	0
P-2875 (1)	0.04	P-2875 (1)	0.03	P-2875 (1)	0.03
P-2875 (2)	0.3	P-2875 (2)	0.05	P-2875 (2)	0.25
P-2878	0.02	P-2878	0.04	P-2878	0.04
P-2884	0.01	P-2884	0.01	P-2884	0.01
P-2885	0	P-2885	0.01	P-2885	0.01
P-2890	0.28	P-2890	0.15	P-2890	0.15
P-2896	0	P-2896	0	P-2896	0
P-2899	0	P-2899	0	P-2899	0
P-290 (1)	0	P-290 (1)	0	P-290 (1)	0
P-290 (2)	0.17	P-290 (2)	0.23	P-290 (2)	0.01
P-2906	0.04	P-2906	0.03	P-2906	0.18
P-2908	0.01	P-2908	0.01	P-2908	0.01
P-2920	0.07	P-2920	0.07	P-2920	0.04
P-2922	0.33	P-2922	0.17	P-2922	0.29
P-2925	0	P-2925	0.01	P-2925	0.01
P-2929	0	P-2929	0.06	P-2929	0.03
P-2933	0.02	P-2933	0.08	P-2933	0.06
P-2946	0	P-2946	0	P-2946	0
P-295	0.01	P-295	0.01	P-295	0.01
P-2951	0.41	P-2951	0.36	P-2951	0.4
P-2957	0.41	P-2957	0.38	P-2957	0.35
P-2958	0.01	P-2958	0.01	P-2958	0.01
P-2970	0.01	P-2970	0.05	P-2970	0.08
P-2973	0.01	P-2973	0.02	P-2973	0.03
P-2974	0	P-2974	0	P-2974	0
P-2975	0.04	P-2975	0.06	P-2975	0.06
P-2985	0.35	P-2985	0.4	P-2985	0.4
P-2986	0.06	P-2986	0.05	P-2986	0.06
P-2988	0.12	P-2988	0.11	P-2988	0.05
P-2990	0.01	P-2990	0.01	P-2990	0.02
P-2995	0.14	P-2995	0.15	P-2995	0.11
P-2997 (1)	0	P-2997 (1)	0.01	P-2997 (1)	0.01
P-2997 (2)	0.07	P-2997 (2)	0.13	P-2997 (2)	0.15
P-300	0.09	P-300	0.13	P-300	0.35
P-3005	0.01	P-3005	0.02	P-3005	0.02
P-3006	0.01	P-3006	0.03	P-3006	0.03
P-3014	0	P-3014	0.01	P-3014	0.01
P-3015	0	P-3015	0.01	P-3015	0.01
P-3019	0.04	P-3019	2.79	P-3019	1.79
P-302	0.06	P-302	0.11	P-302	0.05
P-3020	0.17	P-3020	0.42	P-3020	0.38
P-3039	0.06	P-3039	0.18	P-3039	0.26
P-304	0	P-304	0.01	P-304	0.01
P-3043 (1)	0	P-3043 (1)	0	P-3043 (1)	0
P-3043 (2)	0.05	P-3043 (2)	0.23	P-3043 (2)	0.3
P-3044	0	P-3044	0	P-3044	0
P-3046 (1)	0	P-3046 (1)	0.28	P-3046 (1)	0.34
P-3046 (2)	1.6	P-3046 (2)	0.37	P-3046 (2)	1.23
P-3047	0	P-3047	0.28	P-3047	0.34
P-3051	0	P-3051	0	P-3051	0
P-3056	0.01	P-3056	0.01	P-3056	0.02
P-3058	0.06	P-3058	0.16	P-3058	0.13
P-306 (1)	0.09	P-306 (1)	0.17	P-306 (1)	0.06
P-306 (2)	0.11	P-306 (2)	0.02	P-306 (2)	0.14
P-3070	0.01	P-3070	0.02	P-3070	0.02
P-3071	0.62	P-3071	1.46	P-3071	1.31
P-3073	0.03	P-3073	0.05	P-3073	0.08

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-3074	0.76	P-3074	1.1	P-3074	0.39
P-3077	0.17	P-3077	0.22	P-3077	0.24
P-3078	0	P-3078	0.01	P-3078	0.01
P-308	0.01	P-308	0.01	P-308	0.01
P-3081	0.02	P-3081	0.04	P-3081	0.04
P-3083	0.04	P-3083	0.18	P-3083	0.2
P-3085	0.05	P-3085	0.1	P-3085	0.09
P-3089	0.07	P-3089	0.18	P-3089	0.16
P-3091	0.01	P-3091	0.02	P-3091	0.02
P-3093	0.51	P-3093	0.91	P-3093	0.39
P-3097	0.07	P-3097	0.26	P-3097	0.18
P-3098 (1)	0.09	P-3098 (1)	0.35	P-3098 (1)	0.25
P-3098 (2)	0.05	P-3098 (2)	0.17	P-3098 (2)	0.18
P-3105 (1)	0	P-3105 (1)	0.01	P-3105 (1)	0.01
P-3105 (2)	0.1	P-3105 (2)	0.2	P-3105 (2)	0.22
P-3116	0.08	P-3116	0.05	P-3116	0.11
P-312	0	P-312	0.01	P-312	0.01
P-3120	0.01	P-3120	0.12	P-3120	0.24
P-3122	0.05	P-3122	0.05	P-3122	0.03
P-3125	0.02	P-3125	0.03	P-3125	0.02
P-3129	0.43	P-3129	0.77	P-3129	0.41
P-3134	0	P-3134	0.01	P-3134	0.01
P-3139	0.59	P-3139	0.18	P-3139	0.19
P-3140	0	P-3140	0.01	P-3140	0.01
P-3141	0.58	P-3141	0.2	P-3141	0.21
P-3142	0	P-3142	0.01	P-3142	0.01
P-3144	0.02	P-3144	0.07	P-3144	0.05
P-3147	0.18	P-3147	0.52	P-3147	0.73
P-3149 (1)	0.05	P-3149 (1)	0.05	P-3149 (1)	0.07
P-3149 (2)	0.04	P-3149 (2)	0.08	P-3149 (2)	0.08
P-315	0.01	P-315	0.01	P-315	0.01
P-3150	0	P-3150	0	P-3150	0
P-3151	0.02	P-3151	0.02	P-3151	0.03
P-3155	0.03	P-3155	0.06	P-3155	0.06
P-3157	0.01	P-3157	0.01	P-3157	0.01
P-3158	0.04	P-3158	0.02	P-3158	0.02
P-316 (1)	0.11	P-316 (1)	0.19	P-316 (1)	0.11
P-316 (2)	0.01	P-316 (2)	0.01	P-316 (2)	0.01
P-3174	0.01	P-3174	0.2	P-3174	0.26
P-3176 (1)	0.01	P-3176 (1)	0.01	P-3176 (1)	0.01
P-3176 (2)	0	P-3176 (2)	0	P-3176 (2)	0
P-3177 (1)	0.01	P-3177 (1)	0.01	P-3177 (1)	0.01
P-3177 (2)	0	P-3177 (2)	0.01	P-3177 (2)	0.01
P-3180	0.01	P-3180	0.04	P-3180	0.06
P-3184	0.27	P-3184	0.15	P-3184	0.28
P-3186	0	P-3186	0.01	P-3186	0.01
P-3187	0	P-3187	0.01	P-3187	0.01
P-3192	0.02	P-3192	0.03	P-3192	0.03
P-3194	0.06	P-3194	0.04	P-3194	0.07
P-3195 (1)	0.05	P-3195 (1)	0.06	P-3195 (1)	0.08
P-3195 (2)	0.14	P-3195 (2)	0.16	P-3195 (2)	0.28
P-3199	0.02	P-3199	0.04	P-3199	0.06
P-320	0.02	P-320	0.03	P-320	0.03
P-3204 (1)	0	P-3204 (1)	0	P-3204 (1)	0
P-3204 (2)	0.05	P-3204 (2)	0.14	P-3204 (2)	0.19
P-3218	1.04	P-3218	1.19	P-3218	1.53
P-3219	0.36	P-3219	1.83	P-3219	1.86
P-3220	0	P-3220	0.01	P-3220	0.01
P-3224	0.01	P-3224	0.03	P-3224	0.05
P-3226	0.01	P-3226	0.04	P-3226	0.03
P-3227	0	P-3227	0	P-3227	0
P-3232	0	P-3232	0.01	P-3232	0.02
P-3238(1)	0.01	P-3238(1)	0.07	P-3238(1)	0.08
P-3238(2)	0.03	P-3238(2)	0.11	P-3238(2)	0.12
P-324	0	P-324	0.01	P-324	0
P-3242(1)	0.02	P-3242(1)	0.05	P-3242(1)	0.07
P-3242(2)	0.02	P-3242(2)	0.04	P-3242(2)	0.06
P-3243	0.37	P-3243	0.73	P-3243	0.25
P-3246	0	P-3246	0.01	P-3246	0.01
P-3247	0	P-3247	0	P-3247	0
P-3257	0.66	P-3257	0.03	P-3257	0.05

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-3259	0.34	P-3259	0.43	P-3259	0.3
P-3263	0.39	P-3263	0.22	P-3263	0.19
P-3267	1.1	P-3267	0.09	P-3267	0.08
P-3269	0	P-3269	0.01	P-3269	0.01
P-3270	0.02	P-3270	0.04	P-3270	0.04
P-3275	0	P-3275	0	P-3275	0
P-3276	0	P-3276	0	P-3276	0
P-3277	0	P-3277	0	P-3277	0
P-3279	0	P-3279	0	P-3279	0
P-3290	0.03	P-3290	0.04	P-3290	0.21
P-3292	0.03	P-3292	0.03	P-3292	0.09
P-3294	0.1	P-3294	0.04	P-3294	0.08
P-3295	0.1	P-3295	0.07	P-3295	0.29
P-3296	0.11	P-3296	0.04	P-3296	0.06
P-3297	0.21	P-3297	0.28	P-3297	0.27
P-3299	0	P-3299	0	P-3299	0
P-3300	0.21	P-3300	0.11	P-3300	0.23
P-3301	0.01	P-3301	0.02	P-3301	0.02
P-3304 (1)	0.01	P-3304 (1)	0	P-3304 (1)	0.01
P-3304 (2)	0.02	P-3304 (2)	0.03	P-3304 (2)	0.04
P-3306	0.03	P-3306	0.1	P-3306	0.15
P-3308	0	P-3308	0	P-3308	0
P-331	0.07	P-331	0.04	P-331	0.13
P-3310(1)	0.13	P-3310(1)	0.02	P-3310(1)	0.12
P-3310(2)	0.1	P-3310(2)	0.01	P-3310(2)	0.09
P-3315	0.01	P-3315	0.01	P-3315	0.01
P-3316	0	P-3316	0	P-3316	0
P-3317	0	P-3317	0	P-3317	0
P-3318	0.01	P-3318	0.01	P-3318	0.01
P-3319	0.03	P-3319	0.01	P-3319	0.02
P-332	0.06	P-332	0.11	P-332	0.16
P-3320	0	P-3320	0	P-3320	0
P-3324	0	P-3324	0	P-3324	0
P-3325	0	P-3325	0.01	P-3325	0.01
P-3326	0	P-3326	0.01	P-3326	0.01
P-3327	0.01	P-3327	0.02	P-3327	0.02
P-333	0.06	P-333	0.07	P-333	0.09
P-3332 (1)	0.01	P-3332 (1)	0.13	P-3332 (1)	0.09
P-3332 (2)	0.05	P-3332 (2)	0.07	P-3332 (2)	0.34
P-3338	0	P-3338	0	P-3338	0
P-3339	0	P-3339	0	P-3339	0
P-334	0.32	P-334	0.34	P-334	0.48
P-3340	0	P-3340	0	P-3340	0
P-3343 (1)	0.03	P-3343 (1)	0.04	P-3343 (1)	0.16
P-3343 (2)	0.05	P-3343 (2)	0.04	P-3343 (2)	0.02
P-3344	0	P-3344	0	P-3344	0
P-3345	0	P-3345	0.01	P-3345	0.01
P-3347	0.03	P-3347	0.04	P-3347	0.13
P-3349	0	P-3349	0	P-3349	0
P-335	0.01	P-335	0.01	P-335	0.01
P-3351	0.03	P-3351	0.06	P-3351	0.13
P-3354	0.01	P-3354	0.02	P-3354	0.02
P-3355	0.03	P-3355	0.21	P-3355	0.21
P-3356	0.19	P-3356	0.03	P-3356	0.14
P-3364	0	P-3364	0	P-3364	0.04
P-3365 (1)	0.02	P-3365 (1)	0.2	P-3365 (1)	0.23
P-3365 (2)	0	P-3365 (2)	0.01	P-3365 (2)	0.01
P-337	0.02	P-337	0.17	P-337	0.08
P-3370	6.75	P-3370	18.26	P-3370	8.45
P-3371	0.01	P-3371	0.01	P-3371	0.01
P-3372	0.01	P-3372	0.01	P-3372	0.01
P-3374	0.74	P-3374	1.71	P-3374	0.9
P-3375	0.01	P-3375	0.01	P-3375	0.03
P-3376	0.7	P-3376	0.09	P-3376	0.29
P-3378	0.01	P-3378	0.18	P-3378	0.14
P-3383	0	P-3383	0.01	P-3383	0.08
P-3388	0	P-3388	0	P-3388	0
P-3393	0	P-3393	0	P-3393	0
P-3398	0.03	P-3398	0.04	P-3398	0.09
P-3400	0.86	P-3400	1.51	P-3400	0.76
P-3403	0.35	P-3403	0.25	P-3403	0.29

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-3406(1)	0.31
P-3406(2)	0.31
P-3407	0.12
P-341 (1)	0.23
P-341 (2)	0.12
P-3415	0
P-342	0.03
P-3421	0
P-3426	0.29
P-3428	0
P-3430	0
P-3433	0.01
P-3434	0.01
P-3436	0.1
P-3438	0.03
P-3439	0
P-344	0.57
P-3440	0.01
P-3444	0.08
P-3446	0
P-3450	0.05
P-3452	0.02
P-3457	0
P-3467	2.15
P-3468	1.73
P-3469	1.73
P-3470	0.42
P-3471	0.01
P-3477 (1)	0
P-3477 (2)	0.01
P-3487	0.09
P-3488	2.55
P-3489	0.08
P-3491	0.11
P-3493	0
P-3494	1.71
P-3497	0
P-35	0.02
P-3500 (1)	0.28
P-3500 (2)	0.02
P-3501	1.99
P-3502	0
P-3506	0.02
P-351	0
P-3514	0.02
P-3516	0
P-3517	0
P-3519	0
P-3520	0.04
P-3521	0.58
P-3522 (1)	0
P-3522 (2)	0
P-3523	0
P-3524	0
P-3527 (1)	0
P-3527 (2)	0.34
P-3528	0
P-3529	0
P-353	0.01
P-3530	0.04
P-3531	0
P-3532 (1)	0
P-3532 (2)	0.19
P-3534	0.83
P-3540	0.55
P-3541 (1)	0.39
P-3541 (2)	0.01
P-3542	0.01
P-3548	0.01
P-3552	0.3
P-3553	0.06

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-3406(1)	1.43
P-3406(2)	1.43
P-3407	0.04
P-341 (1)	0.9
P-341 (2)	0.07
P-3415	0.01
P-342	0.06
P-3421	0.01
P-3426	0.68
P-3428	0
P-3430	0.01
P-3433	0.01
P-3434	0.01
P-3436	0.11
P-3438	0.05
P-3439	0
P-344	0.51
P-3440	0.02
P-3444	0.06
P-3446	0
P-3450	0.09
P-3452	0.04
P-3457	0
P-3467	3.24
P-3468	2.51
P-3469	2.51
P-3470	0.73
P-3471	0.01
P-3477 (1)	0
P-3477 (2)	0.02
P-3487	0.2
P-3488	2.13
P-3489	0.02
P-3491	0.13
P-3493	0
P-3494	2.47
P-3497	0
P-35	0.01
P-3500 (1)	0.4
P-3500 (2)	0.03
P-3501	2.87
P-3502	0
P-3506	0.02
P-351	0.01
P-3514	0.01
P-3516	0
P-3517	0
P-3519	0.01
P-3520	0.04
P-3521	0.72
P-3522 (1)	0
P-3522 (2)	0.01
P-3523	0
P-3524	0
P-3527 (1)	0
P-3527 (2)	0.59
P-3528	0
P-3529	0
P-353	0.01
P-3530	0.01
P-3531	0
P-3532 (1)	0
P-3532 (2)	0.27
P-3534	0.24
P-3540	0.58
P-3541 (1)	0.5
P-3541 (2)	0.01
P-3542	0.01
P-3548	0.01
P-3552	0.07
P-3553	0.1

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-3406(1)	1.1
P-3406(2)	1.1
P-3407	0.03
P-341 (1)	0.77
P-341 (2)	0.07
P-3415	0.01
P-342	0.13
P-3421	0.01
P-3426	0.35
P-3428	0
P-3430	0.01
P-3433	0.02
P-3434	0.01
P-3436	0.1
P-3438	0.16
P-3439	0
P-344	0.23
P-3440	0.02
P-3444	0.03
P-3446	0
P-3450	0.08
P-3452	0.04
P-3457	0
P-3467	0.23
P-3468	0.05
P-3469	0.05
P-3470	0.18
P-3471	0.01
P-3477 (1)	0
P-3477 (2)	0.02
P-3487	0.23
P-3488	0.62
P-3489	0.05
P-3491	0.22
P-3493	0
P-3494	0.02
P-3497	0
P-35	0.01
P-3500 (1)	0.01
P-3500 (2)	0.02
P-3501	0.01
P-3502	0
P-3506	0.08
P-351	0.01
P-3514	0.04
P-3516	0
P-3517	0
P-3519	0
P-3520	0.01
P-3521	0.52
P-3522 (1)	0
P-3522 (2)	0.01
P-3523	0
P-3524	0
P-3527 (1)	0
P-3527 (2)	0.03
P-3528	0
P-3529	0
P-353	0.02
P-3530	0.03
P-3531	0
P-3532 (1)	0
P-3532 (2)	0.17
P-3534	0.54
P-3540	0.29
P-3541 (1)	0.39
P-3541 (2)	0.01
P-3542	0.01
P-3548	0.01
P-3552	0.31
P-3553	0.31

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-3557	0.01	P-3557	0.01	P-3557	0.01
P-3558	0.34	P-3558	0.42	P-3558	0.04
P-3559	0.01	P-3559	0.01	P-3559	0.01
P-3560	0.06	P-3560	0.05	P-3560	0.04
P-3561	0.29	P-3561	0.35	P-3561	0.01
P-3562	0.28	P-3562	0.33	P-3562	0.03
P-3563	0.01	P-3563	0.01	P-3563	0.01
P-3564	0.26	P-3564	0.3	P-3564	0.05
P-3565 (1)	0.01	P-3565 (1)	0.02	P-3565 (1)	0.02
P-3565 (2)	0.06	P-3565 (2)	0.08	P-3565 (2)	0.04
P-3568	0.07	P-3568	0.18	P-3568	0.16
P-3570	0.03	P-3570	0.05	P-3570	0.08
P-3571(1)	0.19	P-3571(1)	0.63	P-3571(1)	1.02
P-3571(2)	0.19	P-3571(2)	0.63	P-3571(2)	1.02
P-3577	0	P-3577	0.05	P-3577	0.03
P-3579	0.01	P-3579	0.02	P-3579	0.02
P-3588	0.92	P-3588	0.99	P-3588	0.58
P-359	0.29	P-359	0.2	P-359	0.42
P-3591	0	P-3591	0	P-3591	0
P-3593	0.11	P-3593	0.17	P-3593	0.39
P-3597	0	P-3597	0	P-3597	0
P-36	0.01	P-36	0.01	P-36	0.02
P-3609	0.04	P-3609	0.09	P-3609	0.14
P-361	0	P-361	0.01	P-361	0
P-3611	0.27	P-3611	0.36	P-3611	0.42
P-3612	0	P-3612	0	P-3612	0
P-3615	0	P-3615	0	P-3615	0
P-3617	0	P-3617	0	P-3617	0
P-362	0.33	P-362	0.88	P-362	0.46
P-3620	0	P-3620	0	P-3620	0
P-3630 (1)	0.01	P-3630 (1)	0.02	P-3630 (1)	0.03
P-3630 (2)	0	P-3630 (2)	0.01	P-3630 (2)	0.01
P-3633	0	P-3633	0.34	P-3633	0.17
P-3635(2)	0.19	P-3635(2)	0.02	P-3635(2)	0.01
P-3639	0.08	P-3639	0.42	P-3639	0.84
P-3640	0.26	P-3640	0.22	P-3640	0.24
P-3641	0	P-3641	0	P-3641	0
P-3642	0.15	P-3642	0.41	P-3642	0.45
P-3645	1.71	P-3645	3.25	P-3645	3.76
P-3646	1.71	P-3646	3.24	P-3646	3.7
P-3647	1.71	P-3647	3.24	P-3647	3.56
P-3648	1.71	P-3648	3.23	P-3648	3.5
P-3649	1.71	P-3649	3.23	P-3649	3.43
P-365	0.07	P-365	0.03	P-365	0.01
P-3650	1.71	P-3650	3.22	P-3650	3.37
P-3651	1.71	P-3651	3.22	P-3651	3.23
P-3652 (1)	1.71	P-3652 (1)	3.18	P-3652 (1)	3.17
P-3652 (2)	0.02	P-3652 (2)	0.05	P-3652 (2)	0.06
P-3653	1.71	P-3653	3.17	P-3653	3.11
P-3654	1.71	P-3654	3.17	P-3654	3.04
P-3656	0	P-3656	0	P-3656	0
P-3657	0	P-3657	0	P-3657	0
P-3662	0.68	P-3662	1.28	P-3662	1.47
P-3663	0.68	P-3663	1.28	P-3663	1.47
P-3664	0.68	P-3664	1.28	P-3664	1.47
P-3665	0.68	P-3665	1.28	P-3665	1.47
P-3666	0.29	P-3666	0.54	P-3666	0.64
P-3667	0.18	P-3667	0.31	P-3667	0.13
P-3668	0.18	P-3668	0.31	P-3668	0.13
P-3669	0.59	P-3669	0.24	P-3669	0.26
P-3673	0.26	P-3673	0.22	P-3673	0.14
P-3678	0	P-3678	0	P-3678	0.01
P-3681	0	P-3681	0.01	P-3681	0.01
P-3682	0	P-3682	0	P-3682	0
P-3690	0.03	P-3690	0.05	P-3690	0.04
P-3691	1.03	P-3691	1.88	P-3691	1.52
P-3692	0.97	P-3692	1.75	P-3692	1.12
P-3693	0.97	P-3693	1.75	P-3693	1.12
P-3694	0.97	P-3694	1.75	P-3694	1.12
P-3695	0.97	P-3695	1.75	P-3695	1.12
P-3696	0.97	P-3696	1.75	P-3696	1.12

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-3697 (1)	0.97
P-3697 (2)	0.08
P-3698 (1)	0.97
P-3698 (2)	0.03
P-3699	0.96
P-3700	0.96
P-3701	0.96
P-3702 (1)	0.96
P-3702 (2)	0.01
P-3703	0.96
P-3707 (1)	0.16
P-3707 (2)	0
P-3709	0
P-371	1.12
P-3710	0.11
P-3715 (1)	0.03
P-3715 (2)	0.05
P-3716	0
P-3721	0.01
P-3723	0
P-3724	0
P-3725	0
P-3726	0.19
P-3727	0.19
P-3727(1)	0
P-3727(2)	0
P-3728	0.19
P-373	0.33
P-3730	0.01
P-3731	0.21
P-3734	0.28
P-3735	0.03
P-3737	0.13
P-3738	0.04
P-3744	0.04
P-3746 (1)	0
P-3746 (2)	0.02
P-3747 (1)	0
P-3747 (2)	0.01
P-3750	0.01
P-3751	0.01
P-3752	0.04
P-3754	0.16
P-3757	0.01
P-3758	0.02
P-3759	0.02
P-376	0.11
P-3761	0
P-3777	0.01
P-378	0.01
P-3782	0.03
P-379	0.05
P-3793	0.01
P-3799	0.17
P-380	0.38
P-3800 (1)	0
P-3800 (2)	0.06
P-3801	0
P-3805	0.69
P-3806 (1)	0.69
P-3806 (2)	0.01
P-3807 (1)	0.69
P-3807 (2)	0.02
P-3809	0.6
P-381	0
P-3813	0.16
P-3816	0.03
P-3817	0.07
P-3820	0.01
P-3821	0.13
P-3823	0.37

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-3697 (1)	1.75
P-3697 (2)	0.16
P-3698 (1)	1.63
P-3698 (2)	0.06
P-3699	1.52
P-3700	1.46
P-3701	1.41
P-3702 (1)	1.41
P-3702 (2)	0.02
P-3703	1.41
P-3707 (1)	0.3
P-3707 (2)	0.04
P-3709	0
P-371	0
P-3710	0.21
P-3715 (1)	0.06
P-3715 (2)	0.9
P-3716	0.01
P-3721	0.01
P-3723	0
P-3724	0
P-3725	0
P-3726	0.35
P-3727	0.35
P-3727(1)	0.01
P-3727(2)	0.01
P-3728	0.35
P-373	0.24
P-3730	0.01
P-3731	0.38
P-3734	0.4
P-3735	0.15
P-3737	0.08
P-3738	0.06
P-3744	0.09
P-3746 (1)	0
P-3746 (2)	0.09
P-3747 (1)	0
P-3747 (2)	0.01
P-3750	0.04
P-3751	0.01
P-3752	0.08
P-3754	0.31
P-3757	0.01
P-3758	0.03
P-3759	0.03
P-376	0.19
P-3761	0.01
P-3777	0.01
P-378	0.01
P-3782	0.17
P-379	0.02
P-3793	0.02
P-3799	0.11
P-380	0.03
P-3800 (1)	0
P-3800 (2)	0.03
P-3801	0
P-3805	0.69
P-3806 (1)	0.69
P-3806 (2)	0.02
P-3807 (1)	0.69
P-3807 (2)	0.1
P-3809	0.32
P-381	0
P-3813	0.31
P-3816	0.05
P-3817	0.12
P-3820	0.07
P-3821	0.04
P-3823	0.17

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-3697 (1)	1.11
P-3697 (2)	0.1
P-3698 (1)	0.85
P-3698 (2)	0.1
P-3699	0.6
P-3700	0.48
P-3701	0.37
P-3702 (1)	0.37
P-3702 (2)	0.01
P-3703	0.37
P-3707 (1)	0.4
P-3707 (2)	0.03
P-3709	0
P-371	0
P-3710	0.32
P-3715 (1)	0.06
P-3715 (2)	0.95
P-3716	0.01
P-3721	0.02
P-3723	0
P-3724	0
P-3725	0
P-3726	0.31
P-3727	0.31
P-3727(1)	0.01
P-3727(2)	0.01
P-3728	0.31
P-373	0.23
P-3730	0.01
P-3731	0.44
P-3734	0
P-3735	0.15
P-3737	0.08
P-3738	0.06
P-3744	0.19
P-3746 (1)	0
P-3746 (2)	0.11
P-3747 (1)	0
P-3747 (2)	0.01
P-3750	0.04
P-3751	0.01
P-3752	0.08
P-3754	0.36
P-3757	0.01
P-3758	0.04
P-3759	0.04
P-376	0.28
P-3761	0.01
P-3777	0.01
P-378	0.01
P-3782	0.14
P-379	0.02
P-3793	0.02
P-3799	0.07
P-380	0.04
P-3800 (1)	0
P-3800 (2)	0.02
P-3801	0
P-3805	0.5
P-3806 (1)	0.5
P-3806 (2)	0.02
P-3807 (1)	0.5
P-3807 (2)	0.09
P-3809	1.04
P-381	0
P-3813	0.23
P-3816	0.11
P-3817	0.04
P-3820	0.07
P-3821	0.09
P-3823	0.18

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-3828	0	P-3828	0	P-3828	0
P-3830	0.03	P-3830	0.06	P-3830	0.05
P-3837	0	P-3837	0	P-3837	0
P-3841	0.09	P-3841	0.33	P-3841	0.51
P-3851	0.04	P-3851	0.05	P-3851	0.06
P-3854(1)	0.01	P-3854(1)	0.12	P-3854(1)	0.07
P-3854(2)	0.01	P-3854(2)	0.12	P-3854(2)	0.07
P-386	0.01	P-386	0.02	P-386	0.02
P-3862	0.05	P-3862	0.06	P-3862	0.09
P-3864	0	P-3864	0	P-3864	0
P-387	0	P-387	0.02	P-387	0.05
P-3871	0.14	P-3871	0.1	P-3871	0.1
P-3874	0	P-3874	0.01	P-3874	0.01
P-3884	0	P-3884	0.03	P-3884	0.06
P-3887	0	P-3887	0.01	P-3887	0.01
P-3897	0.01	P-3897	0	P-3897	0
P-3899	0.21	P-3899	0.04	P-3899	0.18
P-3901	0.02	P-3901	0.03	P-3901	0.1
P-3902	0.01	P-3902	0.05	P-3902	0.12
P-3907	0.05	P-3907	0.07	P-3907	0.1
P-3911	0	P-3911	0.06	P-3911	0.1
P-3915	0.02	P-3915	0.03	P-3915	0.02
P-3917(1)	0	P-3917(1)	0.01	P-3917(1)	0.01
P-3917(2)	0.01	P-3917(2)	0.01	P-3917(2)	0.01
P-3918	0.09	P-3918	0.05	P-3918	0.04
P-3920	0	P-3920	0.05	P-3920	0.09
P-3921	0	P-3921	0.09	P-3921	0.24
P-3925	0.01	P-3925	0.02	P-3925	0.05
P-3928	0	P-3928	0	P-3928	0
P-3929	0.01	P-3929	0.03	P-3929	0.03
P-3930	0	P-3930	0	P-3930	0
P-3932	0	P-3932	0	P-3932	0
P-3933	0.02	P-3933	0.02	P-3933	0.01
P-3936	0	P-3936	0	P-3936	0
P-3939	0.1	P-3939	0.21	P-3939	0.24
P-3942	0.01	P-3942	0.17	P-3942	0.13
P-3943	0.01	P-3943	0.17	P-3943	0.13
P-3948	0	P-3948	0.04	P-3948	0.14
P-3949(1)(1)	0.25	P-3949(1)(1)	0.2	P-3949(1)(1)	1.15
P-3949(1)(2)	0.27	P-3949(1)(2)	0.22	P-3949(1)(2)	1.27
P-3949(2)	0.27	P-3949(2)	0.22	P-3949(2)	1.27
P-3951	0.01	P-3951	0.02	P-3951	0.01
P-3952	0.07	P-3952	0.08	P-3952	0.23
P-3952(1)	0.47	P-3952(1)	0.27	P-3952(1)	1.25
P-3952(2)	0.35	P-3952(2)	0.21	P-3952(2)	1.08
P-3954	0	P-3954	0	P-3954	0
P-3956	0.02	P-3956	0.03	P-3956	0.03
P-396	0.11	P-396	0.06	P-396	0.17
P-3969	0.02	P-3969	0.02	P-3969	0.03
P-3970	0.19	P-3970	0.27	P-3970	0.17
P-3985	0.04	P-3985	0.1	P-3985	0.08
P-4	0.07	P-4	0.05	P-4	0.11
P-40	0.01	P-40	0.01	P-40	0.01
P-4003	0.41	P-4003	0.23	P-4003	0.1
P-4004(1)	0.01	P-4004(1)	0.01	P-4004(1)	0.02
P-4004(2)	0.02	P-4004(2)	0.02	P-4004(2)	0.02
P-401	0.05	P-401	0.03	P-401	0.04
P-4019	0.13	P-4019	0.03	P-4019	0.08
P-403	0.01	P-403	0.01	P-403	0.01
P-4030	0.04	P-4030	0.06	P-4030	0.06
P-4032	0.02	P-4032	0.02	P-4032	0.01
P-4035	0.27	P-4035	0.07	P-4035	0.19
P-4046	0.07	P-4046	0.04	P-4046	0.01
P-4049	0.9	P-4049	0.94	P-4049	0.53
P-405	0.21	P-405	0.09	P-405	0.05
P-4052	0	P-4052	0	P-4052	0
P-4053	0	P-4053	0	P-4053	0
P-4054	0	P-4054	0	P-4054	0
P-4055	0.14	P-4055	0.11	P-4055	0.08
P-4056	0	P-4056	0	P-4056	0
P-4057	0.16	P-4057	0.15	P-4057	0.05

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-4058	0.01	P-4058	0.02	P-4058	0.02
P-4059	0.16	P-4059	0.15	P-4059	0.05
P-4061	0.1	P-4061	0.04	P-4061	0.09
P-4071	0.09	P-4071	0.03	P-4071	0.05
P-4078	2.81	P-4078	5.85	P-4078	4.92
P-4079	0.39	P-4079	0.27	P-4079	0.42
P-4081(1)	0.1	P-4081(1)	0.05	P-4081(1)	0.07
P-4081(2)	0.1	P-4081(2)	0.05	P-4081(2)	0.07
P-4082	0.03	P-4082	2.8	P-4082	1.8
P-4083	0.03	P-4083	2.8	P-4083	1.8
P-4084	0.03	P-4084	2.8	P-4084	1.8
P-4085	0.03	P-4085	0.05	P-4085	0.05
P-4088	0.03	P-4088	0.06	P-4088	0.06
P-4090	0	P-4090	0	P-4090	0
P-4093	13.42	P-4093	22.98	P-4093	(N/A)
P-4099	0.11	P-4099	0.03	P-4099	0.05
P-4106	13.42	P-4106	22.98	P-4106	18.08
P-4107	13.42	P-4107	22.98	P-4107	(N/A)
P-4111(1)	0.02	P-4111(1)	0.03	P-4111(1)	0.02
P-4111(2)	0.02	P-4111(2)	0.03	P-4111(2)	0.02
P-4112	0.16	P-4112	0.08	P-4112	0.2
P-4116	0	P-4116	0	P-4116	0
P-4120	0	P-4120	0	P-4120	0
P-4121	0	P-4121	0	P-4121	0
P-4122	0	P-4122	0	P-4122	0
P-4131	0.04	P-4131	0.14	P-4131	0.21
P-4139	0.01	P-4139	0.02	P-4139	0.02
P-414	0	P-414	0.04	P-414	0.07
P-4140	0.11	P-4140	0.26	P-4140	0.2
P-4141	0	P-4141	0	P-4141	0
P-4144	0.28	P-4144	0.1	P-4144	0.13
P-4149	0	P-4149	0	P-4149	0
P-415 (1)	0.12	P-415 (1)	0	P-415 (1)	0
P-415 (2)	(N/A)	P-415 (2)	0.57	P-415 (2)	0.59
P-4150	0.05	P-4150	0.11	P-4150	0.09
P-4151	13.42	P-4151	22.98	P-4151	18.08
P-4152	13.43	P-4152	22.98	P-4152	(N/A)
P-4153	13.43	P-4153	22.98	P-4153	(N/A)
P-4153(1)	0.04	P-4153(1)	0.03	P-4153(1)	0.07
P-4153(2)(1)	0.04	P-4153(2)(1)	0.03	P-4153(2)(1)	0.07
P-4153(2)(2)	0.04	P-4153(2)(2)	0.03	P-4153(2)(2)	0.07
P-4154	13.43	P-4154	22.98	P-4154	(N/A)
P-4159	13.43	P-4159	22.98	P-4159	(N/A)
P-4160	13.43	P-4160	22.98	P-4160	(N/A)
P-4161	13.43	P-4161	22.98	P-4161	(N/A)
P-417	0.01	P-417	0.02	P-417	0.03
P-4171	0	P-4171	0	P-4171	0
P-4179	0.34	P-4179	0.27	P-4179	0.29
P-418 (1)	0.11	P-418 (1)	0.04	P-418 (1)	0.05
P-418 (2)	0.07	P-418 (2)	0.09	P-418 (2)	0.09
P-4183	0	P-4183	0	P-4183	0
P-4184	0	P-4184	0	P-4184	0
P-4185	0	P-4185	0	P-4185	0
P-4186	0	P-4186	0	P-4186	0
P-4187	0	P-4187	0	P-4187	0
P-4189	0.02	P-4189	0.01	P-4189	0.02
P-4191	0	P-4191	0.01	P-4191	0.01
P-4200	0.13	P-4200	0.16	P-4200	0.09
P-4201	0	P-4201	0	P-4201	0
P-4202	0	P-4202	0	P-4202	0
P-4204	0	P-4204	0	P-4204	0
P-4204(1)	0.01	P-4204(1)	0.01	P-4204(1)	0.02
P-4204(2)	0.01	P-4204(2)	0.01	P-4204(2)	0.02
P-4205	0.03	P-4205	0.04	P-4205	0.04
P-4206	0.03	P-4206	0.05	P-4206	0.04
P-4207	0.03	P-4207	0.05	P-4207	0.04
P-4208	0.03	P-4208	0.05	P-4208	0.05
P-4209	0.03	P-4209	0.05	P-4209	0.05
P-4210	0	P-4210	0	P-4210	0
P-4211	0	P-4211	0	P-4211	0
P-4212	0.03	P-4212	0.04	P-4212	0.05

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-4213	0	P-4213	0	P-4213	0
P-4214	0	P-4214	0	P-4214	0
P-4218	0.04	P-4218	0.03	P-4218	0.07
P-423	0.02	P-423	0	P-423	0
P-4230	0.09	P-4230	0.05	P-4230	0.03
P-4231 (1)	0.01	P-4231 (1)	0.02	P-4231 (1)	0.02
P-4231 (2)	0.12	P-4231 (2)	0.04	P-4231 (2)	0.06
P-4238	0.01	P-4238	0.01	P-4238	0.01
P-424	0.09	P-424	0.04	P-424	0.04
P-4240	0	P-4240	0	P-4240	0
P-4243	0	P-4243	0	P-4243	0
P-4252	0.2	P-4252	0.33	P-4252	0.24
P-4256	0.03	P-4256	0.06	P-4256	0.05
P-4257	0	P-4257	0	P-4257	0
P-4258	0	P-4258	0	P-4258	0
P-4259	0	P-4259	0	P-4259	0
P-426	0.16	P-426	0.1	P-426	0.35
P-4260	0.01	P-4260	0.01	P-4260	0.02
P-4267	0.06	P-4267	0.03	P-4267	0.04
P-427	0.29	P-427	0.16	P-427	0.51
P-4277	0.1	P-4277	0.09	P-4277	0.02
P-4278	0.01	P-4278	0.01	P-4278	0.01
P-428 (1)	0.51	P-428 (1)	0.19	P-428 (1)	0.18
P-428 (2)	0	P-428 (2)	0.01	P-428 (2)	0.01
P-4280	0.06	P-4280	0.12	P-4280	0.1
P-4289	0.12	P-4289	0.12	P-4289	0.07
P-4290	0.01	P-4290	0.01	P-4290	0.01
P-4297	0.07	P-4297	0.08	P-4297	0.07
P-4298	0.07	P-4298	0.06	P-4298	0.06
P-4301(1)(1)	0.06	P-4301(1)(1)	0.05	P-4301(1)(1)	0.06
P-4301(1)(2)(1)	0.05	P-4301(1)(2)(1)	0.04	P-4301(1)(2)(1)	0.05
P-4301(1)(2)(2)(1)	0.04	P-4301(1)(2)(2)(1)	0.04	P-4301(1)(2)(2)(1)	0.04
P-4301(1)(2)(2)(2)	0.06	P-4301(1)(2)(2)(2)	0.05	P-4301(1)(2)(2)(2)	0.06
P-4301(2)	0.06	P-4301(2)	0.05	P-4301(2)	0.06
P-4305	0.22	P-4305	0.26	P-4305	0.17
P-4310	0.02	P-4310	0.04	P-4310	0.04
P-4311	0.09	P-4311	0.1	P-4311	0.06
P-4314	0.29	P-4314	0.27	P-4314	0.14
P-4323	0.23	P-4323	0.12	P-4323	0.07
P-4326	0.15	P-4326	0.31	P-4326	0.24
P-4327	0.07	P-4327	0.13	P-4327	0.1
P-433	0.11	P-433	0.08	P-433	0.29
P-4331	0.01	P-4331	0.01	P-4331	0.01
P-4333	13.43	P-4333	22.99	P-4333	18.09
P-4334	13.43	P-4334	22.99	P-4334	(N/A)
P-4334(1)	0.05	P-4334(1)	0.02	P-4334(1)	0.04
P-4334(2)	0.05	P-4334(2)	0.02	P-4334(2)	0.04
P-4335	0.17	P-4335	0.14	P-4335	0.08
P-4343	0.04	P-4343	0.16	P-4343	0.17
P-4346	0	P-4346	0	P-4346	0
P-4347	0	P-4347	0	P-4347	0
P-4348	0	P-4348	0	P-4348	0
P-4349	0	P-4349	0	P-4349	0
P-435	0.14	P-435	0.09	P-435	0.09
P-4353	0.13	P-4353	0.19	P-4353	0.22
P-4355	0.05	P-4355	0.16	P-4355	0.1
P-4360	0.06	P-4360	0.05	P-4360	0.04
P-4363	0	P-4363	0	P-4363	0
P-4364	0.1	P-4364	0.03	P-4364	0.01
P-4367 (1)	0.04	P-4367 (1)	0.06	P-4367 (1)	0.05
P-4367 (2)	0.1	P-4367 (2)	0.08	P-4367 (2)	0.05
P-4368	0	P-4368	0	P-4368	0.01
P-4370	0.09	P-4370	0.11	P-4370	0.09
P-4373	0.07	P-4373	0.17	P-4373	0.2
P-4395	0.21	P-4395	0.2	P-4395	0.1
P-4396	0.13	P-4396	0.12	P-4396	0.05
P-440	0.01	P-440	0.01	P-440	0.01
P-4400	0.01	P-4400	0.01	P-4400	0.01
P-4401	0.2	P-4401	0.17	P-4401	0.07
P-4404	0	P-4404	0	P-4404	0
P-4405	0	P-4405	0	P-4405	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-4407	0
P-4408	0.12
P-441	0.01
P-4411	0.1
P-4415	0.03
P-4416	0.04
P-4417	0.03
P-442	0.02
P-4421	0.01
P-4427 (1)	13.43
P-4427 (2)	0.09
P-4428 (1)	0.05
P-4428 (2)	0.02
P-4429	0.05
P-4430	0.18
P-4436	0.08
P-4443	0.03
P-4444	0.05
P-445	1.05
P-4450	0.02
P-4454	0.03
P-4455	0.01
P-4455(1)	0.14
P-4455(2)	0.14
P-4456	0.01
P-4460	0.01
P-4464	0.09
P-4466	0.01
P-4476	0.07
P-4481	0.01
P-4483	0
P-4485	0.01
P-4487	0.02
P-4489	0.66
P-449	0.06
P-4490(1)	0.22
P-4490(2)	0.21
P-4493	0.09
P-4495(1)	0.3
P-4495(2)	0.29
P-4498 (1)	0.01
P-4498 (2)	0.1
P-45	0.74
P-4504	0.01
P-4507(1)	0.09
P-4507(2)	0.09
P-4511	0
P-4516	0
P-4526	0.06
P-453	0.01
P-4531	0.05
P-4532	0.04
P-4534	0.05
P-4539	13.43
P-454	0
P-4544	0.21
P-4551	0.14
P-4555	0.39
P-4559	0.21
P-4563	0.31
P-4568	0.07
P-4572	0.1
P-4574	0.02
P-4575	0.1
P-4585	0.17
P-4596 (1)	0.01
P-4596 (2)	0.12
P-4597	0.05
P-46	0.37
P-4600	0.13
P-4603	0.19

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-4407	0
P-4408	0.25
P-441	0.01
P-4411	0.09
P-4415	0.07
P-4416	0.09
P-4417	0.09
P-442	0.01
P-4421	0.04
P-4427 (1)	22.99
P-4427 (2)	0.17
P-4428 (1)	0.14
P-4428 (2)	0.02
P-4429	0.16
P-4430	0.25
P-4436	0.21
P-4443	0.07
P-4444	0.03
P-445	1.08
P-4450	0.04
P-4454	0.04
P-4455	0.01
P-4455(1)	0.14
P-4455(2)	0.14
P-4456	0.01
P-4460	0.01
P-4464	0.22
P-4466	0.01
P-4476	0.09
P-4481	0.02
P-4483	0.01
P-4485	0.02
P-4487	0.05
P-4489	1.46
P-449	0.05
P-4490(1)	0.22
P-4490(2)	0.21
P-4493	0.08
P-4495(1)	0.36
P-4495(2)	0.35
P-4498 (1)	0.01
P-4498 (2)	0.02
P-45	1.08
P-4504	0.03
P-4507(1)	0.13
P-4507(2)	0.13
P-4511	0.01
P-4516	0.01
P-4526	0.04
P-453	0.09
P-4531	0.12
P-4532	0.11
P-4534	0.05
P-4539	23
P-454	0.01
P-4544	0.18
P-4551	0.06
P-4555	0.65
P-4559	0.17
P-4563	0.08
P-4568	0.07
P-4572	0.32
P-4574	0.02
P-4575	0.1
P-4585	0.22
P-4596 (1)	0.01
P-4596 (2)	0.15
P-4597	0.17
P-46	0.54
P-4600	0.06
P-4603	0.11

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-4407	0
P-4408	0.2
P-441	0.01
P-4411	0.08
P-4415	0.06
P-4416	0.08
P-4417	0.08
P-442	0.04
P-4421	0.03
P-4427 (1)	(N/A)
P-4427 (2)	0.2
P-4428 (1)	0.14
P-4428 (2)	0.06
P-4429	0.16
P-4430	0.24
P-4436	0.2
P-4443	0.08
P-4444	0.05
P-445	1.17
P-4450	0.04
P-4454	0.05
P-4455	0.01
P-4455(1)	0.14
P-4455(2)	0.14
P-4456	0.01
P-4460	0.01
P-4464	0.23
P-4466	0.01
P-4476	0.08
P-4481	0.02
P-4483	0.01
P-4485	0.02
P-4487	0.05
P-4489	1.15
P-449	0.17
P-4490(1)	0.16
P-4490(2)	0.16
P-4493	0.08
P-4495(1)	0.26
P-4495(2)	0.26
P-4498 (1)	0.01
P-4498 (2)	0.02
P-45	0.37
P-4504	0.03
P-4507(1)	0.14
P-4507(2)	0.14
P-4511	0.01
P-4516	0.01
P-4526	0.03
P-453	0.21
P-4531	0.11
P-4532	0.11
P-4534	0.09
P-4539	18.1
P-454	0.01
P-4544	0.12
P-4551	0.13
P-4555	0.76
P-4559	0.04
P-4563	0.15
P-4568	0.07
P-4572	0.32
P-4574	0.01
P-4575	0.1
P-4585	0.22
P-4596 (1)	0.01
P-4596 (2)	0.21
P-4597	0.19
P-46	0.18
P-4600	0.13
P-4603	0.18

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-4605(1)	0.1	P-4605(1)	0.18	P-4605(1)	0.18
P-4605(2)	0.1	P-4605(2)	0.18	P-4605(2)	0.17
P-4607	0.01	P-4607	0.01	P-4607	0.01
P-4610	0.06	P-4610	0.2	P-4610	0.12
P-4611	0.31	P-4611	0.61	P-4611	0.42
P-4612	0.24	P-4612	0.82	P-4612	0.56
P-4613	0.06	P-4613	0.96	P-4613	0.62
P-4614	0.29	P-4614	0.6	P-4614	0.34
P-4615 (1)	0.17	P-4615 (1)	0.54	P-4615 (1)	0.39
P-4615 (2)	0.48	P-4615 (2)	0.27	P-4615 (2)	0.58
P-4616	0.23	P-4616	0.35	P-4616	0.27
P-4617	0.02	P-4617	0.37	P-4617	0.31
P-4618 (1)	0.07	P-4618 (1)	0.45	P-4618 (1)	0.4
P-4618 (2)	0.19	P-4618 (2)	0.11	P-4618 (2)	0.24
P-4619	0.17	P-4619	0.59	P-4619	0.49
P-462 (1)	0.32	P-462 (1)	0.09	P-462 (1)	0.09
P-462 (2)	0.03	P-462 (2)	0.03	P-462 (2)	0.05
P-4620 (1)	0.32	P-4620 (1)	0.25	P-4620 (1)	0.39
P-4620 (2)	0.04	P-4620 (2)	0.05	P-4620 (2)	0.02
P-4621	0.26	P-4621	0.22	P-4621	0.02
P-4622 (1)	0.26	P-4622 (1)	0.21	P-4622 (1)	0.01
P-4622 (2)	0.18	P-4622 (2)	0.12	P-4622 (2)	0.02
P-4623	0.17	P-4623	0.11	P-4623	0.17
P-4624	0.1	P-4624	0.06	P-4624	0.13
P-4626	0.42	P-4626	1.39	P-4626	0.68
P-4627	0.26	P-4627	0.19	P-4627	0.34
P-4629(1)	0.15	P-4629(1)	0.06	P-4629(1)	0.05
P-4629(2)	0.18	P-4629(2)	0.1	P-4629(2)	0.09
P-4630	0.12	P-4630	0.04	P-4630	0.09
P-4631	0.16	P-4631	0.62	P-4631	0.68
P-4633	0.45	P-4633	0.53	P-4633	0.44
P-4636	0.02	P-4636	0.86	P-4636	1.13
P-4637	0.04	P-4637	0.04	P-4637	0.02
P-4638 (1)	0.01	P-4638 (1)	0.01	P-4638 (1)	0.01
P-4638 (2)	0.01	P-4638 (2)	0.01	P-4638 (2)	0.01
P-4639 (1)	0.54	P-4639 (1)	0.8	P-4639 (1)	0.7
P-4639 (2)	0.12	P-4639 (2)	0.16	P-4639 (2)	0.19
P-4640	0.21	P-4640	1.38	P-4640	0.66
P-4642	0.08	P-4642	0.13	P-4642	0.17
P-4642(1)	2.35	P-4642(1)	1.72	P-4642(1)	2.28
P-4642(2)	1.49	P-4642(2)	0.46	P-4642(2)	0.43
P-4647	0.01	P-4647	0.02	P-4647	0.02
P-465	0.73	P-465	1.7	P-465	0.89
P-4650	0.33	P-4650	0.09	P-4650	0.16
P-4651 (1)	0.69	P-4651 (1)	0.84	P-4651 (1)	0.32
P-4651 (2)	0.33	P-4651 (2)	0.4	P-4651 (2)	0.37
P-4654	0.03	P-4654	0.03	P-4654	0.14
P-4657	7.22	P-4657	1.26	P-4657	1.85
P-4658	7.21	P-4658	1.25	P-4658	1.84
P-4659	13.9	P-4659	28.83	P-4659	(N/A)
P-466	1.75	P-466	1.58	P-466	0.65
P-4660	13.9	P-4660	28.82	P-4660	(N/A)
P-4661	13.9	P-4661	28.82	P-4661	(N/A)
P-4662	13.9	P-4662	28.82	P-4662	(N/A)
P-4665	0.01	P-4665	0.02	P-4665	0.02
P-4666 (1)	0.01	P-4666 (1)	0.01	P-4666 (1)	0.01
P-4666 (2)	0.01	P-4666 (2)	0.02	P-4666 (2)	0.03
P-4667(2)	0	P-4667(2)	0	P-4667(2)	0
P-4668 (1)	0.33	P-4668 (1)	0.16	P-4668 (1)	0.27
P-4668 (2)	0.07	P-4668 (2)	0.07	P-4668 (2)	0.13
P-4670	0.24	P-4670	0.29	P-4670	0.25
P-4672	0.77	P-4672	0.8	P-4672	0.43
P-4673	0.19	P-4673	0.4	P-4673	0.29
P-4675	0.02	P-4675	0.05	P-4675	0.06
P-4679(1)	0.25	P-4679(1)	0.54	P-4679(1)	0.38
P-4679(2)	0.25	P-4679(2)	0.54	P-4679(2)	0.38
P-468	0.11	P-468	0.13	P-468	0.56
P-4681	0.19	P-4681	0.12	P-4681	0.1
P-4682	0	P-4682	0.01	P-4682	0.01
P-4683	0.04	P-4683	0.07	P-4683	0.07
P-4684	0.19	P-4684	0.27	P-4684	0.47

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-4689	0.01
P-4693	0.03
P-4697	0.1
P-4698	0.3
P-470	0.71
P-4702	0.04
P-4703	0.35
P-4704	1.39
P-4706	0.22
P-4708	1.02
P-4710	0.12
P-4713	0.03
P-4714	0.02
P-4715 (1)	0
P-4715 (2)	0.01
P-4716	0.01
P-4719	0.03
P-4728	0
P-473	0.1
P-4732	0.07
P-4734	0.09
P-4737	0.14
P-4738	0.18
P-4739 (1)	0.04
P-4739 (2)	0
P-4741	0.01
P-4742	0.47
P-4744(1)	0.24
P-4744(2)(1)	0.24
P-4744(2)(2)	0.24
P-4747	0
P-4748	0
P-475	0.07
P-4754	0
P-4762	0.17
P-4766	0.33
P-4770	0
P-4772	0.01
P-4778	0.52
P-4783	0.07
P-479	0.04
P-4792	0
P-4793	0.15
P-4794(1)(1)	0.11
P-4794(1)(2)	0.08
P-4794(2)	0.11
P-4796	0.1
P-4797 (1)	0.47
P-4797 (2)	0.13
P-4798	0.2
P-480	0
P-4800	0.54
P-4803	0
P-4809	0.21
P-481	0.04
P-4812	0.02
P-482 (1)	0.28
P-482 (2)	0.07
P-4821	0.33
P-4826 (1)	0
P-4826 (2)	0
P-4833	0.01
P-4835	0.16
P-4836 (1)	0.49
P-4836 (2)	0
P-4838	0.62
P-4839	0.88
P-4845	0.26
P-485	0.06
P-4852	0.35
P-4855	0.89

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-4689	0.02
P-4693	0.01
P-4697	0.02
P-4698	0.06
P-470	1.03
P-4702	0.05
P-4703	0.31
P-4704	1.06
P-4706	0.36
P-4708	0.78
P-4710	0.06
P-4713	0.08
P-4714	0.05
P-4715 (1)	0.01
P-4715 (2)	0.02
P-4716	0.79
P-4719	0.06
P-4728	0.01
P-473	0.04
P-4732	0.14
P-4734	0.12
P-4737	0.07
P-4738	0.03
P-4739 (1)	0.26
P-4739 (2)	0.15
P-4741	0.02
P-4742	0.84
P-4744(1)	0.66
P-4744(2)(1)	0.66
P-4744(2)(2)	0.66
P-4747	0.16
P-4748	0.01
P-475	0.03
P-4754	0
P-4762	0.13
P-4766	0.56
P-4770	0.02
P-4772	0.02
P-4778	0.75
P-4783	0.07
P-479	0.08
P-4792	0
P-4793	0.07
P-4794(1)(1)	0.16
P-4794(1)(2)	0.12
P-4794(2)	0.16
P-4796	0.11
P-4797 (1)	0.21
P-4797 (2)	0.13
P-4798	0.21
P-480	0.17
P-4800	1.14
P-4803	0.01
P-4809	0.14
P-481	0.07
P-4812	0.04
P-482 (1)	0.3
P-482 (2)	0.01
P-4821	0.47
P-4826 (1)	0
P-4826 (2)	0.08
P-4833	0.02
P-4835	0.15
P-4836 (1)	0.1
P-4836 (2)	0
P-4838	0.19
P-4839	0.36
P-4845	0.16
P-485	0.04
P-4852	0.05
P-4855	0.31

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-4689	0.01
P-4693	0.02
P-4697	0.03
P-4698	0.32
P-470	1.06
P-4702	0.09
P-4703	0.36
P-4704	1.38
P-4706	0.26
P-4708	1.05
P-4710	0.09
P-4713	0.02
P-4714	0.07
P-4715 (1)	0.01
P-4715 (2)	0.02
P-4716	0.02
P-4719	0.06
P-4728	0.01
P-473	0.05
P-4732	0.11
P-4734	0.1
P-4737	0.07
P-4738	0.03
P-4739 (1)	0.12
P-4739 (2)	0.2
P-4741	0.02
P-4742	0.65
P-4744(1)	0.83
P-4744(2)(1)	0.83
P-4744(2)(2)	0.83
P-4747	0.16
P-4748	0.02
P-475	0.05
P-4754	0
P-4762	0.08
P-4766	0.07
P-4770	0.01
P-4772	0.01
P-4778	0.08
P-4783	0.05
P-479	0.05
P-4792	0
P-4793	0.1
P-4794(1)(1)	0.18
P-4794(1)(2)	0.14
P-4794(2)	0.18
P-4796	0.12
P-4797 (1)	0.26
P-4797 (2)	0.15
P-4798	0.24
P-480	0.2
P-4800	0.9
P-4803	0.01
P-4809	0.17
P-481	0.09
P-4812	0.03
P-482 (1)	0.26
P-482 (2)	0.02
P-4821	0.46
P-4826 (1)	0
P-4826 (2)	0.43
P-4833	0.02
P-4835	0.04
P-4836 (1)	0.42
P-4836 (2)	0
P-4838	0.57
P-4839	0.83
P-4845	0.13
P-485	0.03
P-4852	0.3
P-4855	0.8

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-4858(1)	0.01
P-4858(2)	0.01
P-4859 (1)	0.21
P-4859 (2)	0.02
P-4870	0
P-4877	0.1
P-4878	0.1
P-488	0.01
P-4883	4.02
P-4884	0
P-4885 (1)	4.9
P-4885 (2)	0.04
P-4887	0.02
P-4888	0.01
P-4889	0
P-4890	0.22
P-4893	0.22
P-4896(1)	0.01
P-4896(2)	0.01
P-4899	0.26
P-4901	0.02
P-4904	0.71
P-4905	0.18
P-4907	0
P-4907(1)	0.21
P-4907(2)	0.33
P-4911	0.01
P-4913	0.01
P-4918	0.32
P-4920	0.02
P-4923	0
P-4924	0.32
P-4925	0.01
P-4927 (1)	1.64
P-4927 (2)	0.01
P-493	0.08
P-4930	0.25
P-4933	0
P-4934	0.01
P-4935	0.23
P-4937	0.03
P-4938	0.33
P-4943	0.05
P-4946	0.01
P-4947	0.05
P-4948	0.01
P-4949	0.01
P-4950	0.01
P-4951	0.26
P-4952	0
P-4953	0
P-4954	0.01
P-4955	0
P-4956	0
P-4958	0.01
P-4959	0.01
P-4960	0.13
P-4961	0
P-4967	0.12
P-4969	0.01
P-4970	0.06
P-4971	0.04
P-4972	0.01
P-4974	0
P-4981 (1)	0.42
P-4981 (2)	0.04
P-4982	0.04
P-4984	0
P-4987	2.46
P-4989	2.07
P-4991	1.02

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-4858(1)	0.04
P-4858(2)	0.02
P-4859 (1)	0.14
P-4859 (2)	0.01
P-4870	0.01
P-4877	0.07
P-4878	0.07
P-488	0.03
P-4883	1.35
P-4884	0
P-4885 (1)	1.76
P-4885 (2)	0.07
P-4887	0.01
P-4888	0.01
P-4889	0.01
P-4890	0.24
P-4893	0.18
P-4896(1)	0.01
P-4896(2)	0.02
P-4899	0.31
P-4901	0.03
P-4904	0.84
P-4905	0.23
P-4907	0.01
P-4907(1)	0.01
P-4907(2)	0.03
P-4911	0.03
P-4913	0.02
P-4918	0.04
P-4920	0.02
P-4923	0
P-4924	0.14
P-4925	0.01
P-4927 (1)	2.38
P-4927 (2)	0.04
P-493	0.04
P-4930	0.3
P-4933	0
P-4934	0.02
P-4935	0.25
P-4937	0.05
P-4938	0.14
P-4943	0.07
P-4946	0.02
P-4947	0.07
P-4948	0.02
P-4949	0.02
P-4950	0.04
P-4951	0.63
P-4952	0.01
P-4953	0
P-4954	0.02
P-4955	0.01
P-4956	0
P-4958	0.03
P-4959	0.02
P-4960	0.1
P-4961	0
P-4967	0.04
P-4969	0.01
P-4970	0.04
P-4971	0.05
P-4972	0.02
P-4974	0.01
P-4981 (1)	0.52
P-4981 (2)	0.08
P-4982	0.07
P-4984	0
P-4987	2.69
P-4989	2.22
P-4991	0.89

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-4858(1)	0.34
P-4858(2)	0.73
P-4859 (1)	0.1
P-4859 (2)	0.04
P-4870	0.01
P-4877	0.05
P-4878	0.05
P-488	0.02
P-4883	2.18
P-4884	0
P-4885 (1)	2.87
P-4885 (2)	0.08
P-4887	0.03
P-4888	0.02
P-4889	0.01
P-4890	0.01
P-4893	0.21
P-4896(1)	0.01
P-4896(2)	0.02
P-4899	0.03
P-4901	0.04
P-4904	0.05
P-4905	0.2
P-4907	0.01
P-4907(1)	0.01
P-4907(2)	0.04
P-4911	0.03
P-4913	0.02
P-4918	0.04
P-4920	0.01
P-4923	0
P-4924	0.69
P-4925	0.01
P-4927 (1)	0.69
P-4927 (2)	0.08
P-493	0.04
P-4930	0.04
P-4933	0
P-4934	0.01
P-4935	0.01
P-4937	0.14
P-4938	0.71
P-4943	0.26
P-4946	0.04
P-4947	0.08
P-4948	0.02
P-4949	0.03
P-4950	0.1
P-4951	0.35
P-4952	0.01
P-4953	0
P-4954	0.11
P-4955	0.01
P-4956	0
P-4958	0.03
P-4959	0
P-4960	0.27
P-4961	0
P-4967	0.13
P-4969	0.01
P-4970	0.07
P-4971	0.15
P-4972	0.05
P-4974	0.01
P-4981 (1)	0.11
P-4981 (2)	0.1
P-4982	0.06
P-4984	0
P-4987	0
P-4989	0.19
P-4991	1.02

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-4992	1.01
P-4995	0.3
P-4996 (1)	0.3
P-4996 (2)	0.12
P-4997	0.01
P-4998	0.99
P-5002	9.57
P-5004	0
P-5008	0
P-5015	0.05
P-5016	0.09
P-502 (1)	0.04
P-502 (2)	0.06
P-5021	0.01
P-5022	0.01
P-5023	0.02
P-5024	0.06
P-5027	0.03
P-5032	0.03
P-5038	0.6
P-5039 (1)	0.94
P-5039 (2)	0.01
P-504 (1)	0.02
P-504 (2)	0
P-5040 (1)	0.6
P-5040 (2)	0.01
P-5047	0.01
P-5048	0
P-5049	0.02
P-505	0
P-5054	0.01
P-5062	0.01
P-5063	0.02
P-5065	0
P-5067(1)	0.31
P-5067(2)	0.31
P-5068 (1)	0
P-5068 (2)	0.05
P-5069	0.15
P-507	0.02
P-5070(1)	0.01
P-5070(2)	0.01
P-5071 (1)	0.01
P-5071 (2)	0.02
P-5072	0.01
P-5074	0.01
P-5077	0.01
P-5078 (1)	0
P-5078 (2)	0
P-5079	0
P-5079(1)	0.11
P-5079(2)	0.12
P-508	0.02
P-5083	0.06
P-5087(1)(1)	0.03
P-5087(1)(2)	0.03
P-5087(2)	0.03
P-509	0.27
P-5090	0.04
P-5091	0.9
P-5095	0.02
P-510	0.42
P-5100	0.01
P-5101	0.01
P-5105	0.02
P-5107(1)	0.38
P-5107(2)	0.38
P-5108	0
P-511	0.16
P-5110	0
P-5115	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-4992	0.87
P-4995	0.39
P-4996 (1)	0.4
P-4996 (2)	0.04
P-4997	0.01
P-4998	0.25
P-5002	16.53
P-5004	0.01
P-5008	0.01
P-5015	0.07
P-5016	0.18
P-502 (1)	0.05
P-502 (2)	0.03
P-5021	0.05
P-5022	0.01
P-5023	0.06
P-5024	0.06
P-5027	0.05
P-5032	0.03
P-5038	0.11
P-5039 (1)	0.23
P-5039 (2)	0.02
P-504 (1)	0.02
P-504 (2)	0.01
P-5040 (1)	0.12
P-5040 (2)	0.01
P-5047	0.05
P-5048	0.01
P-5049	0
P-505	0
P-5054	0.05
P-5062	0.01
P-5063	0.05
P-5065	0.01
P-5067(1)	0.22
P-5067(2)	0.22
P-5068 (1)	0.01
P-5068 (2)	0.07
P-5069	0.02
P-507	0.02
P-5070(1)	0.02
P-5070(2)	0.02
P-5071 (1)	0.02
P-5071 (2)	0.04
P-5072	0.01
P-5074	0.01
P-5077	0.03
P-5078 (1)	0
P-5078 (2)	0
P-5079	0.01
P-5079(1)	0.05
P-5079(2)	0.39
P-508	0.03
P-5083	0.09
P-5087(1)(1)	0.05
P-5087(1)(2)	0.05
P-5087(2)	0.05
P-509	0.22
P-5090	0.06
P-5091	0.3
P-5095	0.04
P-510	0.31
P-5100	0.02
P-5101	0.01
P-5105	0.04
P-5107(1)	0.6
P-5107(2)	0.6
P-5108	0.01
P-511	0.29
P-5110	0.02
P-5115	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-4992	1.04
P-4995	0.11
P-4996 (1)	0.11
P-4996 (2)	0.04
P-4997	0.01
P-4998	0.4
P-5002	47.9
P-5004	0.01
P-5008	0.01
P-5015	0.18
P-5016	0.11
P-502 (1)	0.2
P-502 (2)	0.05
P-5021	0.04
P-5022	0.01
P-5023	0.06
P-5024	0.09
P-5027	0.03
P-5032	0.05
P-5038	0.45
P-5039 (1)	0.72
P-5039 (2)	0.03
P-504 (1)	0.1
P-504 (2)	0
P-5040 (1)	0.43
P-5040 (2)	0.01
P-5047	0.02
P-5048	0.01
P-5049	0.01
P-505	0
P-5054	0.05
P-5062	0.01
P-5063	0.05
P-5065	0.01
P-5067(1)	0.11
P-5067(2)	0.11
P-5068 (1)	0.01
P-5068 (2)	0.1
P-5069	0.07
P-507	0.1
P-5070(1)	0.02
P-5070(2)	0.02
P-5071 (1)	0.02
P-5071 (2)	0.04
P-5072	0.01
P-5074	0.01
P-5077	0.03
P-5078 (1)	0
P-5078 (2)	0
P-5079	0.01
P-5079(1)	0.22
P-5079(2)	0.08
P-508	0.06
P-5083	0.09
P-5087(1)(1)	0.04
P-5087(1)(2)	0.04
P-5087(2)	0.04
P-509	0.38
P-5090	0.05
P-5091	0.79
P-5095	0.04
P-510	0.68
P-5100	0.02
P-5101	0.02
P-5105	0.05
P-5107(1)	0.42
P-5107(2)	0.42
P-5108	0.01
P-511	0.09
P-5110	0.02
P-5115	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-5116	0.01
P-5118	0
P-5118(1)	0.19
P-5118(2)	0
P-5121	0.01
P-5127	0
P-5129	0.09
P-513	0.12
P-5131	0.03
P-5132	0.63
P-5134	0.44
P-5135	0.93
P-5138	0.21
P-5139	0.05
P-514	0.02
P-5142	0.2
P-5143	0.2
P-5144	0.2
P-5145	0.26
P-5148	0.03
P-5149	0
P-515	0.06
P-5151	0.2
P-5152	1.63
P-5154	1.98
P-5155	1.98
P-5159 (1)	1.72
P-5159 (2)	0.04
P-516	0.32
P-5160	1.73
P-5161	0.01
P-5162 (1)	2.72
P-5162 (2)	0.05
P-5163	2.72
P-5164	2.72
P-5165	2.83
P-5166	2.83
P-5167	2.83
P-5169	2.82
P-5172 (1)	0.01
P-5172 (2)	0.03
P-5174	0.01
P-5177	0.01
P-5178	0
P-5179 (1)	1.99
P-5179 (2)	0.45
P-518	0.09
P-5182 (1)	0.19
P-5182 (2)	0.01
P-5185	0
P-5186	1.83
P-5191	0.16
P-5192 (1)	2.59
P-5192 (2)	0.02
P-5193	0.06
P-5196	0.23
P-5197 (1)	0.25
P-5197 (2)	0.42
P-5198	0.15
P-5199	0.03
P-5201	0.05
P-5202	0.11
P-5203	2.83
P-5205	0
P-5207	0.02
P-5208	0.26
P-5214	0.21
P-5219	0.09
P-522	0.14
P-5220	0.06
P-5224	0.39

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-5116	0.01
P-5118	0.01
P-5118(1)	0.08
P-5118(2)	0
P-5121	0.05
P-5127	0
P-5129	0.09
P-513	0.31
P-5131	0.05
P-5132	0.27
P-5134	0.36
P-5135	0.23
P-5138	0.22
P-5139	0.01
P-514	0.03
P-5142	0.51
P-5143	0.51
P-5144	0.5
P-5145	0.21
P-5148	0.04
P-5149	0.01
P-515	0.03
P-5151	0.03
P-5152	2.33
P-5154	2.86
P-5155	2.86
P-5159 (1)	2.49
P-5159 (2)	0.02
P-516	0.1
P-5160	2.51
P-5161	0.01
P-5162 (1)	3.33
P-5162 (2)	0.09
P-5163	3.33
P-5164	3.33
P-5165	3.4
P-5166	3.4
P-5167	3.39
P-5169	3.39
P-5172 (1)	0.01
P-5172 (2)	0.05
P-5174	0.01
P-5177	0.01
P-5178	0
P-5179 (1)	2.86
P-5179 (2)	0.49
P-518	0.56
P-5182 (1)	0.25
P-5182 (2)	0.01
P-5185	0
P-5186	2.57
P-5191	0.1
P-5192 (1)	3.18
P-5192 (2)	0.04
P-5193	0.04
P-5196	0.43
P-5197 (1)	0.25
P-5197 (2)	0.23
P-5198	0.1
P-5199	0.12
P-5201	0.01
P-5202	0.14
P-5203	3.41
P-5205	0
P-5207	0.03
P-5208	0.25
P-5214	0.25
P-5219	0.11
P-522	0.03
P-5220	0.08
P-5224	0.47

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-5116	0.01
P-5118	0.01
P-5118(1)	0.13
P-5118(2)	0
P-5121	0.04
P-5127	0
P-5129	0.06
P-513	0.4
P-5131	0.06
P-5132	0.42
P-5134	0.48
P-5135	0.73
P-5138	0.39
P-5139	0.01
P-514	0.02
P-5142	0.91
P-5143	0.91
P-5144	0.9
P-5145	0.48
P-5148	0.04
P-5149	0.01
P-515	0.1
P-5151	0.17
P-5152	0.06
P-5154	0
P-5155	0
P-5159 (1)	0.04
P-5159 (2)	0.02
P-516	0.1
P-5160	0.05
P-5161	0.01
P-5162 (1)	1.06
P-5162 (2)	0.08
P-5163	1.06
P-5164	1.06
P-5165	1.19
P-5166	1.2
P-5167	1.21
P-5169	1.21
P-5172 (1)	0.01
P-5172 (2)	0.05
P-5174	0
P-5177	0.01
P-5178	0
P-5179 (1)	0
P-5179 (2)	0.54
P-518	0.45
P-5182 (1)	0.11
P-5182 (2)	0.02
P-5185	0
P-5186	0.17
P-5191	0.07
P-5192 (1)	0.87
P-5192 (2)	0.03
P-5193	0.14
P-5196	0.46
P-5197 (1)	0.32
P-5197 (2)	0.59
P-5198	0.1
P-5199	0.2
P-5201	0.01
P-5202	0.14
P-5203	1.19
P-5205	0
P-5207	0.02
P-5208	0.1
P-5214	0.06
P-5219	0.11
P-522	0.05
P-5220	0.08
P-5224	0.19

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-5225 (1)	0.06	P-5225 (1)	0.07	P-5225 (1)	0.02
P-5225 (2)	0.06	P-5225 (2)	0.08	P-5225 (2)	0.08
P-5226 (1)	0.15	P-5226 (1)	0.17	P-5226 (1)	0.14
P-5226 (2)	0.23	P-5226 (2)	0.19	P-5226 (2)	0.03
P-5228 (1)	0.01	P-5228 (1)	0.02	P-5228 (1)	0.01
P-5228 (2)	0.02	P-5228 (2)	0.05	P-5228 (2)	0.08
P-5229 (1)	0	P-5229 (1)	0.01	P-5229 (1)	0
P-5229 (2)	0.01	P-5229 (2)	0.01	P-5229 (2)	0.01
P-523	0.01	P-523	0.03	P-523	0.03
P-5230	0.14	P-5230	0.15	P-5230	0.12
P-5233	0.1	P-5233	0.13	P-5233	0.12
P-5234 (1)	0.66	P-5234 (1)	0.72	P-5234 (1)	0.43
P-5234 (2)	0.26	P-5234 (2)	0.12	P-5234 (2)	0.09
P-5237	0.01	P-5237	0.04	P-5237	0.03
P-5238	0.05	P-5238	0.06	P-5238	0.06
P-5239	0.32	P-5239	0.45	P-5239	0.33
P-524	0.01	P-524	0.03	P-524	0.02
P-5241	0.03	P-5241	0.01	P-5241	0.01
P-5245	0.69	P-5245	0.9	P-5245	0.75
P-5247	0.08	P-5247	0.03	P-5247	0.02
P-5252	0.23	P-5252	1.15	P-5252	1.5
P-5256	0.24	P-5256	0.15	P-5256	0.27
P-5258	0.04	P-5258	0.09	P-5258	0.23
P-5259	0.07	P-5259	0.07	P-5259	0.05
P-5260	0.36	P-5260	0.38	P-5260	0.11
P-5261	0.05	P-5261	0.08	P-5261	0.07
P-527	0	P-527	0	P-527	0
P-5271	0	P-5271	0	P-5271	0
P-5272	0.03	P-5272	0.03	P-5272	0.1
P-5273	0	P-5273	0	P-5273	0
P-5277	0.24	P-5277	0.25	P-5277	0.14
P-5278	0.05	P-5278	0.04	P-5278	0.05
P-5279	0.38	P-5279	0.26	P-5279	0.16
P-528 (1)	0.15	P-528 (1)	0.17	P-528 (1)	0.45
P-528 (2)	0	P-528 (2)	0.01	P-528 (2)	0.01
P-5282	0.04	P-5282	0.06	P-5282	0.06
P-5283	0.23	P-5283	0.23	P-5283	0.12
P-5286	0.01	P-5286	0.04	P-5286	0.11
P-5288	0.19	P-5288	0.12	P-5288	0.12
P-529	0.15	P-529	0.02	P-529	0.03
P-5290 (1)	0	P-5290 (1)	0	P-5290 (1)	0
P-5290 (2)	0.05	P-5290 (2)	0.08	P-5290 (2)	0.08
P-5291	0.92	P-5291	0.98	P-5291	0.57
P-5292	0.01	P-5292	0.01	P-5292	0.01
P-5294	0.28	P-5294	0.4	P-5294	0.01
P-5297	0.02	P-5297	0.04	P-5297	0.02
P-5298	0.92	P-5298	0.97	P-5298	0.57
P-530	0	P-530	0	P-530	0
P-5300	0.01	P-5300	0.04	P-5300	0.03
P-5302	0.04	P-5302	0.04	P-5302	0.02
P-5308	0.48	P-5308	0.24	P-5308	0.33
P-531	0.17	P-531	0.12	P-531	0.33
P-5313	0.13	P-5313	0.08	P-5313	0.23
P-5316	0.19	P-5316	0.04	P-5316	0.14
P-5317	0.02	P-5317	0.03	P-5317	0.02
P-5319	0	P-5319	0	P-5319	0
P-532	0.01	P-532	0.01	P-532	0.01
P-5321	0.37	P-5321	0.38	P-5321	0.21
P-5322	0.35	P-5322	0.34	P-5322	0.17
P-5329	0.08	P-5329	0.07	P-5329	0.06
P-5332	0	P-5332	0	P-5332	0
P-5335	0	P-5335	0.01	P-5335	0.01
P-5339	0.01	P-5339	0.01	P-5339	0.01
P-5341(1)	0.71	P-5341(1)	0.02	P-5341(1)	0.02
P-5343 (1)	0.01	P-5343 (1)	0.01	P-5343 (1)	0.01
P-5343 (2)	0.02	P-5343 (2)	0.03	P-5343 (2)	0.03
P-5345	0.03	P-5345	0.04	P-5345	0.04
P-5346 (1)	0	P-5346 (1)	0.01	P-5346 (1)	0.01
P-5346 (2)	0.02	P-5346 (2)	0.06	P-5346 (2)	0.05
P-5347	0	P-5347	0.01	P-5347	0.01
P-5348	0	P-5348	0.01	P-5348	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-5349	0.01	P-5349	0.02	P-5349	0.02
P-535	0	P-535	0	P-535	0
P-5350	0.01	P-5350	0.02	P-5350	0.02
P-5351	0	P-5351	0.01	P-5351	0.01
P-5352	0	P-5352	0	P-5352	0
P-5355	0	P-5355	0	P-5355	0
P-5357 (1)	0.01	P-5357 (1)	0.02	P-5357 (1)	0.01
P-5357 (2)	0.01	P-5357 (2)	0	P-5357 (2)	0
P-5358	0	P-5358	0.01	P-5358	0.01
P-5359	0.01	P-5359	0.01	P-5359	0.01
P-536 (1)	0	P-536 (1)	0	P-536 (1)	0
P-536 (2)	0.01	P-536 (2)	0.01	P-536 (2)	0.01
P-5360	0	P-5360	0.01	P-5360	0.01
P-5361	0	P-5361	0.01	P-5361	0.01
P-5362	0	P-5362	0.01	P-5362	0.01
P-5363	0	P-5363	0.01	P-5363	0.01
P-5371	0.13	P-5371	0.25	P-5371	0.28
P-5374	0.53	P-5374	0.68	P-5374	0.5
P-5378	0.26	P-5378	0.1	P-5378	0.09
P-5380 (1)	2.29	P-5380 (1)	2.71	P-5380 (1)	0.71
P-5380 (2)	0.04	P-5380 (2)	0.02	P-5380 (2)	0.01
P-5386	0.66	P-5386	0.87	P-5386	0.19
P-5392	0	P-5392	0	P-5392	0
P-5394	0.01	P-5394	0.01	P-5394	0.03
P-5395	0.01	P-5395	0.02	P-5395	0.01
P-5396	0	P-5396	0	P-5396	0
P-5399	0.02	P-5399	0.03	P-5399	0.01
P-5401	0.01	P-5401	0.04	P-5401	0.03
P-5406	0.01	P-5406	0.01	P-5406	0.02
P-5408	0.31	P-5408	0.38	P-5408	0.12
P-5409 (1)	0.3	P-5409 (1)	0.37	P-5409 (1)	0.13
P-5409 (2)	0.04	P-5409 (2)	0.06	P-5409 (2)	0.06
P-5410	0	P-5410	0	P-5410	0
P-5412	0.05	P-5412	0.13	P-5412	0.15
P-5414	0	P-5414	0	P-5414	0
P-5419	0.27	P-5419	1.79	P-5419	0.36
P-5423	0.06	P-5423	0.17	P-5423	0.12
P-5429	0.07	P-5429	0.07	P-5429	0.02
P-543	0	P-543	0	P-543	0
P-5430 (1)	0.34	P-5430 (1)	0.4	P-5430 (1)	0.1
P-5430 (2)	0.1	P-5430 (2)	0.05	P-5430 (2)	0.13
P-5434	0	P-5434	0	P-5434	0
P-5437	0.05	P-5437	0.09	P-5437	0.14
P-5440	0.17	P-5440	0.2	P-5440	0.06
P-5441	0.4	P-5441	0.46	P-5441	0.13
P-5442 (1)	0.57	P-5442 (1)	0.65	P-5442 (1)	0.2
P-5442 (2)	0.42	P-5442 (2)	0.44	P-5442 (2)	0.51
P-5445	0.18	P-5445	0.21	P-5445	0.05
P-5450 (1)	2.28	P-5450 (1)	2.69	P-5450 (1)	0.73
P-5450 (2)	0.15	P-5450 (2)	0.1	P-5450 (2)	0.09
P-5451	2.28	P-5451	2.69	P-5451	0.74
P-5452 (1)	2.07	P-5452 (1)	2.41	P-5452 (1)	0.81
P-5452 (2)	0.05	P-5452 (2)	0.05	P-5452 (2)	0.04
P-5453	2.28	P-5453	2.69	P-5453	0.73
P-5453(1)	0.02	P-5453(1)	0.04	P-5453(1)	0.05
P-5453(2)(1)	0.01	P-5453(2)(1)	0.02	P-5453(2)(1)	0.02
P-5453(2)(2)	0.01	P-5453(2)(2)	0.02	P-5453(2)(2)	0.03
P-5454	2.09	P-5454	2.44	P-5454	0.78
P-5454(1)	0.04	P-5454(1)	0.07	P-5454(1)	0.07
P-5454(2)	0.04	P-5454(2)	0.07	P-5454(2)	0.07
P-546	0.21	P-546	0.03	P-546	0.06
P-547	0.03	P-547	0.05	P-547	0.05
P-5470	0.08	P-5470	0.03	P-5470	0.18
P-5476	0.09	P-5476	0.1	P-5476	0.25
P-5478	0.13	P-5478	0.12	P-5478	0.19
P-548	0.28	P-548	0.21	P-548	0.47
P-5480	0.01	P-5480	0.02	P-5480	0.01
P-5481	0	P-5481	0.01	P-5481	0.01
P-5484	0.03	P-5484	0.05	P-5484	0.05
P-5485	0.01	P-5485	0.02	P-5485	0.02
P-5488	0.01	P-5488	0.04	P-5488	0.04

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-549	0.12
P-5500	0
P-5502	0.01
P-5503	0.01
P-5504	0.01
P-5505 (1)	0.02
P-5505 (2)	0.2
P-5506	0.15
P-5507	0.01
P-5508	0.01
P-551	0.02
P-5510 (1)	0
P-5510 (2)	0.02
P-5511 (1)	0.11
P-5511 (2)	0.62
P-5512	0
P-5515	0
P-5517 (1)	0.06
P-5517 (2)	0.01
P-5518	0.01
P-5519	0.1
P-552	0
P-5520	0.01
P-5521 (1)	0.05
P-5521 (2)	0.03
P-5522	0.01
P-5525	0
P-5526	0.01
P-5532	0.01
P-5533	0
P-5536	0.01
P-5542	0.02
P-5545	2.24
P-5546	2.27
P-5547	0.93
P-5548	0.08
P-5549	2.03
P-555 (1)	0.01
P-555 (2)	0
P-5553	2.03
P-5554	0
P-5555	0.74
P-5557	0.07
P-5559	0.03
P-556	0.08
P-5565	0.05
P-5566	0.03
P-5568	0.93
P-5570	0.11
P-5571 (1)	2.27
P-5571 (2)	0.07
P-5574	0.19
P-5575	0.03
P-5576	0.74
P-558	0
P-5583	0.11
P-5585	0.32
P-559	0.02
P-5601	0
P-5602	0.07
P-5605	0.02
P-5606	0.01
P-5608	0
P-5609 (1)	0
P-5609 (2)	0.03
P-561	0.05
P-5611	0
P-5613	0.01
P-5614	0.01
P-5619	0.09
P-562	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-549	0.05
P-5500	0
P-5502	0.01
P-5503	0.02
P-5504	0.01
P-5505 (1)	0.04
P-5505 (2)	0.26
P-5506	0.07
P-5507	0.01
P-5508	0.01
P-551	0.04
P-5510 (1)	0
P-5510 (2)	0.03
P-5511 (1)	0.04
P-5511 (2)	0.52
P-5512	0
P-5515	0
P-5517 (1)	0.02
P-5517 (2)	0.01
P-5518	0.01
P-5519	0.04
P-552	0.01
P-5520	0.01
P-5521 (1)	0.03
P-5521 (2)	0.15
P-5522	0.01
P-5525	0
P-5526	0.01
P-5532	0.03
P-5533	0.01
P-5536	0.02
P-5542	0.38
P-5545	2.52
P-5546	2.46
P-5547	0.71
P-5548	0.14
P-5549	2.29
P-555 (1)	0.02
P-555 (2)	0.01
P-5553	2.29
P-5554	0.01
P-5555	0.91
P-5557	0.03
P-5559	0.05
P-556	0.05
P-5565	0.04
P-5566	0.06
P-5568	0.48
P-5570	0.11
P-5571 (1)	2.46
P-5571 (2)	0.18
P-5574	0.18
P-5575	0.04
P-5576	0.91
P-558	0.01
P-5583	0.04
P-5585	0.38
P-559	0.04
P-5601	0
P-5602	0.05
P-5605	0.03
P-5606	0.02
P-5608	0
P-5609 (1)	0
P-5609 (2)	0.02
P-561	0.07
P-5611	0
P-5613	0.01
P-5614	0.01
P-5619	0.2
P-562	0.01

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-549	0.04
P-5500	0
P-5502	0.01
P-5503	0.02
P-5504	0.01
P-5505 (1)	0.03
P-5505 (2)	0.08
P-5506	0.03
P-5507	0.01
P-5508	0.01
P-551	0.04
P-5510 (1)	0
P-5510 (2)	0.01
P-5511 (1)	0.05
P-5511 (2)	0.01
P-5512	0
P-5515	0
P-5517 (1)	0.04
P-5517 (2)	0.01
P-5518	0.01
P-5519	0.06
P-552	0.01
P-5520	0.01
P-5521 (1)	0.05
P-5521 (2)	0.16
P-5522	0.01
P-5525	0
P-5526	0.03
P-5532	0.06
P-5533	0.01
P-5536	0.01
P-5542	0.51
P-5545	0.64
P-5546	0.45
P-5547	0.94
P-5548	0.16
P-5549	0.65
P-555 (1)	0.02
P-555 (2)	0.01
P-5553	0.65
P-5554	0.01
P-5555	0.61
P-5557	0.18
P-5559	0.06
P-556	0.05
P-5565	0.03
P-5566	0.05
P-5568	0.16
P-5570	0.13
P-5571 (1)	0.45
P-5571 (2)	0.17
P-5574	0.34
P-5575	0.04
P-5576	0.61
P-558	0.01
P-5583	0.06
P-5585	0.04
P-559	0.03
P-5601	0
P-5602	0.06
P-5605	0.09
P-5606	0.03
P-5608	0
P-5609 (1)	0
P-5609 (2)	0.03
P-561	0.2
P-5611	0
P-5613	0.01
P-5614	0.01
P-5619	0.2
P-562	0.01

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-5621	0.06
P-5624 (1)	0.08
P-5624 (2)	0.03
P-563	0.06
P-5633	0.06
P-5634	0.01
P-5637	0.02
P-5638	0.03
P-5639	0
P-5644	0.05
P-5645	0
P-5649	0
P-565	0
P-5650 (1)	0.03
P-5650 (2)	0.01
P-5651	0.01
P-5652	0.04
P-5654	0.02
P-5655	0.04
P-5657	0.11
P-5661	0.08
P-5662	0
P-5664	0.01
P-5665	0.5
P-5666	0.05
P-5667	0.17
P-5670	0
P-5672	0.08
P-5673	0.01
P-5675	0.09
P-5676	0.09
P-5679	0.04
P-5689	0.06
P-569	0.01
P-5695	0.34
P-5696	0.01
P-5698	0.01
P-5701	0.01
P-5702	0.16
P-5704	0.07
P-5706	0.08
P-5707 (1)	0.11
P-5707 (2)	0.46
P-5708	0.01
P-5709	0.08
P-571	0.03
P-5710	0.18
P-5714	0.1
P-5720	0
P-5722	0.01
P-5723	0.01
P-5725	0.17
P-5726	0.17
P-5729	0.01
P-5735	0.02
P-5736	0.19
P-5737	0.07
P-5739	0
P-574 (1)	0.01
P-574 (2)	0.11
P-5740	0.07
P-5741	0.14
P-5747	0.05
P-5748	0.45
P-5749	0.54
P-575	0
P-5751	0.54
P-5752	0
P-5753	0.04
P-5754	0.2
P-5755 (1)	0.06

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-5621	0.02
P-5624 (1)	0.15
P-5624 (2)	0.06
P-563	0.06
P-5633	0.03
P-5634	0.02
P-5637	0.01
P-5638	0.02
P-5639	0
P-5644	0.09
P-5645	0
P-5649	0
P-565	0
P-5650 (1)	0.05
P-5650 (2)	0.02
P-5651	0.02
P-5652	0.05
P-5654	0.04
P-5655	0.08
P-5657	0.11
P-5661	0.06
P-5662	0.01
P-5664	0.02
P-5665	0.11
P-5666	0.02
P-5667	0.12
P-5670	0
P-5672	0.08
P-5673	0.01
P-5675	0.07
P-5676	0.07
P-5679	0.09
P-5689	0.09
P-569	0.01
P-5695	0.01
P-5696	0.02
P-5698	0.01
P-5701	0.01
P-5702	0.24
P-5704	0.03
P-5706	0.05
P-5707 (1)	0.07
P-5707 (2)	0.39
P-5708	0.01
P-5709	0.15
P-571	0.05
P-5710	0.16
P-5714	0.07
P-5720	0.01
P-5722	0.01
P-5723	0.03
P-5725	0.1
P-5726	0.44
P-5729	0.02
P-5735	0.03
P-5736	0.13
P-5737	0.07
P-5739	0.01
P-574 (1)	0.02
P-574 (2)	0.07
P-5740	0.06
P-5741	0.12
P-5747	0.28
P-5748	0.14
P-5749	0.15
P-575	0.01
P-5751	0.13
P-5752	0
P-5753	0.02
P-5754	0.25
P-5755 (1)	0.02

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-5621	0.04
P-5624 (1)	0.12
P-5624 (2)	0.06
P-563	0.1
P-5633	0.01
P-5634	0.03
P-5637	0.01
P-5638	0.02
P-5639	0
P-5644	0.15
P-5645	0
P-5649	0
P-565	0
P-5650 (1)	0.1
P-5650 (2)	0.02
P-5651	0.02
P-5652	0.12
P-5654	0.04
P-5655	0.14
P-5657	0.21
P-5661	0.09
P-5662	0.01
P-5664	0.03
P-5665	0.29
P-5666	0.03
P-5667	0.32
P-5670	0
P-5672	0.11
P-5673	0.01
P-5675	0.04
P-5676	0.06
P-5679	0.09
P-5689	0.02
P-569	0.02
P-5695	0.02
P-5696	0.01
P-5698	0.01
P-5701	0.01
P-5702	0.11
P-5704	0.01
P-5706	0.02
P-5707 (1)	0.02
P-5707 (2)	0.11
P-5708	0.02
P-5709	0.15
P-571	0.04
P-5710	0
P-5714	0.05
P-5720	0.01
P-5722	0.01
P-5723	0.42
P-5725	0.13
P-5726	0.4
P-5729	0.02
P-5735	0.03
P-5736	0.04
P-5737	0.08
P-5739	0.01
P-574 (1)	0.02
P-574 (2)	0.16
P-5740	0.02
P-5741	0.05
P-5747	0.42
P-5748	0.12
P-5749	0.15
P-575	0.01
P-5751	0.14
P-5752	0
P-5753	0.02
P-5754	0.19
P-5755 (1)	0.02

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-5755 (2)	0.01
P-5756	0.08
P-5760 (1)	0.17
P-5760 (2)	0.21
P-5761 (1)	0.13
P-5761 (2)	0.01
P-5762 (1)	0.17
P-5762 (2)	0.46
P-5763	0
P-5765	0.1
P-5768	0.4
P-5769	0.22
P-577 (1)	0
P-577 (2)	0.03
P-5771	0.01
P-5781	0.06
P-5782	0
P-5783	0.05
P-5784	0.05
P-5785	0.03
P-5786 (1)	0.01
P-5786 (2)	0.17
P-5787	0.01
P-5788	0.01
P-579 (1)	0
P-579 (2)	0.14
P-5790	0.02
P-5792 (1)	0.05
P-5792 (2)	0.01
P-5793 (1)	0.01
P-5793 (2)	0.04
P-5794 (1)	0.01
P-5794 (2)	0.48
P-5795	0.01
P-5796	0.04
P-5797 (1)	0.08
P-5797 (2)	0.88
P-580	0.01
P-5800	0.09
P-5801 (1)	0.11
P-5801 (2)	0.12
P-5802 (1)	0.03
P-5802 (2)	0.01
P-5806	0.01
P-5807	0
P-5808	0
P-5809 (1)	0.02
P-5809 (2)	0.35
P-581	0.09
P-5811	0.01
P-5812	0.01
P-5814	0.01
P-5815 (1)	0.01
P-5815 (2)	0.03
P-5816	0.01
P-5817	0.01
P-5818 (1)	0.01
P-5818 (2)	0.83
P-5819	0.02
P-5820	0.02
P-5821	0.04
P-5823	0.42
P-5824	0.05
P-5825	0.41
P-5828	0.02
P-583	0
P-5833 (1)	0
P-5833 (2)	0.01
P-5834	0
P-5839	0.02
P-5841	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-5755 (2)	0.01
P-5756	0.03
P-5760 (1)	0.05
P-5760 (2)	0.39
P-5761 (1)	0.03
P-5761 (2)	0.05
P-5762 (1)	0.07
P-5762 (2)	0.38
P-5763	0
P-5765	0.46
P-5768	0.14
P-5769	0.41
P-577 (1)	0.01
P-577 (2)	0.01
P-5771	0.02
P-5781	0.05
P-5782	0.01
P-5783	0.03
P-5784	0.03
P-5785	0.02
P-5786 (1)	0.02
P-5786 (2)	0.05
P-5787	0.02
P-5788	0.06
P-579 (1)	0.01
P-579 (2)	0.09
P-5790	0.59
P-5792 (1)	0.05
P-5792 (2)	0.03
P-5793 (1)	0.01
P-5793 (2)	0.05
P-5794 (1)	0.01
P-5794 (2)	0.46
P-5795	0.01
P-5796	0.03
P-5797 (1)	0.07
P-5797 (2)	0.41
P-580	0.03
P-5800	0.06
P-5801 (1)	0.09
P-5801 (2)	0.05
P-5802 (1)	0.02
P-5802 (2)	0.01
P-5806	0.01
P-5807	0
P-5808	0
P-5809 (1)	0.03
P-5809 (2)	0.47
P-581	0.05
P-5811	0.01
P-5812	0.02
P-5814	0.01
P-5815 (1)	0.02
P-5815 (2)	0.06
P-5816	0.02
P-5817	0.01
P-5818 (1)	0.01
P-5818 (2)	0.85
P-5819	0.04
P-5820	0.03
P-5821	0.01
P-5823	0.39
P-5824	0.09
P-5825	0.91
P-5828	0.05
P-583	0.01
P-5833 (1)	0.01
P-5833 (2)	0.02
P-5834	0
P-5839	0.03
P-5841	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-5755 (2)	0.01
P-5756	0.02
P-5760 (1)	0.05
P-5760 (2)	0.25
P-5761 (1)	0.03
P-5761 (2)	0.05
P-5762 (1)	0.05
P-5762 (2)	0.11
P-5763	0
P-5765	0.35
P-5768	0.11
P-5769	0.21
P-577 (1)	0.01
P-577 (2)	0.01
P-5771	0.02
P-5781	0.07
P-5782	0.01
P-5783	0.06
P-5784	0.07
P-5785	0.03
P-5786 (1)	0.02
P-5786 (2)	0.09
P-5787	0.02
P-5788	0.09
P-579 (1)	0.01
P-579 (2)	0.24
P-5790	0.11
P-5792 (1)	0.02
P-5792 (2)	0.02
P-5793 (1)	0.01
P-5793 (2)	0.04
P-5794 (1)	0.01
P-5794 (2)	0.42
P-5795	0.01
P-5796	0.04
P-5797 (1)	0.16
P-5797 (2)	0.7
P-580	0
P-5800	0.1
P-5801 (1)	0.17
P-5801 (2)	0.03
P-5802 (1)	0.05
P-5802 (2)	0.01
P-5806	0.01
P-5807	0
P-5808	0
P-5809 (1)	0.02
P-5809 (2)	0.15
P-581	0.05
P-5811	0.01
P-5812	0.02
P-5814	0.01
P-5815 (1)	0.01
P-5815 (2)	0.09
P-5816	0.02
P-5817	0.01
P-5818 (1)	0.01
P-5818 (2)	0.57
P-5819	0.03
P-5820	0.02
P-5821	0.09
P-5823	0.49
P-5824	0.02
P-5825	0.37
P-5828	0.06
P-583	0.01
P-5833 (1)	0.01
P-5833 (2)	0.02
P-5834	0
P-5839	0.03
P-5841	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-585 (1)	0.01	P-585 (1)	0.02	P-585 (1)	0.02
P-585 (2)	0.03	P-585 (2)	0.03	P-585 (2)	0.07
P-5850	0.03	P-5850	0.04	P-5850	0.12
P-5853	1.85	P-5853	1.93	P-5853	0.99
P-5856	0.01	P-5856	0.01	P-5856	0.01
P-5857	0	P-5857	0.01	P-5857	0.01
P-5866	0.04	P-5866	0.07	P-5866	0.06
P-5867	0	P-5867	0.01	P-5867	0.01
P-5869	0.02	P-5869	0.03	P-5869	0.03
P-587	0.01	P-587	0.02	P-587	0.03
P-5870	0.03	P-5870	0.06	P-5870	0.05
P-5873	0.08	P-5873	0.04	P-5873	0.17
P-5874	0.01	P-5874	0.01	P-5874	0.01
P-5875	0.04	P-5875	0.04	P-5875	0.09
P-5876	0.1	P-5876	0.09	P-5876	0.13
P-5877	0.07	P-5877	0.07	P-5877	0.13
P-5878	0.05	P-5878	0.05	P-5878	0.11
P-588	0.05	P-588	0.08	P-588	0.12
P-5881	0.96	P-5881	0.43	P-5881	0.25
P-5887	0.2	P-5887	0.32	P-5887	0.3
P-5888	0.02	P-5888	0.03	P-5888	0.07
P-589	0.01	P-589	0.03	P-589	0.03
P-5891 (1)	0.01	P-5891 (1)	0.02	P-5891 (1)	0.02
P-5891 (2)	0.02	P-5891 (2)	0.05	P-5891 (2)	0.04
P-5894	2.55	P-5894	2.13	P-5894	0.62
P-5897	0	P-5897	0	P-5897	0
P-590	0.06	P-590	0.11	P-590	0.05
P-5900	0.03	P-5900	0.04	P-5900	0.04
P-5901	0	P-5901	0	P-5901	0
P-5903	0	P-5903	0	P-5903	0
P-5906	0.02	P-5906	0.02	P-5906	0.02
P-591	0.01	P-591	0.05	P-591	0.04
P-5910	0	P-5910	0.01	P-5910	0.01
P-5911	0	P-5911	0	P-5911	0
P-5912	0	P-5912	0	P-5912	0
P-5913	0.23	P-5913	0.29	P-5913	0.18
P-5914	0.3	P-5914	0.37	P-5914	0.33
P-5915	0.42	P-5915	0.94	P-5915	0.67
P-5916	0	P-5916	0.01	P-5916	0.01
P-5917	0.13	P-5917	0.16	P-5917	0.16
P-5918	0.14	P-5918	0.18	P-5918	0.15
P-5919 (1)	0.07	P-5919 (1)	0.04	P-5919 (1)	0.06
P-5919 (2)	0.14	P-5919 (2)	0.28	P-5919 (2)	0.22
P-5920	0.14	P-5920	0.42	P-5920	0.92
P-5925	0.01	P-5925	0.05	P-5925	0.14
P-5928	0.01	P-5928	0.01	P-5928	0.01
P-5931	0.01	P-5931	0.01	P-5931	0.02
P-5933	0.03	P-5933	0.26	P-5933	0.23
P-5934	0.3	P-5934	0.36	P-5934	0.34
P-5937 (1)	0.02	P-5937 (1)	0.01	P-5937 (1)	0.01
P-5937 (2)	0	P-5937 (2)	0	P-5937 (2)	0
P-5938 (1)	0.02	P-5938 (1)	0.02	P-5938 (1)	0.02
P-5938 (2)	0.05	P-5938 (2)	0.07	P-5938 (2)	0.06
P-5941	0.09	P-5941	0.07	P-5941	0.06
P-5944	0.01	P-5944	0.02	P-5944	0.02
P-595	0.09	P-595	0.55	P-595	0.45
P-5952 (1)	0	P-5952 (1)	0	P-5952 (1)	0
P-5952 (2)	0	P-5952 (2)	0	P-5952 (2)	0
P-5957 (1)	2.63	P-5957 (1)	1.71	P-5957 (1)	2.27
P-5957 (2)	0.02	P-5957 (2)	0.03	P-5957 (2)	0.03
P-5958 (1)	0	P-5958 (1)	0	P-5958 (1)	0
P-5958 (2)	0.06	P-5958 (2)	0.05	P-5958 (2)	0.05
P-5959	0	P-5959	0	P-5959	0
P-596 (1)	0.1	P-596 (1)	0.6	P-596 (1)	0.49
P-596 (2)	0.03	P-596 (2)	0.04	P-596 (2)	0.05
P-5960	0.12	P-5960	0.28	P-5960	0.22
P-5967 (1)	0	P-5967 (1)	0	P-5967 (1)	0
P-5967 (2)	0.33	P-5967 (2)	0.25	P-5967 (2)	0.35
P-5968 (1)	0.01	P-5968 (1)	0.01	P-5968 (1)	0.01
P-5968 (2)	0.04	P-5968 (2)	0.07	P-5968 (2)	0.06
P-5972	0.01	P-5972	0.02	P-5972	0.02

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-5973	0.65
P-5975	0.02
P-5977	0
P-5978	0.33
P-5980	0.06
P-5981	0.06
P-5982	0
P-5984	0.05
P-5986	0.13
P-5987 (1)	0
P-5987 (2)	0.5
P-5988	0
P-5989	2.66
P-5990	2.8
P-5991	2.8
P-5992 (1)	2.8
P-5992 (2)	0.01
P-5993	0.02
P-5994 (1)	0
P-5994 (2)	0.01
P-5995 (1)	0.01
P-5995 (2)	0.05
P-5996	0.16
P-5998	0.01
P-5999 (1)	0.09
P-5999 (2)	0.06
P-6001	0.01
P-6002 (1)	0.13
P-6002 (2)	0
P-6003	0.01
P-6004	0.01
P-6005 (1)	0.01
P-6005 (2)	0.05
P-6006	2.85
P-6007 (1)	0.01
P-6007 (2)	0.14
P-601	0.01
P-6010	0.01
P-6013	0
P-6015 (1)	2.86
P-6015 (2)	0.02
P-6016 (1)	2.85
P-6016 (2)	0.03
P-6017 (1)	2.85
P-6017 (2)	0.01
P-6018	2.85
P-6019	2.85
P-602	0.02
P-6020	2.85
P-6021	2.85
P-6022 (1)	2.85
P-6022 (2)	0.03
P-6023	0.14
P-6025 (1)	2.85
P-6025 (2)	1.09
P-6026	2.85
P-6027 (1)	2.85
P-6027 (2)	0.61
P-6033	0.06
P-6034	0
P-6039	0.16
P-604	0
P-6040	0
P-6054	0.02
P-6056	0.04
P-6058	0.06
P-6065	0.14
P-6066	0.01
P-6071(1)	0.59
P-6071(2)	0.59
P-6074	0.08

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-5973	0.63
P-5975	0.08
P-5977	0
P-5978	0.14
P-5980	0.63
P-5981	0.07
P-5982	0
P-5984	0.06
P-5986	0.08
P-5987 (1)	0
P-5987 (2)	0.45
P-5988	0
P-5989	1.75
P-5990	2.17
P-5991	2.17
P-5992 (1)	2.17
P-5992 (2)	0.01
P-5993	0.04
P-5994 (1)	0
P-5994 (2)	0.02
P-5995 (1)	0.01
P-5995 (2)	0.09
P-5996	0.15
P-5998	0.01
P-5999 (1)	0.2
P-5999 (2)	0.03
P-6001	0.01
P-6002 (1)	0.32
P-6002 (2)	0
P-6003	0.01
P-6004	0.01
P-6005 (1)	0.01
P-6005 (2)	0.04
P-6006	2.3
P-6007 (1)	0.01
P-6007 (2)	0.17
P-601	0.01
P-6010	0
P-6013	0.02
P-6015 (1)	2.32
P-6015 (2)	0.03
P-6016 (1)	2.3
P-6016 (2)	0.04
P-6017 (1)	2.3
P-6017 (2)	0.01
P-6018	2.29
P-6019	2.29
P-602	0.01
P-6020	2.29
P-6021	2.29
P-6022 (1)	2.29
P-6022 (2)	0.06
P-6023	0.08
P-6025 (1)	2.26
P-6025 (2)	0.95
P-6026	2.29
P-6027 (1)	2.29
P-6027 (2)	0.51
P-6033	0.02
P-6034	0
P-6039	0.41
P-604	0.01
P-6040	0
P-6054	0.04
P-6056	0.07
P-6058	0.02
P-6065	0.05
P-6066	0.02
P-6071(1)	1.42
P-6071(2)	1.42
P-6074	0.06

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-5973	0.67
P-5975	0.2
P-5977	0
P-5978	0.1
P-5980	0.25
P-5981	0.17
P-5982	0
P-5984	0.05
P-5986	0.25
P-5987 (1)	0
P-5987 (2)	0.55
P-5988	0
P-5989	2.32
P-5990	3.24
P-5991	3.24
P-5992 (1)	3.24
P-5992 (2)	0.01
P-5993	0.04
P-5994 (1)	0
P-5994 (2)	0.06
P-5995 (1)	0.01
P-5995 (2)	0.13
P-5996	0.13
P-5998	0.01
P-5999 (1)	0.27
P-5999 (2)	0.02
P-6001	0.01
P-6002 (1)	0.56
P-6002 (2)	0
P-6003	0.01
P-6004	0.01
P-6005 (1)	0.01
P-6005 (2)	0.02
P-6006	3.57
P-6007 (1)	0.01
P-6007 (2)	0.1
P-601	0.01
P-6010	0.01
P-6013	0.03
P-6015 (1)	3.6
P-6015 (2)	0.04
P-6016 (1)	3.55
P-6016 (2)	0.01
P-6017 (1)	3.52
P-6017 (2)	0.01
P-6018	3.5
P-6019	3.47
P-602	0.04
P-6020	3.45
P-6021	3.42
P-6022 (1)	3.4
P-6022 (2)	0.05
P-6023	0.18
P-6025 (1)	3.33
P-6025 (2)	0.37
P-6026	3.38
P-6027 (1)	3.36
P-6027 (2)	0.02
P-6033	0.01
P-6034	0
P-6039	0.37
P-604	0.01
P-6040	0
P-6054	0.03
P-6056	0.1
P-6058	0.01
P-6065	0.04
P-6066	0.01
P-6071(1)	0.77
P-6071(2)	0.77
P-6074	0.2

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-6075	0.01	P-6075	0.01	P-6075	0.01
P-6078	0.01	P-6078	0.01	P-6078	0.02
P-6082	0.07	P-6082	0.32	P-6082	0.31
P-6083	0	P-6083	0	P-6083	0
P-6086	0.02	P-6086	0.05	P-6086	0.06
P-6088	0.07	P-6088	0.03	P-6088	0.07
P-6090	0	P-6090	0.01	P-6090	0.01
P-6092(1)	0.02	P-6092(1)	0.06	P-6092(1)	0.06
P-6092(2)	0.02	P-6092(2)	0.06	P-6092(2)	0.06
P-6093	0.06	P-6093	0.14	P-6093	0.14
P-6094	0.02	P-6094	0.03	P-6094	0.06
P-6097	0.08	P-6097	0.07	P-6097	0.04
P-6100	0.01	P-6100	0.02	P-6100	0.02
P-6102	0.05	P-6102	0.03	P-6102	0.16
P-6103	0.01	P-6103	0.02	P-6103	0.04
P-6105	0.06	P-6105	0.11	P-6105	0.12
P-6108	0	P-6108	0	P-6108	0
P-6110	0.14	P-6110	0.11	P-6110	0.33
P-6113	0.04	P-6113	0.08	P-6113	0.1
P-6115	0.7	P-6115	1.25	P-6115	0.53
P-6116	0.07	P-6116	0.02	P-6116	0.16
P-6118	0	P-6118	0.02	P-6118	0.04
P-6121(1)	0	P-6121(1)	0.01	P-6121(1)	0.08
P-6121(2)	0	P-6121(2)	0.01	P-6121(2)	0.08
P-613	0.06	P-613	0.05	P-613	0.21
P-6130	0.07	P-6130	0.12	P-6130	0.11
P-6131	0.01	P-6131	0.02	P-6131	0.04
P-6134	0	P-6134	0	P-6134	0
P-6136	0.1	P-6136	0.2	P-6136	0.15
P-6142	0.04	P-6142	0.05	P-6142	0.12
P-6143	0.02	P-6143	0.03	P-6143	0.04
P-6144	0.03	P-6144	0.03	P-6144	0.04
P-6151	0.01	P-6151	0.01	P-6151	0.01
P-6155	0.07	P-6155	0.06	P-6155	0.04
P-6157	0.2	P-6157	0.46	P-6157	0.78
P-6158	0.02	P-6158	0.03	P-6158	0.02
P-616	0.01	P-616	0.02	P-616	0.02
P-6161	1.41	P-6161	1.5	P-6161	1.7
P-6165	0.62	P-6165	0.82	P-6165	0.68
P-6170	0.11	P-6170	0.14	P-6170	0.15
P-6171	0.2	P-6171	0.34	P-6171	0.14
P-6172	0.02	P-6172	0.04	P-6172	0.05
P-6174	0	P-6174	0.01	P-6174	0.05
P-6177	0.04	P-6177	0.03	P-6177	0.11
P-6179	0.36	P-6179	0.22	P-6179	0.21
P-618 (1)	0.6	P-618 (1)	1.43	P-618 (1)	0.78
P-618 (2)	0	P-618 (2)	0.01	P-618 (2)	0.01
P-6184	0	P-6184	0.01	P-6184	0.01
P-6185	0.09	P-6185	0.23	P-6185	0.2
P-6187	0	P-6187	0	P-6187	0
P-6188 (1)	0	P-6188 (1)	0	P-6188 (1)	0
P-6188 (2)	0.03	P-6188 (2)	0.05	P-6188 (2)	0.05
P-6190	0.32	P-6190	0.51	P-6190	0.23
P-6193	0.05	P-6193	0.06	P-6193	0.06
P-6196	0.02	P-6196	0.05	P-6196	0.07
P-6197	0.09	P-6197	0.49	P-6197	0.35
P-6198	0.01	P-6198	0.04	P-6198	0.07
P-6199	0.01	P-6199	0.02	P-6199	0.02
P-620	0.01	P-620	0.01	P-620	0.01
P-6201	0.05	P-6201	0.09	P-6201	0.12
P-6205	0.03	P-6205	0.02	P-6205	0.01
P-621	0.04	P-621	0.07	P-621	0.04
P-6212	0.07	P-6212	0.16	P-6212	0.15
P-6214	0.08	P-6214	0.17	P-6214	0.24
P-6219	0.08	P-6219	0.02	P-6219	0.04
P-622	0.12	P-622	0.73	P-622	0.6
P-6220	0.27	P-6220	0.18	P-6220	0.29
P-6229	0.12	P-6229	0.29	P-6229	0.23
P-623	0.04	P-623	0.28	P-623	0.24
P-6233	0.03	P-6233	0.03	P-6233	0.22
P-6234	0	P-6234	0	P-6234	0

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
P-6236 (1)	0.09
P-6236 (2)	0.11
P-6238	0.02
P-6239	0.12
P-624	0.08
P-6240	0.02
P-6241	0.1
P-6245	0.09
P-6247 (1)	0.01
P-6247 (2)	0.2
P-6248	0.01
P-6249	0.05
P-625	0.06
P-6250 (1)	0.1
P-6250 (2)	0
P-6251	0.29
P-6253 (1)	0.44
P-6253 (2)	0
P-6254	0.32
P-6258	0
P-626	0.03
P-6260 (1)	0.03
P-6260 (2)	0.01
P-6261	0
P-6262	0
P-6265	0.03
P-6267	0.01
P-627	0.02
P-6270	0.17
P-6278	0
P-6279	0.01
P-6281	0.04
P-6285	0.24
P-6287	0.03
P-629	0.14
P-6293	0.08
P-6295	0
P-6296	0.04
P-6297	0.02
P-630	0.01
P-6302	0.01
P-6303 (1)	0.03
P-6303 (2)	0.03
P-6304 (1)	0.03
P-6304 (2)	0.11
P-6305	0
P-6306	0
P-6307	0.04
P-6309	0.11
P-6310	0.02
P-6311	0.12
P-6313 (1)	0
P-6313 (2)	0
P-6315	0.05
P-6315(1)	0.02
P-6315(2)	0
P-6316	0.04
P-6319	0.17
P-632	0
P-6320	0.01
P-6323	4.02
P-6324	3.18
P-6325	0.04
P-6326	0
P-6328 (1)	0
P-6328 (2)	0.22
P-6329	0.01
P-6330 (1)	0
P-6330 (2)	0.01
P-6331	0.01
P-6334	0

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-6236 (1)	0.19
P-6236 (2)	0.52
P-6238	0.02
P-6239	0.28
P-624	0.45
P-6240	0.03
P-6241	0.04
P-6245	0.25
P-6247 (1)	0.02
P-6247 (2)	0.04
P-6248	0.02
P-6249	0.07
P-625	0.15
P-6250 (1)	0.2
P-6250 (2)	0.05
P-6251	0.55
P-6253 (1)	0.87
P-6253 (2)	0
P-6254	0.63
P-6258	0
P-626	0.14
P-6260 (1)	0.08
P-6260 (2)	0.01
P-6261	0
P-6262	0
P-6265	0.05
P-6267	0.03
P-627	0.04
P-6270	0.1
P-6278	0
P-6279	0.01
P-6281	0.05
P-6285	0.36
P-6287	0.07
P-629	0.61
P-6293	0.07
P-6295	0.01
P-6296	0.03
P-6297	0.1
P-630	0.01
P-6302	0.01
P-6303 (1)	2.8
P-6303 (2)	0.06
P-6304 (1)	2.8
P-6304 (2)	0.12
P-6305	0
P-6306	0
P-6307	2.8
P-6309	0.03
P-6310	0.03
P-6311	0.13
P-6313 (1)	0.01
P-6313 (2)	0
P-6315	0.03
P-6315(1)	0.04
P-6315(2)	0.01
P-6316	2.8
P-6319	0.3
P-632	0
P-6320	0.02
P-6323	1.35
P-6324	1.59
P-6325	0.06
P-6326	0.77
P-6328 (1)	0
P-6328 (2)	0.33
P-6329	0.01
P-6330 (1)	0
P-6330 (2)	0.01
P-6331	0.03
P-6334	0

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-6236 (1)	0.26
P-6236 (2)	0.3
P-6238	0.01
P-6239	0.23
P-624	0.37
P-6240	0.04
P-6241	0.05
P-6245	0.24
P-6247 (1)	0.02
P-6247 (2)	0.05
P-6248	0.02
P-6249	0.11
P-625	0.09
P-6250 (1)	0.26
P-6250 (2)	0.07
P-6251	0.76
P-6253 (1)	1.16
P-6253 (2)	0.01
P-6254	0.87
P-6258	0
P-626	0.15
P-6260 (1)	0.1
P-6260 (2)	0.01
P-6261	0
P-6262	0
P-6265	0.04
P-6267	0.03
P-627	0.05
P-6270	0.28
P-6278	0
P-6279	0
P-6281	0.05
P-6285	0.37
P-6287	0.04
P-629	0.46
P-6293	0.11
P-6295	0.01
P-6296	0.03
P-6297	0.07
P-630	0.04
P-6302	0.01
P-6303 (1)	1.8
P-6303 (2)	0.03
P-6304 (1)	1.8
P-6304 (2)	0.05
P-6305	0
P-6306	0
P-6307	1.8
P-6309	0.03
P-6310	0.03
P-6311	0.12
P-6313 (1)	0.01
P-6313 (2)	0
P-6315	0.03
P-6315(1)	0.03
P-6315(2)	0.01
P-6316	1.8
P-6319	0.12
P-632	0
P-6320	0.01
P-6323	2.18
P-6324	2.72
P-6325	0.06
P-6326	0
P-6328 (1)	0
P-6328 (2)	0.76
P-6329	0.01
P-6330 (1)	0
P-6330 (2)	0.01
P-6331	0.03
P-6334	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-6337	0.04	P-6337	0.04	P-6337	0.04
P-6339	0.04	P-6339	0.07	P-6339	0.1
P-6340	0	P-6340	0	P-6340	0.05
P-6343	0.02	P-6343	0.04	P-6343	0.05
P-6345	0	P-6345	0	P-6345	0
P-6347	0	P-6347	0	P-6347	0
P-6350	0	P-6350	0.01	P-6350	0.01
P-6355	0.02	P-6355	0.04	P-6355	0.05
P-6356	0	P-6356	0.01	P-6356	0.01
P-6365	0.02	P-6365	0.13	P-6365	0.1
P-637	0	P-637	0	P-637	0
P-6372	0.01	P-6372	0.03	P-6372	0.04
P-6376	0.39	P-6376	0.06	P-6376	0.06
P-6377	0.02	P-6377	0.02	P-6377	0.03
P-6378	0.04	P-6378	0.02	P-6378	0.01
P-638	1.6	P-638	0.37	P-638	1.23
P-6380	0.05	P-6380	0.02	P-6380	0.03
P-6381	0.01	P-6381	0.04	P-6381	0.04
P-6383	0.01	P-6383	0.01	P-6383	0.01
P-6384	0	P-6384	0.01	P-6384	0.01
P-6386	0.16	P-6386	0.15	P-6386	0.15
P-6388	0.05	P-6388	0.08	P-6388	0.06
P-6390	0	P-6390	0	P-6390	0
P-6391	0.33	P-6391	0.4	P-6391	0.37
P-6392 (1)	0	P-6392 (1)	0	P-6392 (1)	0
P-6392 (2)	0.25	P-6392 (2)	0.22	P-6392 (2)	0.28
P-6395 (1)	0	P-6395 (1)	0	P-6395 (1)	0
P-6395 (2)	0.03	P-6395 (2)	0.04	P-6395 (2)	0.03
P-6396 (1)	0.33	P-6396 (1)	0.4	P-6396 (1)	0.37
P-6396 (2)	0	P-6396 (2)	0.01	P-6396 (2)	0.02
P-6397	0.1	P-6397	0.12	P-6397	0.18
P-6398	0	P-6398	0.01	P-6398	0.01
P-640	0	P-640	0.01	P-640	0.02
P-6400 (1)	0	P-6400 (1)	0	P-6400 (1)	0
P-6400 (2)	0.02	P-6400 (2)	0.04	P-6400 (2)	0.03
P-6403	0	P-6403	0	P-6403	0
P-6404	0	P-6404	0.03	P-6404	0.03
P-6409	0	P-6409	0	P-6409	0
P-641	0	P-641	0.01	P-641	0.03
P-6410	0.01	P-6410	0.01	P-6410	0.02
P-6414	0	P-6414	0	P-6414	0.01
P-6415	0.07	P-6415	0.01	P-6415	0.01
P-6416	0.04	P-6416	0.18	P-6416	0.19
P-6420	0.04	P-6420	0.04	P-6420	0.06
P-6421	0.02	P-6421	0.01	P-6421	0.01
P-6422	0	P-6422	0	P-6422	0
P-6423(1)	0.01	P-6423(1)	0.01	P-6423(1)	0.01
P-6423(2)(1)	0.01	P-6423(2)(1)	0.01	P-6423(2)(1)	0.01
P-6423(2)(2)	0.01	P-6423(2)(2)	0.01	P-6423(2)(2)	0.01
P-6424	0.04	P-6424	0.02	P-6424	0.03
P-6426	0.16	P-6426	0.32	P-6426	0.23
P-6428	0.02	P-6428	0.01	P-6428	0.03
P-643	0	P-643	0	P-643	0.03
P-6435	0	P-6435	0.01	P-6435	0.01
P-6436	0	P-6436	0	P-6436	0
P-6437	0.09	P-6437	0.18	P-6437	0.29
P-6438	0.04	P-6438	0.09	P-6438	0.16
P-644	0	P-644	0.02	P-644	0.09
P-6440	0.08	P-6440	0.05	P-6440	0.12
P-6441	0.06	P-6441	0.13	P-6441	0.14
P-6443	0.03	P-6443	0.07	P-6443	0.06
P-6444	0.03	P-6444	0.07	P-6444	0.09
P-6445	0.01	P-6445	0.01	P-6445	0.02
P-6446	0.01	P-6446	0.02	P-6446	0.03
P-6447	0	P-6447	0	P-6447	0
P-645 (1)	0.01	P-645 (1)	0.02	P-645 (1)	0.05
P-645 (2)	0.05	P-645 (2)	0.08	P-645 (2)	0.12
P-6450	0.04	P-6450	0.1	P-6450	0.13
P-6451	0.02	P-6451	0.03	P-6451	0.05
P-6452	0.16	P-6452	0.38	P-6452	0.39
P-6453	0.42	P-6453	0.35	P-6453	0.22

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-6455	0.01	P-6455	0.03	P-6455	0.05
P-6458	0.16	P-6458	0.39	P-6458	0.42
P-6459	0.19	P-6459	0.42	P-6459	0.44
P-646	0.01	P-646	0.01	P-646	0.01
P-6460(1)	0.14	P-6460(1)	0.14	P-6460(1)	0.14
P-6460(2)	0.07	P-6460(2)	0.07	P-6460(2)	0.07
P-6461 (1)	0.25	P-6461 (1)	0.55	P-6461 (1)	0.52
P-6461 (2)	0.02	P-6461 (2)	0.08	P-6461 (2)	0.1
P-6462	0.01	P-6462	0.02	P-6462	0.03
P-6463	0.27	P-6463	0.6	P-6463	0.58
P-6466	0.01	P-6466	0.02	P-6466	0.03
P-6469 (1)	0	P-6469 (1)	0.01	P-6469 (1)	0.01
P-6469 (2)	0.01	P-6469 (2)	0	P-6469 (2)	0.03
P-6474	0	P-6474	0	P-6474	0
P-6477	0	P-6477	0	P-6477	0
P-648	0.01	P-648	0.01	P-648	0.01
P-6480	0.01	P-6480	0.02	P-6480	0.02
P-6483	0.22	P-6483	0.05	P-6483	0.14
P-6484(1)	0.02	P-6484(1)	0.04	P-6484(1)	0.05
P-6484(2)	0.02	P-6484(2)	0.04	P-6484(2)	0.05
P-6488(1)	0.34	P-6488(1)	0.24	P-6488(1)	0.3
P-6488(2)	0.34	P-6488(2)	0.24	P-6488(2)	0.3
P-6498	0.01	P-6498	0.02	P-6498	0.02
P-6511(1)	0	P-6511(1)	0	P-6511(1)	0
P-6511(2)	0	P-6511(2)	0	P-6511(2)	0
P-6517(1)	0.02	P-6517(1)	0.04	P-6517(1)	0.03
P-6517(2)	0.02	P-6517(2)	0.04	P-6517(2)	0.03
P-6528	0.05	P-6528	0.04	P-6528	0.12
P-653	0.05	P-653	0.07	P-653	0.2
P-6531	0.05	P-6531	0.1	P-6531	0.1
P-6534 (1)	0.01	P-6534 (1)	0.02	P-6534 (1)	0.02
P-6534 (2)	0.02	P-6534 (2)	0.05	P-6534 (2)	0.06
P-6538	0.01	P-6538	0.01	P-6538	0.01
P-6540	0.01	P-6540	0.04	P-6540	0.03
P-6541	0	P-6541	0	P-6541	0
P-6547(1)	0.11	P-6547(1)	0.06	P-6547(1)	0.13
P-6547(2)	0.11	P-6547(2)	0.06	P-6547(2)	0.13
P-6556	0.1	P-6556	0.06	P-6556	0.12
P-6557	0.03	P-6557	0.02	P-6557	0.03
P-6558	0.05	P-6558	0.03	P-6558	0.06
P-656	0.02	P-656	0.04	P-656	0.04
P-6567	0	P-6567	0	P-6567	0
P-6569	0	P-6569	0	P-6569	0
P-657	0.02	P-657	0.03	P-657	0.03
P-658	0	P-658	0	P-658	0
P-6584	0.09	P-6584	0.07	P-6584	0.17
P-6590	0.01	P-6590	0.12	P-6590	0.42
P-6598	0.05	P-6598	0.04	P-6598	0.02
P-6599	0.51	P-6599	0.33	P-6599	0.68
P-660	0.31	P-660	0.37	P-660	0.43
P-6601	0.05	P-6601	0.1	P-6601	0.12
P-6605	0.1	P-6605	0.05	P-6605	0.21
P-6607	0.02	P-6607	0.03	P-6607	0.04
P-6609	0.01	P-6609	0.02	P-6609	0.02
P-6613(1)	0.01	P-6613(1)	0.02	P-6613(1)	0.04
P-6613(2)	0.05	P-6613(2)	0.05	P-6613(2)	0.05
P-6616	2.47	P-6616	1.17	P-6616	0
P-6617 (1)	0	P-6617 (1)	0	P-6617 (1)	0
P-6617 (2)	0	P-6617 (2)	0.01	P-6617 (2)	0.02
P-6618	0	P-6618	0	P-6618	0
P-662	0.1	P-662	0.16	P-662	0.22
P-6620 (1)	0.52	P-6620 (1)	0.24	P-6620 (1)	0.02
P-6620 (2)	0.02	P-6620 (2)	0.05	P-6620 (2)	0.03
P-6622	0	P-6622	0	P-6622	0
P-6623 (1)	0	P-6623 (1)	0	P-6623 (1)	0
P-6623 (2)	0.07	P-6623 (2)	0.14	P-6623 (2)	0.23
P-6624	0.2	P-6624	0.29	P-6624	0.34
P-6625	0.22	P-6625	0.11	P-6625	0.02
P-6626	0.19	P-6626	0.08	P-6626	0.03
P-6628	0	P-6628	0	P-6628	0
P-66291	0	P-66291	0.01	P-66291	0.01

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-6631	0.45
P-6633	0.56
P-6635	0
P-6636	0
P-6637	0
P-6638	0.2
P-6639	0.85
P-6640	0.29
P-6644 (1)	0
P-6644 (2)	0.07
P-6645	0
P-6646	0
P-6653	0.01
P-6659	0
P-666	0.23
P-6665	0.01
P-667	0.59
P-6672	0.04
P-669	0.04
P-6697	0.04
P-6698	0.01
P-6699	0.06
P-670	0.05
P-6700	0.03
P-67003	(N/A)
P-6703	0.08
P-6704	0
P-6705	0.01
P-6706	0
P-6712	0
P-6715(1)	0
P-6715(2)	0
P-6716	0.02
P-6717	0.04
P-672	0.08
P-6720	0
P-6723	0.03
P-6726 (1)	0.05
P-6726 (2)	0.01
P-6727	0.02
P-673	0.1
P-6738	0.09
P-674 (1)	0.07
P-674 (2)	0.05
P-6740	0.06
P-6742	0.02
P-6742(1)	0.06
P-6742(2)	0.07
P-6746 (1)	0.2
P-6746 (2)	0.29
P-6747	0.07
P-675	0.02
P-6754	0.04
P-6755	0.07
P-6758	0.27
P-6760	0.71
P-6762	0.02
P-6764	0.07
P-6765	0.39
P-6766	0.39
P-6767	0.39
P-6768	0.39
P-6769	0.39
P-6770	0.18
P-6771 (1)	0.18
P-6771 (2)	0.16
P-6772	0.09
P-6774(1)(1)	0.09
P-6774(1)(2)	0.09
P-6774(2)	0.09
P-6776	0.06

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-6631	0.08
P-6633	0.25
P-6635	0.36
P-6636	0
P-6637	0.36
P-6638	0.12
P-6639	0.07
P-6640	0.56
P-6644 (1)	0
P-6644 (2)	0.13
P-6645	0
P-6646	0
P-6653	0.09
P-6659	0
P-666	0.32
P-6665	0.01
P-667	0.88
P-6672	0.1
P-669	0.27
P-6697	0.05
P-6698	0.07
P-6699	0.13
P-670	0.13
P-6700	0.03
P-67003	(N/A)
P-6703	0.09
P-6704	0.15
P-6705	0.02
P-6706	0.05
P-6712	0.01
P-6715(1)	0
P-6715(2)	0
P-6716	0.13
P-6717	0.11
P-672	0.05
P-6720	0.05
P-6723	0.03
P-6726 (1)	0.07
P-6726 (2)	0.04
P-6727	0.09
P-673	0.18
P-6738	0.07
P-674 (1)	0.12
P-674 (2)	0.08
P-6740	0.09
P-6742	0.07
P-6742(1)	0.06
P-6742(2)	0.06
P-6746 (1)	0.07
P-6746 (2)	0.4
P-6747	0.09
P-675	0.06
P-6754	0.02
P-6755	0.03
P-6758	0.07
P-6760	0.4
P-6762	0.06
P-6764	0.03
P-6765	0.08
P-6766	0.08
P-6767	0.08
P-6768	0.08
P-6769	0.08
P-6770	0.08
P-6771 (1)	0.08
P-6771 (2)	0.44
P-6772	0.14
P-6774(1)(1)	0.15
P-6774(1)(2)	0.15
P-6774(2)	1.12
P-6776	0.76

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-6631	0.09
P-6633	0.02
P-6635	0.17
P-6636	0
P-6637	0.17
P-6638	0.13
P-6639	0.1
P-6640	0.78
P-6644 (1)	0
P-6644 (2)	0.18
P-6645	0
P-6646	0
P-6653	0.08
P-6659	0
P-666	0.44
P-6665	0.01
P-667	0.24
P-6672	0.11
P-669	0.24
P-6697	0.1
P-6698	0.03
P-6699	0.13
P-670	0.1
P-6700	0.06
P-67003	(N/A)
P-6703	0.09
P-6704	0.16
P-6705	0.02
P-6706	0.07
P-6712	0.02
P-6715(1)	0
P-6715(2)	0
P-6716	0.18
P-6717	0.17
P-672	0.08
P-6720	0.05
P-6723	0.05
P-6726 (1)	0.1
P-6726 (2)	0.06
P-6727	0.1
P-673	0.2
P-6738	0.04
P-674 (1)	0.12
P-674 (2)	0.12
P-6740	0.1
P-6742	0.04
P-6742(1)	0.06
P-6742(2)	0.06
P-6746 (1)	0.08
P-6746 (2)	0.3
P-6747	0.09
P-675	0.02
P-6754	0
P-6755	0.01
P-6758	0.02
P-6760	0.44
P-6762	0.06
P-6764	0.03
P-6765	0.05
P-6766	0.06
P-6767	0.06
P-6768	0.06
P-6769	0.06
P-6770	0.03
P-6771 (1)	0.03
P-6771 (2)	0.27
P-6772	0.15
P-6774(1)(1)	0
P-6774(1)(2)	0
P-6774(2)	0.12
P-6776	0.3

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-6777(1)	0.02
P-6777(2)	0.05
P-6778 (1)	0
P-6778 (2)	0.09
P-6780	0
P-6782	0
P-6784	0.07
P-6785	0
P-6785(1)	0.12
P-6785(2)	0.12
P-6787 (1)	0
P-6787 (2)	0.02
P-6788 (1)	0
P-6788 (2)	0.09
P-6791	0.18
P-6793	0.18
P-6794	0.04
P-6795	0
P-6796	0
P-68	0.07
P-680	0
P-6801 (1)	0.01
P-6801 (2)	0.07
P-6802	0.01
P-6804	0.07
P-6810	0.01
P-6818	0.02
P-6819	0.01
P-6820	0.01
P-6821	0.04
P-6823	0.01
P-6824	0.02
P-6825	0.01
P-6826	0.01
P-6828(1)	0.2
P-6828(2)	0.14
P-683	0.15
P-6830	0.01
P-6832	0
P-6833	0.03
P-6835	0
P-6837	0.15
P-684	0.03
P-6840	0.01
P-6849	0.02
P-6853	0.37
P-6854	0.24
P-6855	0.01
P-6860	0.42
P-6861	0.15
P-6864(1)	0.04
P-6864(2)	0.04
P-6865	0.76
P-6869	0
P-6876	0.18
P-6877	0.07
P-6878	0.8
P-688(1)	0.18
P-688(2)	0.07
P-6880	2.79
P-6881	2.58
P-6882	1.68
P-6883	1.91
P-6884	1.95
P-6886	0.01
P-6887	0.01
P-6888	0.22
P-6889 (1)	0.01
P-6889 (2)	0.17
P-689	0.04
P-6890	0.92

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-6777(1)	0.5
P-6777(2)	0.86
P-6778 (1)	0
P-6778 (2)	0.06
P-6780	0.11
P-6782	0
P-6784	0.14
P-6785	0.01
P-6785(1)	0.09
P-6785(2)	0.09
P-6787 (1)	0
P-6787 (2)	0.03
P-6788 (1)	0
P-6788 (2)	0.05
P-6791	0.29
P-6793	0.15
P-6794	0.07
P-6795	0
P-6796	0
P-68	0.05
P-680	0.01
P-6801 (1)	0.01
P-6801 (2)	0.22
P-6802	0.01
P-6804	0.03
P-6810	0.01
P-6818	0.05
P-6819	0
P-6820	0.03
P-6821	0.03
P-6823	0.01
P-6824	0.07
P-6825	0.04
P-6826	0.01
P-6828(1)	0.52
P-6828(2)	0.47
P-683	0.11
P-6830	0.07
P-6832	0.03
P-6833	0.08
P-6835	0
P-6837	0.41
P-684	0.05
P-6840	0.01
P-6849	0.05
P-6853	0.38
P-6854	0.01
P-6855	0.01
P-6860	0.03
P-6861	0.01
P-6864(1)	0.04
P-6864(2)	0.04
P-6865	0.26
P-6869	0
P-6876	0.42
P-6877	0.31
P-6878	0.13
P-688(1)	0.04
P-688(2)	0.02
P-6880	0.46
P-6881	0.44
P-6882	0.52
P-6883	0.6
P-6884	0.46
P-6886	0.01
P-6887	0.01
P-6888	0.05
P-6889 (1)	0.01
P-6889 (2)	0.1
P-689	0.05
P-6890	0.07

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-6777(1)	0.19
P-6777(2)	0.05
P-6778 (1)	0.32
P-6778 (2)	0.03
P-6780	0.22
P-6782	0
P-6784	0.14
P-6785	0.01
P-6785(1)	0.05
P-6785(2)	0.05
P-6787 (1)	0
P-6787 (2)	0.05
P-6788 (1)	0
P-6788 (2)	0.04
P-6791	0.41
P-6793	0.17
P-6794	0.14
P-6795	0
P-6796	0
P-68	0.03
P-680	0.01
P-6801 (1)	0.01
P-6801 (2)	0.12
P-6802	0.01
P-6804	0.04
P-6810	0.01
P-6818	0.07
P-6819	0
P-6820	0.05
P-6821	0.07
P-6823	0.01
P-6824	0.1
P-6825	0.06
P-6826	0.01
P-6828(1)	0.71
P-6828(2)	0.68
P-683	0.31
P-6830	0.07
P-6832	0.03
P-6833	0.09
P-6835	0
P-6837	0.45
P-684	0.06
P-6840	0.01
P-6849	0.05
P-6853	0.21
P-6854	0.02
P-6855	0.01
P-6860	0.02
P-6861	0.01
P-6864(1)	0.09
P-6864(2)	0.09
P-6865	0.26
P-6869	0.01
P-6876	0.2
P-6877	0.35
P-6878	0.09
P-688(1)	0.06
P-688(2)	0.03
P-6880	0.36
P-6881	0.34
P-6882	0.41
P-6883	0.48
P-6884	0.37
P-6886	0.01
P-6887	0.01
P-6888	0.04
P-6889 (1)	0.01
P-6889 (2)	0.35
P-689	0.13
P-6890	0.06

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-6895	0.08
P-6896 (1)	0.37
P-6896 (2)	0.04
P-6897	0
P-6898	0.36
P-6899	0.04
P-690	0.01
P-6900	0.15
P-6902 (1)	0
P-6902 (2)	0.01
P-6904	0.18
P-6904(1)(2)(1)	0.03
P-6904(1)(2)(2)	0.03
P-6904(2)	0.13
P-6905 (1)	0
P-6905 (2)	0
P-6906 (1)	0.21
P-6906 (2)	0.04
P-6907 (1)	0.02
P-6907 (2)	0.27
P-6908 (1)	0.01
P-6908 (2)	0.01
P-6911	0.09
P-6912	0.06
P-6913	0.02
P-6917 (1)	0.2
P-6917 (2)	0
P-6919 (1)	0.35
P-6919 (2)	0.05
P-692	0.26
P-6921	0.05
P-6922	0.05
P-6923	0.04
P-6927	0.02
P-6929	0.21
P-693	0.02
P-6930 (1)	0.01
P-6930 (2)	0.21
P-6931	0.02
P-6932	0.03
P-6933	0
P-6934	0
P-6935	0
P-6936	0
P-6937	0
P-6939	0
P-694	0.35
P-6942 (1)	0.01
P-6942 (2)	0.38
P-6943	0.47
P-6943(1)	0.27
P-6943(2)	0.27
P-6945	0.16
P-6946	0.29
P-6947	0.02
P-6948	0.47
P-6949	0.27
P-6950	0.01
P-6951 (1)	0.01
P-6951 (2)	0
P-6952	0.31
P-6954	0.07
P-6960	0.94
P-6963 (1)	0.47
P-6963 (2)	0.03
P-6967	0.06
P-6972	0.65
P-6977	0
P-6979	0.02
P-6980	0
P-6982	0.03

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-6895	0.09
P-6896 (1)	0.16
P-6896 (2)	0.01
P-6897	0.01
P-6898	0.18
P-6899	0.05
P-690	0.01
P-6900	0.15
P-6902 (1)	0.01
P-6902 (2)	0.11
P-6904	0.04
P-6904(1)(2)(1)	0.01
P-6904(1)(2)(2)	0.01
P-6904(2)	0.3
P-6905 (1)	0.01
P-6905 (2)	0.12
P-6906 (1)	0.08
P-6906 (2)	0.04
P-6907 (1)	0.04
P-6907 (2)	0.27
P-6908 (1)	0.02
P-6908 (2)	0.02
P-6911	0.02
P-6912	0.13
P-6913	0.16
P-6917 (1)	0.77
P-6917 (2)	0
P-6919 (1)	1.33
P-6919 (2)	0.07
P-692	0.71
P-6921	0.68
P-6922	0.52
P-6923	0.52
P-6927	0.03
P-6929	0.23
P-693	0.04
P-6930 (1)	0.32
P-6930 (2)	0.23
P-6931	0.31
P-6932	0.3
P-6933	0.01
P-6934	0
P-6935	0.01
P-6936	0
P-6937	0
P-6939	0
P-694	0.24
P-6942 (1)	0.01
P-6942 (2)	0.36
P-6943	0.57
P-6943(1)	0.36
P-6943(2)	0.36
P-6945	0.03
P-6946	0.02
P-6947	0.57
P-6948	0.05
P-6949	0.04
P-6950	0.02
P-6951 (1)	0.01
P-6951 (2)	0.01
P-6952	0.41
P-6954	0.06
P-6960	2.44
P-6963 (1)	1.22
P-6963 (2)	0.04
P-6967	0.08
P-6972	0.62
P-6977	0.18
P-6979	0.03
P-6980	0.01
P-6982	0.04

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-6895	0.03
P-6896 (1)	0.17
P-6896 (2)	0
P-6897	0.01
P-6898	0.18
P-6899	0.06
P-690	0.01
P-6900	0.34
P-6902 (1)	0.01
P-6902 (2)	0.15
P-6904	0.04
P-6904(1)(2)(1)	0.08
P-6904(1)(2)(2)	0.08
P-6904(2)	0.28
P-6905 (1)	0.01
P-6905 (2)	0.15
P-6906 (1)	0.08
P-6906 (2)	0.12
P-6907 (1)	0.05
P-6907 (2)	0.26
P-6908 (1)	0.03
P-6908 (2)	0.01
P-6911	0.06
P-6912	0.1
P-6913	0.13
P-6917 (1)	0.54
P-6917 (2)	0
P-6919 (1)	0.94
P-6919 (2)	0.07
P-692	0.81
P-6921	0.8
P-6922	0.6
P-6923	0.59
P-6927	0.03
P-6929	0.55
P-693	0.05
P-6930 (1)	0.38
P-6930 (2)	0.55
P-6931	0.36
P-6932	0.35
P-6933	0.01
P-6934	0
P-6935	0.01
P-6936	0
P-6937	0
P-6939	0
P-694	0.25
P-6942 (1)	0.01
P-6942 (2)	0.35
P-6943	0.4
P-6943(1)	0.42
P-6943(2)	0.42
P-6945	0.01
P-6946	0.04
P-6947	0.39
P-6948	0.14
P-6949	0.1
P-6950	0.02
P-6951 (1)	0.01
P-6951 (2)	0.01
P-6952	0.4
P-6954	0.08
P-6960	0.29
P-6963 (1)	0.03
P-6963 (2)	0.04
P-6967	0.07
P-6972	0.68
P-6977	0.56
P-6979	0.03
P-6980	0.01
P-6982	0.04

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-6983	0.21
P-6997	0.05
P-6999	0.01
P-7001	0.11
P-7003	0
P-7004	0
P-7005	0.09
P-7006	0.05
P-7007 (1)	0.04
P-7007 (2)	0.02
P-7008(1)	0.09
P-7008(2)	0.31
P-7010	0
P-7011	0.01
P-7012(1)	0.01
P-7012(2)(1)	0.17
P-7012(2)(2)	0.17
P-7013	0.05
P-7014	0.01
P-7015	0.02
P-7016	0.28
P-7018(1)	0.01
P-7018(2)	0.01
P-7020	0.09
P-7023	0
P-7027	0.05
P-7028(1)	0.05
P-7028(2)	0.05
P-7029(1)	0
P-7029(2)	0
P-703	0.6
P-7031	0.05
P-7033	0.01
P-7036	0.01
P-7037	0.01
P-7038	0.19
P-7038(1)	0.05
P-7038(2)	0.04
P-7042	0.13
P-7043	0.05
P-7045	0
P-7046	0.05
P-7050	0.08
P-7051	0.01
P-7053	0.05
P-7054 (1)	0.13
P-7054 (2)	0.05
P-7055	0.1
P-7056	0.07
P-7056(1)	0.12
P-7056(2)(1)	0.09
P-7056(2)(2)	0.09
P-7060	0.01
P-7061 (1)	0.01
P-7061 (2)	0.01
P-7062	0.04
P-7063	0.05
P-7064	0.07
P-7065(1)	0.27
P-7065(2)	0.01
P-7066	0.15
P-7067	0.01
P-7069	0.23
P-7072	0.07
P-7073	0
P-7074 (1)	0
P-7074 (2)	0.04
P-7075(1)	0.05
P-7075(2)	0.06
P-7077	0.08
P-7078 (1)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-6983	0.14
P-6997	0.12
P-6999	0.01
P-7001	0.22
P-7003	0.01
P-7004	0.03
P-7005	0.02
P-7006	0.09
P-7007 (1)	0.04
P-7007 (2)	0.06
P-7008(1)	0.13
P-7008(2)	0.23
P-7010	0
P-7011	0.15
P-7012(1)	0.01
P-7012(2)(1)	0.06
P-7012(2)(2)	0.06
P-7013	0.03
P-7014	0.01
P-7015	0.01
P-7016	0.3
P-7018(1)	0.01
P-7018(2)	0.01
P-7020	0.02
P-7023	0.03
P-7027	0.07
P-7028(1)	0.03
P-7028(2)	0.02
P-7029(1)	0.23
P-7029(2)	0.23
P-703	0.04
P-7031	0.02
P-7033	0.01
P-7036	0.01
P-7037	0.05
P-7038	0.08
P-7038(1)	0.08
P-7038(2)	0.07
P-7042	0.05
P-7043	0.02
P-7045	0.01
P-7046	0.08
P-7050	0.03
P-7051	0.03
P-7053	0.03
P-7054 (1)	0.13
P-7054 (2)	0.32
P-7055	0.08
P-7056	0.13
P-7056(1)	0.38
P-7056(2)(1)	0.44
P-7056(2)(2)	0.45
P-7060	0.03
P-7061 (1)	0.03
P-7061 (2)	0.01
P-7062	0.06
P-7063	0.07
P-7064	0.06
P-7065(1)	0.05
P-7065(2)	0.01
P-7066	0.13
P-7067	0.02
P-7069	0.51
P-7072	0.03
P-7073	0
P-7074 (1)	0
P-7074 (2)	0.03
P-7075(1)	0.06
P-7075(2)	0.14
P-7077	0.05
P-7078 (1)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-6983	0.09
P-6997	0.07
P-6999	0.01
P-7001	0.22
P-7003	0.01
P-7004	0.02
P-7005	0.03
P-7006	0.07
P-7007 (1)	0.1
P-7007 (2)	0.07
P-7008(1)	0.35
P-7008(2)	0.71
P-7010	0
P-7011	0.19
P-7012(1)	0.01
P-7012(2)(1)	0.06
P-7012(2)(2)	0.06
P-7013	0.03
P-7014	0.02
P-7015	0.02
P-7016	0.09
P-7018(1)	0.01
P-7018(2)	0.01
P-7020	0.02
P-7023	0.03
P-7027	0.07
P-7028(1)	0.06
P-7028(2)	0.05
P-7029(1)	0.59
P-7029(2)	0.59
P-703	0.04
P-7031	0.04
P-7033	0.01
P-7036	0.01
P-7037	0.1
P-7038	0.19
P-7038(1)	0.1
P-7038(2)	0.1
P-7042	0.13
P-7043	0.11
P-7045	0.01
P-7046	0.14
P-7050	0.07
P-7051	0.04
P-7053	0.01
P-7054 (1)	0.08
P-7054 (2)	0.27
P-7055	0.05
P-7056	0.18
P-7056(1)	0.3
P-7056(2)(1)	0.37
P-7056(2)(2)	0.37
P-7060	0.04
P-7061 (1)	0.04
P-7061 (2)	0.01
P-7062	0.04
P-7063	0.06
P-7064	0.04
P-7065(1)	0.06
P-7065(2)	0.01
P-7066	0.12
P-7067	0.02
P-7069	0.41
P-7072	0.01
P-7073	0
P-7074 (1)	0
P-7074 (2)	0.03
P-7075(1)	0.04
P-7075(2)	0.12
P-7077	0.14
P-7078 (1)	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-7078 (2)	0	P-7078 (2)	0.01	P-7078 (2)	0.01
P-7079	0.13	P-7079	0.11	P-7079	0.01
P-7080	0.02	P-7080	0.01	P-7080	0.05
P-7081	0.1	P-7081	0.07	P-7081	0.02
P-7082(1)	0.19	P-7082(1)	0.17	P-7082(1)	0.01
P-7082(2)	0.23	P-7082(2)	0.17	P-7082(2)	0.11
P-7086	0	P-7086	0.01	P-7086	0.01
P-7088	0	P-7088	0	P-7088	0
P-7089	0.01	P-7089	0.02	P-7089	0.04
P-7090	0.14	P-7090	0.13	P-7090	0.03
P-7091	0.02	P-7091	0.03	P-7091	0.02
P-7093	0	P-7093	0.02	P-7093	0
P-7094	0.06	P-7094	0.17	P-7094	0.07
P-7095	0.01	P-7095	0.01	P-7095	0.01
P-7096	0.01	P-7096	0.02	P-7096	0.05
P-7098	0.29	P-7098	0.16	P-7098	0.51
P-7099	0.04	P-7099	0.04	P-7099	0.1
P-7100	0.08	P-7100	0.07	P-7100	0.06
P-7102	0	P-7102	0.01	P-7102	0.01
P-7105(1)	0.06	P-7105(1)	0.11	P-7105(1)	0.14
P-7105(2)	0	P-7105(2)	0	P-7105(2)	0.01
P-7106	0.09	P-7106	0.07	P-7106	0.04
P-7107	0.06	P-7107	0.1	P-7107	0.09
P-7108	0.02	P-7108	0.03	P-7108	0.03
P-7109(1)	0.18	P-7109(1)	0.26	P-7109(1)	0.29
P-7109(2)	0.3	P-7109(2)	0.38	P-7109(2)	0.43
P-7111	0.11	P-7111	0.11	P-7111	0.05
P-7112	0.06	P-7112	0.05	P-7112	0.07
P-7113	0	P-7113	0.01	P-7113	0.01
P-7114	0.06	P-7114	0.12	P-7114	0.12
P-7115	0.08	P-7115	0.14	P-7115	0.11
P-7117	0.07	P-7117	0.03	P-7117	0.02
P-7118	0.24	P-7118	0.28	P-7118	0.24
P-7119	0.07	P-7119	0.09	P-7119	0.17
P-7120	0	P-7120	0	P-7120	0
P-7121	0	P-7121	0	P-7121	0
P-7125	0.57	P-7125	0.21	P-7125	0.22
P-7126	0.08	P-7126	0.03	P-7126	0.18
P-7129	0.04	P-7129	0.02	P-7129	0.04
P-713	0	P-713	0	P-713	0
P-7130	0.01	P-7130	0.01	P-7130	0.01
P-7131	0.06	P-7131	0.13	P-7131	0.17
P-7133	0.08	P-7133	0.07	P-7133	0.06
P-7134	0	P-7134	0	P-7134	0
P-7136	0.01	P-7136	0.01	P-7136	0.01
P-7138	0.17	P-7138	0.21	P-7138	0.22
P-7139	0.01	P-7139	0.01	P-7139	0.01
P-7140	0.07	P-7140	0.19	P-7140	0.21
P-7141	0	P-7141	0.1	P-7141	0.01
P-7142	0.23	P-7142	0.2	P-7142	0.04
P-7144	0.01	P-7144	0	P-7144	0.03
P-7145	0.06	P-7145	0.02	P-7145	0.01
P-7146	0.16	P-7146	0.28	P-7146	0.17
P-7148	0.29	P-7148	0.16	P-7148	0.51
P-7149	0.23	P-7149	0.55	P-7149	0.76
P-7150	0.19	P-7150	0.13	P-7150	0.13
P-7151	0.02	P-7151	0.04	P-7151	0.08
P-7152	0.04	P-7152	0.04	P-7152	0.03
P-7153	0	P-7153	0.01	P-7153	0.01
P-7154	0	P-7154	0	P-7154	0
P-7156(1)	0.04	P-7156(1)	0.15	P-7156(1)	0.16
P-7156(2)	0.04	P-7156(2)	0.15	P-7156(2)	0.16
P-7157	0.03	P-7157	0.04	P-7157	0.04
P-7158	0.01	P-7158	0.03	P-7158	0.04
P-7159	0	P-7159	0.01	P-7159	0.01
P-7160	0.18	P-7160	0.25	P-7160	0.2
P-7161	0.14	P-7161	0.15	P-7161	0.11
P-7166	0.01	P-7166	0.04	P-7166	0.04
P-7169	0	P-7169	0	P-7169	0
P-7170	2.66	P-7170	1.75	P-7170	2.32
P-7171	2.66	P-7171	1.75	P-7171	2.32

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-7172	0.02
P-7174(1)	0.93
P-7174(2)	0.93
P-7175	0.86
P-7181	0.09
P-7182	0.01
P-7183	0.01
P-7186	2.8
P-7188 (1)	0.22
P-7188 (2)	0.05
P-7190 (1)	0.45
P-7190 (2)	0.02
P-7193	0.07
P-7194	2.61
P-7195 (1)	2.61
P-7195 (2)	0.02
P-7196	1.83
P-7196(1)	0.04
P-7196(2)	0.04
P-7197	0.06
P-7198	1.61
P-7199	0.02
P-7200	0.05
P-7205 (1)	0.03
P-7205 (2)	0.09
P-7206	0
P-7207	0.03
P-7208	0.01
P-7209 (1)	0
P-7209 (2)	0.18
P-7210	0
P-7211	0.02
P-7213	0.05
P-7214	0.09
P-7215 (1)	0.09
P-7215 (2)	0.09
P-722	0.09
P-7222	0.24
P-7223	0.06
P-7225	0
P-7228	0
P-7231	0.02
P-7232	2.82
P-7235	0.06
P-7237	0.24
P-7243	0.17
P-7246	0.05
P-7248 (1)	0
P-7248 (2)	0.34
P-7249	0.01
P-725	0.01
P-7250	0.05
P-7251	0.06
P-7253	0
P-7254	0
P-7255	0
P-7256	0.02
P-7258	0
P-7259	0
P-7260 (1)	0
P-7260 (2)	0.03
P-7261(1)(1)	0.18
P-7261(1)(2)	0.19
P-7261(2)(1)	0.19
P-7261(2)(2)	0.19
P-7263	0
P-7264 (1)	0
P-7264 (2)	0.11
P-7265	0.1
P-7267	0
P-7274	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-7172	0.04
P-7174(1)	0.71
P-7174(2)	0.71
P-7175	1.51
P-7181	0.04
P-7182	0.01
P-7183	0.01
P-7186	2.17
P-7188 (1)	0.26
P-7188 (2)	0.01
P-7190 (1)	0.58
P-7190 (2)	0.01
P-7193	0.03
P-7194	2.47
P-7195 (1)	2.47
P-7195 (2)	0.04
P-7196	1.68
P-7196(1)	0.03
P-7196(2)	0.03
P-7197	0.11
P-7198	1.42
P-7199	0.06
P-7200	0.09
P-7205 (1)	0.15
P-7205 (2)	0.05
P-7206	0
P-7207	0.02
P-7208	0.01
P-7209 (1)	0
P-7209 (2)	0.16
P-7210	0.07
P-7211	0.45
P-7213	0.86
P-7214	1.12
P-7215 (1)	1.12
P-7215 (2)	0.1
P-722	0.07
P-7222	0.2
P-7223	0.03
P-7225	0
P-7228	0.03
P-7231	0.03
P-7232	5.86
P-7235	0.03
P-7237	0.22
P-7243	0.61
P-7246	0.11
P-7248 (1)	0
P-7248 (2)	0.24
P-7249	0.03
P-725	0.01
P-7250	0.01
P-7251	0.05
P-7253	0.18
P-7254	0
P-7255	0
P-7256	0.05
P-7258	0
P-7259	0
P-7260 (1)	0.01
P-7260 (2)	0.03
P-7261(1)(1)	0.09
P-7261(1)(2)	0.09
P-7261(2)(1)	0.08
P-7261(2)(2)	0.08
P-7263	0.01
P-7264 (1)	(N/A)
P-7264 (2)	0.21
P-7265	0.2
P-7267	0.01
P-7274	0.02

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-7172	0.04
P-7174(1)	0.94
P-7174(2)	0.94
P-7175	0.77
P-7181	0.02
P-7182	0.01
P-7183	0.01
P-7186	3.24
P-7188 (1)	0.2
P-7188 (2)	0.1
P-7190 (1)	0.5
P-7190 (2)	0.03
P-7193	0.03
P-7194	2.36
P-7195 (1)	2.36
P-7195 (2)	0.04
P-7196	1.62
P-7196(1)	0.05
P-7196(2)	0.05
P-7197	0.11
P-7198	1.42
P-7199	0.06
P-7200	0.24
P-7205 (1)	0.16
P-7205 (2)	0.13
P-7206	0
P-7207	0.07
P-7208	0.01
P-7209 (1)	0
P-7209 (2)	0.01
P-7210	0.01
P-7211	0.04
P-7213	0.05
P-7214	0.12
P-7215 (1)	0.44
P-7215 (2)	0.22
P-722	0.1
P-7222	0.04
P-7223	0.03
P-7225	0
P-7228	0.02
P-7231	0.03
P-7232	4.93
P-7235	0.2
P-7237	0.05
P-7243	0.67
P-7246	0.09
P-7248 (1)	0
P-7248 (2)	0.31
P-7249	0.02
P-725	0.01
P-7250	0.17
P-7251	0.05
P-7253	0.55
P-7254	0
P-7255	0
P-7256	0.25
P-7258	0
P-7259	0.26
P-7260 (1)	0.13
P-7260 (2)	0.02
P-7261(1)(1)	0.06
P-7261(1)(2)	0.06
P-7261(2)(1)	0.07
P-7261(2)(2)	0.07
P-7263	0.01
P-7264 (1)	0
P-7264 (2)	0.16
P-7265	0.24
P-7267	0.01
P-7274	0.03

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-7276	0.19	P-7276	0.13	P-7276	0.13
P-7277 (1)	0	P-7277 (1)	0.34	P-7277 (1)	0.17
P-7277 (2)	0.42	P-7277 (2)	0.23	P-7277 (2)	0.58
P-7284	0.14	P-7284	0.1	P-7284	0.09
P-7287	0.23	P-7287	0.09	P-7287	0.13
P-7288	0.02	P-7288	0.02	P-7288	0.05
P-7289	2.63	P-7289	1.7	P-7289	2.26
P-729	0.15	P-729	0.01	P-729	0.01
P-7291 (1)	0	P-7291 (1)	0.04	P-7291 (1)	0.11
P-7291 (2)	0.11	P-7291 (2)	0.1	P-7291 (2)	0.01
P-7295	0.45	P-7295	0.78	P-7295	0.17
P-730	0	P-730	0	P-730	0
P-7302(1)	0.03	P-7302(1)	0.04	P-7302(1)	0.08
P-7302(2)	0.01	P-7302(2)	0.02	P-7302(2)	0.03
P-7303	0	P-7303	0.01	P-7303	0.01
P-7304	0.06	P-7304	0.07	P-7304	0.16
P-7305	0.04	P-7305	0.03	P-7305	0.03
P-7307	0.16	P-7307	0.15	P-7307	0.13
P-731	0	P-731	0.01	P-731	0.01
P-7310	0.04	P-7310	0.01	P-7310	0.01
P-7311	0.01	P-7311	0.02	P-7311	0.02
P-7313	0.02	P-7313	0.02	P-7313	0.05
P-7317	0.02	P-7317	0.07	P-7317	0.19
P-7318	0	P-7318	0	P-7318	0
P-7318(1)	0.76	P-7318(1)	0.58	P-7318(1)	0.39
P-7318(2)	0.67	P-7318(2)	0.51	P-7318(2)	0.35
P-7319	0.06	P-7319	0.07	P-7319	0.06
P-732	0	P-732	0	P-732	0
P-7320(1)	0.01	P-7320(1)	0.03	P-7320(1)	0.03
P-7320(2)	0.04	P-7320(2)	0.06	P-7320(2)	0.09
P-7322	0	P-7322	0	P-7322	0
P-7323 (1)	0	P-7323 (1)	0	P-7323 (1)	0
P-7323 (2)	0.19	P-7323 (2)	0.39	P-7323 (2)	0.03
P-7326 (1)	0	P-7326 (1)	0	P-7326 (1)	0
P-7326 (2)	0.14	P-7326 (2)	0.41	P-7326 (2)	0.91
P-7327 (1)	(N/A)	P-7327 (1)	(N/A)	P-7327 (1)	(N/A)
P-7327 (2)	0.24	P-7327 (2)	0.4	P-7327 (2)	0.22
P-7328 (1)	0.01	P-7328 (1)	0.02	P-7328 (1)	1.09
P-7328 (2)	0	P-7328 (2)	0	P-7328 (2)	0
P-7329	0.01	P-7329	0.01	P-7329	0.01
P-7330	0	P-7330	0.02	P-7330	0.02
P-7331	0	P-7331	(N/A)	P-7331	(N/A)
P-7331(1)	0	P-7331(1)	0.01	P-7331(1)	0.01
P-7331(2)	0	P-7331(2)	0.01	P-7331(2)	0.01
P-7332	0	P-7332	(N/A)	P-7332	(N/A)
P-7332(1)	0.02	P-7332(1)	0.6	P-7332(1)	0.11
P-7332(2)	0.02	P-7332(2)	0.6	P-7332(2)	0.11
P-7333	0	P-7333	0	P-7333	0
P-7335	0.02	P-7335	0.03	P-7335	0.03
P-7336	0	P-7336	0.1	P-7336	0.16
P-7337	0.25	P-7337	0.78	P-7337	1
P-7338	0.17	P-7338	0.15	P-7338	0.1
P-7340	0.6	P-7340	0.63	P-7340	0.7
P-7341	0.05	P-7341	0.17	P-7341	0.16
P-7342	0	P-7342	0	P-7342	0
P-7343	0.01	P-7343	0.01	P-7343	0.01
P-7344	0	P-7344	0	P-7344	0
P-7345	2.86	P-7345	2.32	P-7345	3.62
P-7346 (1)	2.86	P-7346 (1)	2.32	P-7346 (1)	3.6
P-7346 (2)	3.02	P-7346 (2)	2.64	P-7346 (2)	0.36
P-7347 (1)	2.86	P-7347 (1)	2.32	P-7347 (1)	3.6
P-7347 (2)	0.02	P-7347 (2)	0.06	P-7347 (2)	0.15
P-7348	2.86	P-7348	2.32	P-7348	3.6
P-7350	0.01	P-7350	0.11	P-7350	0.09
P-7351	0.04	P-7351	0.03	P-7351	0.03
P-7354	0.08	P-7354	0.07	P-7354	0.07
P-7357	0	P-7357	0.01	P-7357	0.01
P-7358	0.01	P-7358	0.01	P-7358	0.01
P-7359	0	P-7359	0.01	P-7359	0.03
P-7362	0	P-7362	0	P-7362	0
P-7363	0.22	P-7363	0.19	P-7363	0.02

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-7367 (1)	0.04
P-7367 (2)	0.48
P-7368	0.07
P-7369 (1)	0
P-7369 (2)	0
P-7371	0.14
P-7374	0
P-7377	0.84
P-7378 (1)	0
P-7378 (2)	0.73
P-7379 (1)	0
P-7379 (2)	0.01
P-7380	0
P-7380(1)	0.06
P-7380(2)	0.07
P-7382	0.62
P-7384	0.01
P-7386	1.01
P-7388 (1)	0
P-7388 (2)	0.03
P-7389	0
P-739	0.16
P-7390	0.05
P-7392	0.62
P-7393	0
P-7395	0.2
P-7396	0.06
P-7397 (1)	0
P-7397 (2)	0
P-7398	0.11
P-7399 (1)	0
P-7399 (2)	0
P-740	0.16
P-7400 (1)	0.04
P-7400 (2)	0.07
P-7401	0
P-7402	0.01
P-7404	0
P-7406	0
P-7406(1)	0
P-7406(2)	0
P-7407	0
P-7408 (1)	0
P-7408 (2)	0.04
P-7409	0
P-7410 (1)	0
P-7410 (2)	0.23
P-7411 (1)	0
P-7411 (2)	0.01
P-7412 (1)	0
P-7412 (2)	0.03
P-7414	0.04
P-7416(1)	0.33
P-7416(2)	0.69
P-7418	0.04
P-7419(1)	0.07
P-7419(2)(1)	0.04
P-7419(2)(2)(1)	0.02
P-7419(2)(2)(2)	0.03
P-742	0
P-7422	0
P-7423 (1)	0
P-7423 (2)	0.57
P-7424	0.02
P-7427	0
P-7428	0.06
P-7429	0.26
P-7430	0.04
P-7431	0.02
P-7433 (1)	0.36
P-7433 (2)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-7367 (1)	0.03
P-7367 (2)	0.23
P-7368	0.18
P-7369 (1)	0
P-7369 (2)	0
P-7371	0.08
P-7374	0.01
P-7377	1.35
P-7378 (1)	0.01
P-7378 (2)	1.29
P-7379 (1)	0.01
P-7379 (2)	0.03
P-7380	0.01
P-7380(1)	0.06
P-7380(2)	0.06
P-7382	0.51
P-7384	0.01
P-7386	0.29
P-7388 (1)	0.04
P-7388 (2)	0.04
P-7389	0.01
P-739	0.01
P-7390	0.11
P-7392	0.49
P-7393	0
P-7395	0.33
P-7396	0.04
P-7397 (1)	0
P-7397 (2)	0.01
P-7398	0.1
P-7399 (1)	0.01
P-7399 (2)	0
P-740	0.03
P-7400 (1)	0.44
P-7400 (2)	0.09
P-7401	0.01
P-7402	0.01
P-7404	2.86
P-7406	2.86
P-7406(1)	0.06
P-7406(2)	0.06
P-7407	0
P-7408 (1)	0
P-7408 (2)	0.12
P-7409	0
P-7410 (1)	0
P-7410 (2)	0.4
P-7411 (1)	0.04
P-7411 (2)	0.01
P-7412 (1)	0.02
P-7412 (2)	0.15
P-7414	0.09
P-7416(1)	0.16
P-7416(2)	0.33
P-7418	0.06
P-7419(1)	0.11
P-7419(2)(1)	0.06
P-7419(2)(2)(1)	0.04
P-7419(2)(2)(2)	0.04
P-742	0.01
P-7422	0.06
P-7423 (1)	0.06
P-7423 (2)	0.21
P-7424	0.04
P-7427	0.08
P-7428	0.09
P-7429	0.62
P-7430	0.39
P-7431	0.04
P-7433 (1)	0.8
P-7433 (2)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-7367 (1)	0.05
P-7367 (2)	0.25
P-7368	0.23
P-7369 (1)	0
P-7369 (2)	0
P-7371	0.19
P-7374	0.08
P-7377	0.67
P-7378 (1)	0.01
P-7378 (2)	0.88
P-7379 (1)	0.01
P-7379 (2)	0.03
P-7380	0.01
P-7380(1)	0.06
P-7380(2)	0.06
P-7382	0.02
P-7384	0.01
P-7386	0.84
P-7388 (1)	0.05
P-7388 (2)	0.09
P-7389	0.01
P-739	0.01
P-7390	0.09
P-7392	0.43
P-7393	0.05
P-7395	0.28
P-7396	0.06
P-7397 (1)	0.05
P-7397 (2)	0.01
P-7398	0.01
P-7399 (1)	0
P-7399 (2)	0
P-740	0.04
P-7400 (1)	0.31
P-7400 (2)	0.19
P-7401	0.01
P-7402	0.01
P-7404	1.86
P-7406	1.86
P-7406(1)	0.1
P-7406(2)	0.1
P-7407	0
P-7408 (1)	0
P-7408 (2)	0.29
P-7409	0
P-7410 (1)	0
P-7410 (2)	0.23
P-7411 (1)	0.63
P-7411 (2)	0.01
P-7412 (1)	0.38
P-7412 (2)	0.13
P-7414	0.09
P-7416(1)	0.27
P-7416(2)	0.57
P-7418	0.05
P-7419(1)	0.11
P-7419(2)(1)	0.07
P-7419(2)(2)(1)	0.04
P-7419(2)(2)(2)	0.05
P-742	0.01
P-7422	0.11
P-7423 (1)	0.03
P-7423 (2)	0.41
P-7424	0.04
P-7427	0.43
P-7428	0.32
P-7429	0.34
P-7430	0.24
P-7431	0.04
P-7433 (1)	2.05
P-7433 (2)	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-7435	0.04
P-7438 (1)	0.02
P-7438 (2)	0.11
P-7439	0
P-744 (1)	0.15
P-744 (2)	0.01
P-7445	0.1
P-7447	0.36
P-7449	0.01
P-745	0.03
P-7450 (1)	0
P-7450 (2)	0.15
P-7453	0
P-7454	0.04
P-7457	0.08
P-7460	0
P-7461	0.01
P-7463	0
P-747	0
P-7470 (1)	0.12
P-7470 (2)	2.55
P-7471	0.23
P-7472	0.61
P-7474	0.05
P-7475	0.11
P-748	0.01
P-7482 (1)	0.26
P-7482 (2)	0.41
P-7483	0.22
P-7484	0
P-7485 (1)	0.24
P-7485 (2)	0.19
P-7486 (1)	0.01
P-7486 (2)	0.01
P-7487	0.01
P-7488	0.01
P-7489	0.05
P-749 (1)	0.19
P-749 (2)	0.01
P-7490	0.15
P-7491(1)	0.03
P-7491(2)	0.02
P-7492	0
P-7495	0
P-7496	1.3
P-7497	0.06
P-7498	0
P-750 (1)	0.06
P-750 (2)	0
P-7502	0
P-7503	0.02
P-7506	0
P-7509	1.03
P-7514	0.25
P-7516 (1)	0
P-7516 (2)	0
P-7517	0
P-7519	0.28
P-7520 (1)	0
P-7520 (2)	0.03
P-7522	0.01
P-7523	0.01
P-7524	0.29
P-7529	0.02
P-7532	0.78
P-7533	0.08
P-7534	0.03
P-7535	0.01
P-754	0.41
P-7541	0.11
P-7544	0.06

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-7435	0.12
P-7438 (1)	0.03
P-7438 (2)	0.25
P-7439	0.01
P-744 (1)	0.07
P-744 (2)	0.05
P-7445	0.18
P-7447	0.26
P-7449	0.02
P-745	0.02
P-7450 (1)	0.16
P-7450 (2)	0.33
P-7453	0.01
P-7454	0.06
P-7457	0.05
P-7460	0
P-7461	0.01
P-7463	0
P-747	0.01
P-7470 (1)	0.09
P-7470 (2)	2.13
P-7471	0.47
P-7472	0.8
P-7474	0.09
P-7475	0.08
P-748	0.01
P-7482 (1)	0.5
P-7482 (2)	0.5
P-7483	0.42
P-7484	0
P-7485 (1)	0.47
P-7485 (2)	0.27
P-7486 (1)	0.02
P-7486 (2)	0
P-7487	0.02
P-7488	0.02
P-7489	0.03
P-749 (1)	0.09
P-749 (2)	0.02
P-7490	0.06
P-7491(1)	0.06
P-7491(2)	0.03
P-7492	0
P-7495	0.03
P-7496	0.57
P-7497	0.02
P-7498	0
P-750 (1)	0.14
P-750 (2)	0.01
P-7502	0
P-7503	0.01
P-7506	0.05
P-7509	1.57
P-7514	0.29
P-7516 (1)	0
P-7516 (2)	0
P-7517	0.01
P-7519	0.25
P-7520 (1)	0
P-7520 (2)	0.01
P-7522	0.02
P-7523	0.01
P-7524	0.69
P-7529	0.04
P-7532	0.8
P-7533	0.03
P-7534	0.05
P-7535	0.01
P-754	1.01
P-7541	0.04
P-7544	0.04

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-7435	0.29
P-7438 (1)	0.02
P-7438 (2)	0.1
P-7439	0.01
P-744 (1)	0.21
P-744 (2)	0.05
P-7445	0.16
P-7447	0.4
P-7449	0.03
P-745	0.05
P-7450 (1)	0.1
P-7450 (2)	0.19
P-7453	0.01
P-7454	0.01
P-7457	0.08
P-7460	0
P-7461	0.01
P-7463	0
P-747	0.01
P-7470 (1)	0.1
P-7470 (2)	0.62
P-7471	0.63
P-7472	0.66
P-7474	0.07
P-7475	0.25
P-748	0.01
P-7482 (1)	0.64
P-7482 (2)	1.18
P-7483	0.55
P-7484	0
P-7485 (1)	0.6
P-7485 (2)	0.17
P-7486 (1)	0.02
P-7486 (2)	0.01
P-7487	0.02
P-7488	0.02
P-7489	0.02
P-749 (1)	0.26
P-749 (2)	0.02
P-7490	0.01
P-7491(1)	0.06
P-7491(2)	0.04
P-7492	0
P-7495	0.02
P-7496	0.17
P-7497	0.21
P-7498	0
P-750 (1)	0.11
P-750 (2)	0.01
P-7502	0
P-7503	0.01
P-7506	0.36
P-7509	0.64
P-7514	0.24
P-7516 (1)	0
P-7516 (2)	0
P-7517	0.01
P-7519	0.1
P-7520 (1)	0
P-7520 (2)	0.06
P-7522	0.03
P-7523	0.01
P-7524	0.36
P-7529	0.03
P-7532	0.76
P-7533	0.02
P-7534	0.05
P-7535	0.02
P-754	0.9
P-7541	0.07
P-7544	0.13

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-7545	0
P-7547	0.37
P-7548	0.01
P-7553	0.03
P-7555	0.07
P-7559	0.02
P-7563	0.05
P-7564	0
P-7571(1)(1)	0.06
P-7571(1)(2)	0.04
P-7571(2)(1)	0.02
P-7571(2)(2)	0.11
P-7573	0.22
P-7574	0
P-758	0.01
P-7583	0.11
P-7585	0.04
P-7586(1)	0.24
P-7586(2)	0.38
P-7590 (1)	0
P-7590 (2)	0.01
P-7593	0.29
P-7597	0.05
P-7600	0.18
P-7603(1)	0.41
P-7603(2)(1)	0.29
P-7603(2)(2)	0.41
P-7607	0.02
P-7608(1)	0.03
P-7608(2)	0.04
P-7617(1)(1)(1)(1)	0.21
P-7617(1)(1)(1)(2)	0.18
P-7617(1)(1)(2)	0.21
P-7617(1)(2)	0.21
P-7617(2)	0.02
P-762 (1)	0.1
P-762 (2)	0.04
P-7625(1)	0.01
P-7625(2)	0.01
P-763	0.22
P-7634	0.07
P-7635	0
P-764	0.12
P-7643	0
P-7646	0
P-765	0.03
P-7651	0.1
P-7652	0.02
P-7655	0.01
P-7656	0.28
P-7657	0.22
P-766	0.03
P-7661	0.17
P-7665	0
P-7666	0
P-7671	0.08
P-7678 (1)	0.01
P-7678 (2)	0.09
P-7682	0.02
P-7684	0.96
P-7687	2.83
P-7689	0
P-7690	0.02
P-7691	0.06
P-7693	0.01
P-7696	0.01
P-7698	0
P-7699	0
P-77	0.57
P-7706 (1)	0.03
P-7706 (2)	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-7545	0.01
P-7547	0.38
P-7548	0.04
P-7553	0.35
P-7555	0.17
P-7559	0.05
P-7563	0.03
P-7564	0
P-7571(1)(1)	0.08
P-7571(1)(2)	0.04
P-7571(2)(1)	0.09
P-7571(2)(2)	0.19
P-7573	0.43
P-7574	0
P-758	0.01
P-7583	0.56
P-7585	0.27
P-7586(1)	0.28
P-7586(2)	0.45
P-7590 (1)	0
P-7590 (2)	0.02
P-7593	0.54
P-7597	0.03
P-7600	0.22
P-7603(1)	0.43
P-7603(2)(1)	0.3
P-7603(2)(2)	0.43
P-7607	0.02
P-7608(1)	0.04
P-7608(2)	0.05
P-7617(1)(1)(1)(1)	0.3
P-7617(1)(1)(1)(2)	0.27
P-7617(1)(1)(2)	0.3
P-7617(1)(2)	0.3
P-7617(2)	0.09
P-762 (1)	0.01
P-762 (2)	0.01
P-7625(1)	0.03
P-7625(2)	0.03
P-763	0.06
P-7634	0.09
P-7635	0
P-764	0.03
P-7643	0
P-7646	0
P-765	0.04
P-7651	0.12
P-7652	0.04
P-7655	0.02
P-7656	0.33
P-7657	0.01
P-766	0.06
P-7661	0.07
P-7665	0
P-7666	0
P-7671	0.12
P-7678 (1)	0.02
P-7678 (2)	0.08
P-7682	0.05
P-7684	0.24
P-7687	0.72
P-7689	0.01
P-7690	0.18
P-7691	0.08
P-7693	0.02
P-7696	0.24
P-7698	0.01
P-7699	0.01
P-77	0.52
P-7706 (1)	0.06
P-7706 (2)	0.01

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-7545	0.01
P-7547	0.21
P-7548	0.04
P-7553	0.21
P-7555	0.14
P-7559	0.04
P-7563	0.08
P-7564	0
P-7571(1)(1)	0.08
P-7571(1)(2)	0.02
P-7571(2)(1)	0.18
P-7571(2)(2)	0.15
P-7573	0.34
P-7574	0
P-758	0.01
P-7583	0.49
P-7585	0.16
P-7586(1)	0.22
P-7586(2)	0.37
P-7590 (1)	0
P-7590 (2)	0.04
P-7593	0.64
P-7597	0.08
P-7600	0.13
P-7603(1)	0.49
P-7603(2)(1)	0.34
P-7603(2)(2)	0.49
P-7607	0.03
P-7608(1)	0.04
P-7608(2)	0.06
P-7617(1)(1)(1)(1)	0.29
P-7617(1)(1)(1)(2)	0.25
P-7617(1)(1)(2)	0.29
P-7617(1)(2)	0.29
P-7617(2)	0.13
P-762 (1)	0.05
P-762 (2)	0.01
P-7625(1)	0.02
P-7625(2)	0.02
P-763	0.12
P-7634	0.13
P-7635	0
P-764	0.07
P-7643	0
P-7646	0
P-765	0.07
P-7651	0.21
P-7652	0.04
P-7655	0.02
P-7656	0.08
P-7657	0.02
P-766	0.06
P-7661	0.22
P-7665	0
P-7666	0
P-7671	0.34
P-7678 (1)	0.02
P-7678 (2)	0.02
P-7682	0.06
P-7684	0.22
P-7687	0.69
P-7689	0.01
P-7690	0.18
P-7691	0.04
P-7693	0.02
P-7696	0.24
P-7698	0.01
P-7699	0.01
P-77	0.22
P-7706 (1)	0.05
P-7706 (2)	0.01

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-7708	0
P-7709	0
P-7710	0
P-7711	0
P-7717	0
P-7718	0
P-7719	0
P-772 (1)	0.34
P-772 (2)	0.02
P-7732	0.3
P-7733	0.07
P-7737	0.01
P-7738	0.01
P-7739	0.1
P-7741	0.12
P-7743	0.28
P-7747(1)(1)	0.19
P-7747(2)	0.2
P-7763(1)	0.1
P-7763(2)	0.11
P-7764	0.2
P-7766	0.03
P-7768	0.09
P-7769	0
P-7771	0.02
P-7771(1)	0.03
P-7771(2)	0.01
P-7772	0.02
P-7774	0.18
P-7775	0.04
P-7776	0.02
P-7777	0.01
P-7780 (1)	0.01
P-7780 (2)	0.02
P-7781 (1)	0.02
P-7781 (2)	0.06
P-7783	0
P-7784	0.22
P-7785	0.14
P-7786	0.08
P-7787 (1)	0.01
P-7787 (2)	0.05
P-7792	0
P-7792(1)	0
P-7792(2)	0
P-7793 (1)	0.08
P-7793 (2)	0.12
P-7794 (1)	0.03
P-7794 (2)	0.09
P-7796	0.08
P-7797	0
P-7798	0.06
P-7799	0.08
P-7801	0.12
P-7802 (1)	0
P-7802 (2)	0.4
P-7803	0
P-7806	0.01
P-7807	0.01
P-7808	0.15
P-7817	0.02
P-7821	6.69
P-7826	0.53
P-7827(1)(1)	(N/A)
P-7827(1)(2)	(N/A)
P-7827(2)	1.7
P-7830 (1)	0.06
P-7830 (2)	0.04
P-7831	0.01
P-7832	0.01
P-7833 (1)	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-7708	0
P-7709	0
P-7710	0
P-7711	0
P-7717	0
P-7718	0.01
P-7719	0.01
P-772 (1)	0.1
P-772 (2)	0.04
P-7732	1.4
P-7733	0.33
P-7737	0.02
P-7738	0.02
P-7739	0.49
P-7741	0.52
P-7743	1.37
P-7747(1)(1)	0.91
P-7747(2)	0.89
P-7763(1)	0.1
P-7763(2)	0.1
P-7764	0.55
P-7766	0.11
P-7768	0.04
P-7769	0.92
P-7771	0.15
P-7771(1)	0.06
P-7771(2)	0.02
P-7772	0.02
P-7774	0.39
P-7775	0.12
P-7776	0.02
P-7777	0.02
P-7780 (1)	0.01
P-7780 (2)	0.06
P-7781 (1)	0.04
P-7781 (2)	0.06
P-7783	0
P-7784	0.27
P-7785	0.17
P-7786	0.09
P-7787 (1)	0.02
P-7787 (2)	0.05
P-7792	0
P-7792(1)	0.01
P-7792(2)	0.01
P-7793 (1)	0.15
P-7793 (2)	0.08
P-7794 (1)	0.04
P-7794 (2)	0.09
P-7796	0.24
P-7797	0
P-7798	0.08
P-7799	0.23
P-7801	0.33
P-7802 (1)	0
P-7802 (2)	0.32
P-7803	0
P-7806	0.02
P-7807	0.01
P-7808	0.22
P-7817	0.01
P-7821	9.71
P-7826	1.15
P-7827(1)(1)	(N/A)
P-7827(1)(2)	(N/A)
P-7827(2)	3.09
P-7830 (1)	0.37
P-7830 (2)	0.04
P-7831	0.03
P-7832	0.01
P-7833 (1)	0.02

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-7708	0
P-7709	0
P-7710	0
P-7711	0
P-7717	0
P-7718	0.01
P-7719	0.01
P-772 (1)	0.2
P-772 (2)	0.04
P-7732	1.45
P-7733	0.34
P-7737	0.02
P-7738	0.02
P-7739	0.5
P-7741	0.55
P-7743	1.4
P-7747(1)(1)	1.27
P-7747(2)	1.26
P-7763(1)	0.05
P-7763(2)	0.05
P-7764	0.66
P-7766	0.08
P-7768	0.09
P-7769	0.7
P-7771	0.12
P-7771(1)	0.04
P-7771(2)	0.02
P-7772	0.06
P-7774	0.28
P-7775	0.29
P-7776	0.05
P-7777	0.15
P-7780 (1)	0.13
P-7780 (2)	0.03
P-7781 (1)	0.68
P-7781 (2)	0.04
P-7783	0
P-7784	0.27
P-7785	0.16
P-7786	0.09
P-7787 (1)	0.02
P-7787 (2)	0.05
P-7792	0
P-7792(1)	0.01
P-7792(2)	0.01
P-7793 (1)	0.15
P-7793 (2)	0.02
P-7794 (1)	0.15
P-7794 (2)	0.19
P-7796	0.15
P-7797	0
P-7798	0.06
P-7799	0.15
P-7801	0.27
P-7802 (1)	0
P-7802 (2)	0.47
P-7803	0
P-7806	0.02
P-7807	0.02
P-7808	0.49
P-7817	0.02
P-7821	11.28
P-7826	2.64
P-7827(1)(1)	(N/A)
P-7827(1)(2)	(N/A)
P-7827(2)	2.84
P-7830 (1)	0.79
P-7830 (2)	0.04
P-7831	0.03
P-7832	0.01
P-7833 (1)	0.03

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-7833 (2)	0.25
P-7834 (1)	0
P-7834 (2)	0.13
P-7835 (1)	0.01
P-7835 (2)	1.53
P-7836	1.53
P-7838	0.22
P-7839	0.09
P-7840	0.24
P-7844 (1)	0.01
P-7844 (2)	0.21
P-7845	0.08
P-7847	0.01
P-7848	0.97
P-7849	0.04
P-7851	0.04
P-7853	0.04
P-7856	0.09
P-7857	0.07
P-7859 (1)	0.13
P-7859 (2)	2.26
P-7860 (1)	0.06
P-7860 (2)	2.27
P-7861	0.16
P-7862	0.66
P-7863	0.24
P-7865 (1)	0.02
P-7865 (2)	0.05
P-7866 (1)	0.01
P-7866 (2)	0.01
P-7868(2)	0
P-7869	0
P-7870	0
P-7871 (1)	0
P-7871 (2)	0.07
P-7872	0.04
P-7873	0
P-7874	0
P-7876 (1)	0
P-7876 (2)	2.29
P-7878 (1)	0
P-7878 (2)	0.63
P-7879 (1)	0
P-7879 (2)	0.02
P-788	0.39
P-7880 (1)	0
P-7880 (2)	0.07
P-7883 (1)	0.09
P-7883 (2)	0.01
P-7885	0.11
P-7887	0
P-7889	0.99
P-7891 (1)	1.83
P-7891 (2)	1.03
P-7892	0.19
P-7893	0.21
P-7894 (1)	0.21
P-7894 (2)	0
P-7896 (1)	0
P-7896 (2)	0.03
P-7897 (1)	0.17
P-7897 (2)	0.01
P-7898	0.16
P-7901 (1)	0.26
P-7901 (2)	0.02
P-7902	0.02
P-7903	0.01
P-7904 (1)	0
P-7904 (2)	0.01
P-7906(1)	0
P-7906(2)(1)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-7833 (2)	0.11
P-7834 (1)	0.01
P-7834 (2)	0.22
P-7835 (1)	0.02
P-7835 (2)	0.72
P-7836	0.72
P-7838	0.21
P-7839	0.25
P-7840	0.72
P-7844 (1)	0.39
P-7844 (2)	0.93
P-7845	1.75
P-7847	0.01
P-7848	0.25
P-7849	0.09
P-7851	0.04
P-7853	0.06
P-7856	0.34
P-7857	0.02
P-7859 (1)	0.52
P-7859 (2)	1.18
P-7860 (1)	0.07
P-7860 (2)	1.13
P-7861	0.36
P-7862	0.16
P-7863	0.72
P-7865 (1)	0.04
P-7865 (2)	0.04
P-7866 (1)	0.02
P-7866 (2)	0.01
P-7868(2)	0
P-7869	0.01
P-7870	0.03
P-7871 (1)	0.02
P-7871 (2)	0.2
P-7872	0.11
P-7873	0
P-7874	0
P-7876 (1)	0.02
P-7876 (2)	0.68
P-7878 (1)	0
P-7878 (2)	0.55
P-7879 (1)	0
P-7879 (2)	0.08
P-788	0.13
P-7880 (1)	0
P-7880 (2)	0.12
P-7883 (1)	0.07
P-7883 (2)	0.01
P-7885	5.34
P-7887	0.01
P-7889	1.52
P-7891 (1)	0.96
P-7891 (2)	1.18
P-7892	0.1
P-7893	0.11
P-7894 (1)	0.1
P-7894 (2)	0
P-7896 (1)	0
P-7896 (2)	0.07
P-7897 (1)	0.06
P-7897 (2)	0.03
P-7898	0.57
P-7901 (1)	0.24
P-7901 (2)	0.04
P-7902	0.04
P-7903	0.02
P-7904 (1)	0
P-7904 (2)	0.03
P-7906(1)	0.01
P-7906(2)(1)	0.01

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-7833 (2)	0.1
P-7834 (1)	0.01
P-7834 (2)	0.23
P-7835 (1)	0.03
P-7835 (2)	0.04
P-7836	0.04
P-7838	0.2
P-7839	0.57
P-7840	1.18
P-7844 (1)	0.46
P-7844 (2)	1.09
P-7845	2
P-7847	0.01
P-7848	0.24
P-7849	0.19
P-7851	0.03
P-7853	0.03
P-7856	0.39
P-7857	0.01
P-7859 (1)	0.36
P-7859 (2)	1.41
P-7860 (1)	0.29
P-7860 (2)	1.39
P-7861	0.48
P-7862	0.03
P-7863	1.18
P-7865 (1)	0.11
P-7865 (2)	0.04
P-7866 (1)	0.06
P-7866 (2)	0.01
P-7868(2)	0.18
P-7869	0.19
P-7870	0.18
P-7871 (1)	0.18
P-7871 (2)	0.2
P-7872	0.11
P-7873	0
P-7874	0
P-7876 (1)	0.06
P-7876 (2)	0.67
P-7878 (1)	0
P-7878 (2)	0.51
P-7879 (1)	0
P-7879 (2)	0.04
P-788	0.15
P-7880 (1)	0
P-7880 (2)	0.14
P-7883 (1)	0.02
P-7883 (2)	0.01
P-7885	5.47
P-7887	0.01
P-7889	1.9
P-7891 (1)	1.78
P-7891 (2)	1.16
P-7892	0.17
P-7893	0.23
P-7894 (1)	0.22
P-7894 (2)	0
P-7896 (1)	0
P-7896 (2)	0.06
P-7897 (1)	0.24
P-7897 (2)	0.03
P-7898	0.47
P-7901 (1)	0.19
P-7901 (2)	0.04
P-7902	0.04
P-7903	0.02
P-7904 (1)	0
P-7904 (2)	0.03
P-7906(1)	0.01
P-7906(2)(1)	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-7906(2)(2)	0	P-7906(2)(2)	0.01	P-7906(2)(2)	0.01
P-7908	0.21	P-7908	0.62	P-7908	0.48
P-7911	0.15	P-7911	0.28	P-7911	0.35
P-7913	0.1	P-7913	0.06	P-7913	0.1
P-7914	0.06	P-7914	0.02	P-7914	0.21
P-7915	0.06	P-7915	0.02	P-7915	0.21
P-7917	0.02	P-7917	0.09	P-7917	0.08
P-7917(1)	0.03	P-7917(1)	0.02	P-7917(1)	0.01
P-7917(2)	0.14	P-7917(2)	0.09	P-7917(2)	0.2
P-7918	0.07	P-7918	0.05	P-7918	0.1
P-7919	0.04	P-7919	0.22	P-7919	0.26
P-7920	0.36	P-7920	0.34	P-7920	0.51
P-7921	0.14	P-7921	0.31	P-7921	0.26
P-7922	0.2	P-7922	0.46	P-7922	0.38
P-7925	0.01	P-7925	0.03	P-7925	0.04
P-7926 (1)	0	P-7926 (1)	0	P-7926 (1)	0
P-7926 (2)	0.01	P-7926 (2)	0.02	P-7926 (2)	0.03
P-7927 (1)	0	P-7927 (1)	0	P-7927 (1)	0
P-7927 (2)	0.69	P-7927 (2)	0.34	P-7927 (2)	0.51
P-7928	0.07	P-7928	0.15	P-7928	0.27
P-793	0.19	P-793	0.05	P-793	0.15
P-7931 (1)	0.17	P-7931 (1)	0.22	P-7931 (1)	0.17
P-7931 (2)	0.08	P-7931 (2)	0.1	P-7931 (2)	0.14
P-7933	0.17	P-7933	1.16	P-7933	1.11
P-7934	0.16	P-7934	1.08	P-7934	1.04
P-7935 (1)	0	P-7935 (1)	0	P-7935 (1)	0
P-7935 (2)	0.01	P-7935 (2)	0.01	P-7935 (2)	0.01
P-7936	0	P-7936	0	P-7936	0
P-7937 (1)	0	P-7937 (1)	0	P-7937 (1)	0
P-7937 (2)	0.01	P-7937 (2)	0.02	P-7937 (2)	0.03
P-7938	0	P-7938	0.02	P-7938	0.03
P-7939	0	P-7939	0	P-7939	0
P-7940 (1)	0	P-7940 (1)	0	P-7940 (1)	0
P-7940 (2)	0	P-7940 (2)	0	P-7940 (2)	0
P-7943 (1)	0	P-7943 (1)	0.14	P-7943 (1)	0.42
P-7943 (2)	0.03	P-7943 (2)	0.09	P-7943 (2)	0.08
P-7945	0.01	P-7945	0.03	P-7945	0.03
P-7947 (1)	0	P-7947 (1)	0	P-7947 (1)	0
P-7947 (2)	0	P-7947 (2)	0	P-7947 (2)	0
P-7948 (1)	0.01	P-7948 (1)	0.02	P-7948 (1)	0.04
P-7948 (2)	0.09	P-7948 (2)	0.15	P-7948 (2)	0.33
P-7949	6.47	P-7949	7.83	P-7949	10.25
P-7950	0	P-7950	0	P-7950	0
P-7952	0.78	P-7952	0.18	P-7952	0.16
P-7953	0.15	P-7953	0.55	P-7953	0.39
P-7954 (1)	0.26	P-7954 (1)	0.19	P-7954 (1)	0.27
P-7954 (2)	0.35	P-7954 (2)	1.32	P-7954 (2)	0.93
P-7955	0.77	P-7955	0.09	P-7955	0.04
P-7956	0.01	P-7956	0.06	P-7956	0.04
P-7957	0	P-7957	0.05	P-7957	0.02
P-7959(1)	5.51	P-7959(1)	4.69	P-7959(1)	7.28
P-7959(2)	5.51	P-7959(2)	0	P-7959(2)	0
P-7961	0	P-7961	0.05	P-7961	0.02
P-7962	0.37	P-7962	0.46	P-7962	0.46
P-7963	0.34	P-7963	0.02	P-7963	0.03
P-7964	0.11	P-7964	0.01	P-7964	0.02
P-7965 (1)	0	P-7965 (1)	0	P-7965 (1)	0
P-7965 (2)	0.1	P-7965 (2)	0.26	P-7965 (2)	0.14
P-7966 (1)	0	P-7966 (1)	0	P-7966 (1)	0
P-7966 (2)	0.07	P-7966 (2)	0.19	P-7966 (2)	0.11
P-7967	0.26	P-7967	0.11	P-7967	0.26
P-7968 (1)	0	P-7968 (1)	0.01	P-7968 (1)	0.01
P-7968 (2)	0.26	P-7968 (2)	0.11	P-7968 (2)	0.26
P-7969	0	P-7969	0	P-7969	0
P-7971	0.8	P-7971	0.04	P-7971	0.06
P-7972	0	P-7972	0.75	P-7972	1.02
P-7973	0.11	P-7973	0.06	P-7973	0.12
P-7974 (1)	0.06	P-7974 (1)	0	P-7974 (1)	0
P-7974 (2)	0.02	P-7974 (2)	0.04	P-7974 (2)	0.06
P-7975	0.01	P-7975	0.01	P-7975	0.01
P-7976	0.16	P-7976	0.13	P-7976	0.17

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-7977	0	P-7977	0	P-7977	0
P-7981	0	P-7981	0.02	P-7981	0
P-7982	0	P-7982	0.02	P-7982	0.01
P-7983	0	P-7983	0.01	P-7983	0.01
P-7986 (1)	0.56	P-7986 (1)	0.04	P-7986 (1)	0.08
P-7986 (2)	0.12	P-7986 (2)	0.34	P-7986 (2)	0.2
P-7987	0.29	P-7987	0.31	P-7987	0.38
P-7988	0.27	P-7988	0.24	P-7988	0.3
P-799	0	P-799	0	P-799	0
P-7990	0.24	P-7990	0.04	P-7990	0.06
P-7991	0.04	P-7991	0.05	P-7991	0.04
P-7992 (1)	0.01	P-7992 (1)	0.02	P-7992 (1)	0.02
P-7992 (2)	0.09	P-7992 (2)	0.09	P-7992 (2)	0.1
P-7993	0.1	P-7993	0.06	P-7993	0.08
P-7994	0.16	P-7994	0.08	P-7994	0.12
P-7995 (1)	2.63	P-7995 (1)	0.93	P-7995 (1)	1.18
P-7995 (2)	0.04	P-7995 (2)	0.02	P-7995 (2)	0.08
P-7997	3.46	P-7997	0	P-7997	0
P-7999	0.11	P-7999	0.1	P-7999	0.11
P-800	0.01	P-800	0.03	P-800	0.02
P-8004	1.55	P-8004	0.41	P-8004	0.77
P-8005	0.67	P-8005	1.09	P-8005	1.52
P-8006	0.9	P-8006	2.97	P-8006	0.72
P-8007	0.06	P-8007	0.01	P-8007	0.02
P-8008	0.08	P-8008	0.03	P-8008	0.03
P-8009	0.1	P-8009	0.07	P-8009	0.06
P-8010	0.1	P-8010	0.07	P-8010	0.07
P-8010(1)	0	P-8010(1)	0	P-8010(1)	0
P-8010(2)	0	P-8010(2)	0	P-8010(2)	0
P-8011	2.23	P-8011	1.09	P-8011	0.52
P-8016 (1)	0.01	P-8016 (1)	0.02	P-8016 (1)	0.02
P-8016 (2)	0.29	P-8016 (2)	0.21	P-8016 (2)	0.61
P-8017	0.21	P-8017	0.51	P-8017	0.66
P-8027	0.04	P-8027	0.07	P-8027	0.06
P-8028	0.05	P-8028	0.12	P-8028	0.08
P-8029	0.22	P-8029	0.41	P-8029	0.37
P-8030	0	P-8030	0	P-8030	0
P-8031	0.6	P-8031	0.08	P-8031	0.11
P-8032	0.6	P-8032	0.08	P-8032	0.11
P-8033	0	P-8033	0.18	P-8033	0.56
P-8034 (1)	0.19	P-8034 (1)	0.2	P-8034 (1)	0.18
P-8034 (2)	0	P-8034 (2)	0.1	P-8034 (2)	0.61
P-8035 (1)	0.01	P-8035 (1)	0.01	P-8035 (1)	0.01
P-8035 (2)	0.18	P-8035 (2)	0.3	P-8035 (2)	0.42
P-8036 (1)	0.09	P-8036 (1)	0.25	P-8036 (1)	0.34
P-8036 (2)	0	P-8036 (2)	0	P-8036 (2)	0
P-8038	0	P-8038	0	P-8038	0
P-8039	0.01	P-8039	0.09	P-8039	0.11
P-8043	0.04	P-8043	0.01	P-8043	0.01
P-8050	0.27	P-8050	2.34	P-8050	2.5
P-8051	0.01	P-8051	0.05	P-8051	0.07
P-8052	0.08	P-8052	0.16	P-8052	0.22
P-8054	0.38	P-8054	0.44	P-8054	0.2
P-8055	0.37	P-8055	0.44	P-8055	0.46
P-8056	0.37	P-8056	0.44	P-8056	0.46
P-8057	0.1	P-8057	0.12	P-8057	0.12
P-8058	0.04	P-8058	0	P-8058	0.12
P-8060	0.03	P-8060	0.03	P-8060	0.05
P-8062	0	P-8062	0	P-8062	0
P-8063	0.22	P-8063	0.41	P-8063	0.37
P-8065	1.06	P-8065	0.29	P-8065	0.53
P-8068	0	P-8068	0	P-8068	0
P-8070	0.39	P-8070	0.6	P-8070	0.97
P-8071	0.1	P-8071	0.05	P-8071	0.11
P-8074(1)	0	P-8074(1)	0	P-8074(1)	0
P-8074(2)	0	P-8074(2)	0	P-8074(2)	0
P-8075	0.01	P-8075	0.02	P-8075	0.01
P-8076	0.03	P-8076	0.05	P-8076	0.04
P-8077 (1)	0	P-8077 (1)	0	P-8077 (1)	0
P-8077 (2)	0	P-8077 (2)	0	P-8077 (2)	0
P-8078	0	P-8078	0	P-8078	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-808	0.04	P-808	0.14	P-808	0.12
P-8084	0.19	P-8084	0.26	P-8084	0.32
P-8087	2.83	P-8087	1.01	P-8087	0.96
P-8091(1)	3.78	P-8091(1)	1.64	P-8091(1)	2.44
P-8091(2)	3.78	P-8091(2)	1.64	P-8091(2)	2.44
P-8092	3.79	P-8092	1.65	P-8092	2.45
P-8094	0.14	P-8094	0.18	P-8094	0.15
P-8096	0	P-8096	0	P-8096	0
P-8097	0.02	P-8097	0.05	P-8097	0.27
P-8098	0	P-8098	0.06	P-8098	0.38
P-8099	0.22	P-8099	0.24	P-8099	0.27
P-8100(1)	0.31	P-8100(1)	0.59	P-8100(1)	0.63
P-8100(2)	0.36	P-8100(2)	0.67	P-8100(2)	0.72
P-8101	0.02	P-8101	0.03	P-8101	0.04
P-8102	0.01	P-8102	0.01	P-8102	0.02
P-8105	0.01	P-8105	0.01	P-8105	0.01
P-8106	0	P-8106	0.01	P-8106	0.01
P-8109	0.06	P-8109	0.1	P-8109	0.09
P-811	0.01	P-811	0.02	P-811	0.02
P-8110	0.04	P-8110	0.06	P-8110	0.06
P-8115	1.1	P-8115	1.02	P-8115	0.99
P-8116	1.09	P-8116	1.01	P-8116	1
P-8119	0	P-8119	0	P-8119	0
P-8120	0	P-8120	0	P-8120	0
P-8121	0.56	P-8121	0.29	P-8121	0.33
P-8122	0.03	P-8122	0.04	P-8122	0.07
P-8125	0.04	P-8125	0.03	P-8125	0.03
P-8128	0.06	P-8128	1.81	P-8128	2.12
P-8130	0	P-8130	0	P-8130	0
P-8133	5.52	P-8133	4.66	P-8133	7.29
P-8134	5.52	P-8134	4.66	P-8134	7.29
P-8139	0.14	P-8139	0.6	P-8139	0.54
P-8143	0.15	P-8143	0.27	P-8143	0.21
P-8145	0.11	P-8145	0.04	P-8145	0.1
P-8148 (1)	0.07	P-8148 (1)	0.37	P-8148 (1)	0.29
P-8148 (2)	5.4	P-8148 (2)	9.22	P-8148 (2)	6.53
P-8149	0.4	P-8149	0.06	P-8149	0.09
P-8150	0.17	P-8150	0.04	P-8150	0.08
P-8152	0.09	P-8152	0.05	P-8152	0.12
P-8155	0.03	P-8155	0.14	P-8155	1.09
P-8159	0.11	P-8159	0.2	P-8159	0.18
P-8163 (1)	0.01	P-8163 (1)	0.05	P-8163 (1)	0.03
P-8163 (2)	0.04	P-8163 (2)	0.04	P-8163 (2)	0.07
P-8166	0.07	P-8166	0.17	P-8166	0.17
P-8167	0.03	P-8167	0.08	P-8167	0.02
P-8168	0.07	P-8168	0.05	P-8168	0.13
P-8169(1)	0	P-8169(1)	0.01	P-8169(1)	0.01
P-8169(2)	0	P-8169(2)	0.01	P-8169(2)	0.01
P-8170	0.01	P-8170	0.02	P-8170	0.02
P-8171	0.01	P-8171	0.01	P-8171	0
P-8172	0.02	P-8172	0.01	P-8172	0.01
P-8174	0.04	P-8174	0.06	P-8174	0.05
P-8176	0.01	P-8176	0.06	P-8176	0.03
P-8177	0	P-8177	0.02	P-8177	0.02
P-8178 (1)	0.01	P-8178 (1)	0.11	P-8178 (1)	0.09
P-8178 (2)	0	P-8178 (2)	0.03	P-8178 (2)	0.02
P-818	0.04	P-818	0.08	P-818	0.06
P-8181	0.22	P-8181	0.45	P-8181	0.58
P-8183	1.72	P-8183	0.86	P-8183	0.85
P-8184	0.91	P-8184	0.74	P-8184	0.76
P-8186	0.08	P-8186	0.16	P-8186	0.21
P-8188	0	P-8188	0	P-8188	0.01
P-8189	0	P-8189	0	P-8189	0.01
P-8190(1)	0.35	P-8190(1)	0.24	P-8190(1)	0.22
P-8190(2)(1)	0.35	P-8190(2)(1)	0.24	P-8190(2)(1)	0.22
P-8190(2)(2)	0.16	P-8190(2)(2)	0.11	P-8190(2)(2)	0.1
P-8191 (1)	0	P-8191 (1)	0	P-8191 (1)	0.01
P-8191 (2)	0.04	P-8191 (2)	1.69	P-8191 (2)	1.97
P-8194	0.01	P-8194	0.03	P-8194	0.03
P-8195	0.1	P-8195	0.13	P-8195	0.06
P-8196 (1)	0.22	P-8196 (1)	0.46	P-8196 (1)	0.59

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-8196 (2)	0.01	P-8196 (2)	0.01	P-8196 (2)	0.02
P-8199	0	P-8199	0.03	P-8199	0.03
P-8200	0.01	P-8200	0.02	P-8200	0.02
P-8201	0.01	P-8201	0.02	P-8201	0.02
P-8202 (1)	0	P-8202 (1)	0	P-8202 (1)	0
P-8202 (2)	0.01	P-8202 (2)	0.04	P-8202 (2)	0.04
P-8203	0.24	P-8203	0.03	P-8203	0.04
P-8205	0.15	P-8205	0.23	P-8205	0.5
P-8206	0.24	P-8206	0.37	P-8206	0.46
P-8208	0	P-8208	0	P-8208	0
P-8209	0.01	P-8209	0.01	P-8209	0.01
P-8210	0.01	P-8210	0.02	P-8210	0.01
P-8213	0.12	P-8213	0.06	P-8213	0.2
P-8214	0.1	P-8214	0.06	P-8214	0.18
P-8215	0	P-8215	0	P-8215	0
P-8216	0	P-8216	0	P-8216	0
P-8217	2.55	P-8217	2.13	P-8217	0.62
P-8218	2.55	P-8218	2.13	P-8218	0.62
P-822	0.01	P-822	0.02	P-822	0.02
P-8221 (1)	0	P-8221 (1)	0	P-8221 (1)	0
P-8221 (2)	0.02	P-8221 (2)	0.03	P-8221 (2)	0.03
P-8223	0.03	P-8223	0.01	P-8223	0.04
P-8224	0.05	P-8224	0.07	P-8224	0.08
P-8226	0.01	P-8226	0.02	P-8226	0.02
P-8227	0.02	P-8227	0.01	P-8227	0.03
P-8228 (1)	0.01	P-8228 (1)	0.01	P-8228 (1)	0.01
P-8228 (2)	0.05	P-8228 (2)	0.08	P-8228 (2)	0.08
P-8229 (1)	0.01	P-8229 (1)	0.01	P-8229 (1)	0.01
P-8229 (2)	0.62	P-8229 (2)	0.52	P-8229 (2)	0.53
P-823	0.04	P-823	0.08	P-823	0.21
P-8230	0.87	P-8230	0.72	P-8230	0.74
P-8231	0.12	P-8231	0.25	P-8231	0.41
P-8233	0.55	P-8233	0.28	P-8233	0.4
P-8234	0.83	P-8234	0.39	P-8234	0.6
P-8235	0.23	P-8235	0.55	P-8235	0.76
P-8236	0	P-8236	0	P-8236	1.16
P-8238	0.56	P-8238	0.64	P-8238	0.21
P-8239	0.03	P-8239	0.17	P-8239	0.2
P-824	0.06	P-824	0.12	P-824	0.15
P-8240	0.12	P-8240	0.12	P-8240	0.13
P-8241	0.01	P-8241	0.29	P-8241	0.47
P-8242	0.01	P-8242	0.01	P-8242	0.01
P-8243 (1)	0.03	P-8243 (1)	0.04	P-8243 (1)	0.06
P-8243 (2)	0.16	P-8243 (2)	0.15	P-8243 (2)	0.16
P-8244	0.03	P-8244	0.03	P-8244	0.06
P-8245	0.52	P-8245	0.72	P-8245	1.18
P-8247 (1)	0	P-8247 (1)	0	P-8247 (1)	0
P-8247 (2)	0.01	P-8247 (2)	0.01	P-8247 (2)	0.01
P-8248 (1)	0.09	P-8248 (1)	0.21	P-8248 (1)	0.3
P-8248 (2)	0	P-8248 (2)	0	P-8248 (2)	0
P-8251	0.22	P-8251	0.38	P-8251	0.06
P-8252	0	P-8252	0	P-8252	0
P-8254	0	P-8254	0	P-8254	0
P-8257	0.02	P-8257	0.12	P-8257	0.01
P-8258	0.01	P-8258	0.1	P-8258	0.01
P-8259	0.94	P-8259	0.03	P-8259	0.02
P-8260	0.01	P-8260	0.01	P-8260	0.01
P-8261	0.01	P-8261	0.01	P-8261	0.01
P-8262	0	P-8262	0	P-8262	0
P-8265	0.02	P-8265	0.03	P-8265	0.03
P-8266 (1)	0.01	P-8266 (1)	0.01	P-8266 (1)	0.01
P-8266 (2)	0.33	P-8266 (2)	0.94	P-8266 (2)	0.5
P-8267	0.01	P-8267	0.01	P-8267	0.01
P-8269	0	P-8269	0	P-8269	0.01
P-827	0.12	P-827	0.44	P-827	0.2
P-8270 (1)	0.01	P-8270 (1)	0.1	P-8270 (1)	0.01
P-8270 (2)	0	P-8270 (2)	0	P-8270 (2)	0
P-8271	0	P-8271	0	P-8271	0
P-8272	0.02	P-8272	0.05	P-8272	0.08
P-8273 (1)	0	P-8273 (1)	0	P-8273 (1)	0
P-8273 (2)	0.09	P-8273 (2)	0.13	P-8273 (2)	0.15

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-8274	0.13
P-8275	0.09
P-8276(1)	0.14
P-8276(2)	0.23
P-8279	0.03
P-8280 (1)	0.02
P-8280 (2)	0.04
P-8281	0.3
P-8282	0
P-8283 (1)	0
P-8283 (2)	0.02
P-8284	0
P-8285 (1)	0.02
P-8285 (2)	0.04
P-8287 (1)	0.02
P-8287 (2)	0.09
P-8289	0
P-829	0.01
P-8290	1.31
P-8292 (1)	0
P-8292 (2)	0.14
P-8293 (1)	0
P-8293 (2)	0.14
P-8294	0.12
P-8295	0.04
P-8297 (1)	0
P-8297 (2)	0.04
P-8298	6.73
P-8299 (1)	0
P-8299 (2)	0.28
P-8301	0
P-8303	0.11
P-8304	0.23
P-8306	0
P-8307	0.1
P-8308	0
P-8309	0
P-8310	0
P-8311	0
P-8312 (1)	0
P-8312 (2)	0.05
P-8313	0.27
P-8317 (1)	0
P-8317 (2)	0.01
P-8318	0.02
P-8319	0.1
P-8320	0.1
P-8321	0.27
P-8323	0.23
P-8326	0.01
P-8327	0.58
P-8328	0.58
P-833	0.01
P-8330	0.04
P-8335 (1)	0
P-8335 (2)	0.13
P-8336	0.07
P-8337	0
P-8339	0.19
P-8340	0.01
P-8341 (1)	0
P-8341 (2)	0.03
P-8342 (1)	0
P-8342 (2)	0.04
P-8343	0
P-8344	0
P-8345	0.05
P-8347	0.08
P-8348	0.02
P-835	0.15
P-8352	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-8274	0.19
P-8275	0.14
P-8276(1)	0.2
P-8276(2)	0.34
P-8279	0.03
P-8280 (1)	0.52
P-8280 (2)	0.04
P-8281	1.76
P-8282	0
P-8283 (1)	0
P-8283 (2)	0.04
P-8284	0.01
P-8285 (1)	0.27
P-8285 (2)	0.05
P-8287 (1)	0.81
P-8287 (2)	0.05
P-8289	0
P-829	0.01
P-8290	2.05
P-8292 (1)	0
P-8292 (2)	0.18
P-8293 (1)	0
P-8293 (2)	0.17
P-8294	0.14
P-8295	0.04
P-8297 (1)	0
P-8297 (2)	5.62
P-8298	15.32
P-8299 (1)	0
P-8299 (2)	0.68
P-8301	0
P-8303	0.06
P-8304	0.1
P-8306	0
P-8307	0.04
P-8308	0
P-8309	0
P-8310	0
P-8311	0
P-8312 (1)	0
P-8312 (2)	0.02
P-8313	0.09
P-8317 (1)	0
P-8317 (2)	0.02
P-8318	0.11
P-8319	0.34
P-8320	0.34
P-8321	0.21
P-8323	0.21
P-8326	0.08
P-8327	0.72
P-8328	0.72
P-833	0.01
P-8330	0.02
P-8335 (1)	0
P-8335 (2)	0.12
P-8336	0.06
P-8337	0
P-8339	0.68
P-8340	0.09
P-8341 (1)	0
P-8341 (2)	0.04
P-8342 (1)	0
P-8342 (2)	0.04
P-8343	0.01
P-8344	0
P-8345	0.19
P-8347	0.11
P-8348	0.07
P-835	0.2
P-8352	0.03

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-8274	0.21
P-8275	0.14
P-8276(1)	0.21
P-8276(2)	0.35
P-8279	0.03
P-8280 (1)	0.06
P-8280 (2)	0.05
P-8281	2.21
P-8282	0
P-8283 (1)	0
P-8283 (2)	0.03
P-8284	0.01
P-8285 (1)	0.01
P-8285 (2)	0.04
P-8287 (1)	0.11
P-8287 (2)	0.04
P-8289	0
P-829	0.01
P-8290	3.92
P-8292 (1)	0
P-8292 (2)	0.14
P-8293 (1)	0
P-8293 (2)	0.31
P-8294	0.34
P-8295	0.03
P-8297 (1)	0
P-8297 (2)	5.46
P-8298	5.96
P-8299 (1)	0
P-8299 (2)	0.79
P-8301	0
P-8303	0.06
P-8304	0.14
P-8306	0
P-8307	0.04
P-8308	0
P-8309	0
P-8310	0
P-8311	0
P-8312 (1)	0
P-8312 (2)	0.06
P-8313	0.12
P-8317 (1)	0
P-8317 (2)	0.02
P-8318	0.09
P-8319	0.32
P-8320	0.32
P-8321	0.04
P-8323	0.36
P-8326	0.08
P-8327	0.52
P-8328	0.52
P-833	0.01
P-8330	0.03
P-8335 (1)	0
P-8335 (2)	0.05
P-8336	0.02
P-8337	0
P-8339	0.44
P-8340	0.1
P-8341 (1)	0
P-8341 (2)	0.06
P-8342 (1)	0
P-8342 (2)	0.07
P-8343	0.14
P-8344	0.05
P-8345	0.13
P-8347	0.09
P-8348	0.05
P-835	0.19
P-8352	0.03

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-8353	0.04	P-8353	0.18	P-8353	0.29
P-8354	0.02	P-8354	0.11	P-8354	0.19
P-8357	0	P-8357	0	P-8357	0
P-8358 (1)	0	P-8358 (1)	0	P-8358 (1)	0
P-8358 (2)	0	P-8358 (2)	0	P-8358 (2)	0
P-8359 (1)	0	P-8359 (1)	0	P-8359 (1)	0
P-8359 (2)	0	P-8359 (2)	0	P-8359 (2)	0
P-836	0.94	P-836	0.29	P-836	0.28
P-8361	0	P-8361	0	P-8361	0
P-8362	1.03	P-8362	1.88	P-8362	1.52
P-8364	0	P-8364	0	P-8364	0
P-8364(1)	0.09	P-8364(1)	0.2	P-8364(1)	0.16
P-8364(2)	0.2	P-8364(2)	0.45	P-8364(2)	0.35
P-8365	0	P-8365	0	P-8365	0
P-8367	0.04	P-8367	2.78	P-8367	1.79
P-837 (1)	0.01	P-837 (1)	0.08	P-837 (1)	0.07
P-837 (2)	0.05	P-837 (2)	0.05	P-837 (2)	0.06
P-8371	0	P-8371	0	P-8371	0
P-8373	0.03	P-8373	0.15	P-8373	0.1
P-8374 (1)	0.03	P-8374 (1)	0.59	P-8374 (1)	0.05
P-8374 (2)	0.13	P-8374 (2)	0.17	P-8374 (2)	0.03
P-8376	0.46	P-8376	0.55	P-8376	0.64
P-8378	0	P-8378	0	P-8378	0
P-8379	1.13	P-8379	0.54	P-8379	0.74
P-838	2.61	P-838	0.34	P-838	0.33
P-8380	0.01	P-8380	0.02	P-8380	0.03
P-8382	0.26	P-8382	0.14	P-8382	0.18
P-8383	2.25	P-8383	0.68	P-8383	0.67
P-8386 (1)	0.42	P-8386 (1)	0.83	P-8386 (1)	1.13
P-8386 (2)	0.67	P-8386 (2)	0.34	P-8386 (2)	0.46
P-8387	0.43	P-8387	0.85	P-8387	1.15
P-8388	0.04	P-8388	0.05	P-8388	0.09
P-8388(1)	0.02	P-8388(1)	0.03	P-8388(1)	0.03
P-8388(2)	0.01	P-8388(2)	0.02	P-8388(2)	0.03
P-8389	0	P-8389	0	P-8389	0
P-839 (1)	0.37	P-839 (1)	0.34	P-839 (1)	0.34
P-839 (2)	0.07	P-839 (2)	0.16	P-839 (2)	0.19
P-8391	0.28	P-8391	0.22	P-8391	0.26
P-8392	0.26	P-8392	0.36	P-8392	0.42
P-8393	2.24	P-8393	4.71	P-8393	4
P-8394	2.82	P-8394	5.86	P-8394	4.94
P-8398	0.02	P-8398	0.06	P-8398	0.09
P-840	0.36	P-840	0.03	P-840	0.04
P-8401	0.64	P-8401	0.04	P-8401	0.02
P-8402	0.25	P-8402	0.43	P-8402	0.5
P-8403	0	P-8403	0.01	P-8403	0.01
P-8404 (1)	0.01	P-8404 (1)	0.01	P-8404 (1)	0.01
P-8404 (2)	0	P-8404 (2)	0	P-8404 (2)	0
P-8405 (1)	0.92	P-8405 (1)	0.05	P-8405 (1)	0.05
P-8405 (2)	0.1	P-8405 (2)	0.22	P-8405 (2)	0.1
P-8406	0.11	P-8406	0.31	P-8406	0.22
P-8407	0.1	P-8407	0.08	P-8407	0.12
P-8409	0.04	P-8409	0.05	P-8409	0.04
P-841	0.73	P-841	0.36	P-841	0.36
P-8410	0.11	P-8410	0.09	P-8410	0.1
P-8411	0.03	P-8411	0.27	P-8411	0.28
P-8412	0.08	P-8412	0.3	P-8412	0.29
P-8413	0.04	P-8413	0.03	P-8413	0.03
P-8414	0.04	P-8414	0.03	P-8414	0.03
P-8415	0	P-8415	0	P-8415	0
P-8416	0	P-8416	0.01	P-8416	0.01
P-8417	0.16	P-8417	0.15	P-8417	0.15
P-8418 (1)	3.45	P-8418 (1)	0	P-8418 (1)	0
P-8418 (2)	0	P-8418 (2)	0	P-8418 (2)	0
P-8419 (1)	3.45	P-8419 (1)	0	P-8419 (1)	0
P-8419 (2)	0.06	P-8419 (2)	0.08	P-8419 (2)	0.09
P-8420	0.08	P-8420	0.12	P-8420	0.13
P-8421(1)	0.13	P-8421(1)	0.05	P-8421(1)	0.08
P-8421(2)	0.13	P-8421(2)	0.05	P-8421(2)	0.08
P-8422 (1)	0.01	P-8422 (1)	0.01	P-8422 (1)	0.01
P-8422 (2)	0.24	P-8422 (2)	0.08	P-8422 (2)	0.15

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-8423	0.35	P-8423	0.08	P-8423	0.09
P-8424 (1)	0.17	P-8424 (1)	0.04	P-8424 (1)	0.03
P-8424 (2)	0.72	P-8424 (2)	0.3	P-8424 (2)	0.31
P-8427	0.78	P-8427	0.24	P-8427	0.22
P-8428 (1)	0.14	P-8428 (1)	0.27	P-8428 (1)	0.28
P-8428 (2)	0	P-8428 (2)	0	P-8428 (2)	0.11
P-8429	0.35	P-8429	0.07	P-8429	0.06
P-843	0.92	P-843	0.26	P-843	0.26
P-8431 (1)	0.22	P-8431 (1)	0.2	P-8431 (1)	0.22
P-8431 (2)	0.98	P-8431 (2)	1.45	P-8431 (2)	0.92
P-8433	0	P-8433	0	P-8433	0
P-8434 (1)	0.53	P-8434 (1)	2.21	P-8434 (1)	2.07
P-8434 (2)	0.1	P-8434 (2)	0.1	P-8434 (2)	0.11
P-8438 (1)	0	P-8438 (1)	0.36	P-8438 (1)	0.32
P-8438 (2)	2.15	P-8438 (2)	3.24	P-8438 (2)	0.23
P-8440 (1)	0.01	P-8440 (1)	0.01	P-8440 (1)	0.01
P-8440 (2)	0.08	P-8440 (2)	0.08	P-8440 (2)	0.06
P-8442	0.05	P-8442	0.09	P-8442	0.09
P-8444 (1)	0.01	P-8444 (1)	0.01	P-8444 (1)	0.01
P-8444 (2)	0.1	P-8444 (2)	0.03	P-8444 (2)	0.14
P-8445 (1)	0.25	P-8445 (1)	0.76	P-8445 (1)	0.98
P-8445 (2)	0.01	P-8445 (2)	0.39	P-8445 (2)	0.77
P-8446	0.11	P-8446	0.19	P-8446	0.62
P-8447	0.01	P-8447	0.02	P-8447	0.02
P-8447(1)	0.02	P-8447(1)	0.06	P-8447(1)	0.25
P-8447(2)	0.02	P-8447(2)	0.06	P-8447(2)	0.26
P-8449(1)	0.35	P-8449(1)	0.65	P-8449(1)	0.97
P-8449(2)	0.24	P-8449(2)	0.72	P-8449(2)	1.18
P-8451	0.14	P-8451	0.17	P-8451	0.13
P-8455 (1)	0.01	P-8455 (1)	0.22	P-8455 (1)	0.19
P-8455 (2)	0.03	P-8455 (2)	0.17	P-8455 (2)	0.21
P-8457	0.01	P-8457	0.02	P-8457	0.02
P-8458	0	P-8458	0	P-8458	0
P-846	0.48	P-846	0.33	P-846	0.32
P-8460	11.03	P-8460	7.13	P-8460	13.66
P-8462	0.01	P-8462	0.13	P-8462	0.03
P-8463	1.97	P-8463	3.24	P-8463	3.03
P-8464(1)	0.27	P-8464(1)	2.49	P-8464(1)	3.37
P-8464(2)	0.26	P-8464(2)	2.5	P-8464(2)	3.36
P-8465	1.11	P-8465	0.61	P-8465	0.78
P-8466	1.18	P-8466	0.62	P-8466	0.81
P-8468	0.86	P-8468	1.06	P-8468	0.15
P-8469	0.08	P-8469	0.14	P-8469	0.21
P-847	0.01	P-847	0.01	P-847	0.01
P-8473	0.01	P-8473	0.03	P-8473	0.02
P-8475	0.6	P-8475	0.3	P-8475	0.42
P-8476	0.56	P-8476	0.26	P-8476	0.38
P-8477 (1)	0.01	P-8477 (1)	0.34	P-8477 (1)	0.47
P-8477 (2)	0.17	P-8477 (2)	0.32	P-8477 (2)	0.34
P-8478	0.2	P-8478	0.37	P-8478	0.4
P-848	0.94	P-848	0.12	P-848	0.12
P-8481	0.02	P-8481	0.26	P-8481	0.27
P-8483	0.34	P-8483	0.47	P-8483	0.43
P-8484	0.34	P-8484	0.47	P-8484	0.43
P-8487	0.16	P-8487	0.02	P-8487	0.01
P-8489	0	P-8489	0.04	P-8489	0.14
P-8490	0	P-8490	0	P-8490	0.05
P-8491	0	P-8491	0	P-8491	0
P-8492	1.18	P-8492	2.29	P-8492	4.05
P-8493	0.09	P-8493	0.18	P-8493	0.17
P-8495	0.04	P-8495	0.11	P-8495	0.09
P-8496	0.05	P-8496	0.16	P-8496	0.07
P-8499 (1)	0.15	P-8499 (1)	0.18	P-8499 (1)	0.26
P-8499 (2)	0.03	P-8499 (2)	0.01	P-8499 (2)	0.05
P-8500	0.05	P-8500	0.02	P-8500	0.09
P-8501	0	P-8501	0	P-8501	0
P-8503	2.83	P-8503	3.39	P-8503	1.21
P-8504 (1)	0.29	P-8504 (1)	0.21	P-8504 (1)	0.09
P-8504 (2)	2.82	P-8504 (2)	3.39	P-8504 (2)	1.21
P-8505 (1)	0.29	P-8505 (1)	0.21	P-8505 (1)	0.09
P-8505 (2)	0.01	P-8505 (2)	0.02	P-8505 (2)	0.02

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-8506	0
P-8508	0.12
P-8509	0.09
P-851	0
P-8511	0.33
P-8512	0.33
P-8513	0.32
P-8515	0.01
P-8518	0.19
P-8519	0.05
P-852	0.01
P-8520	0.07
P-8521 (1)	0
P-8521 (2)	0
P-8522	0.05
P-8525	0
P-8526	0
P-8527	0.05
P-8529	0.14
P-8531	0.04
P-8533 (1)	0.6
P-8533 (2)	0.01
P-8534	0.02
P-8535	0.45
P-8536	0.44
P-8539	0.02
P-8544	0.01
P-8545	0.12
P-8547	0.12
P-8548	0.13
P-8551	0.39
P-8554	0.15
P-8555 (1)	0.27
P-8555 (2)	0.31
P-8556	0.3
P-8563	0.38
P-8564	0.22
P-8566	0.04
P-8569	0.32
P-8570 (1)	3.44
P-8570 (2)	0.08
P-8571 (1)	3.44
P-8571 (2)	0
P-8572 (1)	3.44
P-8572 (2)	0.01
P-8574	0.04
P-8575 (1)	3.44
P-8575 (2)	0
P-8576	6.1
P-8577 (1)	6.1
P-8577 (2)	0.01
P-8578	0
P-8578(1)	6.09
P-8578(2)	3.44
P-8579 (1)	6.09
P-8579 (2)	0.04
P-8580	6.09
P-8581 (1)	6.09
P-8581 (2)	0.09
P-8582 (1)	6.09
P-8582 (2)	0.07
P-8583	6.09
P-8584	6.1
P-8585 (1)	6.09
P-8585 (2)	0.64
P-8586 (1)	6.09
P-8586 (2)	0.6
P-8587	6.09
P-8588	0.01
P-8590	0
P-8590(1)	6.1

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-8506	0.01
P-8508	0.33
P-8509	0.15
P-851	0.01
P-8511	0.4
P-8512	0.4
P-8513	0.63
P-8515	0.02
P-8518	0.1
P-8519	0.09
P-852	0.02
P-8520	0.18
P-8521 (1)	0.45
P-8521 (2)	0
P-8522	0.1
P-8525	0
P-8526	0
P-8527	0.1
P-8529	0.41
P-8531	0.44
P-8533 (1)	2.26
P-8533 (2)	0.01
P-8534	0.03
P-8535	0.17
P-8536	0.14
P-8539	0.04
P-8544	0.01
P-8545	5.36
P-8547	0.26
P-8548	0.27
P-8551	0.34
P-8554	0.15
P-8555 (1)	2.34
P-8555 (2)	0.28
P-8556	0.24
P-8563	0.66
P-8564	0.6
P-8566	0.04
P-8569	0.38
P-8570 (1)	5.93
P-8570 (2)	0.17
P-8571 (1)	5.93
P-8571 (2)	0
P-8572 (1)	5.93
P-8572 (2)	0.02
P-8574	0.13
P-8575 (1)	5.93
P-8575 (2)	0.03
P-8576	8.7
P-8577 (1)	8.7
P-8577 (2)	0.07
P-8578	0.01
P-8578(1)	8.69
P-8578(2)	5.93
P-8579 (1)	8.69
P-8579 (2)	0.04
P-8580	8.58
P-8581 (1)	10.85
P-8581 (2)	0.22
P-8582 (1)	10.85
P-8582 (2)	0.16
P-8583	10.87
P-8584	8.7
P-8585 (1)	8.58
P-8585 (2)	0.42
P-8586 (1)	10.85
P-8586 (2)	0.39
P-8587	10.85
P-8588	0.02
P-8590	0
P-8590(1)	10.96

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-8506	0.01
P-8508	0.31
P-8509	0.33
P-851	0.01
P-8511	0.37
P-8512	0.37
P-8513	0.87
P-8515	0.01
P-8518	0.43
P-8519	0.11
P-852	0.02
P-8520	0.21
P-8521 (1)	0.4
P-8521 (2)	0
P-8522	0.04
P-8525	0
P-8526	0
P-8527	0.05
P-8529	0.91
P-8531	0.31
P-8533 (1)	2.99
P-8533 (2)	0.01
P-8534	0.03
P-8535	0.16
P-8536	0.14
P-8539	0.04
P-8544	0.01
P-8545	5.49
P-8547	0.2
P-8548	0.21
P-8551	0.54
P-8554	0.2
P-8555 (1)	2.5
P-8555 (2)	1.67
P-8556	1.46
P-8563	0.63
P-8564	0.49
P-8566	0.03
P-8569	0.03
P-8570 (1)	7.57
P-8570 (2)	0.11
P-8571 (1)	7.57
P-8571 (2)	0
P-8572 (1)	7.57
P-8572 (2)	0.01
P-8574	0.14
P-8575 (1)	7.57
P-8575 (2)	0.18
P-8576	10.56
P-8577 (1)	10.56
P-8577 (2)	0.14
P-8578	0.01
P-8578(1)	10.55
P-8578(2)	7.57
P-8579 (1)	10.55
P-8579 (2)	0.13
P-8580	10.27
P-8581 (1)	13.15
P-8581 (2)	0.16
P-8582 (1)	13.15
P-8582 (2)	0.15
P-8583	13.25
P-8584	10.56
P-8585 (1)	10.27
P-8585 (2)	0.39
P-8586 (1)	13.15
P-8586 (2)	0.36
P-8587	13.15
P-8588	0.03
P-8590	0
P-8590(1)	13.49

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**
P-8590(2)	6.1	P-8590(2)	10.96	P-8590(2)	13.49
P-8591 (1)	6.09	P-8591 (1)	10.85	P-8591 (1)	13.15
P-8591 (2)	0.98	P-8591 (2)	1.46	P-8591 (2)	0.94
P-8592	0.98	P-8592	1.46	P-8592	0.93
P-8593	2.19	P-8593	0.94	P-8593	2.58
P-8594	2.19	P-8594	0.94	P-8594	2.58
P-8595 (1)	6.11	P-8595 (1)	11.05	P-8595 (1)	13.72
P-8595 (2)	0.16	P-8595 (2)	0.42	P-8595 (2)	2.71
P-8596	0.23	P-8596	0.61	P-8596	2.5
P-8597	0	P-8597	0	P-8597	0
P-8598	0.01	P-8598	0.03	P-8598	0.07
P-8599 (1)	6.11	P-8599 (1)	11.11	P-8599 (1)	13.88
P-8599 (2)	0.18	P-8599 (2)	0.08	P-8599 (2)	0.03
P-860	0.01	P-860	0.03	P-860	0.04
P-8601	6.11	P-8601	11.13	P-8601	13.99
P-8601(1)	1.24	P-8601(1)	0.36	P-8601(1)	0.11
P-8601(2)	1.24	P-8601(2)	0.36	P-8601(2)	0.11
P-8602 (1)	6.11	P-8602 (1)	11.15	P-8602 (1)	14.09
P-8602 (2)	1.24	P-8602 (2)	0.36	P-8602 (2)	0.11
P-8603 (1)	6.11	P-8603 (1)	11.13	P-8603 (1)	13.99
P-8603 (2)	0.06	P-8603 (2)	0.16	P-8603 (2)	0.22
P-8604 (1)	6.11	P-8604 (1)	11.13	P-8604 (1)	13.99
P-8604 (2)	0	P-8604 (2)	0.06	P-8604 (2)	0.07
P-8605 (1)	6.11	P-8605 (1)	11.17	P-8605 (1)	14.2
P-8605 (2)	0.08	P-8605 (2)	0.06	P-8605 (2)	0.03
P-8606	6.11	P-8606	11.13	P-8606	13.99
P-8607	0.09	P-8607	0.2	P-8607	0.15
P-8608	0.03	P-8608	0.05	P-8608	0.04
P-8611	0.1	P-8611	0.09	P-8611	0.1
P-8612	6.11	P-8612	12.14	P-8612	14.5
P-8613 (1)	6.11	P-8613 (1)	12.08	P-8613 (1)	14.48
P-8613 (2)	0.05	P-8613 (2)	0.03	P-8613 (2)	0.03
P-8614	0.15	P-8614	0.05	P-8614	0.05
P-8615 (1)	6.11	P-8615 (1)	12.17	P-8615 (1)	14.52
P-8615 (2)	0.01	P-8615 (2)	0.03	P-8615 (2)	0.04
P-8616	0	P-8616	0.03	P-8616	0
P-8618 (1)	0	P-8618 (1)	0	P-8618 (1)	0
P-8618 (2)	0.02	P-8618 (2)	0.02	P-8618 (2)	0.02
P-8620 (1)	0	P-8620 (1)	0.01	P-8620 (1)	0.01
P-8620 (2)	0.2	P-8620 (2)	0.05	P-8620 (2)	0.06
P-8622	0.03	P-8622	0.14	P-8622	0.17
P-8623 (1)	0	P-8623 (1)	0	P-8623 (1)	0
P-8623 (2)	0.02	P-8623 (2)	0.04	P-8623 (2)	0.04
P-8624	0.02	P-8624	0.03	P-8624	0.03
P-8628	0	P-8628	0	P-8628	0
P-8629	0.08	P-8629	0.25	P-8629	0.37
P-863	0.03	P-863	0.08	P-863	0.09
P-8630	0.31	P-8630	0.41	P-8630	0.4
P-8632	0.01	P-8632	0.11	P-8632	0.09
P-8633	0.01	P-8633	0.01	P-8633	0.01
P-8634	0.01	P-8634	0.02	P-8634	0.01
P-8635	0.04	P-8635	0.07	P-8635	0.06
P-8639	0.93	P-8639	0.7	P-8639	0.93
P-8640	0.94	P-8640	0.69	P-8640	0.93
P-8641	0.16	P-8641	0.07	P-8641	0.1
P-8642	0.01	P-8642	0.03	P-8642	0.04
P-8643	0.07	P-8643	0.16	P-8643	0.15
P-8644(1)	0.05	P-8644(1)	0.13	P-8644(1)	0.12
P-8644(2)(1)	0.05	P-8644(2)(1)	0.13	P-8644(2)(1)	0.12
P-8644(2)(2)	0.05	P-8644(2)(2)	0.13	P-8644(2)(2)	0.12
P-8648	0.04	P-8648	0.09	P-8648	0.18
P-8651	0	P-8651	0	P-8651	0.06
P-8652	0	P-8652	0	P-8652	0.06
P-8653 (1)	0.21	P-8653 (1)	0.3	P-8653 (1)	0.03
P-8653 (2)	0.1	P-8653 (2)	0.31	P-8653 (2)	0.45
P-8654 (1)	0.49	P-8654 (1)	0.91	P-8654 (1)	0.81
P-8654 (2)	0.01	P-8654 (2)	0.01	P-8654 (2)	0.01
P-8655	0.55	P-8655	0.44	P-8655	0.26
P-8656	0.48	P-8656	0.22	P-8656	0.39
P-8658	0.01	P-8658	0.03	P-8658	0.03
P-866	0.11	P-866	0.13	P-866	0.12

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-8661 (1)	0.17
P-8661 (2)	0.68
P-8662	0.6
P-8663 (1)	0.01
P-8663 (2)	0
P-8664	0
P-8665	0.06
P-8666	0.15
P-8667 (1)	3.66
P-8667 (2)	0.08
P-8670	0
P-8673	0.03
P-8674	0.03
P-8675	0.05
P-8676	0.05
P-8677	0.02
P-8678	0.03
P-8679	0.01
P-8682(1)	0.36
P-8682(2)	0.36
P-8683	0.02
P-8684	0.01
P-8685	0.74
P-8688	0.2
P-8689	0.06
P-869 (1)	0.19
P-869 (2)	0
P-8690	0
P-8691(1)	0.05
P-8691(2)	0.05
P-8694	0.08
P-8695	0.07
P-8696	0.07
P-8699	0.01
P-8700	0.02
P-8701	0.06
P-8702	0.06
P-8703 (1)	0
P-8703 (2)	0.27
P-8705	0.03
P-8706	0.01
P-871	0.08
P-8711	1.97
P-8712	2.77
P-8715	0.08
P-8719	0.24
P-8720	0.17
P-8723	0.18
P-8725	0.04
P-8728	0
P-8732	0.07
P-8734	0.07
P-8737	0.08
P-8738 (1)	0.02
P-8738 (2)	0.35
P-8739	0
P-8740	0.01
P-8742	0.19
P-8743	0.02
P-8745	0.15
P-8747	0.31
P-8748	0.22
P-8752	0.11
P-8753	0.17
P-8755	0.02
P-8756	0.02
P-8757	0.01
P-8758	0.01
P-8759	0.06
P-8760	0.62
P-8761	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-8661 (1)	0.15
P-8661 (2)	0.69
P-8662	0.32
P-8663 (1)	3.31
P-8663 (2)	0.01
P-8664	0
P-8665	0.06
P-8666	0.16
P-8667 (1)	2.09
P-8667 (2)	0.05
P-8670	0.01
P-8673	0.06
P-8674	2.8
P-8675	0.04
P-8676	0.05
P-8677	0.02
P-8678	0.02
P-8679	0.15
P-8682(1)	0.18
P-8682(2)	0.18
P-8683	0.05
P-8684	0.04
P-8685	0.24
P-8688	0.15
P-8689	0.02
P-869 (1)	0.08
P-869 (2)	0
P-8690	0.02
P-8691(1)	0.04
P-8691(2)	0.04
P-8694	0.04
P-8695	0.14
P-8696	0.12
P-8699	0.01
P-8700	0.03
P-8701	0.04
P-8702	0.04
P-8703 (1)	0.01
P-8703 (2)	0.23
P-8705	0.04
P-8706	0.02
P-871	0.13
P-8711	0.3
P-8712	0.43
P-8715	0.07
P-8719	0.16
P-8720	0.11
P-8723	0.29
P-8725	0.07
P-8728	0
P-8732	0.04
P-8734	0.15
P-8737	0.22
P-8738 (1)	0.03
P-8738 (2)	0.32
P-8739	0
P-8740	0.01
P-8742	0.08
P-8743	0.04
P-8745	0.12
P-8747	0.17
P-8748	0.18
P-8752	0.21
P-8753	0.22
P-8755	0.08
P-8756	0.08
P-8757	0.04
P-8758	0.01
P-8759	0.85
P-8760	1.49
P-8761	0.03

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-8661 (1)	0.1
P-8661 (2)	0.5
P-8662	1.04
P-8663 (1)	2.38
P-8663 (2)	0.01
P-8664	0
P-8665	0.08
P-8666	0.12
P-8667 (1)	1.27
P-8667 (2)	0.14
P-8670	0.01
P-8673	0.06
P-8674	1.8
P-8675	0.1
P-8676	0.12
P-8677	0.02
P-8678	0.02
P-8679	0.39
P-8682(1)	0.3
P-8682(2)	0.3
P-8683	0.07
P-8684	0.05
P-8685	0.36
P-8688	0.27
P-8689	0.02
P-869 (1)	0.08
P-869 (2)	0
P-8690	0.02
P-8691(1)	0.02
P-8691(2)	0.02
P-8694	0.05
P-8695	0.06
P-8696	0.07
P-8699	0.02
P-8700	0.03
P-8701	0.1
P-8702	0.11
P-8703 (1)	0.07
P-8703 (2)	0.08
P-8705	0.04
P-8706	0.02
P-871	0.09
P-8711	0.24
P-8712	0.33
P-8715	0.06
P-8719	0.15
P-8720	0.09
P-8723	0.41
P-8725	0.08
P-8728	0
P-8732	0.06
P-8734	0.17
P-8737	0.25
P-8738 (1)	0.04
P-8738 (2)	0.38
P-8739	0
P-8740	0.03
P-8742	0.09
P-8743	0.04
P-8745	0.09
P-8747	0.42
P-8748	0.28
P-8752	0.17
P-8753	0.17
P-8755	0.11
P-8756	0.11
P-8757	0.04
P-8758	0.01
P-8759	0.88
P-8760	1.13
P-8761	0.07

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-8762	0.01	P-8762	0.03	P-8762	0.08
P-8763	0.3	P-8763	0.15	P-8763	0.26
P-8765	0.05	P-8765	0.09	P-8765	0.09
P-8766	0.08	P-8766	0.14	P-8766	0.15
P-8768	0.4	P-8768	1.04	P-8768	1.37
P-877	0.08	P-877	0.09	P-877	0.15
P-8770	0.02	P-8770	0.04	P-8770	0.03
P-8771	0.31	P-8771	0.1	P-8771	0.2
P-8773	0.05	P-8773	0.02	P-8773	0.02
P-8774	0.24	P-8774	0.12	P-8774	0.09
P-8775	0.41	P-8775	0.25	P-8775	0.3
P-8776	0.41	P-8776	0.25	P-8776	0.3
P-8780	0.03	P-8780	0.03	P-8780	0.04
P-8781	0.58	P-8781	0.72	P-8781	0.52
P-8783	0.4	P-8783	0.52	P-8783	1.2
P-8784	0.4	P-8784	0.52	P-8784	1.2
P-8785	0.21	P-8785	0.12	P-8785	0.12
P-8786	0.18	P-8786	0.1	P-8786	0.11
P-879	0.16	P-879	0.04	P-879	0.04
P-8790(1)	1.25	P-8790(1)	0.71	P-8790(1)	1.63
P-8790(2)	1.42	P-8790(2)	0.82	P-8790(2)	1.88
P-8792	0.01	P-8792	0	P-8792	0
P-8793	0.54	P-8793	0.79	P-8793	1.12
P-8794 (1)	0.2	P-8794 (1)	0.03	P-8794 (1)	0.05
P-8794 (2)	0.53	P-8794 (2)	0.78	P-8794 (2)	1.14
P-8795	0.56	P-8795	0.86	P-8795	1.57
P-8796	0.56	P-8796	0.86	P-8796	1.57
P-8797	0.16	P-8797	0.22	P-8797	0.23
P-8798	0.2	P-8798	0.28	P-8798	0.2
P-8799(2)	0	P-8799(2)	0.07	P-8799(2)	0.42
P-880	0.07	P-880	0.04	P-880	0.03
P-8800	0	P-8800	0.04	P-8800	0.22
P-8801	0.18	P-8801	0.58	P-8801	2.46
P-8803	0.42	P-8803	1.94	P-8803	2.02
P-8804	0.23	P-8804	1.39	P-8804	1.36
P-8805	0.01	P-8805	0.02	P-8805	0.02
P-8806	0.01	P-8806	0.02	P-8806	0.02
P-8810	0	P-8810	0.04	P-8810	0.02
P-8816	0.03	P-8816	0.03	P-8816	0.04
P-8817	0.01	P-8817	0.02	P-8817	0.02
P-8819 (1)	0.01	P-8819 (1)	0.02	P-8819 (1)	0.02
P-8819 (2)	3.37	P-8819 (2)	1.66	P-8819 (2)	2.84
P-8820	3.37	P-8820	1.66	P-8820	2.84
P-8821	0.26	P-8821	0.63	P-8821	0.35
P-8822	0.33	P-8822	0.79	P-8822	0.44
P-8823	0.03	P-8823	0.07	P-8823	0.33
P-8824	0.04	P-8824	0.05	P-8824	0.26
P-8825	0	P-8825	0.05	P-8825	0.09
P-8826	0.03	P-8826	0.22	P-8826	0.21
P-8827 (1)	0.04	P-8827 (1)	0.07	P-8827 (1)	0.07
P-8827 (2)	0.08	P-8827 (2)	0.31	P-8827 (2)	0.5
P-8829	0.15	P-8829	0.28	P-8829	0.3
P-8832	1.66	P-8832	3.09	P-8832	4.63
P-8833	0	P-8833	0.01	P-8833	0.01
P-8834	0.08	P-8834	0.18	P-8834	0.28
P-8835	0	P-8835	0	P-8835	0.02
P-8836	0	P-8836	0	P-8836	0.01
P-8837	0.07	P-8837	0.19	P-8837	0.18
P-8840	0.23	P-8840	0.08	P-8840	0.09
P-8841	0.19	P-8841	0.08	P-8841	0.07
P-8845	0.17	P-8845	0.06	P-8845	0.07
P-8845(1)	0.05	P-8845(1)	0.08	P-8845(1)	0.08
P-8845(2)	0.05	P-8845(2)	0.08	P-8845(2)	0.08
P-8847	0.13	P-8847	0.91	P-8847	0.71
P-8849	1.83	P-8849	2.57	P-8849	0.17
P-8850	1.98	P-8850	2.86	P-8850	0
P-8851	0.01	P-8851	0.02	P-8851	0.02
P-8852	0	P-8852	0.01	P-8852	0.01
P-8853	0.28	P-8853	0.92	P-8853	0.37
P-8855	0	P-8855	0	P-8855	0
P-8856 (1)	0.04	P-8856 (1)	0.03	P-8856 (1)	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-8856 (2)	0	P-8856 (2)	0	P-8856 (2)	0
P-8857	0	P-8857	0.12	P-8857	0.11
P-8859	0.03	P-8859	1.01	P-8859	1.3
P-8861	0.03	P-8861	0.04	P-8861	0.04
P-8862	0.04	P-8862	0.06	P-8862	0.05
P-8864(1)	0.61	P-8864(1)	0.15	P-8864(1)	0.15
P-8865	0.02	P-8865	0.03	P-8865	0.03
P-8866	0.01	P-8866	0.01	P-8866	0.01
P-8867	0.14	P-8867	0.1	P-8867	0.09
P-8868	0.14	P-8868	0.1	P-8868	0.09
P-887	0.58	P-887	0.15	P-887	0.15
P-887(1)	0.03	P-887(1)	0.05	P-887(1)	0.04
P-887(2)	0.03	P-887(2)	0.05	P-887(2)	0.04
P-8871	0	P-8871	0	P-8871	0
P-8872	0.04	P-8872	0.3	P-8872	0.16
P-8873	0.31	P-8873	0.14	P-8873	0.08
P-8874	0.01	P-8874	0.76	P-8874	0.87
P-8875	0.02	P-8875	0.04	P-8875	0.04
P-8876	0.02	P-8876	0.04	P-8876	0.04
P-8877	0	P-8877	0	P-8877	0
P-8879	13.91	P-8879	28.83	P-8879	(N/A)
P-888	0.04	P-888	0.02	P-888	0.02
P-8880	2.81	P-8880	5.85	P-8880	23
P-8881	0.27	P-8881	0.04	P-8881	0.06
P-8882	0.14	P-8882	0.06	P-8882	0.03
P-8883	0.03	P-8883	0.03	P-8883	0.04
P-8884(1)	0.03	P-8884(1)	0.04	P-8884(1)	0.05
P-8884(2)	0	P-8884(2)	0	P-8884(2)	0
P-8885	0.06	P-8885	0.05	P-8885	0.03
P-8887	0.04	P-8887	0.07	P-8887	0.05
P-8888	0.07	P-8888	0.1	P-8888	0.12
P-8889	0.1	P-8889	0.14	P-8889	0.17
P-889	0.03	P-889	0.2	P-889	0.17
P-8890	0.1	P-8890	0.14	P-8890	0.17
P-8891	0.36	P-8891	0.16	P-8891	0.24
P-8892	0.36	P-8892	0.15	P-8892	0.23
P-8893	0.07	P-8893	0.03	P-8893	0.1
P-8894	0.12	P-8894	0.22	P-8894	0.1
P-8896	0.12	P-8896	0.22	P-8896	0.19
P-8898	0.04	P-8898	0.05	P-8898	0.02
P-89	0	P-89	0.01	P-89	0.01
P-8900	0	P-8900	0.01	P-8900	0.07
P-8902	0.02	P-8902	0.08	P-8902	0.1
P-8903	0	P-8903	0	P-8903	0.01
P-8904	0.01	P-8904	0.01	P-8904	0.01
P-8905	0.01	P-8905	0.02	P-8905	0.01
P-8906	0	P-8906	0	P-8906	0
P-8907	0.3	P-8907	0.06	P-8907	0.08
P-8908	0.35	P-8908	0.07	P-8908	0.13
P-8909	0.02	P-8909	0.02	P-8909	0.07
P-891	0.81	P-891	0.06	P-891	0.74
P-8910	0.02	P-8910	0.02	P-8910	0.06
P-8911 (1)	0	P-8911 (1)	0	P-8911 (1)	0
P-8911 (2)	0.32	P-8911 (2)	0.63	P-8911 (2)	0.87
P-8912	0.32	P-8912	0.63	P-8912	0.86
P-8913	0.03	P-8913	0.1	P-8913	0.13
P-8916	0	P-8916	0	P-8916	0
P-8917	0	P-8917	0.02	P-8917	0.02
P-8920	0.45	P-8920	0.08	P-8920	0.09
P-8922	0.24	P-8922	0.33	P-8922	0.43
P-8923	0.63	P-8923	0.69	P-8923	0.12
P-8924	0.62	P-8924	0.68	P-8924	0.13
P-8925	0.01	P-8925	0.01	P-8925	0.01
P-8927	0	P-8927	0.01	P-8927	0
P-8930	0.05	P-8930	0.08	P-8930	0.06
P-8931	0.05	P-8931	0.64	P-8931	0.89
P-8935	0	P-8935	0.01	P-8935	0.08
P-8936 (1)	0.07	P-8936 (1)	0.06	P-8936 (1)	0.05
P-8936 (2)	0	P-8936 (2)	0	P-8936 (2)	0
P-8937	0.33	P-8937	0.15	P-8937	0.31
P-8938	0.06	P-8938	0.05	P-8938	0.06

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-8939 (1)	0.31
P-8939 (2)	0.01
P-8940	0.02
P-8941	0
P-8942	0.02
P-8943	0.02
P-8944	0.02
P-8945	0
P-8947	0
P-8948	0
P-8949	0.01
P-8951	0
P-8952 (1)	0.01
P-8952 (2)	0
P-8953	0.1
P-8954	0.01
P-8955	0.06
P-8956	0.03
P-8959	0.66
P-8961	0.86
P-8962	0.68
P-8963	0
P-8964	0
P-8967	0.17
P-8968 (1)	0.22
P-8968 (2)	0.21
P-8970	0.09
P-8971 (1)	0.3
P-8971 (2)	0.4
P-8973 (1)	0.22
P-8973 (2)	0.01
P-8974	0.01
P-8977	0.3
P-8978	0.3
P-8979	1.77
P-8980	1.53
P-8981	0.2
P-8982	0.09
P-8983	0.19
P-8985	0
P-8986	0
P-8988	0.34
P-899	0.01
P-8990	0.01
P-8991	0.04
P-8992	0.01
P-8993	0.06
P-8995	0.08
P-8996	0.14
P-8997	0
P-8999	0.04
P-90	0.03
P-900	0.01
P-9000	0.05
P-9001	0.5
P-9002	0.35
P-9007	0.07
P-9009	0.44
P-9011	0.01
P-9012	0
P-9013	0.02
P-9014	0.09
P-9015	0.07
P-9016	0.18
P-9017(1)	0.36
P-902	0
P-9020	1.28
P-9023	0.15
P-9026	0.12
P-9031(1)	0.27
P-9031(2)	0.34

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-8939 (1)	0.21
P-8939 (2)	0.01
P-8940	0.02
P-8941	0
P-8942	0.15
P-8943	0.04
P-8944	0.04
P-8945	0
P-8947	0.01
P-8948	0
P-8949	0.21
P-8951	0
P-8952 (1)	0.02
P-8952 (2)	0
P-8953	0.1
P-8954	0.01
P-8955	0.07
P-8956	0.02
P-8959	1.07
P-8961	1.59
P-8962	1.28
P-8963	0.08
P-8964	0.08
P-8967	0.19
P-8968 (1)	0.24
P-8968 (2)	0.06
P-8970	0.16
P-8971 (1)	0.26
P-8971 (2)	0.4
P-8973 (1)	0.22
P-8973 (2)	0.03
P-8974	0.02
P-8977	0.21
P-8978	0.21
P-8979	1.3
P-8980	1.5
P-8981	0.15
P-8982	0.08
P-8983	0.69
P-8985	0.1
P-8986	0.1
P-8988	0.88
P-899	0.05
P-8990	0.09
P-8991	0.08
P-8992	0.03
P-8993	0.08
P-8995	0.11
P-8996	0.18
P-8997	0.01
P-8999	0.08
P-90	0.07
P-900	0.02
P-9000	0.1
P-9001	0.07
P-9002	0.08
P-9007	0.1
P-9009	0.87
P-9011	0.02
P-9012	0.01
P-9013	0.03
P-9014	0.07
P-9015	0.06
P-9016	0.13
P-9017(1)	0.78
P-902	0.01
P-9020	0.38
P-9023	0.02
P-9026	0.01
P-9031(1)	0.63
P-9031(2)	0.76

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-8939 (1)	0.19
P-8939 (2)	0.01
P-8940	0.02
P-8941	0
P-8942	0.12
P-8943	0.05
P-8944	0.05
P-8945	0
P-8947	0.08
P-8948	0
P-8949	0.02
P-8951	0
P-8952 (1)	0.01
P-8952 (2)	0
P-8953	0.07
P-8954	0.01
P-8955	0.11
P-8956	0.04
P-8959	1.5
P-8961	1.54
P-8962	1.47
P-8963	0.01
P-8964	0.01
P-8967	0.06
P-8968 (1)	0.15
P-8968 (2)	0.26
P-8970	0.32
P-8971 (1)	0.16
P-8971 (2)	0.16
P-8973 (1)	0.45
P-8973 (2)	0.67
P-8974	0.67
P-8977	0.18
P-8978	0.18
P-8979	1.4
P-8980	0.79
P-8981	0.04
P-8982	0.06
P-8983	0.65
P-8985	0.01
P-8986	0.01
P-8988	1.01
P-899	0.06
P-8990	0.07
P-8991	0.11
P-8992	0.04
P-8993	0.1
P-8995	0.1
P-8996	0.01
P-8997	0.02
P-8999	0.08
P-90	0.1
P-900	0.02
P-9000	0.11
P-9001	0.09
P-9002	0.19
P-9007	0.15
P-9009	1.17
P-9011	0.02
P-9012	0.01
P-9013	0.05
P-9014	0.09
P-9015	0.03
P-9016	0.11
P-9017(1)	0.99
P-902	0.01
P-9020	0.52
P-9023	0.12
P-9026	0.1
P-9031(1)	0.5
P-9031(2)	0.6

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-9033	0.04	P-9033	0.63	P-9033	0.14
P-9034(1)	0.07	P-9034(1)	1.15	P-9034(1)	0.22
P-9034(2)	0.07	P-9034(2)	0.58	P-9034(2)	0.64
P-9035	0.01	P-9035	0.01	P-9035	0.03
P-9036	0.01	P-9036	0.02	P-9036	0.06
P-9038	0	P-9038	0	P-9038	0
P-9040	0.02	P-9040	0.01	P-9040	0.02
P-9041	4.9	P-9041	1.89	P-9041	2.66
P-9042	6.17	P-9042	2.2	P-9042	3.15
P-9043	0.07	P-9043	0.09	P-9043	0.13
P-9044(1)	0.19	P-9044(1)	0.09	P-9044(1)	0.05
P-9044(2)	0.19	P-9044(2)	0.09	P-9044(2)	0.05
P-9045	0	P-9045	0	P-9045	0
P-9046	0	P-9046	0.01	P-9046	0.01
P-9049 (1)	0.28	P-9049 (1)	0.53	P-9049 (1)	0.57
P-9049 (2)	0.01	P-9049 (2)	0.02	P-9049 (2)	0.02
P-905	0	P-905	0	P-905	0
P-9050	0	P-9050	0.1	P-9050	0.02
P-9051	0.44	P-9051	0.55	P-9051	0.53
P-9052 (1)	0.05	P-9052 (1)	0.09	P-9052 (1)	0.09
P-9052 (2)	0.58	P-9052 (2)	0.73	P-9052 (2)	0.71
P-9053	0.08	P-9053	0.15	P-9053	0.19
P-9054	0.03	P-9054	0.71	P-9054	0.93
P-9055	0.01	P-9055	0.02	P-9055	0.03
P-9056 (1)	0.07	P-9056 (1)	0.13	P-9056 (1)	0.14
P-9056 (2)	0.02	P-9056 (2)	0.03	P-9056 (2)	0.03
P-9057	0.59	P-9057	0	P-9057	0
P-9060	0.01	P-9060	0.01	P-9060	0.01
P-9061	0.05	P-9061	0.12	P-9061	0.15
P-9062	0.04	P-9062	0.12	P-9062	0.14
P-9063 (1)	0.01	P-9063 (1)	0.01	P-9063 (1)	0.01
P-9063 (2)	0	P-9063 (2)	0	P-9063 (2)	0
P-9064	0.03	P-9064	0.04	P-9064	0.13
P-9065	0.09	P-9065	0.13	P-9065	0.22
P-9067	0.06	P-9067	0.11	P-9067	0.1
P-9068	0.05	P-9068	0.1	P-9068	0.09
P-9069(1)	0.01	P-9069(1)	1.67	P-9069(1)	1.33
P-9069(2)	0.01	P-9069(2)	1.67	P-9069(2)	1.34
P-907	0.25	P-907	0.07	P-907	0.32
P-9070	0.01	P-9070	1.24	P-9070	1.14
P-9071	0.08	P-9071	0.16	P-9071	0.05
P-9074	0	P-9074	0	P-9074	0
P-9075	0.58	P-9075	0.72	P-9075	0.52
P-9076	0.58	P-9076	0.72	P-9076	0.52
P-9079 (1)	0.35	P-9079 (1)	0.45	P-9079 (1)	0.44
P-9079 (2)	0.29	P-9079 (2)	0.06	P-9079 (2)	0.05
P-9080	0.24	P-9080	0.16	P-9080	0.14
P-9082 (1)	0.3	P-9082 (1)	0.38	P-9082 (1)	0.37
P-9082 (2)	0.08	P-9082 (2)	0.15	P-9082 (2)	0.19
P-9085	0	P-9085	0	P-9085	0.07
P-9086	0.17	P-9086	0.21	P-9086	0.21
P-9087	0	P-9087	0	P-9087	0
P-9088 (1)	0.08	P-9088 (1)	0.1	P-9088 (1)	0.1
P-9088 (2)	0.03	P-9088 (2)	0.04	P-9088 (2)	0.04
P-9089	0.05	P-9089	0.04	P-9089	0.04
P-9090	2.9	P-9090	3.61	P-9090	1.93
P-9091 (1)	0.06	P-9091 (1)	0.07	P-9091 (1)	0.08
P-9091 (2)	0.14	P-9091 (2)	0.45	P-9091 (2)	0.18
P-9092	0.13	P-9092	0.32	P-9092	0.1
P-9094	0.02	P-9094	0.05	P-9094	0.04
P-9096 (1)	0.06	P-9096 (1)	0.07	P-9096 (1)	0.07
P-9096 (2)	0.07	P-9096 (2)	0.06	P-9096 (2)	0.06
P-9097	0.06	P-9097	0.14	P-9097	0.16
P-9098	0	P-9098	0	P-9098	0
P-9099	0.01	P-9099	0	P-9099	0.01
P-91	0.5	P-91	0.39	P-91	0.28
P-910	0.03	P-910	0.05	P-910	0.04
P-9100 (1)	0.06	P-9100 (1)	0.03	P-9100 (1)	0.04
P-9100 (2)	0.01	P-9100 (2)	0.01	P-9100 (2)	0.01
P-9101	0.02	P-9101	0.04	P-9101	0.01
P-9102	0.02	P-9102	0.05	P-9102	0.04

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-9103 (1)	0.03
P-9103 (2)	0
P-9104	1.25
P-9105	0.02
P-9106 (1)	0.03
P-9106 (2)	0.01
P-9108	0.04
P-9109	0.01
P-911	0.61
P-9110	0.04
P-9110(1)	0.01
P-9110(2)	0.01
P-9111	0.19
P-9112	0.4
P-9115 (1)	0.13
P-9115 (2)	0
P-9116	0
P-9117 (1)	0.01
P-9117 (2)	0.4
P-9118	0.63
P-9119	0.08
P-9122 (1)	1.31
P-9122 (2)	0
P-9123	1.31
P-9123(1)	0.07
P-9123(2)	0.06
P-9124	0.05
P-9126	0.01
P-9128	0
P-913	0
P-9131	8.07
P-9132	7.22
P-9133	0
P-9135	0.05
P-9136	0.03
P-9139	0.28
P-914 (1)	0.04
P-914 (2)	0.02
P-9143	0.25
P-9144(1)	0.52
P-9144(2)	0.52
P-9145	0.06
P-9146	0.03
P-9147	0.03
P-9148	0.01
P-9149	0.05
P-915 (1)	0.21
P-915 (2)	0.04
P-9150	0.03
P-9152	0.53
P-9155	1.61
P-9156	1.14
P-9160	0.09
P-9161	0.07
P-9162	0.01
P-9163	0
P-9164	0
P-9165	0.06
P-9166	0.04
P-9167	0.24
P-9168	0.1
P-9169	0.07
P-9171	0.01
P-9173	0.19
P-9174	0.16
P-9175 (1)	0.15
P-9175 (2)	0.04
P-9176	0.03
P-9178	0.05
P-9179	0.52
P-918	0.02

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-9103 (1)	0.04
P-9103 (2)	0.01
P-9104	4.21
P-9105	0.04
P-9106 (1)	0.03
P-9106 (2)	0.03
P-9108	0.02
P-9109	0.01
P-911	1.17
P-9110	0.02
P-9110(1)	0.01
P-9110(2)	0.01
P-9111	0.25
P-9112	0.51
P-9115 (1)	0.19
P-9115 (2)	0
P-9116	0
P-9117 (1)	0.01
P-9117 (2)	0.34
P-9118	0.53
P-9119	0.18
P-9122 (1)	2.04
P-9122 (2)	0
P-9123	1.99
P-9123(1)	0.14
P-9123(2)	0.12
P-9124	0.1
P-9126	0.01
P-9128	0.02
P-913	0.44
P-9131	0
P-9132	1.26
P-9133	0
P-9135	0.45
P-9136	0.32
P-9139	0.08
P-914 (1)	0.29
P-914 (2)	0.02
P-9143	0.45
P-9144(1)	0.33
P-9144(2)	0.33
P-9145	0.08
P-9146	0.06
P-9147	0.04
P-9148	0.02
P-9149	0.06
P-915 (1)	0.11
P-915 (2)	0.06
P-9150	0.04
P-9152	0.19
P-9155	0.41
P-9156	1.25
P-9160	0.05
P-9161	0.05
P-9162	0.01
P-9163	0
P-9164	0.01
P-9165	0.07
P-9166	0.03
P-9167	0.27
P-9168	0.12
P-9169	0.07
P-9171	0.01
P-9173	0.6
P-9174	0.44
P-9175 (1)	0.09
P-9175 (2)	0.04
P-9176	0.04
P-9178	0.04
P-9179	0.54
P-918	0.07

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-9103 (1)	0.03
P-9103 (2)	0.01
P-9104	1.98
P-9105	0.05
P-9106 (1)	0.02
P-9106 (2)	0.06
P-9108	0.02
P-9109	0.01
P-911	0.14
P-9110	0.02
P-9110(1)	0.01
P-9110(2)	0.01
P-9111	0.21
P-9112	0.38
P-9115 (1)	0.18
P-9115 (2)	0
P-9116	0
P-9117 (1)	0.01
P-9117 (2)	0.03
P-9118	0
P-9119	0.18
P-9122 (1)	3.92
P-9122 (2)	0
P-9123	3.87
P-9123(1)	0.15
P-9123(2)	0.13
P-9124	0.11
P-9126	0.01
P-9128	0.02
P-913	0.9
P-9131	0
P-9132	1.85
P-9133	0.25
P-9135	0.89
P-9136	0.32
P-9139	0.12
P-914 (1)	0.17
P-914 (2)	0.04
P-9143	0.71
P-9144(1)	0.68
P-9144(2)	0.68
P-9145	0.08
P-9146	0.06
P-9147	0.04
P-9148	0.02
P-9149	0.05
P-915 (1)	0.13
P-915 (2)	0.07
P-9150	0.03
P-9152	0.49
P-9155	1.13
P-9156	0.49
P-9160	0.06
P-9161	0.13
P-9162	0.02
P-9163	0.08
P-9164	0.07
P-9165	0.11
P-9166	0.03
P-9167	0.16
P-9168	0.08
P-9169	0.04
P-9171	0.01
P-9173	0.34
P-9174	0.33
P-9175 (1)	0.25
P-9175 (2)	0.03
P-9176	0.06
P-9178	0.03
P-9179	0.3
P-918	0.05

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-9180	0.51	P-9180	0.54	P-9180	0.3
P-9181	0.02	P-9181	0.1	P-9181	0.04
P-9183	0.17	P-9183	0.22	P-9183	0.06
P-9184	0.22	P-9184	0.33	P-9184	0.14
P-9185	0.15	P-9185	0.16	P-9185	0.35
P-9186	0.19	P-9186	0.19	P-9186	0.44
P-9187	0.03	P-9187	0.12	P-9187	0.07
P-9188	0.03	P-9188	0.14	P-9188	0.06
P-9189	0.08	P-9189	0.07	P-9189	0.06
P-9190	0.08	P-9190	0.07	P-9190	0.06
P-9191	0.05	P-9191	0.11	P-9191	0.13
P-9192	0.04	P-9192	0.04	P-9192	0.05
P-9193	0.01	P-9193	0.01	P-9193	0.01
P-9196	0	P-9196	0.01	P-9196	0.01
P-9197	0.02	P-9197	0.01	P-9197	0.03
P-9198	0.01	P-9198	0.01	P-9198	0.03
P-9199	0.02	P-9199	0.07	P-9199	0.07
P-9200	0.04	P-9200	0.11	P-9200	0.1
P-9202	0	P-9202	0	P-9202	0
P-9203	0.21	P-9203	0.26	P-9203	0.19
P-9204(1)(1)	0.22	P-9204(1)(1)	0.24	P-9204(1)(1)	0.17
P-9204(1)(2)	0.23	P-9204(1)(2)	0.25	P-9204(1)(2)	0.18
P-9204(2)	0.23	P-9204(2)	0.26	P-9204(2)	0.19
P-9205	0.21	P-9205	0	P-9205	0.01
P-9207	0	P-9207	0	P-9207	0.01
P-9209	0.02	P-9209	0.05	P-9209	0.1
P-9210	0.08	P-9210	0.09	P-9210	0.24
P-9211	0.04	P-9211	0.04	P-9211	0.06
P-9212	0.11	P-9212	0.11	P-9212	0.14
P-9213	0.14	P-9213	0.07	P-9213	0.24
P-9214	0.29	P-9214	0.16	P-9214	0.51
P-9216	0.02	P-9216	0.04	P-9216	0.03
P-9218	0.01	P-9218	0.04	P-9218	0.06
P-9220	0.29	P-9220	0.55	P-9220	0.76
P-9221	0	P-9221	0	P-9221	0
P-9222	0.28	P-9222	0.32	P-9222	1.49
P-9225	0.14	P-9225	0.09	P-9225	0.1
P-9226	0.05	P-9226	0.02	P-9226	0.02
P-9227	0.65	P-9227	0.8	P-9227	1.19
P-9228	0.75	P-9228	0.93	P-9228	1.37
P-923	0.01	P-923	0.02	P-923	0.02
P-9230	0.19	P-9230	0.07	P-9230	0.17
P-9235	1.18	P-9235	0.93	P-9235	1.08
P-9237	0.06	P-9237	0.44	P-9237	0.96
P-9238	2.71	P-9238	2.98	P-9238	0.92
P-9239	0.04	P-9239	0.05	P-9239	0.14
P-9240	0.03	P-9240	0.05	P-9240	0.05
P-9243	0.03	P-9243	0.07	P-9243	3.06
P-9244	0.02	P-9244	0.03	P-9244	2.66
P-9246	0	P-9246	0	P-9246	0
P-9247	0.06	P-9247	0.17	P-9247	0.41
P-9248	0.19	P-9248	0.35	P-9248	0.63
P-9249	0	P-9249	0	P-9249	0
P-9250	0	P-9250	0	P-9250	0
P-9252(1)	1.72	P-9252(1)	3.21	P-9252(1)	3.68
P-9252(2)	1.71	P-9252(2)	3.25	P-9252(2)	3.82
P-9254	0	P-9254	0	P-9254	0
P-9255(1)	0.64	P-9255(1)	0.33	P-9255(1)	0.24
P-9255(2)	0.64	P-9255(2)	0.33	P-9255(2)	0.24
P-9258	0.9	P-9258	0.29	P-9258	0.7
P-9259	0.03	P-9259	0.04	P-9259	0.21
P-9261	0.03	P-9261	0.13	P-9261	0.09
P-9262	0.08	P-9262	0.15	P-9262	0.22
P-9263	0	P-9263	0	P-9263	0
P-9264	0.15	P-9264	0.08	P-9264	0.19
P-9265	0.16	P-9265	0.24	P-9265	0.52
P-9266 (1)	0.08	P-9266 (1)	0.09	P-9266 (1)	0.25
P-9266 (2)	0.36	P-9266 (2)	0.49	P-9266 (2)	0.26
P-9268	0.55	P-9268	1.24	P-9268	0.6
P-9269	0.02	P-9269	0.08	P-9269	0.08
P-927	0.57	P-927	0.68	P-927	0.71

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-9270	0.03	P-9270	0.05	P-9270	0.05
P-9272	0.01	P-9272	0.01	P-9272	0.01
P-9273	0.23	P-9273	0.23	P-9273	0.12
P-9274	0	P-9274	0	P-9274	0
P-9275	0.01	P-9275	0.02	P-9275	0.02
P-9276	0.01	P-9276	0.01	P-9276	0.01
P-9277	0.01	P-9277	0.01	P-9277	0.01
P-9278	0.02	P-9278	0.04	P-9278	0.03
P-9279	0.01	P-9279	0.02	P-9279	0.04
P-9280	0.01	P-9280	0.01	P-9280	0.03
P-9281	0.4	P-9281	0.61	P-9281	0.75
P-9282	0.16	P-9282	0.24	P-9282	0.29
P-9283	0.11	P-9283	0.03	P-9283	0.04
P-9284	0.11	P-9284	0.04	P-9284	0.05
P-9285	0.04	P-9285	0.01	P-9285	0.01
P-9286	0.09	P-9286	0.03	P-9286	0.03
P-9288	0.03	P-9288	0.33	P-9288	0.37
P-9289	0.33	P-9289	0.18	P-9289	0.23
P-929	0.02	P-929	0.02	P-929	0.02
P-9290	0.06	P-9290	0.05	P-9290	0.05
P-9291	0.26	P-9291	0.2	P-9291	0.37
P-9292	0.1	P-9292	0.05	P-9292	0.09
P-9293	0.11	P-9293	0.24	P-9293	0.3
P-9294	0.09	P-9294	0.17	P-9294	0.21
P-9295	0.3	P-9295	0.03	P-9295	0.03
P-9297	0	P-9297	0.1	P-9297	0.01
P-9298 (1)	0.41	P-9298 (1)	0.32	P-9298 (1)	0.66
P-9298 (2)	0	P-9298 (2)	0.09	P-9298 (2)	0.01
P-9299	0.01	P-9299	0.01	P-9299	0.01
P-9300	0	P-9300	0	P-9300	0
P-9301	1.07	P-9301	1.16	P-9301	0.59
P-9302	0.36	P-9302	0.34	P-9302	0.56
P-9303	0.1	P-9303	0.02	P-9303	0.02
P-9304	0.04	P-9304	0.05	P-9304	0.03
P-9305	0.06	P-9305	0.12	P-9305	0.18
P-9306	0.04	P-9306	0.11	P-9306	0.09
P-9307	0.07	P-9307	0.19	P-9307	0.18
P-9311	0.01	P-9311	0.01	P-9311	0.01
P-9312	0.03	P-9312	0.05	P-9312	0.05
P-9314	0.01	P-9314	0.3	P-9314	0.36
P-9315	0.01	P-9315	0.03	P-9315	0.03
P-9316	0.12	P-9316	0.51	P-9316	0.31
P-9317	0	P-9317	0	P-9317	0
P-9318	0.17	P-9318	0.16	P-9318	0.15
P-9321	0.01	P-9321	0.02	P-9321	0.02
P-9322	0.03	P-9322	0.06	P-9322	0.07
P-9323	0.58	P-9323	0.72	P-9323	0.52
P-9324	0.58	P-9324	0.72	P-9324	0.52
P-9326	0.01	P-9326	0.01	P-9326	0.01
P-9327	0	P-9327	0.08	P-9327	0.43
P-9331	0.02	P-9331	0.03	P-9331	0.03
P-9332	0.01	P-9332	0.02	P-9332	0.02
P-9335	0.12	P-9335	0.06	P-9335	0.19
P-9337	0	P-9337	0	P-9337	0
P-9338	0	P-9338	0	P-9338	0.06
P-9339	0.09	P-9339	0.05	P-9339	0.04
P-9340	0.13	P-9340	0.08	P-9340	0.07
P-9341	0.47	P-9341	0.13	P-9341	0.23
P-9342	0.46	P-9342	0.12	P-9342	0.22
P-9343	3.02	P-9343	2.64	P-9343	0.36
P-9346	0.04	P-9346	0.04	P-9346	0.06
P-9348	0.1	P-9348	0.07	P-9348	0.03
P-9349	0	P-9349	0	P-9349	0
P-9350	0	P-9350	0	P-9350	0
P-9351	0	P-9351	0.01	P-9351	0
P-9352	0.01	P-9352	0.02	P-9352	0.02
P-9353	0.15	P-9353	0.19	P-9353	0.27
P-9354	0.09	P-9354	0.11	P-9354	0.18
P-9355	0.9	P-9355	0.62	P-9355	0.55
P-9360	0.01	P-9360	0.03	P-9360	0.16
P-9361	0.25	P-9361	0.14	P-9361	0.1

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-9362(1)	0.3	P-9362(1)	0.1	P-9362(1)	0.24
P-9362(2)	0.3	P-9362(2)	0.08	P-9362(2)	0.2
P-9366	0.77	P-9366	0.37	P-9366	0.26
P-9367	0.3	P-9367	0.17	P-9367	0.23
P-9368	0.14	P-9368	0.05	P-9368	0.06
P-9369	0.07	P-9369	0.06	P-9369	0.06
P-937	0.06	P-937	0.03	P-937	0.03
P-9372	0.4	P-9372	0.25	P-9372	0.19
P-9374	0.1	P-9374	0.07	P-9374	0.08
P-9375	0.17	P-9375	0.11	P-9375	0.18
P-9376	0.21	P-9376	0.23	P-9376	0.03
P-9377	0	P-9377	0	P-9377	0
P-9383	0.01	P-9383	0.21	P-9383	0.02
P-9385	0.81	P-9385	0.88	P-9385	0.47
P-9386	0.9	P-9386	0.93	P-9386	0.46
P-9387 (1)	0.01	P-9387 (1)	0.02	P-9387 (1)	0.02
P-9387 (2)	0.19	P-9387 (2)	0.05	P-9387 (2)	0.06
P-9388	0.19	P-9388	0.06	P-9388	0.05
P-939	0.09	P-939	0.06	P-939	0.06
P-9391	0.02	P-9391	0.12	P-9391	0.3
P-9392	0.13	P-9392	0.12	P-9392	0.05
P-9394	0.17	P-9394	0.08	P-9394	0.23
P-9395	2.39	P-9395	1.33	P-9395	3.42
P-9397	0.25	P-9397	0.3	P-9397	0.52
P-9398	0.25	P-9398	0.13	P-9398	0.43
P-9399	0.02	P-9399	0.05	P-9399	0.04
P-94	0.83	P-94	0.44	P-94	0.36
P-940	0.04	P-940	0.06	P-940	0.04
P-9400	0	P-9400	0.01	P-9400	0
P-9401	0.05	P-9401	0.04	P-9401	0.04
P-9402	0.44	P-9402	0.21	P-9402	0.29
P-9403	0.2	P-9403	0.2	P-9403	0.29
P-9404	0.28	P-9404	0.27	P-9404	0.41
P-9405	0.01	P-9405	0.01	P-9405	0.01
P-9406	0.02	P-9406	0.02	P-9406	0.08
P-9406(1)	0.01	P-9406(1)	0.01	P-9406(1)	0.01
P-9406(2)	0.01	P-9406(2)	0.01	P-9406(2)	0.01
P-9407	0.04	P-9407	0.11	P-9407	0.13
P-9408	0.06	P-9408	0.16	P-9408	0.19
P-9410	0.12	P-9410	0.25	P-9410	0.42
P-9411	0.35	P-9411	0.72	P-9411	0.55
P-9414	0.15	P-9414	0.41	P-9414	0.27
P-9415	0.07	P-9415	0.08	P-9415	0.27
P-9416	0.04	P-9416	0.04	P-9416	0.14
P-9417	0.06	P-9417	0.05	P-9417	0.06
P-9418(1)	0.16	P-9418(1)	0.05	P-9418(1)	0.04
P-9418(2)	0.23	P-9418(2)	0.13	P-9418(2)	0.11
P-9419	0.69	P-9419	0.21	P-9419	0.23
P-942	0.47	P-942	0.22	P-942	0.22
P-9420	0.47	P-9420	0.2	P-9420	0.22
P-9422	0.4	P-9422	0.37	P-9422	0.51
P-9423	0.01	P-9423	0.05	P-9423	0.06
P-9425	0.04	P-9425	0.03	P-9425	0.04
P-9426	0.03	P-9426	0.03	P-9426	0.03
P-9427	0.07	P-9427	0.06	P-9427	0.06
P-9428	0.16	P-9428	0.09	P-9428	0.1
P-9429	0.07	P-9429	0.05	P-9429	0.11
P-943	0.35	P-943	0.36	P-943	0.36
P-9430	0.06	P-9430	0.04	P-9430	0.1
P-9433	0.11	P-9433	0.12	P-9433	0.08
P-9435	0.03	P-9435	0.31	P-9435	0.48
P-9436	0.04	P-9436	0.33	P-9436	0.51
P-9437(1)	0.13	P-9437(1)	0.36	P-9437(1)	1.48
P-9437(2)	0.13	P-9437(2)	0.36	P-9437(2)	1.48
P-9438	0.17	P-9438	0.36	P-9438	0.88
P-9439	0.04	P-9439	0.03	P-9439	0.03
P-944 (1)	0.44	P-944 (1)	0.54	P-944 (1)	0.56
P-944 (2)	0.01	P-944 (2)	0.04	P-944 (2)	0.04
P-9440	0.05	P-9440	0.05	P-9440	0.05
P-9441	0.23	P-9441	0.06	P-9441	0.02
P-9443	0.04	P-9443	0.11	P-9443	0.11

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-9444	0.07
P-9445	0
P-9446	0
P-9447	0
P-9448	0
P-9449	0.19
P-945 (1)	0.57
P-945 (2)	0.14
P-9450	0.25
P-9451	0
P-9452	0
P-9454	0.04
P-9455	0.05
P-9456	0.06
P-9457	0.03
P-9458	0.14
P-9461	0.07
P-9462(1)(1)	0.02
P-9462(1)(2)	0.02
P-9462(2)	0.02
P-9465	0.3
P-9466	0.26
P-9472	0.07
P-9474	0.02
P-9475	1.23
P-9476	0.94
P-9478	0.01
P-9479	0.1
P-9480	0.13
P-9482	0.26
P-9483	0
P-9485(1)	0.3
P-9485(2)	0.35
P-9486	0.24
P-9488	0.01
P-9489	0.02
P-9490 (1)	0
P-9490 (2)	0.16
P-9495	0.01
P-9496	0.01
P-9497	0.06
P-9498	0.07
P-95	0.01
P-9501(1)	0.43
P-9501(2)	0.44
P-9502	0
P-9505	0.09
P-9506	0.23
P-9507	0.01
P-9511	0.04
P-9512	0.06
P-9513	0.01
P-9514	0.01
P-9517	0.24
P-9518	0.3
P-9519 (1)	0.17
P-9519 (2)	0.43
P-9521	0.04
P-9522	0.02
P-9524	0.11
P-9525 (1)	0.01
P-9525 (2)	0.01
P-9526	0
P-9528	0.05
P-9529 (1)	0.01
P-9529 (2)	0.34
P-9530	0.21
P-9532 (1)	0.02
P-9532 (2)	0.13
P-9533	0.13
P-9534	0.11

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-9444	0.2
P-9445	0
P-9446	0
P-9447	0
P-9448	0
P-9449	0.19
P-945 (1)	0.63
P-945 (2)	0.46
P-9450	0.25
P-9451	0
P-9452	0
P-9454	0.02
P-9455	0.07
P-9456	0.14
P-9457	0.03
P-9458	0.22
P-9461	0.06
P-9462(1)(1)	0.03
P-9462(1)(2)	0.03
P-9462(2)	0.03
P-9465	0.4
P-9466	0.34
P-9472	0.19
P-9474	0.14
P-9475	0.35
P-9476	0.14
P-9478	0.01
P-9479	0.25
P-9480	0.32
P-9482	0.14
P-9483	0.55
P-9485(1)	0.14
P-9485(2)	0.15
P-9486	0.11
P-9488	0.03
P-9489	0.05
P-9490 (1)	0.01
P-9490 (2)	0.23
P-9495	0.01
P-9496	0.01
P-9497	0.08
P-9498	0.08
P-95	0.01
P-9501(1)	0.1
P-9501(2)	0.1
P-9502	0
P-9505	0
P-9506	0.01
P-9507	0.1
P-9511	0.06
P-9512	0.08
P-9513	0.02
P-9514	0.02
P-9517	0.25
P-9518	0.85
P-9519 (1)	0.66
P-9519 (2)	0.15
P-9521	0.06
P-9522	0.03
P-9524	0.02
P-9525 (1)	0.01
P-9525 (2)	0.01
P-9526	0
P-9528	0.06
P-9529 (1)	0.01
P-9529 (2)	0.33
P-9530	0.16
P-9532 (1)	0.03
P-9532 (2)	0.2
P-9533	0.03
P-9534	0.03

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-9444	0.18
P-9445	0
P-9446	0
P-9447	0
P-9448	0
P-9449	0.28
P-945 (1)	0.64
P-945 (2)	0.36
P-9450	0.37
P-9451	0
P-9452	0
P-9454	0.02
P-9455	0.06
P-9456	0.13
P-9457	0.07
P-9458	0.47
P-9461	0.08
P-9462(1)(1)	0.03
P-9462(1)(2)	0.03
P-9462(2)	0.03
P-9465	0.39
P-9466	0.33
P-9472	0.15
P-9474	0.28
P-9475	0.13
P-9476	0.14
P-9478	0.01
P-9479	0.24
P-9480	0.3
P-9482	0.2
P-9483	0.91
P-9485(1)	0.09
P-9485(2)	0.11
P-9486	0.09
P-9488	0.02
P-9489	0.03
P-9490 (1)	0.01
P-9490 (2)	0.4
P-9495	0.02
P-9496	0.02
P-9497	0.1
P-9498	0.04
P-95	0.01
P-9501(1)	0.12
P-9501(2)	0.13
P-9502	0
P-9505	0.01
P-9506	0.01
P-9507	0.12
P-9511	0.06
P-9512	0.02
P-9513	0.08
P-9514	0.12
P-9517	0.36
P-9518	1.02
P-9519 (1)	0.8
P-9519 (2)	0.04
P-9521	0.12
P-9522	0.06
P-9524	0.06
P-9525 (1)	0.01
P-9525 (2)	0.01
P-9526	0
P-9528	0.09
P-9529 (1)	0.01
P-9529 (2)	0.15
P-9530	0.06
P-9532 (1)	0.03
P-9532 (2)	0.21
P-9533	0.06
P-9534	0.06

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-9535	0.09
P-9536	0
P-9537	0.58
P-9539	0.01
P-9540	0
P-9541	0.01
P-9542	0
P-9543	0.18
P-9544	0.13
P-9545	0.02
P-9546	0
P-9547	0.01
P-9548 (1)	0.01
P-9548 (2)	0.01
P-9549	0.76
P-955	0
P-9551(1)	0.04
P-9551(2)	0.15
P-9552	0.22
P-9553	0.01
P-9554 (1)	0.01
P-9554 (2)	0.46
P-9555	0.01
P-9556	0
P-9558	0.67
P-9559	0.01
P-9560	0.02
P-9561	0.8
P-9562	0.76
P-9563	0.01
P-9568	0.09
P-9569	0.26
P-957	0.04
P-9570	0
P-9572	0.04
P-9574	0
P-9576	0.06
P-9577	0.27
P-9579	0.08
P-958	0.08
P-9580	0.1
P-9582	0.07
P-9584	2.56
P-9585	0.01
P-9586	0.01
P-9587	0.02
P-9588	0.16
P-959	0.04
P-9591	0.16
P-9592	0.16
P-9593	0.01
P-9594	0.01
P-9595	0.17
P-9596	0.12
P-9597	0
P-9598	0
P-9600	0.08
P-9601	0
P-9603	0.01
P-9605	0.03
P-9606	0.02
P-9607	8.07
P-9609	0.05
P-961	0.08
P-9612	0.1
P-9613	0.01
P-9614	0.01
P-9615	0
P-9616	0.01
P-9617(1)	0
P-9617(2)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-9535	0.11
P-9536	0
P-9537	0.61
P-9539	0.01
P-9540	0.01
P-9541	0.01
P-9542	0
P-9543	0.09
P-9544	0.03
P-9545	0.03
P-9546	0
P-9547	0.01
P-9548 (1)	0.01
P-9548 (2)	0.01
P-9549	0.43
P-955	0
P-9551(1)	0.29
P-9551(2)	0.32
P-9552	0.33
P-9553	0.03
P-9554 (1)	0.01
P-9554 (2)	0.48
P-9555	0.03
P-9556	0
P-9558	0.63
P-9559	0.02
P-9560	0.04
P-9561	0.64
P-9562	0.54
P-9563	0.01
P-9568	0.19
P-9569	0.34
P-957	0.09
P-9570	0
P-9572	0.11
P-9574	0.15
P-9576	0.05
P-9577	0.23
P-9579	0.25
P-958	0.09
P-9580	0.28
P-9582	0.1
P-9584	2.25
P-9585	0.01
P-9586	0.01
P-9587	0.02
P-9588	0.15
P-959	0.02
P-9591	0.32
P-9592	0.32
P-9593	0.01
P-9594	0.03
P-9595	0.25
P-9596	0.33
P-9597	0
P-9598	0
P-9600	0.11
P-9601	0
P-9603	0.02
P-9605	0.29
P-9606	0.3
P-9607	6.36
P-9609	0.3
P-961	0.06
P-9612	0.11
P-9613	0.02
P-9614	0.01
P-9615	0.01
P-9616	0.02
P-9617(1)	0.22
P-9617(2)	0.22

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-9535	0.09
P-9536	0
P-9537	0.08
P-9539	0.01
P-9540	0.01
P-9541	0.01
P-9542	0
P-9543	0.09
P-9544	0.03
P-9545	0.03
P-9546	0
P-9547	0.01
P-9548 (1)	0.01
P-9548 (2)	0.01
P-9549	0.46
P-955	0
P-9551(1)	0.16
P-9551(2)	0.16
P-9552	0.19
P-9553	0.2
P-9554 (1)	0.01
P-9554 (2)	0.11
P-9555	0.03
P-9556	0
P-9558	0.25
P-9559	0.02
P-9560	0.04
P-9561	0.66
P-9562	0.59
P-9563	0.01
P-9568	0.15
P-9569	0.38
P-957	0.09
P-9570	0
P-9572	0.13
P-9574	0.16
P-9576	0.03
P-9577	0.25
P-9579	0.24
P-958	0.08
P-9580	0.26
P-9582	0.1
P-9584	3.58
P-9585	0.01
P-9586	0.01
P-9587	0.02
P-9588	0.13
P-959	0.05
P-9591	0.18
P-9592	0.18
P-9593	0.01
P-9594	0.03
P-9595	0.23
P-9596	0.31
P-9597	0
P-9598	0
P-9600	0.19
P-9601	0
P-9603	0.01
P-9605	0.2
P-9606	0.21
P-9607	12.92
P-9609	0.35
P-961	0.03
P-9612	0.17
P-9613	0.02
P-9614	0.01
P-9615	0.01
P-9616	0.02
P-9617(1)	0.11
P-9617(2)	0.11

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-9619	0.01
P-9621	0.04
P-9622 (1)	0.09
P-9622 (2)	0.04
P-9623	0.01
P-9624	0.01
P-9625	0.15
P-9626	0.37
P-9627	0.04
P-9628(1)	0.05
P-9628(2)(1)	0.05
P-9628(2)(2)	0.05
P-963	0.02
P-9630	0.01
P-9631	0.07
P-9632	0.05
P-9634	0.01
P-9635	0.04
P-9636	0.12
P-9640	0.14
P-9641	0.02
P-9642	0.04
P-9643	0.32
P-9644	0
P-9645	0.2
P-9646	0.39
P-9647	3.02
P-9648	3.02
P-9649	0.04
P-965	0.01
P-9650	0.01
P-9651	0.31
P-9652	0.44
P-9654	0.03
P-9655	0.08
P-9656	0
P-9657	0.01
P-9661	0.09
P-9662	0.1
P-9663	0.01
P-9664	0
P-9665	0.17
P-9669	0.13
P-9671	0.44
P-9672	0.6
P-9673	2.27
P-9674	1.89
P-9675 (1)	0.16
P-9675 (2)	0.01
P-9676	0.01
P-9677	0.14
P-968	0.43
P-9681 (1)	0.01
P-9681 (2)	0.17
P-9682 (1)	0.01
P-9682 (2)	0.22
P-9683 (1)	0.02
P-9683 (2)	0.01
P-9684	0.06
P-9685	0.01
P-9686	0
P-9687	0.29
P-9688	0.01
P-9689	0.12
P-9690	0
P-9693	0.06
P-9694	0.06
P-9699	0.02
P-970 (1)	0.49
P-970 (2)	0.02
P-9700	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-9619	0.03
P-9621	0.03
P-9622 (1)	0.05
P-9622 (2)	0.03
P-9623	0
P-9624	0
P-9625	0.07
P-9626	0.18
P-9627	0.04
P-9628(1)	0.05
P-9628(2)(1)	0.05
P-9628(2)(2)	0.05
P-963	0.02
P-9630	0.03
P-9631	0.1
P-9632	0.08
P-9634	0.02
P-9635	0.02
P-9636	0.08
P-9640	0.22
P-9641	0.07
P-9642	0.1
P-9643	0.17
P-9644	0
P-9645	0.12
P-9646	0.08
P-9647	2.64
P-9648	2.64
P-9649	0.08
P-965	0.08
P-9650	0.02
P-9651	0.06
P-9652	0.12
P-9654	0.03
P-9655	0.07
P-9656	0
P-9657	0.17
P-9661	0.35
P-9662	0.2
P-9663	0.01
P-9664	0.01
P-9665	0.2
P-9669	0.39
P-9671	0.47
P-9672	0.76
P-9673	2.46
P-9674	2
P-9675 (1)	0.24
P-9675 (2)	0.04
P-9676	0.02
P-9677	0.95
P-968	1.92
P-9681 (1)	0.02
P-9681 (2)	0.36
P-9682 (1)	0.02
P-9682 (2)	0.33
P-9683 (1)	0.03
P-9683 (2)	0.07
P-9684	0.09
P-9685	0.02
P-9686	0
P-9687	0.1
P-9688	0.02
P-9689	0.05
P-9690	0.01
P-9693	0.15
P-9694	0.15
P-9699	0.12
P-970 (1)	2.09
P-970 (2)	0.03
P-9700	0.02

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-9619	0.2
P-9621	0.03
P-9622 (1)	0.1
P-9622 (2)	0.03
P-9623	0
P-9624	0
P-9625	0.02
P-9626	0
P-9627	0.05
P-9628(1)	0.04
P-9628(2)(1)	0.04
P-9628(2)(2)	0.05
P-963	0.02
P-9630	0.04
P-9631	0.1
P-9632	0.12
P-9634	0.02
P-9635	0.05
P-9636	0.14
P-9640	0.1
P-9641	0.05
P-9642	0.13
P-9643	0.44
P-9644	0
P-9645	0.12
P-9646	0.05
P-9647	0.36
P-9648	0.36
P-9649	0.02
P-965	0.08
P-9650	0.02
P-9651	0.04
P-9652	0.1
P-9654	0.04
P-9655	0.1
P-9656	0
P-9657	0.02
P-9661	0.39
P-9662	0.27
P-9663	0.03
P-9664	0.01
P-9665	0.49
P-9669	0.88
P-9671	0.72
P-9672	0.81
P-9673	0.45
P-9674	0.93
P-9675 (1)	0.52
P-9675 (2)	0.03
P-9676	0.03
P-9677	0.12
P-968	1.84
P-9681 (1)	0.03
P-9681 (2)	0.18
P-9682 (1)	0.04
P-9682 (2)	0.09
P-9683 (1)	0.04
P-9683 (2)	0.06
P-9684	0.08
P-9685	0.02
P-9686	0.01
P-9687	0.13
P-9688	0.02
P-9689	0.07
P-9690	0.01
P-9693	0.18
P-9694	0.18
P-9699	0.06
P-970 (1)	1.99
P-970 (2)	0.04
P-9700	0.02

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
P-9701	0.54
P-9702	0
P-9703	0.1
P-9704(1)	0.11
P-9704(2)	0.07
P-9705	0.01
P-9707	0
P-9708	0
P-9709 (1)	0.11
P-9709 (2)	0.83
P-971	0.05
P-9710	0.67
P-9713	0.15
P-9714	0.04
P-9715	0.24
P-9716	0.15
P-9718	0
P-9719	1.99
P-972	0.35
P-9720	2
P-9721	0.18
P-9722	0.19
P-9723	0.02
P-9724 (1)	0.61
P-9724 (2)	0.03
P-9725	0.67
P-9726 (1)	0.79
P-9726 (2)	0.07
P-9727 (1)	0.79
P-9727 (2)	0.29
P-9728	1.02
P-9728(1)	0.3
P-9728(2)	0.3
P-9730	0.01
P-9733	0.18
P-9734 (1)	0.13
P-9734 (2)	0.05
P-9736 (1)	0.01
P-9736 (2)	0
P-9738	0.02
P-9741 (1)	0.06
P-9741 (2)	0.07
P-9743	0.1
P-9744	0.15
P-9744(1)	0.12
P-9744(2)	0.12
P-9745	0
P-9747	0.07
P-9748 (1)	0.12
P-9748 (2)	0.08
P-9749	0.01
P-975	0.01
P-9750	0
P-9751	0.03
P-9754	0
P-9755(1)	0.01
P-9755(2)	0.07
P-9756 (1)	0.38
P-9756 (2)	0.09
P-9757 (1)	0.13
P-9757 (2)	1.14
P-9758 (1)	0.12
P-9758 (2)	0.84
P-9759	0.1
P-9760	0.41
P-9762	0.04
P-9764 (1)	0.2
P-9764 (2)	0.6
P-9765	0.1
P-9766	0.19
P-9767	0.03

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-9701	0.24
P-9702	0
P-9703	0.08
P-9704(1)	0.08
P-9704(2)	0.05
P-9705	0.01
P-9707	0.01
P-9708	0.01
P-9709 (1)	0.07
P-9709 (2)	0.66
P-971	0.12
P-9710	0.54
P-9713	0.24
P-9714	0.19
P-9715	0.42
P-9716	0.26
P-9718	0
P-9719	1.18
P-972	2.1
P-9720	1.2
P-9721	0.04
P-9722	0.03
P-9723	0.02
P-9724 (1)	0.3
P-9724 (2)	0.03
P-9725	0.35
P-9726 (1)	0.49
P-9726 (2)	0.09
P-9727 (1)	0.49
P-9727 (2)	0.4
P-9728	0.76
P-9728(1)	0.41
P-9728(2)	0.41
P-9730	0.01
P-9733	0.12
P-9734 (1)	0.1
P-9734 (2)	0.03
P-9736 (1)	0.02
P-9736 (2)	0
P-9738	0.02
P-9741 (1)	0.09
P-9741 (2)	0.06
P-9743	0.06
P-9744	0.13
P-9744(1)	0.09
P-9744(2)	0.09
P-9745	0
P-9747	0.14
P-9748 (1)	0.06
P-9748 (2)	0.05
P-9749	0.01
P-975	0.05
P-9750	0.01
P-9751	0.06
P-9754	0
P-9755(1)	0.08
P-9755(2)	0.07
P-9756 (1)	0.31
P-9756 (2)	0.02
P-9757 (1)	0.21
P-9757 (2)	0.87
P-9758 (1)	0.22
P-9758 (2)	0.67
P-9759	0.06
P-9760	0.29
P-9762	0.04
P-9764 (1)	0.15
P-9764 (2)	0.23
P-9765	0.07
P-9766	0.07
P-9767	0.07

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
P-9701	0.26
P-9702	0
P-9703	0.09
P-9704(1)	0.1
P-9704(2)	0.07
P-9705	0.01
P-9707	0.01
P-9708	0.01
P-9709 (1)	0.05
P-9709 (2)	1.86
P-971	0.09
P-9710	1.72
P-9713	3.21
P-9714	2.71
P-9715	0.18
P-9716	0.11
P-9718	0
P-9719	2.41
P-972	1.82
P-9720	2.43
P-9721	0.02
P-9722	0.03
P-9723	0.01
P-9724 (1)	0.79
P-9724 (2)	0.01
P-9725	0.7
P-9726 (1)	0.6
P-9726 (2)	0.03
P-9727 (1)	0.6
P-9727 (2)	0.52
P-9728	0.28
P-9728(1)	0.51
P-9728(2)	0.51
P-9730	0.01
P-9733	0.11
P-9734 (1)	0.02
P-9734 (2)	0.03
P-9736 (1)	0.01
P-9736 (2)	0
P-9738	0.02
P-9741 (1)	0.26
P-9741 (2)	0.09
P-9743	0.01
P-9744	0.09
P-9744(1)	0.03
P-9744(2)	0.03
P-9745	0
P-9747	0.07
P-9748 (1)	0.02
P-9748 (2)	0.06
P-9749	0.01
P-975	0.04
P-9750	0
P-9751	0.06
P-9754	0
P-9755(1)	0.12
P-9755(2)	0.08
P-9756 (1)	0.03
P-9756 (2)	0.01
P-9757 (1)	0.66
P-9757 (2)	2.19
P-9758 (1)	0.64
P-9758 (2)	1.87
P-9759	0.17
P-9760	0.77
P-9762	0.05
P-9764 (1)	0.39
P-9764 (2)	0.36
P-9765	0.2
P-9766	0.19
P-9767	0.05

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
P-9768	0.04	P-9768	0.03	P-9768	0.03
P-9769	0	P-9769	0	P-9769	0
P-9770	0.04	P-9770	0.05	P-9770	0.37
P-9771	2.05	P-9771	1.06	P-9771	0.63
P-9772	2.05	P-9772	1.06	P-9772	0.63
P-9773	0.11	P-9773	0.07	P-9773	0.06
P-9773(1)	0.11	P-9773(1)	0.07	P-9773(1)	0.08
P-9773(2)	0.11	P-9773(2)	0.07	P-9773(2)	0.08
P-9774	0	P-9774	0	P-9774	0
P-9775	0.18	P-9775	0.24	P-9775	0.22
P-9776	0.05	P-9776	0.17	P-9776	0.35
P-9779	0.19	P-9779	0.11	P-9779	0.13
P-9780	0.15	P-9780	0.06	P-9780	0.08
P-9781	0.12	P-9781	0.34	P-9781	0.45
P-9782	0.16	P-9782	0.41	P-9782	0.48
P-9783	2.86	P-9783	2.36	P-9783	3.65
P-9784	2.51	P-9784	2.14	P-9784	3.38
P-9785 (1)	0	P-9785 (1)	0	P-9785 (1)	0
P-9785 (2)	0.02	P-9785 (2)	0.19	P-9785 (2)	0.23
P-9786 (1)	0	P-9786 (1)	0	P-9786 (1)	0
P-9786 (2)	0.01	P-9786 (2)	0.02	P-9786 (2)	0.02
P-9787	0.76	P-9787	0.26	P-9787	0.7
P-9790	0.21	P-9790	0.08	P-9790	0.1
P-9791 (1)	0.09	P-9791 (1)	0.06	P-9791 (1)	0.05
P-9791 (2)	0.07	P-9791 (2)	0.39	P-9791 (2)	0.38
P-9792	0.07	P-9792	0.05	P-9792	0.05
P-9794	0.47	P-9794	0.45	P-9794	0.1
P-9795	0	P-9795	0	P-9795	0
P-9795(1)	1.9	P-9795(1)	2.04	P-9795(1)	3.56
P-9795(2)	2.53	P-9795(2)	1.6	P-9795(2)	3.62
P-9796	2.34	P-9796	1.48	P-9796	3.38
P-9797	8.02	P-9797	3.5	P-9797	4.59
P-9798	8.02	P-9798	3.5	P-9798	4.59
P-9799 (1)	0.12	P-9799 (1)	0.09	P-9799 (1)	0.07
P-9799 (2)	0.12	P-9799 (2)	0.11	P-9799 (2)	0.13
P-9801	3.46	P-9801	0	P-9801	0.78
P-9802	0.06	P-9802	0	P-9802	0.78
P-9803	0.15	P-9803	0.4	P-9803	0.67
P-9804	0.34	P-9804	0.62	P-9804	0.21
P-9806	0	P-9806	0.01	P-9806	0.01
P-9807	0.01	P-9807	0.01	P-9807	0.01
P-9809	0.1	P-9809	0.07	P-9809	0.06
P-9810 (1)	0.14	P-9810 (1)	0.1	P-9810 (1)	0.09
P-9810 (2)	0.12	P-9810 (2)	0	P-9810 (2)	0
P-9811	0.06	P-9811	0.07	P-9811	0.15
P-9812	0.06	P-9812	0.05	P-9812	0.14
P-9815	1.02	P-9815	0.19	P-9815	0.51
P-9816	1.86	P-9816	0.43	P-9816	1.05
P-9817	0.02	P-9817	0.01	P-9817	0.01
P-9819	3.37	P-9819	1.66	P-9819	2.84
P-9821	0.02	P-9821	0.03	P-9821	0.05
P-9822	0.02	P-9822	0.04	P-9822	0.06
P-9823	0.18	P-9823	0.92	P-9823	0.33
P-9824	0.12	P-9824	0.34	P-9824	0.44
P-9827	0.18	P-9827	0.31	P-9827	0.39
P-9828	0.16	P-9828	0.28	P-9828	0.31
P-9829(2)	1.43	P-9829(2)	1.17	P-9829(2)	1.2
P-9832	0.11	P-9832	0.09	P-9832	0.06
P-9834	0.34	P-9834	0.35	P-9834	0.36
P-9838	0.07	P-9838	0.05	P-9838	0.02
P-9839	0.02	P-9839	0	P-9839	0.01
P-9842	0	P-9842	0.78	P-9842	0
P-9843(1)	0.01	P-9843(1)	0.01	P-9843(1)	0.01
P-9843(2)	0.06	P-9843(2)	0.07	P-9843(2)	0.02
P-9846	0.23	P-9846	0.68	P-9846	0.8
P-9848	0.06	P-9848	0.04	P-9848	0.04
P-9849(1)	0.06	P-9849(1)	0.06	P-9849(1)	0.04
P-9849(2)	0.06	P-9849(2)	0.06	P-9849(2)	0.04
P-9852 (1)	0.07	P-9852 (1)	0.06	P-9852 (1)	0.06
P-9852 (2)	0.01	P-9852 (2)	0.01	P-9852 (2)	0.01
P-9853	0.12	P-9853	0.2	P-9853	0.25

EXISTING SYSTEM

Pipe Label	Total Volume (MG)
P-9854	0.71
P-9855	0
P-9857 (1)	0.47
P-9857 (2)	0.37
P-9858 (1)	0.48
P-9858 (2)	0.21
P-9859 (1)	0.43
P-9859 (2)	0.43
P-986	0.07
P-9860 (1)	0.39
P-9860 (2)	0.43
P-9861 (1)	0.5
P-9861 (2)	2.21
P-9862	0.13
P-9863 (1)	0.12
P-9863 (2)	0.6
P-9864	0.91
P-9868	0.1
P-9869	0.05
P-9870	0.13
P-9872	0.07
P-9875	0.67
P-9877	0.02
P-9878	0.02
P-9879(1)	0.22
P-9879(2)	0.22
P-9880	0.11
P-9883	0.01
P-9884	0
P-9885	0.5
P-9885(1)	0.92
P-9885(2)(1)	0.77
P-9885(2)(2)(1)	0.77
P-9885(2)(2)(2)	0.92
P-9886 (1)	0.71
P-9886 (2)	1.01
P-9887	0.2
P-9889	0.01
P-9890 (1)	0.84
P-9890 (2)	0.05
P-9891	0.45
P-9892 (1)	0.67
P-9892 (2)	1.6
P-9893 (1)	0.67
P-9893 (2)	0.01
P-9894 (1)	0.66
P-9894 (2)	0.01
P-9895 (1)	0.66
P-9895 (2)	0.05
P-9896 (1)	1.87
P-9896 (2)	0.01
P-9897 (1)	1.88
P-9897 (2)	0.07
P-9898	0.04
P-9899	0.14
P-9900 (1)	0.04
P-9900 (2)	0.12
P-9901 (1)	0.16
P-9901 (2)	0
P-9905 (1)	0
P-9905 (2)	0
P-9906	0
P-9907	0.01
P-9908	0.61
P-9909	0.02
P-991	0.03
P-9911	0.35
P-9914	0.03
P-9916	0.08
P-9918	0.08
P-9919	0.21

2030 SYSTEM

Pipe Label	Total Volume (MG)
P-9854	0.42
P-9855	0
P-9857 (1)	0.24
P-9857 (2)	0.47
P-9858 (1)	0.24
P-9858 (2)	0.27
P-9859 (1)	0.25
P-9859 (2)	1.01
P-986	0.05
P-9860 (1)	0.26
P-9860 (2)	1.01
P-9861 (1)	0.25
P-9861 (2)	0.99
P-9862	0.09
P-9863 (1)	0.07
P-9863 (2)	0.29
P-9864	0.29
P-9868	0.05
P-9869	0.03
P-9870	0.03
P-9872	0.08
P-9875	1.46
P-9877	0.02
P-9878	0.02
P-9879(1)	0.1
P-9879(2)	0.1
P-9880	0.05
P-9883	0.01
P-9884	0.01
P-9885	0.37
P-9885(1)	1.6
P-9885(2)(1)	1.33
P-9885(2)(2)(1)	1.33
P-9885(2)(2)(2)	1.6
P-9886 (1)	0.54
P-9886 (2)	1.1
P-9887	0.05
P-9889	0.02
P-9890 (1)	0.66
P-9890 (2)	0.03
P-9891	0.5
P-9892 (1)	0.54
P-9892 (2)	1.85
P-9893 (1)	0.53
P-9893 (2)	0.01
P-9894 (1)	0.53
P-9894 (2)	0
P-9895 (1)	0.52
P-9895 (2)	0.09
P-9896 (1)	1.12
P-9896 (2)	0.04
P-9897 (1)	1.11
P-9897 (2)	0.16
P-9898	0.02
P-9899	0.18
P-9900 (1)	0.02
P-9900 (2)	0.15
P-9901 (1)	0.05
P-9901 (2)	5.15
P-9905 (1)	0
P-9905 (2)	0.01
P-9906	0
P-9907	0.23
P-9908	0.44
P-9909	0.04
P-991	0.05
P-9911	0.44
P-9914	0.03
P-9916	0.04
P-9918	0.02
P-9919	0.17

2070 SYSTEM

Pipe Label	Total Volume (MG)
P-9854	0.5
P-9855	0
P-9857 (1)	1.06
P-9857 (2)	0.12
P-9858 (1)	1.05
P-9858 (2)	0.07
P-9859 (1)	1.12
P-9859 (2)	0.53
P-986	0.04
P-9860 (1)	1.17
P-9860 (2)	0.53
P-9861 (1)	0.91
P-9861 (2)	1.33
P-9862	0.33
P-9863 (1)	0.09
P-9863 (2)	0.45
P-9864	0.54
P-9868	0.06
P-9869	0.02
P-9870	0.12
P-9872	0.06
P-9875	1.16
P-9877	0.03
P-9878	0.02
P-9879(1)	0.05
P-9879(2)	0.05
P-9880	0.07
P-9883	0.01
P-9884	0.01
P-9885	0.95
P-9885(1)	1.54
P-9885(2)(1)	1.28
P-9885(2)(2)(1)	1.28
P-9885(2)(2)(2)	1.54
P-9886 (1)	1.36
P-9886 (2)	1.33
P-9887	0.06
P-9889	0.09
P-9890 (1)	1.87
P-9890 (2)	0.07
P-9891	0.55
P-9892 (1)	1.71
P-9892 (2)	2.33
P-9893 (1)	1.71
P-9893 (2)	0.01
P-9894 (1)	1.7
P-9894 (2)	0
P-9895 (1)	1.7
P-9895 (2)	0.1
P-9896 (1)	2.33
P-9896 (2)	0.05
P-9897 (1)	2.28
P-9897 (2)	0.04
P-9898	0.08
P-9899	0.66
P-9900 (1)	0.02
P-9900 (2)	0.15
P-9901 (1)	0.05
P-9901 (2)	4.33
P-9905 (1)	0
P-9905 (2)	0.01
P-9906	0
P-9907	0.24
P-9908	0.37
P-9909	0.01
P-991	0.06
P-9911	1.02
P-9914	0.06
P-9916	0.02
P-9918	0.02
P-9919	0.12

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**
P-992	0.03	P-992	0.02	P-992	0.07
P-9920	0.4	P-9920	0.32	P-9920	0.22
P-9921	0.02	P-9921	0.03	P-9921	0.06
P-9924	0.08	P-9924	0.08	P-9924	0.08
P-9927	0.02	P-9927	0.05	P-9927	0.05
P-9928	0.15	P-9928	0.07	P-9928	0.13
P-9929	0	P-9929	0	P-9929	0
P-9930 (1)	0.03	P-9930 (1)	0.05	P-9930 (1)	0.05
P-9930 (2)	8.02	P-9930 (2)	3.49	P-9930 (2)	4.58
P-9931	0.59	P-9931	0.38	P-9931	0.35
P-9932	0	P-9932	0	P-9932	0
P-9934	2.79	P-9934	0.66	P-9934	0.64
P-9937	0	P-9937	0.01	P-9937	0.01
P-9938	0.01	P-9938	0.02	P-9938	0.02
P-9940	0.57	P-9940	1.65	P-9940	1.09
P-9943	0.21	P-9943	0.08	P-9943	0.1
P-9946	0.05	P-9946	0.07	P-9946	0.08
P-9949	0	P-9949	0	P-9949	0
P-9950	0.01	P-9950	0.01	P-9950	0.01
P-9951 (1)	0.05	P-9951 (1)	0.07	P-9951 (1)	0.08
P-9951 (2)	0.13	P-9951 (2)	0.47	P-9951 (2)	0.22
P-9954	1.36	P-9954	0.65	P-9954	0.74
P-9955	0.01	P-9955	0.01	P-9955	0.01
P-9957	0.34	P-9957	0.35	P-9957	0.36
P-9959	0.26	P-9959	0.06	P-9959	0.12
P-9960	0.89	P-9960	0.23	P-9960	0.42
P-9961	0.09	P-9961	0.07	P-9961	0.11
P-9962	0.09	P-9962	0.03	P-9962	0.03
P-9965	0.01	P-9965	0.01	P-9965	0.01
P-9966 (1)	0.08	P-9966 (1)	0.01	P-9966 (1)	0.01
P-9966 (2)	0.01	P-9966 (2)	0.01	P-9966 (2)	0.01
P-9967	0.14	P-9967	0.15	P-9967	0.08
P-9969	0.09	P-9969	0.17	P-9969	0.32
P-997	0.07	P-997	0.04	P-997	0.02
P-9972	0.02	P-9972	0.07	P-9972	0.02
P-9973	0.02	P-9973	0.07	P-9973	0.02
P-9975	0.12	P-9975	0.11	P-9975	0.26
P-9977 (1)	0.05	P-9977 (1)	0.09	P-9977 (1)	0.08
P-9977 (2)	0.02	P-9977 (2)	0.02	P-9977 (2)	0.04
P-9978	0.02	P-9978	0.02	P-9978	0.06
P-9979	0.06	P-9979	0.1	P-9979	0.11
P-9980	0.1	P-9980	0.08	P-9980	0.12
P-9981	0.22	P-9981	0.11	P-9981	0.05
P-9982 (1)	0.01	P-9982 (1)	0.03	P-9982 (1)	0.04
P-9982 (2)	0.18	P-9982 (2)	0.04	P-9982 (2)	0.09
P-9983	0.03	P-9983	0.04	P-9983	0.04
P-9984	0.14	P-9984	0.25	P-9984	0.27
P-9985	0.1	P-9985	0.04	P-9985	0.05
P-9987	0.01	P-9987	0.01	P-9987	0.01
P-9988	0.18	P-9988	0.11	P-9988	0.16
P-9989	0.01	P-9989	0.02	P-9989	0.21
P-9990	0.06	P-9990	0.02	P-9990	0.21
P-9993	2.68	P-9993	1.4	P-9993	0.99
P-9994 (1)	0.01	P-9994 (1)	0.01	P-9994 (1)	0.01
P-9994 (2)	2.67	P-9994 (2)	1.4	P-9994 (2)	0.99
P-9995	0.02	P-9995	0.04	P-9995	0.07
P-9997	0.05	P-9997	0.05	P-9997	0.05
P-9998 (1)	0.11	P-9998 (1)	0.08	P-9998 (1)	0.09
P-9998 (2)	0.12	P-9998 (2)	0.12	P-9998 (2)	0.07
P-9999	0.01	P-9999	0.02	P-9999	0.03
PMP-PICO1-A	0	PMP-PICO1-A	9.98	PMP-PICO1-A	10.43
PMP-PICO1-B	0	PMP-PICO1-B	9.98	PMP-PICO1-B	10.43
PMP-PICO2-A	9.72	PMP-PICO2-A	6.55	PMP-PICO2-A	11.5
PMP-PICO2-B	9.72	PMP-PICO2-B	6.55	PMP-PICO2-B	11.5
PMP-PICO3-A	0	PMP-PICO3-A	0	PMP-PICO3-A	12.22
PMP-PICO3-B	0	PMP-PICO3-B	0	PMP-PICO3-B	12.22
PRV-50028-A	0	PRV-50028-A	0.99	PRV-50028-A	0
PRV-50028-B	0	PRV-50028-B	0.99	PRV-50028-B	0
PRV-50030-A	1.59	PRV-50030-A	1.87	PRV-50030-A	3.02
PRV-50030-B	1.59	PRV-50030-B	1.87	PRV-50030-B	3.02
P-SINE Disch Flow	0	P-SINE Disch Flow	0	P-SINE Disch Flow	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
P-Unused Killam EST control	2.11
P-Unused Loop 20 PRV at Int'l (1)	(N/A)
P-Unused Loop 20 PRV at Int'l (2)	(N/A)
P-Unused Loop 20 PRV at McPherson (1)	0.29
P-Unused Loop 20 PRV at McPherson (2)	0.29
PV-P-1095	(N/A)
PV-P-1096	(N/A)
PV-P-1097	(N/A)
PV-Pinto_Valle_1-A	(N/A)
PV-Pinto_Valle_1-B	(N/A)
PV-Pinto_Valle_2-A	(N/A)
PV-Pinto_Valle_2-B	(N/A)
Q - P-2284	0.32
Q MISC ID67018	(N/A)
Q MISC ID67107	0.35
Q MISC ID67123	(N/A)
Q MISC ID67405	(N/A)
Q to/from LB EST	0.09
Q-11860	0
Q-14415	0.26
Q-20333	1.18
Q-9829(1)	1.06
SINE_1-A	0
SINE_1-B	0
SINE_2-A	0
SINE_2-B	0
SINE_3-A	0
SINE_3-B	0
SINE_4-A	0
SINE_4-B	0
Status Change - 14519	0.2
Status Change - 9390	4.42
Status Change - WD-WM-010886	0.22
Status Change - WD-WM-011687	0.14
Status Change - WD-WM-012164	0.09
Status Change P-21567	(N/A)
Status Change WD-WM-011013	0.1
Status Change WD-WM-011665	0.01
Status Change-10067	0.01
Status Change-10174	0
Status Change-10242	0
Status Change-11700	0.06
Status Change-1190	0.01
Status Change-12489	0
Status Change-12883	2.76
Status Change-13037	0.1
Status Change-14377	0
Status Change-14541(2)	0
Status Change-14997	0
Status Change-155	0.01
Status Change-16107	0.4
Status Change-18130	0
Status Change-18639	0.24
Status Change-18697	0.26
Status Change-18841(1)	2.12
Status Change-18933	3.13
Status Change-18935	3.63
Status Change-19229	0.04
Status Change-19503	0.54
Status Change-19717	0
Status Change-19731	0
Status Change-19781	0.22
Status Change-19783	0
Status Change-20293	0
Status Change-20759	0
Status Change-242	0
Status Change-2540	0
Status Change-2805	0.95
Status Change-3156	0.01
Status Change-3830	0
Status Change-4667(1)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
P-Unused Killam EST control	0.21
P-Unused Loop 20 PRV at Int'l (1)	(N/A)
P-Unused Loop 20 PRV at Int'l (2)	(N/A)
P-Unused Loop 20 PRV at McPherson (	(N/A)
P-Unused Loop 20 PRV at McPherson (	(N/A)
PV-P-1095	(N/A)
PV-P-1096	(N/A)
PV-P-1097	(N/A)
PV-Pinto_Valle_1-A	(N/A)
PV-Pinto_Valle_1-B	(N/A)
PV-Pinto_Valle_2-A	(N/A)
PV-Pinto_Valle_2-B	(N/A)
Q - P-2284	0
Q MISC ID67018	0.41
Q MISC ID67107	0.35
Q MISC ID67123	0.09
Q MISC ID67405	0.36
Q to/from LB EST	0.54
Q-11860	2.86
Q-14415	0.11
Q-20333	0
Q-9829(1)	0.68
SINE_1-A	0
SINE_1-B	0
SINE_2-A	0
SINE_2-B	0
SINE_3-A	0
SINE_3-B	0
SINE_4-A	0
SINE_4-B	0
Status Change - 14519	0.88
Status Change - 9390	5.47
Status Change - WD-WM-010886	0
Status Change - WD-WM-011687	0.08
Status Change - WD-WM-012164	0
Status Change P-21567	0
Status Change WD-WM-011013	0
Status Change WD-WM-011665	0
Status Change-10067	0.21
Status Change-10174	0.95
Status Change-10242	0.6
Status Change-11700	0.08
Status Change-1190	0
Status Change-12489	0.34
Status Change-12883	0
Status Change-13037	0.08
Status Change-14377	0
Status Change-14541(2)	0.34
Status Change-14997	0
Status Change-155	0
Status Change-16107	0
Status Change-18130	1.2
Status Change-18639	1.88
Status Change-18697	0.41
Status Change-18841(1)	0
Status Change-18933	24.92
Status Change-18935	0
Status Change-19229	0
Status Change-19503	0
Status Change-19717	0
Status Change-19731	0.09
Status Change-19781	0
Status Change-19783	0.08
Status Change-20293	0.27
Status Change-20759	0
Status Change-242	0
Status Change-2540	2.86
Status Change-2805	0
Status Change-3156	0
Status Change-3830	0.17
Status Change-4667(1)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
P-Unused Killam EST control	0
P-Unused Loop 20 PRV at Int'l (1)	(N/A)
P-Unused Loop 20 PRV at Int'l (2)	(N/A)
P-Unused Loop 20 PRV at McPherson (	(N/A)
P-Unused Loop 20 PRV at McPherson (	(N/A)
PV-P-1095	(N/A)
PV-P-1096	(N/A)
PV-P-1097	(N/A)
PV-Pinto_Valle_1-A	(N/A)
PV-Pinto_Valle_1-B	(N/A)
PV-Pinto_Valle_2-A	(N/A)
PV-Pinto_Valle_2-B	(N/A)
Q - P-2284	0
Q MISC ID67018	0.35
Q MISC ID67107	0.61
Q MISC ID67123	0.3
Q MISC ID67405	0.17
Q to/from LB EST	0.65
Q-11860	3.03
Q-14415	0.26
Q-20333	0
Q-9829(1)	0.79
SINE_1-A	0
SINE_1-B	0
SINE_2-A	0
SINE_2-B	0
SINE_3-A	0
SINE_3-B	0
SINE_4-A	0
SINE_4-B	0
Status Change - 14519	1.24
Status Change - 9390	7.36
Status Change - WD-WM-010886	0
Status Change - WD-WM-011687	0.06
Status Change - WD-WM-012164	0
Status Change P-21567	0
Status Change WD-WM-011013	0
Status Change WD-WM-011665	0
Status Change-10067	0.1
Status Change-10174	0.73
Status Change-10242	0.59
Status Change-11700	0.16
Status Change-1190	0
Status Change-12489	0.67
Status Change-12883	0
Status Change-13037	0.02
Status Change-14377	0
Status Change-14541(2)	0.28
Status Change-14997	0
Status Change-155	0
Status Change-16107	0
Status Change-18130	1.62
Status Change-18639	0.81
Status Change-18697	0.48
Status Change-18841(1)	0
Status Change-18933	11.48
Status Change-18935	0
Status Change-19229	0
Status Change-19503	0
Status Change-19717	0
Status Change-19731	0.24
Status Change-19781	0
Status Change-19783	0.03
Status Change-20293	0.27
Status Change-20759	0
Status Change-242	0
Status Change-2540	3.03
Status Change-2805	0
Status Change-3156	0
Status Change-3830	0.04
Status Change-4667(1)	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
Status Change-4831	0
Status Change-5019	0
Status Change-5341(2)	0.71
Status Change-66984	(N/A)
Status Change-6769	0
Status Change-6822	0.01
Status Change-7494	0
Status Change-794	1.26
Status Change-8025	0.05
Status Change-8088	0
Status Change-8154	0
Status Change-8268	0
Status Change-8863	0
Status Change-8873	0
Status Change-8932	0
Status Change-8960	0.18
Status Change-9219	0.06
Status Change-9380(1)	0
Status Change-9380(2)	0
Status Change-9908	0
SV-P-472	8.01
SV-PSV-SV-A	8.01
SV-PSV-SV-B	8.01
SV-Sierra_Vista_1-A	(N/A)
SV-Sierra_Vista_1-B	(N/A)
SV-Sierra_Vista_2-A	1.91
SV-Sierra_Vista_2-B	1.91
WD-WM-000065	0
WD-WM-000067	0
WD-WM-000082	0
WD-WM-000089	0
WD-WM-000113(1)(1)	0
WD-WM-000113(1)(2)	0.05
WD-WM-000113(2)	0
WD-WM-000179	0
WD-WM-000197	0
WD-WM-000215	0
WD-WM-000222	0
WD-WM-000233	0
WD-WM-000234	0
WD-WM-000235	0
WD-WM-000236	0
WD-WM-000246	0
WD-WM-000270	0.14
WD-WM-000300	0
WD-WM-000301	0
WD-WM-000308	0
WD-WM-000319	0
WD-WM-000324	0
WD-WM-000325	0
WD-WM-000340(1)	0.02
WD-WM-000340(2)	0.01
WD-WM-000341	0.05
WD-WM-000493	0
WD-WM-000494	0
WD-WM-000498	0
WD-WM-000499	0
WD-WM-000500	0
WD-WM-000501	0
WD-WM-000502	0
WD-WM-000520	0
WD-WM-000606	0
WD-WM-000623	0
WD-WM-000650	0.04
WD-WM-000707	0
WD-WM-000778	0.07
WD-WM-000780	0.03
WD-WM-000781	0.03
WD-WM-000782	0.03
WD-WM-000783	0.03
WD-WM-000807	0.04

2030 SYSTEM	
Pipe Label	Total Volume (MG)
Status Change-4831	0.45
Status Change-5019	0.15
Status Change-5341(2)	0
Status Change-66984	0.03
Status Change-6769	0.2
Status Change-6822	0
Status Change-7494	0.18
Status Change-794	0
Status Change-8025	0
Status Change-8088	0.85
Status Change-8154	0.68
Status Change-8268	0
Status Change-8863	0.49
Status Change-8873	0.77
Status Change-8932	0.78
Status Change-8960	0.92
Status Change-9219	0
Status Change-9380(1)	5.15
Status Change-9380(2)	4.56
Status Change-9908	0.47
SV-P-472	10.25
SV-PSV-SV-A	10.25
SV-PSV-SV-B	10.25
SV-Sierra_Vista_1-A	2.81
SV-Sierra_Vista_1-B	2.81
SV-Sierra_Vista_2-A	1.02
SV-Sierra_Vista_2-B	1.02
WD-WM-000065	0
WD-WM-000067	0
WD-WM-000082	0
WD-WM-000089	0
WD-WM-000113(1)(1)	0
WD-WM-000113(1)(2)	0.03
WD-WM-000113(2)	0
WD-WM-000179	0
WD-WM-000197	0
WD-WM-000215	0
WD-WM-000222	0
WD-WM-000233	0
WD-WM-000234	0
WD-WM-000235	0
WD-WM-000236	0
WD-WM-000246	0
WD-WM-000270	0.04
WD-WM-000300	0
WD-WM-000301	0
WD-WM-000308	0
WD-WM-000319	0
WD-WM-000324	0
WD-WM-000325	0
WD-WM-000340(1)	0.36
WD-WM-000340(2)	0.4
WD-WM-000341	0.07
WD-WM-000493	0
WD-WM-000494	0
WD-WM-000498	0
WD-WM-000499	0
WD-WM-000500	0.01
WD-WM-000501	0.01
WD-WM-000502	0
WD-WM-000520	0
WD-WM-000606	0
WD-WM-000623	0
WD-WM-000650	0.05
WD-WM-000707	0
WD-WM-000778	0.11
WD-WM-000780	0.05
WD-WM-000781	0.05
WD-WM-000782	0.05
WD-WM-000783	0.05
WD-WM-000807	0.08

2070 SYSTEM	
Pipe Label	Total Volume (MG)
Status Change-4831	0.9
Status Change-5019	0.19
Status Change-5341(2)	0
Status Change-66984	0.01
Status Change-6769	0.25
Status Change-6822	0
Status Change-7494	0.15
Status Change-794	0
Status Change-8025	0
Status Change-8088	0.82
Status Change-8154	0.64
Status Change-8268	0
Status Change-8863	0.47
Status Change-8873	0.88
Status Change-8932	1.11
Status Change-8960	0.33
Status Change-9219	0
Status Change-9380(1)	4.33
Status Change-9380(2)	3.83
Status Change-9908	0.48
SV-P-472	14.01
SV-PSV-SV-A	14.01
SV-PSV-SV-B	14.01
SV-Sierra_Vista_1-A	5.61
SV-Sierra_Vista_1-B	5.61
SV-Sierra_Vista_2-A	2.12
SV-Sierra_Vista_2-B	2.12
WD-WM-000065	0
WD-WM-000067	0
WD-WM-000082	0
WD-WM-000089	0
WD-WM-000113(1)(1)	0
WD-WM-000113(1)(2)	0.03
WD-WM-000113(2)	0
WD-WM-000179	0
WD-WM-000197	0
WD-WM-000215	0
WD-WM-000222	0
WD-WM-000233	0
WD-WM-000234	0
WD-WM-000235	0
WD-WM-000236	0
WD-WM-000246	0
WD-WM-000270	0.02
WD-WM-000300	0
WD-WM-000301	0
WD-WM-000308	0
WD-WM-000319	0
WD-WM-000324	0
WD-WM-000325	0
WD-WM-000340(1)	0.33
WD-WM-000340(2)	0.36
WD-WM-000341	0.08
WD-WM-000493	0
WD-WM-000494	0
WD-WM-000498	0
WD-WM-000499	0
WD-WM-000500	0.01
WD-WM-000501	0.01
WD-WM-000502	0
WD-WM-000520	0
WD-WM-000606	0
WD-WM-000623	0
WD-WM-000650	0.12
WD-WM-000707	0
WD-WM-000778	0.07
WD-WM-000780	0.04
WD-WM-000781	0.04
WD-WM-000782	0.04
WD-WM-000783	0.04
WD-WM-000807	0.09

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
WD-WM-000814	0
WD-WM-000833 (1)	0.01
WD-WM-000833 (2)	0.05
WD-WM-000833 (3)	0.02
WD-WM-000875	0
WD-WM-000876	0
WD-WM-000877	0
WD-WM-000912	0.1
WD-WM-000913(1)	0.1
WD-WM-000913(2)	0.1
WD-WM-000931	0
WD-WM-000976	0
WD-WM-000998	0
WD-WM-001027	0
WD-WM-001052(1)	0
WD-WM-001052(2)	0
WD-WM-001060	0
WD-WM-001075	0
WD-WM-001076	0
WD-WM-001077	0
WD-WM-001082	0
WD-WM-001085	0
WD-WM-001090	0.1
WD-WM-001092	0.03
WD-WM-001093	0.03
WD-WM-001104	0
WD-WM-001105	0
WD-WM-001106	0
WD-WM-001107	0
WD-WM-001108	0
WD-WM-001109	0
WD-WM-001110	0
WD-WM-001111	0
WD-WM-001112	0
WD-WM-001113	0
WD-WM-001114	0
WD-WM-001115	0
WD-WM-001116	0
WD-WM-001121	0
WD-WM-001276	0
WD-WM-001277	0
WD-WM-001286	0
WD-WM-001318	0
WD-WM-001324	0
WD-WM-001329	0.01
WD-WM-001330	0.03
WD-WM-001332	0
WD-WM-001333	0.03
WD-WM-001351	0
WD-WM-001354	0
WD-WM-001355	0
WD-WM-001458	0
WD-WM-001461	0
WD-WM-001514	0
WD-WM-001515	0
WD-WM-001540	0
WD-WM-001571	0
WD-WM-001572(1)	0.01
WD-WM-001572(2)	0
WD-WM-001575	0.01
WD-WM-001618	0.01
WD-WM-001620	0
WD-WM-001621	0
WD-WM-001622	0
WD-WM-001626	0
WD-WM-001633	0
WD-WM-001637	0
WD-WM-001671	0.37
WD-WM-001676(1)	0.01
WD-WM-001676(2)	0
WD-WM-001689	0.07

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
WD-WM-000814	0
WD-WM-000833 (1)	0.02
WD-WM-000833 (2)	0.07
WD-WM-000833 (3)	0.03
WD-WM-000875	0
WD-WM-000876	0
WD-WM-000877	0
WD-WM-000912	0.13
WD-WM-000913(1)	0.13
WD-WM-000913(2)	0.13
WD-WM-000931	0
WD-WM-000976	0
WD-WM-000998	0
WD-WM-001027	0
WD-WM-001052(1)	0
WD-WM-001052(2)	0
WD-WM-001060	0
WD-WM-001075	0
WD-WM-001076	0
WD-WM-001077	0
WD-WM-001082	0
WD-WM-001085	0
WD-WM-001090	0.13
WD-WM-001092	0.01
WD-WM-001093	0.01
WD-WM-001104	0
WD-WM-001105	0
WD-WM-001106	0
WD-WM-001107	0
WD-WM-001108	0
WD-WM-001109	0
WD-WM-001110	0
WD-WM-001111	0
WD-WM-001112	0
WD-WM-001113	0
WD-WM-001114	0
WD-WM-001115	0
WD-WM-001116	0
WD-WM-001121	0
WD-WM-001276	0
WD-WM-001277	0
WD-WM-001286	0
WD-WM-001318	0
WD-WM-001324	0
WD-WM-001329	0
WD-WM-001330	0.01
WD-WM-001332	0
WD-WM-001333	0.01
WD-WM-001351	0
WD-WM-001354	0
WD-WM-001355	0
WD-WM-001458	0
WD-WM-001461	0
WD-WM-001514	0
WD-WM-001515	0
WD-WM-001540	0
WD-WM-001571	0.01
WD-WM-001572(1)	0
WD-WM-001572(2)	0
WD-WM-001575	0
WD-WM-001618	0
WD-WM-001620	0
WD-WM-001621	0
WD-WM-001622	0
WD-WM-001626	0
WD-WM-001633	0
WD-WM-001637	0.01
WD-WM-001671	0.1
WD-WM-001676(1)	0
WD-WM-001676(2)	0
WD-WM-001689	0.06

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
WD-WM-000814	0
WD-WM-000833 (1)	0.04
WD-WM-000833 (2)	0.06
WD-WM-000833 (3)	0.03
WD-WM-000875	0
WD-WM-000876	0
WD-WM-000877	0
WD-WM-000912	0.22
WD-WM-000913(1)	0.22
WD-WM-000913(2)	0.22
WD-WM-000931	0
WD-WM-000976	0
WD-WM-000998	0
WD-WM-001027	0
WD-WM-001052(1)	0
WD-WM-001052(2)	0
WD-WM-001060	0
WD-WM-001075	0
WD-WM-001076	0
WD-WM-001077	0
WD-WM-001082	0
WD-WM-001085	0
WD-WM-001090	0.22
WD-WM-001092	0.01
WD-WM-001093	0.01
WD-WM-001104	0
WD-WM-001105	0
WD-WM-001106	0
WD-WM-001107	0
WD-WM-001108	0
WD-WM-001109	0
WD-WM-001110	0
WD-WM-001111	0
WD-WM-001112	0
WD-WM-001113	0
WD-WM-001114	0
WD-WM-001115	0
WD-WM-001116	0
WD-WM-001121	0
WD-WM-001276	0
WD-WM-001277	0
WD-WM-001286	0
WD-WM-001318	0
WD-WM-001324	0
WD-WM-001329	0
WD-WM-001330	0.01
WD-WM-001332	0
WD-WM-001333	0.01
WD-WM-001351	0
WD-WM-001354	0
WD-WM-001355	0
WD-WM-001458	0
WD-WM-001461	0
WD-WM-001514	0
WD-WM-001515	0
WD-WM-001540	0
WD-WM-001571	0
WD-WM-001572(1)	0
WD-WM-001572(2)	0
WD-WM-001575	0
WD-WM-001618	0
WD-WM-001620	0
WD-WM-001621	0
WD-WM-001622	0
WD-WM-001626	0
WD-WM-001633	0
WD-WM-001637	0
WD-WM-001671	0.1
WD-WM-001676(1)	0.01
WD-WM-001676(2)	0
WD-WM-001689	0.1

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**
WD-WM-001690	0.04	WD-WM-001690	0.05	WD-WM-001690	0.02
WD-WM-001700	0	WD-WM-001700	0	WD-WM-001700	0
WD-WM-001713	0	WD-WM-001713	0	WD-WM-001713	0
WD-WM-001722	0	WD-WM-001722	0	WD-WM-001722	0
WD-WM-001737	0	WD-WM-001737	0	WD-WM-001737	0
WD-WM-001738	0	WD-WM-001738	0	WD-WM-001738	0
WD-WM-001748	0	WD-WM-001748	0	WD-WM-001748	0
WD-WM-001850	0	WD-WM-001850	0	WD-WM-001850	0
WD-WM-001864	0	WD-WM-001864	0	WD-WM-001864	0
WD-WM-001865	0	WD-WM-001865	0	WD-WM-001865	0
WD-WM-001866	0	WD-WM-001866	0	WD-WM-001866	0
WD-WM-001867	0	WD-WM-001867	0	WD-WM-001867	0
WD-WM-001917	0	WD-WM-001917	0	WD-WM-001917	0
WD-WM-001918	0	WD-WM-001918	0	WD-WM-001918	0
WD-WM-001919	0	WD-WM-001919	0	WD-WM-001919	0
WD-WM-001977	0	WD-WM-001977	(N/A)	WD-WM-001977	(N/A)
WD-WM-001983	0	WD-WM-001983	(N/A)	WD-WM-001983	(N/A)
WD-WM-002053(1)	0	WD-WM-002053(1)	0	WD-WM-002053(1)	0
WD-WM-002053(2)	0	WD-WM-002053(2)	0	WD-WM-002053(2)	0
WD-WM-002054	0	WD-WM-002054	0	WD-WM-002054	0
WD-WM-002055(1)	0	WD-WM-002055(1)	0	WD-WM-002055(1)	0
WD-WM-002055(2)(1)	0	WD-WM-002055(2)(1)	0	WD-WM-002055(2)(1)	0
WD-WM-002055(2)(2)(1)	0	WD-WM-002055(2)(2)(1)	0	WD-WM-002055(2)(2)(1)	0
WD-WM-002055(2)(2)(2)	0	WD-WM-002055(2)(2)(2)	0	WD-WM-002055(2)(2)(2)	0
WD-WM-002056	0	WD-WM-002056	0	WD-WM-002056	0
WD-WM-002057	0	WD-WM-002057	0	WD-WM-002057	0
WD-WM-002063	0	WD-WM-002063	0	WD-WM-002063	0
WD-WM-002092	0	WD-WM-002092	0	WD-WM-002092	0
WD-WM-002175	0	WD-WM-002175	0	WD-WM-002175	0
WD-WM-002177	0	WD-WM-002177	0	WD-WM-002177	0
WD-WM-002217	0.2	WD-WM-002217	0.15	WD-WM-002217	0.05
WD-WM-002225	0	WD-WM-002225	0	WD-WM-002225	0
WD-WM-002229	0.2	WD-WM-002229	0.15	WD-WM-002229	0.05
WD-WM-002283	0	WD-WM-002283	0	WD-WM-002283	0
WD-WM-002286	0	WD-WM-002286	0	WD-WM-002286	0
WD-WM-002346	0	WD-WM-002346	0	WD-WM-002346	0
WD-WM-002348	0	WD-WM-002348	0	WD-WM-002348	0
WD-WM-002350	0	WD-WM-002350	0	WD-WM-002350	0
WD-WM-002388	0	WD-WM-002388	0	WD-WM-002388	0
WD-WM-002391	0	WD-WM-002391	0	WD-WM-002391	0
WD-WM-002392	0	WD-WM-002392	0	WD-WM-002392	0
WD-WM-002393	0	WD-WM-002393	0	WD-WM-002393	0
WD-WM-002394	0	WD-WM-002394	0	WD-WM-002394	0
WD-WM-002398	0	WD-WM-002398	0	WD-WM-002398	0
WD-WM-002399	0	WD-WM-002399	0	WD-WM-002399	0
WD-WM-002410	0	WD-WM-002410	0	WD-WM-002410	0
WD-WM-002413	0	WD-WM-002413	0	WD-WM-002413	0
WD-WM-002585	0	WD-WM-002585	0	WD-WM-002585	0
WD-WM-002586	0	WD-WM-002586	0	WD-WM-002586	0
WD-WM-002587	0	WD-WM-002587	0	WD-WM-002587	0
WD-WM-002588	0	WD-WM-002588	0	WD-WM-002588	0
WD-WM-002589	0	WD-WM-002589	0	WD-WM-002589	0
WD-WM-002590	0	WD-WM-002590	0	WD-WM-002590	0
WD-WM-002663	0.3	WD-WM-002663	0.27	WD-WM-002663	0.15
WD-WM-002733(2)	0	WD-WM-002733(2)	0	WD-WM-002733(2)	0
WD-WM-002749(1)	0.01	WD-WM-002749(1)	0.02	WD-WM-002749(1)	0.03
WD-WM-002749(2)	0.01	WD-WM-002749(2)	0.02	WD-WM-002749(2)	0.03
WD-WM-002791	0	WD-WM-002791	0	WD-WM-002791	0
WD-WM-002794	0	WD-WM-002794	0	WD-WM-002794	0
WD-WM-002795	0	WD-WM-002795	0	WD-WM-002795	0
WD-WM-002797	0	WD-WM-002797	0	WD-WM-002797	0
WD-WM-002799	0	WD-WM-002799	0	WD-WM-002799	0
WD-WM-003171	0.25	WD-WM-003171	0.09	WD-WM-003171	0.12
WD-WM-003188	0	WD-WM-003188	0	WD-WM-003188	0
WD-WM-003243	0	WD-WM-003243	0	WD-WM-003243	0
WD-WM-003274	0	WD-WM-003274	0	WD-WM-003274	0
WD-WM-003275	0	WD-WM-003275	0	WD-WM-003275	0
WD-WM-003276	0	WD-WM-003276	0	WD-WM-003276	0
WD-WM-003286	0	WD-WM-003286	0	WD-WM-003286	0
WD-WM-003293	0	WD-WM-003293	0	WD-WM-003293	0
WD-WM-003294	0	WD-WM-003294	0	WD-WM-003294	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-003295	0	WD-WM-003295	0	WD-WM-003295	0
WD-WM-003296	0	WD-WM-003296	0	WD-WM-003296	0
WD-WM-003326	0	WD-WM-003326	0	WD-WM-003326	0
WD-WM-003347	0	WD-WM-003347	0	WD-WM-003347	0
WD-WM-003353	0	WD-WM-003353	0	WD-WM-003353	0
WD-WM-003354	0.01	WD-WM-003354	0.01	WD-WM-003354	0.01
WD-WM-003355	0.01	WD-WM-003355	0.01	WD-WM-003355	0.01
WD-WM-003378	0.01	WD-WM-003378	0	WD-WM-003378	0.02
WD-WM-003379	0.02	WD-WM-003379	0.02	WD-WM-003379	0.01
WD-WM-003380	0.02	WD-WM-003380	0.02	WD-WM-003380	0.01
WD-WM-003381	0.02	WD-WM-003381	0.02	WD-WM-003381	0.01
WD-WM-003382	0	WD-WM-003382	0	WD-WM-003382	0
WD-WM-003383(1)(1)	0	WD-WM-003383(1)(1)	0	WD-WM-003383(1)(1)	0
WD-WM-003383(1)(2)	0.02	WD-WM-003383(1)(2)	0.01	WD-WM-003383(1)(2)	0
WD-WM-003383(2)	0.02	WD-WM-003383(2)	0.01	WD-WM-003383(2)	0
WD-WM-003384	0.03	WD-WM-003384	0.02	WD-WM-003384	0.03
WD-WM-003385	0.03	WD-WM-003385	0.02	WD-WM-003385	0.03
WD-WM-003386	0.03	WD-WM-003386	0.02	WD-WM-003386	0.03
WD-WM-003387	0.02	WD-WM-003387	0.03	WD-WM-003387	0.04
WD-WM-003388	0.01	WD-WM-003388	0.01	WD-WM-003388	0.01
WD-WM-003389	0.02	WD-WM-003389	0.03	WD-WM-003389	0.04
WD-WM-003390(1)	0.03	WD-WM-003390(1)	0.02	WD-WM-003390(1)	0.01
WD-WM-003390(2)	0.03	WD-WM-003390(2)	0.02	WD-WM-003390(2)	0.01
WD-WM-003472	0.08	WD-WM-003472	0.08	WD-WM-003472	0.08
WD-WM-003494	0.06	WD-WM-003494	0.12	WD-WM-003494	0.13
WD-WM-003514	0	WD-WM-003514	0	WD-WM-003514	0
WD-WM-003515	0.03	WD-WM-003515	0.03	WD-WM-003515	0.04
WD-WM-003516	0.03	WD-WM-003516	0.03	WD-WM-003516	0.04
WD-WM-003699	0.01	WD-WM-003699	0	WD-WM-003699	0.01
WD-WM-003710	0	WD-WM-003710	0	WD-WM-003710	0
WD-WM-003766	0	WD-WM-003766	0	WD-WM-003766	0
WD-WM-003767	0	WD-WM-003767	0	WD-WM-003767	0
WD-WM-003789	0	WD-WM-003789	0	WD-WM-003789	0
WD-WM-003790	0	WD-WM-003790	0	WD-WM-003790	0
WD-WM-003816	0	WD-WM-003816	0	WD-WM-003816	0
WD-WM-003859	0.02	WD-WM-003859	0.02	WD-WM-003859	0.01
WD-WM-003860	0.02	WD-WM-003860	0.02	WD-WM-003860	0.01
WD-WM-003861	0.02	WD-WM-003861	0.02	WD-WM-003861	0.01
WD-WM-003862	0.01	WD-WM-003862	0	WD-WM-003862	0
WD-WM-003878	0	WD-WM-003878	0.01	WD-WM-003878	0.01
WD-WM-003879	0	WD-WM-003879	0.01	WD-WM-003879	0.01
WD-WM-003880	0	WD-WM-003880	0	WD-WM-003880	0
WD-WM-003904	0.01	WD-WM-003904	0.02	WD-WM-003904	0.02
WD-WM-003905	0.01	WD-WM-003905	0.01	WD-WM-003905	0.01
WD-WM-003906	0.01	WD-WM-003906	0.01	WD-WM-003906	0
WD-WM-003921	0	WD-WM-003921	0	WD-WM-003921	0
WD-WM-003922	0	WD-WM-003922	0	WD-WM-003922	0
WD-WM-003935	0	WD-WM-003935	0	WD-WM-003935	0
WD-WM-003936	0	WD-WM-003936	0	WD-WM-003936	0
WD-WM-003937	0	WD-WM-003937	0	WD-WM-003937	0
WD-WM-003938	0	WD-WM-003938	0	WD-WM-003938	0
WD-WM-003955	0	WD-WM-003955	0	WD-WM-003955	0
WD-WM-003957	0	WD-WM-003957	0	WD-WM-003957	0
WD-WM-003958	0	WD-WM-003958	0	WD-WM-003958	0
WD-WM-003967	2.59	WD-WM-003967	5.23	WD-WM-003967	0
WD-WM-003970	0	WD-WM-003970	0	WD-WM-003970	0
WD-WM-004008	0.3	WD-WM-004008	0.77	WD-WM-004008	0.14
WD-WM-004037	0.09	WD-WM-004037	0.22	WD-WM-004037	0.23
WD-WM-004052	0.02	WD-WM-004052	0.05	WD-WM-004052	0.01
WD-WM-004053	0	WD-WM-004053	0	WD-WM-004053	0
WD-WM-004054	0	WD-WM-004054	0	WD-WM-004054	0
WD-WM-004067	0.09	WD-WM-004067	0.22	WD-WM-004067	0.23
WD-WM-004084	0.01	WD-WM-004084	0.02	WD-WM-004084	0.01
WD-WM-004085	0.01	WD-WM-004085	0.02	WD-WM-004085	0.01
WD-WM-004086	0.01	WD-WM-004086	0.02	WD-WM-004086	0.01
WD-WM-004087	0.01	WD-WM-004087	0.02	WD-WM-004087	0.01
WD-WM-004108	0.01	WD-WM-004108	0.01	WD-WM-004108	0.01
WD-WM-004110	0	WD-WM-004110	0	WD-WM-004110	0
WD-WM-004111	0	WD-WM-004111	0	WD-WM-004111	0
WD-WM-004114	0	WD-WM-004114	0	WD-WM-004114	0
WD-WM-004115	0	WD-WM-004115	0	WD-WM-004115	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-004116	0	WD-WM-004116	0	WD-WM-004116	0
WD-WM-004117	0	WD-WM-004117	0	WD-WM-004117	0
WD-WM-004122	0	WD-WM-004122	0	WD-WM-004122	0
WD-WM-004135	0	WD-WM-004135	0	WD-WM-004135	0
WD-WM-004137	0	WD-WM-004137	0.01	WD-WM-004137	0.01
WD-WM-004138	0	WD-WM-004138	0.01	WD-WM-004138	0.01
WD-WM-004140	0	WD-WM-004140	0	WD-WM-004140	0
WD-WM-004141	0	WD-WM-004141	0	WD-WM-004141	0
WD-WM-004142	0.01	WD-WM-004142	0.01	WD-WM-004142	0.01
WD-WM-004143	0.01	WD-WM-004143	0.01	WD-WM-004143	0.01
WD-WM-004196	0.01	WD-WM-004196	0.01	WD-WM-004196	0.02
WD-WM-004197(1)	0.01	WD-WM-004197(1)	0.01	WD-WM-004197(1)	0.02
WD-WM-004197(2)	0.01	WD-WM-004197(2)	0.01	WD-WM-004197(2)	0.02
WD-WM-004340	0	WD-WM-004340	0	WD-WM-004340	0
WD-WM-004341	0	WD-WM-004341	0	WD-WM-004341	0
WD-WM-004342	0	WD-WM-004342	0	WD-WM-004342	0
WD-WM-004343	0	WD-WM-004343	0	WD-WM-004343	0
WD-WM-004348	0	WD-WM-004348	0	WD-WM-004348	0
WD-WM-004354(1)	0	WD-WM-004354(1)	0	WD-WM-004354(1)	0
WD-WM-004354(2)	0	WD-WM-004354(2)	0	WD-WM-004354(2)	0
WD-WM-004355	0	WD-WM-004355	0	WD-WM-004355	0
WD-WM-004356	0.01	WD-WM-004356	0.01	WD-WM-004356	0.01
WD-WM-004357	0.01	WD-WM-004357	0	WD-WM-004357	0.01
WD-WM-004358	0.01	WD-WM-004358	0	WD-WM-004358	0.01
WD-WM-004359	0.01	WD-WM-004359	0	WD-WM-004359	0.01
WD-WM-004360	0	WD-WM-004360	0	WD-WM-004360	0
WD-WM-004361	0	WD-WM-004361	0	WD-WM-004361	0
WD-WM-004362	0	WD-WM-004362	0	WD-WM-004362	0
WD-WM-004363	0	WD-WM-004363	0	WD-WM-004363	0
WD-WM-004364	0	WD-WM-004364	0	WD-WM-004364	0
WD-WM-004365	0	WD-WM-004365	0	WD-WM-004365	0
WD-WM-004366	0.01	WD-WM-004366	0	WD-WM-004366	0.01
WD-WM-004367	0.01	WD-WM-004367	0	WD-WM-004367	0.01
WD-WM-004368	0.01	WD-WM-004368	0	WD-WM-004368	0.01
WD-WM-004369	0.01	WD-WM-004369	0.01	WD-WM-004369	0.01
WD-WM-004370	0.01	WD-WM-004370	0.01	WD-WM-004370	0.01
WD-WM-004371	0.01	WD-WM-004371	0.01	WD-WM-004371	0.01
WD-WM-004379	0.01	WD-WM-004379	0.01	WD-WM-004379	0.01
WD-WM-004380	0.01	WD-WM-004380	0	WD-WM-004380	0.01
WD-WM-004381	0.01	WD-WM-004381	0	WD-WM-004381	0.01
WD-WM-004382	0.01	WD-WM-004382	0	WD-WM-004382	0.01
WD-WM-004383	0	WD-WM-004383	0	WD-WM-004383	0
WD-WM-004421	0.02	WD-WM-004421	0.04	WD-WM-004421	0.05
WD-WM-004422	0	WD-WM-004422	0	WD-WM-004422	0
WD-WM-004529	0	WD-WM-004529	0	WD-WM-004529	0
WD-WM-004545	0	WD-WM-004545	0	WD-WM-004545	0
WD-WM-004547	0.04	WD-WM-004547	0.02	WD-WM-004547	0.07
WD-WM-004558	0	WD-WM-004558	0	WD-WM-004558	0
WD-WM-004614	0	WD-WM-004614	0	WD-WM-004614	0
WD-WM-004615	0	WD-WM-004615	0	WD-WM-004615	0.01
WD-WM-004616	0	WD-WM-004616	0	WD-WM-004616	0.01
WD-WM-004617	0	WD-WM-004617	0	WD-WM-004617	0
WD-WM-004619	0	WD-WM-004619	0	WD-WM-004619	0
WD-WM-004635	0	WD-WM-004635	0.01	WD-WM-004635	0.01
WD-WM-004636	0	WD-WM-004636	0.01	WD-WM-004636	0.01
WD-WM-004641	0	WD-WM-004641	0	WD-WM-004641	0
WD-WM-004642	0	WD-WM-004642	0	WD-WM-004642	0
WD-WM-004643	0	WD-WM-004643	0	WD-WM-004643	0
WD-WM-004691	0.01	WD-WM-004691	0.01	WD-WM-004691	0.01
WD-WM-004692	0.01	WD-WM-004692	0.01	WD-WM-004692	0.01
WD-WM-004700	0.01	WD-WM-004700	0.02	WD-WM-004700	0.02
WD-WM-004701	0	WD-WM-004701	0	WD-WM-004701	0
WD-WM-004702	0	WD-WM-004702	0	WD-WM-004702	0
WD-WM-004708(1)	0	WD-WM-004708(1)	0.01	WD-WM-004708(1)	0.01
WD-WM-004708(2)(1)	0	WD-WM-004708(2)(1)	0.01	WD-WM-004708(2)(1)	0.01
WD-WM-004708(2)(2)	0	WD-WM-004708(2)(2)	0	WD-WM-004708(2)(2)	0
WD-WM-004709	0.01	WD-WM-004709	0.01	WD-WM-004709	0.01
WD-WM-004732	0	WD-WM-004732	0	WD-WM-004732	0
WD-WM-004733	0	WD-WM-004733	0	WD-WM-004733	0
WD-WM-004755	0	WD-WM-004755	0	WD-WM-004755	0
WD-WM-004772	0	WD-WM-004772	0	WD-WM-004772	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**
WD-WM-004773	0	WD-WM-004773	0	WD-WM-004773	0
WD-WM-004777	0	WD-WM-004777	0	WD-WM-004777	0
WD-WM-004778	0	WD-WM-004778	0	WD-WM-004778	0
WD-WM-004779	0	WD-WM-004779	0	WD-WM-004779	0
WD-WM-004842	0.05	WD-WM-004842	0.01	WD-WM-004842	0.02
WD-WM-004975	0.01	WD-WM-004975	0.02	WD-WM-004975	0.02
WD-WM-004976	0	WD-WM-004976	0	WD-WM-004976	0
WD-WM-004986(1)	0.01	WD-WM-004986(1)	0.03	WD-WM-004986(1)	0.03
WD-WM-004986(2)	0.01	WD-WM-004986(2)	0.03	WD-WM-004986(2)	0.03
WD-WM-004998	0	WD-WM-004998	0	WD-WM-004998	0
WD-WM-005001	0	WD-WM-005001	0	WD-WM-005001	0
WD-WM-005007	0	WD-WM-005007	0	WD-WM-005007	0
WD-WM-005008	0	WD-WM-005008	0	WD-WM-005008	0
WD-WM-005009	0	WD-WM-005009	0	WD-WM-005009	0
WD-WM-005019	0	WD-WM-005019	0	WD-WM-005019	0
WD-WM-005024	0.01	WD-WM-005024	0.02	WD-WM-005024	0.02
WD-WM-005027	0.01	WD-WM-005027	0.01	WD-WM-005027	0.02
WD-WM-005028	0	WD-WM-005028	0	WD-WM-005028	0
WD-WM-005033	0	WD-WM-005033	0	WD-WM-005033	0.01
WD-WM-005034	0	WD-WM-005034	0.01	WD-WM-005034	0.01
WD-WM-005040	0	WD-WM-005040	0	WD-WM-005040	0
WD-WM-005041	0.02	WD-WM-005041	0.04	WD-WM-005041	0.06
WD-WM-005042	0	WD-WM-005042	0	WD-WM-005042	0
WD-WM-005079	0	WD-WM-005079	0	WD-WM-005079	0
WD-WM-005080	0	WD-WM-005080	0.01	WD-WM-005080	0.01
WD-WM-005081	0	WD-WM-005081	0.01	WD-WM-005081	0.01
WD-WM-005095	0	WD-WM-005095	0	WD-WM-005095	0
WD-WM-005097	0	WD-WM-005097	0	WD-WM-005097	0
WD-WM-005102	0	WD-WM-005102	0	WD-WM-005102	0
WD-WM-005104	0	WD-WM-005104	0	WD-WM-005104	0
WD-WM-005120	0	WD-WM-005120	0	WD-WM-005120	0
WD-WM-005126(2)	0.07	WD-WM-005126(2)	0.06	WD-WM-005126(2)	0.07
WD-WM-005135	0	WD-WM-005135	0	WD-WM-005135	0
WD-WM-005146	0	WD-WM-005146	0	WD-WM-005146	0
WD-WM-005150	0	WD-WM-005150	0	WD-WM-005150	0
WD-WM-005294	0.01	WD-WM-005294	0	WD-WM-005294	0
WD-WM-005295	0.01	WD-WM-005295	0	WD-WM-005295	0
WD-WM-005296	0.01	WD-WM-005296	0	WD-WM-005296	0
WD-WM-005302	0	WD-WM-005302	0	WD-WM-005302	0
WD-WM-005303	0.01	WD-WM-005303	0	WD-WM-005303	0
WD-WM-005306	0.14	WD-WM-005306	0.04	WD-WM-005306	0.02
WD-WM-005444	0	WD-WM-005444	0	WD-WM-005444	0
WD-WM-005457	0.01	WD-WM-005457	0.02	WD-WM-005457	0.02
WD-WM-005460	0	WD-WM-005460	0	WD-WM-005460	0
WD-WM-005461	0	WD-WM-005461	0	WD-WM-005461	0
WD-WM-005464	0	WD-WM-005464	0	WD-WM-005464	0
WD-WM-005465	0	WD-WM-005465	0	WD-WM-005465	0
WD-WM-005466	0	WD-WM-005466	0	WD-WM-005466	0
WD-WM-005467	0	WD-WM-005467	0	WD-WM-005467	0
WD-WM-005509	0	WD-WM-005509	0	WD-WM-005509	0
WD-WM-005510	0	WD-WM-005510	0	WD-WM-005510	0
WD-WM-005522	0	WD-WM-005522	0	WD-WM-005522	0
WD-WM-005523	0	WD-WM-005523	0	WD-WM-005523	0
WD-WM-005534	0	WD-WM-005534	0	WD-WM-005534	0
WD-WM-005535	0	WD-WM-005535	0	WD-WM-005535	0
WD-WM-005536	0	WD-WM-005536	0	WD-WM-005536	0
WD-WM-005537	0	WD-WM-005537	0	WD-WM-005537	0
WD-WM-005538	0	WD-WM-005538	0	WD-WM-005538	0
WD-WM-005591	0.17	WD-WM-005591	0.11	WD-WM-005591	0.25
WD-WM-005592	0.17	WD-WM-005592	0.11	WD-WM-005592	0.25
WD-WM-005593	0.17	WD-WM-005593	0.11	WD-WM-005593	0.25
WD-WM-005604	0	WD-WM-005604	0	WD-WM-005604	0
WD-WM-005615	0	WD-WM-005615	0	WD-WM-005615	0
WD-WM-005653	0.01	WD-WM-005653	0.01	WD-WM-005653	0.02
WD-WM-005654	0.01	WD-WM-005654	0.01	WD-WM-005654	0.02
WD-WM-005655	0.01	WD-WM-005655	0.01	WD-WM-005655	0.02
WD-WM-005656	0	WD-WM-005656	0	WD-WM-005656	0
WD-WM-005657	0.01	WD-WM-005657	0.01	WD-WM-005657	0.01
WD-WM-005658	0.01	WD-WM-005658	0.01	WD-WM-005658	0.01
WD-WM-005679	0	WD-WM-005679	0	WD-WM-005679	0
WD-WM-005680	0	WD-WM-005680	0	WD-WM-005680	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-005723	0	WD-WM-005723	0	WD-WM-005723	0
WD-WM-005815	0	WD-WM-005815	0	WD-WM-005815	0
WD-WM-005816	0	WD-WM-005816	0	WD-WM-005816	0
WD-WM-005829	0	WD-WM-005829	0	WD-WM-005829	0
WD-WM-005917	0	WD-WM-005917	0	WD-WM-005917	0
WD-WM-006038	0.01	WD-WM-006038	0	WD-WM-006038	0
WD-WM-006076	1.06	WD-WM-006076	0.29	WD-WM-006076	0.53
WD-WM-006102	0	WD-WM-006102	0	WD-WM-006102	0
WD-WM-006103	0	WD-WM-006103	0	WD-WM-006103	0
WD-WM-006436	0.05	WD-WM-006436	0.01	WD-WM-006436	0.02
WD-WM-006437	0	WD-WM-006437	0	WD-WM-006437	0
WD-WM-006446	0	WD-WM-006446	0	WD-WM-006446	0
WD-WM-006447	0.01	WD-WM-006447	0	WD-WM-006447	0
WD-WM-006448	0.01	WD-WM-006448	0	WD-WM-006448	0
WD-WM-006449	0.01	WD-WM-006449	0	WD-WM-006449	0
WD-WM-006450	0.01	WD-WM-006450	0	WD-WM-006450	0
WD-WM-006451	0.01	WD-WM-006451	0	WD-WM-006451	0
WD-WM-006472	0	WD-WM-006472	0	WD-WM-006472	0
WD-WM-006510	1.06	WD-WM-006510	0.29	WD-WM-006510	0.53
WD-WM-006513	0	WD-WM-006513	0	WD-WM-006513	0
WD-WM-006514	0.04	WD-WM-006514	0.02	WD-WM-006514	0.02
WD-WM-006519	0.75	WD-WM-006519	0.2	WD-WM-006519	0.37
WD-WM-006520	0.75	WD-WM-006520	0.2	WD-WM-006520	0.37
WD-WM-006523	1.54	WD-WM-006523	0.41	WD-WM-006523	0.76
WD-WM-006524	1.54	WD-WM-006524	0.41	WD-WM-006524	0.76
WD-WM-006533	0	WD-WM-006533	0	WD-WM-006533	0
WD-WM-006538	0.01	WD-WM-006538	0.04	WD-WM-006538	0.04
WD-WM-006541	0.01	WD-WM-006541	0	WD-WM-006541	0
WD-WM-006559	0	WD-WM-006559	0	WD-WM-006559	0
WD-WM-006601	0	WD-WM-006601	0	WD-WM-006601	0
WD-WM-006650	0.05	WD-WM-006650	0.07	WD-WM-006650	0.08
WD-WM-006651	0.05	WD-WM-006651	0.07	WD-WM-006651	0.08
WD-WM-006652	0.05	WD-WM-006652	0.07	WD-WM-006652	0.08
WD-WM-006653	0	WD-WM-006653	0	WD-WM-006653	0
WD-WM-006732	0	WD-WM-006732	0	WD-WM-006732	0
WD-WM-006775	0.01	WD-WM-006775	0	WD-WM-006775	0
WD-WM-006776	0	WD-WM-006776	0	WD-WM-006776	0
WD-WM-006777	0	WD-WM-006777	0	WD-WM-006777	0
WD-WM-006796	0	WD-WM-006796	0	WD-WM-006796	0
WD-WM-006797	0	WD-WM-006797	0	WD-WM-006797	0
WD-WM-006798	0.01	WD-WM-006798	0	WD-WM-006798	0
WD-WM-006801	0.01	WD-WM-006801	0.01	WD-WM-006801	0
WD-WM-006804	0	WD-WM-006804	0	WD-WM-006804	0
WD-WM-006821	0	WD-WM-006821	0	WD-WM-006821	0
WD-WM-006825	0	WD-WM-006825	0	WD-WM-006825	0
WD-WM-006826	0	WD-WM-006826	0	WD-WM-006826	0
WD-WM-006857	0	WD-WM-006857	0	WD-WM-006857	0
WD-WM-006858	0	WD-WM-006858	0	WD-WM-006858	0
WD-WM-006859	0	WD-WM-006859	0	WD-WM-006859	0
WD-WM-006860	0	WD-WM-006860	0	WD-WM-006860	0
WD-WM-006886	0	WD-WM-006886	0.04	WD-WM-006886	0.02
WD-WM-006887	0.02	WD-WM-006887	0.04	WD-WM-006887	0.04
WD-WM-006985	0	WD-WM-006985	0	WD-WM-006985	0
WD-WM-007026	0	WD-WM-007026	0	WD-WM-007026	0
WD-WM-007061	0	WD-WM-007061	0	WD-WM-007061	0
WD-WM-007091	0.01	WD-WM-007091	0.05	WD-WM-007091	0.03
WD-WM-007092	0	WD-WM-007092	0	WD-WM-007092	0
WD-WM-007123	0	WD-WM-007123	0	WD-WM-007123	0
WD-WM-007125	0	WD-WM-007125	0	WD-WM-007125	0
WD-WM-007131	0	WD-WM-007131	0	WD-WM-007131	0
WD-WM-007135	0	WD-WM-007135	0	WD-WM-007135	0
WD-WM-007138	0	WD-WM-007138	0	WD-WM-007138	0
WD-WM-007139	0	WD-WM-007139	0	WD-WM-007139	0
WD-WM-007140	0	WD-WM-007140	0	WD-WM-007140	0
WD-WM-007229	0	WD-WM-007229	0	WD-WM-007229	0
WD-WM-007230	0	WD-WM-007230	0	WD-WM-007230	0
WD-WM-007258	0	WD-WM-007258	0	WD-WM-007258	0
WD-WM-007260	0.05	WD-WM-007260	0.07	WD-WM-007260	0.09
WD-WM-007366	0	WD-WM-007366	0	WD-WM-007366	0
WD-WM-007367	0	WD-WM-007367	0	WD-WM-007367	0
WD-WM-007446	0.13	WD-WM-007446	0.13	WD-WM-007446	0.15

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-007448	0.13	WD-WM-007448	0.13	WD-WM-007448	0.15
WD-WM-007472	1.9	WD-WM-007472	1.52	WD-WM-007472	1.55
WD-WM-007682	0	WD-WM-007682	0	WD-WM-007682	0
WD-WM-007685	0	WD-WM-007685	0	WD-WM-007685	0
WD-WM-007723	0.01	WD-WM-007723	0.01	WD-WM-007723	0
WD-WM-007724	0	WD-WM-007724	0	WD-WM-007724	0
WD-WM-007727	0.01	WD-WM-007727	0	WD-WM-007727	0
WD-WM-007728	0	WD-WM-007728	0	WD-WM-007728	0
WD-WM-007729	0	WD-WM-007729	0	WD-WM-007729	0
WD-WM-007732	0	WD-WM-007732	0	WD-WM-007732	0
WD-WM-007737	0	WD-WM-007737	0	WD-WM-007737	0
WD-WM-007738	0	WD-WM-007738	0	WD-WM-007738	0
WD-WM-007750	0	WD-WM-007750	0	WD-WM-007750	0
WD-WM-007754	0.01	WD-WM-007754	0	WD-WM-007754	0
WD-WM-007755	0.01	WD-WM-007755	0	WD-WM-007755	0
WD-WM-007776	0.01	WD-WM-007776	0	WD-WM-007776	0
WD-WM-007811	0	WD-WM-007811	0	WD-WM-007811	0
WD-WM-007812	0	WD-WM-007812	(N/A)	WD-WM-007812	(N/A)
WD-WM-007856	0	WD-WM-007856	0	WD-WM-007856	0
WD-WM-007897	0	WD-WM-007897	0	WD-WM-007897	0
WD-WM-007907	0	WD-WM-007907	0	WD-WM-007907	0
WD-WM-007927	0	WD-WM-007927	0	WD-WM-007927	0
WD-WM-008045	0	WD-WM-008045	0	WD-WM-008045	0
WD-WM-008112	0	WD-WM-008112	0	WD-WM-008112	0
WD-WM-008113	0.02	WD-WM-008113	0.04	WD-WM-008113	0.06
WD-WM-008114	0.02	WD-WM-008114	0.04	WD-WM-008114	0.06
WD-WM-008116	0	WD-WM-008116	0	WD-WM-008116	0
WD-WM-008144	0	WD-WM-008144	0	WD-WM-008144	0
WD-WM-008179	0	WD-WM-008179	0	WD-WM-008179	0
WD-WM-008181	0	WD-WM-008181	0.01	WD-WM-008181	0.01
WD-WM-008197	0	WD-WM-008197	0.01	WD-WM-008197	0.01
WD-WM-008198	0	WD-WM-008198	0.01	WD-WM-008198	0.01
WD-WM-008199	0	WD-WM-008199	0	WD-WM-008199	0.01
WD-WM-008200	0	WD-WM-008200	0	WD-WM-008200	0
WD-WM-008202	0	WD-WM-008202	0.01	WD-WM-008202	0.01
WD-WM-008203	0	WD-WM-008203	0.01	WD-WM-008203	0.01
WD-WM-008239	0	WD-WM-008239	0	WD-WM-008239	0
WD-WM-008256	0	WD-WM-008256	0	WD-WM-008256	0
WD-WM-008259	0	WD-WM-008259	0	WD-WM-008259	0
WD-WM-008260	0	WD-WM-008260	0	WD-WM-008260	0
WD-WM-008297	0	WD-WM-008297	0	WD-WM-008297	0
WD-WM-008299	0	WD-WM-008299	0	WD-WM-008299	0
WD-WM-008301	0	WD-WM-008301	0	WD-WM-008301	0
WD-WM-008302	0	WD-WM-008302	0	WD-WM-008302	0
WD-WM-008313	0	WD-WM-008313	0	WD-WM-008313	0
WD-WM-008314	0	WD-WM-008314	0	WD-WM-008314	0
WD-WM-008356	0	WD-WM-008356	0	WD-WM-008356	0
WD-WM-008357	0	WD-WM-008357	0	WD-WM-008357	0
WD-WM-008358	0	WD-WM-008358	0	WD-WM-008358	0
WD-WM-008360	0	WD-WM-008360	0	WD-WM-008360	0
WD-WM-008426	0	WD-WM-008426	0	WD-WM-008426	0
WD-WM-008431	0	WD-WM-008431	0	WD-WM-008431	0
WD-WM-008454	0	WD-WM-008454	0	WD-WM-008454	0
WD-WM-008455	0	WD-WM-008455	0	WD-WM-008455	0
WD-WM-008573	0	WD-WM-008573	0	WD-WM-008573	0
WD-WM-008575	0	WD-WM-008575	0	WD-WM-008575	0
WD-WM-008580	0	WD-WM-008580	0	WD-WM-008580	0
WD-WM-008600	0	WD-WM-008600	0	WD-WM-008600	0
WD-WM-008602	0	WD-WM-008602	0	WD-WM-008602	0
WD-WM-008638(1)	0.26	WD-WM-008638(1)	0.22	WD-WM-008638(1)	0.22
WD-WM-008638(2)	0	WD-WM-008638(2)	0	WD-WM-008638(2)	0
WD-WM-008639	0.26	WD-WM-008639	0.22	WD-WM-008639	0.22
WD-WM-008642	0.65	WD-WM-008642	0.61	WD-WM-008642	0.59
WD-WM-008737	0	WD-WM-008737	0	WD-WM-008737	0
WD-WM-008738	0	WD-WM-008738	0	WD-WM-008738	0
WD-WM-008741	0	WD-WM-008741	0	WD-WM-008741	0
WD-WM-008769	0	WD-WM-008769	0	WD-WM-008769	0
WD-WM-008818	0	WD-WM-008818	0	WD-WM-008818	0
WD-WM-008820	0	WD-WM-008820	0	WD-WM-008820	0
WD-WM-008821	0	WD-WM-008821	0	WD-WM-008821	0
WD-WM-008823(1)	0	WD-WM-008823(1)	0	WD-WM-008823(1)	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-008823(2)	0	WD-WM-008823(2)	0	WD-WM-008823(2)	0
WD-WM-008824	0	WD-WM-008824	0	WD-WM-008824	0
WD-WM-008825(1)	0	WD-WM-008825(1)	0	WD-WM-008825(1)	0
WD-WM-008825(2)	0	WD-WM-008825(2)	0	WD-WM-008825(2)	0
WD-WM-008826	0.04	WD-WM-008826	0.05	WD-WM-008826	0.05
WD-WM-008827	0	WD-WM-008827	0	WD-WM-008827	0
WD-WM-008828	0	WD-WM-008828	0	WD-WM-008828	0
WD-WM-008839	0	WD-WM-008839	0	WD-WM-008839	0
WD-WM-008847	0	WD-WM-008847	0	WD-WM-008847	0
WD-WM-008854	0	WD-WM-008854	0	WD-WM-008854	0
WD-WM-009005(1)	0.04	WD-WM-009005(1)	0.11	WD-WM-009005(1)	0.13
WD-WM-009005(2)	0.01	WD-WM-009005(2)	0.02	WD-WM-009005(2)	0.02
WD-WM-009080	0	WD-WM-009080	0	WD-WM-009080	0
WD-WM-009081	0	WD-WM-009081	0	WD-WM-009081	0
WD-WM-009212	0.09	WD-WM-009212	0.22	WD-WM-009212	0.23
WD-WM-009223	0	WD-WM-009223	0.01	WD-WM-009223	0
WD-WM-009249	0.01	WD-WM-009249	0.01	WD-WM-009249	0.02
WD-WM-009251	0.02	WD-WM-009251	0.01	WD-WM-009251	0.03
WD-WM-009252	0.04	WD-WM-009252	0.03	WD-WM-009252	0.01
WD-WM-009253	0.03	WD-WM-009253	0.02	WD-WM-009253	0.03
WD-WM-009254	0.02	WD-WM-009254	0.02	WD-WM-009254	0.03
WD-WM-009255	0	WD-WM-009255	0	WD-WM-009255	0
WD-WM-009256	0	WD-WM-009256	0	WD-WM-009256	0
WD-WM-009257	0	WD-WM-009257	0	WD-WM-009257	0
WD-WM-009258	0	WD-WM-009258	0	WD-WM-009258	0
WD-WM-009259	0	WD-WM-009259	0	WD-WM-009259	0
WD-WM-009260	0	WD-WM-009260	0	WD-WM-009260	0
WD-WM-009261	0	WD-WM-009261	0	WD-WM-009261	0
WD-WM-009262	0	WD-WM-009262	0	WD-WM-009262	0
WD-WM-009263	0	WD-WM-009263	0	WD-WM-009263	0
WD-WM-009264	0	WD-WM-009264	0	WD-WM-009264	0
WD-WM-009265	0	WD-WM-009265	0	WD-WM-009265	0
WD-WM-009268	0	WD-WM-009268	0	WD-WM-009268	0
WD-WM-009269	0	WD-WM-009269	0	WD-WM-009269	0
WD-WM-009270	0	WD-WM-009270	0	WD-WM-009270	0
WD-WM-009273	0	WD-WM-009273	0	WD-WM-009273	0
WD-WM-009283	0	WD-WM-009283	0	WD-WM-009283	0
WD-WM-009290	0.01	WD-WM-009290	0	WD-WM-009290	0
WD-WM-009294	0.02	WD-WM-009294	0.01	WD-WM-009294	0.01
WD-WM-009300	0	WD-WM-009300	0	WD-WM-009300	0
WD-WM-009313	0	WD-WM-009313	0	WD-WM-009313	0
WD-WM-009322	0	WD-WM-009322	0	WD-WM-009322	0
WD-WM-009323	0	WD-WM-009323	0	WD-WM-009323	0
WD-WM-009363	0	WD-WM-009363	0	WD-WM-009363	0
WD-WM-009386(1)	0	WD-WM-009386(1)	0	WD-WM-009386(1)	0
WD-WM-009386(2)	0	WD-WM-009386(2)	0	WD-WM-009386(2)	0
WD-WM-009410	0	WD-WM-009410	0	WD-WM-009410	0
WD-WM-009411	0	WD-WM-009411	0	WD-WM-009411	0
WD-WM-009418	0	WD-WM-009418	0	WD-WM-009418	0
WD-WM-009425	0	WD-WM-009425	0	WD-WM-009425	0
WD-WM-009426	0	WD-WM-009426	0	WD-WM-009426	0
WD-WM-009427	0	WD-WM-009427	0	WD-WM-009427	0
WD-WM-009459	0.13	WD-WM-009459	0.04	WD-WM-009459	0.3
WD-WM-009461	0.04	WD-WM-009461	0.01	WD-WM-009461	0.08
WD-WM-009469	0.04	WD-WM-009469	0.01	WD-WM-009469	0.08
WD-WM-009472	0.09	WD-WM-009472	0.03	WD-WM-009472	0.22
WD-WM-009490	0	WD-WM-009490	0	WD-WM-009490	0
WD-WM-009491	0.02	WD-WM-009491	0.04	WD-WM-009491	0.04
WD-WM-009672	0.03	WD-WM-009672	0.06	WD-WM-009672	0.04
WD-WM-009673	0.19	WD-WM-009673	0.33	WD-WM-009673	0.52
WD-WM-009891	0.65	WD-WM-009891	0.61	WD-WM-009891	0.59
WD-WM-009892	0	WD-WM-009892	0	WD-WM-009892	0
WD-WM-009900	0	WD-WM-009900	0	WD-WM-009900	0
WD-WM-010089	0	WD-WM-010089	0	WD-WM-010089	0
WD-WM-010155	0.03	WD-WM-010155	0.03	WD-WM-010155	0.03
WD-WM-010223	0	WD-WM-010223	0	WD-WM-010223	0
WD-WM-010251	0	WD-WM-010251	0	WD-WM-010251	0
WD-WM-010256	0	WD-WM-010256	0	WD-WM-010256	0
WD-WM-010257	0	WD-WM-010257	0	WD-WM-010257	0
WD-WM-010265	0	WD-WM-010265	0	WD-WM-010265	0
WD-WM-010347	0.01	WD-WM-010347	0.02	WD-WM-010347	0.04

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-010348	0.07	WD-WM-010348	0.1	WD-WM-010348	0.3
WD-WM-010349	0.14	WD-WM-010349	0.21	WD-WM-010349	0.5
WD-WM-010350	0.44	WD-WM-010350	0.66	WD-WM-010350	1.43
WD-WM-010409	0	WD-WM-010409	0	WD-WM-010409	0
WD-WM-010422	0.02	WD-WM-010422	0.04	WD-WM-010422	0.04
WD-WM-010552	0	WD-WM-010552	0	WD-WM-010552	0
WD-WM-010573	0	WD-WM-010573	0	WD-WM-010573	0
WD-WM-010663	0.03	WD-WM-010663	0.3	WD-WM-010663	0.11
WD-WM-010667	0	WD-WM-010667	0	WD-WM-010667	0
WD-WM-010673	0	WD-WM-010673	0	WD-WM-010673	0
WD-WM-010675	0	WD-WM-010675	0	WD-WM-010675	0
WD-WM-010681	0	WD-WM-010681	0	WD-WM-010681	0
WD-WM-010686(1)	0	WD-WM-010686(1)	0	WD-WM-010686(1)	0
WD-WM-010686(2)	0	WD-WM-010686(2)	0	WD-WM-010686(2)	0
WD-WM-010688	0	WD-WM-010688	0	WD-WM-010688	0
WD-WM-010690(1)	0	WD-WM-010690(1)	0	WD-WM-010690(1)	0
WD-WM-010690(2)	0	WD-WM-010690(2)	0	WD-WM-010690(2)	0
WD-WM-010692	0	WD-WM-010692	0	WD-WM-010692	0
WD-WM-010710	0.48	WD-WM-010710	0.44	WD-WM-010710	0.69
WD-WM-010733	0	WD-WM-010733	0	WD-WM-010733	0
WD-WM-010874	0.01	WD-WM-010874	0.01	WD-WM-010874	0.01
WD-WM-010885	0.12	WD-WM-010885	0.07	WD-WM-010885	0.04
WD-WM-010908	0	WD-WM-010908	0	WD-WM-010908	0
WD-WM-010909	0	WD-WM-010909	0	WD-WM-010909	0
WD-WM-010919	0	WD-WM-010919	0	WD-WM-010919	0
WD-WM-010920	0	WD-WM-010920	0	WD-WM-010920	0
WD-WM-010960	0.04	WD-WM-010960	0.08	WD-WM-010960	0.1
WD-WM-010961	0	WD-WM-010961	0	WD-WM-010961	0
WD-WM-010969	0	WD-WM-010969	0	WD-WM-010969	0
WD-WM-010992	0	WD-WM-010992	0	WD-WM-010992	0
WD-WM-010993	0	WD-WM-010993	0	WD-WM-010993	0
WD-WM-011007	0	WD-WM-011007	0.01	WD-WM-011007	0.01
WD-WM-011008	0.04	WD-WM-011008	0	WD-WM-011008	0
WD-WM-011009	0	WD-WM-011009	0	WD-WM-011009	0
WD-WM-011010	0.05	WD-WM-011010	0.02	WD-WM-011010	0.02
WD-WM-011011	0.04	WD-WM-011011	0	WD-WM-011011	0
WD-WM-011012	0.04	WD-WM-011012	0	WD-WM-011012	0
WD-WM-011014	0.06	WD-WM-011014	0.02	WD-WM-011014	0.01
WD-WM-011015	0.07	WD-WM-011015	0.02	WD-WM-011015	0.02
WD-WM-011016	0.14	WD-WM-011016	0.08	WD-WM-011016	0.06
WD-WM-011025	0.01	WD-WM-011025	0.01	WD-WM-011025	0.01
WD-WM-011026	0	WD-WM-011026	0.01	WD-WM-011026	0.01
WD-WM-011027	0.01	WD-WM-011027	0.02	WD-WM-011027	0.01
WD-WM-011028	0	WD-WM-011028	0.01	WD-WM-011028	0.01
WD-WM-011029	0	WD-WM-011029	0	WD-WM-011029	0
WD-WM-011074	0.01	WD-WM-011074	0.01	WD-WM-011074	0.01
WD-WM-011075	0	WD-WM-011075	0.01	WD-WM-011075	0.01
WD-WM-011078	0	WD-WM-011078	0	WD-WM-011078	0
WD-WM-011100	0.06	WD-WM-011100	0.05	WD-WM-011100	0.12
WD-WM-011101	0.09	WD-WM-011101	0.12	WD-WM-011101	0.04
WD-WM-011102	0.1	WD-WM-011102	0.13	WD-WM-011102	0.02
WD-WM-011103	0.04	WD-WM-011103	0.06	WD-WM-011103	0.14
WD-WM-011104	0	WD-WM-011104	0	WD-WM-011104	0
WD-WM-011105	0.05	WD-WM-011105	0.07	WD-WM-011105	0.14
WD-WM-011106	0.12	WD-WM-011106	0.14	WD-WM-011106	0.11
WD-WM-011107	0.01	WD-WM-011107	0.02	WD-WM-011107	0.01
WD-WM-011108	0.13	WD-WM-011108	0.11	WD-WM-011108	0.08
WD-WM-011109	0	WD-WM-011109	0.01	WD-WM-011109	0.01
WD-WM-011110	0	WD-WM-011110	0.01	WD-WM-011110	0.01
WD-WM-011111	0.04	WD-WM-011111	0.1	WD-WM-011111	0.08
WD-WM-011112	0.01	WD-WM-011112	0.02	WD-WM-011112	0.02
WD-WM-011114	0	WD-WM-011114	0	WD-WM-011114	0
WD-WM-011115	0	WD-WM-011115	0	WD-WM-011115	0
WD-WM-011116	0	WD-WM-011116	0	WD-WM-011116	0
WD-WM-011117	0	WD-WM-011117	0	WD-WM-011117	0
WD-WM-011118	0	WD-WM-011118	0	WD-WM-011118	0
WD-WM-011136	0.07	WD-WM-011136	0.03	WD-WM-011136	0.04
WD-WM-011149	0.02	WD-WM-011149	0.35	WD-WM-011149	0.33
WD-WM-011151	0.02	WD-WM-011151	0.02	WD-WM-011151	0.02
WD-WM-011152	0.02	WD-WM-011152	0.02	WD-WM-011152	0.02
WD-WM-011153	0.04	WD-WM-011153	0.03	WD-WM-011153	0.03

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-011154	0.01	WD-WM-011154	0.01	WD-WM-011154	0.01
WD-WM-011155	0.03	WD-WM-011155	0.03	WD-WM-011155	0.04
WD-WM-011156	0.03	WD-WM-011156	0.04	WD-WM-011156	0.04
WD-WM-011157	0.03	WD-WM-011157	0.05	WD-WM-011157	0.05
WD-WM-011158	0	WD-WM-011158	0.4	WD-WM-011158	0.36
WD-WM-011159	0	WD-WM-011159	0.41	WD-WM-011159	0.35
WD-WM-011160	0	WD-WM-011160	0	WD-WM-011160	0
WD-WM-011161	0.02	WD-WM-011161	0.03	WD-WM-011161	0.04
WD-WM-011162	0.03	WD-WM-011162	0.05	WD-WM-011162	0.06
WD-WM-011163	0.03	WD-WM-011163	0.05	WD-WM-011163	0.07
WD-WM-011164(1)	0.09	WD-WM-011164(1)	0.16	WD-WM-011164(1)	0.2
WD-WM-011164(2)(1)	0.09	WD-WM-011164(2)(1)	0.16	WD-WM-011164(2)(1)	0.21
WD-WM-011164(2)(2)	0.13	WD-WM-011164(2)(2)	0.23	WD-WM-011164(2)(2)	0.29
WD-WM-011165	0.13	WD-WM-011165	0.23	WD-WM-011165	0.3
WD-WM-011166	0.13	WD-WM-011166	0.24	WD-WM-011166	0.3
WD-WM-011170	0.02	WD-WM-011170	0.01	WD-WM-011170	0.06
WD-WM-011171	0	WD-WM-011171	0.01	WD-WM-011171	0.01
WD-WM-011172	0.02	WD-WM-011172	0.02	WD-WM-011172	0.05
WD-WM-011173	0.02	WD-WM-011173	0.02	WD-WM-011173	0.05
WD-WM-011174	0	WD-WM-011174	0.01	WD-WM-011174	0.01
WD-WM-011175	0.02	WD-WM-011175	0.03	WD-WM-011175	0.04
WD-WM-011176	0.03	WD-WM-011176	0.06	WD-WM-011176	0.08
WD-WM-011177	0.03	WD-WM-011177	0.06	WD-WM-011177	0.07
WD-WM-011178	0.02	WD-WM-011178	0.03	WD-WM-011178	0.04
WD-WM-011179	0.03	WD-WM-011179	0.05	WD-WM-011179	0.06
WD-WM-011180	0.01	WD-WM-011180	0.02	WD-WM-011180	0.02
WD-WM-011181(1)	0.04	WD-WM-011181(1)	0.06	WD-WM-011181(1)	0.08
WD-WM-011181(2)	0	WD-WM-011181(2)	0	WD-WM-011181(2)	0
WD-WM-011182	0.04	WD-WM-011182	0.07	WD-WM-011182	0.08
WD-WM-011183	0.06	WD-WM-011183	0.11	WD-WM-011183	0.13
WD-WM-011184	0.02	WD-WM-011184	0.04	WD-WM-011184	0.05
WD-WM-011185	0.01	WD-WM-011185	0.01	WD-WM-011185	0.01
WD-WM-011186	0	WD-WM-011186	0.01	WD-WM-011186	0.01
WD-WM-011187	0	WD-WM-011187	0	WD-WM-011187	0
WD-WM-011188	0.04	WD-WM-011188	0.06	WD-WM-011188	0.08
WD-WM-011189	0.04	WD-WM-011189	0.07	WD-WM-011189	0.09
WD-WM-011190	0	WD-WM-011190	0	WD-WM-011190	0
WD-WM-011201	0.02	WD-WM-011201	0.11	WD-WM-011201	0.04
WD-WM-011202	0.01	WD-WM-011202	0.05	WD-WM-011202	0.01
WD-WM-011203	0.03	WD-WM-011203	0.04	WD-WM-011203	0.05
WD-WM-011205	0.03	WD-WM-011205	0.04	WD-WM-011205	0.06
WD-WM-011206	0.01	WD-WM-011206	0.09	WD-WM-011206	0.02
WD-WM-011208	0.06	WD-WM-011208	0.06	WD-WM-011208	0.12
WD-WM-011209	0	WD-WM-011209	0	WD-WM-011209	0.01
WD-WM-011210	0.01	WD-WM-011210	0.02	WD-WM-011210	0.02
WD-WM-011212	0.02	WD-WM-011212	0.03	WD-WM-011212	0.03
WD-WM-011213	0	WD-WM-011213	0.01	WD-WM-011213	0.01
WD-WM-011214	0.01	WD-WM-011214	0.01	WD-WM-011214	0.02
WD-WM-011215	0.01	WD-WM-011215	0.01	WD-WM-011215	0.02
WD-WM-011216	0	WD-WM-011216	0.01	WD-WM-011216	0.01
WD-WM-011217	0.03	WD-WM-011217	0.02	WD-WM-011217	0.05
WD-WM-011218	0.02	WD-WM-011218	0.01	WD-WM-011218	0.03
WD-WM-011219	0.05	WD-WM-011219	0.04	WD-WM-011219	0.1
WD-WM-011247	0	WD-WM-011247	0	WD-WM-011247	0
WD-WM-011286	0	WD-WM-011286	0	WD-WM-011286	0
WD-WM-011338	0.04	WD-WM-011338	0.01	WD-WM-011338	0.08
WD-WM-011339	0	WD-WM-011339	0	WD-WM-011339	0
WD-WM-011340	0.04	WD-WM-011340	0.01	WD-WM-011340	0.08
WD-WM-011364	0	WD-WM-011364	0	WD-WM-011364	0
WD-WM-011378	0	WD-WM-011378	0	WD-WM-011378	0
WD-WM-011379	0	WD-WM-011379	0	WD-WM-011379	0
WD-WM-011380	0	WD-WM-011380	0	WD-WM-011380	0
WD-WM-011384	0	WD-WM-011384	0	WD-WM-011384	0
WD-WM-011385	0	WD-WM-011385	0	WD-WM-011385	0
WD-WM-011386	0	WD-WM-011386	0	WD-WM-011386	0
WD-WM-011389	0.01	WD-WM-011389	0.03	WD-WM-011389	0.02
WD-WM-011390	0.01	WD-WM-011390	0.01	WD-WM-011390	0.01
WD-WM-011391	0	WD-WM-011391	0.01	WD-WM-011391	0.01
WD-WM-011395	0.01	WD-WM-011395	0.05	WD-WM-011395	0.02
WD-WM-011396	0.01	WD-WM-011396	0.05	WD-WM-011396	0.02
WD-WM-011397	0.01	WD-WM-011397	0.02	WD-WM-011397	0.02

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-011398	0.01	WD-WM-011398	0.01	WD-WM-011398	0.01
WD-WM-011399	0	WD-WM-011399	0	WD-WM-011399	0
WD-WM-011400	0	WD-WM-011400	0.01	WD-WM-011400	0.01
WD-WM-011401	0.01	WD-WM-011401	0.01	WD-WM-011401	0.01
WD-WM-011402	0.01	WD-WM-011402	0.01	WD-WM-011402	0.01
WD-WM-011403	0	WD-WM-011403	0	WD-WM-011403	0.01
WD-WM-011404	0.01	WD-WM-011404	0.01	WD-WM-011404	0.01
WD-WM-011405	0.01	WD-WM-011405	0.02	WD-WM-011405	0.03
WD-WM-011406	0.01	WD-WM-011406	0.09	WD-WM-011406	0.02
WD-WM-011407	0.02	WD-WM-011407	0.03	WD-WM-011407	0.04
WD-WM-011411	0.01	WD-WM-011411	0.01	WD-WM-011411	0.02
WD-WM-011412	0.02	WD-WM-011412	0.02	WD-WM-011412	0.03
WD-WM-011413	0.01	WD-WM-011413	0.03	WD-WM-011413	0.03
WD-WM-011416	0.02	WD-WM-011416	0.1	WD-WM-011416	0.04
WD-WM-011417	0	WD-WM-011417	0.05	WD-WM-011417	0.02
WD-WM-011418	0.01	WD-WM-011418	0.04	WD-WM-011418	0.02
WD-WM-011419	0.01	WD-WM-011419	0.02	WD-WM-011419	0.02
WD-WM-011420	0	WD-WM-011420	0.02	WD-WM-011420	0.01
WD-WM-011421	0.01	WD-WM-011421	0.02	WD-WM-011421	0.01
WD-WM-011422	0.01	WD-WM-011422	0.01	WD-WM-011422	0.02
WD-WM-011423	0.01	WD-WM-011423	0.01	WD-WM-011423	0.01
WD-WM-011424	0.02	WD-WM-011424	0.01	WD-WM-011424	0.03
WD-WM-011425	0.02	WD-WM-011425	0.01	WD-WM-011425	0.03
WD-WM-011426	0.03	WD-WM-011426	0.03	WD-WM-011426	0.05
WD-WM-011427	0.03	WD-WM-011427	0.04	WD-WM-011427	0.05
WD-WM-011428	0.08	WD-WM-011428	0.05	WD-WM-011428	0.16
WD-WM-011429	0.09	WD-WM-011429	0.05	WD-WM-011429	0.16
WD-WM-011626	0	WD-WM-011626	0	WD-WM-011626	0
WD-WM-011627	0	WD-WM-011627	0.01	WD-WM-011627	0.01
WD-WM-011628	0	WD-WM-011628	0.01	WD-WM-011628	0.01
WD-WM-011642	0.51	WD-WM-011642	0.13	WD-WM-011642	0.06
WD-WM-011648	0.01	WD-WM-011648	0.02	WD-WM-011648	0.01
WD-WM-011649	0.06	WD-WM-011649	0.07	WD-WM-011649	0.05
WD-WM-011650	0.06	WD-WM-011650	0.06	WD-WM-011650	0.05
WD-WM-011651	0.01	WD-WM-011651	0.03	WD-WM-011651	0.02
WD-WM-011652	0.1	WD-WM-011652	0	WD-WM-011652	0
WD-WM-011653	0.04	WD-WM-011653	0.1	WD-WM-011653	0.08
WD-WM-011654	0	WD-WM-011654	0	WD-WM-011654	0
WD-WM-011658	0.06	WD-WM-011658	0.07	WD-WM-011658	0.15
WD-WM-011659	0.09	WD-WM-011659	0.12	WD-WM-011659	0.03
WD-WM-011660	0.06	WD-WM-011660	0.07	WD-WM-011660	0.15
WD-WM-011661	0.05	WD-WM-011661	0.05	WD-WM-011661	0.11
WD-WM-011662	0.01	WD-WM-011662	0.01	WD-WM-011662	0.01
WD-WM-011663	0.01	WD-WM-011663	0.01	WD-WM-011663	0.01
WD-WM-011664	0.13	WD-WM-011664	0.11	WD-WM-011664	0.09
WD-WM-011671	0.01	WD-WM-011671	0.02	WD-WM-011671	0.02
WD-WM-011672	0.01	WD-WM-011672	0.03	WD-WM-011672	0.02
WD-WM-011673	0.04	WD-WM-011673	0.06	WD-WM-011673	0.14
WD-WM-011674	0.1	WD-WM-011674	0.13	WD-WM-011674	0.02
WD-WM-011675	0.07	WD-WM-011675	0.04	WD-WM-011675	0.14
WD-WM-011676	0	WD-WM-011676	0	WD-WM-011676	0
WD-WM-011677	0	WD-WM-011677	0.01	WD-WM-011677	0.01
WD-WM-011678	0.06	WD-WM-011678	0.05	WD-WM-011678	0.04
WD-WM-011679	0.07	WD-WM-011679	0.04	WD-WM-011679	0.03
WD-WM-011680	0	WD-WM-011680	0	WD-WM-011680	0
WD-WM-011681	0.06	WD-WM-011681	0.06	WD-WM-011681	0.05
WD-WM-011682	0.04	WD-WM-011682	0.01	WD-WM-011682	0.01
WD-WM-011683	0.06	WD-WM-011683	0.01	WD-WM-011683	0.01
WD-WM-011684	0.01	WD-WM-011684	0.03	WD-WM-011684	0.02
WD-WM-011685	0.07	WD-WM-011685	0.02	WD-WM-011685	0.02
WD-WM-011686	0.13	WD-WM-011686	0.08	WD-WM-011686	0.06
WD-WM-011688	0.48	WD-WM-011688	0.07	WD-WM-011688	0
WD-WM-011689	0.48	WD-WM-011689	0.08	WD-WM-011689	0
WD-WM-011690	0.22	WD-WM-011690	0.08	WD-WM-011690	0.03
WD-WM-011691	0.12	WD-WM-011691	0.07	WD-WM-011691	0.04
WD-WM-011692	0.12	WD-WM-011692	0.07	WD-WM-011692	0.04
WD-WM-011693	0.05	WD-WM-011693	0.02	WD-WM-011693	0.01
WD-WM-011694	0.04	WD-WM-011694	0.01	WD-WM-011694	0.01
WD-WM-011695	0.01	WD-WM-011695	0.01	WD-WM-011695	0.01
WD-WM-011696	0.01	WD-WM-011696	0.02	WD-WM-011696	0.02
WD-WM-011697	0	WD-WM-011697	0	WD-WM-011697	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-011705	0.1
WD-WM-011708	0.1
WD-WM-011709	0.1
WD-WM-011710	0.1
WD-WM-011711	0
WD-WM-011712	0
WD-WM-011713	0
WD-WM-011714	0.09
WD-WM-011715	0
WD-WM-011716	0
WD-WM-011717	0.09
WD-WM-011718	0
WD-WM-011719	0
WD-WM-011720	0.09
WD-WM-011721	0.09
WD-WM-011722	0.08
WD-WM-011723	0.08
WD-WM-011724	0.08
WD-WM-011725	0.08
WD-WM-011726	0.08
WD-WM-011727	0
WD-WM-011728	0
WD-WM-011729	0.07
WD-WM-011730	0
WD-WM-011731	0
WD-WM-011732	0.07
WD-WM-011733	0.06
WD-WM-011734	0.06
WD-WM-011735	0.06
WD-WM-011736	0.06
WD-WM-011737	0.05
WD-WM-011738	0
WD-WM-011739	0
WD-WM-011740	0
WD-WM-011741	0
WD-WM-011742	0
WD-WM-011743	0.05
WD-WM-011744	0.05
WD-WM-011746	0.05
WD-WM-011747	0.05
WD-WM-011748	0
WD-WM-011749	0
WD-WM-011750	0.04
WD-WM-011751	0.04
WD-WM-011752	0
WD-WM-011753	0
WD-WM-011754	0.04
WD-WM-011755	0.03
WD-WM-011756	0.03
WD-WM-011757	0.03
WD-WM-011758	0.03
WD-WM-011759	0
WD-WM-011819	0
WD-WM-011820	0
WD-WM-011821	0
WD-WM-011822	0
WD-WM-011823	0
WD-WM-011971	0.22
WD-WM-011972	0.21
WD-WM-011975	0.11
WD-WM-011976	0.11
WD-WM-011982	0.03
WD-WM-011983	0.03
WD-WM-012029	0.06
WD-WM-012125	0.01
WD-WM-012126	0.01
WD-WM-012162	0.03
WD-WM-012163	0.03
WD-WM-012165	0.09
WD-WM-012166	0.08
WD-WM-012167	0.12

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-011705	0.42
WD-WM-011708	0.42
WD-WM-011709	0.42
WD-WM-011710	0.41
WD-WM-011711	0.01
WD-WM-011712	0.01
WD-WM-011713	0
WD-WM-011714	0.4
WD-WM-011715	0.01
WD-WM-011716	0
WD-WM-011717	0.4
WD-WM-011718	0
WD-WM-011719	0.01
WD-WM-011720	0.39
WD-WM-011721	0.39
WD-WM-011722	0.38
WD-WM-011723	0.37
WD-WM-011724	0.38
WD-WM-011725	0.38
WD-WM-011726	0.38
WD-WM-011727	0.01
WD-WM-011728	0
WD-WM-011729	0.37
WD-WM-011730	0.01
WD-WM-011731	0.01
WD-WM-011732	0.36
WD-WM-011733	0.35
WD-WM-011734	0.35
WD-WM-011735	0.35
WD-WM-011736	0.35
WD-WM-011737	0.34
WD-WM-011738	0.01
WD-WM-011739	0.01
WD-WM-011740	0
WD-WM-011741	0.01
WD-WM-011742	0
WD-WM-011743	0.33
WD-WM-011744	0.33
WD-WM-011746	0.33
WD-WM-011747	0.32
WD-WM-011748	0.01
WD-WM-011749	0
WD-WM-011750	0.32
WD-WM-011751	0.32
WD-WM-011752	0.01
WD-WM-011753	0
WD-WM-011754	0.31
WD-WM-011755	0.31
WD-WM-011756	0.3
WD-WM-011757	0.3
WD-WM-011758	0.3
WD-WM-011759	0
WD-WM-011819	0
WD-WM-011820	0
WD-WM-011821	0
WD-WM-011822	0
WD-WM-011823	0
WD-WM-011971	0.3
WD-WM-011972	0.29
WD-WM-011975	0.15
WD-WM-011976	0.15
WD-WM-011982	0.05
WD-WM-011983	0.05
WD-WM-012029	0.04
WD-WM-012125	0.01
WD-WM-012126	0.01
WD-WM-012162	0.06
WD-WM-012163	0.06
WD-WM-012165	0
WD-WM-012166	0.01
WD-WM-012167	0.06

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-011705	0.32
WD-WM-011708	0.31
WD-WM-011709	0.32
WD-WM-011710	0.31
WD-WM-011711	0.01
WD-WM-011712	0.01
WD-WM-011713	0
WD-WM-011714	0.29
WD-WM-011715	0.01
WD-WM-011716	0
WD-WM-011717	0.28
WD-WM-011718	0
WD-WM-011719	0.01
WD-WM-011720	0.27
WD-WM-011721	0.27
WD-WM-011722	0.26
WD-WM-011723	0.24
WD-WM-011724	0.25
WD-WM-011725	0.25
WD-WM-011726	0.25
WD-WM-011727	0.01
WD-WM-011728	0
WD-WM-011729	0.23
WD-WM-011730	0.01
WD-WM-011731	0.01
WD-WM-011732	0.21
WD-WM-011733	0.21
WD-WM-011734	0.21
WD-WM-011735	0.2
WD-WM-011736	0.2
WD-WM-011737	0.18
WD-WM-011738	0.01
WD-WM-011739	0.01
WD-WM-011740	0
WD-WM-011741	0.01
WD-WM-011742	0
WD-WM-011743	0.17
WD-WM-011744	0.16
WD-WM-011746	0.16
WD-WM-011747	0.16
WD-WM-011748	0.01
WD-WM-011749	0
WD-WM-011750	0.14
WD-WM-011751	0.14
WD-WM-011752	0.01
WD-WM-011753	0
WD-WM-011754	0.13
WD-WM-011755	0.12
WD-WM-011756	0.12
WD-WM-011757	0.12
WD-WM-011758	0.11
WD-WM-011759	0
WD-WM-011819	0
WD-WM-011820	0
WD-WM-011821	0
WD-WM-011822	0
WD-WM-011823	0
WD-WM-011971	0.53
WD-WM-011972	0.52
WD-WM-011975	0.27
WD-WM-011976	0.27
WD-WM-011982	0.1
WD-WM-011983	0.1
WD-WM-012029	0.11
WD-WM-012125	0.01
WD-WM-012126	0.01
WD-WM-012162	0.05
WD-WM-012163	0.04
WD-WM-012165	0
WD-WM-012166	0.01
WD-WM-012167	0.04

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-012168	0.08	WD-WM-012168	0.01	WD-WM-012168	0.01
WD-WM-012169	0.08	WD-WM-012169	0.01	WD-WM-012169	0.01
WD-WM-012170	0.08	WD-WM-012170	0.02	WD-WM-012170	0.01
WD-WM-012171	0.08	WD-WM-012171	0.02	WD-WM-012171	0.02
WD-WM-012172	0	WD-WM-012172	0.01	WD-WM-012172	0.01
WD-WM-012173	0	WD-WM-012173	0	WD-WM-012173	0
WD-WM-012174	0.07	WD-WM-012174	0.03	WD-WM-012174	0.03
WD-WM-012175	0.07	WD-WM-012175	0.04	WD-WM-012175	0.03
WD-WM-012176	0.07	WD-WM-012176	0.04	WD-WM-012176	0.03
WD-WM-012177	0.13	WD-WM-012177	0.14	WD-WM-012177	0.34
WD-WM-012178	0.01	WD-WM-012178	0.01	WD-WM-012178	0.01
WD-WM-012179	0.12	WD-WM-012179	0.12	WD-WM-012179	0.33
WD-WM-012180	0.12	WD-WM-012180	0.12	WD-WM-012180	0.32
WD-WM-012181	0.11	WD-WM-012181	0.11	WD-WM-012181	0.31
WD-WM-012182	0	WD-WM-012182	0.01	WD-WM-012182	0.01
WD-WM-012183	0.11	WD-WM-012183	0.11	WD-WM-012183	0.31
WD-WM-012184	0.11	WD-WM-012184	0.11	WD-WM-012184	0.31
WD-WM-012185	0.11	WD-WM-012185	0.11	WD-WM-012185	0.3
WD-WM-012186	0.1	WD-WM-012186	0.1	WD-WM-012186	0.3
WD-WM-012243	0.01	WD-WM-012243	0.01	WD-WM-012243	0.01
WD-WM-012277	0.03	WD-WM-012277	0.03	WD-WM-012277	0.04
WD-WM-012278	0.03	WD-WM-012278	0.03	WD-WM-012278	0.04
WD-WM-012299	0	WD-WM-012299	0	WD-WM-012299	0
WD-WM-012302	0.02	WD-WM-012302	0.04	WD-WM-012302	0.05
WD-WM-012303(1)	0	WD-WM-012303(1)	0.01	WD-WM-012303(1)	0.01
WD-WM-012303(2)	0.02	WD-WM-012303(2)	0.05	WD-WM-012303(2)	0.06
WD-WM-012304	0.01	WD-WM-012304	0.04	WD-WM-012304	0.05
WD-WM-012305	0.01	WD-WM-012305	0.02	WD-WM-012305	0.03
WD-WM-012306	0.02	WD-WM-012306	0.04	WD-WM-012306	0.06
WD-WM-012307	0.01	WD-WM-012307	0.02	WD-WM-012307	0.02
WD-WM-012308(1)(1)	0.05	WD-WM-012308(1)(1)	0.08	WD-WM-012308(1)(1)	0.09
WD-WM-012308(1)(2)	0.03	WD-WM-012308(1)(2)	0.06	WD-WM-012308(1)(2)	0.07
WD-WM-012308(2)	0.03	WD-WM-012308(2)	0.03	WD-WM-012308(2)	0.03
WD-WM-012310	0.02	WD-WM-012310	0.05	WD-WM-012310	0.06
WD-WM-012311	0	WD-WM-012311	0.01	WD-WM-012311	0.01
WD-WM-012312(1)	0.01	WD-WM-012312(1)	0.04	WD-WM-012312(1)	0.05
WD-WM-012312(2)	0	WD-WM-012312(2)	0.01	WD-WM-012312(2)	0.01
WD-WM-012313	0.01	WD-WM-012313	0.03	WD-WM-012313	0.04
WD-WM-012318	0	WD-WM-012318	0.01	WD-WM-012318	0.01
WD-WM-012319(1)	0.02	WD-WM-012319(1)	0.06	WD-WM-012319(1)	0.07
WD-WM-012319(2)	0.03	WD-WM-012319(2)	0.1	WD-WM-012319(2)	0.11
WD-WM-012320	0.02	WD-WM-012320	0.03	WD-WM-012320	0.04
WD-WM-012322	0	WD-WM-012322	0	WD-WM-012322	0
WD-WM-012323	0	WD-WM-012323	0	WD-WM-012323	0
WD-WM-012324	0	WD-WM-012324	0	WD-WM-012324	0
WD-WM-012325(1)	0	WD-WM-012325(1)	0	WD-WM-012325(1)	0
WD-WM-012325(2)	0	WD-WM-012325(2)	0	WD-WM-012325(2)	0
WD-WM-012326	0	WD-WM-012326	0	WD-WM-012326	0
WD-WM-012327(1)	0	WD-WM-012327(1)	0.01	WD-WM-012327(1)	0.01
WD-WM-012327(2)	0	WD-WM-012327(2)	0.06	WD-WM-012327(2)	0.26
WD-WM-012328	0	WD-WM-012328	0	WD-WM-012328	0
WD-WM-012329	0	WD-WM-012329	0.12	WD-WM-012329	0.34
WD-WM-012330	0	WD-WM-012330	0	WD-WM-012330	0
WD-WM-012331	0	WD-WM-012331	0	WD-WM-012331	0
WD-WM-012332(1)	0.05	WD-WM-012332(1)	0.07	WD-WM-012332(1)	0.29
WD-WM-012332(2)	0.05	WD-WM-012332(2)	0.08	WD-WM-012332(2)	0.18
WD-WM-012333	0	WD-WM-012333	0	WD-WM-012333	0
WD-WM-012334	0.05	WD-WM-012334	0.08	WD-WM-012334	0.17
WD-WM-012340	0	WD-WM-012340	0	WD-WM-012340	0
WD-WM-012342	0	WD-WM-012342	0	WD-WM-012342	0.01
WD-WM-012343	0	WD-WM-012343	0	WD-WM-012343	0.02
WD-WM-012344	0	WD-WM-012344	0	WD-WM-012344	0.03
WD-WM-012345	0	WD-WM-012345	0	WD-WM-012345	0.02
WD-WM-012346	0	WD-WM-012346	0	WD-WM-012346	0.01
WD-WM-012347	0	WD-WM-012347	0	WD-WM-012347	0.03
WD-WM-012348	0	WD-WM-012348	0	WD-WM-012348	0.03
WD-WM-012349	0	WD-WM-012349	0	WD-WM-012349	0.01
WD-WM-012350	0	WD-WM-012350	0	WD-WM-012350	0
WD-WM-012351	0	WD-WM-012351	0	WD-WM-012351	0.23
WD-WM-012352	0	WD-WM-012352	0	WD-WM-012352	0.23
WD-WM-012358	0.01	WD-WM-012358	0	WD-WM-012358	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-012370	0.02	WD-WM-012370	0.01	WD-WM-012370	0.01
WD-WM-012371	0.05	WD-WM-012371	0.09	WD-WM-012371	0.1
WD-WM-012372	0.05	WD-WM-012372	0.09	WD-WM-012372	0.1
WD-WM-012373	0.05	WD-WM-012373	0.1	WD-WM-012373	0.11
WD-WM-012374	0.06	WD-WM-012374	0.1	WD-WM-012374	0.12
WD-WM-012375	0.06	WD-WM-012375	0.11	WD-WM-012375	0.13
WD-WM-012376	0.06	WD-WM-012376	0.11	WD-WM-012376	0.12
WD-WM-012377	0.07	WD-WM-012377	0.12	WD-WM-012377	0.14
WD-WM-012378	0.07	WD-WM-012378	0.13	WD-WM-012378	0.14
WD-WM-012379	0.07	WD-WM-012379	0.13	WD-WM-012379	0.15
WD-WM-012380	0.08	WD-WM-012380	0.14	WD-WM-012380	0.16
WD-WM-012381	0.04	WD-WM-012381	0.08	WD-WM-012381	0.09
WD-WM-012382	0.04	WD-WM-012382	0.07	WD-WM-012382	0.08
WD-WM-012383	0.04	WD-WM-012383	0.07	WD-WM-012383	0.08
WD-WM-012384	0.02	WD-WM-012384	0.04	WD-WM-012384	0.04
WD-WM-012385	0.01	WD-WM-012385	0.02	WD-WM-012385	0.03
WD-WM-012395	0.01	WD-WM-012395	0.01	WD-WM-012395	0.01
WD-WM-012397	0	WD-WM-012397	0.01	WD-WM-012397	0.01
WD-WM-012398	0	WD-WM-012398	0	WD-WM-012398	0
WD-WM-012399	0	WD-WM-012399	0	WD-WM-012399	0
WD-WM-012400	0.01	WD-WM-012400	0.01	WD-WM-012400	0.01
WD-WM-012401	0.01	WD-WM-012401	0.02	WD-WM-012401	0.02
WD-WM-012402	0.02	WD-WM-012402	0.03	WD-WM-012402	0.04
WD-WM-012403	0.01	WD-WM-012403	0.02	WD-WM-012403	0.02
WD-WM-012404	0.01	WD-WM-012404	0.02	WD-WM-012404	0.02
WD-WM-012405	0	WD-WM-012405	0.01	WD-WM-012405	0.01
WD-WM-012408	0.01	WD-WM-012408	0.02	WD-WM-012408	0.02
WD-WM-012412	0.01	WD-WM-012412	0.02	WD-WM-012412	0.02
WD-WM-012413	0.01	WD-WM-012413	0.02	WD-WM-012413	0.02
WD-WM-012414	0.01	WD-WM-012414	0.02	WD-WM-012414	0.02
WD-WM-012415	0.01	WD-WM-012415	0.02	WD-WM-012415	0.02
WD-WM-012417	0.01	WD-WM-012417	0.02	WD-WM-012417	0.02
WD-WM-012418	0.01	WD-WM-012418	0.02	WD-WM-012418	0.02
WD-WM-012419	0.01	WD-WM-012419	0.02	WD-WM-012419	0.02
WD-WM-012421	0	WD-WM-012421	0	WD-WM-012421	0
WD-WM-012422	0.01	WD-WM-012422	0.02	WD-WM-012422	0.02
WD-WM-012423	0.01	WD-WM-012423	0.02	WD-WM-012423	0.02
WD-WM-012424	0.01	WD-WM-012424	0.02	WD-WM-012424	0.02
WD-WM-012425	0.01	WD-WM-012425	0.02	WD-WM-012425	0.02
WD-WM-012426	0.01	WD-WM-012426	0.02	WD-WM-012426	0.02
WD-WM-012427	0.01	WD-WM-012427	0.02	WD-WM-012427	0.02
WD-WM-012428	0.01	WD-WM-012428	0.02	WD-WM-012428	0.02
WD-WM-012429	0.01	WD-WM-012429	0.02	WD-WM-012429	0.02
WD-WM-012430	0.01	WD-WM-012430	0.02	WD-WM-012430	0.02
WD-WM-012431	0	WD-WM-012431	0	WD-WM-012431	0
WD-WM-012432	0	WD-WM-012432	0	WD-WM-012432	0
WD-WM-012433	0	WD-WM-012433	0	WD-WM-012433	0
WD-WM-012434	0.01	WD-WM-012434	0.02	WD-WM-012434	0.02
WD-WM-012435	0	WD-WM-012435	0	WD-WM-012435	0
WD-WM-012436	0	WD-WM-012436	0	WD-WM-012436	0
WD-WM-012437	0	WD-WM-012437	0	WD-WM-012437	0
WD-WM-012438	0.01	WD-WM-012438	0.02	WD-WM-012438	0.02
WD-WM-012439	0.01	WD-WM-012439	0.02	WD-WM-012439	0.02
WD-WM-012440	0.01	WD-WM-012440	0.02	WD-WM-012440	0.02
WD-WM-012443	0.83	WD-WM-012443	0.25	WD-WM-012443	0.35
WD-WM-012444	0.83	WD-WM-012444	0.25	WD-WM-012444	0.35
WD-WM-012445	0.96	WD-WM-012445	0.28	WD-WM-012445	0.39
WD-WM-012446	1.29	WD-WM-012446	0.38	WD-WM-012446	0.52
WD-WM-012447	0	WD-WM-012447	0	WD-WM-012447	0
WD-WM-012448	0	WD-WM-012448	0	WD-WM-012448	0
WD-WM-012449	1.29	WD-WM-012449	0.38	WD-WM-012449	0.52
WD-WM-012450	0	WD-WM-012450	0	WD-WM-012450	0
WD-WM-012451	1.29	WD-WM-012451	0.38	WD-WM-012451	0.52
WD-WM-012452	0.33	WD-WM-012452	0.1	WD-WM-012452	0.13
WD-WM-012453	0.12	WD-WM-012453	0.03	WD-WM-012453	0.04
WD-WM-012454	0.12	WD-WM-012454	0.03	WD-WM-012454	0.04
WD-WM-012455	0.96	WD-WM-012455	0.28	WD-WM-012455	0.39
WD-WM-012456	0.33	WD-WM-012456	0.1	WD-WM-012456	0.13
WD-WM-012457	0.11	WD-WM-012457	0.03	WD-WM-012457	0.04
WD-WM-012460	0.22	WD-WM-012460	0.07	WD-WM-012460	0.09
WD-WM-012463	0	WD-WM-012463	0	WD-WM-012463	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-012464	0.22
WD-WM-012465	0
WD-WM-012466	0.22
WD-WM-012467	0.23
WD-WM-012468	0.23
WD-WM-012469	0.22
WD-WM-012470	0.45
WD-WM-012474	0
WD-WM-012507	0.06
WD-WM-012508	0.04
WD-WM-012509(1)(1)	0
WD-WM-012509(1)(2)	0
WD-WM-012509(2)	0
WD-WM-012510	0
WD-WM-012511	0
WD-WM-012513(1)(1)	0
WD-WM-012513(1)(2)	0
WD-WM-012513(2)(1)	0
WD-WM-012513(2)(2)	0
WD-WM-012514(1)(1)	0
WD-WM-012514(2)	0
WD-WM-012515	0
WD-WM-012516(1)	0
WD-WM-012516(2)	0
WD-WM-012517	0
WD-WM-012518	0
WD-WM-012519	0
WD-WM-012520	0
WD-WM-012521	0
WD-WM-012522	0
WD-WM-012523	0
WD-WM-012524	0
WD-WM-012525	0
WD-WM-012526	0
WD-WM-012527	0
WD-WM-012528	0
WD-WM-012529	0
WD-WM-012530	0
WD-WM-012532	0.04
WD-WM-012533	0.04
WD-WM-012534	0.04
WD-WM-012535	0.04
WD-WM-012536	0.04
WD-WM-012540	0
WD-WM-012541	0
WD-WM-012542	0
WD-WM-012543	0
WD-WM-012544	0
WD-WM-012545	0
WD-WM-012546	0
WD-WM-012547	0
WD-WM-012548	0
WD-WM-012549	0
WD-WM-012550	0
WD-WM-012551	0
WD-WM-012552	0
WD-WM-012571	0.07
WD-WM-012572	0.07
WD-WM-012573	0.06
WD-WM-012574	0.06
WD-WM-012575	0.06
WD-WM-012579	0
WD-WM-012580	0
WD-WM-012594	0.07
WD-WM-012595	0.07
WD-WM-012596	0.07
WD-WM-012597	0.06
WD-WM-012598	0.04
WD-WM-012599	0.04
WD-WM-012600	0.04
WD-WM-012601	0.03

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-012464	0.07
WD-WM-012465	0
WD-WM-012466	0.07
WD-WM-012467	0.07
WD-WM-012468	0.07
WD-WM-012469	0.07
WD-WM-012470	0.13
WD-WM-012474	0
WD-WM-012507	0.05
WD-WM-012508	0.06
WD-WM-012509(1)(1)	1.54
WD-WM-012509(1)(2)	1.54
WD-WM-012509(2)	1.54
WD-WM-012510	0
WD-WM-012511	1.54
WD-WM-012513(1)(1)	4.62
WD-WM-012513(1)(2)	4.61
WD-WM-012513(2)(1)	4.61
WD-WM-012513(2)(2)	4.61
WD-WM-012514(1)(1)	4.65
WD-WM-012514(2)	4.64
WD-WM-012515	1.54
WD-WM-012516(1)	0
WD-WM-012516(2)	3.07
WD-WM-012517	3.07
WD-WM-012518	0
WD-WM-012519	0
WD-WM-012520	0
WD-WM-012521	1.54
WD-WM-012522	0
WD-WM-012523	1.54
WD-WM-012524	0
WD-WM-012525	0
WD-WM-012526	0
WD-WM-012527	0
WD-WM-012528	0
WD-WM-012529	0.01
WD-WM-012530	0.01
WD-WM-012532	0.06
WD-WM-012533	0.07
WD-WM-012534	0.07
WD-WM-012535	0.07
WD-WM-012536	0.08
WD-WM-012540	0.01
WD-WM-012541	0
WD-WM-012542	0
WD-WM-012543	0
WD-WM-012544	0
WD-WM-012545	0
WD-WM-012546	0
WD-WM-012547	0
WD-WM-012548	0
WD-WM-012549	0
WD-WM-012550	0
WD-WM-012551	0
WD-WM-012552	0.01
WD-WM-012571	0.04
WD-WM-012572	0.04
WD-WM-012573	0.05
WD-WM-012574	0.05
WD-WM-012575	0.05
WD-WM-012579	0
WD-WM-012580	1.54
WD-WM-012594	0.12
WD-WM-012595	0.12
WD-WM-012596	0.11
WD-WM-012597	0.1
WD-WM-012598	0.07
WD-WM-012599	0.07
WD-WM-012600	0.06
WD-WM-012601	0.06

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-012464	0.09
WD-WM-012465	0
WD-WM-012466	0.09
WD-WM-012467	0.09
WD-WM-012468	0.09
WD-WM-012469	0.09
WD-WM-012470	0.17
WD-WM-012474	0
WD-WM-012507	0.12
WD-WM-012508	0.15
WD-WM-012509(1)(1)	0
WD-WM-012509(1)(2)	0
WD-WM-012509(2)	0
WD-WM-012510	0
WD-WM-012511	0
WD-WM-012513(1)(1)	0.03
WD-WM-012513(1)(2)	0
WD-WM-012513(2)(1)	0
WD-WM-012513(2)(2)	0
WD-WM-012514(1)(1)	0.17
WD-WM-012514(2)	0.14
WD-WM-012515	0
WD-WM-012516(1)	0
WD-WM-012516(2)	0
WD-WM-012517	0
WD-WM-012518	0
WD-WM-012519	0
WD-WM-012520	0
WD-WM-012521	0
WD-WM-012522	0
WD-WM-012523	0
WD-WM-012524	0
WD-WM-012525	0
WD-WM-012526	0
WD-WM-012527	0
WD-WM-012528	0
WD-WM-012529	0.03
WD-WM-012530	0.03
WD-WM-012532	0.15
WD-WM-012533	0.15
WD-WM-012534	0.16
WD-WM-012535	0.16
WD-WM-012536	0.16
WD-WM-012540	0.01
WD-WM-012541	0
WD-WM-012542	0
WD-WM-012543	0
WD-WM-012544	0
WD-WM-012545	0
WD-WM-012546	0
WD-WM-012547	0
WD-WM-012548	0
WD-WM-012549	0
WD-WM-012550	0
WD-WM-012551	0
WD-WM-012552	0.01
WD-WM-012571	0.13
WD-WM-012572	0.13
WD-WM-012573	0.13
WD-WM-012574	0.12
WD-WM-012575	0.12
WD-WM-012579	0
WD-WM-012580	0
WD-WM-012594	0.24
WD-WM-012595	0.23
WD-WM-012596	0.22
WD-WM-012597	0.2
WD-WM-012598	0.14
WD-WM-012599	0.13
WD-WM-012600	0.12
WD-WM-012601	0.11

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-012602	0.03	WD-WM-012602	0.05	WD-WM-012602	0.1
WD-WM-012603	0.03	WD-WM-012603	0.04	WD-WM-012603	0.08
WD-WM-012604	0.02	WD-WM-012604	0.04	WD-WM-012604	0.07
WD-WM-012605	0.02	WD-WM-012605	0.03	WD-WM-012605	0.06
WD-WM-012606	0.01	WD-WM-012606	0.02	WD-WM-012606	0.05
WD-WM-012607	0.01	WD-WM-012607	0.02	WD-WM-012607	0.04
WD-WM-012608	0.01	WD-WM-012608	0.01	WD-WM-012608	0.02
WD-WM-012609	0	WD-WM-012609	0.01	WD-WM-012609	0.01
WD-WM-012611	0.01	WD-WM-012611	0.02	WD-WM-012611	0.05
WD-WM-012612	0.01	WD-WM-012612	0.02	WD-WM-012612	0.04
WD-WM-012613	0.01	WD-WM-012613	0.01	WD-WM-012613	0.02
WD-WM-012614	0	WD-WM-012614	0.01	WD-WM-012614	0.01
WD-WM-012626	0.02	WD-WM-012626	0.01	WD-WM-012626	0.01
WD-WM-012627	0	WD-WM-012627	0	WD-WM-012627	0
WD-WM-012628	0	WD-WM-012628	0	WD-WM-012628	0
WD-WM-012629	0	WD-WM-012629	0	WD-WM-012629	0
WD-WM-012630	0	WD-WM-012630	0	WD-WM-012630	0
WD-WM-012633	0.02	WD-WM-012633	0.01	WD-WM-012633	0.01
WD-WM-012634	0	WD-WM-012634	0	WD-WM-012634	0
WD-WM-012635	0	WD-WM-012635	0	WD-WM-012635	0
WD-WM-012636	0	WD-WM-012636	0	WD-WM-012636	0
WD-WM-012637	0	WD-WM-012637	0	WD-WM-012637	0
WD-WM-012638	0	WD-WM-012638	0	WD-WM-012638	0
WD-WM-012639	0	WD-WM-012639	0	WD-WM-012639	0
WD-WM-012640	0	WD-WM-012640	0	WD-WM-012640	0
WD-WM-012664	0.17	WD-WM-012664	0.19	WD-WM-012664	0.3
WD-WM-012665	0.18	WD-WM-012665	0.19	WD-WM-012665	0.29
WD-WM-012666	0.18	WD-WM-012666	0.18	WD-WM-012666	0.28
WD-WM-012667	0.18	WD-WM-012667	0.18	WD-WM-012667	0.28
WD-WM-012668	0.06	WD-WM-012668	0.08	WD-WM-012668	0.13
WD-WM-012669	0.12	WD-WM-012669	0.09	WD-WM-012669	0.13
WD-WM-012670	0.12	WD-WM-012670	0.09	WD-WM-012670	0.13
WD-WM-012671	0.06	WD-WM-012671	0.09	WD-WM-012671	0.14
WD-WM-012672	0.08	WD-WM-012672	0.2	WD-WM-012672	0.32
WD-WM-012673	0.03	WD-WM-012673	0.08	WD-WM-012673	0.14
WD-WM-012674	0.13	WD-WM-012674	0.11	WD-WM-012674	0.14
WD-WM-012675	0.12	WD-WM-012675	0.11	WD-WM-012675	0.15
WD-WM-012676	0.17	WD-WM-012676	0.19	WD-WM-012676	0.28
WD-WM-012681	0.31	WD-WM-012681	0.52	WD-WM-012681	0.76
WD-WM-012682	0.31	WD-WM-012682	0.53	WD-WM-012682	0.77
WD-WM-012683	0.01	WD-WM-012683	0.23	WD-WM-012683	0.35
WD-WM-012687	0.24	WD-WM-012687	0.04	WD-WM-012687	0.03
WD-WM-012688	0.23	WD-WM-012688	0.04	WD-WM-012688	0.03
WD-WM-012689	0.32	WD-WM-012689	0.24	WD-WM-012689	0.35
WD-WM-012690	0.32	WD-WM-012690	0.24	WD-WM-012690	0.36
WD-WM-012691	0.17	WD-WM-012691	0.19	WD-WM-012691	0.3
WD-WM-012692	0	WD-WM-012692	0.01	WD-WM-012692	0.01
WD-WM-012693	0.31	WD-WM-012693	0.24	WD-WM-012693	0.36
WD-WM-012694	0	WD-WM-012694	0	WD-WM-012694	0.01
WD-WM-012695	0	WD-WM-012695	0.24	WD-WM-012695	0.37
WD-WM-012696	0	WD-WM-012696	0.24	WD-WM-012696	0.36
WD-WM-012697	0.01	WD-WM-012697	0.23	WD-WM-012697	0.36
WD-WM-012698	0.08	WD-WM-012698	0.2	WD-WM-012698	0.31
WD-WM-012699	0.03	WD-WM-012699	0.09	WD-WM-012699	0.14
WD-WM-012700	0.12	WD-WM-012700	0.09	WD-WM-012700	0.12
WD-WM-012721	0	WD-WM-012721	0	WD-WM-012721	0
WD-WM-012747	0	WD-WM-012747	0	WD-WM-012747	0
WD-WM-012786	0	WD-WM-012786	0	WD-WM-012786	0
WD-WM-012787	0	WD-WM-012787	0	WD-WM-012787	0
WD-WM-012788	0	WD-WM-012788	0	WD-WM-012788	0
WD-WM-012789	0	WD-WM-012789	0	WD-WM-012789	0
WD-WM-012790	0	WD-WM-012790	0	WD-WM-012790	0
WD-WM-012791	0	WD-WM-012791	0	WD-WM-012791	0
WD-WM-012792	0	WD-WM-012792	0	WD-WM-012792	0
WD-WM-012793	0	WD-WM-012793	0	WD-WM-012793	0
WD-WM-012794	0	WD-WM-012794	0	WD-WM-012794	0
WD-WM-012795	0	WD-WM-012795	0	WD-WM-012795	0
WD-WM-012796	0	WD-WM-012796	0	WD-WM-012796	0
WD-WM-012811	0	WD-WM-012811	0	WD-WM-012811	0
WD-WM-012812	0.08	WD-WM-012812	0.1	WD-WM-012812	0.09
WD-WM-012814	0.08	WD-WM-012814	0.1	WD-WM-012814	0.09

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-012815	0
WD-WM-012816	0
WD-WM-012817	0.08
WD-WM-012818(1)(1)(1)	0
WD-WM-012818(1)(1)(2)	0
WD-WM-012818(1)(2)	0
WD-WM-012818(2)	0
WD-WM-012819(1)(1)	0.08
WD-WM-012819(1)(2)	0.08
WD-WM-012819(2)(1)	0.08
WD-WM-012819(2)(2)	0.08
WD-WM-012822	0.08
WD-WM-012823(1)	0.08
WD-WM-012823(2)	0.08
WD-WM-013068	0
WD-WM-013084	0
WD-WM-013102	0
WD-WM-013103	0
WD-WM-013104	0
WD-WM-013117	0.08
WD-WM-013133	0
WD-WM-013150	0
WD-WM-013153	0
WD-WM-013156(1)(1)	0
WD-WM-013156(1)(2)	0
WD-WM-013156(2)	0
WD-WM-013157	0
WD-WM-013158(1)	0
WD-WM-013158(2)	0
WD-WM-013159	0
WD-WM-013160	0
WD-WM-013162	0
WD-WM-013165	0
WD-WM-013168	0
WD-WM-013169	0
WD-WM-013170	0
WD-WM-013172	0
WD-WM-013173	0
WD-WM-013186	0
WD-WM-013188	0
WD-WM-013190	0
WD-WM-013191	0
WD-WM-013211	0
WD-WM-013232	0
WD-WM-013233	0
WD-WM-013239	0
WD-WM-013240	0
WD-WM-013241	0
WD-WM-013245	0
WD-WM-013246	0.01
WD-WM-013247	0.15
WD-WM-013248	0.14
WD-WM-013249	0.14
WD-WM-013250	0.14
WD-WM-013251	0.13
WD-WM-013252	0.01
WD-WM-013253	0
WD-WM-013254	0.12
WD-WM-013255	0.09
WD-WM-013256	0.09
WD-WM-013257	0.08
WD-WM-013258	0.03
WD-WM-013259	0.03
WD-WM-013260	0.02
WD-WM-013261	0.02
WD-WM-013262	0.02
WD-WM-013263	0.01
WD-WM-013264	0.01
WD-WM-013265	0.01
WD-WM-013266	0
WD-WM-013267	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-012815	0
WD-WM-012816	0
WD-WM-012817	0.1
WD-WM-012818(1)(1)(1)	0
WD-WM-012818(1)(1)(2)	0
WD-WM-012818(1)(2)	0
WD-WM-012818(2)	0
WD-WM-012819(1)(1)	0.1
WD-WM-012819(1)(2)	0.1
WD-WM-012819(2)(1)	0.1
WD-WM-012819(2)(2)	0.1
WD-WM-012822	0.1
WD-WM-012823(1)	0.1
WD-WM-012823(2)	0.1
WD-WM-013068	0
WD-WM-013084	0
WD-WM-013102	0
WD-WM-013103	0
WD-WM-013104	0
WD-WM-013117	0.13
WD-WM-013133	0
WD-WM-013150	0
WD-WM-013153	0
WD-WM-013156(1)(1)	0
WD-WM-013156(1)(2)	0
WD-WM-013156(2)	0
WD-WM-013157	0
WD-WM-013158(1)	0
WD-WM-013158(2)	0
WD-WM-013159	0
WD-WM-013160	0
WD-WM-013162	0
WD-WM-013165	0
WD-WM-013168	0
WD-WM-013169	0
WD-WM-013170	0
WD-WM-013172	0
WD-WM-013173	0
WD-WM-013186	0
WD-WM-013188	0
WD-WM-013190	0
WD-WM-013191	0
WD-WM-013211	0
WD-WM-013232	0
WD-WM-013233	0
WD-WM-013239	0
WD-WM-013240	0
WD-WM-013241	0
WD-WM-013245	0.01
WD-WM-013246	0.01
WD-WM-013247	0.34
WD-WM-013248	0.31
WD-WM-013249	0.31
WD-WM-013250	0.3
WD-WM-013251	0.29
WD-WM-013252	0.01
WD-WM-013253	0.01
WD-WM-013254	0.27
WD-WM-013255	0.2
WD-WM-013256	0.19
WD-WM-013257	0.18
WD-WM-013258	0.06
WD-WM-013259	0.07
WD-WM-013260	0.05
WD-WM-013261	0.04
WD-WM-013262	0.04
WD-WM-013263	0.03
WD-WM-013264	0.02
WD-WM-013265	0.01
WD-WM-013266	0.01
WD-WM-013267	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-012815	0
WD-WM-012816	0
WD-WM-012817	0.09
WD-WM-012818(1)(1)(1)	0
WD-WM-012818(1)(1)(2)	0
WD-WM-012818(1)(2)	0
WD-WM-012818(2)	0
WD-WM-012819(1)(1)	0.09
WD-WM-012819(1)(2)	0.09
WD-WM-012819(2)(1)	0.09
WD-WM-012819(2)(2)	0.09
WD-WM-012822	0.09
WD-WM-012823(1)	0.09
WD-WM-012823(2)	0.09
WD-WM-013068	0
WD-WM-013084	0
WD-WM-013102	0
WD-WM-013103	0
WD-WM-013104	0
WD-WM-013117	0.15
WD-WM-013133	0
WD-WM-013150	0
WD-WM-013153	0
WD-WM-013156(1)(1)	0
WD-WM-013156(1)(2)	0
WD-WM-013156(2)	0
WD-WM-013157	0
WD-WM-013158(1)	0
WD-WM-013158(2)	0
WD-WM-013159	0
WD-WM-013160	0
WD-WM-013162	0
WD-WM-013165	0
WD-WM-013168	0
WD-WM-013169	0
WD-WM-013170	0
WD-WM-013172	0
WD-WM-013173	0
WD-WM-013186	0
WD-WM-013188	0
WD-WM-013190	0
WD-WM-013191	0
WD-WM-013211	0
WD-WM-013232	0
WD-WM-013233	0
WD-WM-013239	0
WD-WM-013240	0
WD-WM-013241	0
WD-WM-013245	0.01
WD-WM-013246	0.02
WD-WM-013247	0.53
WD-WM-013248	0.5
WD-WM-013249	0.49
WD-WM-013250	0.48
WD-WM-013251	0.46
WD-WM-013252	0.02
WD-WM-013253	0.01
WD-WM-013254	0.43
WD-WM-013255	0.31
WD-WM-013256	0.3
WD-WM-013257	0.29
WD-WM-013258	0.09
WD-WM-013259	0.1
WD-WM-013260	0.08
WD-WM-013261	0.07
WD-WM-013262	0.06
WD-WM-013263	0.05
WD-WM-013264	0.03
WD-WM-013265	0.02
WD-WM-013266	0.01
WD-WM-013267	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-013268	0.16	WD-WM-013268	0.34	WD-WM-013268	0.55
WD-WM-013310	0	WD-WM-013310	0	WD-WM-013310	0
WD-WM-013314	0	WD-WM-013314	0	WD-WM-013314	0
WD-WM-013315	0	WD-WM-013315	0	WD-WM-013315	0
WD-WM-013316	0	WD-WM-013316	0	WD-WM-013316	0
WD-WM-013317	0	WD-WM-013317	0	WD-WM-013317	0
WD-WM-013318	0	WD-WM-013318	0	WD-WM-013318	0
WD-WM-013319	0	WD-WM-013319	0	WD-WM-013319	0
WD-WM-013320	0	WD-WM-013320	0	WD-WM-013320	0
WD-WM-013321	0	WD-WM-013321	0	WD-WM-013321	0
WD-WM-013322	0	WD-WM-013322	0	WD-WM-013322	0
WD-WM-013323	0	WD-WM-013323	0	WD-WM-013323	0
WD-WM-013324	0	WD-WM-013324	0	WD-WM-013324	0
WD-WM-013325	0	WD-WM-013325	0	WD-WM-013325	0
WD-WM-013326	0	WD-WM-013326	0	WD-WM-013326	0
WD-WM-013327	0	WD-WM-013327	0	WD-WM-013327	0
WD-WM-013328	0	WD-WM-013328	0	WD-WM-013328	0
WD-WM-013329	0	WD-WM-013329	0	WD-WM-013329	0
WD-WM-013330	0	WD-WM-013330	0	WD-WM-013330	0
WD-WM-013331	0	WD-WM-013331	0	WD-WM-013331	0
WD-WM-013332	0	WD-WM-013332	0	WD-WM-013332	0
WD-WM-013333	0	WD-WM-013333	0	WD-WM-013333	0
WD-WM-013334	0	WD-WM-013334	0	WD-WM-013334	0
WD-WM-013335	0	WD-WM-013335	0	WD-WM-013335	0
WD-WM-013336	0	WD-WM-013336	0	WD-WM-013336	0
WD-WM-013337	0	WD-WM-013337	0	WD-WM-013337	0
WD-WM-013338	0	WD-WM-013338	0	WD-WM-013338	0
WD-WM-013339	0	WD-WM-013339	0	WD-WM-013339	0
WD-WM-013340	0	WD-WM-013340	0	WD-WM-013340	0
WD-WM-013341	0	WD-WM-013341	0	WD-WM-013341	0
WD-WM-013342	0	WD-WM-013342	0	WD-WM-013342	0
WD-WM-013343	0	WD-WM-013343	0	WD-WM-013343	0
WD-WM-013344	0	WD-WM-013344	0	WD-WM-013344	0
WD-WM-013345	0	WD-WM-013345	0	WD-WM-013345	0
WD-WM-013346	0	WD-WM-013346	0	WD-WM-013346	0
WD-WM-013347	0	WD-WM-013347	0	WD-WM-013347	0
WD-WM-013348	0	WD-WM-013348	0	WD-WM-013348	0
WD-WM-013349	0	WD-WM-013349	0	WD-WM-013349	0
WD-WM-013350	0	WD-WM-013350	0	WD-WM-013350	0
WD-WM-013351	0	WD-WM-013351	0	WD-WM-013351	0
WD-WM-013352	0	WD-WM-013352	0	WD-WM-013352	0
WD-WM-013353	0	WD-WM-013353	0	WD-WM-013353	0
WD-WM-013354	0	WD-WM-013354	0	WD-WM-013354	0
WD-WM-013355	0	WD-WM-013355	0	WD-WM-013355	0
WD-WM-013356	0	WD-WM-013356	0	WD-WM-013356	0
WD-WM-013357	0	WD-WM-013357	0	WD-WM-013357	0
WD-WM-013358	0	WD-WM-013358	0	WD-WM-013358	0
WD-WM-013359	0	WD-WM-013359	0	WD-WM-013359	0
WD-WM-013360	0	WD-WM-013360	0	WD-WM-013360	0
WD-WM-013361	0	WD-WM-013361	0	WD-WM-013361	0
WD-WM-013362	0	WD-WM-013362	0	WD-WM-013362	0
WD-WM-013363	0	WD-WM-013363	0	WD-WM-013363	0
WD-WM-013364	0	WD-WM-013364	0	WD-WM-013364	0
WD-WM-013365	0	WD-WM-013365	0	WD-WM-013365	0
WD-WM-013366	0	WD-WM-013366	0	WD-WM-013366	0
WD-WM-013367	0	WD-WM-013367	0	WD-WM-013367	0
WD-WM-013368	0	WD-WM-013368	0	WD-WM-013368	0
WD-WM-013369	0	WD-WM-013369	0	WD-WM-013369	0
WD-WM-013370	0	WD-WM-013370	0	WD-WM-013370	0
WD-WM-013371	0	WD-WM-013371	0	WD-WM-013371	0
WD-WM-013383	0.07	WD-WM-013383	0.29	WD-WM-013383	0.56
WD-WM-013384	0.07	WD-WM-013384	0.28	WD-WM-013384	0.56
WD-WM-013385	0.02	WD-WM-013385	0.07	WD-WM-013385	0.14
WD-WM-013386	0.02	WD-WM-013386	0.07	WD-WM-013386	0.14
WD-WM-013387	0.03	WD-WM-013387	0.14	WD-WM-013387	0.28
WD-WM-013388	0.02	WD-WM-013388	0.07	WD-WM-013388	0.13
WD-WM-013389	0.02	WD-WM-013389	0.07	WD-WM-013389	0.13
WD-WM-013390	0.02	WD-WM-013390	0.07	WD-WM-013390	0.13
WD-WM-013391	0.02	WD-WM-013391	0.06	WD-WM-013391	0.13
WD-WM-013392	0.01	WD-WM-013392	0.06	WD-WM-013392	0.12
WD-WM-013393	0.01	WD-WM-013393	0.06	WD-WM-013393	0.12

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-013394	0.06	WD-WM-013394	0.26	WD-WM-013394	0.52
WD-WM-013395	0.01	WD-WM-013395	0.06	WD-WM-013395	0.12
WD-WM-013396	0.03	WD-WM-013396	0.14	WD-WM-013396	0.27
WD-WM-013397	0.06	WD-WM-013397	0.26	WD-WM-013397	0.51
WD-WM-013398	0.06	WD-WM-013398	0.26	WD-WM-013398	0.51
WD-WM-013399	0.01	WD-WM-013399	0.08	WD-WM-013399	0.15
WD-WM-013400	0.03	WD-WM-013400	0.12	WD-WM-013400	0.24
WD-WM-013401	0.02	WD-WM-013401	0.06	WD-WM-013401	0.12
WD-WM-013402	0.03	WD-WM-013402	0.12	WD-WM-013402	0.23
WD-WM-013403	0.01	WD-WM-013403	0.08	WD-WM-013403	0.15
WD-WM-013404	0.01	WD-WM-013404	0.07	WD-WM-013404	0.14
WD-WM-013405	0.01	WD-WM-013405	0.07	WD-WM-013405	0.14
WD-WM-013406	0.02	WD-WM-013406	0.06	WD-WM-013406	0.12
WD-WM-013407	0.02	WD-WM-013407	0.06	WD-WM-013407	0.12
WD-WM-013408	0.02	WD-WM-013408	0.06	WD-WM-013408	0.12
WD-WM-013409	0.01	WD-WM-013409	0.06	WD-WM-013409	0.13
WD-WM-013410	0.02	WD-WM-013410	0.07	WD-WM-013410	0.13
WD-WM-013411	0.02	WD-WM-013411	0.07	WD-WM-013411	0.13
WD-WM-013412	0.02	WD-WM-013412	0.07	WD-WM-013412	0.13
WD-WM-013413	0.02	WD-WM-013413	0.07	WD-WM-013413	0.14
WD-WM-013414	0.02	WD-WM-013414	0.07	WD-WM-013414	0.14
WD-WM-013574(1)	0.21	WD-WM-013574(1)	0.2	WD-WM-013574(1)	0.19
WD-WM-013574(2)	0	WD-WM-013574(2)	0	WD-WM-013574(2)	0
WD-WM-013658	0	WD-WM-013658	0	WD-WM-013658	0
WD-WM-013662	0	WD-WM-013662	0	WD-WM-013662	0
WD-WM-013712	0.57	WD-WM-013712	0.83	WD-WM-013712	1.46
WD-WM-013713	0.52	WD-WM-013713	0.74	WD-WM-013713	1.3
WD-WM-013714	0.52	WD-WM-013714	0.74	WD-WM-013714	1.29
WD-WM-013715	0.52	WD-WM-013715	0.74	WD-WM-013715	1.29
WD-WM-013716	0.57	WD-WM-013716	0.78	WD-WM-013716	1.36
WD-WM-013717	0.02	WD-WM-013717	0.04	WD-WM-013717	0.09
WD-WM-013718	0.02	WD-WM-013718	0.04	WD-WM-013718	0.09
WD-WM-013719	0.57	WD-WM-013719	0.78	WD-WM-013719	1.35
WD-WM-013720	0.66	WD-WM-013720	0.9	WD-WM-013720	1.59
WD-WM-013721	0.1	WD-WM-013721	0.13	WD-WM-013721	0.25
WD-WM-013722	0.1	WD-WM-013722	0.14	WD-WM-013722	0.26
WD-WM-013723	0.1	WD-WM-013723	0.14	WD-WM-013723	0.26
WD-WM-013724	0.66	WD-WM-013724	0.9	WD-WM-013724	1.59
WD-WM-013725	0.87	WD-WM-013725	1.18	WD-WM-013725	2.09
WD-WM-013726	0.21	WD-WM-013726	0.28	WD-WM-013726	0.51
WD-WM-013727	0.21	WD-WM-013727	0.29	WD-WM-013727	0.52
WD-WM-013728	0.87	WD-WM-013728	1.17	WD-WM-013728	2.08
WD-WM-013729	0.48	WD-WM-013729	0.76	WD-WM-013729	1.68
WD-WM-013730	0.31	WD-WM-013730	0.27	WD-WM-013730	0.14
WD-WM-013731	0.3	WD-WM-013731	0.27	WD-WM-013731	0.14
WD-WM-013732	0.48	WD-WM-013732	0.76	WD-WM-013732	1.67
WD-WM-013733	0.48	WD-WM-013733	0.75	WD-WM-013733	1.67
WD-WM-013735	0.45	WD-WM-013735	0.68	WD-WM-013735	1.47
WD-WM-013736	0.08	WD-WM-013736	0.19	WD-WM-013736	0.49
WD-WM-013737	0.08	WD-WM-013737	0.19	WD-WM-013737	0.49
WD-WM-013738	0.16	WD-WM-013738	0.25	WD-WM-013738	0.54
WD-WM-013739	0.16	WD-WM-013739	0.25	WD-WM-013739	0.54
WD-WM-013740	0.12	WD-WM-013740	0.19	WD-WM-013740	0.42
WD-WM-013741	0.12	WD-WM-013741	0.19	WD-WM-013741	0.41
WD-WM-013742	0.2	WD-WM-013742	0.26	WD-WM-013742	0.48
WD-WM-013743	0.2	WD-WM-013743	0.27	WD-WM-013743	0.49
WD-WM-013744	0.21	WD-WM-013744	0.27	WD-WM-013744	0.5
WD-WM-013745	0.01	WD-WM-013745	0.02	WD-WM-013745	0.03
WD-WM-013746	0.01	WD-WM-013746	0.02	WD-WM-013746	0.03
WD-WM-013747	0	WD-WM-013747	0.01	WD-WM-013747	0.02
WD-WM-013748	0	WD-WM-013748	0.01	WD-WM-013748	0.01
WD-WM-013749	0	WD-WM-013749	0	WD-WM-013749	0.01
WD-WM-013750	0.22	WD-WM-013750	0.3	WD-WM-013750	0.54
WD-WM-013751	0.21	WD-WM-013751	0.29	WD-WM-013751	0.53
WD-WM-013752	0.22	WD-WM-013752	0.3	WD-WM-013752	0.55
WD-WM-013753	0.22	WD-WM-013753	0.31	WD-WM-013753	0.55
WD-WM-013754	0.22	WD-WM-013754	0.31	WD-WM-013754	0.56
WD-WM-013757	0.1	WD-WM-013757	0.13	WD-WM-013757	0.22
WD-WM-013758	0.1	WD-WM-013758	0.13	WD-WM-013758	0.23
WD-WM-013759	0	WD-WM-013759	0.01	WD-WM-013759	0.01
WD-WM-013760	0	WD-WM-013760	0	WD-WM-013760	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-013761	0.11	WD-WM-013761	0.14	WD-WM-013761	0.24
WD-WM-013762	0.11	WD-WM-013762	0.15	WD-WM-013762	0.25
WD-WM-013763	0.11	WD-WM-013763	0.15	WD-WM-013763	0.26
WD-WM-013765	0.12	WD-WM-013765	0.19	WD-WM-013765	0.35
WD-WM-013766	0.12	WD-WM-013766	0.19	WD-WM-013766	0.35
WD-WM-013767	0.12	WD-WM-013767	0.19	WD-WM-013767	0.36
WD-WM-013768	0.03	WD-WM-013768	0.03	WD-WM-013768	0.01
WD-WM-013769	0.16	WD-WM-013769	0.22	WD-WM-013769	0.37
WD-WM-013770	0.16	WD-WM-013770	0.22	WD-WM-013770	0.38
WD-WM-013771	0.12	WD-WM-013771	0.15	WD-WM-013771	0.24
WD-WM-013772	0.03	WD-WM-013772	0.03	WD-WM-013772	0.01
WD-WM-013773	0.03	WD-WM-013773	0.03	WD-WM-013773	0.02
WD-WM-013774	0.04	WD-WM-013774	0.08	WD-WM-013774	0.15
WD-WM-013775	0.04	WD-WM-013775	0.07	WD-WM-013775	0.14
WD-WM-013776	0.04	WD-WM-013776	0.08	WD-WM-013776	0.15
WD-WM-013777	0.05	WD-WM-013777	0.08	WD-WM-013777	0.16
WD-WM-013779	0	WD-WM-013779	0.02	WD-WM-013779	0
WD-WM-013781	0	WD-WM-013781	0.02	WD-WM-013781	0
WD-WM-013782	0	WD-WM-013782	0.02	WD-WM-013782	0
WD-WM-013783	0	WD-WM-013783	0.02	WD-WM-013783	0
WD-WM-013784	0	WD-WM-013784	0.01	WD-WM-013784	0
WD-WM-013785	0	WD-WM-013785	0.01	WD-WM-013785	0
WD-WM-013786	0	WD-WM-013786	0.01	WD-WM-013786	0
WD-WM-013787	0	WD-WM-013787	0	WD-WM-013787	0
WD-WM-013788	0	WD-WM-013788	0	WD-WM-013788	0
WD-WM-013789	0	WD-WM-013789	0	WD-WM-013789	0
WD-WM-013790	0	WD-WM-013790	0	WD-WM-013790	0
WD-WM-013791	0	WD-WM-013791	0	WD-WM-013791	0
WD-WM-013792	0	WD-WM-013792	0	WD-WM-013792	0
WD-WM-013793	0	WD-WM-013793	0.02	WD-WM-013793	0
WD-WM-013864	0	WD-WM-013864	0	WD-WM-013864	0
WD-WM-013900	0	WD-WM-013900	0	WD-WM-013900	0
WD-WM-013901	0	WD-WM-013901	0	WD-WM-013901	0
WD-WM-013902	0	WD-WM-013902	0	WD-WM-013902	0
WD-WM-013903	0	WD-WM-013903	0	WD-WM-013903	0
WD-WM-013904	0	WD-WM-013904	0	WD-WM-013904	0
WD-WM-013905	0	WD-WM-013905	0	WD-WM-013905	0
WD-WM-013906	0	WD-WM-013906	0	WD-WM-013906	0
WD-WM-013907	0	WD-WM-013907	0	WD-WM-013907	0
WD-WM-013908	0	WD-WM-013908	0	WD-WM-013908	0
WD-WM-013909	0	WD-WM-013909	0	WD-WM-013909	0
WD-WM-013910	0	WD-WM-013910	0	WD-WM-013910	0
WD-WM-013911	0	WD-WM-013911	0	WD-WM-013911	0
WD-WM-013912	0	WD-WM-013912	0	WD-WM-013912	0
WD-WM-013913	0	WD-WM-013913	0	WD-WM-013913	0
WD-WM-013914	0	WD-WM-013914	0	WD-WM-013914	0
WD-WM-013915	0	WD-WM-013915	0	WD-WM-013915	0
WD-WM-013916	0	WD-WM-013916	0	WD-WM-013916	0
WD-WM-013917	0	WD-WM-013917	0.03	WD-WM-013917	0.11
WD-WM-013918	0	WD-WM-013918	0.03	WD-WM-013918	0.11
WD-WM-013919	0	WD-WM-013919	0.03	WD-WM-013919	0.11
WD-WM-013920	0	WD-WM-013920	0.03	WD-WM-013920	0.11
WD-WM-013921	0	WD-WM-013921	0.03	WD-WM-013921	0.11
WD-WM-013922	0	WD-WM-013922	0.03	WD-WM-013922	0.11
WD-WM-013923	0	WD-WM-013923	0.03	WD-WM-013923	0.11
WD-WM-013924	0	WD-WM-013924	0	WD-WM-013924	0
WD-WM-013925	0	WD-WM-013925	0	WD-WM-013925	0
WD-WM-013926	0	WD-WM-013926	0	WD-WM-013926	0
WD-WM-013927	0	WD-WM-013927	0	WD-WM-013927	0
WD-WM-013928(1)	0	WD-WM-013928(1)	0.03	WD-WM-013928(1)	0.11
WD-WM-013928(2)	0	WD-WM-013928(2)	0.03	WD-WM-013928(2)	0.11
WD-WM-013929	0	WD-WM-013929	0.03	WD-WM-013929	0.11
WD-WM-013930	0	WD-WM-013930	0.05	WD-WM-013930	0.2
WD-WM-013932	0	WD-WM-013932	0.03	WD-WM-013932	0.15
WD-WM-013933	0	WD-WM-013933	0.03	WD-WM-013933	0.15
WD-WM-013934	0	WD-WM-013934	0.03	WD-WM-013934	0.1
WD-WM-013935	0	WD-WM-013935	0.03	WD-WM-013935	0.11
WD-WM-013936	0	WD-WM-013936	0.05	WD-WM-013936	0.2
WD-WM-013937	0	WD-WM-013937	0.03	WD-WM-013937	0.1
WD-WM-013938	0	WD-WM-013938	0.03	WD-WM-013938	0.1
WD-WM-013939	0	WD-WM-013939	0.03	WD-WM-013939	0.1

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-013940	0	WD-WM-013940	0.03	WD-WM-013940	0.1
WD-WM-013941	0	WD-WM-013941	0.03	WD-WM-013941	0.1
WD-WM-013942	0	WD-WM-013942	0.03	WD-WM-013942	0.1
WD-WM-013943	0	WD-WM-013943	0.03	WD-WM-013943	0.1
WD-WM-013944	0	WD-WM-013944	0.03	WD-WM-013944	0.1
WD-WM-013945	0	WD-WM-013945	0.03	WD-WM-013945	0.1
WD-WM-013946	0	WD-WM-013946	0.07	WD-WM-013946	0.27
WD-WM-013947	0	WD-WM-013947	0.07	WD-WM-013947	0.27
WD-WM-013948	0	WD-WM-013948	0.03	WD-WM-013948	0.1
WD-WM-013949	0	WD-WM-013949	0.08	WD-WM-013949	0.22
WD-WM-013950	0	WD-WM-013950	0.08	WD-WM-013950	0.22
WD-WM-013951	0	WD-WM-013951	0.08	WD-WM-013951	0.22
WD-WM-013952	0	WD-WM-013952	0.08	WD-WM-013952	0.22
WD-WM-013953	0	WD-WM-013953	0.08	WD-WM-013953	0.22
WD-WM-013958	0	WD-WM-013958	0.08	WD-WM-013958	0.22
WD-WM-013959	0	WD-WM-013959	0.08	WD-WM-013959	0.22
WD-WM-013960	0	WD-WM-013960	0.08	WD-WM-013960	0.22
WD-WM-013977	0	WD-WM-013977	0	WD-WM-013977	0
WD-WM-013988	0	WD-WM-013988	0.05	WD-WM-013988	0.17
WD-WM-013989	0	WD-WM-013989	0.03	WD-WM-013989	0.1
WD-WM-013990	0	WD-WM-013990	0.01	WD-WM-013990	0.03
WD-WM-013991	0	WD-WM-013991	0.02	WD-WM-013991	0.07
WD-WM-013992	0	WD-WM-013992	0.03	WD-WM-013992	0.1
WD-WM-013993	0	WD-WM-013993	0.01	WD-WM-013993	0.03
WD-WM-013994	0	WD-WM-013994	0.02	WD-WM-013994	0.07
WD-WM-013995	0	WD-WM-013995	0.03	WD-WM-013995	0.1
WD-WM-013996	0	WD-WM-013996	0.01	WD-WM-013996	0.03
WD-WM-013997	0	WD-WM-013997	0.03	WD-WM-013997	0.1
WD-WM-013998	0	WD-WM-013998	0.01	WD-WM-013998	0.03
WD-WM-013999	0	WD-WM-013999	0.01	WD-WM-013999	0.03
WD-WM-014000	0	WD-WM-014000	0	WD-WM-014000	0
WD-WM-014001	0	WD-WM-014001	0	WD-WM-014001	0
WD-WM-014002	0	WD-WM-014002	0	WD-WM-014002	0
WD-WM-014003	0	WD-WM-014003	0.01	WD-WM-014003	0.03
WD-WM-014004	0	WD-WM-014004	0.09	WD-WM-014004	0.25
WD-WM-014005	0	WD-WM-014005	0.09	WD-WM-014005	0.25
WD-WM-014006	0	WD-WM-014006	0	WD-WM-014006	0
WD-WM-014007	0	WD-WM-014007	0.09	WD-WM-014007	0.25
WD-WM-014008	0	WD-WM-014008	0.09	WD-WM-014008	0.25
WD-WM-014009	0	WD-WM-014009	0.09	WD-WM-014009	0.25
WD-WM-014010	0	WD-WM-014010	0.09	WD-WM-014010	0.25
WD-WM-014011	0	WD-WM-014011	0.08	WD-WM-014011	0.25
WD-WM-014012	0	WD-WM-014012	0.08	WD-WM-014012	0.25
WD-WM-014013	0	WD-WM-014013	0.08	WD-WM-014013	0.25
WD-WM-014014	0	WD-WM-014014	0	WD-WM-014014	0
WD-WM-014015	0	WD-WM-014015	0	WD-WM-014015	0
WD-WM-014016	0	WD-WM-014016	0.08	WD-WM-014016	0.24
WD-WM-014017	0	WD-WM-014017	0.05	WD-WM-014017	0.18
WD-WM-014018	0	WD-WM-014018	0.05	WD-WM-014018	0.18
WD-WM-014019	0	WD-WM-014019	0	WD-WM-014019	0
WD-WM-014020	0	WD-WM-014020	0.08	WD-WM-014020	0.25
WD-WM-014021	0	WD-WM-014021	0.08	WD-WM-014021	0.24
WD-WM-014022	0	WD-WM-014022	0	WD-WM-014022	0
WD-WM-014023	0	WD-WM-014023	0	WD-WM-014023	0
WD-WM-014024	0	WD-WM-014024	0	WD-WM-014024	0
WD-WM-014025	0	WD-WM-014025	0	WD-WM-014025	0
WD-WM-014026	0	WD-WM-014026	0	WD-WM-014026	0
WD-WM-014027	0	WD-WM-014027	0	WD-WM-014027	0
WD-WM-014028	0	WD-WM-014028	0	WD-WM-014028	0
WD-WM-014029	0	WD-WM-014029	0	WD-WM-014029	0
WD-WM-014030	0	WD-WM-014030	0	WD-WM-014030	0
WD-WM-014031	0	WD-WM-014031	0	WD-WM-014031	0
WD-WM-014032	0	WD-WM-014032	0	WD-WM-014032	0
WD-WM-014033	0	WD-WM-014033	0	WD-WM-014033	0
WD-WM-014034	0	WD-WM-014034	0	WD-WM-014034	0
WD-WM-014035	0	WD-WM-014035	0	WD-WM-014035	0
WD-WM-014036	0	WD-WM-014036	0	WD-WM-014036	0
WD-WM-014037	0	WD-WM-014037	0	WD-WM-014037	0
WD-WM-014038	0	WD-WM-014038	0	WD-WM-014038	0
WD-WM-014039	0	WD-WM-014039	0	WD-WM-014039	0
WD-WM-014040	0	WD-WM-014040	0	WD-WM-014040	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-014041	0
WD-WM-014042	0
WD-WM-014043	0
WD-WM-014047	0
WD-WM-014083	2.43
WD-WM-014084	2.44
WD-WM-014085	2.44
WD-WM-014086	2.44
WD-WM-014087	2.45
WD-WM-014088	1.21
WD-WM-014089	1.22
WD-WM-014090	1.24
WD-WM-014091	1.24
WD-WM-014092	1.25
WD-WM-014093	1.25
WD-WM-014094	1.25
WD-WM-014095	1.26
WD-WM-014096	1.26
WD-WM-014097	2.5
WD-WM-014098	1.24
WD-WM-014099	0
WD-WM-014100	0
WD-WM-014101	0
WD-WM-014102	0
WD-WM-014103	0
WD-WM-014104	0
WD-WM-014105	0
WD-WM-014106	0
WD-WM-014107	0
WD-WM-014108	0
WD-WM-014109	0
WD-WM-014110	0
WD-WM-014111	0
WD-WM-014112	0
WD-WM-014113	0
WD-WM-014114	0
WD-WM-014115	0
WD-WM-014116	0
WD-WM-014117	0
WD-WM-014118	0
WD-WM-014119	0
WD-WM-014120	0
WD-WM-014121	0
WD-WM-014122	0
WD-WM-014123	0
WD-WM-014124	0
WD-WM-014125	0
WD-WM-014126	0
WD-WM-014127	0
WD-WM-014128	0
WD-WM-014129	0
WD-WM-014130	0
WD-WM-014131	0
WD-WM-014132	0
WD-WM-014133	0
WD-WM-014134	0
WD-WM-014135	0
WD-WM-014136	0
WD-WM-014137	0
WD-WM-014138	0
WD-WM-014139	0
WD-WM-014140	0
WD-WM-014141	0
WD-WM-014142	0
WD-WM-014143	0
WD-WM-014144	0
WD-WM-014145	0
WD-WM-014146	0
WD-WM-014147	0
WD-WM-014148	0
WD-WM-014149	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-014041	0
WD-WM-014042	0
WD-WM-014043	0
WD-WM-014047	0
WD-WM-014083	0.04
WD-WM-014084	0.04
WD-WM-014085	0.03
WD-WM-014086	0.02
WD-WM-014087	0.02
WD-WM-014088	0.01
WD-WM-014089	0
WD-WM-014090	0
WD-WM-014091	0.01
WD-WM-014092	0.01
WD-WM-014093	0.02
WD-WM-014094	0.03
WD-WM-014095	0.03
WD-WM-014096	0.04
WD-WM-014097	0.08
WD-WM-014098	0.03
WD-WM-014099	0
WD-WM-014100	0
WD-WM-014101	0
WD-WM-014102	0.05
WD-WM-014103	0.05
WD-WM-014104	0
WD-WM-014105	0.05
WD-WM-014106	0.05
WD-WM-014107	0
WD-WM-014108	0.05
WD-WM-014109	0
WD-WM-014110	0
WD-WM-014111	0.06
WD-WM-014112	0.03
WD-WM-014113	0.06
WD-WM-014114	0.05
WD-WM-014115	0.05
WD-WM-014116	0.02
WD-WM-014117	0.02
WD-WM-014118	0.03
WD-WM-014119	0.03
WD-WM-014120	0.06
WD-WM-014121	0.09
WD-WM-014122	0.04
WD-WM-014123	0.04
WD-WM-014124	0.04
WD-WM-014125	0.04
WD-WM-014126	0.04
WD-WM-014127	0.04
WD-WM-014128	0.04
WD-WM-014129	0.01
WD-WM-014130	0.04
WD-WM-014131	0.04
WD-WM-014132	0.04
WD-WM-014133	0.01
WD-WM-014134	0.01
WD-WM-014135	0.05
WD-WM-014136	0.05
WD-WM-014137	0.06
WD-WM-014138	0.06
WD-WM-014139	0.06
WD-WM-014140	0.06
WD-WM-014141	0.06
WD-WM-014142	0.06
WD-WM-014143	0.03
WD-WM-014144	0.09
WD-WM-014145	0.03
WD-WM-014146	0.03
WD-WM-014147	0.03
WD-WM-014148	0
WD-WM-014149	0.04

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-014041	0
WD-WM-014042	0
WD-WM-014043	0
WD-WM-014047	0
WD-WM-014083	0.05
WD-WM-014084	0.05
WD-WM-014085	0.04
WD-WM-014086	0.03
WD-WM-014087	0.02
WD-WM-014088	0.01
WD-WM-014089	0
WD-WM-014090	0
WD-WM-014091	0.01
WD-WM-014092	0.02
WD-WM-014093	0.03
WD-WM-014094	0.03
WD-WM-014095	0.04
WD-WM-014096	0.05
WD-WM-014097	0.1
WD-WM-014098	0.04
WD-WM-014099	0
WD-WM-014100	0
WD-WM-014101	0
WD-WM-014102	0.18
WD-WM-014103	0.18
WD-WM-014104	0
WD-WM-014105	0.18
WD-WM-014106	0.18
WD-WM-014107	0
WD-WM-014108	0.18
WD-WM-014109	0
WD-WM-014110	0
WD-WM-014111	0.16
WD-WM-014112	0.08
WD-WM-014113	0.16
WD-WM-014114	0.18
WD-WM-014115	0.18
WD-WM-014116	0.02
WD-WM-014117	0.02
WD-WM-014118	0.02
WD-WM-014119	0.08
WD-WM-014120	0.14
WD-WM-014121	0.13
WD-WM-014122	0.11
WD-WM-014123	0.11
WD-WM-014124	0.11
WD-WM-014125	0.11
WD-WM-014126	0.11
WD-WM-014127	0.11
WD-WM-014128	0.11
WD-WM-014129	0.01
WD-WM-014130	0.1
WD-WM-014131	0.1
WD-WM-014132	0.1
WD-WM-014133	0.01
WD-WM-014134	0.01
WD-WM-014135	0.1
WD-WM-014136	0.1
WD-WM-014137	0.17
WD-WM-014138	0.17
WD-WM-014139	0.17
WD-WM-014140	0.17
WD-WM-014141	0.17
WD-WM-014142	0.17
WD-WM-014143	0.07
WD-WM-014144	0.23
WD-WM-014145	0.07
WD-WM-014146	0.07
WD-WM-014147	0.07
WD-WM-014148	0
WD-WM-014149	0.1

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-014150	0	WD-WM-014150	0.04	WD-WM-014150	0.1
WD-WM-014151	0	WD-WM-014151	0.04	WD-WM-014151	0.1
WD-WM-014152	0	WD-WM-014152	0.04	WD-WM-014152	0.1
WD-WM-014153	0	WD-WM-014153	0.01	WD-WM-014153	0.02
WD-WM-014154	0	WD-WM-014154	0.05	WD-WM-014154	0.12
WD-WM-014155	0	WD-WM-014155	0	WD-WM-014155	0
WD-WM-014156	0	WD-WM-014156	0.05	WD-WM-014156	0.12
WD-WM-014157	0	WD-WM-014157	0.05	WD-WM-014157	0.12
WD-WM-014158	0	WD-WM-014158	0.05	WD-WM-014158	0.12
WD-WM-014159	0	WD-WM-014159	0.05	WD-WM-014159	0.12
WD-WM-014160	0	WD-WM-014160	0.05	WD-WM-014160	0.12
WD-WM-014161	0	WD-WM-014161	0.05	WD-WM-014161	0.12
WD-WM-014162	0	WD-WM-014162	0.05	WD-WM-014162	0.12
WD-WM-014163	0	WD-WM-014163	0.01	WD-WM-014163	0.02
WD-WM-014164	0	WD-WM-014164	0.04	WD-WM-014164	0.08
WD-WM-014165	0	WD-WM-014165	0.04	WD-WM-014165	0.08
WD-WM-014166	0	WD-WM-014166	0.04	WD-WM-014166	0.08
WD-WM-014167	0	WD-WM-014167	0.04	WD-WM-014167	0.08
WD-WM-014168	0	WD-WM-014168	0.04	WD-WM-014168	0.08
WD-WM-014169	0	WD-WM-014169	0.02	WD-WM-014169	0.04
WD-WM-014170	0	WD-WM-014170	0.02	WD-WM-014170	0.04
WD-WM-014171	0	WD-WM-014171	0.02	WD-WM-014171	0.04
WD-WM-014172	0	WD-WM-014172	0.07	WD-WM-014172	0.24
WD-WM-014173	0	WD-WM-014173	0.06	WD-WM-014173	0.23
WD-WM-014174	0	WD-WM-014174	0.06	WD-WM-014174	0.23
WD-WM-014175	0	WD-WM-014175	0.03	WD-WM-014175	0.02
WD-WM-014176	0	WD-WM-014176	0.03	WD-WM-014176	0.02
WD-WM-014177	0	WD-WM-014177	0.03	WD-WM-014177	0.02
WD-WM-014178	0	WD-WM-014178	0.05	WD-WM-014178	0.2
WD-WM-014179	0	WD-WM-014179	0.06	WD-WM-014179	0.22
WD-WM-014180	0	WD-WM-014180	0.06	WD-WM-014180	0.23
WD-WM-014181	0	WD-WM-014181	0.06	WD-WM-014181	0.05
WD-WM-014182	0	WD-WM-014182	0.06	WD-WM-014182	0.23
WD-WM-014183	0	WD-WM-014183	0.01	WD-WM-014183	0.01
WD-WM-014184	0	WD-WM-014184	0.01	WD-WM-014184	0.01
WD-WM-014185	0	WD-WM-014185	0.01	WD-WM-014185	0
WD-WM-014186	0	WD-WM-014186	0.01	WD-WM-014186	0
WD-WM-014187	0	WD-WM-014187	0.06	WD-WM-014187	0.05
WD-WM-014188	0	WD-WM-014188	0	WD-WM-014188	0
WD-WM-014189	0	WD-WM-014189	0	WD-WM-014189	0.01
WD-WM-014190	0	WD-WM-014190	0	WD-WM-014190	0.01
WD-WM-014191	0	WD-WM-014191	0	WD-WM-014191	0.01
WD-WM-014192	0	WD-WM-014192	0	WD-WM-014192	0.04
WD-WM-014193	0	WD-WM-014193	0	WD-WM-014193	0
WD-WM-014194	0	WD-WM-014194	0	WD-WM-014194	0
WD-WM-014195	0	WD-WM-014195	0	WD-WM-014195	0.03
WD-WM-014196	0	WD-WM-014196	0	WD-WM-014196	0.03
WD-WM-014197	0	WD-WM-014197	0	WD-WM-014197	0.01
WD-WM-014198	0	WD-WM-014198	0	WD-WM-014198	0.01
WD-WM-014199	0	WD-WM-014199	0	WD-WM-014199	0.08
WD-WM-014200	0	WD-WM-014200	0	WD-WM-014200	0
WD-WM-014201	0	WD-WM-014201	0	WD-WM-014201	0
WD-WM-014202	0	WD-WM-014202	0	WD-WM-014202	0.07
WD-WM-014203	0	WD-WM-014203	0	WD-WM-014203	0.01
WD-WM-014204	0	WD-WM-014204	0	WD-WM-014204	0.01
WD-WM-014205	0	WD-WM-014205	0	WD-WM-014205	0.01
WD-WM-014206	0	WD-WM-014206	0	WD-WM-014206	0.01
WD-WM-014207	0	WD-WM-014207	0	WD-WM-014207	0.12
WD-WM-014208	0	WD-WM-014208	0	WD-WM-014208	0.14
WD-WM-014209	0	WD-WM-014209	0	WD-WM-014209	0.02
WD-WM-014210	0	WD-WM-014210	0	WD-WM-014210	0.02
WD-WM-014211	0	WD-WM-014211	0	WD-WM-014211	0.25
WD-WM-014212	0	WD-WM-014212	0	WD-WM-014212	0
WD-WM-014213(1)	0.02	WD-WM-014213(1)	0.07	WD-WM-014213(1)	0.19
WD-WM-014213(2)(1)(1)	0.02	WD-WM-014213(2)(1)(1)	0.06	WD-WM-014213(2)(1)(1)	0.16
WD-WM-014213(2)(1)(2)	0.02	WD-WM-014213(2)(1)(2)	0.05	WD-WM-014213(2)(1)(2)	0.14
WD-WM-014213(2)(2)	0.02	WD-WM-014213(2)(2)	0.05	WD-WM-014213(2)(2)	0.13
WD-WM-014214(1)	0.02	WD-WM-014214(1)	0.07	WD-WM-014214(1)	0.19
WD-WM-014214(2)	0	WD-WM-014214(2)	0	WD-WM-014214(2)	0.01
WD-WM-014215	0.02	WD-WM-014215	0.07	WD-WM-014215	0.18
WD-WM-014216	0	WD-WM-014216	0	WD-WM-014216	0.01

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-014217	0.01
WD-WM-014218	0
WD-WM-014221	0
WD-WM-014222	0
WD-WM-014226	0
WD-WM-014228	0
WD-WM-014238	0
WD-WM-014239	0
WD-WM-014242	0.06
WD-WM-014243	0.07
WD-WM-014244	0.07
WD-WM-014245	0.07
WD-WM-014246	0.07
WD-WM-014247	0
WD-WM-014248	0
WD-WM-014249	0.07
WD-WM-014250	0.08
WD-WM-014251	0.04
WD-WM-014252	0.04
WD-WM-014253	0.04
WD-WM-014254	0.04
WD-WM-014255	0.04
WD-WM-014256	0.12
WD-WM-014257	0.12
WD-WM-014258	0.12
WD-WM-014259	0.12
WD-WM-014269	0.01
WD-WM-014271	0
WD-WM-014274	0
WD-WM-014297	0.01
WD-WM-014392	0.02
WD-WM-014395	0.01
WD-WM-014396	0.01
WD-WM-014397	0.01
WD-WM-014398	0.01
WD-WM-014400	0.03
WD-WM-014401	0.03
WD-WM-014402	0.03
WD-WM-014419	0
WD-WM-014420	0
WD-WM-014421	0.03
WD-WM-014448	0
WD-WM-014453	0
WD-WM-014465	0
WD-WM-014466	0
WD-WM-014467(1)	0
WD-WM-014467(2)	0
WD-WM-014468	0
WD-WM-014469	0
WD-WM-014477	0
WD-WM-014478	0
WD-WM-014479	0
WD-WM-014502	0
WD-WM-014509	0
WD-WM-014513	0
WD-WM-014519	0
WD-WM-014520	0
WD-WM-014521	0
WD-WM-014522	0
WD-WM-014523	0
WD-WM-014524	0
WD-WM-014525	0
WD-WM-014528	0
WD-WM-014650	0.01
WD-WM-014651	0
WD-WM-014652	0
WD-WM-014653	0
WD-WM-014655	0
WD-WM-014656	0
WD-WM-014657	0.01
WD-WM-014658	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-014217	0.02
WD-WM-014218	0.01
WD-WM-014221	0
WD-WM-014222	0
WD-WM-014226	0
WD-WM-014228	0
WD-WM-014238	0
WD-WM-014239	0
WD-WM-014242	0.08
WD-WM-014243	0.08
WD-WM-014244	0.07
WD-WM-014245	0.07
WD-WM-014246	0.07
WD-WM-014247	0
WD-WM-014248	0.01
WD-WM-014249	0.06
WD-WM-014250	0.06
WD-WM-014251	0.08
WD-WM-014252	0.08
WD-WM-014253	0.07
WD-WM-014254	0.07
WD-WM-014255	0.07
WD-WM-014256	0.12
WD-WM-014257	0.12
WD-WM-014258	0.12
WD-WM-014259	0.11
WD-WM-014269	0.01
WD-WM-014271	0.01
WD-WM-014274	0
WD-WM-014297	0.04
WD-WM-014392	0.03
WD-WM-014395	0.03
WD-WM-014396	0.03
WD-WM-014397	0.03
WD-WM-014398	0.03
WD-WM-014400	0.06
WD-WM-014401	0.06
WD-WM-014402	0.06
WD-WM-014419	0
WD-WM-014420	0
WD-WM-014421	0.06
WD-WM-014448	0
WD-WM-014453	0
WD-WM-014465	0
WD-WM-014466	0
WD-WM-014467(1)	0
WD-WM-014467(2)	0
WD-WM-014468	0
WD-WM-014469	0
WD-WM-014477	0
WD-WM-014478	0
WD-WM-014479	0
WD-WM-014502	0
WD-WM-014509	0
WD-WM-014513	0
WD-WM-014519	0
WD-WM-014520	0
WD-WM-014521	0
WD-WM-014522	0
WD-WM-014523	0
WD-WM-014524	0
WD-WM-014525	0
WD-WM-014528	0
WD-WM-014650	0.04
WD-WM-014651	0
WD-WM-014652	0
WD-WM-014653	0
WD-WM-014655	0.01
WD-WM-014656	0
WD-WM-014657	0.03
WD-WM-014658	0.02

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-014217	0.04
WD-WM-014218	0.02
WD-WM-014221	0
WD-WM-014222	0
WD-WM-014226	0
WD-WM-014228	0
WD-WM-014238	0
WD-WM-014239	0
WD-WM-014242	0.13
WD-WM-014243	0.12
WD-WM-014244	0.11
WD-WM-014245	0.11
WD-WM-014246	0.1
WD-WM-014247	0.01
WD-WM-014248	0.01
WD-WM-014249	0.08
WD-WM-014250	0.08
WD-WM-014251	0.13
WD-WM-014252	0.12
WD-WM-014253	0.12
WD-WM-014254	0.11
WD-WM-014255	0.1
WD-WM-014256	0.17
WD-WM-014257	0.17
WD-WM-014258	0.16
WD-WM-014259	0.16
WD-WM-014269	0.01
WD-WM-014271	0.01
WD-WM-014274	0
WD-WM-014297	0.04
WD-WM-014392	0.04
WD-WM-014395	0.04
WD-WM-014396	0.04
WD-WM-014397	0.04
WD-WM-014398	0.04
WD-WM-014400	0.07
WD-WM-014401	0.07
WD-WM-014402	0.07
WD-WM-014419	0
WD-WM-014420	0
WD-WM-014421	0.07
WD-WM-014448	0
WD-WM-014453	0
WD-WM-014465	0
WD-WM-014466	0
WD-WM-014467(1)	0
WD-WM-014467(2)	0
WD-WM-014468	0
WD-WM-014469	0
WD-WM-014477	0
WD-WM-014478	0
WD-WM-014479	0
WD-WM-014502	0
WD-WM-014509	0
WD-WM-014513	0
WD-WM-014519	0
WD-WM-014520	0
WD-WM-014521	0
WD-WM-014522	0
WD-WM-014523	0
WD-WM-014524	0
WD-WM-014525	0
WD-WM-014528	0
WD-WM-014650	0.1
WD-WM-014651	0.01
WD-WM-014652	0.01
WD-WM-014653	0.01
WD-WM-014655	0.03
WD-WM-014656	0.01
WD-WM-014657	0.07
WD-WM-014658	0.04

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-014659	0	WD-WM-014659	0.01	WD-WM-014659	0.02
WD-WM-014660	0	WD-WM-014660	0.01	WD-WM-014660	0.02
WD-WM-014663	0.02	WD-WM-014663	0.05	WD-WM-014663	0.07
WD-WM-014664	0.01	WD-WM-014664	0.02	WD-WM-014664	0.03
WD-WM-014665	0.01	WD-WM-014665	0.02	WD-WM-014665	0.02
WD-WM-014666	0.01	WD-WM-014666	0.01	WD-WM-014666	0.02
WD-WM-014667	0	WD-WM-014667	0.01	WD-WM-014667	0.01
WD-WM-014668	0	WD-WM-014668	0	WD-WM-014668	0
WD-WM-014669	0	WD-WM-014669	0	WD-WM-014669	0
WD-WM-014670	0	WD-WM-014670	0.01	WD-WM-014670	0.01
WD-WM-014671	0	WD-WM-014671	0.01	WD-WM-014671	0.01
WD-WM-014672	0	WD-WM-014672	0	WD-WM-014672	0.01
WD-WM-014673	0	WD-WM-014673	0.01	WD-WM-014673	0.01
WD-WM-014674	0.01	WD-WM-014674	0.03	WD-WM-014674	0.04
WD-WM-014675	0.01	WD-WM-014675	0.02	WD-WM-014675	0.04
WD-WM-014676	0.01	WD-WM-014676	0.01	WD-WM-014676	0.02
WD-WM-014677	0	WD-WM-014677	0.01	WD-WM-014677	0.01
WD-WM-014679	0.02	WD-WM-014679	0.03	WD-WM-014679	0.04
WD-WM-014686	0	WD-WM-014686	0.01	WD-WM-014686	0.01
WD-WM-014687	0	WD-WM-014687	0	WD-WM-014687	0
WD-WM-014688	0.02	WD-WM-014688	0.02	WD-WM-014688	0.03
WD-WM-014689	0.01	WD-WM-014689	0.02	WD-WM-014689	0.03
WD-WM-014690	0.01	WD-WM-014690	0.02	WD-WM-014690	0.03
WD-WM-014691	0.01	WD-WM-014691	0.01	WD-WM-014691	0.01
WD-WM-014692	0	WD-WM-014692	0.01	WD-WM-014692	0.01
WD-WM-014693	0	WD-WM-014693	0	WD-WM-014693	0.01
WD-WM-014694	0	WD-WM-014694	0	WD-WM-014694	0
WD-WM-014695	0	WD-WM-014695	0	WD-WM-014695	0
WD-WM-014696	0	WD-WM-014696	0	WD-WM-014696	0.01
WD-WM-014698	0	WD-WM-014698	0	WD-WM-014698	0
WD-WM-014705	0.03	WD-WM-014705	0.05	WD-WM-014705	0.08
WD-WM-014706	0	WD-WM-014706	0.01	WD-WM-014706	0.01
WD-WM-014707	0.01	WD-WM-014707	0.01	WD-WM-014707	0.02
WD-WM-014708	0.03	WD-WM-014708	0.05	WD-WM-014708	0.07
WD-WM-014709	0.02	WD-WM-014709	0.04	WD-WM-014709	0.05
WD-WM-014853	0.01	WD-WM-014853	0.06	WD-WM-014853	0.11
WD-WM-014854	0	WD-WM-014854	0	WD-WM-014854	0
WD-WM-014855	0	WD-WM-014855	0	WD-WM-014855	0
WD-WM-014856	0.01	WD-WM-014856	0.05	WD-WM-014856	0.11
WD-WM-014857	0.01	WD-WM-014857	0.05	WD-WM-014857	0.1
WD-WM-014858	0.01	WD-WM-014858	0.05	WD-WM-014858	0.09
WD-WM-014859	0	WD-WM-014859	0.01	WD-WM-014859	0.01
WD-WM-014860	0	WD-WM-014860	0	WD-WM-014860	0.01
WD-WM-014861	0	WD-WM-014861	0	WD-WM-014861	0.01
WD-WM-014862	0	WD-WM-014862	0	WD-WM-014862	0
WD-WM-014863	0	WD-WM-014863	0	WD-WM-014863	0
WD-WM-014864	0.01	WD-WM-014864	0.04	WD-WM-014864	0.09
WD-WM-014865	0.01	WD-WM-014865	0.04	WD-WM-014865	0.08
WD-WM-014866	0	WD-WM-014866	0	WD-WM-014866	0.01
WD-WM-014867	0	WD-WM-014867	0	WD-WM-014867	0
WD-WM-014868	0	WD-WM-014868	0	WD-WM-014868	0
WD-WM-014869	0	WD-WM-014869	0.04	WD-WM-014869	0.07
WD-WM-014870	0	WD-WM-014870	0.04	WD-WM-014870	0.07
WD-WM-014871	0.03	WD-WM-014871	0.12	WD-WM-014871	0.23
WD-WM-014872	0.03	WD-WM-014872	0.12	WD-WM-014872	0.23
WD-WM-014873	0.03	WD-WM-014873	0.11	WD-WM-014873	0.22
WD-WM-014874	0.01	WD-WM-014874	0.01	WD-WM-014874	0.02
WD-WM-014875	0.03	WD-WM-014875	0.11	WD-WM-014875	0.22
WD-WM-014876	0.03	WD-WM-014876	0.11	WD-WM-014876	0.22
WD-WM-014877	0.01	WD-WM-014877	0.02	WD-WM-014877	0.05
WD-WM-014878	0.02	WD-WM-014878	0.09	WD-WM-014878	0.17
WD-WM-014879	0.01	WD-WM-014879	0.02	WD-WM-014879	0.04
WD-WM-014880	0.01	WD-WM-014880	0.01	WD-WM-014880	0.02
WD-WM-014881	0.02	WD-WM-014881	0.08	WD-WM-014881	0.16
WD-WM-014882	0.01	WD-WM-014882	0.02	WD-WM-014882	0.04
WD-WM-014883	0.01	WD-WM-014883	0.01	WD-WM-014883	0.02
WD-WM-014925(1)	0	WD-WM-014925(1)	0	WD-WM-014925(1)	0
WD-WM-014925(2)	0	WD-WM-014925(2)	0	WD-WM-014925(2)	0
WD-WM-014933	0.19	WD-WM-014933	0.13	WD-WM-014933	0.11
WD-WM-014957	0	WD-WM-014957	0	WD-WM-014957	0
WD-WM-014962	0.07	WD-WM-014962	0.16	WD-WM-014962	0.2

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-014963	0
WD-WM-014967	0.05
WD-WM-014968(1)	0.05
WD-WM-014968(2)	0.05
WD-WM-014990	0
WD-WM-014991	0
WD-WM-014992	0
WD-WM-014994	0
WD-WM-014997	0
WD-WM-014998	0.07
WD-WM-015019	0
WD-WM-015020	0.07
WD-WM-015036	0
WD-WM-015053	0
WD-WM-015075	0
WD-WM-015079	0
WD-WM-015084	0
WD-WM-015087	0.01
WD-WM-015104	0
WD-WM-015134	0.07
WD-WM-015135	0.07
WD-WM-015136	0.07
WD-WM-015137	0
WD-WM-015138	0
WD-WM-015140	0
WD-WM-015141	0
WD-WM-015142	0
WD-WM-015230	0
WD-WM-015232	0.04
WD-WM-015233	0.08
WD-WM-015237(1)	0.01
WD-WM-015237(2)	0
WD-WM-015242	0
WD-WM-015243	0.01
WD-WM-015244(1)	0.01
WD-WM-015244(2)	0.01
WD-WM-015247	0
WD-WM-015248	0
WD-WM-015249(1)	0
WD-WM-015249(2)	0
WD-WM-015250	0
WD-WM-015251(1)	0
WD-WM-015251(2)	0
WD-WM-015252	0
WD-WM-015253(1)	0
WD-WM-015253(2)(1)	0
WD-WM-015253(2)(2)	0
WD-WM-015254(1)	0
WD-WM-015254(2)(1)	0
WD-WM-015254(2)(2)	0
WD-WM-015255	0
WD-WM-015256	0
WD-WM-015265	0.35
WD-WM-015362	0
WD-WM-015374	0
WD-WM-015420	0.01
WD-WM-015692	0
WD-WM-015813	0
WD-WM-015896	0.56
WD-WM-015900	0
WD-WM-016005	0
WD-WM-016047	0
WD-WM-016278	0
WD-WM-016282	0
WD-WM-016291	0
WD-WM-016292	0
WD-WM-016483	0
WD-WM-016484	0
WD-WM-016485	0
WD-WM-016486	0
WD-WM-016490	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-014963	0.01
WD-WM-014967	0.2
WD-WM-014968(1)	0.2
WD-WM-014968(2)	0.2
WD-WM-014990	0
WD-WM-014991	0
WD-WM-014992	0
WD-WM-014994	0
WD-WM-014997	0
WD-WM-014998	0.06
WD-WM-015019	0
WD-WM-015020	0.06
WD-WM-015036	0
WD-WM-015053	0
WD-WM-015075	0
WD-WM-015079	0
WD-WM-015084	0
WD-WM-015087	0.02
WD-WM-015104	0
WD-WM-015134	0.11
WD-WM-015135	0.11
WD-WM-015136	0.12
WD-WM-015137	0
WD-WM-015138	0
WD-WM-015140	0
WD-WM-015141	0
WD-WM-015142	0
WD-WM-015230	0
WD-WM-015232	0.01
WD-WM-015233	0.01
WD-WM-015237(1)	0.01
WD-WM-015237(2)	0
WD-WM-015242	0
WD-WM-015243	0.01
WD-WM-015244(1)	0.01
WD-WM-015244(2)	0.01
WD-WM-015247	0.01
WD-WM-015248	0
WD-WM-015249(1)	0
WD-WM-015249(2)	0
WD-WM-015250	0
WD-WM-015251(1)	0
WD-WM-015251(2)	0
WD-WM-015252	0
WD-WM-015253(1)	0
WD-WM-015253(2)(1)	0
WD-WM-015253(2)(2)	0
WD-WM-015254(1)	0
WD-WM-015254(2)(1)	0
WD-WM-015254(2)(2)	0
WD-WM-015255	0
WD-WM-015256	0
WD-WM-015265	0.36
WD-WM-015362	0
WD-WM-015374	0
WD-WM-015420	0.01
WD-WM-015692	0
WD-WM-015813	0
WD-WM-015896	1.31
WD-WM-015900	0
WD-WM-016005	0
WD-WM-016047	0
WD-WM-016278	0.01
WD-WM-016282	0.01
WD-WM-016291	0
WD-WM-016292	0
WD-WM-016483	0
WD-WM-016484	0
WD-WM-016485	0
WD-WM-016486	0
WD-WM-016490	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-014963	0.01
WD-WM-014967	0.3
WD-WM-014968(1)	0.3
WD-WM-014968(2)	0.3
WD-WM-014990	0
WD-WM-014991	0
WD-WM-014992	0
WD-WM-014994	0
WD-WM-014997	0
WD-WM-014998	0.14
WD-WM-015019	0
WD-WM-015020	0.14
WD-WM-015036	0
WD-WM-015053	0
WD-WM-015075	0
WD-WM-015079	0
WD-WM-015084	0
WD-WM-015087	0.01
WD-WM-015104	0
WD-WM-015134	0.1
WD-WM-015135	0.1
WD-WM-015136	0.11
WD-WM-015137	0
WD-WM-015138	0
WD-WM-015140	0
WD-WM-015141	0
WD-WM-015142	0
WD-WM-015230	0
WD-WM-015232	0.01
WD-WM-015233	0.02
WD-WM-015237(1)	0.01
WD-WM-015237(2)	0
WD-WM-015242	0
WD-WM-015243	0.01
WD-WM-015244(1)	0.01
WD-WM-015244(2)	0.01
WD-WM-015247	0.01
WD-WM-015248	0
WD-WM-015249(1)	0
WD-WM-015249(2)	0
WD-WM-015250	0
WD-WM-015251(1)	0
WD-WM-015251(2)	0
WD-WM-015252	0
WD-WM-015253(1)	0
WD-WM-015253(2)(1)	0
WD-WM-015253(2)(2)	0
WD-WM-015254(1)	0
WD-WM-015254(2)(1)	0
WD-WM-015254(2)(2)	0
WD-WM-015255	0
WD-WM-015256	0
WD-WM-015265	0.1
WD-WM-015362	0
WD-WM-015374	0
WD-WM-015420	0.02
WD-WM-015692	0
WD-WM-015813	0
WD-WM-015896	1.2
WD-WM-015900	0
WD-WM-016005	0
WD-WM-016047	0
WD-WM-016278	0.01
WD-WM-016282	0.01
WD-WM-016291	0
WD-WM-016292	0
WD-WM-016483	0
WD-WM-016484	0
WD-WM-016485	0
WD-WM-016486	0
WD-WM-016490	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-016491	0
WD-WM-016492	0
WD-WM-016493	0
WD-WM-016629	0
WD-WM-016630	0
WD-WM-016631	0
WD-WM-016632	0
WD-WM-016633	0
WD-WM-016634	0
WD-WM-016639	0
WD-WM-016640	0
WD-WM-016819	0
WD-WM-016990(1)	0.02
WD-WM-016990(2)	0.02
WD-WM-017053	0.19
WD-WM-017318(1)(1)	0
WD-WM-017318(1)(2)	0.01
WD-WM-017318(2)(1)	0.01
WD-WM-017318(2)(2)	0.03
WD-WM-017326	0.01
WD-WM-017348(1)	0
WD-WM-017348(2)	0.03
WD-WM-017379	0
WD-WM-017409	0
WD-WM-017410	0
WD-WM-017411	0
WD-WM-017450	0
WD-WM-017459	0
WD-WM-017460	0
WD-WM-017461	0
WD-WM-017489	0.27
WD-WM-017508	0
WD-WM-017517(1)	0.04
WD-WM-017517(2)(1)	0.05
WD-WM-017517(2)(2)(1)(1)(1)	0
WD-WM-017517(2)(2)(1)(1)(2)	0
WD-WM-017517(2)(2)(1)(2)	0
WD-WM-017517(2)(2)(2)(1)	0
WD-WM-017517(2)(2)(2)(2)	0
WD-WM-017541	0.1
WD-WM-017549	0.03
WD-WM-017550	0.03
WD-WM-017554	0
WD-WM-017555	0.03
WD-WM-017693	0
WD-WM-017860	0.04
WD-WM-017898(1)	0.07
WD-WM-017898(2)	0
WD-WM-017914	0.01
WD-WM-017965	0
WD-WM-018117	0
WD-WM-018239	0
WD-WM-018240	0
WD-WM-018257	0.09
WD-WM-018258	0.09
WD-WM-018259	0.09
WD-WM-018260	0
WD-WM-018263	0
WD-WM-018265	0.61
WD-WM-018285	0
WD-WM-018477	0
WD-WM-018709(1)	0.01
WD-WM-018709(2)(1)	0
WD-WM-018709(2)(2)	0.01
WD-WM-018854	0
WD-WM-019187	0.22
WD-WM-019302	0.16
WD-WM-019321	0
WD-WM-019322	0
WD-WM-019367	0
WD-WM-019368(1)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-016491	0
WD-WM-016492	0
WD-WM-016493	0
WD-WM-016629	0
WD-WM-016630	0
WD-WM-016631	0
WD-WM-016632	0
WD-WM-016633	0
WD-WM-016634	0
WD-WM-016639	0
WD-WM-016640	0
WD-WM-016819	0
WD-WM-016990(1)	0.19
WD-WM-016990(2)	0.29
WD-WM-017053	0.17
WD-WM-017318(1)(1)	0.01
WD-WM-017318(1)(2)	0.01
WD-WM-017318(2)(1)	0.02
WD-WM-017318(2)(2)	0.04
WD-WM-017326	0.01
WD-WM-017348(1)	0
WD-WM-017348(2)	0.04
WD-WM-017379	0
WD-WM-017409	0
WD-WM-017410	0
WD-WM-017411	0
WD-WM-017450	0
WD-WM-017459	0
WD-WM-017460	0
WD-WM-017461	0
WD-WM-017489	0.4
WD-WM-017508	0
WD-WM-017517(1)	0.3
WD-WM-017517(2)(1)	0.26
WD-WM-017517(2)(2)(1)(1)(1)	0.25
WD-WM-017517(2)(2)(1)(1)(2)	0.25
WD-WM-017517(2)(2)(1)(2)	0.15
WD-WM-017517(2)(2)(2)(1)	0
WD-WM-017517(2)(2)(2)(2)	0
WD-WM-017541	0.17
WD-WM-017549	0.06
WD-WM-017550	0.06
WD-WM-017554	0
WD-WM-017555	0.06
WD-WM-017693	0
WD-WM-017860	0.04
WD-WM-017898(1)	0.13
WD-WM-017898(2)	0
WD-WM-017914	0.01
WD-WM-017965	0
WD-WM-018117	0
WD-WM-018239	0
WD-WM-018240	0
WD-WM-018257	0.07
WD-WM-018258	0.07
WD-WM-018259	0.07
WD-WM-018260	0
WD-WM-018263	0
WD-WM-018265	0.24
WD-WM-018285	0
WD-WM-018477	0
WD-WM-018709(1)	0.01
WD-WM-018709(2)(1)	0.01
WD-WM-018709(2)(2)	0.01
WD-WM-018854	0
WD-WM-019187	0.09
WD-WM-019302	0.03
WD-WM-019321	0
WD-WM-019322	0
WD-WM-019367	0
WD-WM-019368(1)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-016491	0
WD-WM-016492	0
WD-WM-016493	0
WD-WM-016629	0
WD-WM-016630	0
WD-WM-016631	0
WD-WM-016632	0
WD-WM-016633	0
WD-WM-016634	0
WD-WM-016639	0
WD-WM-016640	0
WD-WM-016819	0
WD-WM-016990(1)	0.15
WD-WM-016990(2)	0.23
WD-WM-017053	0.16
WD-WM-017318(1)(1)	0.01
WD-WM-017318(1)(2)	0.02
WD-WM-017318(2)(1)	0.02
WD-WM-017318(2)(2)	0.19
WD-WM-017326	0.01
WD-WM-017348(1)	0
WD-WM-017348(2)	0.02
WD-WM-017379	0
WD-WM-017409	0
WD-WM-017410	0
WD-WM-017411	0
WD-WM-017450	0
WD-WM-017459	0
WD-WM-017460	0
WD-WM-017461	0
WD-WM-017489	0.01
WD-WM-017508	0
WD-WM-017517(1)	0.3
WD-WM-017517(2)(1)	0.22
WD-WM-017517(2)(2)(1)(1)(1)	0.07
WD-WM-017517(2)(2)(1)(1)(2)	1.47
WD-WM-017517(2)(2)(1)(2)	0.88
WD-WM-017517(2)(2)(2)(1)	0.09
WD-WM-017517(2)(2)(2)(2)	0.09
WD-WM-017541	0.06
WD-WM-017549	0.06
WD-WM-017550	0.06
WD-WM-017554	0
WD-WM-017555	0.06
WD-WM-017693	0
WD-WM-017860	0.05
WD-WM-017898(1)	0.1
WD-WM-017898(2)	0
WD-WM-017914	0.01
WD-WM-017965	0
WD-WM-018117	0
WD-WM-018239	0
WD-WM-018240	0
WD-WM-018257	0.05
WD-WM-018258	0.05
WD-WM-018259	0.05
WD-WM-018260	0
WD-WM-018263	0
WD-WM-018265	0.59
WD-WM-018285	0
WD-WM-018477	0
WD-WM-018709(1)	0.03
WD-WM-018709(2)(1)	0.05
WD-WM-018709(2)(2)	0.09
WD-WM-018854	0
WD-WM-019187	0.03
WD-WM-019302	0.02
WD-WM-019321	0
WD-WM-019322	0
WD-WM-019367	0
WD-WM-019368(1)	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-019368(2)	0	WD-WM-019368(2)	0	WD-WM-019368(2)	0
WD-WM-019369(1)	0	WD-WM-019369(1)	0	WD-WM-019369(1)	0
WD-WM-019369(2)	0	WD-WM-019369(2)	0	WD-WM-019369(2)	0
WD-WM-019370(1)	0	WD-WM-019370(1)	0	WD-WM-019370(1)	0
WD-WM-019370(2)	0	WD-WM-019370(2)	0	WD-WM-019370(2)	0
WD-WM-019371	0	WD-WM-019371	0	WD-WM-019371	0
WD-WM-019380	0.01	WD-WM-019380	0.01	WD-WM-019380	0.01
WD-WM-019381	0.01	WD-WM-019381	0.01	WD-WM-019381	0.01
WD-WM-019382	0.01	WD-WM-019382	0.01	WD-WM-019382	0.01
WD-WM-019384	0	WD-WM-019384	0	WD-WM-019384	0
WD-WM-019385	0	WD-WM-019385	0	WD-WM-019385	0
WD-WM-019386	0.01	WD-WM-019386	0.01	WD-WM-019386	0.01
WD-WM-019387(1)	0.01	WD-WM-019387(1)	0.01	WD-WM-019387(1)	0.01
WD-WM-019387(2)	0.01	WD-WM-019387(2)	0.01	WD-WM-019387(2)	0.01
WD-WM-019388	0.02	WD-WM-019388	0.02	WD-WM-019388	0.01
WD-WM-019389	0.01	WD-WM-019389	0.01	WD-WM-019389	0.01
WD-WM-019390	0	WD-WM-019390	0	WD-WM-019390	0
WD-WM-019391	0.01	WD-WM-019391	0.01	WD-WM-019391	0.01
WD-WM-019405(1)	0	WD-WM-019405(1)	0	WD-WM-019405(1)	0
WD-WM-019405(2)(1)	0.89	WD-WM-019405(2)(1)	0.91	WD-WM-019405(2)(1)	0.44
WD-WM-019405(2)(2)	1	WD-WM-019405(2)(2)	0.74	WD-WM-019405(2)(2)	0.13
WD-WM-019506	0.02	WD-WM-019506	0.01	WD-WM-019506	0.08
WD-WM-019610	0.02	WD-WM-019610	0.02	WD-WM-019610	0.03
WD-WM-019611	0.02	WD-WM-019611	0.01	WD-WM-019611	0.02
WD-WM-019718	0	WD-WM-019718	0	WD-WM-019718	0
WD-WM-019851	0	WD-WM-019851	0	WD-WM-019851	0
WD-WM-019878	0	WD-WM-019878	0	WD-WM-019878	0
WD-WM-019964	0	WD-WM-019964	0	WD-WM-019964	0
WD-WM-019979	0	WD-WM-019979	0	WD-WM-019979	0
WD-WM-019984(1)	0	WD-WM-019984(1)	0	WD-WM-019984(1)	0
WD-WM-019984(2)	0	WD-WM-019984(2)	0	WD-WM-019984(2)	0
WD-WM-020141	0.01	WD-WM-020141	0.03	WD-WM-020141	0.03
WD-WM-020305	0	WD-WM-020305	0	WD-WM-020305	0
WD-WM-020312	0	WD-WM-020312	0	WD-WM-020312	0
WD-WM-020313	0	WD-WM-020313	0	WD-WM-020313	0
WD-WM-020314	0	WD-WM-020314	0	WD-WM-020314	0
WD-WM-020315	0	WD-WM-020315	0	WD-WM-020315	0
WD-WM-020316	0	WD-WM-020316	0	WD-WM-020316	0
WD-WM-020317	0	WD-WM-020317	0	WD-WM-020317	0
WD-WM-020357	0	WD-WM-020357	0	WD-WM-020357	0
WD-WM-020448(1)	0.01	WD-WM-020448(1)	0.01	WD-WM-020448(1)	0.01
WD-WM-020448(2)	0.02	WD-WM-020448(2)	0.02	WD-WM-020448(2)	0.01
WD-WM-020466	0.02	WD-WM-020466	0.18	WD-WM-020466	0.19
WD-WM-020508	0.89	WD-WM-020508	0.92	WD-WM-020508	0.45
WD-WM-020509	0	WD-WM-020509	0	WD-WM-020509	0
WD-WM-020529	0	WD-WM-020529	0	WD-WM-020529	0
WD-WM-020552	0	WD-WM-020552	0	WD-WM-020552	0
WD-WM-020553	0	WD-WM-020553	0	WD-WM-020553	0
WD-WM-020556	0.15	WD-WM-020556	0.27	WD-WM-020556	0.26
WD-WM-020557	0	WD-WM-020557	0	WD-WM-020557	0
WD-WM-020562(1)	0	WD-WM-020562(1)	0	WD-WM-020562(1)	0
WD-WM-020562(2)	0	WD-WM-020562(2)	0	WD-WM-020562(2)	0
WD-WM-020565	0.01	WD-WM-020565	0.01	WD-WM-020565	0.01
WD-WM-020566	0.04	WD-WM-020566	0.05	WD-WM-020566	0.09
WD-WM-020571	0.01	WD-WM-020571	0.01	WD-WM-020571	0.01
WD-WM-020572	0.02	WD-WM-020572	0.03	WD-WM-020572	0.06
WD-WM-020579	0	WD-WM-020579	0	WD-WM-020579	0
WD-WM-020589	0.03	WD-WM-020589	0.27	WD-WM-020589	0.28
WD-WM-020590	0	WD-WM-020590	0	WD-WM-020590	0
WD-WM-020591	0	WD-WM-020591	0	WD-WM-020591	0
WD-WM-020613	0.04	WD-WM-020613	0.17	WD-WM-020613	0.16
WD-WM-020622	0.36	WD-WM-020622	0.12	WD-WM-020622	0.15
WD-WM-020623	0.78	WD-WM-020623	0.18	WD-WM-020623	0.16
WD-WM-020624	0.38	WD-WM-020624	0.13	WD-WM-020624	0.17
WD-WM-020625	0.75	WD-WM-020625	0.22	WD-WM-020625	0.26
WD-WM-020626	0.01	WD-WM-020626	0.02	WD-WM-020626	0.03
WD-WM-020627	0	WD-WM-020627	0	WD-WM-020627	0
WD-WM-020628	0.72	WD-WM-020628	0.29	WD-WM-020628	0.39
WD-WM-020629	0.73	WD-WM-020629	0.27	WD-WM-020629	0.35
WD-WM-020630	0.39	WD-WM-020630	0.12	WD-WM-020630	0.14
WD-WM-020631	0.76	WD-WM-020631	0.21	WD-WM-020631	0.23

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-020635	0.02	WD-WM-020635	0.04	WD-WM-020635	0.04
WD-WM-020636	0.25	WD-WM-020636	0.49	WD-WM-020636	0.62
WD-WM-020637	0.01	WD-WM-020637	0.03	WD-WM-020637	0.03
WD-WM-020638	0	WD-WM-020638	0.01	WD-WM-020638	0.01
WD-WM-020639	0	WD-WM-020639	0.01	WD-WM-020639	0.01
WD-WM-020641	0.28	WD-WM-020641	0.54	WD-WM-020641	0.67
WD-WM-020642	0	WD-WM-020642	0.01	WD-WM-020642	0.01
WD-WM-020643	0.01	WD-WM-020643	0.01	WD-WM-020643	0.02
WD-WM-020644	0.04	WD-WM-020644	0.09	WD-WM-020644	0.12
WD-WM-020645	0.01	WD-WM-020645	0.01	WD-WM-020645	0.01
WD-WM-020646	0.02	WD-WM-020646	0.04	WD-WM-020646	0.05
WD-WM-020647	0.02	WD-WM-020647	0.04	WD-WM-020647	0.05
WD-WM-020648	0	WD-WM-020648	0	WD-WM-020648	0.01
WD-WM-020649	1.29	WD-WM-020649	0.79	WD-WM-020649	0.25
WD-WM-020650	0.18	WD-WM-020650	0.04	WD-WM-020650	0.2
WD-WM-020651	0.11	WD-WM-020651	0.02	WD-WM-020651	0.12
WD-WM-020652	1.24	WD-WM-020652	0.7	WD-WM-020652	0.37
WD-WM-020653	0.29	WD-WM-020653	0.06	WD-WM-020653	0.33
WD-WM-020654	0.01	WD-WM-020654	0.02	WD-WM-020654	0.04
WD-WM-020655	0.12	WD-WM-020655	0.03	WD-WM-020655	0.16
WD-WM-020656	0.17	WD-WM-020656	0.06	WD-WM-020656	0.17
WD-WM-020657	0.08	WD-WM-020657	0.05	WD-WM-020657	0.02
WD-WM-020658	0.07	WD-WM-020658	0.03	WD-WM-020658	0.03
WD-WM-020659	0.09	WD-WM-020659	0.05	WD-WM-020659	0.04
WD-WM-020660	0.04	WD-WM-020660	0.08	WD-WM-020660	0.12
WD-WM-020661	0.35	WD-WM-020661	0.16	WD-WM-020661	0.2
WD-WM-020662	0	WD-WM-020662	0.01	WD-WM-020662	0.01
WD-WM-020663	0.01	WD-WM-020663	0.03	WD-WM-020663	0.04
WD-WM-020664	0.01	WD-WM-020664	0.01	WD-WM-020664	0.01
WD-WM-020665	0.11	WD-WM-020665	0.02	WD-WM-020665	0.13
WD-WM-020666	0.01	WD-WM-020666	0.02	WD-WM-020666	0.04
WD-WM-020667	0.09	WD-WM-020667	0.05	WD-WM-020667	0.04
WD-WM-020670	0	WD-WM-020670	0	WD-WM-020670	0
WD-WM-020671	0	WD-WM-020671	0	WD-WM-020671	0
WD-WM-020672	0	WD-WM-020672	0.01	WD-WM-020672	0.01
WD-WM-020673	0.08	WD-WM-020673	0.14	WD-WM-020673	0.17
WD-WM-020674	0.09	WD-WM-020674	0.15	WD-WM-020674	0.18
WD-WM-020675	0	WD-WM-020675	0	WD-WM-020675	0
WD-WM-020676	0.08	WD-WM-020676	0.15	WD-WM-020676	0.2
WD-WM-020677	0.08	WD-WM-020677	0.14	WD-WM-020677	0.17
WD-WM-020678	0	WD-WM-020678	0	WD-WM-020678	0
WD-WM-020679(1)(1)	0.07	WD-WM-020679(1)(1)	0.1	WD-WM-020679(1)(1)	0.12
WD-WM-020679(1)(2)	0	WD-WM-020679(1)(2)	0	WD-WM-020679(1)(2)	0.01
WD-WM-020679(2)	0	WD-WM-020679(2)	0	WD-WM-020679(2)	0
WD-WM-020684	0.07	WD-WM-020684	0.11	WD-WM-020684	0.13
WD-WM-020685	0	WD-WM-020685	0.01	WD-WM-020685	0.42
WD-WM-020686	0.06	WD-WM-020686	0.14	WD-WM-020686	0.23
WD-WM-020687	0.31	WD-WM-020687	0.15	WD-WM-020687	0.35
WD-WM-020688	0.24	WD-WM-020688	0.3	WD-WM-020688	0.31
WD-WM-020689	0.25	WD-WM-020689	0.39	WD-WM-020689	0.47
WD-WM-020690	0.54	WD-WM-020690	0.54	WD-WM-020690	0.23
WD-WM-020691	0.55	WD-WM-020691	0.54	WD-WM-020691	0.22
WD-WM-020692	0	WD-WM-020692	0	WD-WM-020692	0.02
WD-WM-020694	0.03	WD-WM-020694	0.08	WD-WM-020694	0.13
WD-WM-020696	0.03	WD-WM-020696	0.06	WD-WM-020696	0.1
WD-WM-020697	0.01	WD-WM-020697	0.02	WD-WM-020697	0.04
WD-WM-020698	0.01	WD-WM-020698	0.02	WD-WM-020698	0.03
WD-WM-020699	0.01	WD-WM-020699	0.02	WD-WM-020699	0.03
WD-WM-020701	0.02	WD-WM-020701	0.04	WD-WM-020701	0.07
WD-WM-020702	0	WD-WM-020702	0.01	WD-WM-020702	0.02
WD-WM-020703	0	WD-WM-020703	0.01	WD-WM-020703	0.01
WD-WM-020704	0.01	WD-WM-020704	0.02	WD-WM-020704	0.04
WD-WM-020705	0.01	WD-WM-020705	0.02	WD-WM-020705	0.03
WD-WM-020706(1)	0	WD-WM-020706(1)	0.01	WD-WM-020706(1)	0.01
WD-WM-020706(2)	0.01	WD-WM-020706(2)	0.02	WD-WM-020706(2)	0.04
WD-WM-020707	0.01	WD-WM-020707	0.03	WD-WM-020707	0.05
WD-WM-020708	0.01	WD-WM-020708	0.02	WD-WM-020708	0.03
WD-WM-020709	0	WD-WM-020709	0.01	WD-WM-020709	0.02
WD-WM-020710	0	WD-WM-020710	0.01	WD-WM-020710	0.01
WD-WM-020711	0.01	WD-WM-020711	0.02	WD-WM-020711	0.03
WD-WM-020712	0.01	WD-WM-020712	0.01	WD-WM-020712	0.02

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-020713	0.01	WD-WM-020713	0.02	WD-WM-020713	0.03
WD-WM-020714	0	WD-WM-020714	0.01	WD-WM-020714	0.02
WD-WM-020715	0	WD-WM-020715	0	WD-WM-020715	0
WD-WM-020716	0.01	WD-WM-020716	0.03	WD-WM-020716	0.06
WD-WM-020717	0	WD-WM-020717	0.01	WD-WM-020717	0.01
WD-WM-020718	0.01	WD-WM-020718	0.02	WD-WM-020718	0.04
WD-WM-020719	0.01	WD-WM-020719	0.01	WD-WM-020719	0.02
WD-WM-020720	0.01	WD-WM-020720	0.01	WD-WM-020720	0.03
WD-WM-020721	0	WD-WM-020721	0.01	WD-WM-020721	0.02
WD-WM-020722	0.01	WD-WM-020722	0.02	WD-WM-020722	0.03
WD-WM-020723	0.02	WD-WM-020723	0.04	WD-WM-020723	0.08
WD-WM-020724	0.01	WD-WM-020724	0.01	WD-WM-020724	0.02
WD-WM-020725	0.01	WD-WM-020725	0.02	WD-WM-020725	0.04
WD-WM-020726	0.01	WD-WM-020726	0.04	WD-WM-020726	0.06
WD-WM-020727	0.01	WD-WM-020727	0.03	WD-WM-020727	0.05
WD-WM-020728	0	WD-WM-020728	0	WD-WM-020728	0.01
WD-WM-020729	0.01	WD-WM-020729	0.03	WD-WM-020729	0.05
WD-WM-020730	0.03	WD-WM-020730	0.36	WD-WM-020730	0.14
WD-WM-020732	0.03	WD-WM-020732	0.36	WD-WM-020732	0.14
WD-WM-020733	0.03	WD-WM-020733	0.36	WD-WM-020733	0.14
WD-WM-020734	0.03	WD-WM-020734	0.36	WD-WM-020734	0.14
WD-WM-020735	0.03	WD-WM-020735	0.36	WD-WM-020735	0.14
WD-WM-020736	0.03	WD-WM-020736	0.36	WD-WM-020736	0.14
WD-WM-020738	0.03	WD-WM-020738	0.36	WD-WM-020738	0.14
WD-WM-020739	0.03	WD-WM-020739	0.36	WD-WM-020739	0.14
WD-WM-020745	0	WD-WM-020745	0	WD-WM-020745	0
WD-WM-020746	0	WD-WM-020746	0	WD-WM-020746	0
WD-WM-020747	0	WD-WM-020747	0	WD-WM-020747	0
WD-WM-020748	0	WD-WM-020748	0	WD-WM-020748	0
WD-WM-020749	0	WD-WM-020749	0	WD-WM-020749	0
WD-WM-020750	0	WD-WM-020750	0	WD-WM-020750	0
WD-WM-020751	0.03	WD-WM-020751	0.36	WD-WM-020751	0.14
WD-WM-020754	0	WD-WM-020754	0	WD-WM-020754	0
WD-WM-020755	0	WD-WM-020755	0	WD-WM-020755	0
WD-WM-020756	0	WD-WM-020756	0	WD-WM-020756	0
WD-WM-020757	0	WD-WM-020757	0	WD-WM-020757	0
WD-WM-020758	0	WD-WM-020758	0	WD-WM-020758	0
WD-WM-020759	0	WD-WM-020759	0	WD-WM-020759	0
WD-WM-020760	0	WD-WM-020760	0	WD-WM-020760	0
WD-WM-020761	0.03	WD-WM-020761	0.36	WD-WM-020761	0.14
WD-WM-020762	0.03	WD-WM-020762	0.36	WD-WM-020762	0.14
WD-WM-020763	0.03	WD-WM-020763	0.36	WD-WM-020763	0.14
WD-WM-020770	0.06	WD-WM-020770	0.06	WD-WM-020770	0.07
WD-WM-020773	0	WD-WM-020773	0	WD-WM-020773	0
WD-WM-020775	0	WD-WM-020775	0	WD-WM-020775	0
WD-WM-020779	0	WD-WM-020779	0	WD-WM-020779	0
WD-WM-020783	0.01	WD-WM-020783	0.06	WD-WM-020783	0.07
WD-WM-020784	0.09	WD-WM-020784	0.1	WD-WM-020784	0.1
WD-WM-020785(1)	0.1	WD-WM-020785(1)	0.16	WD-WM-020785(1)	0.18
WD-WM-020785(2)	0.15	WD-WM-020785(2)	0.2	WD-WM-020785(2)	0.21
WD-WM-020786	0.05	WD-WM-020786	0.04	WD-WM-020786	0.04
WD-WM-020787	0.11	WD-WM-020787	0.23	WD-WM-020787	0.26
WD-WM-020788	0.24	WD-WM-020788	0.31	WD-WM-020788	0.31
WD-WM-020789	0.01	WD-WM-020789	0.05	WD-WM-020789	0.1
WD-WM-020790	0.01	WD-WM-020790	0.05	WD-WM-020790	0.1
WD-WM-020791	0.01	WD-WM-020791	0.05	WD-WM-020791	0.1
WD-WM-020793	0.04	WD-WM-020793	0.16	WD-WM-020793	0.3
WD-WM-020795(1)	0.11	WD-WM-020795(1)	0.41	WD-WM-020795(1)	0.8
WD-WM-020795(2)	0.1	WD-WM-020795(2)	0.36	WD-WM-020795(2)	0.7
WD-WM-020796	0.01	WD-WM-020796	0.05	WD-WM-020796	0.1
WD-WM-020797	0.04	WD-WM-020797	0.16	WD-WM-020797	0.3
WD-WM-020801(1)	0.01	WD-WM-020801(1)	0.01	WD-WM-020801(1)	0.02
WD-WM-020801(2)(1)	0.08	WD-WM-020801(2)(1)	0.07	WD-WM-020801(2)(1)	0.06
WD-WM-020801(2)(2)(1)	0.11	WD-WM-020801(2)(2)(1)	0.11	WD-WM-020801(2)(2)(1)	0.11
WD-WM-020801(2)(2)(2)	0.06	WD-WM-020801(2)(2)(2)	0.07	WD-WM-020801(2)(2)(2)	0.08
WD-WM-020802	0.08	WD-WM-020802	0.07	WD-WM-020802	0.07
WD-WM-020803	0.05	WD-WM-020803	0.05	WD-WM-020803	0.06
WD-WM-020804	0.04	WD-WM-020804	0.04	WD-WM-020804	0.03
WD-WM-020805	0.05	WD-WM-020805	0.04	WD-WM-020805	0.03
WD-WM-020806(1)	0.07	WD-WM-020806(1)	0.07	WD-WM-020806(1)	0.07
WD-WM-020806(2)(1)	0.21	WD-WM-020806(2)(1)	0.2	WD-WM-020806(2)(1)	0.21

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-020806(2)(2)	0.14
WD-WM-020807	0.14
WD-WM-020808(1)	0.11
WD-WM-020808(2)	0.16
WD-WM-020809	0.05
WD-WM-020810	0
WD-WM-020811	0.15
WD-WM-020812(1)	0.43
WD-WM-020812(2)	0.31
WD-WM-020813(1)	0.12
WD-WM-020813(2)	0.01
WD-WM-020814	0.01
WD-WM-020815	0
WD-WM-020816	0.06
WD-WM-020817	0.01
WD-WM-020818	0.23
WD-WM-020819	0.01
WD-WM-020820(1)	0.09
WD-WM-020820(2)	0.05
WD-WM-020821	0.01
WD-WM-020822	0.06
WD-WM-020824	0.01
WD-WM-020825	0.78
WD-WM-020826	0
WD-WM-020834(1)	0
WD-WM-020834(2)	0.41
WD-WM-020836	0.38
WD-WM-020840	0.02
WD-WM-020844	0.01
WD-WM-020845	0.01
WD-WM-020846	0.01
WD-WM-020847	0.13
WD-WM-020850	0.27
WD-WM-020851	0
WD-WM-020852	0
WD-WM-020853	0
WD-WM-020854	0
WD-WM-020855	0
WD-WM-020879	0.02
WD-WM-020882	0
WD-WM-020883	0.41
WD-WM-020884	0.41
WD-WM-020887	0
WD-WM-020889	0
WD-WM-020890	0
WD-WM-020892(1)	0
WD-WM-020892(2)	0
WD-WM-020893	0
WD-WM-020894(1)	0
WD-WM-020894(2)(1)	0.01
WD-WM-020894(2)(2)	0.01
WD-WM-020895	0
WD-WM-020896	0
WD-WM-020897	0
WD-WM-020898	0
WD-WM-020899	0
WD-WM-020900	0
WD-WM-020901	0
WD-WM-020902	0.01
WD-WM-020903	0
WD-WM-020904	0.01
WD-WM-020905	0
WD-WM-020906	0.01
WD-WM-020907	0.03
WD-WM-020908	0.03
WD-WM-020909	0
WD-WM-020916	0.04
WD-WM-020917	0.07
WD-WM-020918	0.03
WD-WM-020919	0.03
WD-WM-020920	0.07

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-020806(2)(2)	0.13
WD-WM-020807	0.14
WD-WM-020808(1)	0.1
WD-WM-020808(2)	0.16
WD-WM-020809	0.05
WD-WM-020810	0.01
WD-WM-020811	0.15
WD-WM-020812(1)	0.48
WD-WM-020812(2)	0.34
WD-WM-020813(1)	0.13
WD-WM-020813(2)	0.01
WD-WM-020814	0.01
WD-WM-020815	0.01
WD-WM-020816	0.08
WD-WM-020817	0.01
WD-WM-020818	0.24
WD-WM-020819	0.01
WD-WM-020820(1)	0.09
WD-WM-020820(2)	0.06
WD-WM-020821	0.01
WD-WM-020822	0.06
WD-WM-020824	0.01
WD-WM-020825	0.75
WD-WM-020826	0
WD-WM-020834(1)	0
WD-WM-020834(2)	0.24
WD-WM-020836	0.53
WD-WM-020840	0.09
WD-WM-020844	0.02
WD-WM-020845	0.03
WD-WM-020846	0.06
WD-WM-020847	0.26
WD-WM-020850	0.4
WD-WM-020851	0
WD-WM-020852	0
WD-WM-020853	0
WD-WM-020854	0
WD-WM-020855	0
WD-WM-020879	0.03
WD-WM-020882	0
WD-WM-020883	0.25
WD-WM-020884	0.25
WD-WM-020887	0
WD-WM-020889	0
WD-WM-020890	0
WD-WM-020892(1)	0.01
WD-WM-020892(2)	0.01
WD-WM-020893	0.01
WD-WM-020894(1)	0
WD-WM-020894(2)(1)	0.02
WD-WM-020894(2)(2)	0.02
WD-WM-020895	0.01
WD-WM-020896	0
WD-WM-020897	0
WD-WM-020898	0.01
WD-WM-020899	0.01
WD-WM-020900	0
WD-WM-020901	0.01
WD-WM-020902	0.03
WD-WM-020903	0
WD-WM-020904	0.03
WD-WM-020905	0
WD-WM-020906	0.02
WD-WM-020907	0.04
WD-WM-020908	0.04
WD-WM-020909	0
WD-WM-020916	0.02
WD-WM-020917	0.05
WD-WM-020918	0.02
WD-WM-020919	0.02
WD-WM-020920	0.04

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-020806(2)(2)	0.13
WD-WM-020807	0.14
WD-WM-020808(1)	0.11
WD-WM-020808(2)	0.18
WD-WM-020809	0.06
WD-WM-020810	0.01
WD-WM-020811	0.18
WD-WM-020812(1)	0.56
WD-WM-020812(2)	0.39
WD-WM-020813(1)	0.15
WD-WM-020813(2)	0.02
WD-WM-020814	0.02
WD-WM-020815	0.01
WD-WM-020816	0.08
WD-WM-020817	0.02
WD-WM-020818	0.27
WD-WM-020819	0.02
WD-WM-020820(1)	0.1
WD-WM-020820(2)	0.07
WD-WM-020821	0.02
WD-WM-020822	0.07
WD-WM-020824	0.02
WD-WM-020825	0.77
WD-WM-020826	0
WD-WM-020834(1)	0
WD-WM-020834(2)	0.3
WD-WM-020836	0.51
WD-WM-020840	0.13
WD-WM-020844	0.03
WD-WM-020845	0.05
WD-WM-020846	0.08
WD-WM-020847	0.29
WD-WM-020850	0.01
WD-WM-020851	0
WD-WM-020852	0
WD-WM-020853	0
WD-WM-020854	0
WD-WM-020855	0
WD-WM-020879	0.03
WD-WM-020882	0
WD-WM-020883	0.3
WD-WM-020884	0.3
WD-WM-020887	0
WD-WM-020889	0
WD-WM-020890	0
WD-WM-020892(1)	0.02
WD-WM-020892(2)	0.01
WD-WM-020893	0.01
WD-WM-020894(1)	0.02
WD-WM-020894(2)(1)	0.02
WD-WM-020894(2)(2)	0.03
WD-WM-020895	0.01
WD-WM-020896	0
WD-WM-020897	0
WD-WM-020898	0.02
WD-WM-020899	0.01
WD-WM-020900	0.01
WD-WM-020901	0.02
WD-WM-020902	0.06
WD-WM-020903	0
WD-WM-020904	0.04
WD-WM-020905	0
WD-WM-020906	0.03
WD-WM-020907	0.02
WD-WM-020908	0.02
WD-WM-020909	0
WD-WM-020916	0.02
WD-WM-020917	0.03
WD-WM-020918	0.01
WD-WM-020919	0.01
WD-WM-020920	0.03

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-020921	0.03
WD-WM-020922	0.07
WD-WM-020924	0
WD-WM-020925	0
WD-WM-020926	0
WD-WM-020927	0
WD-WM-020933	0.11
WD-WM-020934	0.11
WD-WM-020935	0
WD-WM-020936(1)	0
WD-WM-020936(2)	0
WD-WM-020937	0
WD-WM-020938	0
WD-WM-020939(1)(1)	0
WD-WM-020939(1)(2)	0
WD-WM-020939(2)(1)	0
WD-WM-020939(2)(2)	0
WD-WM-020940	0
WD-WM-020941	0
WD-WM-020942	0
WD-WM-020943	0
WD-WM-020945	0
WD-WM-020946	0
WD-WM-020947(1)	0.02
WD-WM-020947(2)	0
WD-WM-020948	0
WD-WM-020950	0
WD-WM-020951	0.02
WD-WM-020954	0.16
WD-WM-020955	0.09
WD-WM-020956	0.02
WD-WM-020957	0.25
WD-WM-020958	0
WD-WM-020959	0
WD-WM-020960	0.27
WD-WM-020961	0.55
WD-WM-020962(1)	0
WD-WM-020962(2)	0.55
WD-WM-020963	0
WD-WM-020964	0.52
WD-WM-020965	0.09
WD-WM-020969(1)	0
WD-WM-020969(2)	0
WD-WM-020970	0
WD-WM-020971	0
WD-WM-020973	0
WD-WM-020975	0
WD-WM-020978	0
WD-WM-020985	0
WD-WM-020989	0
WD-WM-020992	0
WD-WM-020995	0.01
WD-WM-020996	0.02
WD-WM-020997	0.02
WD-WM-020998	0
WD-WM-020999	1.24
WD-WM-021000	0.04
WD-WM-021001	0.01
WD-WM-021002	0
WD-WM-021003	0
WD-WM-021004	0
WD-WM-021005	1.24
WD-WM-021006(1)	0.09
WD-WM-021006(2)	0.09
WD-WM-021008	0
WD-WM-021009(1)	0.01
WD-WM-021009(2)(1)	0.01
WD-WM-021009(2)(2)	0
WD-WM-021010	0
WD-WM-021011	0
WD-WM-021012	0.12

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-020921	0.01
WD-WM-020922	0.03
WD-WM-020924	0
WD-WM-020925	0
WD-WM-020926	0
WD-WM-020927	0
WD-WM-020933	0.11
WD-WM-020934	0.13
WD-WM-020935	0.01
WD-WM-020936(1)	0
WD-WM-020936(2)	0
WD-WM-020937	0.01
WD-WM-020938	0
WD-WM-020939(1)(1)	0
WD-WM-020939(1)(2)	0
WD-WM-020939(2)(1)	0.01
WD-WM-020939(2)(2)	0.01
WD-WM-020940	0
WD-WM-020941	0
WD-WM-020942	0
WD-WM-020943	0.01
WD-WM-020945	0
WD-WM-020946	0
WD-WM-020947(1)	0.05
WD-WM-020947(2)	0
WD-WM-020948	0
WD-WM-020950	0
WD-WM-020951	0.04
WD-WM-020954	0.06
WD-WM-020955	0.04
WD-WM-020956	0.05
WD-WM-020957	0.1
WD-WM-020958	0
WD-WM-020959	0
WD-WM-020960	0.09
WD-WM-020961	0.17
WD-WM-020962(1)	0
WD-WM-020962(2)	0.18
WD-WM-020963	0
WD-WM-020964	0.14
WD-WM-020965	0.04
WD-WM-020969(1)	0
WD-WM-020969(2)	0
WD-WM-020970	0
WD-WM-020971	0
WD-WM-020973	0
WD-WM-020975	(N/A)
WD-WM-020978	(N/A)
WD-WM-020985	0
WD-WM-020989	0
WD-WM-020992	0
WD-WM-020995	0.01
WD-WM-020996	0.04
WD-WM-020997	0.05
WD-WM-020998	0.01
WD-WM-020999	0.7
WD-WM-021000	0.08
WD-WM-021001	0.02
WD-WM-021002	0.01
WD-WM-021003	0.01
WD-WM-021004	0.01
WD-WM-021005	0.69
WD-WM-021006(1)	0.24
WD-WM-021006(2)	0.24
WD-WM-021008	0
WD-WM-021009(1)	0.02
WD-WM-021009(2)(1)	0.01
WD-WM-021009(2)(2)	0.01
WD-WM-021010	0.01
WD-WM-021011	0.01
WD-WM-021012	0.08

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-020921	0.01
WD-WM-020922	0.03
WD-WM-020924	0
WD-WM-020925	0
WD-WM-020926	0
WD-WM-020927	0
WD-WM-020933	0.13
WD-WM-020934	0.14
WD-WM-020935	0.01
WD-WM-020936(1)	0.01
WD-WM-020936(2)	0.01
WD-WM-020937	0.01
WD-WM-020938	0.42
WD-WM-020939(1)(1)	0
WD-WM-020939(1)(2)	0.01
WD-WM-020939(2)(1)	0.01
WD-WM-020939(2)(2)	0.02
WD-WM-020940	0
WD-WM-020941	0
WD-WM-020942	0.01
WD-WM-020943	0
WD-WM-020945	0
WD-WM-020946	0
WD-WM-020947(1)	0.07
WD-WM-020947(2)	0
WD-WM-020948	0
WD-WM-020950	0
WD-WM-020951	0.07
WD-WM-020954	0.12
WD-WM-020955	0.06
WD-WM-020956	0.08
WD-WM-020957	0.17
WD-WM-020958	0
WD-WM-020959	0
WD-WM-020960	0.24
WD-WM-020961	0.36
WD-WM-020962(1)	0
WD-WM-020962(2)	0.36
WD-WM-020963	0
WD-WM-020964	0.41
WD-WM-020965	0.06
WD-WM-020969(1)	0
WD-WM-020969(2)	0
WD-WM-020970	0
WD-WM-020971	0
WD-WM-020973	0
WD-WM-020975	0
WD-WM-020978	0
WD-WM-020985	0
WD-WM-020989	0
WD-WM-020992	0
WD-WM-020995	0.01
WD-WM-020996	0.05
WD-WM-020997	0.07
WD-WM-020998	0.01
WD-WM-020999	0.37
WD-WM-021000	0.12
WD-WM-021001	0.03
WD-WM-021002	0.01
WD-WM-021003	0.01
WD-WM-021004	0.01
WD-WM-021005	0.38
WD-WM-021006(1)	0.33
WD-WM-021006(2)	0.33
WD-WM-021008	0
WD-WM-021009(1)	0.02
WD-WM-021009(2)(1)	0.02
WD-WM-021009(2)(2)	0.01
WD-WM-021010	0.01
WD-WM-021011	0.01
WD-WM-021012	0.18

EXISTING SYSTEM	
Pipe Label	**Total Volume (MG)**
WD-WM-021013(1)	0
WD-WM-021013(2)(1)(1)	0.01
WD-WM-021013(2)(1)(2)	0.11
WD-WM-021013(2)(2)	0.1
WD-WM-021016	0
WD-WM-021019(1)	0.02
WD-WM-021019(2)(1)	0.01
WD-WM-021019(2)(2)	0.03
WD-WM-021020	0.01
WD-WM-021021	0.04
WD-WM-021022	0.02
WD-WM-021027	0.09
WD-WM-021034	0
WD-WM-021039(1)	0
WD-WM-021039(2)	0
WD-WM-021040	0
WD-WM-021052(1)	0
WD-WM-021052(2)	0
WD-WM-021053	0
WD-WM-021070(1)(1)	0
WD-WM-021070(1)(2)	0.01
WD-WM-021070(2)	0
WD-WM-021081(1)	0.09
WD-WM-021081(2)(1)	0.09
WD-WM-021081(2)(2)(1)	0.07
WD-WM-021081(2)(2)(2)	0.04
WD-WM-021082	0.02
WD-WM-021083(1)(1)	0.02
WD-WM-021083(1)(2)	0.06
WD-WM-021083(2)(1)	0.09
WD-WM-021083(2)(2)	0.13
WD-WM-021084	0.04
WD-WM-021085(1)	0.02
WD-WM-021085(2)	0.03
WD-WM-021086	0.03
WD-WM-021087	0
WD-WM-021088	0
WD-WM-021089(1)(1)	0.02
WD-WM-021089(1)(2)	0.01
WD-WM-021089(2)	0.01
WD-WM-021090(1)(1)	0
WD-WM-021090(1)(2)	0
WD-WM-021090(2)	0
WD-WM-021091(1)(1)	0
WD-WM-021091(1)(2)	0
WD-WM-021091(2)(1)	0
WD-WM-021091(2)(2)	0.01
WD-WM-021092	0.01
WD-WM-021093(1)	0.01
WD-WM-021093(2)	0.01
WD-WM-021094	0
WD-WM-021095	0
WD-WM-021096(1)(1)	0.01
WD-WM-021096(1)(2)	0
WD-WM-021096(2)	0.01
WD-WM-021097	0
WD-WM-021098	0
WD-WM-021099(1)	0
WD-WM-021099(2)	0
WD-WM-021115	0.07
WD-WM-021125	0
WD-WM-021126	0
WD-WM-021127	0
WD-WM-021128	0
WD-WM-021129	0
WD-WM-021135	0
WD-WM-021138	0.15
WD-WM-021139	0.09
WD-WM-021140(1)	0.18
WD-WM-021140(2)	0.09
WD-WM-021141	0.06

2030 SYSTEM	
Pipe Label	**Total Volume (MG)**
WD-WM-021013(1)	0.01
WD-WM-021013(2)(1)(1)	0.01
WD-WM-021013(2)(1)(2)	0.07
WD-WM-021013(2)(2)	0.06
WD-WM-021016	0.01
WD-WM-021019(1)	0.03
WD-WM-021019(2)(1)	0.02
WD-WM-021019(2)(2)	0.05
WD-WM-021020	0.01
WD-WM-021021	0.07
WD-WM-021022	0.03
WD-WM-021027	0.24
WD-WM-021034	0
WD-WM-021039(1)	0
WD-WM-021039(2)	0
WD-WM-021040	0
WD-WM-021052(1)	0
WD-WM-021052(2)	0
WD-WM-021053	0
WD-WM-021070(1)(1)	0
WD-WM-021070(1)(2)	0.03
WD-WM-021070(2)	0
WD-WM-021081(1)	0.11
WD-WM-021081(2)(1)	0.11
WD-WM-021081(2)(2)(1)	0.07
WD-WM-021081(2)(2)(2)	0.04
WD-WM-021082	0.01
WD-WM-021083(1)(1)	0.02
WD-WM-021083(1)(2)	0.06
WD-WM-021083(2)(1)	0.09
WD-WM-021083(2)(2)	0.18
WD-WM-021084	0.05
WD-WM-021085(1)	0.04
WD-WM-021085(2)	0.03
WD-WM-021086	0.03
WD-WM-021087	0
WD-WM-021088	0.01
WD-WM-021089(1)(1)	0.28
WD-WM-021089(1)(2)	0.21
WD-WM-021089(2)	0.07
WD-WM-021090(1)(1)	0.11
WD-WM-021090(1)(2)	0.12
WD-WM-021090(2)	0.02
WD-WM-021091(1)(1)	0.01
WD-WM-021091(1)(2)	0.06
WD-WM-021091(2)(1)	0.08
WD-WM-021091(2)(2)	0.14
WD-WM-021092	0.07
WD-WM-021093(1)	0.14
WD-WM-021093(2)	0.15
WD-WM-021094	0.01
WD-WM-021095	0.06
WD-WM-021096(1)(1)	0.1
WD-WM-021096(1)(2)	0.05
WD-WM-021096(2)	0.1
WD-WM-021097	0.05
WD-WM-021098	0.01
WD-WM-021099(1)	0.12
WD-WM-021099(2)	0.12
WD-WM-021115	0.07
WD-WM-021125	0
WD-WM-021126	0
WD-WM-021127	0
WD-WM-021128	0
WD-WM-021129	0
WD-WM-021135	0
WD-WM-021138	0.06
WD-WM-021139	0.04
WD-WM-021140(1)	0.08
WD-WM-021140(2)	0.04
WD-WM-021141	0.02

2070 SYSTEM	
Pipe Label	**Total Volume (MG)**
WD-WM-021013(1)	0.01
WD-WM-021013(2)(1)(1)	0.02
WD-WM-021013(2)(1)(2)	0.19
WD-WM-021013(2)(2)	0.22
WD-WM-021016	0.01
WD-WM-021019(1)	0.06
WD-WM-021019(2)(1)	0.05
WD-WM-021019(2)(2)	0.11
WD-WM-021020	0.01
WD-WM-021021	0.13
WD-WM-021022	0.06
WD-WM-021027	0.33
WD-WM-021034	0
WD-WM-021039(1)	0.01
WD-WM-021039(2)	0
WD-WM-021040	0.01
WD-WM-021052(1)	0
WD-WM-021052(2)	0
WD-WM-021053	0
WD-WM-021070(1)(1)	0
WD-WM-021070(1)(2)	0.03
WD-WM-021070(2)	0
WD-WM-021081(1)	0.11
WD-WM-021081(2)(1)	0.11
WD-WM-021081(2)(2)(1)	0.06
WD-WM-021081(2)(2)(2)	0.03
WD-WM-021082	0.01
WD-WM-021083(1)(1)	0.02
WD-WM-021083(1)(2)	0.04
WD-WM-021083(2)(1)	0.07
WD-WM-021083(2)(2)	0.11
WD-WM-021084	0.05
WD-WM-021085(1)	0.05
WD-WM-021085(2)	0.04
WD-WM-021086	0.03
WD-WM-021087	0.41
WD-WM-021088	0.01
WD-WM-021089(1)(1)	0.21
WD-WM-021089(1)(2)	0.16
WD-WM-021089(2)	0.03
WD-WM-021090(1)(1)	0.26
WD-WM-021090(1)(2)	0.14
WD-WM-021090(2)	0
WD-WM-021091(1)(1)	0.01
WD-WM-021091(1)(2)	0.04
WD-WM-021091(2)(1)	0.04
WD-WM-021091(2)(2)	0.06
WD-WM-021092	0.05
WD-WM-021093(1)	0.11
WD-WM-021093(2)	0.02
WD-WM-021094	0.01
WD-WM-021095	0.02
WD-WM-021096(1)(1)	0.08
WD-WM-021096(1)(2)	0.04
WD-WM-021096(2)	0.08
WD-WM-021097	0.04
WD-WM-021098	0.01
WD-WM-021099(1)	0.03
WD-WM-021099(2)	0.04
WD-WM-021115	0.07
WD-WM-021125	0
WD-WM-021126	0
WD-WM-021127	0
WD-WM-021128	0
WD-WM-021129	0
WD-WM-021135	0
WD-WM-021138	0.12
WD-WM-021139	0.06
WD-WM-021140(1)	0.11
WD-WM-021140(2)	0.06
WD-WM-021141	0.07

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-021142	0.1	WD-WM-021142	0.05	WD-WM-021142	0.05
WD-WM-021143	0	WD-WM-021143	0	WD-WM-021143	0
WD-WM-021144(1)	0.35	WD-WM-021144(1)	0.17	WD-WM-021144(1)	0.2
WD-WM-021144(2)	0.16	WD-WM-021144(2)	0.08	WD-WM-021144(2)	0.08
WD-WM-021145	0.11	WD-WM-021145	0.08	WD-WM-021145	0.02
WD-WM-021169	0.03	WD-WM-021169	0.06	WD-WM-021169	0.05
WD-WM-021173(1)	0.02	WD-WM-021173(1)	0.04	WD-WM-021173(1)	0.03
WD-WM-021173(2)	0.04	WD-WM-021173(2)	0.08	WD-WM-021173(2)	0.07
WD-WM-021174	0	WD-WM-021174	0.01	WD-WM-021174	0.01
WD-WM-021176	0.02	WD-WM-021176	0.04	WD-WM-021176	0.02
WD-WM-021177	0.03	WD-WM-021177	0.06	WD-WM-021177	0.04
WD-WM-021178	0	WD-WM-021178	0.01	WD-WM-021178	0.01
WD-WM-021179(1)	0	WD-WM-021179(1)	0.01	WD-WM-021179(1)	0
WD-WM-021179(2)	0.01	WD-WM-021179(2)	0.03	WD-WM-021179(2)	0.03
WD-WM-021180	0	WD-WM-021180	0.01	WD-WM-021180	0.01
WD-WM-021181	0	WD-WM-021181	0.01	WD-WM-021181	0.01
WD-WM-021184	0.02	WD-WM-021184	0.05	WD-WM-021184	0.04
WD-WM-021187	0.01	WD-WM-021187	0.01	WD-WM-021187	0.01
WD-WM-021188	0.01	WD-WM-021188	0.02	WD-WM-021188	0.02
WD-WM-021189	0.01	WD-WM-021189	0.01	WD-WM-021189	0.02
WD-WM-021190	0.01	WD-WM-021190	0.03	WD-WM-021190	0.03
WD-WM-021191(1)	0.06	WD-WM-021191(1)	0.13	WD-WM-021191(1)	0.15
WD-WM-021191(2)	0.01	WD-WM-021191(2)	0.03	WD-WM-021191(2)	0.01
WD-WM-021192(1)	0.05	WD-WM-021192(1)	0.12	WD-WM-021192(1)	0.15
WD-WM-021192(2)	0.05	WD-WM-021192(2)	0.11	WD-WM-021192(2)	0.14
WD-WM-021193(1)	0.01	WD-WM-021193(1)	0.02	WD-WM-021193(1)	0.02
WD-WM-021193(2)	0	WD-WM-021193(2)	0.01	WD-WM-021193(2)	0.01
WD-WM-021194	0.01	WD-WM-021194	0.03	WD-WM-021194	0.03
WD-WM-021195	0.03	WD-WM-021195	0.08	WD-WM-021195	0.09
WD-WM-021196	0	WD-WM-021196	0.01	WD-WM-021196	0.01
WD-WM-021197	0	WD-WM-021197	0.01	WD-WM-021197	0.01
WD-WM-021198	0	WD-WM-021198	0	WD-WM-021198	0
WD-WM-021199	0.03	WD-WM-021199	0.01	WD-WM-021199	0.03
WD-WM-021212	0.24	WD-WM-021212	0.38	WD-WM-021212	0.3
WD-WM-021213	0.18	WD-WM-021213	0.3	WD-WM-021213	0.26
WD-WM-021214	0.18	WD-WM-021214	0.3	WD-WM-021214	0.26
WD-WM-021215	0.07	WD-WM-021215	0.12	WD-WM-021215	0.12
WD-WM-021216	0.25	WD-WM-021216	0.43	WD-WM-021216	0.38
WD-WM-021217	0.25	WD-WM-021217	0.44	WD-WM-021217	0.39
WD-WM-021218	0.01	WD-WM-021218	0.02	WD-WM-021218	0.02
WD-WM-021219	0.01	WD-WM-021219	0.01	WD-WM-021219	0.01
WD-WM-021220	0	WD-WM-021220	0.01	WD-WM-021220	0.01
WD-WM-021221	0.31	WD-WM-021221	0.6	WD-WM-021221	0.55
WD-WM-021222	0.07	WD-WM-021222	0.14	WD-WM-021222	0.13
WD-WM-021223	0.06	WD-WM-021223	0.13	WD-WM-021223	0.12
WD-WM-021224	0.06	WD-WM-021224	0.13	WD-WM-021224	0.12
WD-WM-021225	0.06	WD-WM-021225	0.12	WD-WM-021225	0.11
WD-WM-021226	0.06	WD-WM-021226	0.1	WD-WM-021226	0.08
WD-WM-021227	0.06	WD-WM-021227	0.12	WD-WM-021227	0.1
WD-WM-021228	0.01	WD-WM-021228	0.01	WD-WM-021228	0.01
WD-WM-021229	0	WD-WM-021229	0.01	WD-WM-021229	0.01
WD-WM-021230	0.06	WD-WM-021230	0.1	WD-WM-021230	0.08
WD-WM-021231	0.06	WD-WM-021231	0.09	WD-WM-021231	0.07
WD-WM-021232	0.06	WD-WM-021232	0.09	WD-WM-021232	0.06
WD-WM-021233	0.06	WD-WM-021233	0.08	WD-WM-021233	0.06
WD-WM-021236	0.31	WD-WM-021236	0.59	WD-WM-021236	0.55
WD-WM-021240	0	WD-WM-021240	0	WD-WM-021240	0
WD-WM-021241	0	WD-WM-021241	0	WD-WM-021241	0
WD-WM-021255	0	WD-WM-021255	0	WD-WM-021255	0
WD-WM-021256	0	WD-WM-021256	0	WD-WM-021256	0
WD-WM-021267	0.03	WD-WM-021267	0.06	WD-WM-021267	0.05
WD-WM-021268	0.03	WD-WM-021268	0.06	WD-WM-021268	0.05
WD-WM-021269	0.02	WD-WM-021269	0.04	WD-WM-021269	0.06
WD-WM-021270	0.02	WD-WM-021270	0.04	WD-WM-021270	0.07
WD-WM-021271	0.02	WD-WM-021271	0.04	WD-WM-021271	0.07
WD-WM-021272	0.02	WD-WM-021272	0.03	WD-WM-021272	0.07
WD-WM-021273	0.01	WD-WM-021273	0.03	WD-WM-021273	0.08
WD-WM-021274	0.01	WD-WM-021274	0.02	WD-WM-021274	0.08
WD-WM-021275	0.01	WD-WM-021275	0.02	WD-WM-021275	0.08
WD-WM-021276	0.01	WD-WM-021276	0.02	WD-WM-021276	0.08
WD-WM-021277	0.01	WD-WM-021277	0.02	WD-WM-021277	0.09

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-021278	0.01	WD-WM-021278	0.01	WD-WM-021278	0.01
WD-WM-021279	0	WD-WM-021279	0	WD-WM-021279	0
WD-WM-021280	0.01	WD-WM-021280	0.01	WD-WM-021280	0.01
WD-WM-021281	0	WD-WM-021281	0.01	WD-WM-021281	0.01
WD-WM-021282	0	WD-WM-021282	0.01	WD-WM-021282	0.01
WD-WM-021283	0	WD-WM-021283	0	WD-WM-021283	0
WD-WM-021284	0	WD-WM-021284	0	WD-WM-021284	0
WD-WM-021285	0	WD-WM-021285	0	WD-WM-021285	0
WD-WM-021286	0	WD-WM-021286	0	WD-WM-021286	0
WD-WM-021287	0.2	WD-WM-021287	0.03	WD-WM-021287	0.01
WD-WM-021288	0.28	WD-WM-021288	0.05	WD-WM-021288	0.01
WD-WM-021289	0.2	WD-WM-021289	0.03	WD-WM-021289	0
WD-WM-021290	0.2	WD-WM-021290	0.03	WD-WM-021290	0
WD-WM-021291	0.2	WD-WM-021291	0.03	WD-WM-021291	0
WD-WM-021292	0.2	WD-WM-021292	0.03	WD-WM-021292	0
WD-WM-021293	0.2	WD-WM-021293	0.04	WD-WM-021293	0
WD-WM-021294	0.2	WD-WM-021294	0.04	WD-WM-021294	0.01
WD-WM-021295	0.2	WD-WM-021295	0.04	WD-WM-021295	0.01
WD-WM-021296	0.2	WD-WM-021296	0.04	WD-WM-021296	0.01
WD-WM-021297	0.2	WD-WM-021297	0.04	WD-WM-021297	0.01
WD-WM-021298	0.21	WD-WM-021298	0.05	WD-WM-021298	0.01
WD-WM-021299	0.21	WD-WM-021299	0.05	WD-WM-021299	0.02
WD-WM-021300	0.21	WD-WM-021300	0.05	WD-WM-021300	0.02
WD-WM-021301	0.21	WD-WM-021301	0.05	WD-WM-021301	0.02
WD-WM-021302	0.21	WD-WM-021302	0.05	WD-WM-021302	0.02
WD-WM-021303	0.21	WD-WM-021303	0.06	WD-WM-021303	0.03
WD-WM-021304	0.21	WD-WM-021304	0.06	WD-WM-021304	0.03
WD-WM-021305	0.21	WD-WM-021305	0.06	WD-WM-021305	0.03
WD-WM-021306	0.21	WD-WM-021306	0.06	WD-WM-021306	0.03
WD-WM-021307	0.29	WD-WM-021307	0.07	WD-WM-021307	0.03
WD-WM-021308	0.29	WD-WM-021308	0.07	WD-WM-021308	0.03
WD-WM-021309	0.29	WD-WM-021309	0.06	WD-WM-021309	0.02
WD-WM-021310	0.29	WD-WM-021310	0.06	WD-WM-021310	0.02
WD-WM-021311	0.29	WD-WM-021311	0.07	WD-WM-021311	0.03
WD-WM-021312	0.29	WD-WM-021312	0.06	WD-WM-021312	0.02
WD-WM-021313	0.29	WD-WM-021313	0.06	WD-WM-021313	0.02
WD-WM-021314	0	WD-WM-021314	0	WD-WM-021314	0
WD-WM-021316	0.29	WD-WM-021316	0.05	WD-WM-021316	0.01
WD-WM-021322	0.02	WD-WM-021322	0.04	WD-WM-021322	0.02
WD-WM-021328	0	WD-WM-021328	0	WD-WM-021328	0
WD-WM-021329	0	WD-WM-021329	0	WD-WM-021329	0
WD-WM-021330	0	WD-WM-021330	0	WD-WM-021330	0
WD-WM-021337	0	WD-WM-021337	0	WD-WM-021337	0
WD-WM-021416	0.08	WD-WM-021416	0	WD-WM-021416	0
WD-WM-021419	0	WD-WM-021419	0	WD-WM-021419	0
WD-WM-021420	0	WD-WM-021420	0	WD-WM-021420	0
WD-WM-021421	0	WD-WM-021421	0	WD-WM-021421	0
WD-WM-021422	0	WD-WM-021422	0	WD-WM-021422	0
WD-WM-021423	0	WD-WM-021423	0	WD-WM-021423	0
WD-WM-021425	0	WD-WM-021425	0	WD-WM-021425	0
WD-WM-021426	0	WD-WM-021426	0	WD-WM-021426	0
WD-WM-021427	0	WD-WM-021427	0	WD-WM-021427	0
WD-WM-021428	0	WD-WM-021428	0	WD-WM-021428	0
WD-WM-021429	0	WD-WM-021429	0	WD-WM-021429	0
WD-WM-021430	0	WD-WM-021430	0	WD-WM-021430	0
WD-WM-021431	0	WD-WM-021431	0	WD-WM-021431	0
WD-WM-021432	0	WD-WM-021432	0	WD-WM-021432	0
WD-WM-021433	0	WD-WM-021433	0	WD-WM-021433	0
WD-WM-021434	0	WD-WM-021434	0	WD-WM-021434	0
WD-WM-021435	0	WD-WM-021435	0	WD-WM-021435	0
WD-WM-021437	0	WD-WM-021437	0	WD-WM-021437	0
WD-WM-021438	0	WD-WM-021438	0	WD-WM-021438	0
WD-WM-021439	0	WD-WM-021439	0	WD-WM-021439	0
WD-WM-021440	0	WD-WM-021440	0	WD-WM-021440	0
WD-WM-021441	0	WD-WM-021441	0	WD-WM-021441	0
WD-WM-021442	0	WD-WM-021442	0	WD-WM-021442	0
WD-WM-021450(1)	0	WD-WM-021450(1)	0.01	WD-WM-021450(1)	0.03
WD-WM-021450(2)	0.01	WD-WM-021450(2)	0.01	WD-WM-021450(2)	0.01
WD-WM-021451(1)	0.01	WD-WM-021451(1)	0	WD-WM-021451(1)	0.04
WD-WM-021451(2)(1)	0.01	WD-WM-021451(2)(1)	0	WD-WM-021451(2)(1)	0.06
WD-WM-021451(2)(2)	0.03	WD-WM-021451(2)(2)	0.01	WD-WM-021451(2)(2)	0.15

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-021452	0.01
WD-WM-021534	0.02
WD-WM-021535	0.03
WD-WM-021536(1)	0.01
WD-WM-021536(2)(1)	0.01
WD-WM-021536(2)(2)	0.01
WD-WM-021537	0
WD-WM-021538(1)	0
WD-WM-021538(2)	0
WD-WM-021539	0
WD-WM-021540(1)(1)	0.01
WD-WM-021540(1)(2)	0.01
WD-WM-021540(2)	0.01
WD-WM-021541(1)	0.01
WD-WM-021541(2)(1)	0.01
WD-WM-021541(2)(2)	0
WD-WM-021542	0
WD-WM-021543(1)	0.01
WD-WM-021543(2)	0
WD-WM-021544	0
WD-WM-021545	0
WD-WM-021546	0.02
WD-WM-021547	0
WD-WM-021548	0.01
WD-WM-021549	0
WD-WM-021550	0
WD-WM-021551	0.02
WD-WM-021578	0
WD-WM-021580	0
WD-WM-021581	0.02
WD-WM-021582	0
WD-WM-021583	0
WD-WM-021584	0
WD-WM-021585	0
WD-WM-021586	0
WD-WM-021587	0
WD-WM-021588	0.01
WD-WM-021589	0
WD-WM-021590	0
WD-WM-021591	0.02
WD-WM-021592	0.01
WD-WM-021593	0.01
WD-WM-021594(1)	0.03
WD-WM-021594(2)(1)	0.03
WD-WM-021594(2)(2)	0.03
WD-WM-021595	0.02
WD-WM-021598	0.02
WD-WM-021599	0.02
WD-WM-021600	0.02
WD-WM-021601	0.02
WD-WM-021602	0.02
WD-WM-021603	0.02
WD-WM-021604	0.02
WD-WM-021605	0.02
WD-WM-021606	0.02
WD-WM-021607	0.05
WD-WM-021608	0.05
WD-WM-021609	0.05
WD-WM-021610	0.05
WD-WM-021611	0.02
WD-WM-021612	0.05
WD-WM-021613	0.03
WD-WM-021614	0.03
WD-WM-021615	0.03
WD-WM-021616	0.03
WD-WM-021617	0.04
WD-WM-021622	0
WD-WM-021623	0
WD-WM-021624	0
WD-WM-021625	0
WD-WM-021628	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-021452	0
WD-WM-021534	0.03
WD-WM-021535	0.05
WD-WM-021536(1)	0.02
WD-WM-021536(2)(1)	0.02
WD-WM-021536(2)(2)	0.02
WD-WM-021537	0
WD-WM-021538(1)	0.01
WD-WM-021538(2)	0
WD-WM-021539	0.01
WD-WM-021540(1)(1)	0.02
WD-WM-021540(1)(2)	0.02
WD-WM-021540(2)	0.02
WD-WM-021541(1)	0.01
WD-WM-021541(2)(1)	0.01
WD-WM-021541(2)(2)	0.01
WD-WM-021542	0
WD-WM-021543(1)	0.01
WD-WM-021543(2)	0.01
WD-WM-021544	0.01
WD-WM-021545	0.01
WD-WM-021546	0.04
WD-WM-021547	0.01
WD-WM-021548	0.02
WD-WM-021549	0.01
WD-WM-021550	0.01
WD-WM-021551	0.03
WD-WM-021578	0
WD-WM-021580	0.01
WD-WM-021581	0.05
WD-WM-021582	0
WD-WM-021583	0.01
WD-WM-021584	0.01
WD-WM-021585	0.01
WD-WM-021586	0
WD-WM-021587	0
WD-WM-021588	0.02
WD-WM-021589	0.01
WD-WM-021590	0.01
WD-WM-021591	0.05
WD-WM-021592	0.02
WD-WM-021593	0.03
WD-WM-021594(1)	0.08
WD-WM-021594(2)(1)	0.08
WD-WM-021594(2)(2)	0.08
WD-WM-021595	0.04
WD-WM-021598	0.04
WD-WM-021599	0.04
WD-WM-021600	0.04
WD-WM-021601	0.03
WD-WM-021602	0.03
WD-WM-021603	0.03
WD-WM-021604	0.03
WD-WM-021605	0.03
WD-WM-021606	0.03
WD-WM-021607	0.08
WD-WM-021608	0.08
WD-WM-021609	0.08
WD-WM-021610	0.08
WD-WM-021611	0.03
WD-WM-021612	0.08
WD-WM-021613	0.05
WD-WM-021614	0.05
WD-WM-021615	0.05
WD-WM-021616	0.05
WD-WM-021617	0.05
WD-WM-021622	0
WD-WM-021623	0
WD-WM-021624	0
WD-WM-021625	0
WD-WM-021628	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-021452	0.02
WD-WM-021534	0.03
WD-WM-021535	0.05
WD-WM-021536(1)	0.02
WD-WM-021536(2)(1)	0.02
WD-WM-021536(2)(2)	0.02
WD-WM-021537	0
WD-WM-021538(1)	0.01
WD-WM-021538(2)	0
WD-WM-021539	0.01
WD-WM-021540(1)(1)	0.02
WD-WM-021540(1)(2)	0.02
WD-WM-021540(2)	0.02
WD-WM-021541(1)	0.01
WD-WM-021541(2)(1)	0.01
WD-WM-021541(2)(2)	0.01
WD-WM-021542	0
WD-WM-021543(1)	0.01
WD-WM-021543(2)	0.01
WD-WM-021544	0.01
WD-WM-021545	0.01
WD-WM-021546	0.04
WD-WM-021547	0.01
WD-WM-021548	0.02
WD-WM-021549	0.01
WD-WM-021550	0.01
WD-WM-021551	0.03
WD-WM-021578	0.01
WD-WM-021580	0.02
WD-WM-021581	0.15
WD-WM-021582	0.01
WD-WM-021583	0.02
WD-WM-021584	0.02
WD-WM-021585	0.03
WD-WM-021586	0.01
WD-WM-021587	0.01
WD-WM-021588	0.06
WD-WM-021589	0.03
WD-WM-021590	0.02
WD-WM-021591	0.14
WD-WM-021592	0.05
WD-WM-021593	0.07
WD-WM-021594(1)	0.21
WD-WM-021594(2)(1)	0.22
WD-WM-021594(2)(2)	0.23
WD-WM-021595	0.05
WD-WM-021598	0.05
WD-WM-021599	0.05
WD-WM-021600	0.08
WD-WM-021601	0.08
WD-WM-021602	0.08
WD-WM-021603	0.09
WD-WM-021604	0.09
WD-WM-021605	0.1
WD-WM-021606	0.1
WD-WM-021607	0.17
WD-WM-021608	0.17
WD-WM-021609	0.16
WD-WM-021610	0.16
WD-WM-021611	0.1
WD-WM-021612	0.15
WD-WM-021613	0.08
WD-WM-021614	0.08
WD-WM-021615	0.08
WD-WM-021616	0.08
WD-WM-021617	0.08
WD-WM-021622	0
WD-WM-021623	0
WD-WM-021624	0
WD-WM-021625	0
WD-WM-021628	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-021639	0.08
WD-WM-021640	0.09
WD-WM-021641	0.09
WD-WM-021642	0.09
WD-WM-021643	0.09
WD-WM-021644	0.09
WD-WM-021647	1.23
WD-WM-021648	1.23
WD-WM-021649	1.23
WD-WM-021650	1.22
WD-WM-021653	0.01
WD-WM-021654	0
WD-WM-021655	0
WD-WM-021656	0.01
WD-WM-021657	0.01
WD-WM-021658	0
WD-WM-021659	0.01
WD-WM-021660	0
WD-WM-021661	0
WD-WM-021662	0
WD-WM-021673	0.47
WD-WM-021674	0.02
WD-WM-021675	0.45
WD-WM-021676	0.02
WD-WM-021677	0.16
WD-WM-021678	0.17
WD-WM-021679	0.16
WD-WM-021680	0.16
WD-WM-021681	0.11
WD-WM-021682	0.11
WD-WM-021683	0.11
WD-WM-021684	0
WD-WM-021685	0
WD-WM-021686	0.11
WD-WM-021687	0.1
WD-WM-021688	0.1
WD-WM-021689	0.1
WD-WM-021690	0.1
WD-WM-021691	0.1
WD-WM-021692	0.1
WD-WM-021693	0.09
WD-WM-021694	0.11
WD-WM-021695	0.11
WD-WM-021696	0.03
WD-WM-021697	0.08
WD-WM-021698	0.03
WD-WM-021699	0.03
WD-WM-021700	0.03
WD-WM-021701	0.03
WD-WM-021702	0.03
WD-WM-021703	0.03
WD-WM-021704	0.07
WD-WM-021705	0.07
WD-WM-021706	0.07
WD-WM-021707	0.02
WD-WM-021708	0.02
WD-WM-021709	0.17
WD-WM-021710	0.15
WD-WM-021711	0.14
WD-WM-021712	0.17
WD-WM-021713	0.17
WD-WM-021719(1)	0.12
WD-WM-021719(2)	0.12
WD-WM-021720	0
WD-WM-021722	0.12
WD-WM-021723	0
WD-WM-021724	0
WD-WM-021726	0
WD-WM-021728	0
WD-WM-021729	0.01
WD-WM-021731	0.01

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-021639	0
WD-WM-021640	0.01
WD-WM-021641	0.01
WD-WM-021642	0.01
WD-WM-021643	0.02
WD-WM-021644	0.02
WD-WM-021647	0.03
WD-WM-021648	0.02
WD-WM-021649	0.01
WD-WM-021650	0.01
WD-WM-021653	0.03
WD-WM-021654	0.01
WD-WM-021655	0.01
WD-WM-021656	0.02
WD-WM-021657	0.01
WD-WM-021658	0
WD-WM-021659	0.01
WD-WM-021660	0.01
WD-WM-021661	0.01
WD-WM-021662	0
WD-WM-021673	0.75
WD-WM-021674	0.06
WD-WM-021675	0.68
WD-WM-021676	0.06
WD-WM-021677	0.24
WD-WM-021678	0.29
WD-WM-021679	0.24
WD-WM-021680	0.24
WD-WM-021681	0.19
WD-WM-021682	0.18
WD-WM-021683	0.18
WD-WM-021684	0.01
WD-WM-021685	0
WD-WM-021686	0.17
WD-WM-021687	0.16
WD-WM-021688	0.16
WD-WM-021689	0.15
WD-WM-021690	0.15
WD-WM-021691	0.15
WD-WM-021692	0.14
WD-WM-021693	0.14
WD-WM-021694	0.19
WD-WM-021695	0.18
WD-WM-021696	0.07
WD-WM-021697	0.12
WD-WM-021698	0.06
WD-WM-021699	0.06
WD-WM-021700	0.05
WD-WM-021701	0.05
WD-WM-021702	0.05
WD-WM-021703	0.04
WD-WM-021704	0.11
WD-WM-021705	0.11
WD-WM-021706	0.1
WD-WM-021707	0.05
WD-WM-021708	0.06
WD-WM-021709	0.28
WD-WM-021710	0.22
WD-WM-021711	0.21
WD-WM-021712	0.28
WD-WM-021713	0.29
WD-WM-021719(1)	0.17
WD-WM-021719(2)	0.17
WD-WM-021720	0
WD-WM-021722	0.17
WD-WM-021723	0
WD-WM-021724	0.01
WD-WM-021726	0.01
WD-WM-021728	0.01
WD-WM-021729	0.01
WD-WM-021731	0.01

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-021639	0.01
WD-WM-021640	0.01
WD-WM-021641	0.02
WD-WM-021642	0.03
WD-WM-021643	0.03
WD-WM-021644	0.04
WD-WM-021647	0.03
WD-WM-021648	0.02
WD-WM-021649	0.02
WD-WM-021650	0.01
WD-WM-021653	0.04
WD-WM-021654	0.01
WD-WM-021655	0.01
WD-WM-021656	0.02
WD-WM-021657	0.02
WD-WM-021658	0
WD-WM-021659	0.02
WD-WM-021660	0.01
WD-WM-021661	0.01
WD-WM-021662	0
WD-WM-021673	1.66
WD-WM-021674	0.18
WD-WM-021675	1.47
WD-WM-021676	0.17
WD-WM-021677	0.52
WD-WM-021678	0.69
WD-WM-021679	0.52
WD-WM-021680	0.53
WD-WM-021681	0.41
WD-WM-021682	0.4
WD-WM-021683	0.39
WD-WM-021684	0.01
WD-WM-021685	0.01
WD-WM-021686	0.37
WD-WM-021687	0.37
WD-WM-021688	0.36
WD-WM-021689	0.35
WD-WM-021690	0.35
WD-WM-021691	0.34
WD-WM-021692	0.33
WD-WM-021693	0.33
WD-WM-021694	0.46
WD-WM-021695	0.46
WD-WM-021696	0.12
WD-WM-021697	0.33
WD-WM-021698	0.12
WD-WM-021699	0.11
WD-WM-021700	0.1
WD-WM-021701	0.1
WD-WM-021702	0.09
WD-WM-021703	0.08
WD-WM-021704	0.32
WD-WM-021705	0.32
WD-WM-021706	0.31
WD-WM-021707	0.14
WD-WM-021708	0.15
WD-WM-021709	0.67
WD-WM-021710	0.51
WD-WM-021711	0.5
WD-WM-021712	0.67
WD-WM-021713	0.68
WD-WM-021719(1)	0.16
WD-WM-021719(2)	0.16
WD-WM-021720	0
WD-WM-021722	0.16
WD-WM-021723	0
WD-WM-021724	0.01
WD-WM-021726	0.01
WD-WM-021728	0.01
WD-WM-021729	0.01
WD-WM-021731	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**
WD-WM-021732	0.01	WD-WM-021732	0.01	WD-WM-021732	0.01
WD-WM-021736	0	WD-WM-021736	0	WD-WM-021736	0
WD-WM-021795	0.01	WD-WM-021795	0.02	WD-WM-021795	0.03
WD-WM-021796	0.01	WD-WM-021796	0.02	WD-WM-021796	0.02
WD-WM-021797	0.01	WD-WM-021797	0.01	WD-WM-021797	0.02
WD-WM-021798	0.01	WD-WM-021798	0.01	WD-WM-021798	0.01
WD-WM-021799	0	WD-WM-021799	0	WD-WM-021799	0.01
WD-WM-021800	0.01	WD-WM-021800	0.01	WD-WM-021800	0.02
WD-WM-021801	0	WD-WM-021801	0	WD-WM-021801	0.01
WD-WM-021802	0	WD-WM-021802	0	WD-WM-021802	0.01
WD-WM-021803	0	WD-WM-021803	0.01	WD-WM-021803	0.01
WD-WM-021804	0	WD-WM-021804	0.01	WD-WM-021804	0.01
WD-WM-021805	0.01	WD-WM-021805	0.02	WD-WM-021805	0.03
WD-WM-021806	0	WD-WM-021806	0.01	WD-WM-021806	0.01
WD-WM-021807	0	WD-WM-021807	0.01	WD-WM-021807	0.01
WD-WM-021808	0	WD-WM-021808	0	WD-WM-021808	0
WD-WM-021809	0	WD-WM-021809	0.01	WD-WM-021809	0.01
WD-WM-021810	0	WD-WM-021810	0	WD-WM-021810	0
WD-WM-021811	0	WD-WM-021811	0	WD-WM-021811	0
WD-WM-021812	0.01	WD-WM-021812	0.01	WD-WM-021812	0.01
WD-WM-021813	0.02	WD-WM-021813	0.03	WD-WM-021813	0.05
WD-WM-021814	0	WD-WM-021814	0	WD-WM-021814	0
WD-WM-021815	0.01	WD-WM-021815	0.02	WD-WM-021815	0.02
WD-WM-021816	0.04	WD-WM-021816	0.07	WD-WM-021816	0.09
WD-WM-021817	0.01	WD-WM-021817	0.01	WD-WM-021817	0.01
WD-WM-021818	0.02	WD-WM-021818	0.04	WD-WM-021818	0.04
WD-WM-021819	0.01	WD-WM-021819	0.01	WD-WM-021819	0.01
WD-WM-021820	0.01	WD-WM-021820	0.03	WD-WM-021820	0.03
WD-WM-021821	0.01	WD-WM-021821	0.01	WD-WM-021821	0.01
WD-WM-021822	0.01	WD-WM-021822	0.02	WD-WM-021822	0.03
WD-WM-021823(1)(1)	0.06	WD-WM-021823(1)(1)	0.11	WD-WM-021823(1)(1)	0.13
WD-WM-021823(1)(2)	0.02	WD-WM-021823(1)(2)	0.05	WD-WM-021823(1)(2)	0.05
WD-WM-021823(2)	0.01	WD-WM-021823(2)	0.01	WD-WM-021823(2)	0.01
WD-WM-021824(1)	0.03	WD-WM-021824(1)	0.06	WD-WM-021824(1)	0.07
WD-WM-021824(2)	0.03	WD-WM-021824(2)	0.06	WD-WM-021824(2)	0.07
WD-WM-021825	0.07	WD-WM-021825	0.12	WD-WM-021825	0.14
WD-WM-021826	0.01	WD-WM-021826	0.01	WD-WM-021826	0.01
WD-WM-021827(1)	0.08	WD-WM-021827(1)	0.14	WD-WM-021827(1)	0.17
WD-WM-021827(2)	0.08	WD-WM-021827(2)	0.15	WD-WM-021827(2)	0.18
WD-WM-021828	0.01	WD-WM-021828	0.01	WD-WM-021828	0.01
WD-WM-021832	0	WD-WM-021832	0	WD-WM-021832	0
WD-WM-021852	0.09	WD-WM-021852	0.22	WD-WM-021852	0.23
WD-WM-021853	0.09	WD-WM-021853	0.22	WD-WM-021853	0.23
WD-WM-021854	0.09	WD-WM-021854	0.22	WD-WM-021854	0.23
WD-WM-021858	0.09	WD-WM-021858	0.22	WD-WM-021858	0.23
WD-WM-021915	0	WD-WM-021915	0	WD-WM-021915	0
WD-WM-021916	0	WD-WM-021916	0	WD-WM-021916	0
WD-WM-021917	0	WD-WM-021917	0	WD-WM-021917	0
WD-WM-021918	0	WD-WM-021918	0	WD-WM-021918	0
WD-WM-021919	0	WD-WM-021919	0	WD-WM-021919	0
WD-WM-021920	0	WD-WM-021920	0	WD-WM-021920	0
WD-WM-021921	0	WD-WM-021921	0	WD-WM-021921	0
WD-WM-021922	0	WD-WM-021922	0	WD-WM-021922	0
WD-WM-021923	0	WD-WM-021923	0	WD-WM-021923	0
WD-WM-021924	0	WD-WM-021924	0	WD-WM-021924	0
WD-WM-021925	0	WD-WM-021925	0	WD-WM-021925	0
WD-WM-021926	0	WD-WM-021926	0	WD-WM-021926	0
WD-WM-021927	0	WD-WM-021927	0	WD-WM-021927	0
WD-WM-021928	0	WD-WM-021928	0	WD-WM-021928	0
WD-WM-021941	0	WD-WM-021941	0	WD-WM-021941	0
WD-WM-021942	0	WD-WM-021942	0	WD-WM-021942	0
WD-WM-021945	0	WD-WM-021945	0	WD-WM-021945	0
WD-WM-021946	0	WD-WM-021946	0	WD-WM-021946	0
WD-WM-021949	0	WD-WM-021949	0	WD-WM-021949	0
WD-WM-021950	0	WD-WM-021950	0	WD-WM-021950	0
WD-WM-021953	0	WD-WM-021953	0	WD-WM-021953	0
WD-WM-021999	0.03	WD-WM-021999	0.01	WD-WM-021999	0
WD-WM-022016	0	WD-WM-022016	0	WD-WM-022016	0
WD-WM-022017	0	WD-WM-022017	0	WD-WM-022017	0
WD-WM-022018	0	WD-WM-022018	0	WD-WM-022018	0
WD-WM-022020	0	WD-WM-022020	0	WD-WM-022020	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-022021	0	WD-WM-022021	0	WD-WM-022021	0
WD-WM-022046	0	WD-WM-022046	0	WD-WM-022046	0
WD-WM-022048	0	WD-WM-022048	0	WD-WM-022048	0
WD-WM-022049	0	WD-WM-022049	0	WD-WM-022049	0
WD-WM-022143	0	WD-WM-022143	0	WD-WM-022143	0
WD-WM-022145	0	WD-WM-022145	0	WD-WM-022145	0
WD-WM-022182	0	WD-WM-022182	0	WD-WM-022182	0
WD-WM-022229	0	WD-WM-022229	0	WD-WM-022229	0
WD-WM-022230	0	WD-WM-022230	0	WD-WM-022230	0
WD-WM-022252	0	WD-WM-022252	0	WD-WM-022252	0
WD-WM-022253	0	WD-WM-022253	0	WD-WM-022253	0
WD-WM-022261	0	WD-WM-022261	0	WD-WM-022261	0
WD-WM-022262	0	WD-WM-022262	0	WD-WM-022262	0
WD-WM-022263	0	WD-WM-022263	0	WD-WM-022263	0
WD-WM-022324(1)(1)	0.01	WD-WM-022324(1)(1)	0.04	WD-WM-022324(1)(1)	0.02
WD-WM-022324(1)(2)	0.38	WD-WM-022324(1)(2)	0.23	WD-WM-022324(1)(2)	0.23
WD-WM-022324(2)	0	WD-WM-022324(2)	0	WD-WM-022324(2)	0
WD-WM-022344	0	WD-WM-022344	0	WD-WM-022344	0
WD-WM-022345	0.01	WD-WM-022345	0.02	WD-WM-022345	0.02
WD-WM-022346	0.01	WD-WM-022346	0.02	WD-WM-022346	0.02
WD-WM-022347	0.17	WD-WM-022347	0.3	WD-WM-022347	0.48
WD-WM-022348	0.18	WD-WM-022348	0.31	WD-WM-022348	0.49
WD-WM-022349	0.01	WD-WM-022349	0.01	WD-WM-022349	0.01
WD-WM-022350	0.01	WD-WM-022350	0.01	WD-WM-022350	0.01
WD-WM-022351	0.15	WD-WM-022351	0.25	WD-WM-022351	0.42
WD-WM-022352	0.07	WD-WM-022352	0.12	WD-WM-022352	0.2
WD-WM-022353	0.06	WD-WM-022353	0.1	WD-WM-022353	0.17
WD-WM-022354	0.06	WD-WM-022354	0.1	WD-WM-022354	0.17
WD-WM-022355	0.14	WD-WM-022355	0.24	WD-WM-022355	0.41
WD-WM-022356	0.07	WD-WM-022356	0.13	WD-WM-022356	0.21
WD-WM-022357	0.06	WD-WM-022357	0.11	WD-WM-022357	0.18
WD-WM-022358	0.03	WD-WM-022358	0.05	WD-WM-022358	0.09
WD-WM-022359	0.04	WD-WM-022359	0.06	WD-WM-022359	0.12
WD-WM-022360	0.02	WD-WM-022360	0.03	WD-WM-022360	0.06
WD-WM-022361	0.05	WD-WM-022361	0.08	WD-WM-022361	0.15
WD-WM-022362	0.05	WD-WM-022362	0.09	WD-WM-022362	0.15
WD-WM-022363	0	WD-WM-022363	0	WD-WM-022363	0.03
WD-WM-022364	0.01	WD-WM-022364	0.01	WD-WM-022364	0.04
WD-WM-022365	0.05	WD-WM-022365	0.09	WD-WM-022365	0.16
WD-WM-022366	0.04	WD-WM-022366	0.07	WD-WM-022366	0.11
WD-WM-022367	0.01	WD-WM-022367	0.02	WD-WM-022367	0.05
WD-WM-022368	0	WD-WM-022368	0.01	WD-WM-022368	0.02
WD-WM-022369	0.02	WD-WM-022369	0.04	WD-WM-022369	0.06
WD-WM-022370	0.02	WD-WM-022370	0.03	WD-WM-022370	0.06
WD-WM-022371	0.03	WD-WM-022371	0.06	WD-WM-022371	0.1
WD-WM-022372	0.01	WD-WM-022372	0.01	WD-WM-022372	0.01
WD-WM-022373	0.01	WD-WM-022373	0.02	WD-WM-022373	0.02
WD-WM-022374	0.01	WD-WM-022374	0.01	WD-WM-022374	0.03
WD-WM-022385	0	WD-WM-022385	0	WD-WM-022385	0
WD-WM-022389	0	WD-WM-022389	0	WD-WM-022389	0
WD-WM-022409	0.01	WD-WM-022409	0.03	WD-WM-022409	0.03
WD-WM-022410(1)	0.01	WD-WM-022410(1)	0.02	WD-WM-022410(1)	0.02
WD-WM-022410(2)	0	WD-WM-022410(2)	0.01	WD-WM-022410(2)	0.01
WD-WM-022411	0	WD-WM-022411	0.01	WD-WM-022411	0.01
WD-WM-022415	0	WD-WM-022415	0.12	WD-WM-022415	0.34
WD-WM-022416	0	WD-WM-022416	0.12	WD-WM-022416	0.34
WD-WM-022417	0	WD-WM-022417	0.12	WD-WM-022417	0.34
WD-WM-022418	0	WD-WM-022418	0.12	WD-WM-022418	0.34
WD-WM-022419	0	WD-WM-022419	0.12	WD-WM-022419	0.34
WD-WM-022420	0	WD-WM-022420	0.12	WD-WM-022420	0.34
WD-WM-022421	0	WD-WM-022421	0.12	WD-WM-022421	0.34
WD-WM-022422	0	WD-WM-022422	0.12	WD-WM-022422	0.34
WD-WM-022425	0	WD-WM-022425	0	WD-WM-022425	0
WD-WM-022426	0	WD-WM-022426	0	WD-WM-022426	0
WD-WM-022427	0	WD-WM-022427	0	WD-WM-022427	0
WD-WM-022435	0	WD-WM-022435	0.01	WD-WM-022435	0.01
WD-WM-022436	0	WD-WM-022436	0.06	WD-WM-022436	0.21
WD-WM-022437	0	WD-WM-022437	0.01	WD-WM-022437	0
WD-WM-022438	0	WD-WM-022438	0.06	WD-WM-022438	0.22
WD-WM-022439	0	WD-WM-022439	0.06	WD-WM-022439	0.23
WD-WM-022440	0	WD-WM-022440	0.01	WD-WM-022440	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-022441	0	WD-WM-022441	0.06	WD-WM-022441	0.23
WD-WM-022442	0	WD-WM-022442	0.03	WD-WM-022442	0.02
WD-WM-022443	0	WD-WM-022443	0.06	WD-WM-022443	0.22
WD-WM-022444	0	WD-WM-022444	0.05	WD-WM-022444	0.2
WD-WM-022445	0	WD-WM-022445	0.05	WD-WM-022445	0.2
WD-WM-022446	0	WD-WM-022446	0	WD-WM-022446	0
WD-WM-022447	0	WD-WM-022447	0.11	WD-WM-022447	0.28
WD-WM-022448	0	WD-WM-022448	0.05	WD-WM-022448	0.2
WD-WM-022449	0	WD-WM-022449	0.07	WD-WM-022449	0.24
WD-WM-022450	0	WD-WM-022450	0.01	WD-WM-022450	0.01
WD-WM-022451	0	WD-WM-022451	0.06	WD-WM-022451	0.23
WD-WM-022452	0	WD-WM-022452	0	WD-WM-022452	0
WD-WM-022453	0	WD-WM-022453	0	WD-WM-022453	0
WD-WM-022454	0	WD-WM-022454	0	WD-WM-022454	0
WD-WM-022455	0	WD-WM-022455	0	WD-WM-022455	0
WD-WM-022456	0	WD-WM-022456	0	WD-WM-022456	0
WD-WM-022457	0	WD-WM-022457	0	WD-WM-022457	0
WD-WM-022458	0	WD-WM-022458	0	WD-WM-022458	0
WD-WM-022459	0	WD-WM-022459	0	WD-WM-022459	0
WD-WM-022511	0.05	WD-WM-022511	0.07	WD-WM-022511	0.09
WD-WM-022512	0.05	WD-WM-022512	0.07	WD-WM-022512	0.08
WD-WM-022513	0.05	WD-WM-022513	0.07	WD-WM-022513	0.09
WD-WM-022514	0	WD-WM-022514	0	WD-WM-022514	0
WD-WM-022515(1)	0.01	WD-WM-022515(1)	0.02	WD-WM-022515(1)	0.02
WD-WM-022515(2)	0	WD-WM-022515(2)	0	WD-WM-022515(2)	0
WD-WM-022516	0	WD-WM-022516	0	WD-WM-022516	0
WD-WM-022517	0	WD-WM-022517	0	WD-WM-022517	0
WD-WM-022518	0.02	WD-WM-022518	0.05	WD-WM-022518	0.07
WD-WM-022519	0.02	WD-WM-022519	0.04	WD-WM-022519	0.06
WD-WM-022520	0	WD-WM-022520	0	WD-WM-022520	0
WD-WM-022521	0.01	WD-WM-022521	0.03	WD-WM-022521	0.06
WD-WM-022522	0	WD-WM-022522	0	WD-WM-022522	0
WD-WM-022523	0	WD-WM-022523	0.05	WD-WM-022523	0.18
WD-WM-022524	0	WD-WM-022524	0.05	WD-WM-022524	0.18
WD-WM-022525	0	WD-WM-022525	0.05	WD-WM-022525	0.18
WD-WM-022526	0	WD-WM-022526	0.05	WD-WM-022526	0.18
WD-WM-022527	0	WD-WM-022527	0.03	WD-WM-022527	0.02
WD-WM-022528	0	WD-WM-022528	0.06	WD-WM-022528	0.14
WD-WM-022529	0	WD-WM-022529	0.03	WD-WM-022529	0.02
WD-WM-022530	0	WD-WM-022530	0.09	WD-WM-022530	0.13
WD-WM-022534	0	WD-WM-022534	0.03	WD-WM-022534	0.08
WD-WM-022535	0	WD-WM-022535	0.03	WD-WM-022535	0.08
WD-WM-022536	0	WD-WM-022536	0.03	WD-WM-022536	0.08
WD-WM-022537	0	WD-WM-022537	0	WD-WM-022537	0
WD-WM-022538	0	WD-WM-022538	0	WD-WM-022538	0
WD-WM-022539	0	WD-WM-022539	0.03	WD-WM-022539	0.07
WD-WM-022540	0	WD-WM-022540	0	WD-WM-022540	0
WD-WM-022541	0	WD-WM-022541	0	WD-WM-022541	0
WD-WM-022542	0	WD-WM-022542	0.03	WD-WM-022542	0.07
WD-WM-022543	0	WD-WM-022543	0.06	WD-WM-022543	0.17
WD-WM-022544	0	WD-WM-022544	0.09	WD-WM-022544	0.23
WD-WM-022545	0	WD-WM-022545	0.06	WD-WM-022545	0.17
WD-WM-022546	0	WD-WM-022546	0.06	WD-WM-022546	0.17
WD-WM-022547	0	WD-WM-022547	0.06	WD-WM-022547	0.17
WD-WM-022548	0	WD-WM-022548	0.06	WD-WM-022548	0.17
WD-WM-022549	0	WD-WM-022549	0.06	WD-WM-022549	0.17
WD-WM-022550	0	WD-WM-022550	0.05	WD-WM-022550	0.1
WD-WM-022551	0	WD-WM-022551	0.05	WD-WM-022551	0.1
WD-WM-022552	0	WD-WM-022552	0	WD-WM-022552	0
WD-WM-022553	0	WD-WM-022553	0	WD-WM-022553	0
WD-WM-022554	0	WD-WM-022554	0	WD-WM-022554	0
WD-WM-022567(1)	0	WD-WM-022567(1)	0	WD-WM-022567(1)	0
WD-WM-022567(2)	0	WD-WM-022567(2)	0	WD-WM-022567(2)	0
WD-WM-022568	0	WD-WM-022568	0	WD-WM-022568	0
WD-WM-022571	0.01	WD-WM-022571	0.01	WD-WM-022571	0.02
WD-WM-022572	0.02	WD-WM-022572	0.04	WD-WM-022572	0.07
WD-WM-022573	0.01	WD-WM-022573	0.03	WD-WM-022573	0.05
WD-WM-022578	0	WD-WM-022578	0	WD-WM-022578	0
WD-WM-022579	0	WD-WM-022579	0	WD-WM-022579	0
WD-WM-022580	0	WD-WM-022580	0	WD-WM-022580	0
WD-WM-022581	0	WD-WM-022581	0	WD-WM-022581	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-022582	0
WD-WM-022583	0
WD-WM-022584	0
WD-WM-022585	0
WD-WM-022586	0
WD-WM-022587	0
WD-WM-022588	0
WD-WM-022589	0
WD-WM-022590	0
WD-WM-022591	0
WD-WM-022592	0
WD-WM-022593	0
WD-WM-022594	0
WD-WM-022597	0.74
WD-WM-022598(1)	0.82
WD-WM-022598(2)(1)	0
WD-WM-022598(2)(2)	0
WD-WM-022599	0.74
WD-WM-022600(1)	0.78
WD-WM-022600(2)	0.77
WD-WM-022601	0.77
WD-WM-022602	0.72
WD-WM-022603	0.75
WD-WM-022604	0
WD-WM-022605	0.73
WD-WM-022606	0.73
WD-WM-022607	0.74
WD-WM-022608	0.82
WD-WM-022609(1)	0.01
WD-WM-022609(2)	0
WD-WM-022610	0
WD-WM-022612	0.78
WD-WM-022614	0
WD-WM-022615	0.76
WD-WM-022616	0
WD-WM-022617	0.75
WD-WM-022620	0
WD-WM-022621	0
WD-WM-022622	0.18
WD-WM-022625	0.12
WD-WM-022626	0
WD-WM-022627	0.12
WD-WM-022628	0
WD-WM-022629	0
WD-WM-022630	0.11
WD-WM-022631	0.11
WD-WM-022632	0
WD-WM-022633	0.11
WD-WM-022634	0.11
WD-WM-022635	0.11
WD-WM-022636	0.11
WD-WM-022637	0.11
WD-WM-022638	0.11
WD-WM-022639	0.11
WD-WM-022640	0.11
WD-WM-022641	0
WD-WM-022644	0.11
WD-WM-022645	0.11
WD-WM-022646	0.11
WD-WM-022647	0.01
WD-WM-022648	0.01
WD-WM-022649	0
WD-WM-022650	0
WD-WM-022651	0
WD-WM-022652	0.01
WD-WM-022653	0.1
WD-WM-022654	0
WD-WM-022655	0.09
WD-WM-022656	0.09
WD-WM-022657(1)	0.02
WD-WM-022657(2)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-022582	0
WD-WM-022583	0
WD-WM-022584	0
WD-WM-022585	0
WD-WM-022586	0
WD-WM-022587	0
WD-WM-022588	0
WD-WM-022589	0
WD-WM-022590	0
WD-WM-022591	0
WD-WM-022592	0
WD-WM-022593	0
WD-WM-022594	0
WD-WM-022597	0.63
WD-WM-022598(1)	0.77
WD-WM-022598(2)(1)	0.01
WD-WM-022598(2)(2)	0.01
WD-WM-022599	0.64
WD-WM-022600(1)	0.7
WD-WM-022600(2)	0.69
WD-WM-022601	0.68
WD-WM-022602	0.61
WD-WM-022603	0.65
WD-WM-022604	0.01
WD-WM-022605	0.62
WD-WM-022606	0.62
WD-WM-022607	0.64
WD-WM-022608	0.77
WD-WM-022609(1)	0.01
WD-WM-022609(2)	0.01
WD-WM-022610	0.01
WD-WM-022612	0.71
WD-WM-022614	0.01
WD-WM-022615	0.66
WD-WM-022616	0.01
WD-WM-022617	0.66
WD-WM-022620	0.01
WD-WM-022621	0
WD-WM-022622	0.32
WD-WM-022625	0.33
WD-WM-022626	0
WD-WM-022627	0.33
WD-WM-022628	0
WD-WM-022629	0
WD-WM-022630	0.32
WD-WM-022631	0.32
WD-WM-022632	0
WD-WM-022633	0.32
WD-WM-022634	0.31
WD-WM-022635	0.31
WD-WM-022636	0.31
WD-WM-022637	0.31
WD-WM-022638	0.3
WD-WM-022639	0.3
WD-WM-022640	0.3
WD-WM-022641	0
WD-WM-022644	0.28
WD-WM-022645	0.28
WD-WM-022646	0.28
WD-WM-022647	0.03
WD-WM-022648	0.03
WD-WM-022649	0.01
WD-WM-022650	0.01
WD-WM-022651	0
WD-WM-022652	0.03
WD-WM-022653	0.27
WD-WM-022654	0.01
WD-WM-022655	0.22
WD-WM-022656	0.22
WD-WM-022657(1)	0.01
WD-WM-022657(2)	0.01

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-022582	0
WD-WM-022583	0
WD-WM-022584	0
WD-WM-022585	0
WD-WM-022586	0
WD-WM-022587	0
WD-WM-022588	0
WD-WM-022589	0
WD-WM-022590	0
WD-WM-022591	0
WD-WM-022592	0
WD-WM-022593	0
WD-WM-022594	0
WD-WM-022597	0.14
WD-WM-022598(1)	0.13
WD-WM-022598(2)(1)	0.01
WD-WM-022598(2)(2)	0.01
WD-WM-022599	0.12
WD-WM-022600(1)	0
WD-WM-022600(2)	0.01
WD-WM-022601	0.03
WD-WM-022602	0.18
WD-WM-022603	0.1
WD-WM-022604	0.01
WD-WM-022605	0.15
WD-WM-022606	0.16
WD-WM-022607	0.11
WD-WM-022608	0.14
WD-WM-022609(1)	0.02
WD-WM-022609(2)	0.01
WD-WM-022610	0.01
WD-WM-022612	0.02
WD-WM-022614	0.01
WD-WM-022615	0.07
WD-WM-022616	0.01
WD-WM-022617	0.08
WD-WM-022620	0.01
WD-WM-022621	0
WD-WM-022622	0.5
WD-WM-022625	0.54
WD-WM-022626	0.01
WD-WM-022627	0.53
WD-WM-022628	0.01
WD-WM-022629	0.01
WD-WM-022630	0.51
WD-WM-022631	0.49
WD-WM-022632	0
WD-WM-022633	0.49
WD-WM-022634	0.48
WD-WM-022635	0.47
WD-WM-022636	0.47
WD-WM-022637	0.46
WD-WM-022638	0.46
WD-WM-022639	0.45
WD-WM-022640	0.44
WD-WM-022641	0.01
WD-WM-022644	0.4
WD-WM-022645	0.39
WD-WM-022646	0.39
WD-WM-022647	0.08
WD-WM-022648	0.08
WD-WM-022649	0.03
WD-WM-022650	0.02
WD-WM-022651	0.01
WD-WM-022652	0.09
WD-WM-022653	0.38
WD-WM-022654	0.03
WD-WM-022655	0.26
WD-WM-022656	0.25
WD-WM-022657(1)	0.08
WD-WM-022657(2)	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-022658(1)	0.02	WD-WM-022658(1)	0.01	WD-WM-022658(1)	0.08
WD-WM-022658(2)	0	WD-WM-022658(2)	0.01	WD-WM-022658(2)	0.01
WD-WM-022659(1)	0.02	WD-WM-022659(1)	0.01	WD-WM-022659(1)	0.07
WD-WM-022659(2)	0.05	WD-WM-022659(2)	0.02	WD-WM-022659(2)	0.14
WD-WM-022660	0.09	WD-WM-022660	0.05	WD-WM-022660	0.23
WD-WM-022661(1)	0.05	WD-WM-022661(1)	0.03	WD-WM-022661(1)	0.13
WD-WM-022661(2)	0	WD-WM-022661(2)	0.01	WD-WM-022661(2)	0.01
WD-WM-022662(1)	0.09	WD-WM-022662(1)	0.05	WD-WM-022662(1)	0.22
WD-WM-022662(2)	0	WD-WM-022662(2)	0.01	WD-WM-022662(2)	0.01
WD-WM-022664(1)	0.02	WD-WM-022664(1)	0.02	WD-WM-022664(1)	0.11
WD-WM-022664(2)	0.04	WD-WM-022664(2)	0.03	WD-WM-022664(2)	0.17
WD-WM-022665	0	WD-WM-022665	0.01	WD-WM-022665	0.01
WD-WM-022666	0	WD-WM-022666	0.01	WD-WM-022666	0.01
WD-WM-022667	0	WD-WM-022667	0.01	WD-WM-022667	0.01
WD-WM-022668	0.09	WD-WM-022668	0.22	WD-WM-022668	0.24
WD-WM-022669	0.09	WD-WM-022669	0.22	WD-WM-022669	0.24
WD-WM-022672	0.09	WD-WM-022672	0.22	WD-WM-022672	0.23
WD-WM-022673	0	WD-WM-022673	0	WD-WM-022673	0
WD-WM-022674	0.09	WD-WM-022674	0.21	WD-WM-022674	0.22
WD-WM-022675	0	WD-WM-022675	0	WD-WM-022675	0.01
WD-WM-022676	0.09	WD-WM-022676	0.21	WD-WM-022676	0.23
WD-WM-022677	0.09	WD-WM-022677	0.21	WD-WM-022677	0.21
WD-WM-022678	0.09	WD-WM-022678	0.2	WD-WM-022678	0.21
WD-WM-022679	0.09	WD-WM-022679	0.2	WD-WM-022679	0.2
WD-WM-022680	0	WD-WM-022680	0	WD-WM-022680	0
WD-WM-022681	0.09	WD-WM-022681	0.2	WD-WM-022681	0.2
WD-WM-022682	0	WD-WM-022682	0	WD-WM-022682	0.01
WD-WM-022683	0.08	WD-WM-022683	0.19	WD-WM-022683	0.18
WD-WM-022684	0.08	WD-WM-022684	0.19	WD-WM-022684	0.18
WD-WM-022685	0.08	WD-WM-022685	0.19	WD-WM-022685	0.17
WD-WM-022686	0.08	WD-WM-022686	0.19	WD-WM-022686	0.17
WD-WM-022687	0.08	WD-WM-022687	0.18	WD-WM-022687	0.16
WD-WM-022688	0.01	WD-WM-022688	0.02	WD-WM-022688	0.04
WD-WM-022689	0.08	WD-WM-022689	0.16	WD-WM-022689	0.11
WD-WM-022690	0.08	WD-WM-022690	0.18	WD-WM-022690	0.16
WD-WM-022691	0.08	WD-WM-022691	0.16	WD-WM-022691	0.11
WD-WM-022692	0.07	WD-WM-022692	0.16	WD-WM-022692	0.11
WD-WM-022693	0.07	WD-WM-022693	0.16	WD-WM-022693	0.1
WD-WM-022694	0	WD-WM-022694	0	WD-WM-022694	0
WD-WM-022696	0.07	WD-WM-022696	0.15	WD-WM-022696	0.09
WD-WM-022697	0.07	WD-WM-022697	0.15	WD-WM-022697	0.09
WD-WM-022698	0.07	WD-WM-022698	0.15	WD-WM-022698	0.09
WD-WM-022699	0.07	WD-WM-022699	0.15	WD-WM-022699	0.09
WD-WM-022700	0.07	WD-WM-022700	0.14	WD-WM-022700	0.08
WD-WM-022701	0.07	WD-WM-022701	0.14	WD-WM-022701	0.08
WD-WM-022702	0.07	WD-WM-022702	0.14	WD-WM-022702	0.08
WD-WM-022703	0	WD-WM-022703	0	WD-WM-022703	0
WD-WM-022704	0.07	WD-WM-022704	0.14	WD-WM-022704	0.08
WD-WM-022705	0.07	WD-WM-022705	0.13	WD-WM-022705	0.08
WD-WM-022706	0.07	WD-WM-022706	0.13	WD-WM-022706	0.08
WD-WM-022707	0	WD-WM-022707	0	WD-WM-022707	0.01
WD-WM-022708	0.06	WD-WM-022708	0.12	WD-WM-022708	0.08
WD-WM-022709	0	WD-WM-022709	0.01	WD-WM-022709	0.01
WD-WM-022710	0.07	WD-WM-022710	0.13	WD-WM-022710	0.07
WD-WM-022711	0.06	WD-WM-022711	0.12	WD-WM-022711	0.08
WD-WM-022712	0.06	WD-WM-022712	0.12	WD-WM-022712	0.08
WD-WM-022713	0.06	WD-WM-022713	0.11	WD-WM-022713	0.08
WD-WM-022714	0.06	WD-WM-022714	0.11	WD-WM-022714	0.08
WD-WM-022715	0.06	WD-WM-022715	0.11	WD-WM-022715	0.08
WD-WM-022716	0.06	WD-WM-022716	0.11	WD-WM-022716	0.08
WD-WM-022717	0.06	WD-WM-022717	0.11	WD-WM-022717	0.08
WD-WM-022718	0.06	WD-WM-022718	0.11	WD-WM-022718	0.08
WD-WM-022719	0.06	WD-WM-022719	0.1	WD-WM-022719	0.08
WD-WM-022720	0.06	WD-WM-022720	0.1	WD-WM-022720	0.08
WD-WM-022721	0.06	WD-WM-022721	0.1	WD-WM-022721	0.09
WD-WM-022722	0.06	WD-WM-022722	0.1	WD-WM-022722	0.09
WD-WM-022723	0.06	WD-WM-022723	0.1	WD-WM-022723	0.09
WD-WM-022724	0	WD-WM-022724	0	WD-WM-022724	0.01
WD-WM-022725	0.06	WD-WM-022725	0.1	WD-WM-022725	0.09
WD-WM-022726	0.06	WD-WM-022726	0.08	WD-WM-022726	0.12
WD-WM-022727	0	WD-WM-022727	0	WD-WM-022727	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-022728	0.05	WD-WM-022728	0.08	WD-WM-022728	0.12
WD-WM-022729	0.05	WD-WM-022729	0.08	WD-WM-022729	0.12
WD-WM-022730	0.05	WD-WM-022730	0.08	WD-WM-022730	0.13
WD-WM-022731	0.05	WD-WM-022731	0.07	WD-WM-022731	0.13
WD-WM-022732	0.05	WD-WM-022732	0.06	WD-WM-022732	0.18
WD-WM-022733	0.05	WD-WM-022733	0.06	WD-WM-022733	0.18
WD-WM-022734	0.05	WD-WM-022734	0.06	WD-WM-022734	0.19
WD-WM-022735	0.05	WD-WM-022735	0.06	WD-WM-022735	0.19
WD-WM-022736	0	WD-WM-022736	0	WD-WM-022736	0.01
WD-WM-022737	0	WD-WM-022737	0	WD-WM-022737	0.01
WD-WM-022738	0.05	WD-WM-022738	0.05	WD-WM-022738	0.19
WD-WM-022739	0.05	WD-WM-022739	0.05	WD-WM-022739	0.2
WD-WM-022740	0	WD-WM-022740	0	WD-WM-022740	0.01
WD-WM-022742	0.05	WD-WM-022742	0.05	WD-WM-022742	0.21
WD-WM-022743	0.05	WD-WM-022743	0.05	WD-WM-022743	0.21
WD-WM-022744(1)	0.05	WD-WM-022744(1)	0.05	WD-WM-022744(1)	0.22
WD-WM-022744(2)	0.05	WD-WM-022744(2)	0.04	WD-WM-022744(2)	0.26
WD-WM-022745	0	WD-WM-022745	0	WD-WM-022745	0
WD-WM-022746	0	WD-WM-022746	0	WD-WM-022746	0.01
WD-WM-022748	0	WD-WM-022748	0.02	WD-WM-022748	0.04
WD-WM-022749	0	WD-WM-022749	0.01	WD-WM-022749	0.03
WD-WM-022750	0	WD-WM-022750	0	WD-WM-022750	0
WD-WM-022752	0	WD-WM-022752	0.01	WD-WM-022752	0.02
WD-WM-022753	0	WD-WM-022753	0.01	WD-WM-022753	0.02
WD-WM-022754	0	WD-WM-022754	0.01	WD-WM-022754	0.01
WD-WM-022755	0	WD-WM-022755	0	WD-WM-022755	0.01
WD-WM-022756	0	WD-WM-022756	0	WD-WM-022756	0
WD-WM-022757	0	WD-WM-022757	0	WD-WM-022757	0
WD-WM-022758	0	WD-WM-022758	0	WD-WM-022758	0.01
WD-WM-022759	0	WD-WM-022759	0.01	WD-WM-022759	0.01
WD-WM-022760	0	WD-WM-022760	0.01	WD-WM-022760	0.02
WD-WM-022761	0	WD-WM-022761	0.01	WD-WM-022761	0.02
WD-WM-022762	0	WD-WM-022762	0.01	WD-WM-022762	0.03
WD-WM-022763	0	WD-WM-022763	0.01	WD-WM-022763	0.03
WD-WM-022764	0	WD-WM-022764	0.02	WD-WM-022764	0.04
WD-WM-022765	0.01	WD-WM-022765	0.02	WD-WM-022765	0.04
WD-WM-022766	0.01	WD-WM-022766	0.02	WD-WM-022766	0.05
WD-WM-022767	0.01	WD-WM-022767	0.02	WD-WM-022767	0.05
WD-WM-022768	0.01	WD-WM-022768	0.02	WD-WM-022768	0.06
WD-WM-022769	0.01	WD-WM-022769	0.03	WD-WM-022769	0.06
WD-WM-022771	0	WD-WM-022771	0	WD-WM-022771	0
WD-WM-022772	0	WD-WM-022772	0	WD-WM-022772	0
WD-WM-022776	0	WD-WM-022776	0	WD-WM-022776	0.01
WD-WM-022778	0	WD-WM-022778	0	WD-WM-022778	0
WD-WM-022779	0	WD-WM-022779	0	WD-WM-022779	0
WD-WM-022780	0	WD-WM-022780	0	WD-WM-022780	0
WD-WM-022781	0.19	WD-WM-022781	0.34	WD-WM-022781	0.53
WD-WM-022800	0	WD-WM-022800	0	WD-WM-022800	0
WD-WM-022801	0	WD-WM-022801	0	WD-WM-022801	0
WD-WM-022802	0	WD-WM-022802	0	WD-WM-022802	0
WD-WM-022807	0	WD-WM-022807	0.04	WD-WM-022807	0.1
WD-WM-022808	0	WD-WM-022808	0.04	WD-WM-022808	0.1
WD-WM-022809	0	WD-WM-022809	0.04	WD-WM-022809	0.11
WD-WM-022810	0	WD-WM-022810	0.04	WD-WM-022810	0.08
WD-WM-022811	0	WD-WM-022811	0.04	WD-WM-022811	0.1
WD-WM-022812	0	WD-WM-022812	0.01	WD-WM-022812	0.02
WD-WM-022813	0	WD-WM-022813	0.04	WD-WM-022813	0.1
WD-WM-022814	0	WD-WM-022814	0.05	WD-WM-022814	0.12
WD-WM-022815	0	WD-WM-022815	0.04	WD-WM-022815	0.1
WD-WM-022816	0	WD-WM-022816	0.05	WD-WM-022816	0.1
WD-WM-022817	0	WD-WM-022817	0.01	WD-WM-022817	0.01
WD-WM-022818	0	WD-WM-022818	0.01	WD-WM-022818	0.01
WD-WM-022819	0	WD-WM-022819	0.05	WD-WM-022819	0.12
WD-WM-022820	0	WD-WM-022820	0.05	WD-WM-022820	0.12
WD-WM-022821	0	WD-WM-022821	0	WD-WM-022821	0
WD-WM-022822	0	WD-WM-022822	0	WD-WM-022822	0
WD-WM-022823	0	WD-WM-022823	0	WD-WM-022823	0
WD-WM-022824	0	WD-WM-022824	0.05	WD-WM-022824	0.12
WD-WM-022825	0	WD-WM-022825	0	WD-WM-022825	0
WD-WM-022826	0	WD-WM-022826	0	WD-WM-022826	0
WD-WM-022829	0	WD-WM-022829	0	WD-WM-022829	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-022830	0	WD-WM-022830	0.04	WD-WM-022830	0
WD-WM-022831	0	WD-WM-022831	0.04	WD-WM-022831	0
WD-WM-022832	0	WD-WM-022832	0.04	WD-WM-022832	0
WD-WM-022833	0	WD-WM-022833	0	WD-WM-022833	0
WD-WM-022834	0	WD-WM-022834	0	WD-WM-022834	0
WD-WM-022835	0	WD-WM-022835	0.04	WD-WM-022835	0
WD-WM-022836	0	WD-WM-022836	0.05	WD-WM-022836	0
WD-WM-022840	0	WD-WM-022840	0.04	WD-WM-022840	0
WD-WM-022841	0	WD-WM-022841	0	WD-WM-022841	0
WD-WM-022842	0	WD-WM-022842	0.02	WD-WM-022842	0
WD-WM-022843	0	WD-WM-022843	0.02	WD-WM-022843	0
WD-WM-022844	0	WD-WM-022844	0.04	WD-WM-022844	0
WD-WM-022845	0	WD-WM-022845	0.02	WD-WM-022845	0
WD-WM-022846	0	WD-WM-022846	0.01	WD-WM-022846	0
WD-WM-022847	0	WD-WM-022847	0.01	WD-WM-022847	0
WD-WM-022848	0	WD-WM-022848	0	WD-WM-022848	0
WD-WM-022849	0	WD-WM-022849	0	WD-WM-022849	0
WD-WM-022850	0	WD-WM-022850	0.01	WD-WM-022850	0
WD-WM-022851	0	WD-WM-022851	0	WD-WM-022851	0
WD-WM-022852	0	WD-WM-022852	0	WD-WM-022852	0
WD-WM-022853	0	WD-WM-022853	0.01	WD-WM-022853	0
WD-WM-022854	0	WD-WM-022854	0.01	WD-WM-022854	0
WD-WM-022855	0	WD-WM-022855	0.01	WD-WM-022855	0
WD-WM-022856	0	WD-WM-022856	0	WD-WM-022856	0
WD-WM-022857	0	WD-WM-022857	0	WD-WM-022857	0.01
WD-WM-022858	0	WD-WM-022858	0	WD-WM-022858	0.01
WD-WM-022859	0	WD-WM-022859	0	WD-WM-022859	0.01
WD-WM-022860	0	WD-WM-022860	0	WD-WM-022860	0.02
WD-WM-022861	0	WD-WM-022861	0	WD-WM-022861	0.01
WD-WM-022862	0	WD-WM-022862	0	WD-WM-022862	0.03
WD-WM-022863	0	WD-WM-022863	0	WD-WM-022863	0
WD-WM-022864	0	WD-WM-022864	0	WD-WM-022864	0
WD-WM-022865	0	WD-WM-022865	0	WD-WM-022865	0.04
WD-WM-022866	0	WD-WM-022866	0	WD-WM-022866	0.01
WD-WM-022867	0	WD-WM-022867	0	WD-WM-022867	0.03
WD-WM-022868	0	WD-WM-022868	0	WD-WM-022868	0.01
WD-WM-022869	0	WD-WM-022869	0	WD-WM-022869	0.02
WD-WM-022870	0	WD-WM-022870	0	WD-WM-022870	0.01
WD-WM-022871	0	WD-WM-022871	0	WD-WM-022871	0.01
WD-WM-022872	0	WD-WM-022872	0	WD-WM-022872	0
WD-WM-022873	0	WD-WM-022873	0	WD-WM-022873	0.07
WD-WM-022874	0	WD-WM-022874	0	WD-WM-022874	0
WD-WM-022875	0	WD-WM-022875	0	WD-WM-022875	0
WD-WM-022876	0	WD-WM-022876	0	WD-WM-022876	0.08
WD-WM-022878	0	WD-WM-022878	0	WD-WM-022878	0.01
WD-WM-022879	0	WD-WM-022879	0	WD-WM-022879	0.06
WD-WM-022880	0	WD-WM-022880	0	WD-WM-022880	0.01
WD-WM-022881	0	WD-WM-022881	0	WD-WM-022881	0.01
WD-WM-022882	0	WD-WM-022882	0	WD-WM-022882	0.07
WD-WM-022883	0	WD-WM-022883	0	WD-WM-022883	0.01
WD-WM-022884	0	WD-WM-022884	0	WD-WM-022884	0.14
WD-WM-022885	0	WD-WM-022885	0	WD-WM-022885	0.12
WD-WM-022886	0	WD-WM-022886	0	WD-WM-022886	0.01
WD-WM-022887	0	WD-WM-022887	0	WD-WM-022887	0
WD-WM-022892	0	WD-WM-022892	0	WD-WM-022892	0.09
WD-WM-022893	0	WD-WM-022893	0	WD-WM-022893	0.25
WD-WM-022894	0	WD-WM-022894	0	WD-WM-022894	0.02
WD-WM-022895	0	WD-WM-022895	0	WD-WM-022895	0.14
WD-WM-022896	0	WD-WM-022896	0	WD-WM-022896	0.02
WD-WM-022897	0	WD-WM-022897	0	WD-WM-022897	0
WD-WM-022898	0	WD-WM-022898	0	WD-WM-022898	0
WD-WM-022899	0	WD-WM-022899	0	WD-WM-022899	0
WD-WM-022900	0	WD-WM-022900	0	WD-WM-022900	0
WD-WM-022901	0	WD-WM-022901	0	WD-WM-022901	0
WD-WM-022905	0	WD-WM-022905	0	WD-WM-022905	0
WD-WM-022906	0	WD-WM-022906	0	WD-WM-022906	0
WD-WM-022907	0	WD-WM-022907	0	WD-WM-022907	0
WD-WM-022908	0	WD-WM-022908	0	WD-WM-022908	0
WD-WM-022909	0	WD-WM-022909	0	WD-WM-022909	0
WD-WM-022910	0	WD-WM-022910	0	WD-WM-022910	0
WD-WM-022913	0	WD-WM-022913	0	WD-WM-022913	0.28

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-022914	0
WD-WM-022915	0
WD-WM-022916	0
WD-WM-022917	0
WD-WM-022919	0
WD-WM-022920	0
WD-WM-022921	0
WD-WM-022922	0
WD-WM-022923	0
WD-WM-022924	0
WD-WM-022925	0
WD-WM-022926	0
WD-WM-022931	0
WD-WM-022942	0
WD-WM-022943	0
WD-WM-022947	0
WD-WM-022948	0
WD-WM-022949	0
WD-WM-022951	0
WD-WM-022952	0
WD-WM-022955	0
WD-WM-022956	0
WD-WM-022957	0
WD-WM-022958	0
WD-WM-022959	0
WD-WM-022962	0
WD-WM-022965	0
WD-WM-022966	0
WD-WM-022967	0
WD-WM-022968	0
WD-WM-022969	0
WD-WM-022970	0
WD-WM-022971	0
WD-WM-022972	0
WD-WM-022973	0
WD-WM-022974	0
WD-WM-022975	0
WD-WM-022976	0
WD-WM-022977	0
WD-WM-022978	0
WD-WM-022979	0
WD-WM-022981	0
WD-WM-022982	0
WD-WM-022983	0
WD-WM-022984	0
WD-WM-022985	0
WD-WM-022986	0
WD-WM-022987	0
WD-WM-022988	0
WD-WM-022989	0
WD-WM-022990	0
WD-WM-022991	0
WD-WM-022992	0
WD-WM-022993	0
WD-WM-022994	0
WD-WM-022995	0
WD-WM-022996	0
WD-WM-023002	0
WD-WM-023013	0
WD-WM-023014	0
WD-WM-023015	0
WD-WM-023016	0
WD-WM-023017	0
WD-WM-023022	0
WD-WM-023023	0.07
WD-WM-023024	0.07
WD-WM-023025	0.07
WD-WM-023026	0.08
WD-WM-023027	0
WD-WM-023029	0.07
WD-WM-023030	0.15

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-022914	0
WD-WM-022915	0
WD-WM-022916	0
WD-WM-022917	0
WD-WM-022919	0
WD-WM-022920	0
WD-WM-022921	0
WD-WM-022922	0
WD-WM-022923	0
WD-WM-022924	0
WD-WM-022925	0
WD-WM-022926	0
WD-WM-022931	0
WD-WM-022942	0
WD-WM-022943	0
WD-WM-022947	0.01
WD-WM-022948	0.01
WD-WM-022949	0
WD-WM-022951	0
WD-WM-022952	0.01
WD-WM-022955	0
WD-WM-022956	0
WD-WM-022957	0
WD-WM-022958	0
WD-WM-022959	0
WD-WM-022962	(N/A)
WD-WM-022965	0.09
WD-WM-022966	0
WD-WM-022967	0.09
WD-WM-022968	0.09
WD-WM-022969	0.09
WD-WM-022970	0.09
WD-WM-022971	0.09
WD-WM-022972	0.09
WD-WM-022973	0
WD-WM-022974	0.09
WD-WM-022975	0.09
WD-WM-022976	0.09
WD-WM-022977	0.09
WD-WM-022978	0
WD-WM-022979	0.09
WD-WM-022981	0
WD-WM-022982	0.09
WD-WM-022983	0
WD-WM-022984	0.09
WD-WM-022985	0.09
WD-WM-022986	0.09
WD-WM-022987	0
WD-WM-022988	0
WD-WM-022989	0.09
WD-WM-022990	0.09
WD-WM-022991	0
WD-WM-022992	0.09
WD-WM-022993	0
WD-WM-022994	0.09
WD-WM-022995	0.09
WD-WM-022996	0
WD-WM-023002	0
WD-WM-023013	0
WD-WM-023014	0
WD-WM-023015	0
WD-WM-023016	0
WD-WM-023017	0
WD-WM-023022	0
WD-WM-023023	0.08
WD-WM-023024	0.08
WD-WM-023025	0.08
WD-WM-023026	0.07
WD-WM-023027	0
WD-WM-023029	0.08
WD-WM-023030	0.15

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-022914	0
WD-WM-022915	0.23
WD-WM-022916	0.05
WD-WM-022917	0.23
WD-WM-022919	0.06
WD-WM-022920	0.06
WD-WM-022921	0.06
WD-WM-022922	0.06
WD-WM-022923	0.06
WD-WM-022924	0.06
WD-WM-022925	0.06
WD-WM-022926	0.06
WD-WM-022931	0.01
WD-WM-022942	0
WD-WM-022943	0
WD-WM-022947	0.03
WD-WM-022948	0.02
WD-WM-022949	0.01
WD-WM-022951	0.01
WD-WM-022952	0.02
WD-WM-022955	0.01
WD-WM-022956	0.01
WD-WM-022957	0.01
WD-WM-022958	0.01
WD-WM-022959	0.01
WD-WM-022962	0
WD-WM-022965	0.3
WD-WM-022966	0
WD-WM-022967	0.3
WD-WM-022968	0.3
WD-WM-022969	0.3
WD-WM-022970	0.3
WD-WM-022971	0.3
WD-WM-022972	0.3
WD-WM-022973	0
WD-WM-022974	0.3
WD-WM-022975	0.3
WD-WM-022976	0.3
WD-WM-022977	0.3
WD-WM-022978	0
WD-WM-022979	0.3
WD-WM-022981	0
WD-WM-022982	0.3
WD-WM-022983	0
WD-WM-022984	0.3
WD-WM-022985	0.3
WD-WM-022986	0.3
WD-WM-022987	0
WD-WM-022988	0
WD-WM-022989	0.3
WD-WM-022990	0.3
WD-WM-022991	0
WD-WM-022992	0.3
WD-WM-022993	0
WD-WM-022994	0.3
WD-WM-022995	0.3
WD-WM-022996	0
WD-WM-023002	0
WD-WM-023013	0
WD-WM-023014	0
WD-WM-023015	0
WD-WM-023016	0
WD-WM-023017	0
WD-WM-023022	0.01
WD-WM-023023	0.14
WD-WM-023024	0.14
WD-WM-023025	0.13
WD-WM-023026	0.13
WD-WM-023027	0
WD-WM-023029	0.13
WD-WM-023030	0.25

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-023031	0.08
WD-WM-023032	0
WD-WM-023033	0
WD-WM-023034	0.15
WD-WM-023035	0.15
WD-WM-023036	0.11
WD-WM-023037	0.27
WD-WM-023038	0.27
WD-WM-023039	0.11
WD-WM-023040	0.11
WD-WM-023041	0.11
WD-WM-023046	0
WD-WM-023047	0
WD-WM-023049	0
WD-WM-023057	0
WD-WM-023059	0
WD-WM-023060	0
WD-WM-023063(1)	0
WD-WM-023063(2)	0
WD-WM-023064	0
WD-WM-023069	0
WD-WM-023073	0.47
WD-WM-023074	0.47
WD-WM-023075	0.16
WD-WM-023076	0.16
WD-WM-023078	0.16
WD-WM-023079	0.17
WD-WM-023080	0.17
WD-WM-023081	0.07
WD-WM-023082	0.07
WD-WM-023083	0.08
WD-WM-023084	0.08
WD-WM-023085	0.13
WD-WM-023086	0.14
WD-WM-023087	0.14
WD-WM-023088	0.15
WD-WM-023089	0.61
WD-WM-023090	0.62
WD-WM-023091	0.25
WD-WM-023092	0.25
WD-WM-023093	0.04
WD-WM-023094	0.04
WD-WM-023095	0.11
WD-WM-023096	0.11
WD-WM-023097	0.17
WD-WM-023098	0.2
WD-WM-023099	0.21
WD-WM-023100	0.2
WD-WM-023101	0.17
WD-WM-023102	0.17
WD-WM-023103	0.32
WD-WM-023104	0.16
WD-WM-023105	0.16
WD-WM-023106	0.17
WD-WM-023107	0.17
WD-WM-023108	0.18
WD-WM-023109	0.19
WD-WM-023110	0.18
WD-WM-023148	0
WD-WM-023149	0
WD-WM-023150	0
WD-WM-023151	0
WD-WM-023152	0
WD-WM-023153	0
WD-WM-023154	0
WD-WM-023156	0
WD-WM-023175	0.13
WD-WM-023176	0.12
WD-WM-023177	0.08
WD-WM-023178	0.07
WD-WM-023179	0.07

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-023031	0.07
WD-WM-023032	0
WD-WM-023033	0.01
WD-WM-023034	0.14
WD-WM-023035	0.14
WD-WM-023036	0.09
WD-WM-023037	0.1
WD-WM-023038	0.1
WD-WM-023039	0.09
WD-WM-023040	0.08
WD-WM-023041	0.08
WD-WM-023046	0
WD-WM-023047	0
WD-WM-023049	0
WD-WM-023057	0
WD-WM-023059	0
WD-WM-023060	0
WD-WM-023063(1)	0
WD-WM-023063(2)	0
WD-WM-023064	0
WD-WM-023069	0
WD-WM-023073	0.46
WD-WM-023074	0.47
WD-WM-023075	0.16
WD-WM-023076	0.17
WD-WM-023078	0.17
WD-WM-023079	0.18
WD-WM-023080	0.19
WD-WM-023081	0.08
WD-WM-023082	0.08
WD-WM-023083	0.09
WD-WM-023084	0.1
WD-WM-023085	0.15
WD-WM-023086	0.16
WD-WM-023087	0.17
WD-WM-023088	0.18
WD-WM-023089	0.75
WD-WM-023090	0.76
WD-WM-023091	0.31
WD-WM-023092	0.3
WD-WM-023093	0.04
WD-WM-023094	0.04
WD-WM-023095	0.13
WD-WM-023096	0.12
WD-WM-023097	0.19
WD-WM-023098	0.23
WD-WM-023099	0.24
WD-WM-023100	0.22
WD-WM-023101	0.18
WD-WM-023102	0.18
WD-WM-023103	0.32
WD-WM-023104	0.15
WD-WM-023105	0.16
WD-WM-023106	0.17
WD-WM-023107	0.18
WD-WM-023108	0.19
WD-WM-023109	0.21
WD-WM-023110	0.2
WD-WM-023148	0
WD-WM-023149	0
WD-WM-023150	0
WD-WM-023151	0
WD-WM-023152	0
WD-WM-023153	0
WD-WM-023154	0
WD-WM-023156	0
WD-WM-023175	0.18
WD-WM-023176	0.19
WD-WM-023177	0.12
WD-WM-023178	0.12
WD-WM-023179	0.12

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-023031	0.13
WD-WM-023032	0.01
WD-WM-023033	0.01
WD-WM-023034	0.25
WD-WM-023035	0.25
WD-WM-023036	0.02
WD-WM-023037	0.25
WD-WM-023038	0.25
WD-WM-023039	0.02
WD-WM-023040	0.02
WD-WM-023041	0.02
WD-WM-023046	0
WD-WM-023047	0
WD-WM-023049	0
WD-WM-023057	0
WD-WM-023059	0
WD-WM-023060	0
WD-WM-023063(1)	0
WD-WM-023063(2)	0
WD-WM-023064	0
WD-WM-023069	0
WD-WM-023073	0.12
WD-WM-023074	0.11
WD-WM-023075	0.03
WD-WM-023076	0.02
WD-WM-023078	0.02
WD-WM-023079	0.01
WD-WM-023080	0.02
WD-WM-023081	0.01
WD-WM-023082	0.01
WD-WM-023083	0.03
WD-WM-023084	0.04
WD-WM-023085	0.04
WD-WM-023086	0.06
WD-WM-023087	0.07
WD-WM-023088	0.09
WD-WM-023089	0.3
WD-WM-023090	0.31
WD-WM-023091	0.12
WD-WM-023092	0.1
WD-WM-023093	0.02
WD-WM-023094	0.01
WD-WM-023095	0.04
WD-WM-023096	0.03
WD-WM-023097	0.03
WD-WM-023098	0.07
WD-WM-023099	0.08
WD-WM-023100	0.05
WD-WM-023101	0.01
WD-WM-023102	0.01
WD-WM-023103	0.06
WD-WM-023104	0.05
WD-WM-023105	0.04
WD-WM-023106	0.02
WD-WM-023107	0.01
WD-WM-023108	0.01
WD-WM-023109	0.04
WD-WM-023110	0.02
WD-WM-023148	0
WD-WM-023149	0
WD-WM-023150	0
WD-WM-023151	0
WD-WM-023152	0
WD-WM-023153	0
WD-WM-023154	0
WD-WM-023156	0
WD-WM-023175	0.11
WD-WM-023176	0.12
WD-WM-023177	0.07
WD-WM-023178	0.08
WD-WM-023179	0.08

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**	**Pipe Label**	**Total Volume (MG)**
WD-WM-023180	0.07	WD-WM-023180	0.12	WD-WM-023180	0.08
WD-WM-023181	0.07	WD-WM-023181	0.12	WD-WM-023181	0.08
WD-WM-023182	0.07	WD-WM-023182	0.13	WD-WM-023182	0.1
WD-WM-023183	0.07	WD-WM-023183	0.13	WD-WM-023183	0.1
WD-WM-023184	0.06	WD-WM-023184	0.13	WD-WM-023184	0.11
WD-WM-023185	0.06	WD-WM-023185	0.13	WD-WM-023185	0.11
WD-WM-023186	0.1	WD-WM-023186	0.23	WD-WM-023186	0.2
WD-WM-023187	0.1	WD-WM-023187	0.23	WD-WM-023187	0.2
WD-WM-023188	0.1	WD-WM-023188	0.24	WD-WM-023188	0.2
WD-WM-023189	0	WD-WM-023189	0.01	WD-WM-023189	0.01
WD-WM-023190	0	WD-WM-023190	0	WD-WM-023190	0.01
WD-WM-023191	0	WD-WM-023191	0	WD-WM-023191	0
WD-WM-023192	0.04	WD-WM-023192	0.09	WD-WM-023192	0.08
WD-WM-023193	0.04	WD-WM-023193	0.09	WD-WM-023193	0.08
WD-WM-023194	0.04	WD-WM-023194	0.09	WD-WM-023194	0.07
WD-WM-023195	0.05	WD-WM-023195	0.09	WD-WM-023195	0.07
WD-WM-023196	0.04	WD-WM-023196	0.09	WD-WM-023196	0.07
WD-WM-023197	0	WD-WM-023197	0	WD-WM-023197	0
WD-WM-023198	0	WD-WM-023198	0	WD-WM-023198	0.01
WD-WM-023199	0	WD-WM-023199	0	WD-WM-023199	0.01
WD-WM-023200	0.05	WD-WM-023200	0.07	WD-WM-023200	0.04
WD-WM-023201	0.05	WD-WM-023201	0.07	WD-WM-023201	0.05
WD-WM-023202	0.05	WD-WM-023202	0.07	WD-WM-023202	0.05
WD-WM-023203	0.05	WD-WM-023203	0.08	WD-WM-023203	0.05
WD-WM-023204	0	WD-WM-023204	0.01	WD-WM-023204	0.01
WD-WM-023205	0.05	WD-WM-023205	0.08	WD-WM-023205	0.07
WD-WM-023207	0	WD-WM-023207	0	WD-WM-023207	0
WD-WM-023208	0	WD-WM-023208	0	WD-WM-023208	0
WD-WM-023209	0	WD-WM-023209	0	WD-WM-023209	0
WD-WM-023211	0	WD-WM-023211	0	WD-WM-023211	0
WD-WM-023212	0	WD-WM-023212	0	WD-WM-023212	0
WD-WM-023220	0	WD-WM-023220	0	WD-WM-023220	0
WD-WM-023221	0	WD-WM-023221	0	WD-WM-023221	0
WD-WM-023223	0.01	WD-WM-023223	0.01	WD-WM-023223	0.01
WD-WM-023224	0.01	WD-WM-023224	0.01	WD-WM-023224	0.01
WD-WM-023246	0	WD-WM-023246	0	WD-WM-023246	0
WD-WM-023247	0	WD-WM-023247	0	WD-WM-023247	0
WD-WM-023248	0	WD-WM-023248	0	WD-WM-023248	0
WD-WM-023249	0	WD-WM-023249	0	WD-WM-023249	0
WD-WM-023250	0	WD-WM-023250	0	WD-WM-023250	0
WD-WM-023251	0	WD-WM-023251	0	WD-WM-023251	0
WD-WM-023252	0	WD-WM-023252	0	WD-WM-023252	0
WD-WM-023253	0	WD-WM-023253	0	WD-WM-023253	0
WD-WM-023255	0	WD-WM-023255	0	WD-WM-023255	0
WD-WM-023256	0	WD-WM-023256	0	WD-WM-023256	0
WD-WM-023257	0	WD-WM-023257	0	WD-WM-023257	0
WD-WM-023258	0	WD-WM-023258	0	WD-WM-023258	0
WD-WM-023259	0	WD-WM-023259	0	WD-WM-023259	0
WD-WM-023260	0	WD-WM-023260	0	WD-WM-023260	0
WD-WM-023261	0	WD-WM-023261	0	WD-WM-023261	0
WD-WM-023262	0	WD-WM-023262	0	WD-WM-023262	0
WD-WM-023263	0	WD-WM-023263	0	WD-WM-023263	0
WD-WM-023264	0	WD-WM-023264	0	WD-WM-023264	0
WD-WM-023265	0	WD-WM-023265	0	WD-WM-023265	0
WD-WM-023266	0	WD-WM-023266	0	WD-WM-023266	0
WD-WM-023267	0	WD-WM-023267	0	WD-WM-023267	0
WD-WM-023268	0	WD-WM-023268	0	WD-WM-023268	0
WD-WM-023269	0	WD-WM-023269	0	WD-WM-023269	0
WD-WM-023281	0	WD-WM-023281	0	WD-WM-023281	0
WD-WM-023282	0	WD-WM-023282	0	WD-WM-023282	0
WD-WM-023283	0	WD-WM-023283	0	WD-WM-023283	0
WD-WM-023347	0	WD-WM-023347	0	WD-WM-023347	0.01
WD-WM-023349	0.31	WD-WM-023349	0.02	WD-WM-023349	0.15
WD-WM-023354	0.03	WD-WM-023354	0.06	WD-WM-023354	0.08
WD-WM-023355(1)	0.02	WD-WM-023355(1)	0.04	WD-WM-023355(1)	0.04
WD-WM-023355(2)	0.01	WD-WM-023355(2)	0.02	WD-WM-023355(2)	0.02
WD-WM-023356(1)	0	WD-WM-023356(1)	0.01	WD-WM-023356(1)	0.01
WD-WM-023356(2)	0.01	WD-WM-023356(2)	0.02	WD-WM-023356(2)	0.02
WD-WM-023357	0	WD-WM-023357	0.01	WD-WM-023357	0.01
WD-WM-023358	0.03	WD-WM-023358	0.06	WD-WM-023358	0.07
WD-WM-023359	0.03	WD-WM-023359	0.05	WD-WM-023359	0.07

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-023360	0.03
WD-WM-023361	0.03
WD-WM-023362	0.03
WD-WM-023363	0.01
WD-WM-023364	0.01
WD-WM-023365	0
WD-WM-023366	0
WD-WM-023367	0.03
WD-WM-023368	0.03
WD-WM-023370	0.03
WD-WM-023371	0.03
WD-WM-023372	0.02
WD-WM-023373	0.04
WD-WM-023374	0.04
WD-WM-023375	0.04
WD-WM-023376	0.04
WD-WM-023377	0.02
WD-WM-023386	0.02
WD-WM-023397	0.26
WD-WM-023398	0.26
WD-WM-023399	0.27
WD-WM-023400	0.27
WD-WM-023401	0.27
WD-WM-023402	0.27
WD-WM-023403	0.28
WD-WM-023404	0.28
WD-WM-023405	0.28
WD-WM-023406	0.28
WD-WM-023407	0.28
WD-WM-023408	0.29
WD-WM-023409	0.29
WD-WM-023410	0.29
WD-WM-023411	0.29
WD-WM-023412	0.3
WD-WM-023413	0.3
WD-WM-023414	0.3
WD-WM-023415	0.3
WD-WM-023416	0.31
WD-WM-023417	0.31
WD-WM-023437	0
WD-WM-023441	0
WD-WM-023453(1)	0.17
WD-WM-023453(2)	0.05
WD-WM-023454(1)(1)(1)	0
WD-WM-023454(1)(1)(2)	0.12
WD-WM-023454(1)(2)(1)	0.11
WD-WM-023454(1)(2)(2)	0.07
WD-WM-023454(2)(1)	0.07
WD-WM-023454(2)(2)	0.11
WD-WM-023455	0.02
WD-WM-023456	0.05
WD-WM-023457	0
WD-WM-023458	0.02
WD-WM-023459	0.05
WD-WM-023461	0
WD-WM-023462	0
WD-WM-023464	0
WD-WM-023465	0
WD-WM-023466	0
WD-WM-023467	0
WD-WM-023468	0
WD-WM-023469	0
WD-WM-023470	0
WD-WM-023471	0
WD-WM-023472	0
WD-WM-023473	0
WD-WM-023474	0
WD-WM-023475	0
WD-WM-023476	0
WD-WM-023477	0
WD-WM-023478	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-023360	0.05
WD-WM-023361	0.05
WD-WM-023362	0.05
WD-WM-023363	0.01
WD-WM-023364	0.01
WD-WM-023365	0.01
WD-WM-023366	0
WD-WM-023367	0.06
WD-WM-023368	0.06
WD-WM-023370	0.06
WD-WM-023371	0.05
WD-WM-023372	0.03
WD-WM-023373	0.08
WD-WM-023374	0.08
WD-WM-023375	0.07
WD-WM-023376	0.07
WD-WM-023377	0.03
WD-WM-023386	0.05
WD-WM-023397	0.13
WD-WM-023398	0.13
WD-WM-023399	0.12
WD-WM-023400	0.12
WD-WM-023401	0.11
WD-WM-023402	0.1
WD-WM-023403	0.1
WD-WM-023404	0.09
WD-WM-023405	0.09
WD-WM-023406	0.08
WD-WM-023407	0.08
WD-WM-023408	0.07
WD-WM-023409	0.07
WD-WM-023410	0.06
WD-WM-023411	0.06
WD-WM-023412	0.05
WD-WM-023413	0.05
WD-WM-023414	0.04
WD-WM-023415	0.03
WD-WM-023416	0.03
WD-WM-023417	0.02
WD-WM-023437	0
WD-WM-023441	0
WD-WM-023453(1)	0.58
WD-WM-023453(2)	0.2
WD-WM-023454(1)(1)(1)	0.01
WD-WM-023454(1)(1)(2)	0.37
WD-WM-023454(1)(2)(1)	0.23
WD-WM-023454(1)(2)(2)	0.14
WD-WM-023454(2)(1)	0.14
WD-WM-023454(2)(2)	0.23
WD-WM-023455	0.14
WD-WM-023456	0.1
WD-WM-023457	0
WD-WM-023458	0.14
WD-WM-023459	0.09
WD-WM-023461	0
WD-WM-023462	0
WD-WM-023464	0
WD-WM-023465	0
WD-WM-023466	0
WD-WM-023467	0
WD-WM-023468	0.01
WD-WM-023469	0
WD-WM-023470	0
WD-WM-023471	0.01
WD-WM-023472	0
WD-WM-023473	0
WD-WM-023474	0
WD-WM-023475	0
WD-WM-023476	0
WD-WM-023477	0
WD-WM-023478	0.01

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-023360	0.07
WD-WM-023361	0.06
WD-WM-023362	0.06
WD-WM-023363	0.02
WD-WM-023364	0.01
WD-WM-023365	0.01
WD-WM-023366	0
WD-WM-023367	0.08
WD-WM-023368	0.08
WD-WM-023370	0.07
WD-WM-023371	0.07
WD-WM-023372	0.04
WD-WM-023373	0.1
WD-WM-023374	0.1
WD-WM-023375	0.09
WD-WM-023376	0.09
WD-WM-023377	0.04
WD-WM-023386	0.05
WD-WM-023397	0.24
WD-WM-023398	0.21
WD-WM-023399	0.2
WD-WM-023400	0.19
WD-WM-023401	0.16
WD-WM-023402	0.15
WD-WM-023403	0.15
WD-WM-023404	0.12
WD-WM-023405	0.09
WD-WM-023406	0.08
WD-WM-023407	0.07
WD-WM-023408	0.06
WD-WM-023409	0.04
WD-WM-023410	0.02
WD-WM-023411	0.02
WD-WM-023412	0.02
WD-WM-023413	0.04
WD-WM-023414	0.05
WD-WM-023415	0.07
WD-WM-023416	0.1
WD-WM-023417	0.11
WD-WM-023437	0
WD-WM-023441	0
WD-WM-023453(1)	0.8
WD-WM-023453(2)	0.29
WD-WM-023454(1)(1)(1)	0.03
WD-WM-023454(1)(1)(2)	0.48
WD-WM-023454(1)(2)(1)	0.27
WD-WM-023454(1)(2)(2)	0.16
WD-WM-023454(2)(1)	0.16
WD-WM-023454(2)(2)	0.27
WD-WM-023455	0.21
WD-WM-023456	0.11
WD-WM-023457	0
WD-WM-023458	0.21
WD-WM-023459	0.11
WD-WM-023461	0
WD-WM-023462	0
WD-WM-023464	0
WD-WM-023465	0
WD-WM-023466	0
WD-WM-023467	0
WD-WM-023468	0.01
WD-WM-023469	0
WD-WM-023470	0
WD-WM-023471	0.01
WD-WM-023472	0
WD-WM-023473	0
WD-WM-023474	0
WD-WM-023475	0
WD-WM-023476	0
WD-WM-023477	0
WD-WM-023478	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-023479	0	WD-WM-023479	0.01	WD-WM-023479	0.01
WD-WM-023480	0	WD-WM-023480	0.01	WD-WM-023480	0.01
WD-WM-023481	0	WD-WM-023481	0.01	WD-WM-023481	0.01
WD-WM-023482	0	WD-WM-023482	0	WD-WM-023482	0
WD-WM-023484	0	WD-WM-023484	0	WD-WM-023484	0
WD-WM-023491	0	WD-WM-023491	0	WD-WM-023491	0
WD-WM-023497	0	WD-WM-023497	0	WD-WM-023497	0
WD-WM-023550	0.08	WD-WM-023550	0.11	WD-WM-023550	0.13
WD-WM-023551	0.08	WD-WM-023551	0.11	WD-WM-023551	0.13
WD-WM-023552	0.04	WD-WM-023552	0.06	WD-WM-023552	0.07
WD-WM-023555	0.08	WD-WM-023555	0.11	WD-WM-023555	0.13
WD-WM-023556	0.01	WD-WM-023556	0.02	WD-WM-023556	0.02
WD-WM-023558	0.01	WD-WM-023558	0.02	WD-WM-023558	0.02
WD-WM-023562	0	WD-WM-023562	0	WD-WM-023562	0
WD-WM-023568	0	WD-WM-023568	0	WD-WM-023568	0
WD-WM-023574	0	WD-WM-023574	0	WD-WM-023574	0
WD-WM-023575	0	WD-WM-023575	0	WD-WM-023575	0
WD-WM-023576	0.01	WD-WM-023576	0.02	WD-WM-023576	0.02
WD-WM-023582	0	WD-WM-023582	0	WD-WM-023582	0
WD-WM-023593	0	WD-WM-023593	0	WD-WM-023593	0
WD-WM-023607	0	WD-WM-023607	0	WD-WM-023607	0
WD-WM-023608	0	WD-WM-023608	0	WD-WM-023608	0
WD-WM-023609(1)	0	WD-WM-023609(1)	0	WD-WM-023609(1)	0
WD-WM-023609(2)	0	WD-WM-023609(2)	0	WD-WM-023609(2)	0
WD-WM-023610	0	WD-WM-023610	0	WD-WM-023610	0
WD-WM-023621(1)	0	WD-WM-023621(1)	0	WD-WM-023621(1)	0
WD-WM-023621(2)	0	WD-WM-023621(2)	0	WD-WM-023621(2)	0
WD-WM-023622	0	WD-WM-023622	0	WD-WM-023622	0
WD-WM-023640	0	WD-WM-023640	0	WD-WM-023640	0
WD-WM-023641	0	WD-WM-023641	0	WD-WM-023641	0
WD-WM-023644	0	WD-WM-023644	0	WD-WM-023644	0
WD-WM-023645	0	WD-WM-023645	0	WD-WM-023645	0
WD-WM-023646	0	WD-WM-023646	0	WD-WM-023646	0
WD-WM-023664(1)	0	WD-WM-023664(1)	0.01	WD-WM-023664(1)	0.01
WD-WM-023664(2)	0.01	WD-WM-023664(2)	0.02	WD-WM-023664(2)	0.02
WD-WM-023665	0	WD-WM-023665	0.01	WD-WM-023665	0.01
WD-WM-023678	0.11	WD-WM-023678	0.04	WD-WM-023678	0.09
WD-WM-023685	0	WD-WM-023685	0	WD-WM-023685	0
WD-WM-023688	0.01	WD-WM-023688	0	WD-WM-023688	0
WD-WM-023689	0	WD-WM-023689	0	WD-WM-023689	0
WD-WM-023722	0	WD-WM-023722	0	WD-WM-023722	0
WD-WM-023723	0	WD-WM-023723	0.01	WD-WM-023723	0.01
WD-WM-023724	0.01	WD-WM-023724	0.01	WD-WM-023724	0.01
WD-WM-023725	0.01	WD-WM-023725	0.01	WD-WM-023725	0.02
WD-WM-023726	0.01	WD-WM-023726	0.02	WD-WM-023726	0.02
WD-WM-023727	0.01	WD-WM-023727	0.02	WD-WM-023727	0.02
WD-WM-023728	0.01	WD-WM-023728	0.02	WD-WM-023728	0.03
WD-WM-023729	0.01	WD-WM-023729	0.02	WD-WM-023729	0.03
WD-WM-023730	0.02	WD-WM-023730	0.03	WD-WM-023730	0.04
WD-WM-023731	0	WD-WM-023731	0	WD-WM-023731	0
WD-WM-023732	0.02	WD-WM-023732	0.03	WD-WM-023732	0.04
WD-WM-023733	0.02	WD-WM-023733	0.04	WD-WM-023733	0.05
WD-WM-023734	0.02	WD-WM-023734	0.04	WD-WM-023734	0.05
WD-WM-023735	0.02	WD-WM-023735	0.04	WD-WM-023735	0.06
WD-WM-023736	0.03	WD-WM-023736	0.05	WD-WM-023736	0.06
WD-WM-023737	0.03	WD-WM-023737	0.05	WD-WM-023737	0.06
WD-WM-023738	0.08	WD-WM-023738	0.14	WD-WM-023738	0.18
WD-WM-023739	0.08	WD-WM-023739	0.14	WD-WM-023739	0.18
WD-WM-023740	0.05	WD-WM-023740	0.09	WD-WM-023740	0.11
WD-WM-023741	0.05	WD-WM-023741	0.08	WD-WM-023741	0.11
WD-WM-023742	0.03	WD-WM-023742	0.05	WD-WM-023742	0.06
WD-WM-023743	0.02	WD-WM-023743	0.04	WD-WM-023743	0.06
WD-WM-023744	0.02	WD-WM-023744	0.04	WD-WM-023744	0.05
WD-WM-023745	0	WD-WM-023745	0	WD-WM-023745	0
WD-WM-023746	0	WD-WM-023746	0.01	WD-WM-023746	0.01
WD-WM-023747	0.01	WD-WM-023747	0.01	WD-WM-023747	0.01
WD-WM-023748	0.01	WD-WM-023748	0.01	WD-WM-023748	0.02
WD-WM-023749	0.01	WD-WM-023749	0.03	WD-WM-023749	0.03
WD-WM-023750	0.01	WD-WM-023750	0.02	WD-WM-023750	0.03
WD-WM-023751	0	WD-WM-023751	0	WD-WM-023751	0
WD-WM-023752	0	WD-WM-023752	0.01	WD-WM-023752	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-023753	0.01	WD-WM-023753	0.01	WD-WM-023753	0.01
WD-WM-023754	0.01	WD-WM-023754	0.01	WD-WM-023754	0.01
WD-WM-023755	0	WD-WM-023755	0.01	WD-WM-023755	0.01
WD-WM-023756	0	WD-WM-023756	0	WD-WM-023756	0
WD-WM-023757	0	WD-WM-023757	0.01	WD-WM-023757	0.01
WD-WM-023758	0	WD-WM-023758	0	WD-WM-023758	0
WD-WM-023759	0.01	WD-WM-023759	0.01	WD-WM-023759	0.01
WD-WM-023760	0.01	WD-WM-023760	0.01	WD-WM-023760	0.01
WD-WM-023761	0.02	WD-WM-023761	0.03	WD-WM-023761	0.04
WD-WM-023762	0.02	WD-WM-023762	0.03	WD-WM-023762	0.04
WD-WM-023763	0.02	WD-WM-023763	0.03	WD-WM-023763	0.04
WD-WM-023764	0.01	WD-WM-023764	0.02	WD-WM-023764	0.03
WD-WM-023765	0.01	WD-WM-023765	0.02	WD-WM-023765	0.03
WD-WM-023766	0.01	WD-WM-023766	0.02	WD-WM-023766	0.02
WD-WM-023767	0.01	WD-WM-023767	0.02	WD-WM-023767	0.02
WD-WM-023768	0.01	WD-WM-023768	0.01	WD-WM-023768	0.02
WD-WM-023802	0.03	WD-WM-023802	0.17	WD-WM-023802	0.41
WD-WM-023803	0.03	WD-WM-023803	0.17	WD-WM-023803	0.4
WD-WM-023804	0.03	WD-WM-023804	0.16	WD-WM-023804	0.4
WD-WM-023805	0.03	WD-WM-023805	0.16	WD-WM-023805	0.4
WD-WM-023806	0.03	WD-WM-023806	0.16	WD-WM-023806	0.39
WD-WM-023807	0	WD-WM-023807	0	WD-WM-023807	0.01
WD-WM-023808	0	WD-WM-023808	0	WD-WM-023808	0
WD-WM-023809	0	WD-WM-023809	0.04	WD-WM-023809	0.09
WD-WM-023810	0	WD-WM-023810	0.04	WD-WM-023810	0.08
WD-WM-023811	0.02	WD-WM-023811	0.09	WD-WM-023811	0.23
WD-WM-023812	0.02	WD-WM-023812	0.09	WD-WM-023812	0.23
WD-WM-023813	0.02	WD-WM-023813	0.09	WD-WM-023813	0.23
WD-WM-023814	0.01	WD-WM-023814	0.05	WD-WM-023814	0.12
WD-WM-023815	0.01	WD-WM-023815	0.04	WD-WM-023815	0.11
WD-WM-023816	0.01	WD-WM-023816	0.04	WD-WM-023816	0.11
WD-WM-023817	0.01	WD-WM-023817	0.02	WD-WM-023817	0.06
WD-WM-023818	0	WD-WM-023818	0.02	WD-WM-023818	0.05
WD-WM-023819	0	WD-WM-023819	0.02	WD-WM-023819	0.04
WD-WM-023820	0	WD-WM-023820	0.01	WD-WM-023820	0.04
WD-WM-023821	0	WD-WM-023821	0.01	WD-WM-023821	0.03
WD-WM-023822	0	WD-WM-023822	0.01	WD-WM-023822	0.03
WD-WM-023823	0	WD-WM-023823	0.01	WD-WM-023823	0.03
WD-WM-023824	0	WD-WM-023824	0.01	WD-WM-023824	0.02
WD-WM-023825	0	WD-WM-023825	0.01	WD-WM-023825	0.02
WD-WM-023826	0	WD-WM-023826	0	WD-WM-023826	0.01
WD-WM-023827	0	WD-WM-023827	0	WD-WM-023827	0.01
WD-WM-023828	0	WD-WM-023828	0	WD-WM-023828	0
WD-WM-023829	0	WD-WM-023829	0	WD-WM-023829	0
WD-WM-023830	0	WD-WM-023830	0	WD-WM-023830	0
WD-WM-023831	0	WD-WM-023831	0	WD-WM-023831	0.01
WD-WM-023832	0	WD-WM-023832	0	WD-WM-023832	0.01
WD-WM-023833	0	WD-WM-023833	0.01	WD-WM-023833	0.02
WD-WM-023834	0.01	WD-WM-023834	0.02	WD-WM-023834	0.05
WD-WM-023835	0	WD-WM-023835	0.01	WD-WM-023835	0.02
WD-WM-023836	0	WD-WM-023836	0.01	WD-WM-023836	0.02
WD-WM-023837	0	WD-WM-023837	0.01	WD-WM-023837	0.03
WD-WM-023838	0	WD-WM-023838	0.01	WD-WM-023838	0.02
WD-WM-023839	0	WD-WM-023839	0.01	WD-WM-023839	0.02
WD-WM-023840	0	WD-WM-023840	0	WD-WM-023840	0.01
WD-WM-023841	0	WD-WM-023841	0	WD-WM-023841	0.01
WD-WM-023842	0	WD-WM-023842	0.01	WD-WM-023842	0.03
WD-WM-023843	0	WD-WM-023843	0.01	WD-WM-023843	0.02
WD-WM-023844	0	WD-WM-023844	0	WD-WM-023844	0.01
WD-WM-023845	0	WD-WM-023845	0	WD-WM-023845	0
WD-WM-023846	0	WD-WM-023846	0	WD-WM-023846	0.01
WD-WM-023847	0	WD-WM-023847	0	WD-WM-023847	0
WD-WM-023848	0	WD-WM-023848	0.01	WD-WM-023848	0.02
WD-WM-023849	0	WD-WM-023849	0.01	WD-WM-023849	0.03
WD-WM-023850	0	WD-WM-023850	0.01	WD-WM-023850	0.03
WD-WM-023851	0	WD-WM-023851	0	WD-WM-023851	0
WD-WM-023852	0	WD-WM-023852	0	WD-WM-023852	0
WD-WM-023853	0	WD-WM-023853	0	WD-WM-023853	0.01
WD-WM-023854	0	WD-WM-023854	0	WD-WM-023854	0.01
WD-WM-023855	0	WD-WM-023855	0	WD-WM-023855	0.01
WD-WM-023856	0	WD-WM-023856	0	WD-WM-023856	0.01

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-023857	0	WD-WM-023857	0	WD-WM-023857	0
WD-WM-023858	0	WD-WM-023858	0.01	WD-WM-023858	0.03
WD-WM-023859	0	WD-WM-023859	0.01	WD-WM-023859	0.03
WD-WM-023860	0	WD-WM-023860	0.01	WD-WM-023860	0.04
WD-WM-023861	0	WD-WM-023861	0.02	WD-WM-023861	0.04
WD-WM-023862	0	WD-WM-023862	0.02	WD-WM-023862	0.04
WD-WM-023863	0.01	WD-WM-023863	0.04	WD-WM-023863	0.1
WD-WM-023864	0.01	WD-WM-023864	0.04	WD-WM-023864	0.1
WD-WM-023865	0.01	WD-WM-023865	0.02	WD-WM-023865	0.05
WD-WM-023866	0	WD-WM-023866	0.02	WD-WM-023866	0.05
WD-WM-023867	0	WD-WM-023867	0.02	WD-WM-023867	0.04
WD-WM-023868	0	WD-WM-023868	0.02	WD-WM-023868	0.04
WD-WM-023869	0	WD-WM-023869	0.01	WD-WM-023869	0.04
WD-WM-023871	0	WD-WM-023871	0	WD-WM-023871	0
WD-WM-023872	0	WD-WM-023872	0	WD-WM-023872	0
WD-WM-023873	0	WD-WM-023873	0	WD-WM-023873	0
WD-WM-023874	0	WD-WM-023874	0	WD-WM-023874	0
WD-WM-023875	0	WD-WM-023875	0	WD-WM-023875	0
WD-WM-023876	0	WD-WM-023876	0	WD-WM-023876	0
WD-WM-023878	0	WD-WM-023878	0	WD-WM-023878	0
WD-WM-023879	0	WD-WM-023879	0	WD-WM-023879	0
WD-WM-023880	0	WD-WM-023880	0	WD-WM-023880	0
WD-WM-023882	0.08	WD-WM-023882	0.18	WD-WM-023882	0.28
WD-WM-023883	0	WD-WM-023883	0.01	WD-WM-023883	0.01
WD-WM-023884	0.08	WD-WM-023884	0.17	WD-WM-023884	0.27
WD-WM-023885	0.04	WD-WM-023885	0.08	WD-WM-023885	0.13
WD-WM-023886	0.03	WD-WM-023886	0.07	WD-WM-023886	0.12
WD-WM-023887	0.03	WD-WM-023887	0.07	WD-WM-023887	0.1
WD-WM-023888	0.03	WD-WM-023888	0.06	WD-WM-023888	0.09
WD-WM-023889	0.02	WD-WM-023889	0.05	WD-WM-023889	0.08
WD-WM-023890	0.02	WD-WM-023890	0.04	WD-WM-023890	0.07
WD-WM-023891	0.02	WD-WM-023891	0.04	WD-WM-023891	0.06
WD-WM-023892	0.01	WD-WM-023892	0.03	WD-WM-023892	0.05
WD-WM-023893	0.01	WD-WM-023893	0.02	WD-WM-023893	0.03
WD-WM-023894	0.01	WD-WM-023894	0.01	WD-WM-023894	0.02
WD-WM-023895	0	WD-WM-023895	0.01	WD-WM-023895	0.01
WD-WM-023897	0	WD-WM-023897	0.01	WD-WM-023897	0.01
WD-WM-023898	0.01	WD-WM-023898	0.01	WD-WM-023898	0.02
WD-WM-023899	0.01	WD-WM-023899	0.02	WD-WM-023899	0.03
WD-WM-023900	0.01	WD-WM-023900	0.03	WD-WM-023900	0.05
WD-WM-023901	0.02	WD-WM-023901	0.04	WD-WM-023901	0.06
WD-WM-023902	0.03	WD-WM-023902	0.07	WD-WM-023902	0.12
WD-WM-023903	0.03	WD-WM-023903	0.07	WD-WM-023903	0.1
WD-WM-023904	0.03	WD-WM-023904	0.06	WD-WM-023904	0.09
WD-WM-023905	0.01	WD-WM-023905	0.01	WD-WM-023905	0.02
WD-WM-023906	0	WD-WM-023906	0.01	WD-WM-023906	0.01
WD-WM-023931	0.09	WD-WM-023931	0.21	WD-WM-023931	0.29
WD-WM-023932	0.04	WD-WM-023932	0.09	WD-WM-023932	0.13
WD-WM-023933	0.03	WD-WM-023933	0.08	WD-WM-023933	0.11
WD-WM-023934	0.03	WD-WM-023934	0.07	WD-WM-023934	0.1
WD-WM-023935	0.02	WD-WM-023935	0.07	WD-WM-023935	0.09
WD-WM-023936	0.01	WD-WM-023936	0.02	WD-WM-023936	0.03
WD-WM-023937	0	WD-WM-023937	0.02	WD-WM-023937	0.02
WD-WM-023938	0.02	WD-WM-023938	0.05	WD-WM-023938	0.06
WD-WM-023939	0.02	WD-WM-023939	0.06	WD-WM-023939	0.07
WD-WM-023940	0	WD-WM-023940	0.01	WD-WM-023940	0.01
WD-WM-023941	0.01	WD-WM-023941	0.03	WD-WM-023941	0.03
WD-WM-023942	0.02	WD-WM-023942	0.02	WD-WM-023942	0.05
WD-WM-023943	0.01	WD-WM-023943	0.01	WD-WM-023943	0.02
WD-WM-023944	0.02	WD-WM-023944	0.02	WD-WM-023944	0.04
WD-WM-023945	0	WD-WM-023945	0.02	WD-WM-023945	0.02
WD-WM-023946	0	WD-WM-023946	0.01	WD-WM-023946	0.01
WD-WM-023947	0	WD-WM-023947	0.01	WD-WM-023947	0.01
WD-WM-023948	0.04	WD-WM-023948	0.1	WD-WM-023948	0.14
WD-WM-023949	0.08	WD-WM-023949	0.2	WD-WM-023949	0.28
WD-WM-023950	0.04	WD-WM-023950	0.09	WD-WM-023950	0.13
WD-WM-023951	0.03	WD-WM-023951	0.08	WD-WM-023951	0.12
WD-WM-023952	0.03	WD-WM-023952	0.08	WD-WM-023952	0.1
WD-WM-023953	0.03	WD-WM-023953	0.07	WD-WM-023953	0.09
WD-WM-023954	0.02	WD-WM-023954	0.06	WD-WM-023954	0.08
WD-WM-023955	0.02	WD-WM-023955	0.05	WD-WM-023955	0.06

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-023956	0	WD-WM-023956	0.01	WD-WM-023956	0.01
WD-WM-023957	0.01	WD-WM-023957	0.04	WD-WM-023957	0.03
WD-WM-023958	0.01	WD-WM-023958	0.04	WD-WM-023958	0.05
WD-WM-023959	0.01	WD-WM-023959	0.02	WD-WM-023959	0.02
WD-WM-023960	0	WD-WM-023960	0	WD-WM-023960	0
WD-WM-023961	0	WD-WM-023961	0	WD-WM-023961	0
WD-WM-023962	0	WD-WM-023962	0	WD-WM-023962	0
WD-WM-023963	0	WD-WM-023963	0	WD-WM-023963	0
WD-WM-023964	0	WD-WM-023964	0	WD-WM-023964	0
WD-WM-023965	0	WD-WM-023965	0	WD-WM-023965	0
WD-WM-023966	0	WD-WM-023966	0	WD-WM-023966	0
WD-WM-023967	0	WD-WM-023967	0	WD-WM-023967	0
WD-WM-023968	0	WD-WM-023968	0	WD-WM-023968	0
WD-WM-023969	0	WD-WM-023969	0	WD-WM-023969	0
WD-WM-023970	0	WD-WM-023970	0	WD-WM-023970	0
WD-WM-023971	0	WD-WM-023971	0	WD-WM-023971	0
WD-WM-023972	0	WD-WM-023972	0	WD-WM-023972	0
WD-WM-023973	0	WD-WM-023973	0	WD-WM-023973	0
WD-WM-023974	0	WD-WM-023974	0	WD-WM-023974	0
WD-WM-023975	0	WD-WM-023975	0	WD-WM-023975	0
WD-WM-023976	0	WD-WM-023976	0	WD-WM-023976	0
WD-WM-023977	0	WD-WM-023977	0	WD-WM-023977	0
WD-WM-023978	0	WD-WM-023978	0	WD-WM-023978	0
WD-WM-023979	0	WD-WM-023979	0	WD-WM-023979	0
WD-WM-023980	0	WD-WM-023980	0	WD-WM-023980	0
WD-WM-023981	0	WD-WM-023981	0	WD-WM-023981	0
WD-WM-023982	0	WD-WM-023982	0	WD-WM-023982	0
WD-WM-023983	0	WD-WM-023983	0	WD-WM-023983	0
WD-WM-023984	0	WD-WM-023984	0	WD-WM-023984	0
WD-WM-023985	0	WD-WM-023985	0	WD-WM-023985	0
WD-WM-023986	0	WD-WM-023986	0	WD-WM-023986	0
WD-WM-023987	0	WD-WM-023987	0	WD-WM-023987	0
WD-WM-023988	0	WD-WM-023988	0	WD-WM-023988	0
WD-WM-023989	0	WD-WM-023989	0	WD-WM-023989	0
WD-WM-023990	0	WD-WM-023990	0	WD-WM-023990	0
WD-WM-023993	0	WD-WM-023993	0	WD-WM-023993	0
WD-WM-023994	0	WD-WM-023994	0	WD-WM-023994	0
WD-WM-023995	0	WD-WM-023995	0	WD-WM-023995	0
WD-WM-023996	0	WD-WM-023996	0	WD-WM-023996	0
WD-WM-023997	0	WD-WM-023997	0	WD-WM-023997	0
WD-WM-023998	0	WD-WM-023998	0	WD-WM-023998	0
WD-WM-023999	0	WD-WM-023999	0	WD-WM-023999	0
WD-WM-024000	0.09	WD-WM-024000	0.17	WD-WM-024000	0.2
WD-WM-024001	0.12	WD-WM-024001	0.21	WD-WM-024001	0.25
WD-WM-024002	0.12	WD-WM-024002	0.22	WD-WM-024002	0.26
WD-WM-024003	0.16	WD-WM-024003	0.28	WD-WM-024003	0.33
WD-WM-024004	0.16	WD-WM-024004	0.29	WD-WM-024004	0.34
WD-WM-024005	0.16	WD-WM-024005	0.29	WD-WM-024005	0.34
WD-WM-024006	0.21	WD-WM-024006	0.38	WD-WM-024006	0.45
WD-WM-024007	0.22	WD-WM-024007	0.39	WD-WM-024007	0.46
WD-WM-024008	0.22	WD-WM-024008	0.39	WD-WM-024008	0.46
WD-WM-024011	0.05	WD-WM-024011	0.09	WD-WM-024011	0.1
WD-WM-024013	0.04	WD-WM-024013	0.08	WD-WM-024013	0.09
WD-WM-024014	0.04	WD-WM-024014	0.06	WD-WM-024014	0.08
WD-WM-024015	0.03	WD-WM-024015	0.05	WD-WM-024015	0.06
WD-WM-024016	0.02	WD-WM-024016	0.04	WD-WM-024016	0.05
WD-WM-024017	0.02	WD-WM-024017	0.03	WD-WM-024017	0.03
WD-WM-024018	0.01	WD-WM-024018	0.02	WD-WM-024018	0.02
WD-WM-024019	0	WD-WM-024019	0.01	WD-WM-024019	0.01
WD-WM-024021	0.03	WD-WM-024021	0.05	WD-WM-024021	0.06
WD-WM-024022	0.02	WD-WM-024022	0.04	WD-WM-024022	0.04
WD-WM-024023	0.01	WD-WM-024023	0.03	WD-WM-024023	0.03
WD-WM-024024	0.01	WD-WM-024024	0.01	WD-WM-024024	0.02
WD-WM-024025	0.01	WD-WM-024025	0.02	WD-WM-024025	0.03
WD-WM-024027	0.02	WD-WM-024027	0.03	WD-WM-024027	0.04
WD-WM-024028	0	WD-WM-024028	0	WD-WM-024028	0
WD-WM-024029	0.01	WD-WM-024029	0.01	WD-WM-024029	0.01
WD-WM-024036	0.07	WD-WM-024036	0.34	WD-WM-024036	0.49
WD-WM-024037	0.03	WD-WM-024037	0.06	WD-WM-024037	0.13
WD-WM-024038	0	WD-WM-024038	0.01	WD-WM-024038	0.04
WD-WM-024039	0.07	WD-WM-024039	0.33	WD-WM-024039	0.47

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-024040	0.03	WD-WM-024040	0.06	WD-WM-024040	0.13
WD-WM-024041	0.09	WD-WM-024041	0.26	WD-WM-024041	0.27
WD-WM-024042	0.09	WD-WM-024042	0.25	WD-WM-024042	0.25
WD-WM-024043	0.1	WD-WM-024043	0.25	WD-WM-024043	0.22
WD-WM-024044	0	WD-WM-024044	0	WD-WM-024044	0.01
WD-WM-024045	0.1	WD-WM-024045	0.24	WD-WM-024045	0.21
WD-WM-024046(1)	0.1	WD-WM-024046(1)	0.24	WD-WM-024046(1)	0.21
WD-WM-024046(2)	0	WD-WM-024046(2)	0	WD-WM-024046(2)	0
WD-WM-024047	0	WD-WM-024047	0	WD-WM-024047	0
WD-WM-024048	0	WD-WM-024048	0	WD-WM-024048	0.01
WD-WM-024049	0.02	WD-WM-024049	0.03	WD-WM-024049	0.06
WD-WM-024050	0.03	WD-WM-024050	0.05	WD-WM-024050	0.12
WD-WM-024051	0.01	WD-WM-024051	0.03	WD-WM-024051	0.05
WD-WM-024052	0.01	WD-WM-024052	0.02	WD-WM-024052	0.05
WD-WM-024053	0.01	WD-WM-024053	0.02	WD-WM-024053	0.04
WD-WM-024054	0.01	WD-WM-024054	0.02	WD-WM-024054	0.04
WD-WM-024055	0.01	WD-WM-024055	0.02	WD-WM-024055	0.04
WD-WM-024056	0.01	WD-WM-024056	0.02	WD-WM-024056	0.04
WD-WM-024057	0.01	WD-WM-024057	0.01	WD-WM-024057	0.03
WD-WM-024058	0.01	WD-WM-024058	0.01	WD-WM-024058	0.03
WD-WM-024059	0	WD-WM-024059	0.01	WD-WM-024059	0.01
WD-WM-024060	0	WD-WM-024060	0.01	WD-WM-024060	0.01
WD-WM-024061	0	WD-WM-024061	0	WD-WM-024061	0.01
WD-WM-024062	0	WD-WM-024062	0	WD-WM-024062	0
WD-WM-024063	0	WD-WM-024063	0	WD-WM-024063	0
WD-WM-024064	0	WD-WM-024064	0	WD-WM-024064	0
WD-WM-024065	0	WD-WM-024065	0	WD-WM-024065	0
WD-WM-024066	0	WD-WM-024066	0.01	WD-WM-024066	0.01
WD-WM-024067	0	WD-WM-024067	0	WD-WM-024067	0
WD-WM-024068	0	WD-WM-024068	0	WD-WM-024068	0
WD-WM-024069	0	WD-WM-024069	0	WD-WM-024069	0
WD-WM-024070	0	WD-WM-024070	0	WD-WM-024070	0
WD-WM-024071	0	WD-WM-024071	0	WD-WM-024071	0.01
WD-WM-024072	0	WD-WM-024072	0.01	WD-WM-024072	0.01
WD-WM-024073	0	WD-WM-024073	0.01	WD-WM-024073	0.01
WD-WM-024074	0.01	WD-WM-024074	0.01	WD-WM-024074	0.02
WD-WM-024075	0.01	WD-WM-024075	0.02	WD-WM-024075	0.05
WD-WM-024076	0.01	WD-WM-024076	0.02	WD-WM-024076	0.05
WD-WM-024077	0.01	WD-WM-024077	0.02	WD-WM-024077	0.05
WD-WM-024078	0.01	WD-WM-024078	0.03	WD-WM-024078	0.05
WD-WM-024079	0.01	WD-WM-024079	0.01	WD-WM-024079	0.03
WD-WM-024086	0.01	WD-WM-024086	0.02	WD-WM-024086	0.02
WD-WM-024089	0	WD-WM-024089	0	WD-WM-024089	0
WD-WM-024091(1)	0.01	WD-WM-024091(1)	0.02	WD-WM-024091(1)	0.02
WD-WM-024091(2)	0	WD-WM-024091(2)	0	WD-WM-024091(2)	0
WD-WM-024092	0.01	WD-WM-024092	0.02	WD-WM-024092	0.02
WD-WM-024098	0.01	WD-WM-024098	0.02	WD-WM-024098	0.02
WD-WM-024099	0.01	WD-WM-024099	0.02	WD-WM-024099	0.02
WD-WM-024100	0.01	WD-WM-024100	0.02	WD-WM-024100	0.02
WD-WM-024101	0.01	WD-WM-024101	0.02	WD-WM-024101	0.02
WD-WM-024105	0	WD-WM-024105	0	WD-WM-024105	0
WD-WM-024106	0	WD-WM-024106	0	WD-WM-024106	0
WD-WM-024107	0	WD-WM-024107	0	WD-WM-024107	0
WD-WM-024108	0	WD-WM-024108	0	WD-WM-024108	0
WD-WM-024109	0	WD-WM-024109	0	WD-WM-024109	0
WD-WM-024110	0	WD-WM-024110	0	WD-WM-024110	0
WD-WM-024111	0	WD-WM-024111	0	WD-WM-024111	0
WD-WM-024112	0	WD-WM-024112	0	WD-WM-024112	0
WD-WM-024113	0	WD-WM-024113	0	WD-WM-024113	0
WD-WM-024114	0	WD-WM-024114	0	WD-WM-024114	0
WD-WM-024115	0	WD-WM-024115	0	WD-WM-024115	0
WD-WM-024116	0	WD-WM-024116	0	WD-WM-024116	0
WD-WM-024117	0	WD-WM-024117	0	WD-WM-024117	0
WD-WM-024118	0	WD-WM-024118	0	WD-WM-024118	0
WD-WM-024119	0.02	WD-WM-024119	0.18	WD-WM-024119	0.19
WD-WM-024120	0.02	WD-WM-024120	0.18	WD-WM-024120	0.19
WD-WM-024121	0.02	WD-WM-024121	0.18	WD-WM-024121	0.19
WD-WM-024122(1)	0.02	WD-WM-024122(1)	0.18	WD-WM-024122(1)	0.19
WD-WM-024122(2)	0	WD-WM-024122(2)	0	WD-WM-024122(2)	0
WD-WM-024123	0.02	WD-WM-024123	0.18	WD-WM-024123	0.19
WD-WM-024124	0.02	WD-WM-024124	0.18	WD-WM-024124	0.19

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-024125	0.02
WD-WM-024127	0.02
WD-WM-024128	0
WD-WM-024130	0
WD-WM-024131	0
WD-WM-024146	0.01
WD-WM-024147	0.01
WD-WM-024148	0.01
WD-WM-024149	0
WD-WM-024150	0
WD-WM-024151	0
WD-WM-024152	0
WD-WM-024153	0
WD-WM-024154	0
WD-WM-024155	0
WD-WM-024156	0
WD-WM-024157	0
WD-WM-024158	0
WD-WM-024159	0
WD-WM-024160	0
WD-WM-024161	0
WD-WM-024162	0
WD-WM-024163	0.02
WD-WM-024164	0.02
WD-WM-024165	0
WD-WM-024166	0.02
WD-WM-024167	0.02
WD-WM-024197	0.01
WD-WM-024199	0
WD-WM-024200	0
WD-WM-024201	0
WD-WM-024202	0
WD-WM-024203	0
WD-WM-024204	0
WD-WM-024205	0
WD-WM-024230	0
WD-WM-024231	0
WD-WM-024232	0
WD-WM-024233	0
WD-WM-024234	0
WD-WM-024235	0
WD-WM-024236	0
WD-WM-024237	0
WD-WM-024238	0
WD-WM-024239	0
WD-WM-024240	0
WD-WM-024241	0
WD-WM-024264	0.03
WD-WM-024265	0.03
WD-WM-024266	0
WD-WM-024267	0
WD-WM-024268	0
WD-WM-024275	0
WD-WM-024278(1)	0
WD-WM-024278(2)	0
WD-WM-024284	0
WD-WM-024285	0
WD-WM-024287	0
WD-WM-024308	0
WD-WM-024309	0
WD-WM-024310	0
WD-WM-024311	0
WD-WM-024312	0
WD-WM-024313	0
WD-WM-024314	0
WD-WM-024316	0
WD-WM-024317	0
WD-WM-024318	0
WD-WM-024319	0
WD-WM-024320	0
WD-WM-024321	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-024125	0.18
WD-WM-024127	0.18
WD-WM-024128	0
WD-WM-024130	0
WD-WM-024131	0
WD-WM-024146	0.03
WD-WM-024147	0.02
WD-WM-024148	0.02
WD-WM-024149	0.02
WD-WM-024150	0.02
WD-WM-024151	0.01
WD-WM-024152	0.01
WD-WM-024153	0.01
WD-WM-024154	0.01
WD-WM-024155	0
WD-WM-024156	0
WD-WM-024157	0
WD-WM-024158	0
WD-WM-024159	0.01
WD-WM-024160	0.01
WD-WM-024161	0.01
WD-WM-024162	0.01
WD-WM-024163	0.12
WD-WM-024164	0.12
WD-WM-024165	0.02
WD-WM-024166	0.14
WD-WM-024167	0.14
WD-WM-024197	0.06
WD-WM-024199	0.01
WD-WM-024200	0.01
WD-WM-024201	0.01
WD-WM-024202	0.01
WD-WM-024203	0.01
WD-WM-024204	0.01
WD-WM-024205	0.01
WD-WM-024230	0
WD-WM-024231	0
WD-WM-024232	0
WD-WM-024233	0
WD-WM-024234	0
WD-WM-024235	0
WD-WM-024236	0
WD-WM-024237	0
WD-WM-024238	0
WD-WM-024239	0
WD-WM-024240	0
WD-WM-024241	0
WD-WM-024264	0.05
WD-WM-024265	0.05
WD-WM-024266	0.01
WD-WM-024267	0
WD-WM-024268	0
WD-WM-024275	0
WD-WM-024278(1)	0
WD-WM-024278(2)	0
WD-WM-024284	0
WD-WM-024285	0
WD-WM-024287	0
WD-WM-024308	0
WD-WM-024309	0
WD-WM-024310	0
WD-WM-024311	0
WD-WM-024312	0
WD-WM-024313	0
WD-WM-024314	0
WD-WM-024316	0
WD-WM-024317	0
WD-WM-024318	0
WD-WM-024319	0
WD-WM-024320	0
WD-WM-024321	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-024125	0.19
WD-WM-024127	0.19
WD-WM-024128	0
WD-WM-024130	0
WD-WM-024131	0
WD-WM-024146	0.07
WD-WM-024147	0.06
WD-WM-024148	0.06
WD-WM-024149	0.05
WD-WM-024150	0.04
WD-WM-024151	0.04
WD-WM-024152	0.03
WD-WM-024153	0.03
WD-WM-024154	0.02
WD-WM-024155	0.01
WD-WM-024156	0.01
WD-WM-024157	0.01
WD-WM-024158	0.01
WD-WM-024159	0.02
WD-WM-024160	0.03
WD-WM-024161	0.03
WD-WM-024162	0.04
WD-WM-024163	0.28
WD-WM-024164	0.28
WD-WM-024165	0.04
WD-WM-024166	0.33
WD-WM-024167	0.34
WD-WM-024197	0.14
WD-WM-024199	0.09
WD-WM-024200	0.09
WD-WM-024201	0.09
WD-WM-024202	0.09
WD-WM-024203	0.09
WD-WM-024204	0.09
WD-WM-024205	0.09
WD-WM-024230	0
WD-WM-024231	0
WD-WM-024232	0
WD-WM-024233	0
WD-WM-024234	0
WD-WM-024235	0
WD-WM-024236	0
WD-WM-024237	0
WD-WM-024238	0
WD-WM-024239	0
WD-WM-024240	0
WD-WM-024241	0
WD-WM-024264	0.06
WD-WM-024265	0.06
WD-WM-024266	0.01
WD-WM-024267	0
WD-WM-024268	0
WD-WM-024275	0
WD-WM-024278(1)	0
WD-WM-024278(2)	0
WD-WM-024284	0
WD-WM-024285	0
WD-WM-024287	0
WD-WM-024308	0
WD-WM-024309	0
WD-WM-024310	0
WD-WM-024311	0
WD-WM-024312	0
WD-WM-024313	0
WD-WM-024314	0
WD-WM-024316	0
WD-WM-024317	0
WD-WM-024318	0
WD-WM-024319	0
WD-WM-024320	0
WD-WM-024321	0

EXISTING SYSTEM		2030 SYSTEM		2070 SYSTEM	
Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)	Pipe Label	Total Volume (MG)
WD-WM-024322	0	WD-WM-024322	0	WD-WM-024322	0
WD-WM-024323	0	WD-WM-024323	0	WD-WM-024323	0
WD-WM-024328	0	WD-WM-024328	0	WD-WM-024328	0
WD-WM-024336(1)	0.17	WD-WM-024336(1)	0.1	WD-WM-024336(1)	0.09
WD-WM-024336(2)	0	WD-WM-024336(2)	0	WD-WM-024336(2)	0
WD-WM-024472	0	WD-WM-024472	0	WD-WM-024472	0
WD-WM-024473	0	WD-WM-024473	0	WD-WM-024473	0
WD-WM-024481	0.09	WD-WM-024481	0	WD-WM-024481	0
WD-WM-024482	0.1	WD-WM-024482	0	WD-WM-024482	0.01
WD-WM-024483	0.1	WD-WM-024483	0.01	WD-WM-024483	0.01
WD-WM-024484	0.1	WD-WM-024484	0.01	WD-WM-024484	0.02
WD-WM-024485	0.1	WD-WM-024485	0.01	WD-WM-024485	0.03
WD-WM-024486	0.1	WD-WM-024486	0.02	WD-WM-024486	0.03
WD-WM-024537	0	WD-WM-024537	0	WD-WM-024537	0
WD-WM-024541	0	WD-WM-024541	0	WD-WM-024541	0
WD-WM-024542	0	WD-WM-024542	0	WD-WM-024542	0
WD-WM-024549	0	WD-WM-024549	0	WD-WM-024549	0
WD-WM-024553	0.02	WD-WM-024553	0.03	WD-WM-024553	0.04
WD-WM-024554	0.01	WD-WM-024554	0.01	WD-WM-024554	0.02
WD-WM-024555	0.01	WD-WM-024555	0.01	WD-WM-024555	0.01
WD-WM-024556	0	WD-WM-024556	0.01	WD-WM-024556	0.01
WD-WM-024557	0	WD-WM-024557	0.01	WD-WM-024557	0.01
WD-WM-024558	0	WD-WM-024558	0	WD-WM-024558	0
WD-WM-024559	0	WD-WM-024559	0	WD-WM-024559	0
WD-WM-024560	0	WD-WM-024560	0	WD-WM-024560	0
WD-WM-024561	0	WD-WM-024561	0	WD-WM-024561	0
WD-WM-024562	0.02	WD-WM-024562	0.03	WD-WM-024562	0.03
WD-WM-024563	0.01	WD-WM-024563	0.02	WD-WM-024563	0.03
WD-WM-024564	0.01	WD-WM-024564	0.01	WD-WM-024564	0.01
WD-WM-024565	0	WD-WM-024565	0.01	WD-WM-024565	0.01
WD-WM-024566	0	WD-WM-024566	0.01	WD-WM-024566	0.01
WD-WM-024567	0	WD-WM-024567	0.01	WD-WM-024567	0.01
WD-WM-024568	0.01	WD-WM-024568	0.01	WD-WM-024568	0.01
WD-WM-024569	0.01	WD-WM-024569	0.01	WD-WM-024569	0.02
WD-WM-024570	0.01	WD-WM-024570	0.02	WD-WM-024570	0.02
WD-WM-024571	0	WD-WM-024571	0	WD-WM-024571	0
WD-WM-024572	0	WD-WM-024572	0.01	WD-WM-024572	0.01
WD-WM-024573	0.01	WD-WM-024573	0.01	WD-WM-024573	0.01
WD-WM-024574	0.01	WD-WM-024574	0.01	WD-WM-024574	0.02
WD-WM-024575	0.01	WD-WM-024575	0.02	WD-WM-024575	0.03
WD-WM-024576	0.02	WD-WM-024576	0.04	WD-WM-024576	0.05
WD-WM-024577	0.02	WD-WM-024577	0.04	WD-WM-024577	0.05
WD-WM-024578	0	WD-WM-024578	0	WD-WM-024578	0
WD-WM-024579	0	WD-WM-024579	0.01	WD-WM-024579	0.01
WD-WM-024580	0.03	WD-WM-024580	0.05	WD-WM-024580	0.06
WD-WM-024581	0.03	WD-WM-024581	0.05	WD-WM-024581	0.07
WD-WM-024582	0.03	WD-WM-024582	0.06	WD-WM-024582	0.07
WD-WM-024583	0.03	WD-WM-024583	0.06	WD-WM-024583	0.07
WD-WM-024584	0.03	WD-WM-024584	0.06	WD-WM-024584	0.08
WD-WM-024585	0.04	WD-WM-024585	0.06	WD-WM-024585	0.08
WD-WM-024586	0.04	WD-WM-024586	0.07	WD-WM-024586	0.09
WD-WM-024587	0	WD-WM-024587	0	WD-WM-024587	0
WD-WM-024588	0	WD-WM-024588	0.01	WD-WM-024588	0.01
WD-WM-024589	0.01	WD-WM-024589	0.01	WD-WM-024589	0.01
WD-WM-024590	0	WD-WM-024590	0.01	WD-WM-024590	0.01
WD-WM-024594	0.81	WD-WM-024594	0.76	WD-WM-024594	0.12
WD-WM-024595	0.81	WD-WM-024595	0.76	WD-WM-024595	0.11
WD-WM-024596	0.01	WD-WM-024596	0.02	WD-WM-024596	0.04
WD-WM-024597(1)	0.01	WD-WM-024597(1)	0.01	WD-WM-024597(1)	0.02
WD-WM-024597(2)	0	WD-WM-024597(2)	0.01	WD-WM-024597(2)	0.01
WD-WM-024598	0	WD-WM-024598	0.01	WD-WM-024598	0.01
WD-WM-024599	0	WD-WM-024599	0.01	WD-WM-024599	0.01
WD-WM-024600	0	WD-WM-024600	0.01	WD-WM-024600	0.01
WD-WM-024601	0.8	WD-WM-024601	0.74	WD-WM-024601	0.09
WD-WM-024602	0.78	WD-WM-024602	0.71	WD-WM-024602	0.03
WD-WM-024603	0.02	WD-WM-024603	0.03	WD-WM-024603	0.05
WD-WM-024604	0	WD-WM-024604	0.01	WD-WM-024604	0.01
WD-WM-024605	0	WD-WM-024605	0.01	WD-WM-024605	0.01
WD-WM-024653	0	WD-WM-024653	0	WD-WM-024653	0
WD-WM-024664	0	WD-WM-024664	0	WD-WM-024664	0
WD-WM-024672	0	WD-WM-024672	0	WD-WM-024672	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-024673	0
WD-WM-024676	0
WD-WM-024677(1)	0
WD-WM-024677(2)	0
WD-WM-024678	0
WD-WM-024681	0
WD-WM-024685	0
WD-WM-024691	0
WD-WM-024693	0
WD-WM-024694(1)	0
WD-WM-024694(2)	0
WD-WM-046135	0.14
WD-WM-046136	0
WD-WM-046144	0
WD-WM-046152	0
WD-WM-046153(1)	0.01
WD-WM-046153(2)	0.01
WD-WM-046154(1)(1)(1)	0.01
WD-WM-046154(1)(1)(2)	0.02
WD-WM-046154(1)(2)	0.13
WD-WM-046154(2)	0.06
WD-WM-046155(1)	0
WD-WM-046155(2)	0.07
WD-WM-046156(1)	0
WD-WM-046156(2)	0.07
WD-WM-046159	0
WD-WM-046160	0
WD-WM-046161	0
WD-WM-046166	0
WD-WM-046168	0
WD-WM-046174	0
WD-WM-046175	0
WD-WM-046176	0
WD-WM-046177	0
WD-WM-046178	0
WD-WM-046190(1)	0.01
WD-WM-046190(2)	0.02
WD-WM-046217	0.01
WD-WM-046219	0.01
WD-WM-046220	0.01
WD-WM-046221	0.01
WD-WM-046222	0.01
WD-WM-046224	0.01
WD-WM-046229	0.01
WD-WM-046230	0.01
WD-WM-046231	0.01
WD-WM-046245(1)	0.11
WD-WM-046245(2)	0.18
WD-WM-046246	0.07
WD-WM-046247	0.05
WD-WM-046252(1)	0.08
WD-WM-046252(2)	0.09
WD-WM-046253	0.03
WD-WM-046254	0.02
WD-WM-046255(1)(1)(1)(1)	0
WD-WM-046255(1)(1)(1)(2)	0.03
WD-WM-046255(1)(1)(2)	0.03
WD-WM-046255(1)(2)	0.03
WD-WM-046255(2)	0.05
WD-WM-046256(1)	0.12
WD-WM-046256(2)	0
WD-WM-046257	0
WD-WM-046258	0
WD-WM-046265	0
WD-WM-046267	0.02
WD-WM-046284	0.03
WD-WM-046285	0.03
WD-WM-046286	0.03
WD-WM-046287	0
WD-WM-046288	0
WD-WM-046289(1)	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-024673	0
WD-WM-024676	0
WD-WM-024677(1)	0
WD-WM-024677(2)	0
WD-WM-024678	0
WD-WM-024681	0
WD-WM-024685	1.54
WD-WM-024691	0
WD-WM-024693	0
WD-WM-024694(1)	0
WD-WM-024694(2)	0
WD-WM-046135	0.13
WD-WM-046136	0
WD-WM-046144	0
WD-WM-046152	0
WD-WM-046153(1)	0.01
WD-WM-046153(2)	0.01
WD-WM-046154(1)(1)(1)	0.01
WD-WM-046154(1)(1)(2)	0.03
WD-WM-046154(1)(2)	0.17
WD-WM-046154(2)	0.08
WD-WM-046155(1)	0
WD-WM-046155(2)	0.08
WD-WM-046156(1)	0
WD-WM-046156(2)	0.08
WD-WM-046159	0
WD-WM-046160	0
WD-WM-046161	0
WD-WM-046166	0
WD-WM-046168	0
WD-WM-046174	0
WD-WM-046175	0
WD-WM-046176	0
WD-WM-046177	0
WD-WM-046178	0
WD-WM-046190(1)	0.03
WD-WM-046190(2)	0.09
WD-WM-046217	0.03
WD-WM-046219	0.03
WD-WM-046220	0.03
WD-WM-046221	0.03
WD-WM-046222	0.03
WD-WM-046224	0.02
WD-WM-046229	0.03
WD-WM-046230	0.06
WD-WM-046231	0.06
WD-WM-046245(1)	0.13
WD-WM-046245(2)	0.18
WD-WM-046246	0.06
WD-WM-046247	0.06
WD-WM-046252(1)	0.1
WD-WM-046252(2)	0.13
WD-WM-046253	0.04
WD-WM-046254	0.03
WD-WM-046255(1)(1)(1)(1)	0
WD-WM-046255(1)(1)(1)(2)	0.04
WD-WM-046255(1)(1)(2)	0.04
WD-WM-046255(1)(2)	0.04
WD-WM-046255(2)	0.07
WD-WM-046256(1)	0.17
WD-WM-046256(2)	0
WD-WM-046257	0
WD-WM-046258	0
WD-WM-046265	0
WD-WM-046267	0.05
WD-WM-046284	0.04
WD-WM-046285	0.04
WD-WM-046286	0.04
WD-WM-046287	0
WD-WM-046288	0
WD-WM-046289(1)	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-024673	0
WD-WM-024676	0
WD-WM-024677(1)	0
WD-WM-024677(2)	0
WD-WM-024678	0
WD-WM-024681	0
WD-WM-024685	0
WD-WM-024691	0
WD-WM-024693	0
WD-WM-024694(1)	0
WD-WM-024694(2)	0
WD-WM-046135	0.12
WD-WM-046136	0
WD-WM-046144	0
WD-WM-046152	0
WD-WM-046153(1)	0.01
WD-WM-046153(2)	0.01
WD-WM-046154(1)(1)(1)	0.01
WD-WM-046154(1)(1)(2)	0.04
WD-WM-046154(1)(2)	0.29
WD-WM-046154(2)	0.14
WD-WM-046155(1)	0
WD-WM-046155(2)	0.14
WD-WM-046156(1)	0
WD-WM-046156(2)	0.14
WD-WM-046159	0
WD-WM-046160	0
WD-WM-046161	0
WD-WM-046166	0
WD-WM-046168	0
WD-WM-046174	0
WD-WM-046175	0
WD-WM-046176	0
WD-WM-046177	0
WD-WM-046178	0
WD-WM-046190(1)	0.05
WD-WM-046190(2)	0.13
WD-WM-046217	0.05
WD-WM-046219	0.05
WD-WM-046220	0.05
WD-WM-046221	0.05
WD-WM-046222	0.05
WD-WM-046224	0.03
WD-WM-046229	0.05
WD-WM-046230	0.08
WD-WM-046231	0.08
WD-WM-046245(1)	0.09
WD-WM-046245(2)	0.12
WD-WM-046246	0.04
WD-WM-046247	0.04
WD-WM-046252(1)	0.09
WD-WM-046252(2)	0.12
WD-WM-046253	0.04
WD-WM-046254	0.02
WD-WM-046255(1)(1)(1)(1)	0
WD-WM-046255(1)(1)(1)(2)	0.04
WD-WM-046255(1)(1)(2)	0.04
WD-WM-046255(1)(2)	0.04
WD-WM-046255(2)	0.06
WD-WM-046256(1)	0.16
WD-WM-046256(2)	0
WD-WM-046257	0
WD-WM-046258	0
WD-WM-046265	0
WD-WM-046267	0.01
WD-WM-046284	0.04
WD-WM-046285	0.04
WD-WM-046286	0.04
WD-WM-046287	0
WD-WM-046288	0
WD-WM-046289(1)	0

EXISTING SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-046289(2)(1)	0.22
WD-WM-046289(2)(2)	0
WD-WM-046290	0.22
WD-WM-046296	0.22
WD-WM-046298	0
WD-WM-046299	0
WD-WM-046300	0
WD-WM-046301	0
WD-WM-046302	0
WD-WM-046303	0
WD-WM-046304	0
WD-WM-046305	0
WD-WM-046306	0.01
WD-WM-046309	0
WD-WM-046311	0
WD-WM-046329	0
WD-WM-046334	0
WD-WM-046339	0.04
WD-WM-046341	1.06
WD-WM-046346	0
WD-WM-046347	0
WD-WM-046348	0
WD-WM-046349	0
WD-WM-046351	0.09
WD-WM-046357	0.03
WD-WM-046358	0
WD-WM-046359	0

2030 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-046289(2)(1)	0.25
WD-WM-046289(2)(2)	0
WD-WM-046290	0.25
WD-WM-046296	0.25
WD-WM-046298	0
WD-WM-046299	0
WD-WM-046300	0
WD-WM-046301	0
WD-WM-046302	0
WD-WM-046303	0
WD-WM-046304	0
WD-WM-046305	0
WD-WM-046306	0.01
WD-WM-046309	0.59
WD-WM-046311	0.59
WD-WM-046329	0
WD-WM-046334	0
WD-WM-046339	0.02
WD-WM-046341	0.29
WD-WM-046346	0
WD-WM-046347	0
WD-WM-046348	0.59
WD-WM-046349	0
WD-WM-046351	0.11
WD-WM-046357	0.04
WD-WM-046358	0
WD-WM-046359	0

2070 SYSTEM	
Pipe Label	Total Volume (MG)
WD-WM-046289(2)(1)	0.2
WD-WM-046289(2)(2)	0
WD-WM-046290	0.2
WD-WM-046296	0.2
WD-WM-046298	0
WD-WM-046299	0
WD-WM-046300	0
WD-WM-046301	0
WD-WM-046302	0
WD-WM-046303	0
WD-WM-046304	0
WD-WM-046305	0
WD-WM-046306	0.14
WD-WM-046309	0.5
WD-WM-046311	0.5
WD-WM-046329	0
WD-WM-046334	0
WD-WM-046339	0.02
WD-WM-046341	0.53
WD-WM-046346	0
WD-WM-046347	0
WD-WM-046348	0.5
WD-WM-046349	0
WD-WM-046351	0.01
WD-WM-046357	0.05
WD-WM-046358	0
WD-WM-046359	0

EXISTING SYSTEM	
Pump Label	Total Volume (MG)
CIP - CBOL P1	(N/A)
CIP - CBOL P2	(N/A)
CIP - CBOL P3	(N/A)
CIP - CBOL P4	(N/A)
CIP Hendrick P1	(N/A)
CIP Hendrick P2	(N/A)
CIP Hendrick P3	(N/A)
CV P1	(N/A)
CV P2	(N/A)
CV P3	(N/A)
CV P4	(N/A)
EL PICO P1	0
EL PICO P2	9.72
EL PICO P3	0
EL PICO P4	(N/A)
EL PICO P5	(N/A)
El Pico Transfer	9.71
H/U P1	(N/A)
H/U P2	(N/A)
H/U P3	(N/A)
H/U P4	(N/A)
Hachar P1	0
Hachar P2	0
Hachar P3	0
Hachar P4	0
Highland P0 (Jockey)	0
Highland P1	0
Highland P2	1.72
Highland P3	1.72
Highland P4	0
Hwy359 P1	0
Hwy359 P2	0
Hwy359 P3	0
Jefferson EP2 (East)	16.05
Jefferson EP4 (East)	0
Jefferson EP6 (East)	0
Jefferson Transfer	70.16
Jefferson WP1 (West)	5.61
Jefferson WP3 (West)	0
Jefferson WP5 (West)	11.59
Lyon P1	5.43
Lyon P2	4.13
Lyon P3	0
Lyon P4	0
Lyon P5	0
MHOC P1	0
MHOC P2	0
MHOC P3	0
MHOC P4	7.42
MHOC P5	7.42
MHOC P6	0
Milmo P1	5.81
Milmo P2	2.55
Milmo P3	0
Milmo P4	0
Sierra Vista P1	(N/A)
Sierra Vista P2	1.91
Sierra Vista P3	6.42
SINE P1	0
SINE P2	0
SINE P3	0
SINE P4	0
Z Laredo_Columbia_1	(N/A)
Z Laredo_Columbia_2	(N/A)

2030 SYSTEM	
Pump Label	Total Volume (MG)
CIP - CBOL P1	(N/A)
CIP - CBOL P2	(N/A)
CIP - CBOL P3	(N/A)
CIP - CBOL P4	(N/A)
CIP Hendrick P1	3.92
CIP Hendrick P2	3.92
CIP Hendrick P3	3.92
CV P1	0.0
CV P2	0.0
CV P3	0.0
CV P4	0.0
EL PICO P1	9.98
EL PICO P2	6.55
EL PICO P3	0
EL PICO P4	(N/A)
EL PICO P5	(N/A)
El Pico Transfer	16.77
H/U P1	(N/A)
H/U P2	(N/A)
H/U P3	(N/A)
H/U P4	(N/A)
Hachar P1	1.2
Hachar P2	1.2
Hachar P3	1.2
Hachar P4	1.2
Highland P0 (Jockey)	0
Highland P1	0
Highland P2	0
Highland P3	0
Highland P4	0
Hwy359 P1	0
Hwy359 P2	0.8
Hwy359 P3	0
Jefferson EP2 (East)	13.09
Jefferson EP4 (East)	8.91
Jefferson EP6 (East)	8.91
Jefferson Transfer	71.95
Jefferson WP1 (West)	13.47
Jefferson WP3 (West)	13.47
Jefferson WP5 (West)	13.58
Lyon P1	0
Lyon P2	0
Lyon P3	0
Lyon P4	0.98
Lyon P5	2.24
MHOC P1	5.32
MHOC P2	4.98
MHOC P3	2.03
MHOC P4	7.31
MHOC P5	7.31
MHOC P6	1.3
Milmo P1	4.03
Milmo P2	4.75
Milmo P3	4.06
Milmo P4	4.06
Sierra Vista P1	2.81
Sierra Vista P2	1.02
Sierra Vista P3	6.59
SINE P1	0
SINE P2	0
SINE P3	0
SINE P4	0
Z Laredo_Columbia_1	(N/A)
Z Laredo_Columbia_2	(N/A)

2070 SYSTEM	
Pump Label	Total Volume (MG)
CIP - CBOL P1	7.6
CIP - CBOL P2	7.6
CIP - CBOL P3	7.6
CIP - CBOL P4	7.6
CIP Hendrick P1	3.8
CIP Hendrick P2	3.8
CIP Hendrick P3	3.8
CV P1	3.4
CV P2	6.8
CV P3	6.8
CV P4	6.75
EL PICO P1	10.43
EL PICO P2	11.5
EL PICO P3	12.22
EL PICO P4	10.43
EL PICO P5	3.31
El Pico Transfer	47.94
H/U P1	1.7
H/U P2	1.7
H/U P3	1.7
H/U P4	1.7
Hachar P1	0
Hachar P2	0
Hachar P3	0
Hachar P4	0
Highland P0 (Jockey)	0
Highland P1	0
Highland P2	0
Highland P3	0
Highland P4	0
Hwy359 P1	0
Hwy359 P2	1.72
Hwy359 P3	1.05
Jefferson EP2 (East)	18.18
Jefferson EP4 (East)	9.07
Jefferson EP6 (East)	9.07
Jefferson Transfer	92.59
Jefferson WP1 (West)	18.64
Jefferson WP3 (West)	18.64
Jefferson WP5 (West)	19.13
Lyon P1	0
Lyon P2	0
Lyon P3	5.97
Lyon P4	1.46
Lyon P5	5.38
MHOC P1	6.51
MHOC P2	1.82
MHOC P3	0.91
MHOC P4	1.63
MHOC P5	12.3
MHOC P6	1.48
Milmo P1	0
Milmo P2	4.38
Milmo P3	4.38
Milmo P4	5.44
Sierra Vista P1	5.61
Sierra Vista P2	2.12
Sierra Vista P3	6.58
SINE P1	0
SINE P2	0
SINE P3	0
SINE P4	0
Z Laredo_Columbia_1	(N/A)
Z Laredo_Columbia_2	(N/A)

EXISTING SYSTEM	
Pump Label	**Total Volume (MG)**
Z Laredo_Columbia_3	(N/A)
Z Pinto_Valle_1	(N/A)
Z Pinto_Valle_2	(N/A)

2030 SYSTEM	
Pump Label	**Total Volume (MG)**
Z Laredo_Columbia_3	(N/A)
Z Pinto_Valle_1	(N/A)
Z Pinto_Valle_2	(N/A)

2070 SYSTEM	
Pump Label	**Total Volume (MG)**
Z Laredo_Columbia_3	(N/A)
Z Pinto_Valle_1	(N/A)
Z Pinto_Valle_2	(N/A)

EXISTING SYSTEM	
Tank Label	**Total Volume (MG)**
Airport EST	(N/A)
Bartlett EST	2.8
CIP - CBOL GST	(N/A)
Columbia HPT	(N/A)
Cuatro Vientos EST	1.9
CV GST	(N/A)
Del Mar EST	(N/A)
El Pico Clearwell	0.19
H/U EST	(N/A)
H/U GST	(N/A)
Hachar GST	0
Hachar HPT	0
Hendrick GST	(N/A)
Highland HPT	0
Hwy 359 GST	0
JWTP Upper Clearwells	36.91
Killam EST	0.26
Las Blancas EST	0.09
Lyon St GST	6.44
McPherson EST	0.06
MHOC GST	5.03
Milmo GST	4.58
Northwest EST	1.05
Pinto Valle GST	(N/A)
Pinto Valle HPT	(N/A)
SE EST	(N/A)
Sierra Vista GST	1.9
SINE EST	1.59
SINE GST	0
SINE HPT	0
South Laredo EST	1.75
SV HPT	(N/A)

2030 SYSTEM	
Tank Label	**Total Volume (MG)**
Airport EST	0.57
Bartlett EST	2.6
CIP - CBOL GST	0
Columbia HPT	(N/A)
Cuatro Vientos EST	1.43
CV GST	0.0
Del Mar EST	(N/A)
El Pico Clearwell	2.85
H/U EST	0.41
H/U GST	(N/A)
Hachar GST	0.1
Hachar HPT	(N/A)
Hendrick GST	1.36
Highland HPT	0
Hwy 359 GST	0.55
JWTP Upper Clearwells	1.99
Killam EST	2.5
Las Blancas EST	0.54
Lyon St GST	4.24
McPherson EST	0.01
MHOC GST	2.15
Milmo GST	3.13
Northwest EST	1.08
Pinto Valle GST	(N/A)
Pinto Valle HPT	(N/A)
SE EST	1.7
Sierra Vista GST	4.76
SINE EST	6.76
SINE GST	0
SINE HPT	0
South Laredo EST	1.58
SV HPT	(N/A)

2070 SYSTEM	
Tank Label	**Total Volume (MG)**
Airport EST	0.6
Bartlett EST	2.4
CIP - CBOL GST	1.8
Columbia HPT	(N/A)
Cuatro Vientos EST	1.0
CV GST	2.6
Del Mar EST	(N/A)
El Pico Clearwell	4.44
H/U EST	1.53
H/U GST	2.58
Hachar GST	0
Hachar HPT	(N/A)
Hendrick GST	0.86
Highland HPT	0
Hwy 359 GST	0.36
JWTP Upper Clearwells	2.54
Killam EST	3.36
Las Blancas EST	0.65
Lyon St GST	8.07
McPherson EST	0.78
MHOC GST	6.63
Milmo GST	4.17
Northwest EST	1.17
Pinto Valle GST	(N/A)
Pinto Valle HPT	(N/A)
SE EST	3.39
Sierra Vista GST	3.49
SINE EST	3.6
SINE GST	0
SINE HPT	0
South Laredo EST	0.65
SV HPT	(N/A)

16 APPENDIX G
Laredo Customer Meter Data

Meter Sizes and Letters Designating Meter Size
City of Laredo Utilities

Turbines Meters		
Meter Size	Letter Designating Meter Size	Meter Count
3/4" X 5/8"	A	64,380
3/4" x 3/4"	B	11,538
1"	C	1,994
1 1/2"	D	1,141
2"	E	1,657
3"	F	370
4"	G	64
6"	H	17
8"	I	4
2" Fire Hydrant	FH	-
Compound Meters		
Large Register	**Letter Designating Meter Size**	**Meter Count**
2"	E	1,021
3"	F	248
4"	G	40
6"	H	15
8"	I	2
Compound Meters		
Small Register	**Letter Designating Meter Size**	**Meter Count**
5/8"	EA	636
5/8"	FA	122
3/4"	GB	24
1"	HC	2
1"	IC	2

17 APPENDIX H
Metropolitan Transportation Plan (2020-2045)

LARADO

Metropolitan

Transportation

Plan

2020–2045 Update

Chapter 1: Planning Context

Introduction

The quality of the transportation system is a critical contributor to the economic health and quality of life within a metropolitan area. In addition to providing opportunities for the mobility of people and goods, the transportation system also influences patterns of growth and the economic activity within a region. The performance of the regional transportation system is also connected to public policy concerns including air quality, natural resource consumption, environmental justice, development patterns, and economic development.

This document, the **Laredo 2020-2045 Metropolitan Transportation Plan** (MTP), serves as a comprehensive, multimodal guide for making transportation improvements and investments in the Laredo region for the next 25 years and is required to be updated every five years. The MTP identifies policies, programs and projects for each mode of travel including roadways, transit, bicycle, pedestrian, aviation, rail, and freight movement that will be necessary to meet regional transportation needs through the year 2045.

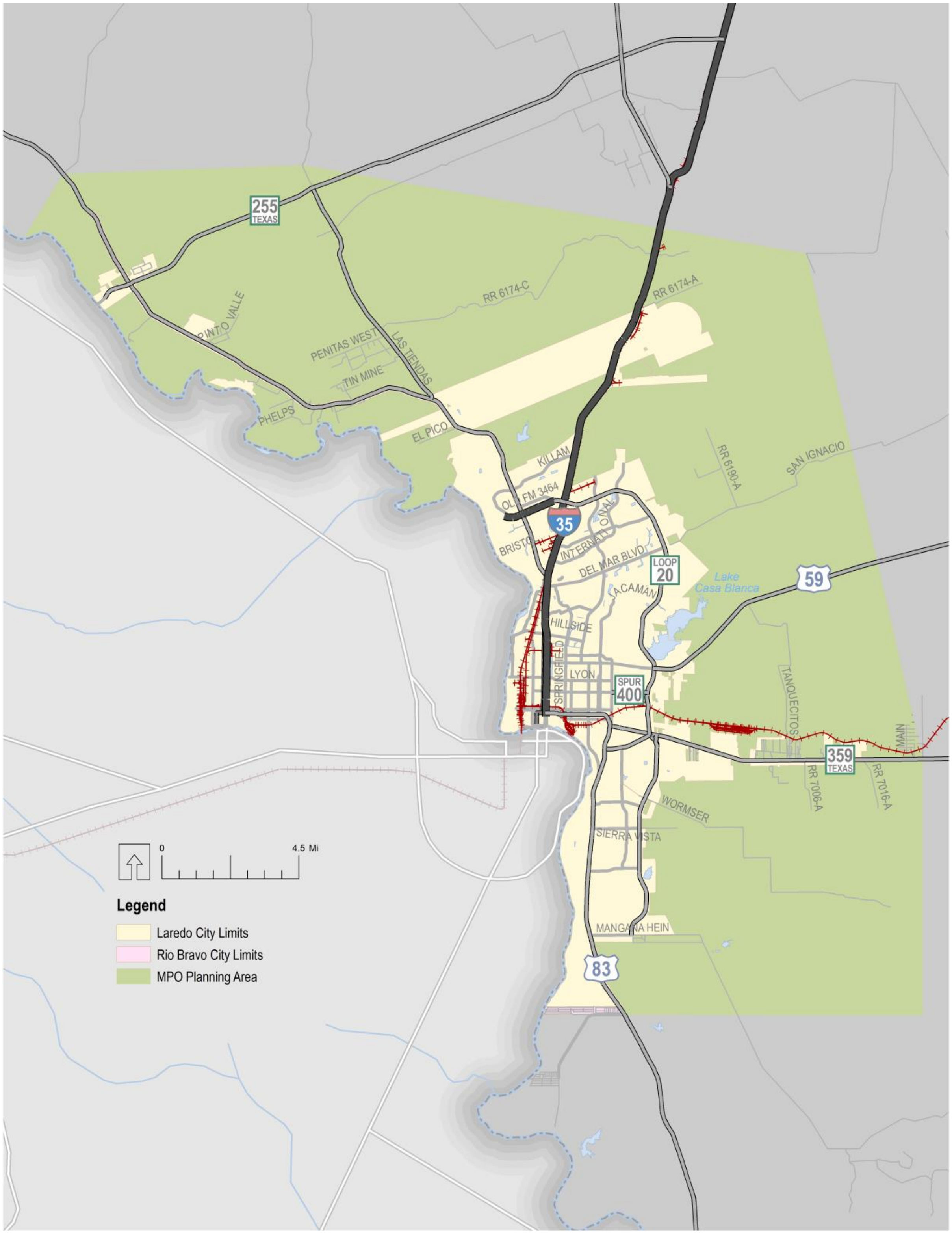
The metropolitan transportation planning process used in developing this MTP is also a formal, federally mandated process required for a region to receive federal transportation improvement dollars. The metropolitan planning process undertaken for this MTP reflects the continuous, cooperative, and comprehensive planning approach (known as “3C”) required under federal law.

This 2045 MTP was developed over an 18-month period and serves as an update to the previously adopted 2040 MTP in meeting all federal regulations. It documents the comprehensive consideration and evaluation of multimodal transportation strategies, and identifies strategies for operating, maintaining, managing, building, and financing the transportation network to achieve long-term goals and improve overall quality of life in the region. It was developed through technical analysis and the continuous and collaborative participation of numerous transportation agencies and organizations in an open, timely, and meaningful public outreach process. A major goal for this regional plan update was to incorporate at a regional level the City of Laredo’s recently adopted Comprehensive Plan, *Viva Laredo*, which outlines a series of goals, objectives, and strategies to improve mobility, diversify the economy, increase employment opportunities, celebrate the local history and unique culture of Laredo, improve the health of residents, improve affordability, and enhance quality of life.

The planning area for the Laredo 2020-2045 MTP encompasses the City of Laredo, the City of Rio Bravo, and portions of Webb County, Texas. These boundaries are defined by the U.S. Census urbanized boundary and include adjacent areas expected to become urbanized within a 20-year forecast period. **Figure 1-1** shows the boundaries of the metropolitan planning area.

The remaining sections of this chapter provide the planning context for development of the MTP and organization of the MTP and includes details on the ways in which the MTP was developed to meet federal requirements and incorporate a comprehensive, cooperative and continuous planning approach.

Figure 1-1: Laredo Metropolitan Study Area



DRAFT

Metropolitan Planning Background and Structure

Metropolitan Planning Organizations (MPOs) serve a critical and federally mandated role in the planning and decision-making for the transportation system. In 1962, Congress passed the **Federal Highway Act**, which requires that all urbanized areas with populations of 50,000 or more establish MPOs to ensure that federally funded transportation projects and programs are based on a the 3-C planning process. While state Departments of Transportation build and manage the Interstate Highway System and state roads, and city and county governments define local priorities and needs, the establishment of MPOs provide the *regional* view that enables transportation projects to be planned and delivered at a scale that can view the connections across jurisdictional boundaries, and that can facilitate cooperative priority-setting and decision-making for all modes of transportation.

The Laredo Urban Transportation Study (LUTS), also known as the Laredo Metropolitan Planning Organization (Laredo MPO), is the designated MPO responsible for transportation planning in accordance with the federal metropolitan planning requirements for the Laredo region.

The Laredo MPO is required to work cooperatively with federal, state, and local governments and transportation service providers within the context of a well-defined metropolitan transportation planning process. The Laredo MPO does not lead the implementation of transportation projects, but rather serves as the venue for planning and programming for transportation improvements within the Laredo region. Furthermore, as required by federal legislation, the Laredo MPO must provide the public and interested parties with reasonable and meaningful opportunities to be involved in the transportation planning process.

Laredo MPO Structure

The Laredo MPO is comprised of a policy committee, technical committee, and planning staff to support transportation planning activities. A set of by-laws establishes the structure and representation of the MPO. The Policy Committee, comprised of representatives from the city, county, state, and local transit provider, has the decision-making authority and is responsible for overseeing transportation planning efforts. The Technical Committee, comprised of representatives from the same entities plus those from school districts and the private sector, serves in an advisory role to the Policy Committee and is responsible for professional and technical review of work programs, policy recommendations, and transportation planning activities. The current membership of the Policy Committee and Technical Committee can be viewed at www.laredompo.org. City of Laredo Planning Department staff supports the efforts of both committees in transportation planning and works in cooperation with the Texas Department of Transportation (TxDOT) and other entities to carry out various planning tasks.

MPO Planning Documents

To carry out its function as the coordinating agency for transportation planning, the Laredo MPO develops, implements, monitors, and updates a variety of transportation plans including the

Unified Planning Work Program (UPWP), the Transportation Improvement Program (TIP), and this MTP.

The UPWP is an annual work program and budget and identifies all planning-level activities to be undertaken by each member agency in a fiscal year. The TIP is the short-range program of transportation projects based on the long-range MTP and covers a period of four years. Finally, the MTP is the long-range, financially constrained transportation plan for the region covering a planning horizon of 25 years. All projects identified in the TIP must be consistent with the MTP.

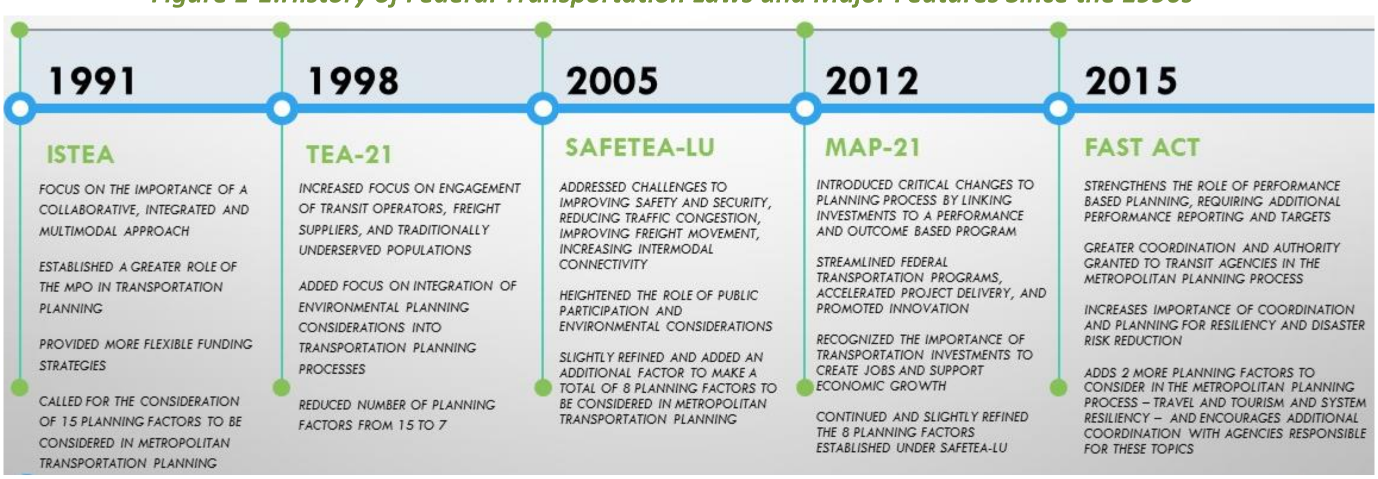
According to federal law, all MTPs must be updated every four or five years. For the Laredo metropolitan area, the MTP must be updated every five years, because it is in attainment for certain air quality standards. As the MPO carries out their 3C planning process, amendments to this MTP are expected. These may occur due to changes in project priorities, funding availability, or state and/or federal guidance. Amendments to the MTP require adoption by the MPO Policy Committee, following an opportunity for the public to review and comment.

Establishing the Framework for the MTP

While long-range transportation may be thought of as a good general planning practice, there are strict federal mandates that must be adhered to in carrying out the metropolitan planning process and developing an MTP to maintaining eligibility for federal funding.

Following the passage of the **Federal Highway Act of 1962**, which established MPOs and the foundation and objectives of metropolitan transportation planning, Congress has continued to pass a series of surface transportation bills that further detail the federal requirements MPOs must adhere to in carrying out a 3-C planning approach and in developing MTPs. While basic requirements of these processes have not changed – metropolitan planning must address at least a 20-year planning horizon for how the metropolitan area will manage and operate a multimodal transportation system within a fiscally-constrained plan – since the 1990s, federal transportation laws have focused on integrated planning processes and the scope and requirements for metropolitan planning and MTPs have therefore evolved through each successive law. **Figure 1-2** provides a brief overview of the major federal surface transportation laws and how provisions have evolved over the last nearly 30 years.

Figure 1-1:History of Federal Transportation Laws and Major Features Since the 1990s



The most current surface transportation law outlining these requirements is the 2015 Fixing America's Surface Transportation (FAST) Act. The 2020-2045 Laredo MTP was developed in compliance all requirements of the FAST Act.

The FAST Act builds on and refines many of the highway, transit, bike, and pedestrian programs and policies established in previous federal surface transportation laws and sets the requirements for MTP development. 23 CFR § 450.306 outlines three major requirements in the scope of the MTP process that established the framework for development and organization of this plan:

- Developing a performance-driven and outcome-based approach
- Considering of a series of 10 planning factors in carrying out a continuous, cooperative, and comprehensive metropolitan planning process
- Integrating directly, or by reference, the goals, objectives, performance measures and targets in other statewide and local and regional plans

Given the emphasis placed on these requirements under federal law, each of these elements and how they have been incorporated into this MTP are discussed in greater detail below.

A Performance Based Approach

The development and implementation of performance measures for MPOs serves to assess how the transportation system and/or the MPO is functioning and operating. Performance measures can inform the decision-making process and improve accountability for the efficient and effective implementation of programs and projects. Performance measures serve the following functions for the Laredo MPO:

- During the **Plan Development** process, performance measures provide a framework to benchmark performance and the effects of alternatives. This data can help inform decision-making between trade-offs and help communicate the anticipated impacts of different investment strategies.
- Performance measures support **Plan Implementation** by emphasizing the Laredo MPO guiding principles and integrating them into budgeting, program structure, project selection, and implementation policies.
- System performance relative to the vision and guiding principles of the Laredo MTP can be tracked and reported to support **Accountability** for plan implementation and results.

The performance measures for the Laredo MPO were determined by the federally required performance measures for state departments of transportation and MPOs to use as outlined in the FAST Act. The National Performance Rule Making (NPRM) identified five performance areas required for State DOTs and MPOs. These performance areas include Safety, Pavement and Bridge Condition, Roadway System Performance and Transit Asset Management. According to the NPRM, State DOTs and MPOs are to establish quantifiable statewide performance targets for the required performance measures to be achieved over a four-year performance period, with the first performance period starting in 2018. MPOs may establish targets by either supporting the State DOT's statewide target or defining a target unique to the metropolitan planning area each time the State DOT establishes a target.

The Laredo MPO has adopted the federally required performance measures in coordination with TxDOT and incorporated these into the MTP, as noted in **Table 1-1**. Additional performance measures and targets have also been identified to address the goals and objectives defined through the MTP process. Performance management and performance targets for the MTP are discussed in detail in **Chapter 12**.

Table 1-1: MTP Federal Performance Measures Content Requirements

Federal Performance Area	Performance Measure
Safety	• Number of fatalities • Rate of fatalities per 100 M Vehicle Miles Traveled (VMT) • Number of serious injuries • Rate of serious injuries per 100 M VMT • Number of non-motorized fatalities and serious injuries
Pavement and Bridge Measures	• % of Interstate pavements in Good condition • % of Interstate pavements in Poor condition • % of Non-Interstate NHS pavements in Good condition • % of Non-Interstate NHS pavements in Poor condition • % of NHS bridges by deck area classified as in Good condition • % of NHS bridges by deck area classified as in Poor condition
System Performance	• Travel time reliability on the interstate and non-interstate NHS • Truck travel time reliability
Transit Asset Management	• % of non-revenue vehicles met or exceeded useful life benchmark • % of revenue vehicles met or exceeded useful life benchmark • % of assets with condition rating below 3.0 on FTA TERM Scale

Consideration of Planning Factors

On May 27, 2016, the U.S. Department of Transportation promulgated the Final Rule on Statewide and Metropolitan Transportation Planning. Within 23 CFR § 450.306, a series of ten planning factors are identified and required to be considered in the metropolitan transportation planning process. The MPO's approach to these planning factors is as follows.

1) Economic Vitality

The transportation network provides the region with access to jobs, shopping, education, and recreational activities. It also enables inter-regional travel and affects freight movement and international trade. Therefore, the transportation network must be planned for in such a way as to maintain mobility and increase system efficiency. The MTP provides recommendations for projects and strategies that should relieve congestion on key transportation corridors that provide access to primary activity centers such as jobs, schools, shopping, and other recreational activities. Further, improvements to infrastructure supporting freight movement and air travel are also considered in the MTP to increase regional and global competitiveness.

2) Safety

Motorized and non-motorized users of the transportation system expect and deserve a safe experience while travelling. As such, the Laredo MPO has developed this plan with safety considerations forefront in mind. Strategies to improve safety include developing transportation system management techniques such as access management, system expansion projects within congested corridors to increase capacity, designing new facilities to meet current design standards, and reducing the number of at-grade intersections – especially for rail and vehicular traffic. The City of Laredo adopted a Vision Zero initiative in 2019. As part of Vision Zero, the City of Laredo is developing a data-driven action plan to reduce traffic fatalities in an effort to reduce the number of traffic fatalities to zero.

3) Security

Concerns for security have gained more prominence in transportation planning. As a major international gateway, serious consideration has been given to possible threats, both natural and man-made, while developing this plan.

4) Accessibility and Mobility

Improving the mobility of both people and freight is a key objective of the Laredo MPO. By adding new transit centers, constructing new interchanges, building bikeways, planning for new freight railroad facilities and a new international border crossing, the MPO is performing the proper planning and making the necessary investments to increase the accessibility and mobility of both people and goods.

5) Environment, Energy Conservation, and Planned Growth

People are increasingly more conscious of their actions on the environment, making sure natural resources can sufficiently meet today's needs and those of future generations. As such, new technologies and alternative energy sources are becoming increasingly sought after. As growth and development occurs, the amount of travel increases, which in turn, leads to increased congestion, poorer air quality, and wasted fuel. Therefore, the MPO encourages smarter growth supported by sounder transportation investments to improve the quality of life for all residents in the Laredo region.

6) Modal Integration and Connectivity

The MTP includes projects that support a balanced, multimodal system. Specifically, the MPO is investing in new transit centers, additional bike paths, and strategic additions to the roadway system, all of which promote better integration of modes and enhance system connectivity.

7) System Management and Operation

Getting the most out of the existing transportation infrastructure is a key goal of the Laredo MPO. By investing resources in ITS solutions, improving access management along existing roadways, and improving existing intersections and interchanges, the existing system can perform more efficiently. Moreover, by encouraging non-automobile methods of travel, the burden on the existing roadway system can be reduced.

8) System Preservation

While growth in the region certainly calls for increased transportation capacity, it is just as important to maintain the existing infrastructure in a state of good repair.

9) Resiliency and Reliability

The ability to effectively manage, operate, and maintain a safe and reliable transportation system under disruptive circumstances has become increasingly important. Resiliency and reliability involve several components including emergency response, redundancy in the transportation system to ensure mobility, travel demand management, reducing vulnerability of the transportation system during extreme weather events, and reducing or mitigating storm water impacts.

10) Travel and Tourism

Travel and tourism are essential to the economic vitality of the region. Investments in improvements that enhance travel and tourism will support economic growth by resulting in a more efficient movement of people and goods.

Consistency with State and Local Plans

As detailed in 23 CFR § 450.306 (d)(4), MTPs should also integrate, to the extent possible, the goals, objectives, performance measures, and targets developed in other statewide transportation plans, regional public transportation plans, and be consistent with other related local transportation plan goals and objectives. In developing this MTP update, several state and local plans were reviewed to integrate statewide and local planning comprehensively and consistently. **Table 1-2** provides a summary of state and local plans reviewed in the process of this MTP update.

Table 1-2: State and Local Plans Reviewed for MTP Integration and Consistency

Document Name	Summary Description
TxDOT Transportation Plan	The Texas Transportation Commission adopted the Texas Transportation Plan (TTP) serves as TxDOT's long-range, performance-based transportation plan. The TTP addresses the statewide planning requirements under federal transportation law, and guides planning and programming decisions for the statewide multimodal transportation system over a 25-year period.
TxDOT Strategic Plan	This document is an overarching policy statement designed to provide a framework for taking action within TxDOT. It addresses strategies and tactics that are necessary for TxDOT to fulfill its mission and goals over five years (2019-2023) and establishes performance measures to monitor its progress
TxDOT Transportation Asset Management Plan	Federal law requires each state to "develop and implement a Risk Based Asset Management Plan for the National Highway System (NHS) to improve or preserve the condition and performance of the system." TxDOT has developed an initial TAMP to meet these requirements. The document serves to inform decision-making and investments and will continue to be updated periodically. The initial TAMP consists of pavements and bridges either on the NHS or on the State Highway System.
Texas Strategic Highway Safety Plan (SHSP)	The SHSP seeks to implement effective highway safety counter measures and change the current driving culture to reduce the human and societal costs of motor vehicle traffic crashes, deaths, and injuries on public roads. This document is updated every 5 years.
Report on Texas Bridges	This document, updated every 2 years, describes the conditions of publicly owned vehicular bridges and tracks the progress that TxDOT has made towards its goals of improving bridge conditions. It also outlines a plan to improve Texas bridges and meet TxDOT's goals.
Unified Transportation Program (UTP)	This document is a 10-year plan approved by the Texas Transportation Commission and addresses 12 different categories of funding that will guide transportation project development and construction in the state of Texas. The UTP is updated annually by August 31 each year. The UTP is further divided into two documents; the Statewide Mobility Program (STP) and the Statewide Preservation Program (SPP). It represents a mid-term planning document that should be consistent with MTPs across the state.
Texas Freight Mobility Plan	This document provides TxDOT's short- and long-term freight planning activities and investments in accordance with federal requirements. The plan outlines priorities for freight investments, identifies facilities that are critical for economic growth and goods movement, strategies for enhanced economic growth, expands freight policies, ensures consistency with neighboring states and federal goals and objects, and provides an implementation plan.
Viva Laredo	Viva Laredo is the comprehensive plan for the City of Laredo. The plan provides a basis and vision for a coordinated planning approach in managing the future growth of the city. Viva Laredo was adopted by City Council on September 18, 2017.
Laredo Transit Development Plan	The TDP is a five-year plan examining policy, operations, capital issues, and funding with El Metro Transit's fixed route and paratransit services. This plan provides short and longer-term recommendations for preservation and maintenance of transit infrastructure, route modifications, and other technology and infrastructure upgrades. A TAMP was developed in coordination with this plan and reviewed to understand long-range operating and maintenance needs and capital replacement schedules.
Public Participation Plan	Updated by the Laredo MPO in 2017, this document serves as the plan for involving all citizens and transportation stakeholders in the public involvement process for metropolitan transportation planning.
Limited English	In accordance with the Title VI of the Civil Rights Act of 1964, the Laredo MPO adopted the

Document Name	Summary Description
Proficiency Plan	Limited English Proficiency Plan in 2016 to address the responsibilities of the MPO as a recipient of federal assistance as they relate to the needs of individuals with limited English proficiency skills. The plan helps to identify reasonable steps for providing language assistance to persons with limited English proficiency who wish to access services provided.

Meeting MTP Content Requirements

Specific requirements of the metropolitan transportation planning process and content of the MTP are outlined in federal regulations and are reviewed by the Federal Highway Administration in reviewing MTPs for compliance and so they maintain federal funding eligibility. **Table X** provides a summary of these major provisions of law and serves as a reference guide to the Laredo MPO's approach to address these requirements in the MTP.

Table 1-3: Federal MTP Requirements and Compliance

Federal Content Requirement	Laredo MTP Content
The transportation planning process shall address at least a 20-year planning horizon	This plan has a 25-year planning horizon, covering the years from 2020 to 2045.
The transportation plan shall include both long-range and short-range strategies that lead to an integrated multimodal transportation system	The long-range MTP includes specific projects and strategies for all transportation modes, including roads, transit, bicycle/pedestrian facilities, aviation, rail, and intermodal facilities. Further, the needs of freight transportation have also been considered. The MTP categorizes projects as short-term (2020-2029) and long-term (2030-2045). In addition, the MTP includes illustrative projects that are beyond the financial capacity of the MTP. These projects are considered very long-term (beyond 2045). Should additional funding become available, it is expected that some of these projects would be moved to the long-term horizon.
The MPO shall review and update the transportation plan at least every four years in nonattainment areas and maintenance areas and at least every five years in attainment areas	Because the Laredo metropolitan planning area is in attainment for ozone or carbon monoxide, the plan is on a five-year update cycle. This MTP reflects a new, updated plan that supersedes the previous plan which was adopted in 2014 and was periodically amended to reflect updated project listings. The next MTP update is expected to occur in 2024.
In metropolitan areas that are in nonattainment for ozone or carbon monoxide, the MPO shall coordinate the development of the transportation plan with the Transportation Control Measures (TCMs) in the State Implementation Plan (SIP)	The Laredo metropolitan planning area is considered in attainment for ozone and carbon monoxide; therefore, this requirement is not applicable.

Federal Content Requirement	Laredo MTP Content
The MPO shall base updates on the latest available estimates for population, land use, travel, employment, congestion, and economic activity	The 2045 Laredo MTP is based on the most recent available set of socioeconomic and transportation planning data. Specifically, the most recent existing land use data was utilized. In addition, up to date population and employment data was developed for the regional travel demand model. Finally, the future year socioeconomic data was developed to account for currently planned developments as well as areas of the region most suitable for growth.
The transportation plan shall include current and projected transportation demand of persons and goods in the metropolitan planning area over the period of the transportation plan	As part of the transportation planning process, the MTP project development team updated the regional travel model, which was used to predict future vehicular travel in 2045. In addition, the MTP includes an analysis of projected freight movement through the region.
The transportation plan shall include existing and proposed transportation facilities that should function as an integrated system	Chapters 4 through 8 of the MTP includes a thorough discussion of the existing transportation system, while Chapter 11 includes a list of planned projects that will shape the future transportation system. Roadway, transit, bicycle, pedestrian, aviation, rail, and freight movement are also addressed within the MTP.
The transportation plan shall include a description of the performance measures and targets, with a system performance report evaluating MPO progress in meeting performance targets	The federal performance areas and associated performance management for the Laredo MPO are discussed in Chapter 11
The transportation plan shall include operational and management strategies to improve the performance of existing transportation facilities	In Chapters 4 through 8, the MTP addresses operational and management strategies to improve the performance of the existing system to relieve congestion and enhance the safety and mobility of people and goods in the Laredo region.
The transportation plan shall consider the results of the congestion management process in TMAs	Chapter 9 discusses the summary of the congestion management process adopted by the MPO and how the CMP has incorporated this process into the MTP development.
The transportation plan shall include an assessment of capital investment and other strategies to preserve the existing system and provide for multimodal capacity increases and reduce vulnerability to natural disasters	The MTP addresses capital investment strategies to preserve existing transportation infrastructure and provide for multimodal capacity increases based on regional priorities and needs. Chapter 11 outlines capacity enhancing projects for various modes of transportation.
The transportation plan shall include transportation and transit enhancement activities, including consideration for intercity buses	The MTP includes a list of transportation enhancement projects in Chapter 11.

Federal Content Requirement	Laredo MTP Content
The transportation plan shall include descriptions of all existing and proposed transportation facilities in enough detail for conformity determinations. In all areas (regardless of air quality designation), all proposed improvements shall be described in enough detail to develop cost estimates	The MTP project development team worked closely with project proponents to sufficiently define the scope of all projects to develop reasonable cost estimates. The MTP projects listed in Chapter 11 present both project descriptions and cost estimates.
The transportation plan shall include a discussion of potential environmental mitigation activities to restore and maintain environmental functions affected by the transportation plan	In Chapter 9, the MTP includes a discussion of the environmental impacts of the transportation plan and potential mitigation efforts. In addition, various stakeholders were invited to a roundtable discussion to address such environmental impacts and mitigation efforts.
The transportation plan shall include pedestrian walkway and bicycle transportation facilities	The MTP recognizes the importance of providing pedestrian and bicycle facilities. The existing and proposed bicycle and pedestrian facilities in this MTP reflect findings from the Viva Laredo Plan and support non-motorized travel options.
The transportation plan shall include a financial plan that demonstrates how the adopted transportation plan can be implemented and that meets several requirements as outlined in 23 CFR § 450.322	A financially constrained plan with costs and revenues in year of expenditure dollars is presented in Chapter 11. Only reasonably available funding sources were considered. The MTP was developed cooperatively with TxDOT, the City of Laredo, Webb County, and El Metro.
The metropolitan planning organization shall consult with state and local agencies responsible for land use management, natural resources, environmental protection, conservation, and historic preservation regarding development of the transportation plan	The Laredo MPO's public participation plan calls for involving all stakeholders in the development of the MTP, including the agencies with an interest in the areas of land use management, environmental resources, environmental protection, conservation, and historic preservation. Moreover, representatives of such entities were invited to participate in a series of roundtable discussions.
The transportation plan should integrate priorities, goals, countermeasures, or projects contained in the Highway Safety Improvement Program as well as emergency relief and disaster preparedness plans and strategies and policies that support homeland security and safeguard the personal security of all motorized and non-motorized users	The MPO recognizes the importance of providing a safe and secure transportation system. In addition, several transportation projects included in the plan explicitly address safety and security issues.
The MPO shall provide interested parties with a reasonable opportunity to comment on the transportation plan	The Laredo MPO strictly adheres to its public participation plan and has provided all interested parties (including citizens, public agencies, freight shippers, freight carriers, representatives of users of pedestrian walkways and bicycle facilities, representatives of the disabled, and others) with extensive opportunity and ample time to comment on all aspects of the MTP. The process by which the MTP was developed is presented in the MTP and included substantial and proactive public outreach efforts.

Federal Content Requirement	Laredo MTP Content
The MTP shall be published or otherwise made readily available for public review	The Laredo MTP is made available for public review through both printed copies available at the MPO offices and electronically accessible formats through the MPO's website: www.laredompo.org. In addition, the draft document was made available for public review at the Laredo City Planning office for a 30-day period.
The MPO shall not be required to select any project from the illustrative list of additional projects included in the financial plan	Although an illustrative list of additional projects is included in the MTP, the MPO acknowledges that it will not be required to select any from that list.
In nonattainment and maintenance areas for transportation-related pollutants, the MPO must make a conformity determination on any updated or amended transportation plan in accordance with transportation conformity regulations	The Laredo metropolitan planning area is considered in attainment for ozone and carbon monoxide; therefore, this requirement is not applicable.

Chapter 2:
Regional Context

Introduction

The City of Laredo is the third most populated U.S. city on the U.S.-Mexico border. The city has a population of over 250,000. The cross-border Laredo-Nuevo Laredo Metropolitan Area has an estimated population of over 650,000. There are few places in the nation tied as closely to a sister city across a border. The border is the focal point of the regional economy, history, culture, and importance. As a gateway between the United States and Mexico, Laredo plays a major role in both the local/regional economy as well as in inter- and intra-state commerce. Based upon the most recently developed estimates, the population is expected to grow by more than 50 percent between the years 2018 and 2045, with an estimated population of approximately 419,000 people. As a "gateway" to the United States and a dominant inland port along the United States- Mexico border, smart investments in transportation infrastructure are important in meeting today's needs and the future demands of the region.

This chapter provides greater details on the context of the Laredo region in terms of geographic context, socio-economic conditions, land use and transportation patterns, and economic development trends. These factors provide the region-specific and interrelated conditions, issues, and opportunities that were important in the development of this long-range MTP.

Geographical Context

The planning area of the Laredo MPO encompasses the corporate limits of the cities of Laredo and Rio Bravo, and a portion of Webb County (see **Figure 1-1** in Chapter 1). The planning area boundary consists of about 417.8 square miles, covering approximately 12.4 percent of the area of Webb County. The City of Laredo is located on the north side of the Rio Grande along the border between the United States and Mexico about 150 miles southwest of San Antonio and 135 miles west of Corpus Christi. Across the Rio Grande, Laredo shares cultural and economic ties with Nuevo Laredo, Tamaulipas, Mexico.

Socioeconomic Conditions

Examining current and projected socioeconomic data in a region is an important step in determining current and future transportation needs. Socioeconomic characteristics, such as population, size and number of households, and employment, are key variables that aid in understanding the traveling habits of the region's population. Because most data are reported at the county level and because the MPO planning area accounts for nearly all the population and employment in the county, county-level data is presented throughout this chapter.

Population

Population data is considered the most important element of a region's socioeconomic characteristics. Based on the magnitude and location of population, decisions can be made to satisfy regional transportation needs. **Table 2-1** below indicates the total population for Webb County in 2000, 2010, and 2017, with comparative statistics for the State of Texas and the nation based on data from US Census, 2000, US Census 2010, and 2017 ACS 1-Year Estimates.

Table 2-1: Population

Geography	2000 Census	2010 Census	2017 ACS 1-Year Estimate	Annual Growth Rate (2000-2010)	Annual Growth Rate (2010-2017)
Laredo City	176,576	236,091	261,935	2.95%	1.50%
Webb County	193,117	250,304	274,794	2.63%	1.34%
Texas	20,851,820	25,145,561	28,304,596	1.89%	1.70%
United States	281,421,906	308,745,538	325,719,178	0.93%	0.77%

Source: U.S. Census Bureau, 2019

Figure 2-1 displays population concentrations in the Laredo MPO region in terms of the number of people per acre for each traffic analysis zone (TAZ). Analyzing the distribution of people in a region is necessary to understand how transportation improvements can affect different numbers of people. Smarter infrastructure investments can be made by pinpointing transportation improvements in more densely populated areas that serve more people. This is especially true for public transit, as the efficiency and effectiveness of public transit is largely dependent on the number of people it can serve. The most densely populated areas of Laredo are the older residential area east of I-35 and in the southeastern portion of the city.

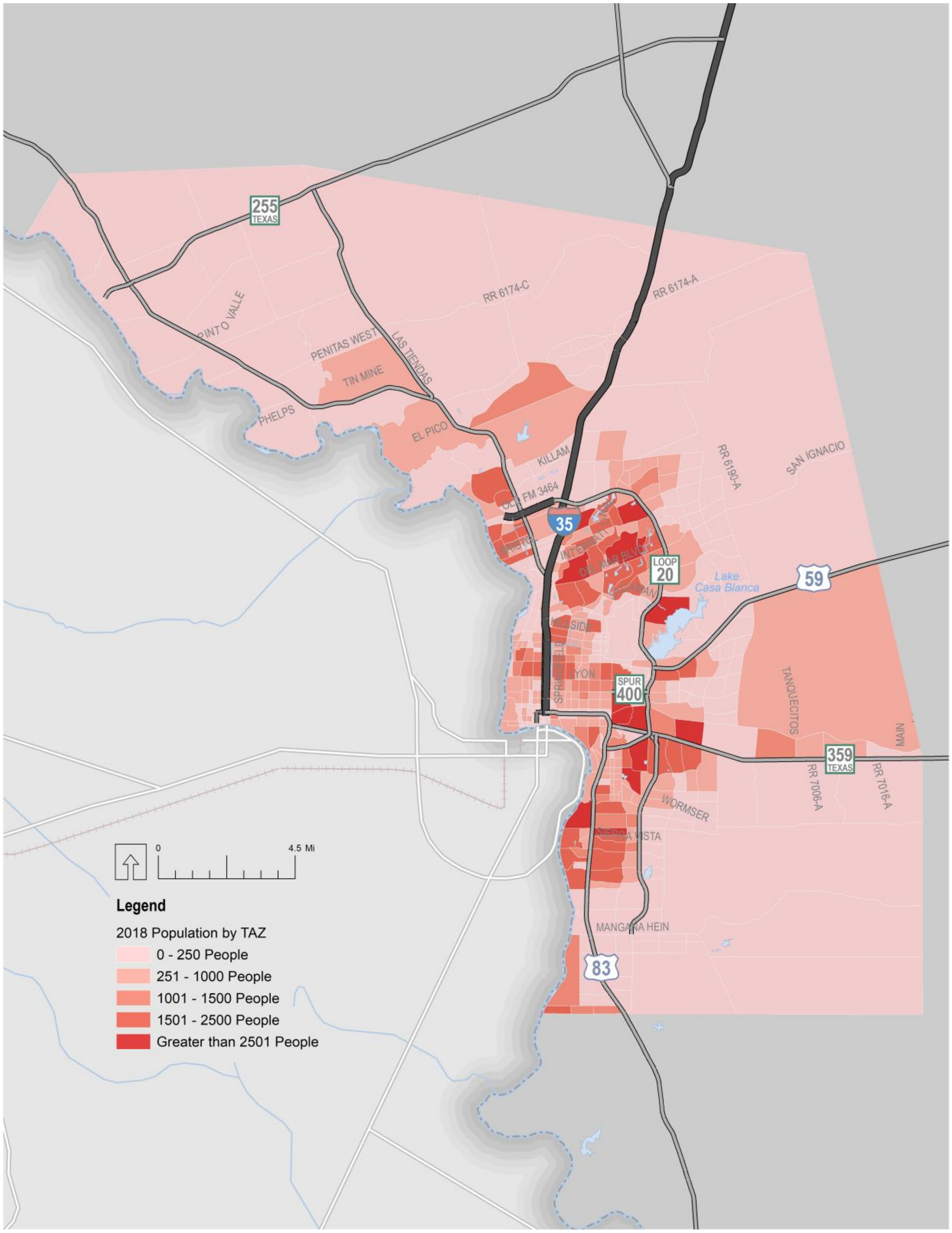
Figure 2-2 displays the population density in the Laredo MPO region in terms of the number of people per acre for each traffic analysis zone (TAZ) forecasted to the year 2045. Population is forecasted to grow outward from the current core area of Laredo in all directions: northwards up the Mines Rd corridor, between Mines Rd and IH-35, north and west of Loop 20, eastwards between US 59 and SH 359, and south along Cuatro Vientos Blvd and US 83. The 2045 projection is not showing a population density within the historic core of downtown Laredo. Population forecasts for the Laredo MPO area are shown in **Table 2-2**.

Table 2-2: Laredo MPO Population Forecasts

Forecast Year	Forecast Population
2018	286,442
2030	350,136
2040	413,907
2045	450,024

Source: TxDOT-TPP 2008 Validated Travel Demand Model

Figure 2-1: Population Density by TAZ, 2018

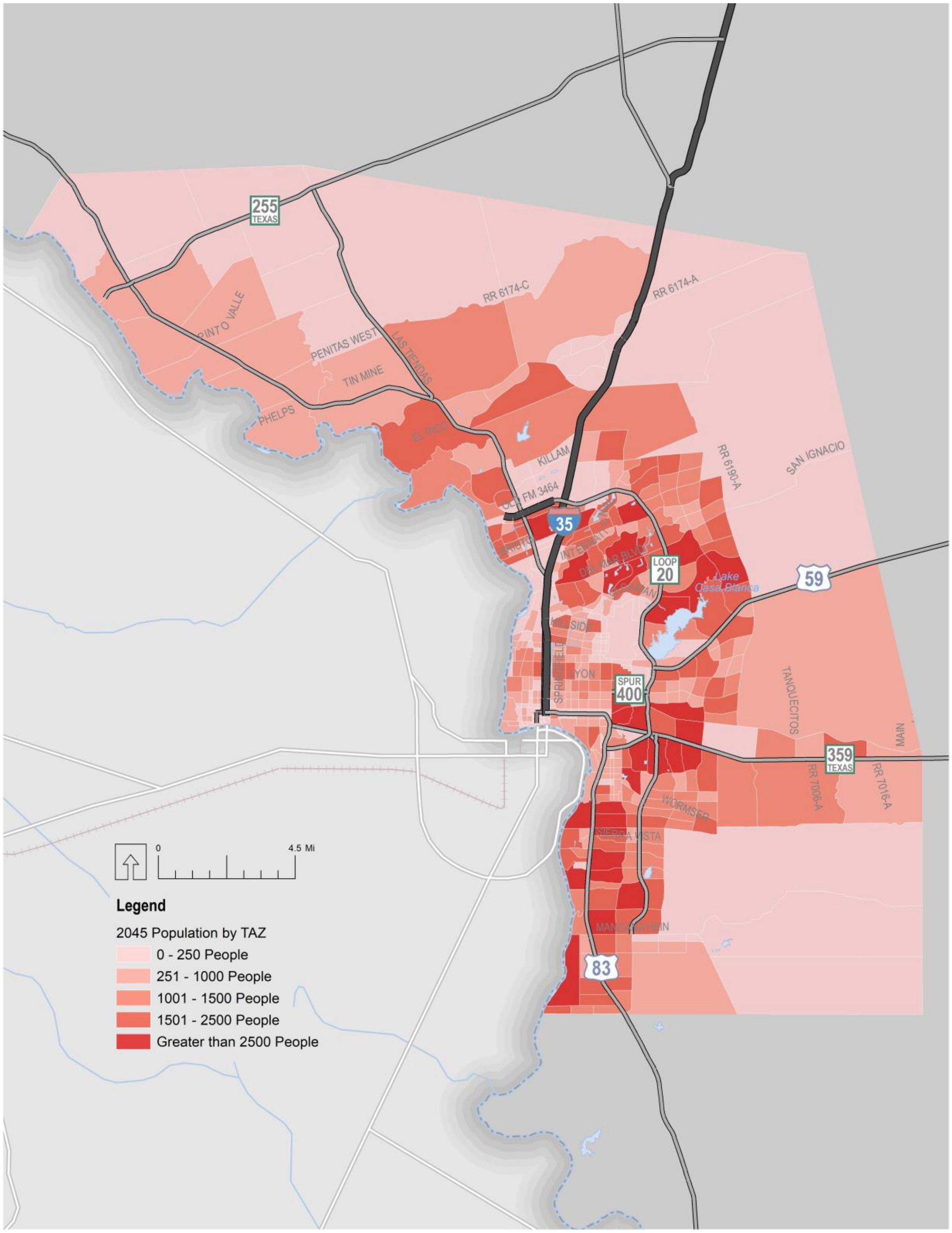


Source: TxDOT-TPP 2008 Validated Travel Demand Model

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Figure 2-2: Forecasted Population Density by TAZ, 2045



Source: TxDOT-TPP 2008 Validated Travel Demand Model

Households

The number of households and the size of those households effects the number of trips made within the region. Larger households generally tend to generate more trips than smaller households. Similar to an increase in population, an increase in the number of households correlates to an increased demand on the transportation system. Across the United States, the number of households has increased while the size of households has decreased over time. Various cultural factors such as the decrease in children per family and an increase in single-parent households may contribute to this national trend. **Table 2-3** shows the total number of households for Webb County, Texas, and the United States from the 2000 U.S. Census, the 2010 U.S. Census, and the 2017 ACS 5-Year Estimates as provided by the U.S. Census Bureau.

Table 2-3: Households

Geography	2000 Census	2010 Census	2017 ACS 5-Year Estimates	Annual Growth Rate (2000-2010)	Annual Growth Rate (2010-2017)
Webb County	50,740	67,106	72,379	2.84%	1.09%
Texas	7,393,354	8,922,933	9,430,419	1.90%	0.79%
United States	105,480,101	116,716,292	118,825,921	1.02%	0.26%

Source: U.S. Census Bureau, 2019

Figure 2-3shows the existing spatial distribution of households. The density of households aligns with the density of populations. Households are concentrated within the older residential area east of I-35 and in the southeastern portion of the city.

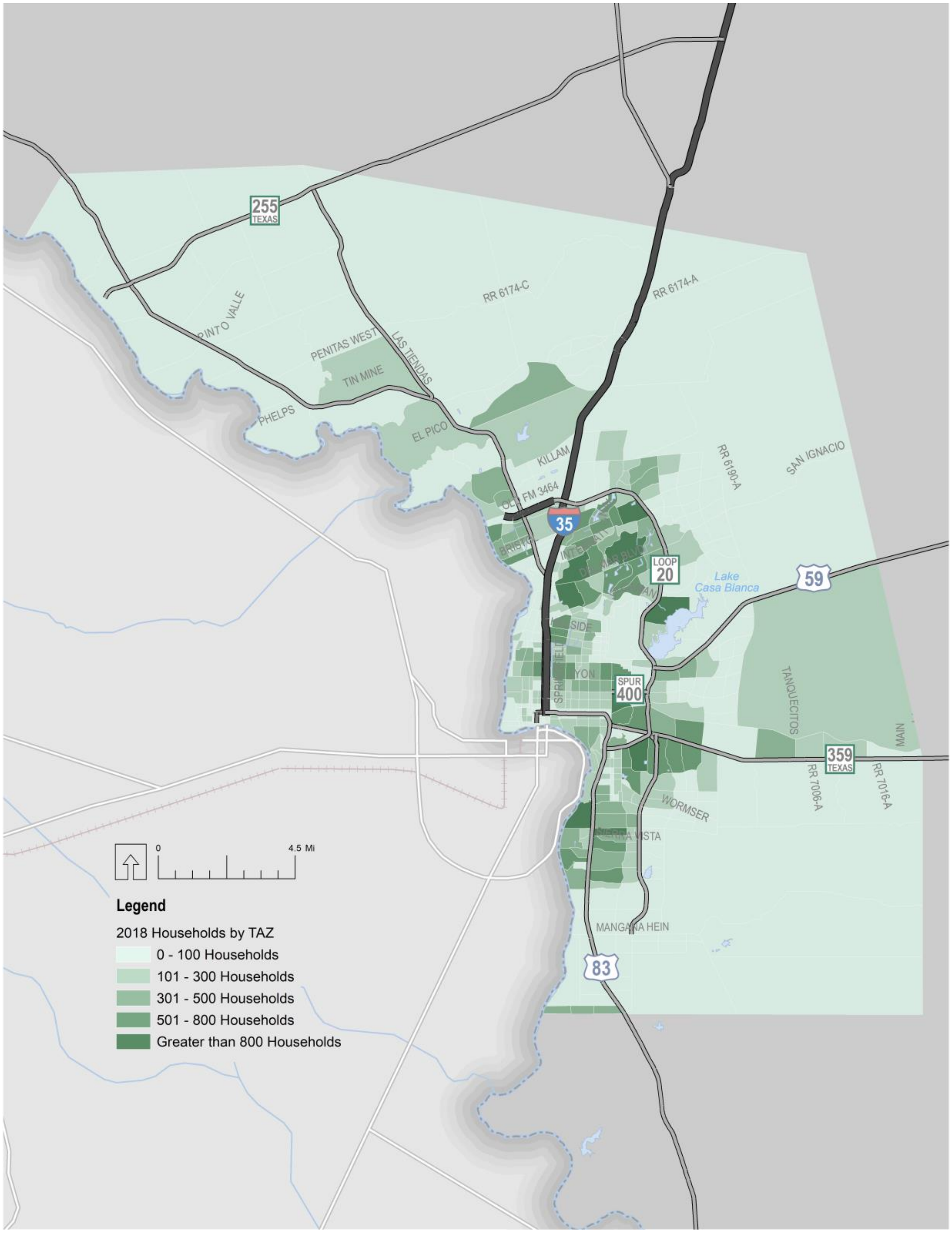
Figure 2-4 shows the density by TAZ of households forecasted to the year 2045. Similar to population density, the spatial distribution of households is expected to develop a density along Loop 20 and within the north and south sides of the Laredo region. This projection is important to consider as the Laredo MPO develops policy guidance to avoid the transportation challenges that arise from urban sprawl. Population forecasts for the Laredo MPO area are shown in **Table 2-4.**

Table 2-4: Laredo MPO Households Forecasts

Forecast Year	Forecast Households
2018	80,487
2030	103,161
2040	126,864
2045	140,686

Source: TxDOT-TPP 2008 Validated Travel Demand Model

Figure 2-3: Household Density by TAZ, 2018

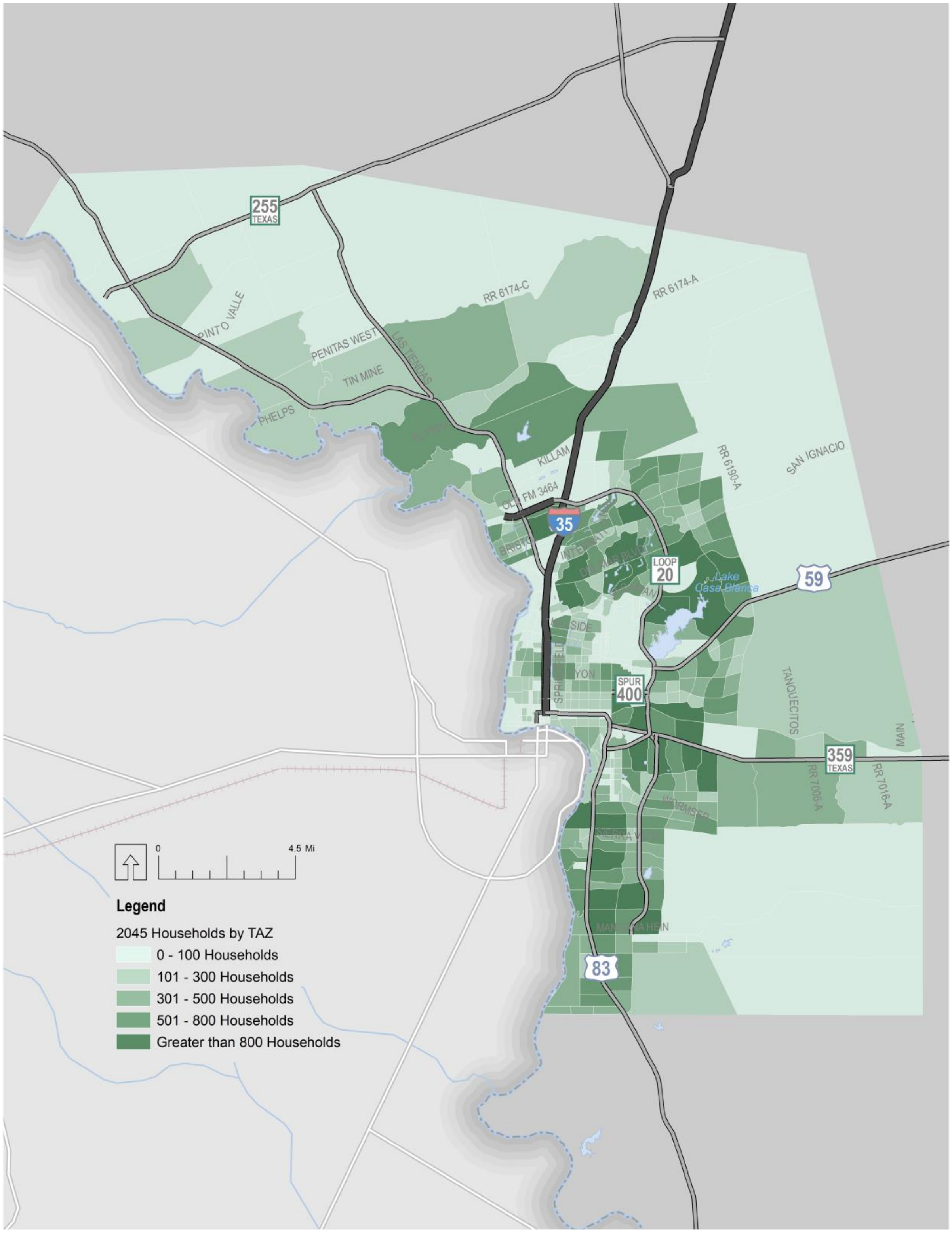


Source: TxDOT-TPP 2008 Validated Travel Demand Model

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Figure 2-4: Forecasted Household Density by TAZ, 2045



Source: TxDOT-TPP 2008 Validated Travel Demand Model

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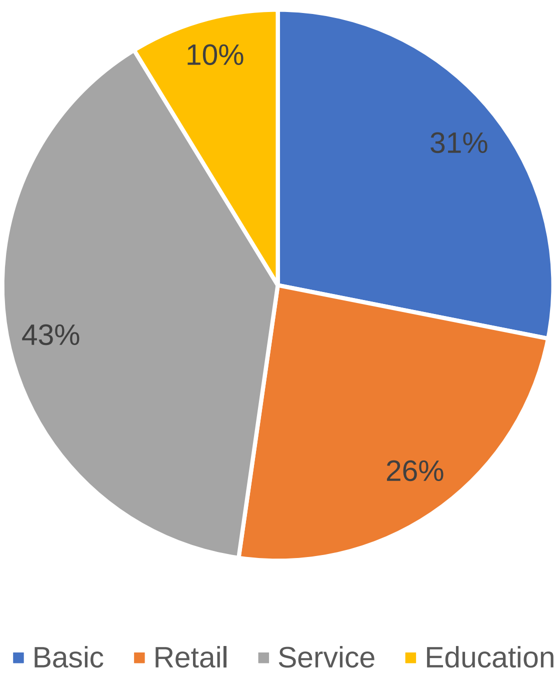
Employment

The regional economy is dependent on the ability of workers to travel to their places of work. The regional transportation system must meet the needs of the users by providing adequate access and connectivity. Regional employment generates a significant number of trips. Economic indicators are essential to review to properly plan future transportation investments. **Figure 2-5** illustrates the distribution of employment in the Laredo MPO planning area by economic sector (Basic, Retail, Service, and Education) in 2018 based on TxDOT Transportation Planning and Program Division (TxDOT-TPP) data. Employment within the basic economic sector include industries that produce goods for export such as mining, logging, and manufacturing.

Figure 2-5: Distribution of Employment by Economic Sector



Source: TxDOT-TPP 2008 Validated Travel Demand Model

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Major Employers

Based on a 2017 study from the Laredo Economic Development Corporation, **Table 2-5** shows a listing of the major employers within the City of Laredo.

Table 2-5: Major Employers

Number of Employees	Employer
Over 2,000	The Outlet Shoppes (55 stores)
	United Independent School District
	Laredo Independent School District
	City of Laredo
	Wal-Mart (4 Locations)
1,500 to 1,999	US CBP—Customs Field Officers
	H-E-B (7 locations)
	McDonald's Restaurant
	Webb County
1,000 to 1,499	Laredo Medical Center
	Laredo Sector Border Patrol
	Texas A&M International University
500 to 999	Convergys
	Laredo Community College
	Doctor's Hospital
	International Bank of Commerce (multiple locations)
200 to 499	Target Greatland (2 Stores)
	Falcon International Bank (7 locations)
	Border Region Behavioral Health Center
	Gateway Community Health Clinic
	Sames Motor Company
125 to 200	BBVA Compass Bank (11 locations)
	Laredo Energy Arena
	Union Pacific Railroad
	U.S. Post Office
	Family Chevrolet
	FedEx Freight
	Sears & Roebuck and Co.

Source: Laredo Economic Development Corporation, 2017

Not only is it important to consider employment levels in major industry sectors and major employers, but it is also useful to consider the relative locations of all employment within a region. **Figure 2-6** shows the employment density by TAZ in 2018 for the Laredo MPO region. In evaluating transportation improvement options, it is useful to identify concentrations of employment to assess the relative locations of major travel destinations. Employment with the Laredo region is primarily located within the urban core and along major arterial facilities. In addition, there is high concentration of employment within the area's industrial parks.

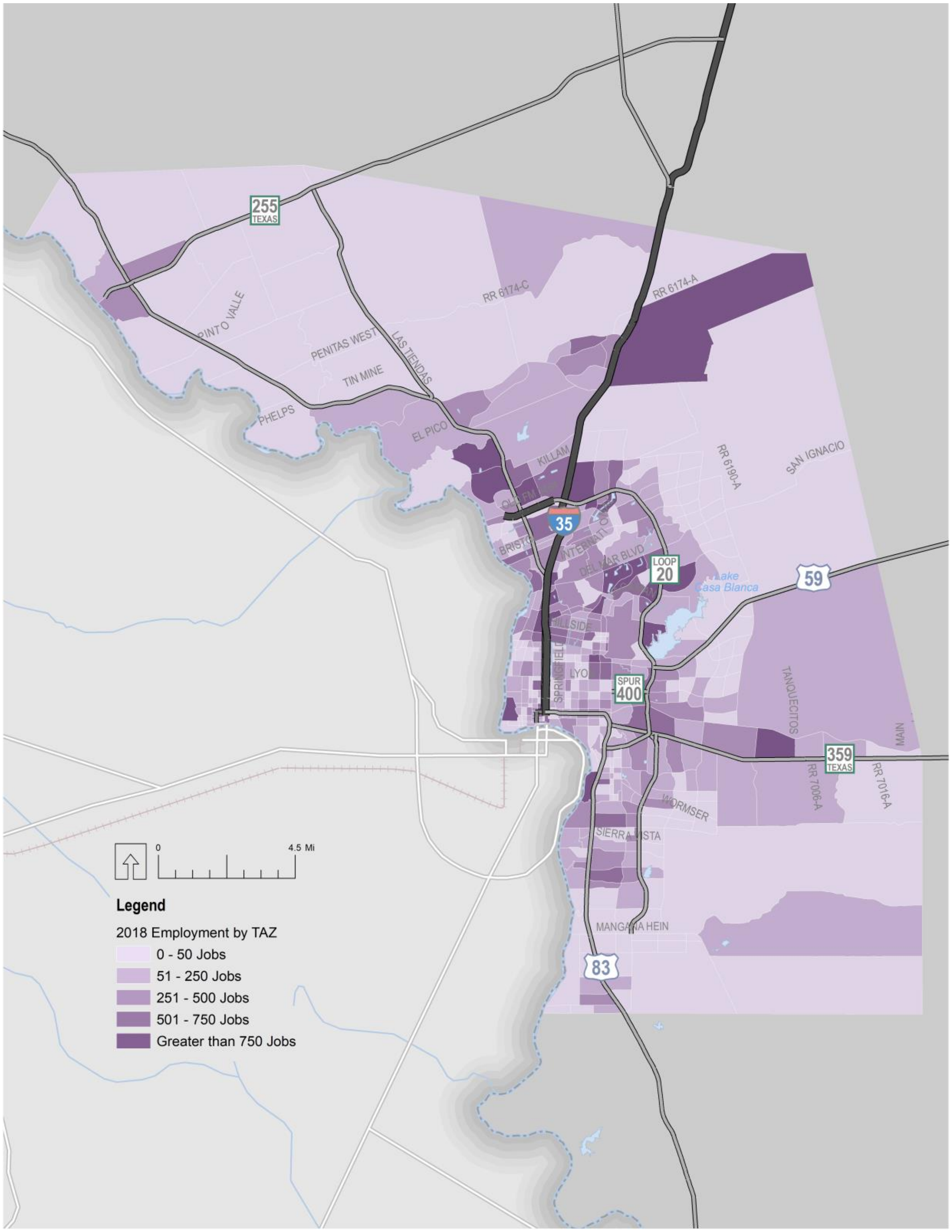
Figure 2-7 shows the employment density by TAZ forecast to the year 2045 for the Laredo MPO region. New employment is shown growing north along the Mines Rd corridor and eastwards from Mines Rd to the Uniroyal interchange and along the planned Hachar Parkway, east along SH 359, and south along US 83. Employment growth in the Basic category is expected to spread strongly according to these patterns, while growth in the Retail, Service, and Education categories are more closely linked to population growth patterns. This spatial distribution of employment is a shift from 2018 where we see employment density centered within Loop 20. This change will result in a shift of worker commuting patterns across the region. Employment forecasts for the Laredo MPO area are shown in **Table 2-6.**

Table 2-6: Laredo MPO Employment Forecasts

Forecast Year	Forecast Employment
2018	105,267
2030	133,613
2040	166,083
2045	180,009

Source: TxDOT-TPP 2008 Validated Travel Demand Model

Figure 2-6: Employment Density by TAZ, 2018

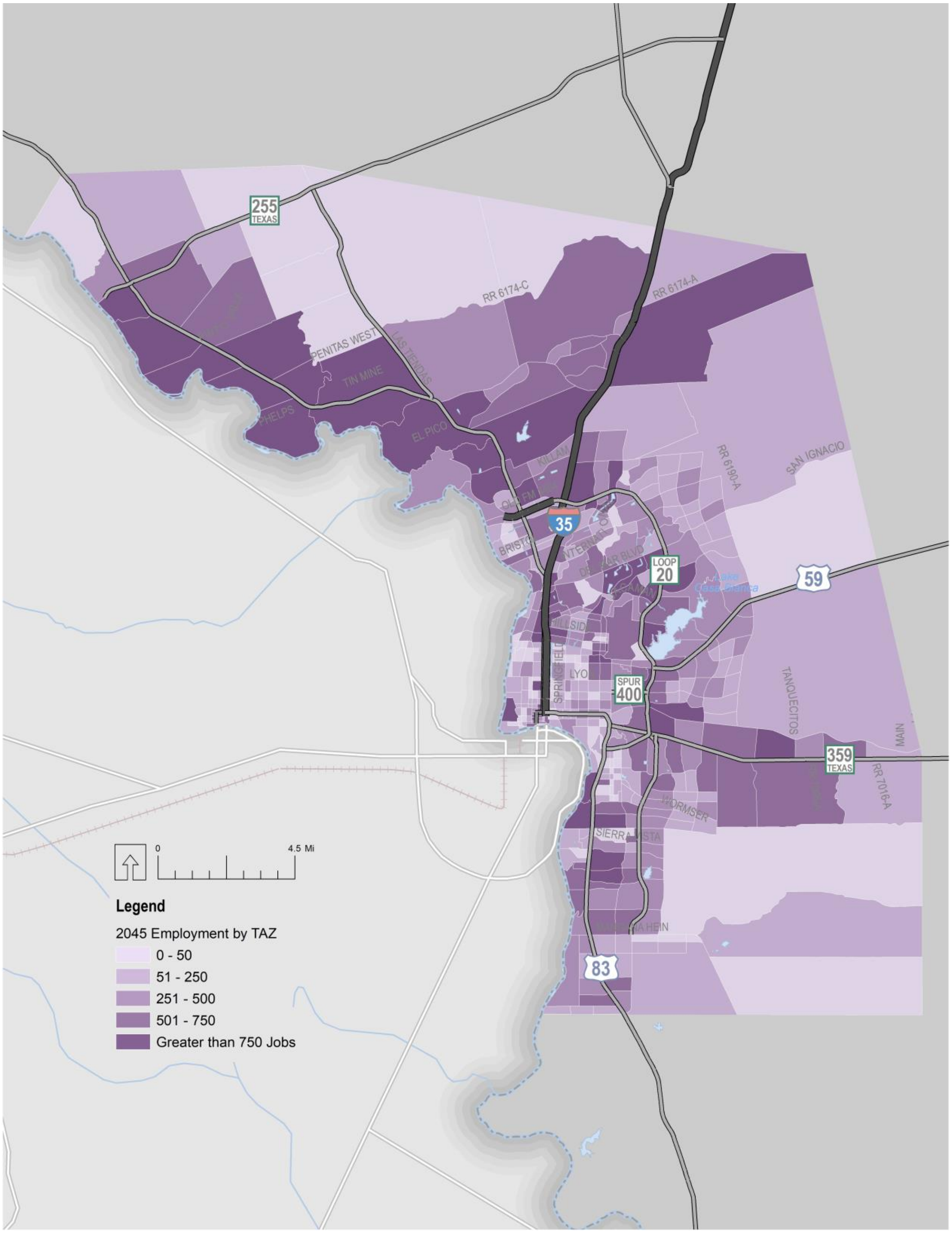


Source: TxDOT-TPP 2008 Validated Travel Demand Model

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Figure 2-7: Forecasted Employment Density by TAZ, 2045



Source: TxDOT-TPP 2008 Validated Travel Demand Model

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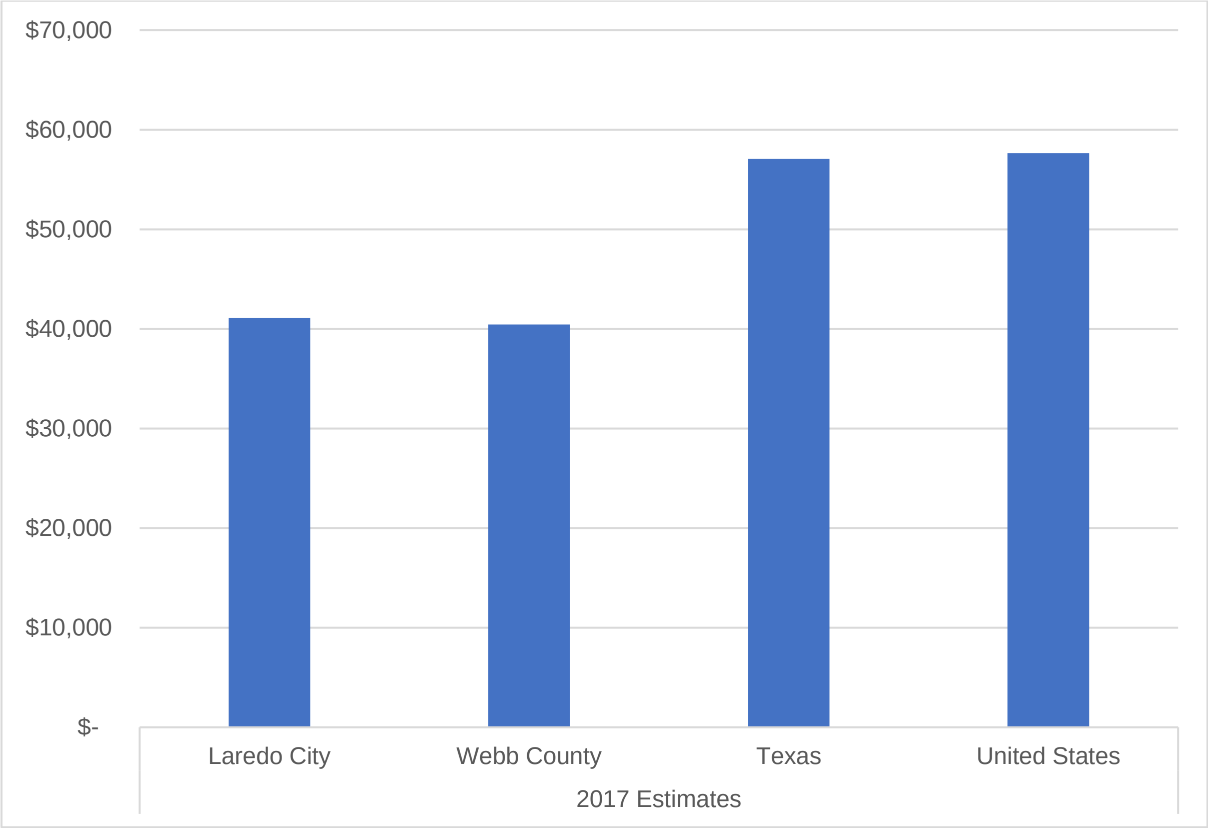
Income

Income is one important attribute of socioeconomics of a place. It could be related to consuming power and travel behavior and therefore could affect the planning of transportation systems. Based on 2013-2017 American Community Survey 5-Year Estimates, the comparison of the median household incomes for Laredo City, Webb County, Texas, and the United States for 2017 is shown in **Figure 2-8**.

Figure 2-8: Median Household Income, 2017



Source: 2017 ACS 5-Year Estimates

Table 2-7 shows the percentage of households by income range for Laredo City, Webb County, Texas, and the United States. Compared to Texas or the United States averages, there are more percentages of households falling under the categories of earning less than $40,000 in either Laredo City of Webb County. Households who earn less than $10,000 account for 13.1 percent and 13.2 percent of the households in Laredo City and Webb County respectively.

Table 2-7: Percentage of Households by Income Range

Income Range	Laredo City	Webb County	Texas	United States
Total Households	68,851	72,379	9,430,419	118,825,921
Less than $10,000	13.1%	13.2%	6.7%	6.7%
$10,000 to $14,999	7.3%	7.4%	4.6%	72.6%
$15,000 to $19,999	6.4%	6.6%	4.8%	99.3%
$20,000 to $24,999	5.8%	5.9%	5.1%	103.2%
$25,000 to $29,999	5.5%	5.7%	4.9%	95.1%
$30,000 to $34,999	6.2%	6.3%	4.9%	101.6%
$35,000 to $39,999	4.4%	4.5%	4.6%	93.4%
$40,000 to $44,999	4.7%	4.7%	4.6%	100.4%
$45,000 to $49,999	4.5%	4.4%	4.0%	88.2%
$50,000 to $59,999	7.6%	7.7%	7.9%	194.3%
$60,000 to $74,999	8.2%	8.1%	10.0%	128.7%
$75,000 to $99,999	9.6%	9.5%	12.0%	123.8%
$100,000 to $124,999	6.6%	6.6%	8.6%	70.2%
$125,000 to $149,999	4.0%	3.8%	5.4%	62.6%
$150,000 to $199,999	3.0%	2.9%	5.7%	107.8%
$200,000 or more	2.8%	2.7%	6.3%	107.7%

Source: 2017 ACS 5-Year Estimates

Environmental Justice

Environmental justice seeks to provide an equitable distribution of both benefits and adverse impacts borne of public policy decisions. These decisions could refer to, for example, the equal distribution of clean air and water, parks, healthcare, education, and transportation. In particular, Title VI of the Civil Rights Act of 1964 states, “No person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance."

As defined by USDOT, the three fundamental environmental justice principles include the following:

- ***To avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.***
- ***To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.***
- ***To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations.***

Then, in 1994 Executive Order 12898 mandated that every federal agency was responsible for incorporating environmental justice concerns into their programs, policies, and activities. In doing so, the U.S. Department of Transportation (USDOT) issued its own mandate to ensure that environmental justice concerns were addressed in transportation decisions, including those of transportation planning agencies.

In order to account for environmental justice concerns in relation to transportation investments, Census and American Community Survey (ACS) data from the U.S. Census Bureau were used in order to identify population characteristics and geographic distributions of minority, low income, elderly, and the disabled population. Furthermore, because of Laredo’s special circumstances, the existence and locations of “colonias” were also considered.

Minority Populations

USDOT has defined five minimum race categories for environmental justice considerations, including African-American, Hispanic, Asian, Native American or Alaskan Native, and Native Hawaiian or Other Pacific Islander. **Table 2-8** illustrates the 2017 racial distribution of the Laredo MPO region and compares it with the rest of Texas and the United States based on 2017 ACS 5-Year Estimates.

Table 2-8: Population by Race, 2017

Population Estimate	Webb County Count	Webb County Percent	Texas Percent	United States Percent
White	256,620	95.2%	74.6%	73.0%
Black or African American	1,089	0.4%	12.0%	12.7%
American Indian and Alaska Native	585	0.2%	0.5%	0.8%
Asian	1,407	0.5%	4.5%	5.4%
Native Hawaiian and Other Pacific Islander	25	0.0%	0.1%	0.2%
Some other race	8,499	3.2%	5.8%	4.8%
Total	269,624	100.0%	100.0%	100.0%
One race	268,225	99.5%	97.4%	96.9%
Two or more races	1,399	0.5%	2.6%	3.1%
Hispanic or Latino (of any race)	257,482	95.5%	38.9%	17.6%

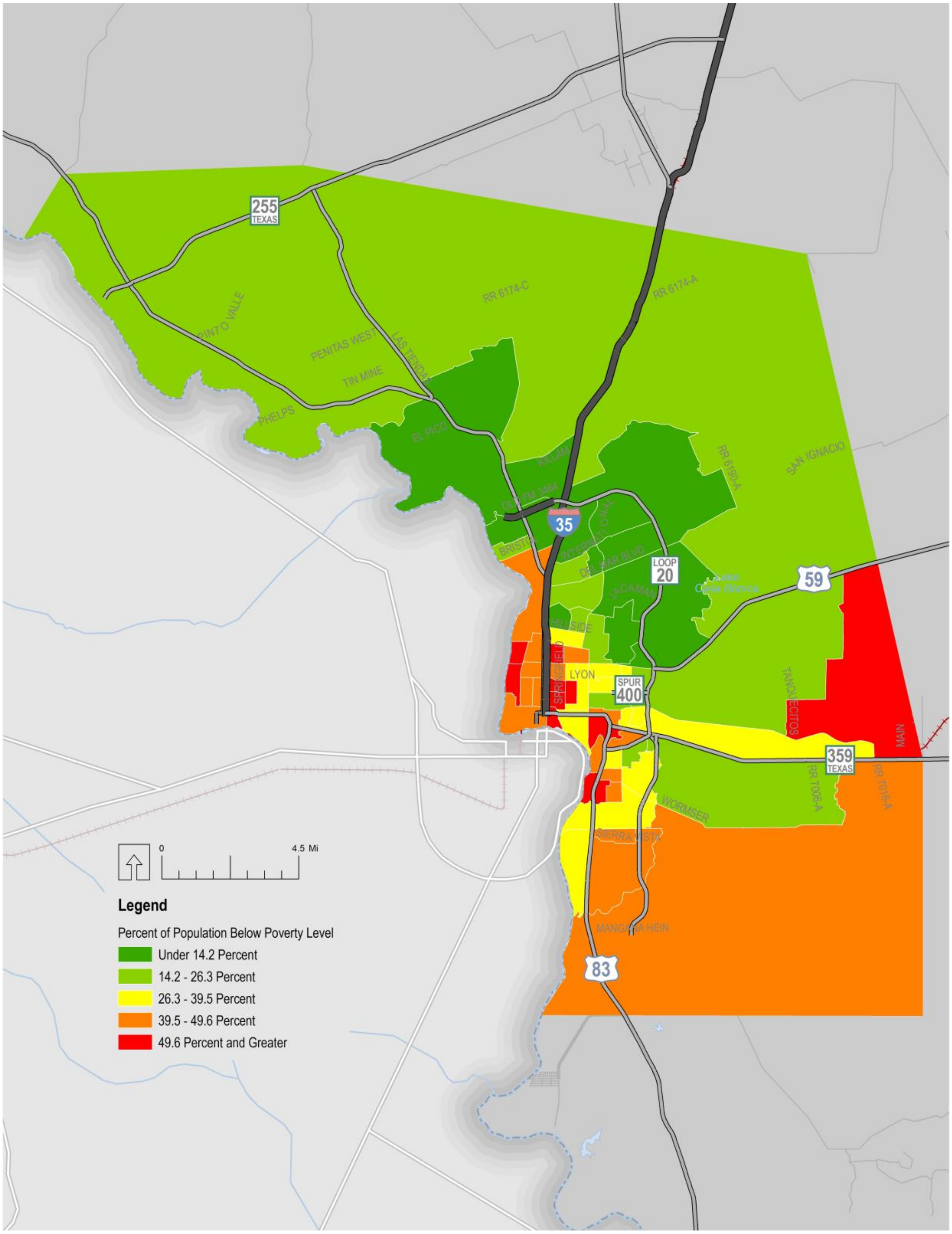
Source: U.S. Census Bureau, 2019

Low Income Populations

The U.S. Census Bureau uses a set of money income thresholds that vary by family size and composition, following the Office of Management and Budget's (OMB) Statistical Policy Directive 14, to determine the poverty numbers. If a family's total income is less than the threshold number, then that family and every individual is considered in poverty. The calculation of poverty thresholds considers inflation with Consumer Price Index (CPI-U). These thresholds do not vary geographically.

Figure 2-9 shows the 2017 ACS 5-Year Estimates for the percentage of the population below the poverty level by Census tracts in Webb County. The low-income areas are generally distributed in the central city of Laredo, south Laredo, and southeast side of the Laredo MPO region.

Figure 2-9: Percent of Population Below Poverty Level by Census Tract



Source: 2017 ACS 5-Year Estimates

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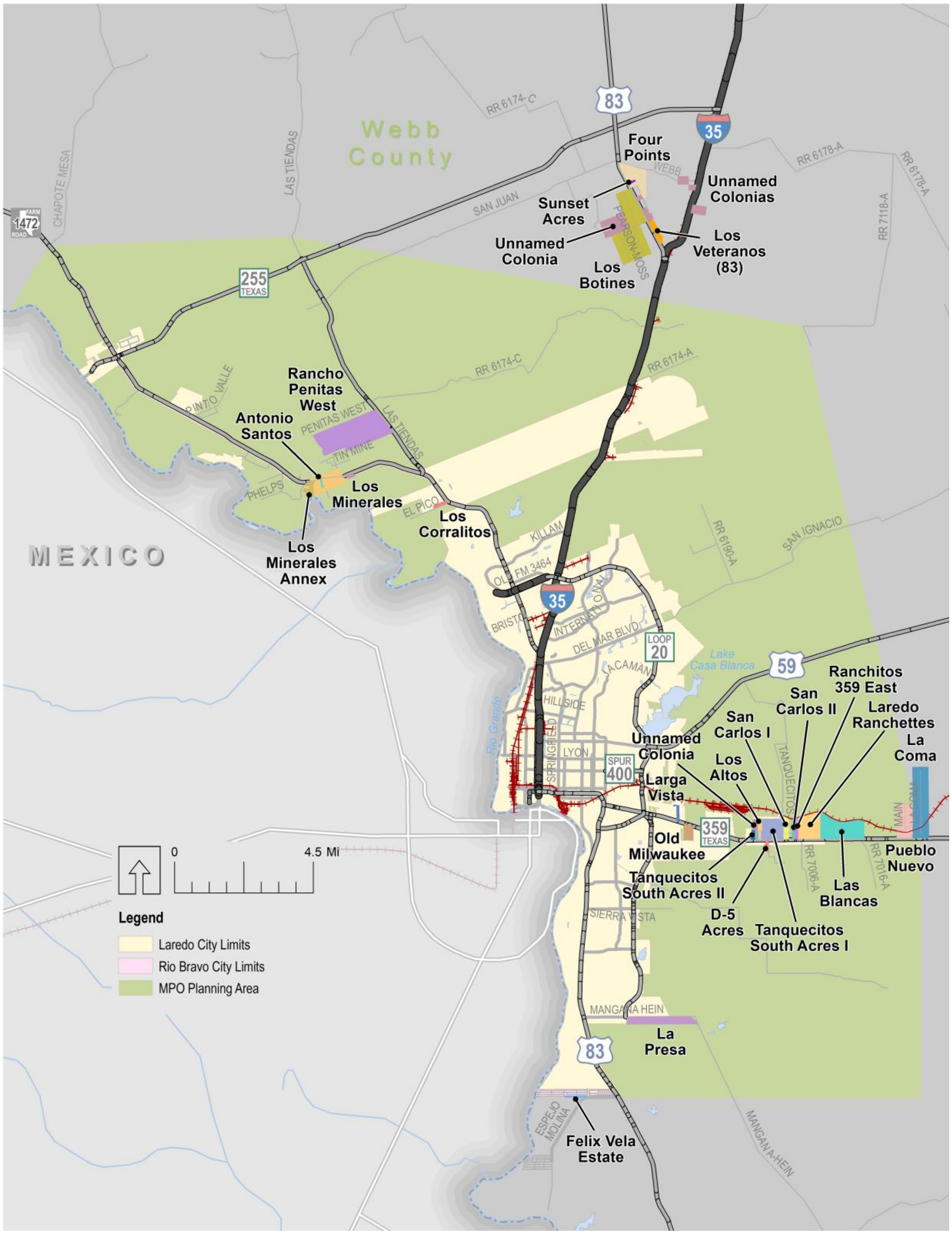
Regional Context - Colonias

"Colonia" is the Spanish term for a community or neighborhood. Within Texas, colonias are defined as economically distressed residential areas located in unincorporated land along the US-Mexico border, often lacking basic public infrastructure, including potable water, sewer systems, electricity, paved roads, and safe and sanitary housing. Residents of colonias are mostly low-income individuals seeking access to affordable living accommodations. Moreover, colonias are usually located on undesirable land such as floodplains and in unincorporated areas with looser governmental regulations.

Figure 2-10 displays the locations of colonias within the Laredo MPO region. When considering these areas, it is important to consider transportation improvements, as well as public transit needs of these more rural areas.

Figure 2-10: Colonias



Source: Laredo MPO

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Laredo Urban Transportation Study

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Land Development Patterns

Over the course of 250 years, Laredo has developed from a small settlement with a single river crossing of the Rio Grande into a major city with the largest inland port of entry in the United States. As a city established in 1755 by Spanish colonists, the historical development patterns of the City of Laredo reflect the Spanish laws, guidelines, and traditions for the establishment of colonial settlements. The historic settlement included a plaza, narrow streets, and buildings constructed at the street edge and property lines. Laredo remains a mostly gridded city, though recent development has utilized a suburban pattern.

At the time the City of Laredo was established, the primary modes of transportation were by foot, mule, or horse-drawn cart. The introduction of the streetcar connecting Laredo and Nuevo Laredo in 1890 allowed for development to begin pushing further from the historic downtown core. The construction of highways resulting from the Federal Highway Act of 1921 induced land development patterns even further outside the historic downtown core. Development patterns have gradually shifted from a denser more urban development pattern with a mix of land uses to a sprawling more suburban development pattern with a separation of land uses.

Existing Land Uses

The existing land uses within the Laredo MPO area are showing in **Figure 2-11**. Overall, commercial and retail development tends to be situated along major road thoroughfares such as IH 35. The most predominant area of commercial and retail development is in the Mall del Norte area along IH 35, between Del Mar Boulevard and Calton Road.

Industrial facilities are concentrated in industrial park areas on the outskirts of the City of Laredo, especially along I-35, Mines Road, and Bob Bullock Loop towards the north.

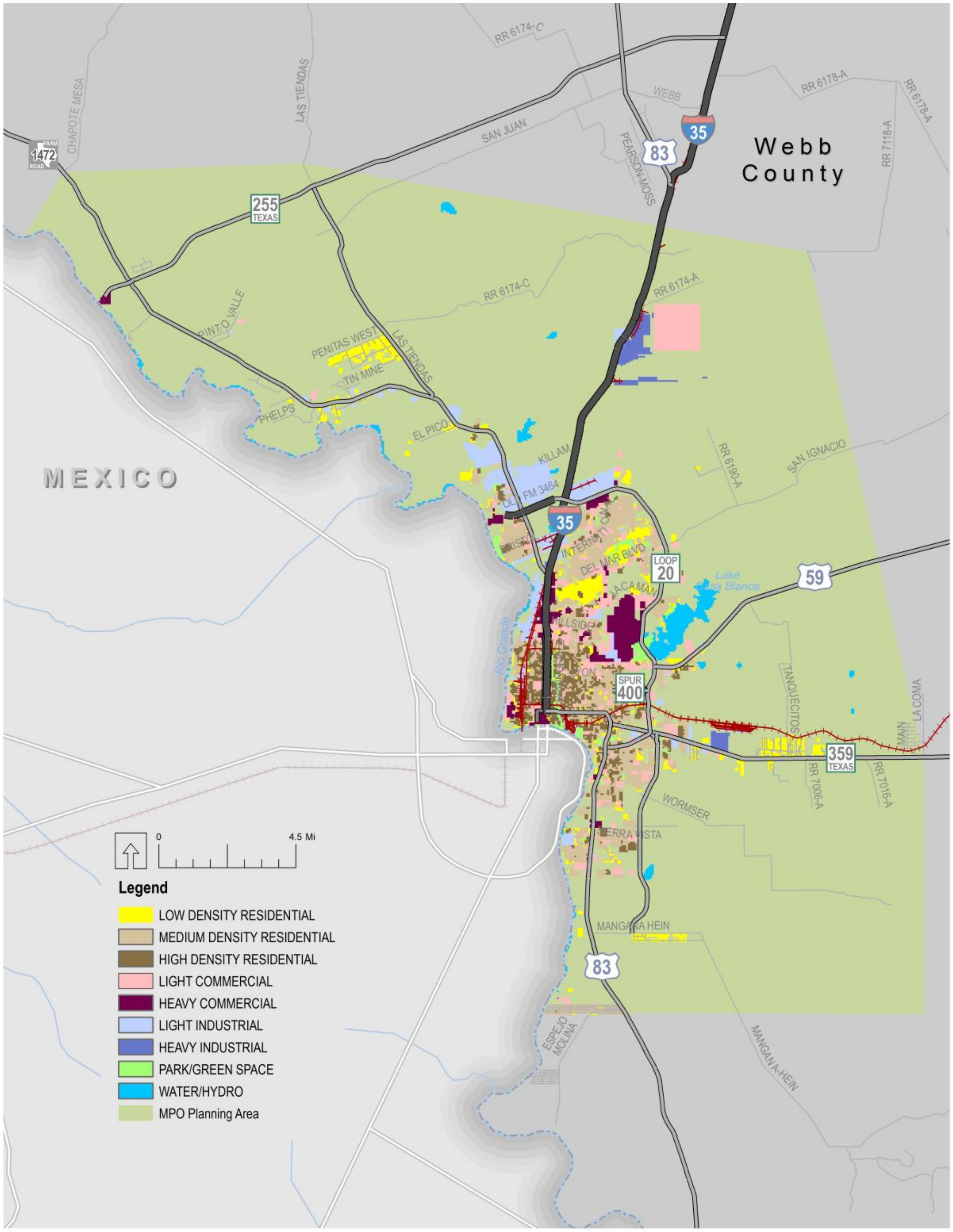
Commercial land use category includes office spaces, retail shops, public buildings, institutional areas parks, and open spaces. Public or institutional uses are interspersed throughout the City of Laredo, particularly in the city center and in residential areas.

Parks and open spaces are also interspersed throughout the City and often in proximity or adjacent to water features such as creeks. The main park in the region is Lake Casa Blanca State Park in the northeast.

Lastly, residential development which accounts for 17.4% of all land area in the City of Laredo is contained primarily between the Rio Grande River and Bob Bullock Loop (Loop 20), although there are clusters along Mines Roads, Zapata Highway (US 83), and SH 359.

Table 2-9 shows the current land use type by square miles and percent of total are for both the City of Laredo and the full MPO planning area. As shown in the figure, a major of the area within the Laredo MPO is unclassified, undeveloped, or vacant. The availability of undeveloped or vacant land outside of the jurisdiction of land use controls can lead to an increase in urban sprawl and leapfrog development patterns when experiencing a growing population.

Figure 2-11: Existing Land Use



Source: City of Laredo

Table 2-9: Land Use Type

Land Use Type	MPO Planning Area		City of Laredo	
	Square Miles	Percent	Square Miles	Percent
Commercial	20.00	5.1%	19.16	23.8%
Industrial	0.48	0.1%	0.48	0.6%
Residential	14.07	3.6%	14.03	17.4%
Agricultural, Farm, and Ranch	34.18	8.8%	29.52	36.7%
Utilities	0.43	0.1%	0.43	0.5%
Vacant	6.45	1.7%	6.42	8.0%
Other	0.33	0.1%	0.33	0.4%
Unclassified	314.52	80.6%	10.12	12.6%
Total	390.45	100.0%	80.48	100.0%

Source: Laredo MPO

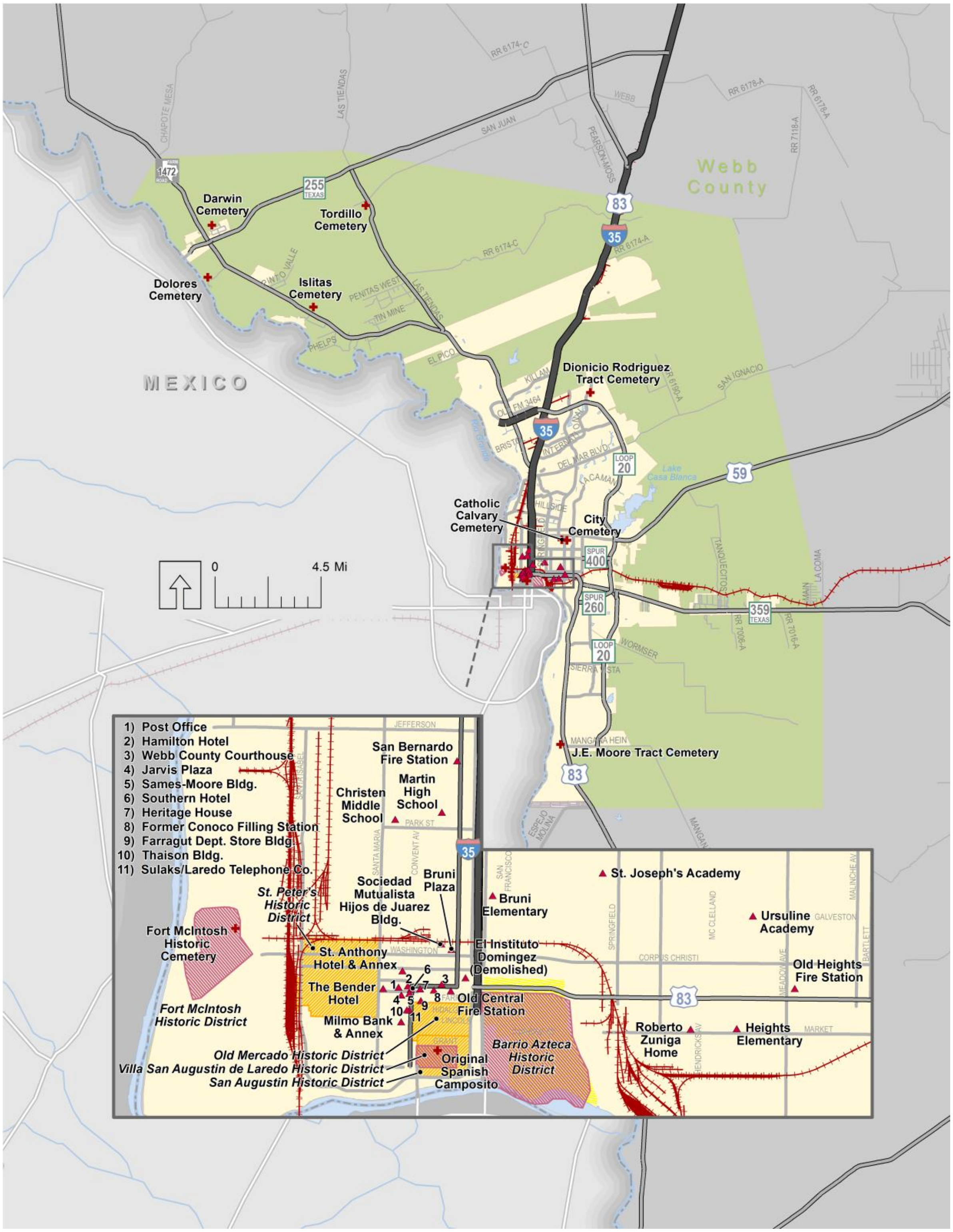
Cultural Landmarks

As required by federal law, all federal agencies must establish their own historic preservation programs for identifying, evaluating, and protecting historic properties. Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended in 1976, 1980, and 1992) and Section 4(f) of the Department of Transportation Act of 1966 requires such historical preservation responsibilities of the Federal Highway Administration (FHWA). Therefore, it is important for metropolitan transportation planning purposes to identify such historical landmarks and sites.

As mandated by the National Historic Preservation Act of 1966, the National Park Service administers the National Register of Historic Places (NRHP) as part of a national program to determine and protect landmarks and sites of historic significance (**Figure 2-12**). As such, the NRHP is the official list of the nation's historic landmarks and sites deemed historically important and worthy of preservation. To be eligible, a property must meet the National Register Criteria for Evaluation in relation to the property's age, integrity, and significance.

Within the Laredo region, many landmarks and sites have been identified as historically significant at either the local, state, or national level. Specifically, eight historical places in Webb County have been identified on the National Register of Historic Places, including the San Jose de Palafox Historic/Archeological District, Barrio Azteca Historic District, Fort McIntosh, Hamilton Hotel, Los Ojuelos, San Augustin de Laredo Historic District, U.S. Post Office and Custom House, and the Webb County Courthouse. Most of these places are located within the city's downtown area. Additional locally identified historic districts include the San Augustin District, the Old Mercado District, and the St. Peter's District. Local historic urban design guidelines and policies for development can be found in the City of Laredo's Historic Urban Design Guidelines, adopted by City Council in 1997.

Figure 2-12: Historic Districts and Landmarks



Source: City of Laredo

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Laredo Urban Transportation Study

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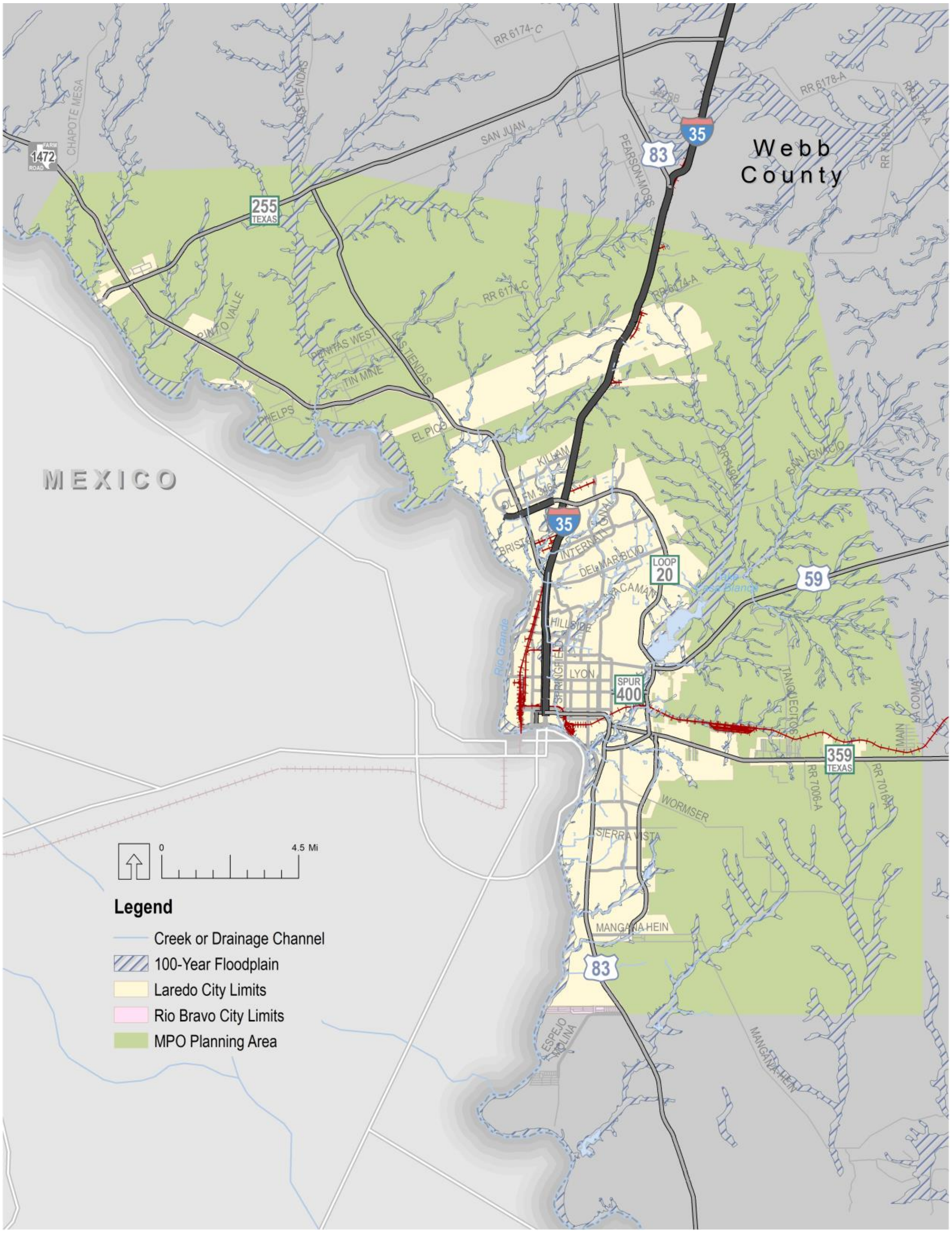
Geographic Barriers and Water Feature Considerations

An awareness of the geographic characteristics of an area are is needed to understand the natural barriers or opportunities for developing transportation networks and infrastructure. Furthermore, the natural resources of an area are significant not only in terms of the ecosystem, but also in terms of the attractiveness of a region. Developing with the natural features, instead of against them, are smart investment strategies for the future.

Within the vast Texas geography, Laredo is located south of the Edwards Plateau of Central Texas, on the west side of the Rio Grande Plains, west of the Coastal Plains, and east of the mountains of Mexico. The land is relatively flat with a few rolling hills and an average elevation of about 438 feet. The flat land is primarily covered with brush consisting of grasslands, oak, and mesquite trees. Besides the Rio Grande River, Lake Case Blanca in Lake Casa Blanca International State Park, which consists of about 756 surface acres along Chacon Creek, is another significant feature located northeast of downtown Laredo, just west of Bob Bullock Loop.

Other water features include several smaller lakes and creeks that drain into the Rio Grande River including San Idelfonso Cuervo, Becerra, Sombreitillo, Chacon, Zacate, and Santa Isabel creeks. These creeks in the local drainage basin are more prone to flooding and tend to be within the 100- and 500-year floodplains, as classified according to the Federal Emergency Management Agency (FEMA) as shown in **Figure 2-13**. In relation to transportation planning, it is especially important to allow the creeks to drain as nature intended and to avoid constructing transportation infrastructure within the flood areas.

Figure 2-13: Floodplains



Source: City of Laredo

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Travel and Tourism Considerations

The Laredo MPO area attracts tourists to see and experience the unique cultural, historical, recreational, and environmental assets within the area. Incorporating these assets into the planning process ensures the development of smart transportation solutions that will enhance a visitor's experience, reinforce the local economy, improve resident travel, and protect the environment.

To incorporate travel and tourism into the planning process, the Laredo MPO has sought input and consultation with agencies and officials responsible for tourism as part of the updated 2017 Public Participation Plan. Officials representing travel and tourism interests have been identified and documented as part the Interested Parties contact list that the MPO maintains. The South Texas Economic Development Corporation was also included as an MPO technical committee member in the development of this MTP.

In November 2018, a focus group meeting on travel, tourism, and economic development was held to obtain input for the development of this MTP. The focus group meeting served as a forum for members of both public and private sector agencies and organizations who play a key role in the future development of the region, focused on ways to optimize and coordinate transportation and land development, promote economic development, and address issues related to travel and tourism that impact the Laredo region's quality of life and economic development initiatives.

The City of Laredo Convention and Visitor's Bureau maintains VisitLaredo.com. The website provides detailed information on attractions, lodging, and transportation options throughout the region. The Visit Laredo mobile application can be downloaded on smart phones for mobile access to the variety of tourism attractions and transportation options to travel throughout the city.

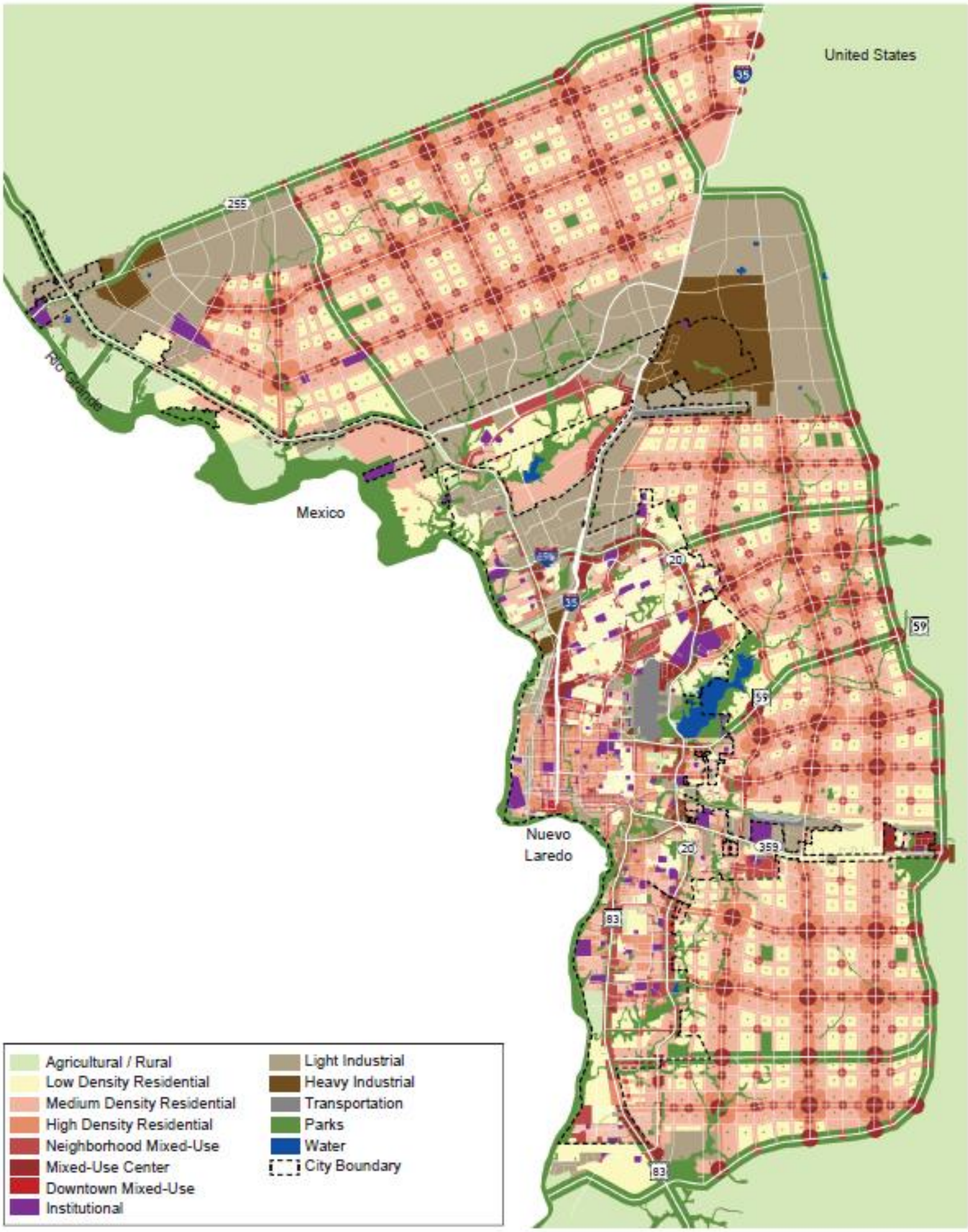
Future Land Use and Policy Considerations

The City of Laredo Comprehensive Plan, Viva Laredo, was recently adopted in December of 2017. Viva Laredo provides a basis and vision for land development in the City of Laredo. It includes policies based on goals, objectives, and strategies for a coordinated planning approach in managing future growth. Viva Laredo focuses on four land use strategies to achieve a more accessible, connected, and livable Laredo:

- **Focus on Downtown**: The City of Laredo is committed to developing policy to encourage infill and redevelopment of the historic downtown core. Revitalization of the historic center will anchor and enhance the overall character of the city and contribute to long-term sustainability.
- **Revitalize Older Neighborhoods**: The older neighborhoods of Laredo feature walkable streets, parks, a mix of land uses, a variety of housing types, and many historic buildings. Revitalization includes improving public infrastructure, infilling empty lots and parking lots, and restoring valuable older buildings.
- **Retrofit Suburban Neighborhoods at Strategic Locations**: Suburban areas segregate housing, shopping, and offices into separate distracts that can only be reached by automobile. Suburban style development patterns have become increasingly unpopular and unattractive to American appetites. Viva Laredo provides a variety of techniques for retrofitting suburban areas to increase a diversity of land uses to provide opportunities for people of all ages, backgrounds, and people to live and work.
- **Ensure that New Subdivisions Complete the Community**: New developments should be quality additions that enhance and compliment Laredo's best older neighborhoods. The monoculture of single-family housing must be avoided.

Viva Laredo developed a Future Land Use Map to guide city growth and policy, **Figure 2-14**. The Future Land Use map organizes development based on place types organized by intensity. Walkable, mixed-use place types include regional mixed-use centers, neighborhood mixed-use centers, and hamlets. The vision depicted by the Future Land Use Map maintains the historic gridded pattern of development. Densities of a mix of land uses are centered downtown and encouraged at intersections of major roadways and activity centers on both the north and south sides of Laredo.

Figure 2-14: Future Land Use



Source: Viva Laredo (2017), City of Laredo

Transportation Patterns

Transportation Related Socioeconomic Statistics

Analyzing transportation data such as how people travel to work, the travel time required to reach work, vehicle miles traveled, availability of vehicles, and the number of registered vehicles suggests transportation needs and trends. Increased travel time to work could correspond with an expanding population as well as a congested transportation network. The ways in which people travel to work may indicate the importance of certain types of modes over others. The availability of vehicles or the number of registered vehicles could be related to the number of people driving to work. These issues are important in identifying improvements in transportation infrastructure.

Travel Time to Work

Table 2-10 shows the breakdown of commuters by travel time to work for Webb County, Texas, and the United States based on 2012 ACS estimates. Compared to the rest of Texas and the U.S., people in Webb County spend less time commuting to work. This is not surprising as the urbanized area of Webb County is generally smaller in area and more compact, which enables commuters to spend less time traveling to work.

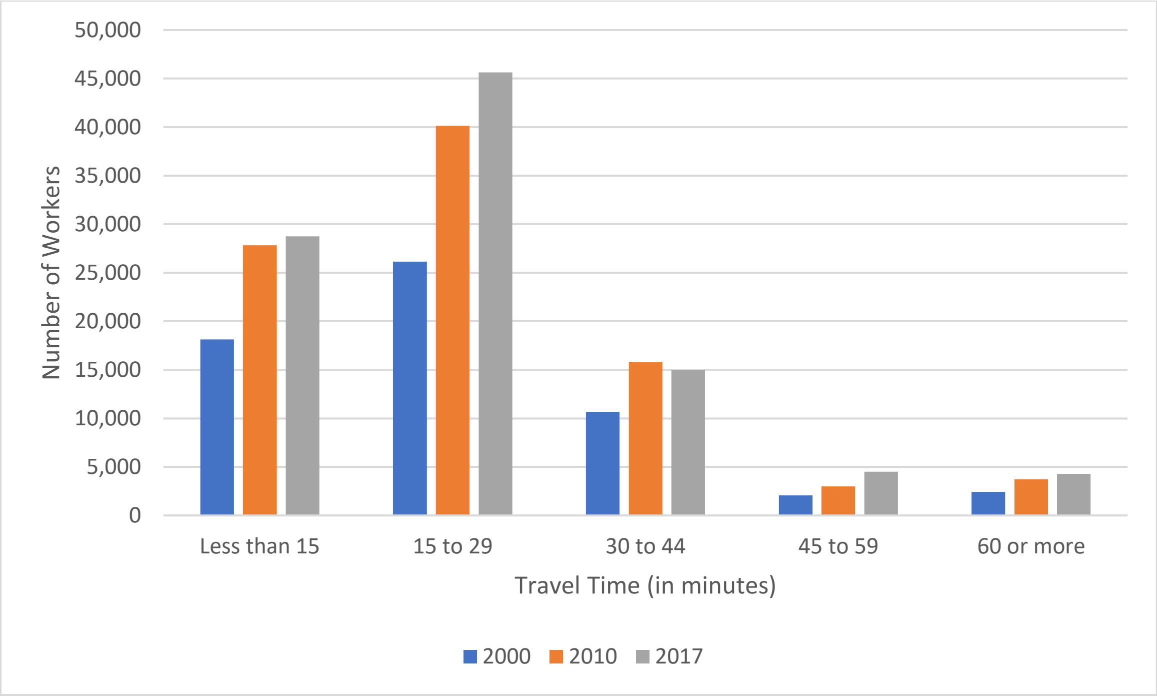
Table 2-10: Percent of Commuters by Travel Time to Work, 2017

Travel Time	Webb County	Texas	United States
Total Commuters	98,170	11,988,267	141,404,632
Less than 5 minutes	2%	3%	3%
5 to 9 minutes	9%	10%	10%
10 to 14 minutes	18%	14%	14%
15 to 19 minutes	24%	16%	15%
20 to 24 minutes	17%	14%	15%
25 to 29 minutes	5%	6%	6%
30 to 34 minutes	12%	15%	14%
35 to 39 minutes	1%	3%	3%
40 to 44 minutes	2%	4%	4%
45 to 59 minutes	5%	9%	8%
60 to 89 minutes	2%	6%	6%
90 or more minutes	2%	2%	3%

Source: 2017 ACS 5-Year Estimates

Figure 2-15 displays the number of workers in Webb County according to their daily commute time for 2010 and 2017. As shown, compared to 2010, the number of workers commuting in 2017 increased by more than 50% from 2000, which further indicates an increased level of use of the region's transportation network in the last decade. This also corresponds with the overall increase in population for the region. Longer commute times can also correlate with increased congestion and people living further from their workplace. Moreover, with the increase in travel time and more people using the transportation system, this can also indicate increased congestion problems in certain areas.

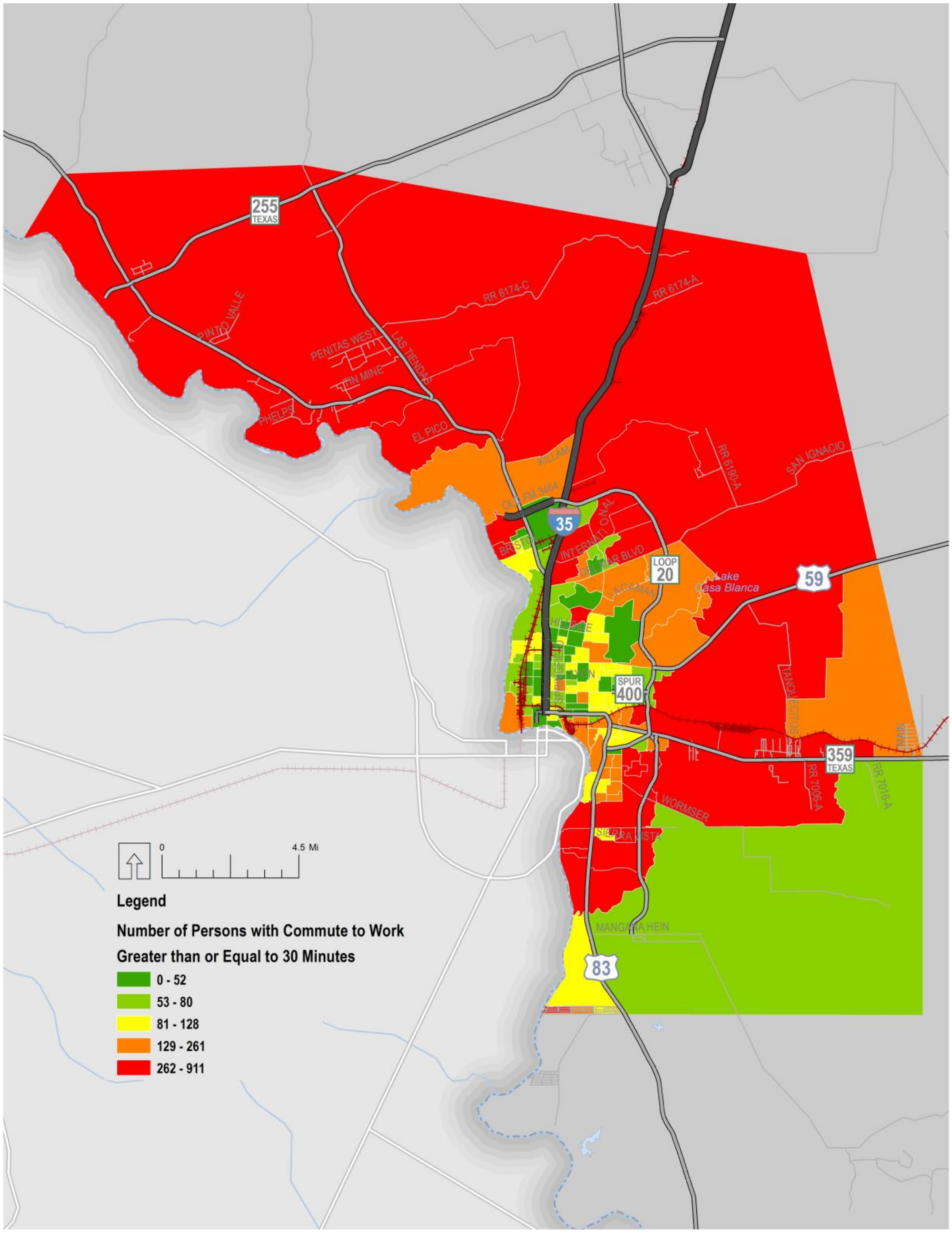
Figure 2-15: Travel Time to Work in Webb County in 2010 and 2017



Source: 2000, 2010, and 2017 ACS 5-Year Estimates

Figure 2-16 displays the number of persons with travel times to work greater or equal to 30 minutes by census block group. This map indicates parts of the region where travel times are the highest. Individuals residing within these census block groups tend to travel long distances to reach work destinations. As shown in the map, census block groups represent a large number of individuals with long travel times to work. Taking this information into consideration is important when making transportation investments.

Figure 2-16: Travel Time to Work Greater than Thirty Minutes by Census Block Group



Source: 2010 and 2017 ACS 5-Year Estimates

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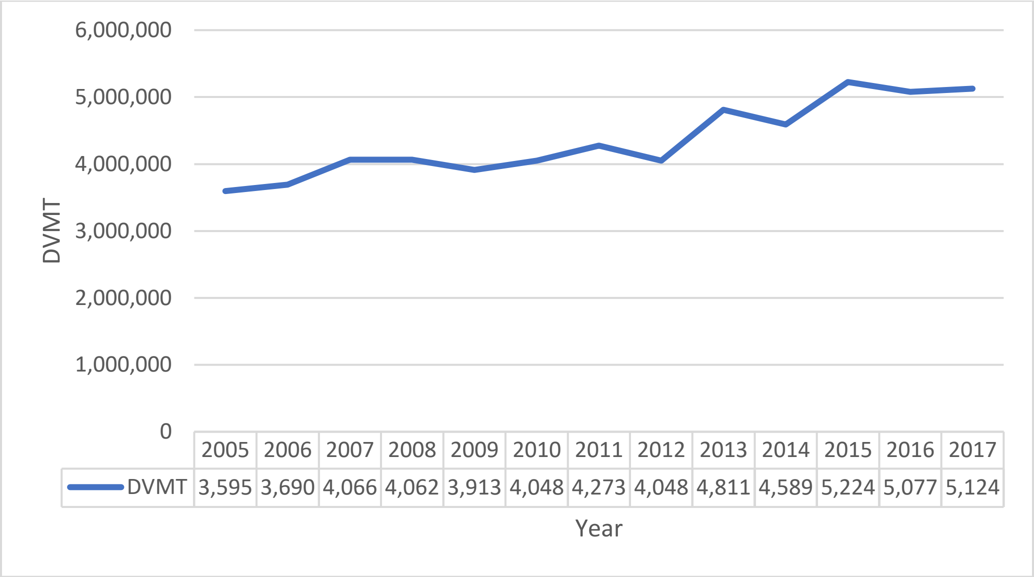
Vehicle Miles Traveled

Vehicle miles traveled (VMT) is the total amount miles traveled by all vehicles on all public roads. **Figure 2-17** displays the total daily VMT (DVMT) for Laredo District from 2005 to 2017. During this time, DVMT generally showed a trend of increase despite a few recent decreases. Compared to 2005, DVMT in Laredo District in 2017 is about 1.5 million more than that in 2005. Increased DVMT is also related to population growth and expansion and may further indicate that people are living further from their workplace. Additionally, a region's income and economy may also reflect the use and access of personal vehicles, which in turn, will cause DVMT to increase.

Figure 2-17: Daily Vehicle Miles Traveled in the TxDOT Laredo District



Source: TxDOT-TPP Roadway Inventory

Means of Transportation to Work

Table 2-11 displays the means of transportation to work by percentage of workers in Webb County, Texas, and the United States based on 2017 ACS 5-Year Estimates. The data shows that the percentage of workers who drove alone to work in Webb County is higher than both Texas and the United States. More workers in Webb County, however, tend to carpool as compared to all workers in Texas or United States.

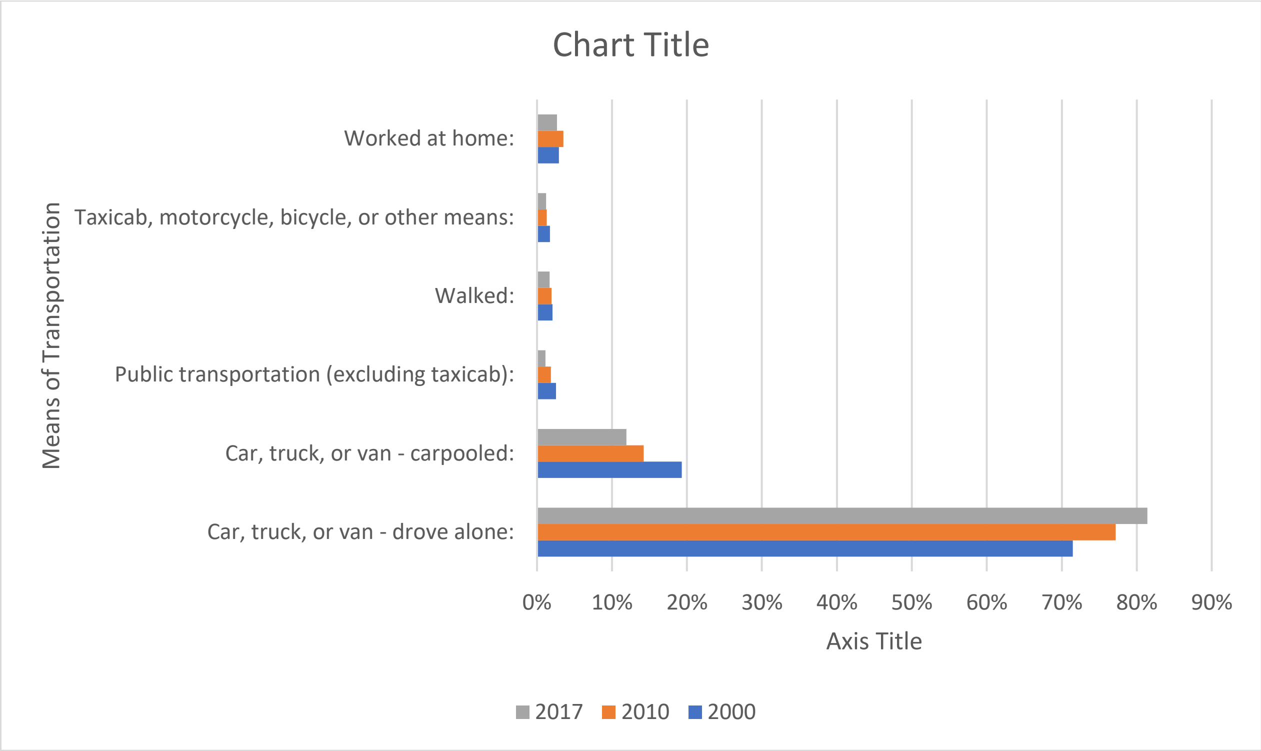
Figure 2-18 indicates the percentage of workers (who are 16 years and older) in Webb County that used a certain type of transportation to commute to work in 2000 and 2012. As shown, the percentage of people that drove alone increased from 2000 to 2012. This increase directly relates to the decrease in the percentage of people that carpooled, used public transportation, or used an alternative means (such as walking or biking) during the same time periods. The percentage of workers who worked at home increased from 2.9% in 2000 to 4.3% in 2012, by almost 50%.

Table 2-11: Means of Transportation to Work

Means	Webb County	Texas	United States
Total (workers 16 years and older)	100,860	10,776,005	148,432,042
Drove alone	81.4%	80.2%	76.4%
Carpooled	11.9%	10.4%	9.2%
Public transportation	1.1%	1.7%	5.1%
Walked	1.7%	1.6%	2.7%
Taxicab, motorcycle, bicycle, or other means	1.2%	1.7%	1.8%
Worked at home	2.7%	4.4%	4.7%

Source: 2017 ACS 5-Year Estimates

Figure 2-18: Means of Transportation to Work in Webb County in 2000, 2010, and 2017



Source: 2010 and 2017 ACS 5-Year Estimates

Vehicle Availability

Table 2-12 indicates the vehicle availability of households in Webb County, Texas, and the United States in 2017 based off 2017 ACS 5 Year estimates. As shown, a larger percentage of households were less likely to have access to any vehicle as compared to Texas. The numbers of Webb County are similar to the national average. The higher number of households with no vehicle available suggests that mobility in this region is more related to the provision of public transportation than a typical county in Texas.

Figure 2-12: Number of Vehicles Available

Number of Vehicles	Estimate 2017		
	Webb County	Texas	United States of America
Total	72,379	9,430,419	118,825,921
No vehicle available	6.7%	5.5%	8.8%
1 vehicle available	32.4%	33.4%	33.2%
2 vehicles available	37.1%	40.3%	37.4%
3 vehicles available	16.0%	14.8%	14.2%
4 or more vehicles available	7.7%	6.0%	6.4%

Source: 2017 ACS 5-Year Estimates

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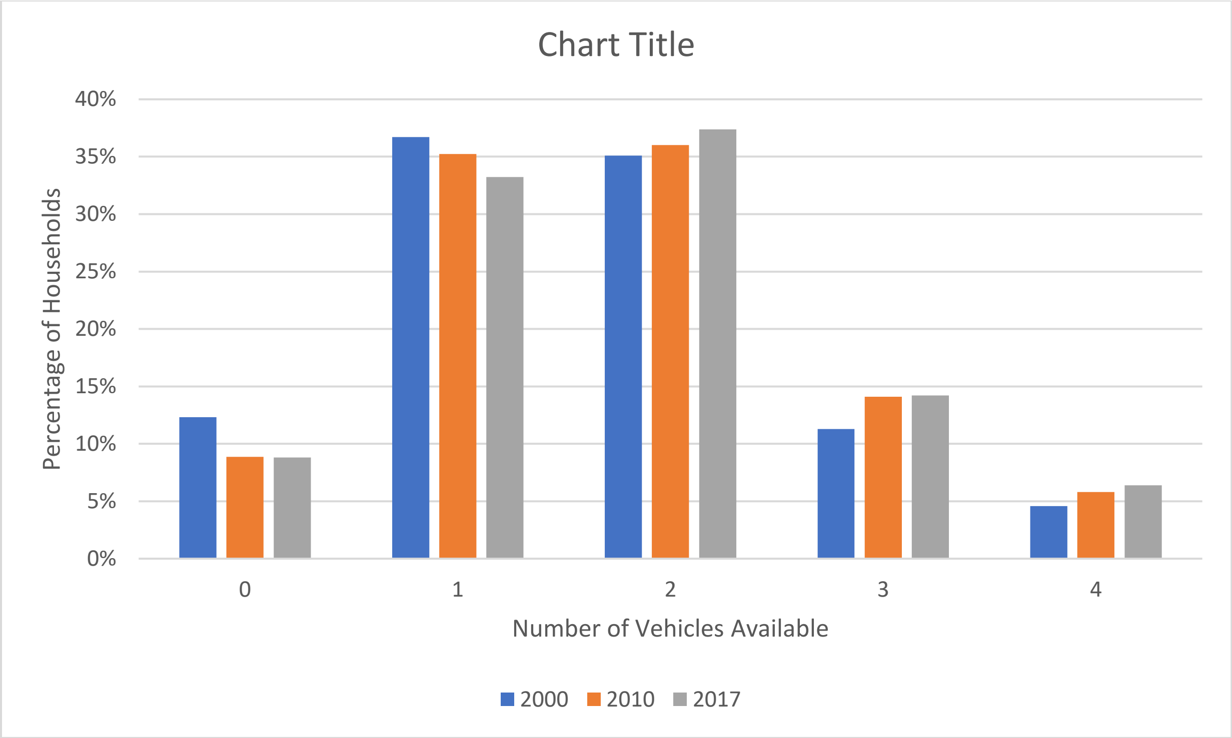
Figure 2-19 displays the vehicle availability for households in Webb County for the years 2010 and 2017. The percentage of households owning only one or no vehicles decreased over time, while the percentage of households owning two or three cars increased over time. This occurrence also directly relates to the increase in driving alone and the decrease in use of public transportation, and alternative means during the same time.

Figure 2-19: Number of Vehicles Available, Webb County



Source: 2010 and 2017 ACS 5-Year Estimates

Registered Vehicles

Table 2-13 displays the number of registered vehicles for 2012, 2013,2014, 2015, 2016, 2017, 2018, and the compounded annual growth rate from 2009 to 2012 for Webb County and Texas. As shown, the number of vehicles registered continually increased for each year for both Texas and Webb County. However, Webb County's registered vehicles increased by a larger growth rate than Texas. This increase in registered vehicles relates to the increase in vehicle availability, use of personal transportation, and total vehicle miles traveled in Webb County.

Table 2-13: Registered Vehicles

Year	Webb County	Texas
2012	177,742	22,768,989
2013	186,361	23,341,861
2014	192,046	24,093,838
2015	196,148	24,264,398
2016	197,805	24,195,726
2017	201,161	24,533,437
2018	205,384	24,628,118
Annual Growth Rate (2012-2018)	2.09%	1.13%

Source: Texas Department of Motor Vehicles

Freight Transportation Patterns

Positioned along the I-35 corridor and adjacent to Mexico, Laredo is a dominant inland port. Laredo is the home to five ports of entry serving the border crossings between the U.S. and Mexico. International freight is a main economic driver in the Laredo region and impacts development patterns and land uses. In 1926, US 81 (present day I-35) was constructed through the city center of Laredo terminating at the international border. With the rapid increase in automobiles, the reach of development has continued to expand further outward from the historic downtown core. The growth of the port and the expansion of freight traffic influences the development patterns of the Laredo. Federal plans including the construction of a loop highway at the furthest extent of the city and the construction of additional entries into Nuevo Laredo will continue to shape the landscape of development.

Roadway Transportation Patterns

Downtown Laredo and adjacent areas to the north and east developed with a small block and street grid. The area north of US 59 and south of Lomas Del Sur Boulevard, however, have developed a less connected local street network consisting of subdivisions that connect to a system of collector and arterial roadways. I-35 connects from the border crossing at bridge 2 to the north. Loop 20, or Bob Bullock Loop, connects the eastern edge of the city to the northern and southern portions. Additional major highways within the region include US 83 in the south, US 59 and US 359 in the east, and FM 1472 (Mines Road) in the northwest.

Major Traffic Generators

Special traffic generators, such as public facilities, hospitals, universities, shopping centers, and other special transportation hubs, such as airports, place special demands upon the transportation system. In Laredo, this is particularly true of industrial parks, as the commercial vehicle traffic related to the international trade activity is an important issue for the region. These points of major activities attract many people, and thus contribute to the regional traffic volumes and flow patterns. It is important to identify where these regional traffic generators are located to effectively plan for transportation infrastructure and improvements. **Figure 2-20** shows the locations of major traffic generators within the region.

Figure 2-20: Major Traffic Generators

Source: Laredo MPO

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Laredo Urban Transportation Study

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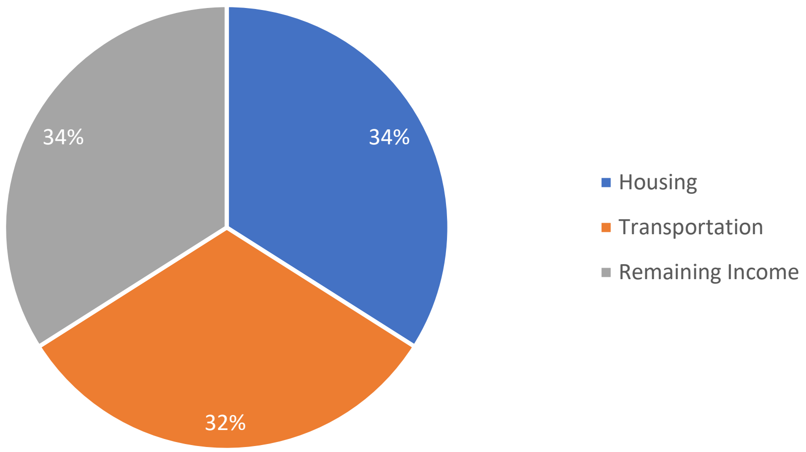
Household and Transportation Costs

Transportation costs are typically the second largest expenditure for a household, following the cost for housing. Location matters. Transportation costs are largely a function of the characteristic of the neighborhood in which a household is located. Neighborhoods with a denser land development pattern, hosting a mix of land uses create an environment ripe for multimodal transportation options. These compact and dynamic neighborhoods host walkable streets, opportunities for transit, and access to jobs and destinations. Compact neighborhoods are more efficient, affordable, and sustainable; benefiting both households and businesses.

The Center for Neighborhood Technology (CNT) maintains the Housing and Transportation (H+T) Affordability Index to provide a comprehensive view of affordability that includes the cost of housing and transportation. According to the CNT H+T Affordability Index, transportation costs residents of the Laredo MPO area an average of 32 percent of total income. **Figure 2-21** shows the breakdown below. Considering both housing and transportation costs provides a more comprehensive understanding of regional affordability.

Figure 2-21: Average Housing and Transportation Costs as a Percent of Income for the Laredo MPO Area



In areas with a more dispersed, suburban style of development, the population requires more vehicles to drive far distances which increases the cost of living. Transportation costs for the Laredo MPO area based on the CNT H+T Affordability Index is shown in **Figure 2-14**.

Figure 2-14: Transportation Costs in the Laredo MPO Area

Annual Transportation Costs	$12,413
Autos per Household	1.80
Average Household VMT	22,839
Transit Ridership % of Workers	3%
Annual Transportation Cost	$12,413
Annual Auto Ownership Cost	$9,281
Average Monthly Housing Cost	$1,094
Residential Density	1.31 Households per Acre
Employment Access Index	14,583 Jobs per Square Mile

Economic Conditions in the Laredo Region

Understanding the trends in employment and industry growth helps to understand transportation investments that are appropriate to meet the needs of the Laredo region both today and in the future. Total employment within the Laredo MSA for 2018 is 112,190 employed individuals. This number represents 112,190 individuals who are employed with jobs. **Table 2-15** displays the total employment for the years 2005 through 2018. With the exception of 2009, the Laredo MSA has experienced an annual percent increase in total employment of 1 percent or greater. Most recently, the Laredo MSA experienced a 2 percent increase in total employment from 2017 to 2018. Assuming a 1 percent annual increase in employment between today and 2045, the Laredo MSA could experience an increase of 34,578 jobs added to the region by the year 2045. The Laredo region must invest in transportation improvements today to appropriately accommodate the growth that is expected to occur 25 years into the future.

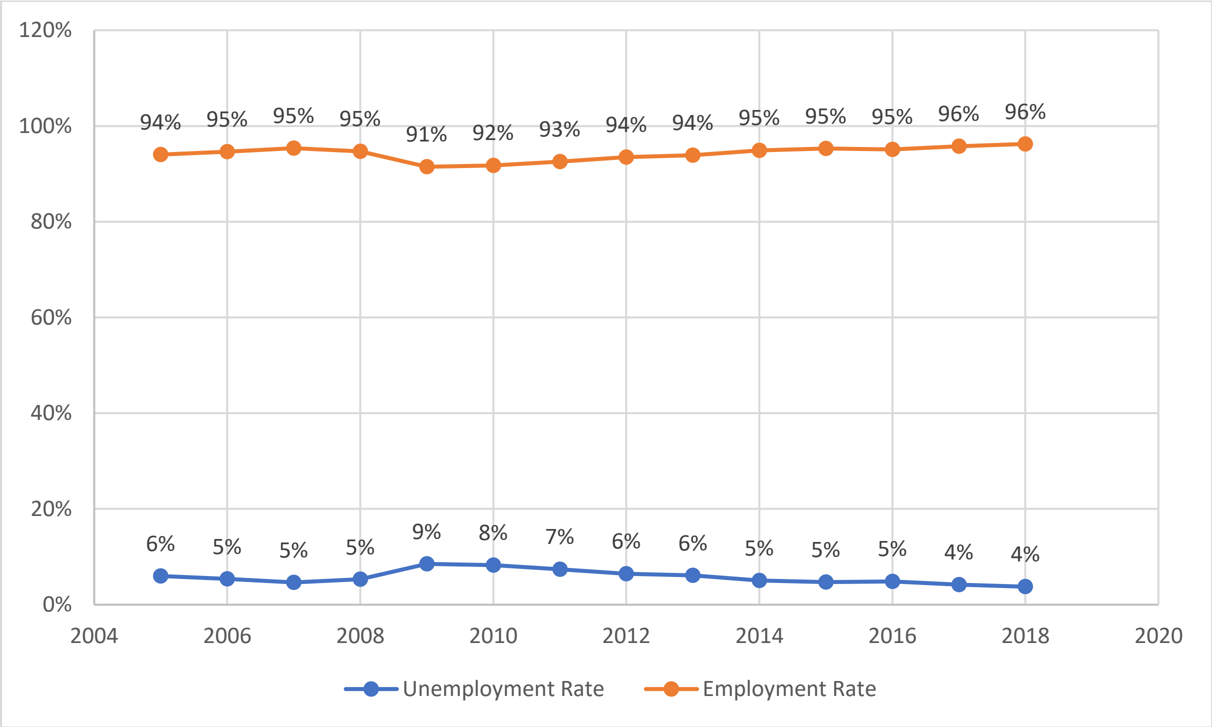
Table 2-15: Employment Totals and Annual Percent Change for Laredo MSA, 2005-2018

Year	Employment Total	Annual Percent Change
2005	80,484	-
2006	83,168	3%
2007	85,129	2%
2008	87,472	3%
2009	86,110	-2%
2010	96,364	12%
2011	99,885	4%
2012	102,072	2%
2013	103,601	1%
2014	105,664	2%
2015	106,590	1%
2016	108,333	2%
2017	110,384	2%
2018	112,190	2%

Source: Texas Labor Market Information

As shown in **Figure 2-22**, the unemployment rate of the region as steadily decreased since 2009. With a labor force of 116,573 in the Laredo MSA, the unemployment rate is only 3.8%. Laredo continues to thrive with an abundant, productive, and bilingual workforce.

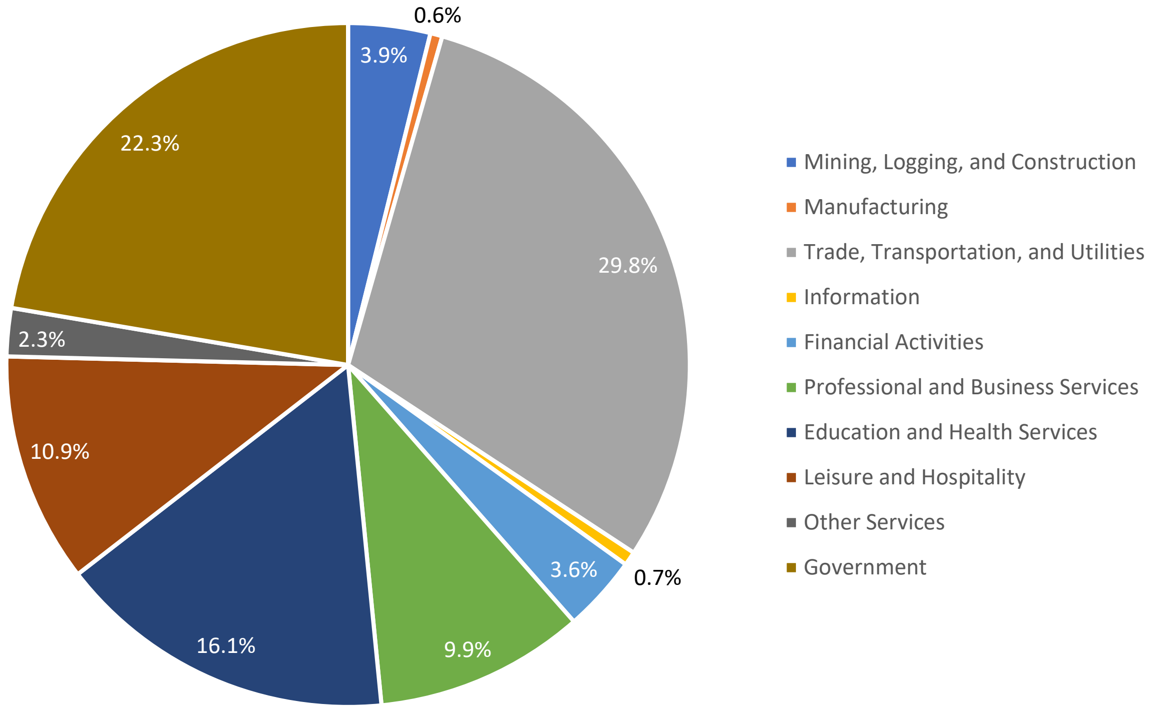
Figure: 2-22: Employment Rate and Unemployment Rate for Laredo MSA



Source: Texas Labor Market Information

The top five employment sectors within the Laredo MSA are (1) trade, transportation, and utilities: 29.8 percent, (2) government: 22.3 percent, (3) education and health: 16.1 percent, (4) leisure and hospitality: 10.9 percent, and (5) professional and business services: 9.9 percent. The industry composition by employment sector is shown in **Figure 2-23**. Trade, transportation, and utilities is the dominant employment sector at no surprise.

Figure 2-23: Industry Composition by Employment Sector, 2019



Source: Texas Labor Market Information

Laredo is a gateway for trade. According to the Laredo Economic Development Corporation, Laredo handled 87 percent of trade between the United States and Mexico. Over 2 million commercial trucks cross the U.S. Mexico border annually through Laredo. The Laredo region is served by two class 1 railroads, Union Pacific and Kansas City Southern. Within the region, over 40 million square feet of land is occupied for transportation and logistics use. Compared to ports within the United States, the Port of Laredo is ranked second for imports and exports in 2018 in total trade by monetary value.

As the Laredo region looks forward to the year 2045, maintaining the transportation network, developing efficiencies in the network, and finding ways to balance freight and other regional transportation needs is increasingly important for region leading the nation in international trade.

Chapter 3:
Public Input and the 2045 MTP

Introduction

The public participation process for the 2020-2045 MTP is consistent with all FAST Act federal transportation planning guidelines at the time of this plan's development. This chapter outlines the framework and schedule developed for the MTP, summarizes the process and outreach methods undertaken at a series of distinct stages of MTP development, and concludes with a summary of "What We Heard" from these outreach efforts and how this input shaped the vision, goals, and objectives for the plan. In addition to technical analysis, the MTP was shaped by input from the MPO Technical Advisory Committee, the public, and agencies through meetings, focus groups, and other targeted outreach. Additional details on the public participation process and copies of materials referenced within this chapter may be found in **Appendix A**.

MTP Outreach Framework

The 2020-2045 MTP was developed through the consensus of both the general community as well as the public and private entities included within the MPO's Policy Board and Technical Committee. Throughout the transportation planning process, the MPO has provided a wide range of opportunities for the public to be involved in the development of this MTP, and the approach and schedule undertaken are summarized below.

Public Participation Plan

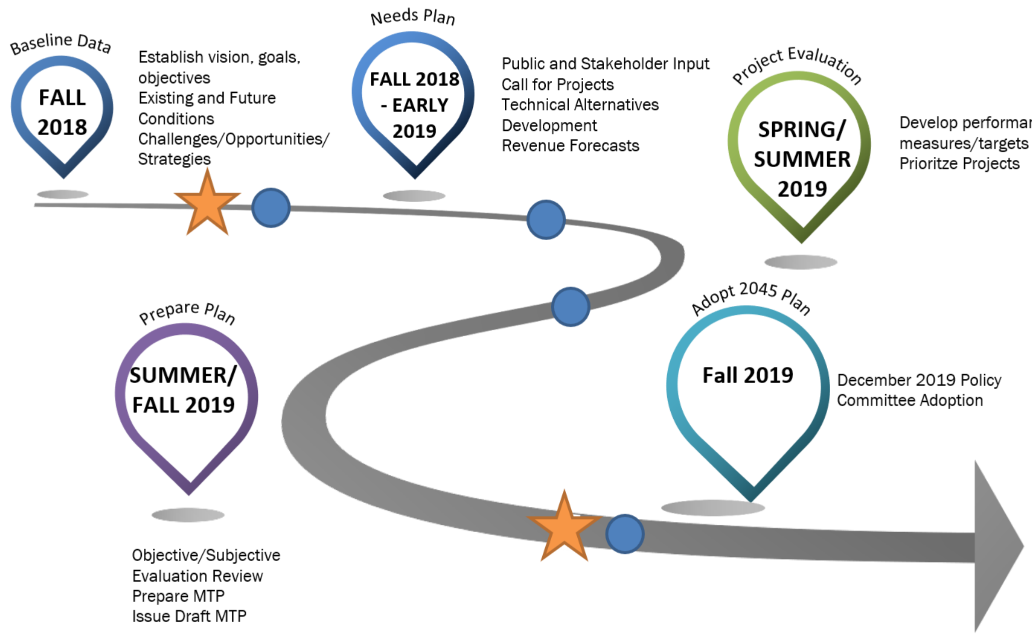
The Public Participation Plan (PPP) for the Laredo MPO provides the framework by which interested and affected individuals, organizations, agencies, and governmental entities are consulted and included in the metropolitan transportation planning process. The Laredo PPP was updated in May of 2017 to be compliant with 23 CFR 450.316.

As required by 23 CFR 450.316 (a), the PPP was updated to include providing opportunity for input from public ports and private providers of transportation. While employer-based transit incentive programs are not currently in place, the MPO continues to coordinate with the private industry on opportunities to enhance these incentives as well.

In addition, the Laredo MPO maintains a contact list of groups and individuals which have expressed interest in transportation planning activities. As required by 23 CFR 450.316 (b), the MPO expanded the contact list as described in the PPP to seek consultation with agencies and officials responsible for tourism and natural disaster risk reduction. The contact list for the MTP included over 700 interested and affected individuals, organizations, agencies and governmental entities and provided a way to disseminate information about public and agency meetings, and to solicit input and provide feedback on MTP development.

Public and agency involvement included a series of strategies that were employed at key points to develop the plan, including in developing the MTP vision, goals, and objectives, in identifying regional needs, soliciting project ideas and developing evaluation criteria for ranking project priorities, and to review and obtain additional input on the plan. The public and agency involvement schedule for this MTP is shown in **Figure 3-1**.

Figure 3-0-1: Public and Agency Involvement Schedule



Additional Targeted Elected Official and Environmental Justice Outreach

In addition to the outreach processes noted above and regular communications with an array of stakeholders through the MPO contact list, additional targeted outreach to several elected officials, agencies, and community organizations was undertaken to further solicit input into the process, particularly by stakeholders and groups that represent environmental justice or other traditionally underserved members of the community. One-on-one email and telephone communications were conducted to introduce the purpose of the MTP and to solicit input on the vision, goals, and objectives of the plan as well as to identify regional needs. As necessary, additional in-person interviews were conducted with interested contacts.

In addition to providing opportunities for one-on-one input from MPO Policy Board members, targeted elected officials outreach was conducted with City of Laredo and Webb County elected official representatives from the South Side of Laredo and several governmental and community organizations in the region, as noted below.

- South Texas Development Council
- US Border Patrol, Port of Entry
- United ISD
- Habitat for Humanity
- Elderly Nutrition Project
- Embarcadero Business Park
- Communities in Action
- Azteca Economic Development and Preservation Corporation
- City of Laredo Blue Ribbon Committee for People with Disabilities
- Laredo Clean Cities Coalition
- Rio Grande/Rio Bravo Basin Coalition
- Environmental Division, City of Laredo
- Barrio De Colores (BDC) community near Laredo
- Rio Grande International Study Center – Laredo
- Centro de Servicios Sociales Aztlan
- La Azteca Neighborhood Center
- Laredo Rotary
- Laredo Area Community Foundation

An Objectives-Driven Approach to Public Involvement

Establishing objectives for public outreach and measures of effectiveness to evaluate results of outreach is an important way to monitor and continue to improve public input processes in the region. The following objectives for outreach were established to ensure extensive opportunities for community input into the MTP process and to provide ways to continually monitor the success of outreach efforts and make continual improvements to outreach processes. These objectives and measures of effectiveness were evaluated following each public meeting series in the development of the plan and will continue to be reviewed as part of the MPO's commitment to a continuous, cooperative, and comprehensive public outreach process. Detailed results of these objectives and measures of effectiveness for each meeting may be found in **Appendix A**.

Table 3-0-1: Public Involvement Strategies and Measures of Effectiveness

Objective 1: Provide opportunities for input by a diverse stakeholder group of affected agencies and organizations in the Laredo region.	
Strategies and Tools	**Measures of Effectiveness**
Contact list	Number of representatives from each stakeholder group identified in federal regulations (23 CFR 450.316(a) and (b)) – At least one representative from each stakeholder group targeted in outreach efforts
Surveys	Number of surveys distributed to stakeholders and members of the public – at least 200
	Number of survey responses received – at least 10% of # of surveys distributed via stakeholder communications
Technical Advisory Committee meetings	At least one representative of local and state roadway, regional public transportation, and freight/railroad providers advising on the technical committee through the MTP process
Focus group meetings	Hold at least four thematic round table/focus group meetings during development of the plan to obtain input on a diversity of topics related to transportation issues
Objective 2: Raise awareness of public outreach meetings and events to reach a wide audience of Laredo residents and stakeholders.	
Strategies and Tools	**Measures of Effectiveness**
Public Notices	Postings are made available at major local government buildings/service centers
	# of people reached through email communications of public meetings – email notices sent out to at least 300 people
	Public notices posted at least 72 hours prior to public outreach events
	Public meeting notices posted/available on the MPO and Webb County websites
Press Releases/Media Coverage	# of media outlets reached through press releases – minimum of 25 outlets
	# of articles published about public meetings – at least two articles published (English and Spanish)
	Public meeting notifications posted in at least one English and Spanish publications of general circulation
	Publications of meetings includes al major formats: newspapers, electronic communications, website posting and physical postings at community/government buildings
Survey	% of respondents who heard about the meeting from varying notification sources (e.g. newspapers, advertisements, email)

Objective 3: Seek out input and participation by a diversity of Laredo residents and stakeholders, particularly those traditionally underserved by existing transportation systems, such as the disabled and elderly as well as low income and minority populations.	
Strategies and Tools	**Measures of Effectiveness**
Contact List	# of stakeholder groups representing the disabled or elderly community – at least five representative groups from public/private sector
	# of stakeholder groups identified representing Environmental Justice (i.e. Low Income and Minority) groups – at least five representative groups identified
Meeting Accessibility	Hold public meetings at locations reasonably accessible by public transportation. (All meetings within ½-mile walking distance of bus stop)
Survey	Representation of survey responses indicating low income or minority populations filled out/provided input through survey
Sign In Sheet	Mapping to indicate representation by zip code for attendees of public meetings – target representation from at least 50% of zip codes in the region.
Objective 4: Provide a public outreach process that encourages public participation in the transportation decision-making process.	
Strategies and Tools	**Measures of Effectiveness**
Meeting Locations and Scheduling	Hold at least two rounds of public meetings at each major public decision-making point at geographically diverse locations.
	Hold public meetings on weekday evenings after typical work days (5pm) and allow a window of time adequate for people to reasonably participate
Survey	# or % of respondents indicating that they felt they had an opportunity to participate and that their time was well utilized – At least 85% of survey respondent at least “agreed” that they had the opportunity to participate and that time was well utilized
Sign-In Sheets	All sign in sheets provide an opportunity for individuals to sign up to receive future communications and ways to be involved
Communication/Notification Materials	All communications provide people with contact information to answer questions and provide additional information to the public
Call for Projects	# of agencies and organizations reached in soliciting ideas on projects – at least 25 agencies and public/private organizations contacted to solicit project proposals
	Newspaper notification of public call for projects published at least 90 days before any Board action is taken to adopt plan
Objective 5: Ensure that all MTP Plan print and electronic materials communicate the Laredo MPO’s messages in a clear and effective way through the use of easy to understand language and that employs visualization techniques.	
Strategies and Tools	**Measures of Effectiveness**
MTP Logo	Development of a logo that concisely and consistently communicates information about the MTP
Meeting Materials and Notifications	All meeting materials and print notifications made available in English and Spanish
	Meeting handouts provided to clearly explain public meeting formats and ways to participate at the meeting
Surveys	85% of survey respondents that “agreed” that public meeting materials were visually appealing and easy to understand

Summary of Outreach Methods

Public and agency involvement was continuous throughout the MTP development, and targeted at several key milestones in developing the plan, as further discussed in the sections below:

- Establishing the regional vision, goals, and objectives
- Identifying regional needs and projects
- Evaluating and prioritizing projects
- Plan review and adoption

This section summarizes the methods employed to obtain input at each major project milestone. A summary of what we heard as a result of these meetings is provided as a final section to this chapter. Additional details on meetings, notes, and public involvement materials referenced may also be found in **Appendix A**.

Establishing the Regional Vision, Goals, and Objectives

Project Kickoff Meeting

A project kickoff meeting was held on Wednesday, August 20, 2018 with the Technical Advisory Committee. At this meeting, the project scope and schedule were reviewed, and members of the MPO Technical Advisory Committee were provided an opportunity to discuss their main concerns about the development and content of the MTP. The vision statement, developed through previous MTP development was discussed for any further refinement, and interactive exercises helped to further develop draft goals and objectives for the plan. The MPO Technical Committee consists of representatives of the agencies identified below.

MPO Technical Committee

City of Laredo

- City Bridge Director
- City Engineering Director

Public Meetings - Series 1

The first series of public meetings was held in October 2018. The first public meeting was held on Wednesday, October 17, 2018, from 5:30 PM to 7:00 PM at the Laredo Public Library, H-E-B Multipurpose Room (1120 E. Calton Road, Laredo, TX 78041), and the second public meeting was held on Thursday, October 18, 2018 from 5:30 to 7:00 PM at the Laredo College South Campus, William M. “Billy” Hall, Jr. Student Center (5500 South Zapata Highway, Laredo, TX

78046). These meeting locations were chosen to provide opportunities for public participation in diverse locations within the region, including traditionally underserved populations in the southern portion of the region.

Various outreach methods were used to advertise the meeting and encourage public participation. Outreach efforts prior to the public meetings included:

- Email notifications with attachment including details in both English and Spanish: The first email notification was sent on October 3, 2018, and a reminder email notification was sent on October 16, 2018.
- Twitter and Facebook: The City of Laredo Public Information Officer posted an invitation to the public meetings on Facebook and Twitter.
- Press release in both English and Spanish was distributed through the City of Laredo to a list of 37 regional media outlets.
- An advertisement was placed in the *Laredo Morning Times* newspaper on Sunday, October 7, 2018; Wednesday, October 10, 2018; and Monday, October 15, 2018.
- Flyers advertising the public meetings were placed on October 8, 2018 at Laredo City Hall, Webb County Commission Court Building, the TxDOT District Office, El Metro Transit Building, public libraries, and recreational facilities.
- The Laredo MPO placed a link on their website home page to the public meeting flyer.
- Advertisements in both English and Spanish were placed in the El Metro Bus System buses to inform the transit riding public about the meeting.

The first series of public meetings was intended to introduce the planning process to the public and collect public opinions on the transportation issues and needs for the region. Approximately 36 members of the community and professionals from various entities attended the public meetings.

The public meeting was hosted in an open house format for the public to provide input at any time during the duration of the meeting. Exhibits were displayed on large posters as well as projected on a screen through a looped presentation. All exhibits were displayed in both English and Spanish. The following exhibits were presented during the public meetings:

- Transportation Planning in Laredo
- Current and Future Needs
- Regional Growth
- Roadways and Travel Trends
- Freight and Other Intermodal Conditions
- El Metro Transit
- Existing and Proposed Bicycle Facilities
- MTP Vision and Draft Goals
- MTP Draft Goals and Objectives

Upon signing in, participants were given a welcome flyer, available in both English and Spanish. Large scale aerial maps were displayed on tables to allow participants to identify and discuss transportation issues and concerns with study team members. The exhibit board “MTP Draft Goals and Objectives” involved an interactive exercise that encouraged participants to identify their top three priorities for the Laredo region regarding draft goals and objectives of the MTP or to provide additional input on proposed goals and objectives.

The public was also provided a survey at the public meetings to obtain their input on the regional plan and to help evaluate the effectiveness of the public meetings and notifications. A follow up email was sent to meeting attendees and the Laredo MPO database of stakeholders on Monday, October 22, 2018 with an attachment of the survey in a fillable PDF form. Survey responses were requested for submission from the public by Wednesday, November 7, 2018. In total, 33 surveys were received – 15 surveys were received at the October 17 public meeting, 3 surveys were received at the October 18 public meeting, and 15 surveys were received by email.

Identifying Regional Needs and Projects

In follow up to initial meetings to establish vision, goals, and objectives of the plan, several outreach methods were initiated to obtain additional input from the public and stakeholder organizations on regional needs and potential projects, including focus group meetings, additional targeted outreach efforts to elected officials and representatives of environmental justice populations in the region, and issuance of a public and agency call for projects.

Focus Group Meetings

The Laredo MPO hosted a series of focus group meetings to obtain additional input from a variety of perspectives at the Traffic Safety Conference Room (5512 Thomas Ave, Laredo, TX 78041) on Wednesday, November 14, 2018 and Thursday, November 15, 2018. The purpose of the meetings was to explore "what it will take" to satisfy the mobility needs of the Laredo MPO region, from public sector transportation investments and land use policies to private sector economic and community development initiatives. Detailed summaries of discussion topics, invitees, and attendees can be found in **Appendix A**. The five roundtables were organized around the following five themes:

- **Freight, Goods Movements, and Economic Strategy**: A forum for regional carriers, shippers, and members of the international trade industry focused on issues related to the transportation system's capacity, accessibility, and reliability for freight and goods movement and economic development, both now and in the future.
- **Safety, Security, and Resiliency**: A forum for public and private agencies focused on the environmental sustainability, safety, and security of local residents to discuss how the transportation system can best address emergency response and preparedness issues, border control and security, and environmental and resiliency issues over the next 25 years.
- **System Preservation, Congestion Management, and Transportation Systems Management and Operational Efficiency**: A forum of local and statewide agency representatives tasked with transportation system preservation and operational efficiency to discuss the roles of congestion management, intelligent transportation systems, and other transportation demand management strategies in enhancing the long-term maintenance and operation of the existing system and addressing capacity constraints.

- **Multimodal Integration and Accessibility**: A forum for public transportation service providers, local government representatives, and related community service organizations focused on regional strategies to enhance accessibility and effectively integrate all transportation modes to meet the mobility needs of the region and best serve people of all ages and abilities.
- **Travel, Tourism, and Economic Development**: A forum for members of both public and private sector agencies and organizations that will play a key role in the future development of the region, focused on ways to optimize and coordinate transportation and land development, promote economic development, and address issues related to travel and tourism that impact the region's quality of life and economic development initiatives.

These topics were defined through initial outreach efforts in identifying goals, objectives and needs in the region, and were cross referenced against the federally required planning factors to ensure a comprehensive and coordinated planning process, as indicated in **Table 3-2**.

Table 3-2: Focus Group Meetings and Federal Planning Factor Considerations

	Federal Planning Factors	Focus Group				
		1	2	3	4	5
1	Support **economic vitality**	X				X
2	Increase **safety**		X			
3	Increase **security**		X			
4	Increase **accessibility and mobility**				X	
5	Improve **quality of life, environment, energy conservation**		X		X	
6	Enhance **integration and connectivity** across and between modes	X			X	X
7	Promote **system management and operation**	X	X	X		
8	Emphasize **preservation** of the existing system	X	X	X		
9	Improve **resiliency and reliability**		X	X		
10	Enhance **travel and tourism**					X

Other Targeted Outreach Efforts

Between December 2018 and April 2019, the project team also conducted one-on-one outreach in the form of emails, phone calls, and as needed, one-on-one meetings with members of the MPO Policy Board, City and County elected officials, and community groups to solicit additional feedback and input on the MTP development.

Project Nomination Forms

The Laredo MPO issued a call for projects on December 10, 2018 for inclusion in the 2020-2045 MTP. Public agencies and members of the public were invited to nominate projects. A notification email was sent to the Laredo MPO contacts database that includes stakeholders and interested parties to inform of the call for projects. The notification email included the notification form and instructions for completion of the nomination form. Separate nomination forms were developed for members of the public and public agency sponsors to provide more streamlined information gathering from public ideas for projects than from agencies. The nomination form for the public agency sponsors required information on the scope, schedule, and budget of nominated projects. The nomination form for the public was a simplified nomination form, requiring less specific project information. The form instructions, members of the public nomination form, and the public agency sponsors nomination form can be found in **Appendix A**.

To comply with the Laredo MPO PPP, a bilingual project nomination form was also advertised in English and Spanish in the *Laredo Morning Times* on Monday, December 10, 2018. Links to the project nomination instructions, the members of the public nomination form, and the public agencies sponsor nomination form were posted online at the Laredo MPO website. The project nomination period was from December 10, 2018 to January 31, 2019.

Evaluating and Prioritizing Projects

Technical Advisory Committee Meetings

A meeting was held on July 15, 2019 with the Technical Advisory Committee. During this meeting, the goals, objectives, and performance measures and targets were reviewed. In addition, the proposed project list was presented. During a following meeting on September 10, 2019, members of the MPO Technical Advisory Committee completed subjective scores as part of the project prioritization process.

TxDOT Coordination

On July 16, 2019, a meeting with TxDOT was held to review the proposed project list and discuss any gaps. This meeting provided TxDOT the opportunity to provide comments on the project list and ensure that all necessary projects were captured.

The revenue forecasting and prioritized project list was coordinated with TxDOT during August 2019. Coordination gave TxDOT the opportunity to comment on the revenue forecasting and the prioritized project list.

MPO Policy Committee Meetings

A presentation to the MPO Policy Committee was held on July 15, 2019 to review the goals, objectives, and performance measures and targets. The MPO Policy Committee was provided the list of projects and the evaluation criteria.

Plan Review and Input

Presentations to MPO Committees

A presentation to the MPO Policy Committee was held on Month Day, Year to present the draft MTP and key findings. This presentation initiated the comment period for the full draft MTP.

During the MPO Policy Committee Meeting on Month Day, Year, a presentation was held to review any comments received on the draft MTP during the comment period, and how these comments were addressed. The formal adoption of the 2020-2045 MTP occurred at this MPO Policy Committee meeting.

Public Meetings - Series 2

To be included Summer 2019. Public Meetings Series 2 will focus on presenting the draft MTP and highlighting key findings.

What We Heard

Key Themes

Several themes emerged from the public input received for the development of the 2020-2045 MTP. Overall, Laredo residents are frustrated with the increasing levels of congestion and concerned about aging and deteriorating infrastructure. As a national leader in international trade, Laredo experiences significant freight congestion and use of the roadways by heavy commercial trucks. The community desires to accommodate freight movements while maintaining safe communities, a state of good repair, and a high quality of life. Many also desire more transportation options, with a preference for more bicycle lanes over new roads. New bicycle lanes are a viable mode of travel, with the majority of citizens who filled out surveys (57%) indicating that a typical one-way commute is only between 1-5 miles.

Common Themes from Public Input

Frustration with congestion

Balance freight traffic with quality of life concerns

Invest in more transportation options, including bicycle lanes and transit

Maintain a state of good repair

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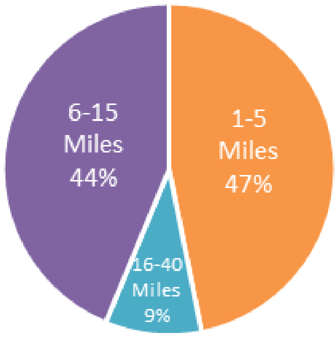
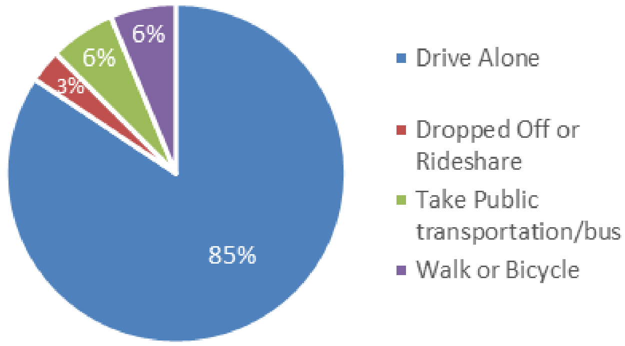
Figure 3-2: Public Survey Results - Key Themes

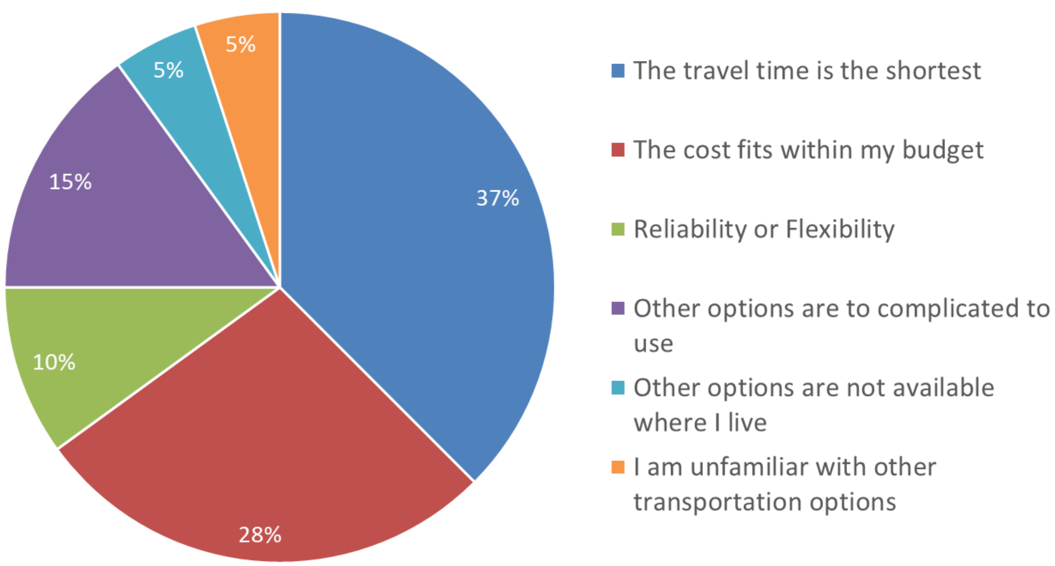
Typical One-Way Commute



Current Mode of Transportation



Factors Determining Mode Choice



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Vision, Goals, and Objectives

The vision, goals, and objectives of the 2020-2045 Laredo MTP will guide policy recommendations, project selection, and ultimately transportation investments in the region. The vision, goals, and objectives reflect input received from the MPO Policy Board and Technical Advisory Committee, the public and elected officials during meetings and other targeted outreach, and policy and legislative guidance. The vision defines the overall direction of long-range transportation planning efforts within the Laredo region, while the goals and objectives provide a strategic framework for establishing priorities and policies through the planning process.

Vision Statement

Develop a transportation system that offers safe, efficient, affordable travel choices for people and goods, while supporting economic development and long-term quality of life.

Goals and Objectives

To support the regional vision, this MTP includes a series of goals and objectives that reflect the regional values and satisfy long-term transportation needs. The goals serve as a guide to achieve the vision statement, and the objectives define results that must be attained or actions that must be followed.

The goals and objectives of this plan were based on policy guidance and community priorities collected during the October 2018 public meetings. The goals and objectives are aligned with state plans, federal guidelines, and are compliant with the requirements of the FAST Act.

Goal 1

Provide a transportation network that is safe and secure for all transportation modes and all system users.

Objectives:

- Support projects that address existing and identified safety or security needs
- Support projects, programs, and strategies that advance safe and secure travel for all users.
- Continue coordination with TxDOT to meet federal safety performance targets.

Goal 2

Sustain the region's existing transportation assets and infrastructure over the planning horizon.

Objectives

- Maintain existing roadway assets as a priority, before system expansion in considered.
- Promote construction/maintenance techniques, materials, and practices that maximize life cycles of roadway facilities and reduce maintenance needs.
- Support projects, programs, and strategies to better manage travel demand on existing infrastructure before adding new infrastructure.

Goal 3

Promote an efficient network and system operations to maintain travel time reliability and reduce congestion in moving people and goods within and throughout the region

Objectives

- Manage congestion by supporting projects, programs and strategies to maintain or improve travel time reliability and congestion.
- Address critical congestion management plan (CMP) network interstate and highway bottlenecks as a priority.
- Improve system operations through technology applications

Goal 4

Foster continued economic vitality by providing an effective and efficient freight network and supporting access to jobs and major destinations in the region.

Objectives

- Ensure the region is well positioned to remain a leader in global logistics and freight movement
- Support projects, programs and strategies to alleviate truck bottlenecks and improve truck travel times.
- Maintain or reduce average travel times to major economic centers in the region.
- Support projects, policies, and strategies to enhance safe movements between freight and other modes.
- Provide alternative access to single occupancy vehicle commuting and provide first and last mile connections to major economic destinations.

- Encourage tourism my developing efficient multimodal connections to and between downtown, the airport, recreational locations, schools, shopping and other key destinations in the region.

Goal 5

Develop an integrated and connected transportation network that encourages vibrant, affordable, and equitable communities.

Objectives

- Support projects, programs, and strategies to alleviate congestion and maintain or improve community affordability.
- Create a balanced built environment where existing and planned land uses are supported by an efficient multimodal system.
- Support complete streets solutions and no-motorized and alternative transportation access to safety sensitive locations in the region, including schools, recreational facilities, in downtown and where conflicts are most present.
- Support the equitable funding of transportation investments in Environmental Justice communities in the region.

Performance Measures and Targets

The goals and objectives provided the framework for the region. In accordance with FAST Act requirements, and following technical analysis, these goals and objectives were used to establish key performance measures and targets to allow the MTP to be continually monitored and updated, as needed, to address the goals and objectives of this plan. Additional details on performance measures and targets developed for this plan are further discussed in **Chapter 10**.

Chapter 4: Roadways, Border Crossings, and Bridges

Introduction

The Laredo MPO region's roadways, border crossings, and bridges provide the foundation of the transportation system, facilitating the movement of people and goods within and throughout the region. This infrastructure also forms the backbone for other modal systems in the region, such as transit bus routes that operate along these facilities and bicycle and pedestrian facilities that are often collocated with roadway corridors.

This chapter discusses this interconnected network of roadways, border crossings, and bridges within the region. It then provides information on both current and future conditions of this infrastructure to identify needs through the 2045 planning horizon. Based on the identification of needs, this chapter also provides a series of strategies that will feed into project selection and evaluation over the 2045 planning horizon.

Overview of Roadways, Bridges and Border Crossings in the Region

Roadways

There are a number of ways in which roadways are categorized and designated that are important to understand how the regional roadway network functions and is monitored and funded. At the most basic level are roadway function classifications, which groups roadways into categories according to their function. Additionally, at a federal level, several designations exist to define major roadways that provide national connectivity and help to prioritize roadway investments to meet strategic national goals and objectives.

Functional Classifications

Two important variables define roadway function: mobility and access. Freeways provide the highest level of mobility and the lowest level of access. Local streets, on the other hand, provide local access to businesses and residences and are not intended for travel over long distances. **Table 4-1** provides additional details regarding the functional classification categories and examples within the Laredo MPO regional roadway network. For the purposes of this MTP, the Federal Highway Administration (FHWA's) functional classification scheme is used.

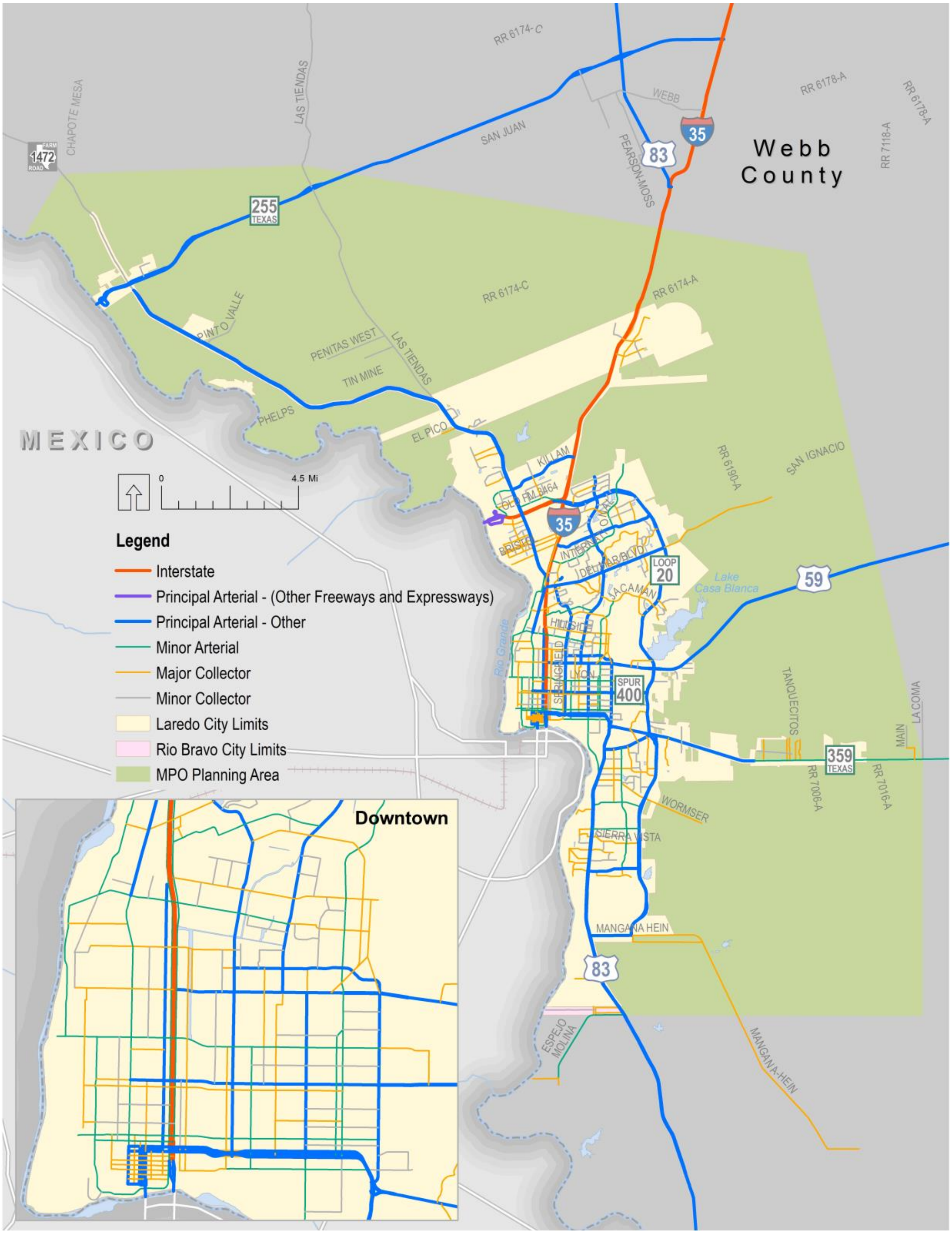
The functional classification system should be routinely reviewed to ensure that road use and function is consistent with current travel patterns. **Figure 4-1** shows the functional classifications of the roadway network in the Laredo MPO region. All roads classified as an urban collector and above are eligible to receive federal funding assistance.

Table 4-1: Functional Classification Definitions

Functional Classification	Characteristics	Example	Jurisdiction
Interstate	• High speed, divided highway with full control of access and grade separated interchanges • Moves inter- and intra-regional traffic, particularly long trips in high traffic volume corridors. Provides access between cities and across metropolitan areas • Normally in excess of 20,000 vehicles per day • Formally designated by US DOT	Interstate 35	National Highway System (NHS)
Other Freeway	• High speed, divided highway with full control of access and grade separated interchanges crossing metropolitan areas and between major activity centers (2 or more miles) • Normally in excess of 20,000 vehicles per day	Loop 20 at World Trade Bridge	National Highway System (NHS)
Principal Arterial	• Typically, a divided street with major access points at intersections with the surface street system. Some direct access permitted to abutting land uses • Serves major centers of activity, with service to abutting land uses secondary to the provision of travel service • Normally 10,000 to 30,000 vehicles per day	McPherson Blvd US 83 (Zapata Hwy)	National Highway System (NHS)
Minor Arterial	• Number of lanes and type of median directly relate to traffic volumes and abutting land use • Augments and feeds primary arterial system and distributes traffic to geographic areas smaller than those served by the higher system, with more emphasis on service to abutting land uses	Springfield Ave Meadow Ave south of Chihuahua St	Not NHS

Functional Classification	Characteristics	Example	Jurisdiction
	• Normally 5,000 to 15,000 vehicles per day		
Collector	• High access to local streets and driveways connecting local streets to the arterial system. • Typically used for trips that are near their origin or destination point, primarily connecting neighborhoods within and among sub-regions • Normally 1,500 to 10,000 vehicles per day	Fenwick Dr La Pita Mangana Rd	Not NHS
Local	• High access to driveways • Provides direct access to abutting property • Normally 1,500 or fewer vehicles per day	Basswood Dr Madera Ave	Not NHS

Figure 4-1 Functional Classification of Roadways



Source: Texas Department of Transportation GIS Data

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Within the Laredo region, major interstates and freeways include Interstate 35 (IH 35), Business Interstate 35 (BI 35), and Loop 20 (Bob Bullock Loop). Several principal arterials also provide primary regional connectivity, including US Highway 59 (US 59), US 83, State Highway 255 (SH 255), SH 359, and others. The major interstates, freeways, and principal arterials within the Laredo MPO region, and information on daily traffic volumes are summarized below in **Table 4-2**.

Table 4-2: Characteristics of Major Roadways in Laredo MPO

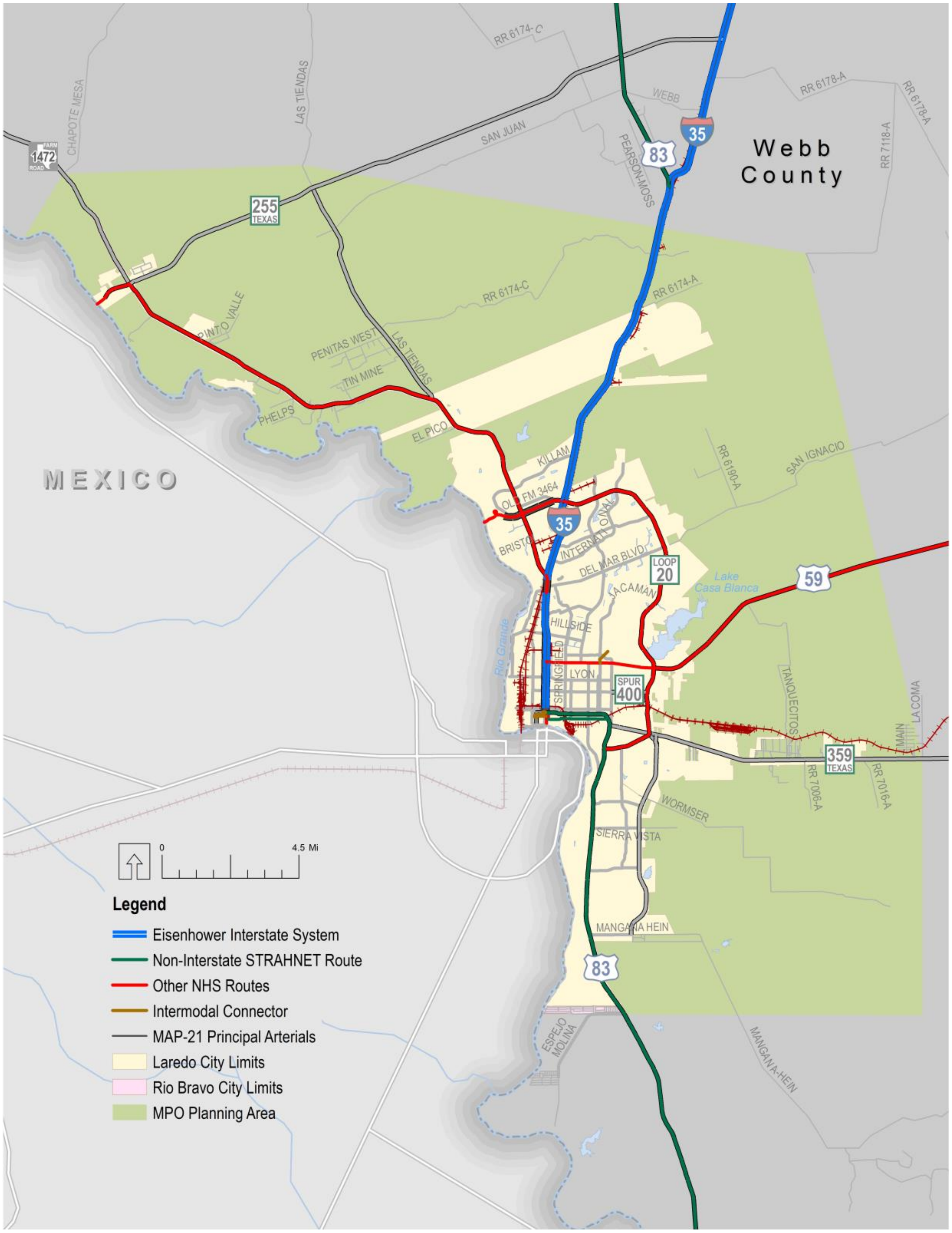
Roadway	Functional Classification	Vehicles Per Day (VPD)
IH 35	Interstate	20,000 – 113,000
BI 35	Interstate	11,600 – 14,300
US 59	Principal Arterial - Other	2,200 – 31,400
US 83	Principal Arterial - Other	6,700 – 38,200
Loop 20 (Bob Bullock Loop)	Principal Arterial - Other	21,200 – 64,200
SH 255	Principal Arterial - Other	1,135 – 3,800
SH 359	Principal Arterial / Minor Arterial	12,800 – 28,400
State Spur 400	Principal Arterial - Other	15,400
State Spur 260	Principal Arterial - Other	16,000 – 20,100
FM 1472	Principal Arterial - Other	900 – 44,700
FM 3338	Principal Arterial - Other	500 – 2,000

National Highway System

In addition to functional classifications, the federal government has designated a series of roadways into the National Highway System (NHS). The NHS was developed by the US Department of Transportation in cooperation with the states, local officials, and Metropolitan Planning Organizations. These NHS roadways are comprised of the Interstate Highway System and other roads that are important to the nation's economy, defense, and mobility, and are eligible to receive federal NHS funding. The following roadways in the Laredo MPO region are part of the NHS: IH 35, US 59, US 83, State Spur 20 (Bob Bullock Loop), SH 359, and FM 1472. The Laredo MPO continues to coordinate with TxDOT on adoption of any principal arterials onto the NHS.

Within the NHS, the Strategic Highway Network (STRAHNET) is an additional designated network of highways which provide defense access, continuity, and emergency capabilities for defense purposes. Roadways within the Laredo MPO area under the STRAHNET designation include IH 35 and US 83.

Figure 4-2: National Highway System Roadways



Source: USDOT Bureau of Transportation Statistics

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Laredo Urban Transportation Study

DRAFT

National Highway Freight Network

The FAST Act provided for a new National Highway Freight Network (NHFN). The designation of the NHFN serves to strategically direct federal resources and policies toward improved performance of highway portions of the freight transportation system. The NHFN includes four subsystems of roadways.

- **Primary Highway Freight System (PHFS):** The most critical highway portions of the US freight transportation system.
- **Other Interstate portions not on the PHFS:** The remaining Interstate highways not included on the PHFS. These routes provide important continuity and access to freight transportation facilities.
- **Critical Rural Freight Corridors (CRFCs):** Public roads not in an urbanized area that provide access and connection to important freight facilities
- **Critical Urban Freight Corridors (CUFCs):** Public roads in urbanized areas that provide access and connection to important freight and intermodal facilities

Within the Laredo MPO area, there are 19 miles of the PHFS as part of the NHFN. The other NHFN subsystems are not represented within the Laredo MPO region.

Roadways on the NHFN in the Laredo MPO region, shown in **Figure 4-3**, include: IH-35 as far as the end of its Interstate Highway designation at Victoria Street; US 59 from IH-35 east to Bartlett Avenue; and the Bartlett Ave / Maher Avenue connection to the industrial area on the west side of the Laredo International Airport at Pappas Street.

National Multimodal Freight Network

In addition to the NHFN designation, the FAST Act also provided for a new National Multimodal Freight Network (NMFN). The purpose of the NMFN is to:

- Strategically direct resources toward improved system performance for the efficient movement of freight
- Inform freight transportation planning
- Assist in the prioritization of Federal investments
- Evaluate and support investments to achieve national goals

An Interim National Multimodal Freight Network (Interim NMFN) was established in 2016 for public comment, and the public comment period ended in February 2018. The Interim NMFN consists of the NHFN, the freight rail systems of Class I railroads, public ports of the United States that have total annual foreign and domestic trade of at least 2,000,000 short tons, the inland and intracoastal waterways of the United States, Great Lakes, the St. Lawrence Seaway, and coastal and ocean routes along which domestic freight is transported, the 50 airports located in the United States with the highest annual landed weight, and other strategic freight assets such as railroad connectors and border crossings.

Figure 4-3: National Highway Freight Network Roadways

Source: USDOT Bureau of Transportation Statistics GIS Data

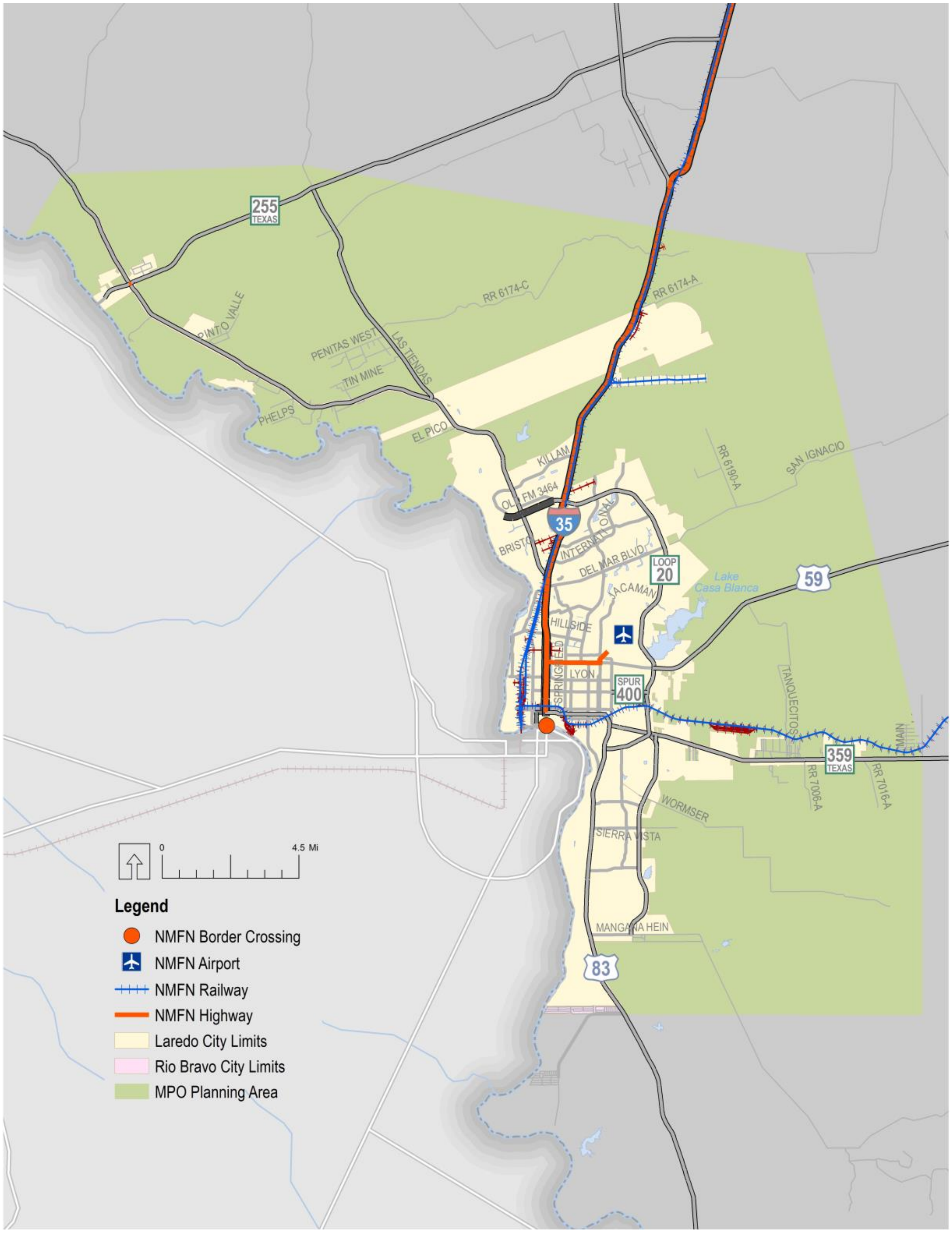
Components of the NMFN within the Laredo MPO area are mapped in **Figure 4-4**. These components include:

- *Airports*: Laredo International Airport (LRD)
- *Border Crossings*: Lincoln-Juarez/Bridge #2
- *Highways*: 19 miles total consisting of the NHFN designations of I-35, US 59, Bartlett Avenue, and Maher Avenue
- *Railways*: 40 miles total consisting of KCS and Union Pacific (UP) railroads

Congestion Management Process

Per federal regulations, the Laredo MPO has formulated a Congestion Management Process (CMP) to relieve congestion and prevent congestion from occurring where it does not occur to the greatest extent possible. Congestion affects IH and non-IH travel time reliability, one of the performance measures established by TxDOT as required by the FAST Act. The Laredo MPO's congestion management process considers congestion management strategies including travel demand reduction and operations management strategies. **Figure 4-5** shows the roadways managed by the Laredo MPO's congestion management plan.

Figure 4-4: National Multimodal Freight Network



Source: USDOT Bureau of Transportation Statistics GIS Data

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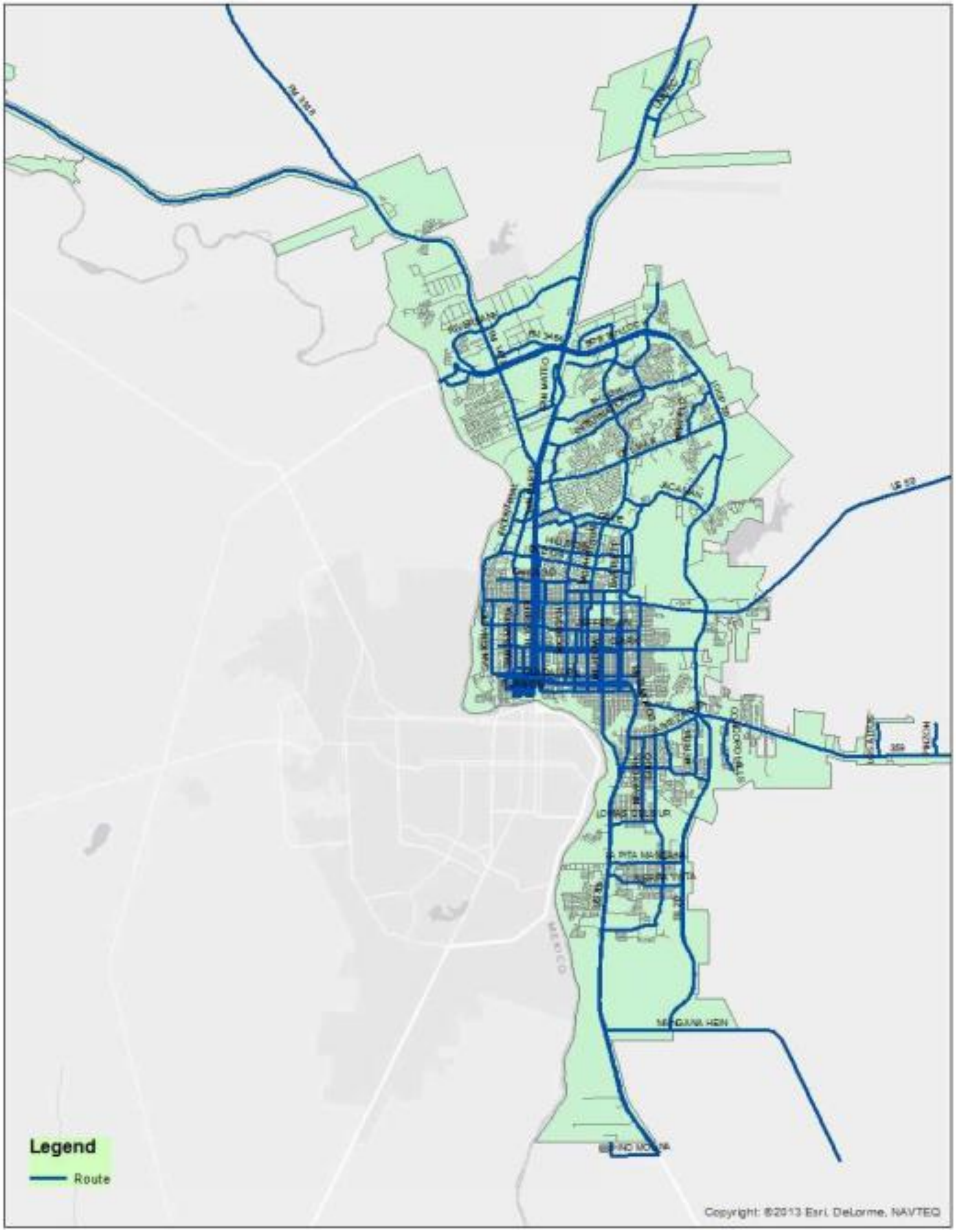
Figure 4-5: Congestion Management Boundary



Source: Laredo MPO

Border Crossings and Bridges

Of the 29 international roadway border crossings between the US and Mexico in the State of Texas, four are in the Laredo MPO area and collectively make up the **City of Laredo International Bridge System**. They are as follows, from south to north:

- The **Juarez-Lincoln International Bridge (Bridge #2)** consists of eight lanes and is reserved for buses and non-commercial auto traffic.
- The **Gateway to the Americas International Bridge (Bridge #1)** consists of four lanes with two pedestrian walkways and is open to all traffic.
- The **KCS International Railroad Bridge** is a railroad bridge connecting the northern termini of the Kansas City Southern Railway to the western termini of the Texas-Mexican Railway.
- The **World Trade International Bridge (Bridge #4)** is a 14-lane bridge reserved solely for commercial traffic.
- The **Laredo Columbia Solidarity Bridge (Bridge #3)** consists of eight lanes and is open to all traffic.

Figure 4-6 shows the location of each of these border crossings within the larger context of the Laredo MPO region. Due to the status of Laredo as the premier trade hub between Mexico and the US, travel from Mexico to the US and vice versa is critical to the economy and society of Laredo.

There is a proposed fifth border crossing, the Laredo V International Bridge, that is intended to relieve commercial traffic at the World Trade International Bridge. Currently more work on planning and constructing the bridge is pending submission of one consolidated application from Webb County and the City of Laredo and approval from Mexican officials. **Table 4-3** shows the current toll rates for traveling through border crossings. All four bridges in the Laredo Bridge System, except for the Gateway to the Americas Bridge, offers a “Laredo Trade Tag” (LTT), which is based on an Automatic Vehicle Identification (AVI) system and enables both commercial and non-commercial customers an alternative form of toll payment.

Table 4-3: Toll Rates of Laredo International Bridge System

Mode of Travel	Toll Rate
Pedestrian/Bicyclist	$1.00
Non-Commercial	$1.75 per axle
Commercial	$4.75 per axle

Source: City of Laredo

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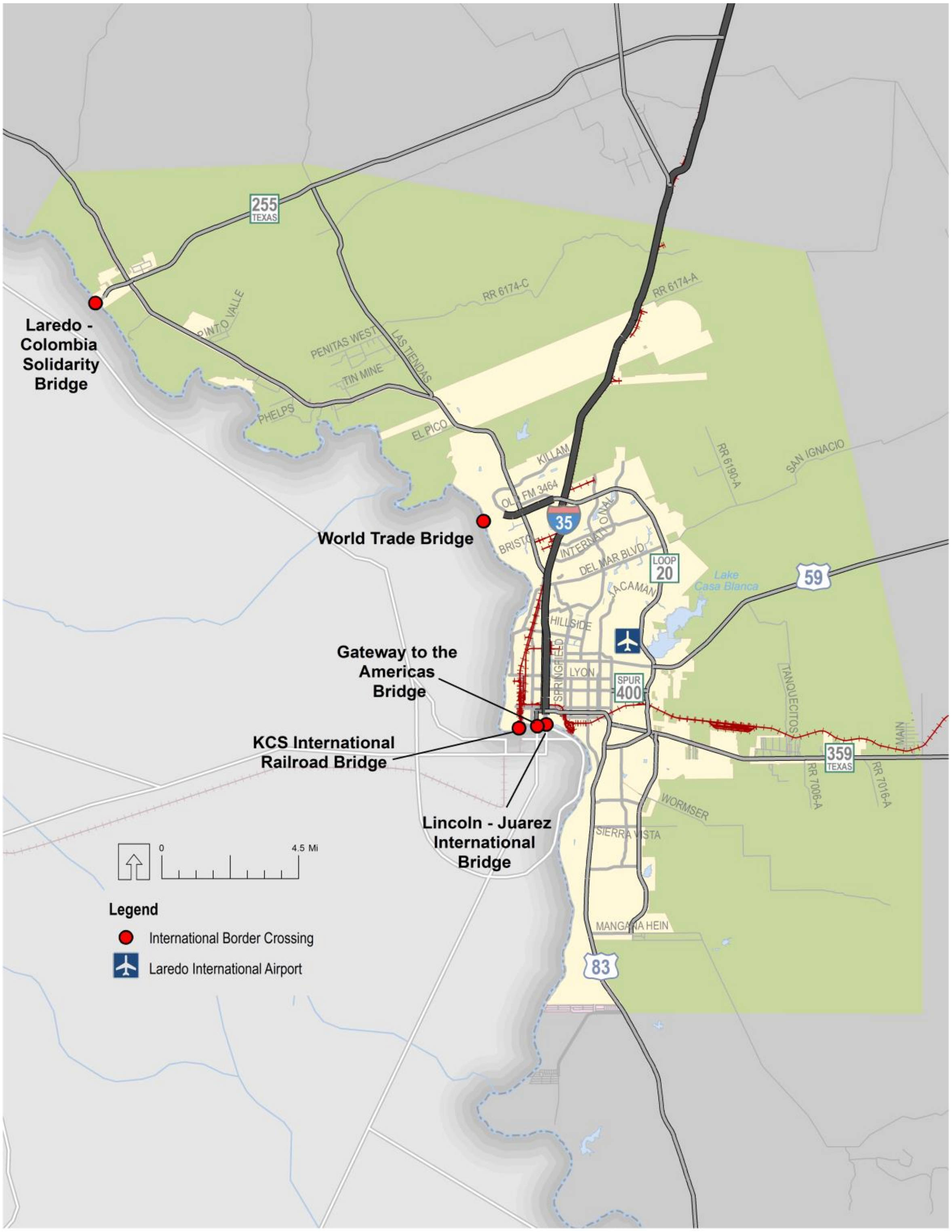
Figure 4-6: International Border Crossings



Source: City of Laredo, International Bridge System

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Understanding Infrastructure Conditions and Needs

To understand regional needs for roadways, border crossings, and bridges in the region, an analysis of current and historic data was conducted and future 2045 conditions were modeled to understand both existing and future needs through the 2045 planning horizon.

Roadway Conditions and Needs

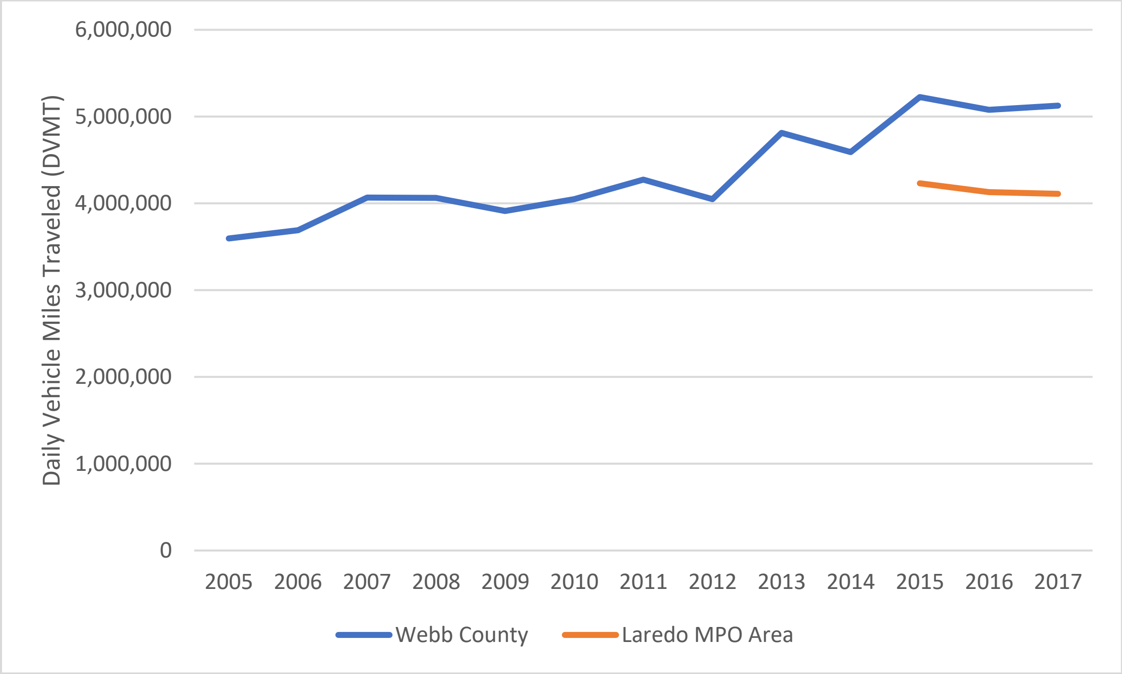
Several variables used to evaluate roadway conditions and needs, including vehicle miles traveled (VMT), daily traffic volumes, truck volumes, level of service (LOS), and roadway crash data, were used to identify current roadway conditions and address roadway needs in the Laredo MPO area.

Vehicle Miles Traveled

Vehicle-Miles Traveled (VMT) is the total number of miles driven by all vehicles within a given time and geographic area. VMT is important in evaluating how well transportation investments and land use policies work together, and directly affects gas consumption, emissions, and traffic patterns. It is influenced by factors such as population, the number of vehicles per household, the number of car trips per day, and distance traveled.

Historic Daily Vehicle Miles Traveled (DVMT) for Webb County for years 2005 to 2017 was obtained from TxDOT and summarized in **Figure 4-7**. The DVMT for the Laredo MPO is only available beginning in 2015.

Figure 4-7: Daily Vehicle Miles Traveled, TxDOT Laredo District



Source: TxDOT, Transportation Planning and Programming Division

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

In the Laredo region, VMT during the time period shows a sharp increase from 2012 to 2013 and then peaks in 2014 before falling to 9.8 million in 2017. VMT in the Laredo District has therefore been mostly stagnant since 2013 and future projections assume similar trends, while accounting for population and economic growth and development through the 2045 planning horizon. Based on the Laredo MPO Travel Demand Model projections, VMT is expected to grow by about 3 percent annually over the next 25 years.

Without a shift away from vehicular travel as the primary mode of choice in the region in the future, a greater increase in VMT can be expected to occur. In addition, as new mobility options like ride hailing, car sharing services, and other advancements like automated and connected vehicles become a reality, these technologies may in fact lead to higher VMT levels that will need to be addressed. While these technologies offer more integrated and seamless travel options for people, they can also increase the total VMT for making trips and will require strong and continued regional, state and federal policies coordination and monitoring to address these future technological advancements.

Daily Traffic Volumes

Historic traffic volumes were reviewed to understand changes in traffic volumes in the region over time. **Table 4-4** presents the absolute growth and percent growth for locations that experienced high increase in daily traffic volumes between 2007 and 2017. The most significant growth occurred along State Loop 20, which highlights the growing importance of the roadway and the increasing population and development pressure in this part of the region. In light of the significant growth in traffic on and along State Loop 20, improvements to reduce congestion at the State Loop 20 / Spur 400 intersection are under construction. Additionally, TxDOT is proposing improvements to 24 miles of IH 35 in the northern part of the Laredo MPO area. The Webb County City of Laredo Regional Mobility Authority (WC-CL RMA) is also vigorously investigating methods of funding for the upgrade of Loop 20 South (Cuatro Vientos) from US 59 to the new proposed Port of Entry (Bridge 5).

Table 4-4: High Traffic Volume Growth Locations

Roadway	Location	2007	2017	Absolute Growth	Annual Growth Rate
Loop 20 (Bob Bullock Loop)	Between Wormser Pipe Road and Loma Del Sur Boulevard	0	27,917	27,917	-
Loop 20 (Bob Bullock Loop)	Between Ben Cha Drive and SH 359	41,000	64,158	23,158	4.56%
US 83	Between Mines Road and San Dario Avenue	87,000	101,004	14,004	1.50%
Loop 20 (Bob Bullock Loop)	Between River Bank Drive and Mines Road	0	21,220	21,220	-
Loop 20 (Bob Bullock Loop)	Between Mines Road and I-35	31,000	47,335	16,335	4.32%
Loop 20 (Bob Bullock Loop)	Between I-35 and McPherson Road	33,000	45,810	12,810	3.33%
US 59	Between Loop 20 and Casa Blanca Road	0	29,078	29,078	-
Loop 20 (Bob Bullock Loop)	Between E Saunders Street and Clark Boulevard	41,000	60,341	19,341	3.94%
Loop 20 (Bob Bullock Loop)	Between E Saunders Street and Casa Blanca Road	28,000	48,727	20,727	5.7%
I-35	Between Martineta Road and County Line	0	19,077	19,077	-

Source: TxDOT, Transportation Planning and Programming Division

Truck Volumes

The trucking industry plays a vital role in the movement of freight through the region. Texas Roadway Inventory obtained from the TxDOT website was used in calculating trends in truck traffic in the region. The Texas Roadway Inventory contains various truck percentages and total ADT for the year 2017. Truck percentages were thus applied to total ADT counts to obtain truck traffic. The location with the highest observed truck volumes in 2017 was along I-35 between Del Mar Boulevard and International Boulevard. **Table 4-5** shows the locations with the highest truck ADT for the year 2017 and the associated truck volumes along with their proportion of total traffic. Around the freight hubs on the north side of Laredo on IH 35, US 59, and State Loop 20, trucks are a very large percentage of total traffic, ranging from 26% to 60% at count locations. This causes a variety of issues, including conflicts between trucks and vehicles, poor safety for bicyclists and pedestrians, poorly accommodated turning movements, pollution impacting the environment and the health of residents, and poor pavement quality.

Currently, there is no comprehensive freight master plan in place in the region. Given the large part that freight plays in the continued economic vitality of the region, the number of interests and multimodal owners of transportation infrastructure, and the freight network's associated impacts on safety and infrastructure conditions now and into the future, developing a regional master freight plan is an identified need in the near-term. The MPO has allocated funds for the development of a long-range freight plan, currently programmed in the 2018 Unified Planning Work Program.

Table 4-5: High Truck Traffic Volume Locations

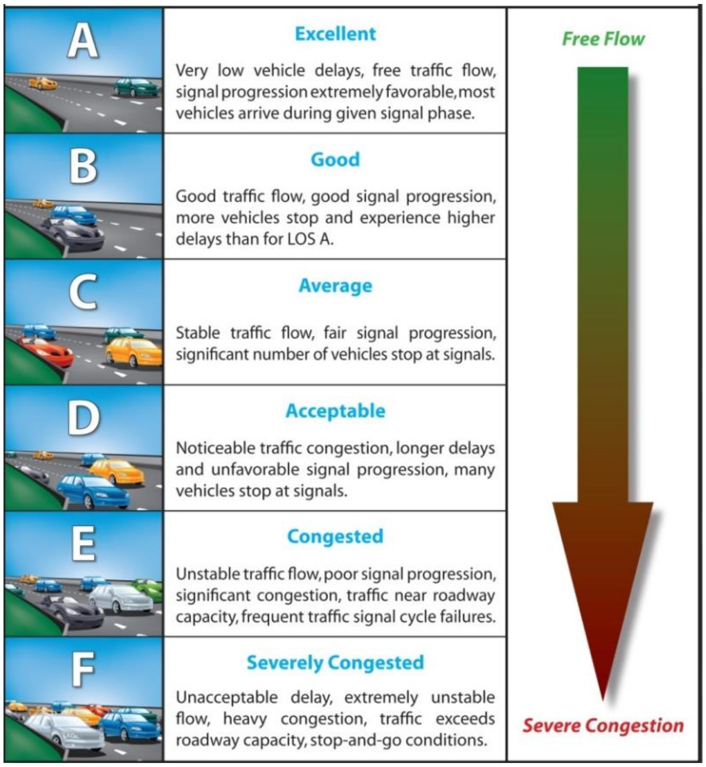
Roadway	Location	Truck 2017 Traffic	Total 2017 Traffic	% Truck Traffic
I-69/US 59	From Riverbank Dr to Mines Rd (FM 1472)	12,639	21,220	59.60%
I-35	From US 83 to Uniroyal Dr	10,272	23,427	43.80%
I-69/US 59	From Mines Rd (FM 1472) to I-35	15,919	47,335	33.60%
I-35	From Uniroyal Dr to Bob Bollock Loop (Loop 20)	13,958	44.993	31.00%
Loop 20 (Bob Bullock Loop)	From I-35 to McPherson	12,002	45,810	26.20%
US 83	From Market St to Jaime Zapata Memorial Hwy (TX 260)	5,245	38,292	12.70%
I-35	From Bob Bullock Loop (Loop 20) to Mines Rd (FM 1472)	5,439	57,726	9.40%
I-35	From Mines Rd (FM 1472) to Del Mar Blvd	5,769	101,004	5.70%
I-35	From Mann Rd to US 59	5,621	105,458	5.30%
I-35	From Del Mar Blvd to Mann Rd	5,848	113,378	5.20%

Source: TxDOT, Transportation Planning and Programming Division

Level of Service Analysis

Congestion on a roadway can be indicated by its level-of-service. Level-of-service (LOS) is a qualitative measure of traffic operations, ranging in values from LOS A to LOS F, and is based upon the ratio of a roadway's traffic volume to the roadway's capacity (VC ratio). The graphic to the right describes the conditions a driver would experience on a roadway given a particular level of service rating. The thresholds of VC ratios used to determine LOS values are as follows:

- 0.0-0.2: LOS A
- 0.2-0.4: LOS B
- 0.4-0.6: LOS C
- 0.6-0.8: LOS D
- 0.8-1.0: LOS E
- >1.0: LOS F



The primary factors in determining a roadway's capacity include the number of travel lanes, the type of traffic control at intersections, the number of access points, and speed limit.

A planning level capacity assessment of existing roadway system traffic conditions was developed using the regional travel demand model. This model was updated to a base year of 2008 and attempts to predict travel conditions in the region by looking at both the supply of and demand for transportation. The supply dimension of the model is reflected in the roadway network, while the socioeconomic data of the region reflects the demand side of the equation.

According to the interim year 2013 travel demand model, current roadway congestion is marginal in much of eastern Laredo and in the Mines Rd area, and is most severe in six general locations:

- Along the southern end of Mines Rd in the vicinity of the freight warehouses
- At the Uniroyal interchange and IH 35 approaching the interchange
- The at-grade crossing of Loop 20 at IH 35
- Sections of Loop 20 north and south of US 59
- SH 359 approaching Loop 20
- US 83 in southern Laredo
- The combined segment of SH 359/US 83 (Guadalupe St and Chihuahua St) between US 83 and IH 35

The Level of Service (LOS) for all modeled roadways is shown in **Figure 4-8**. For clarity in the display, LOS ranges are grouped with LOS A, B, and C being rated as acceptable congestion, LOS D and E as marginal, and LOS F as unacceptable.

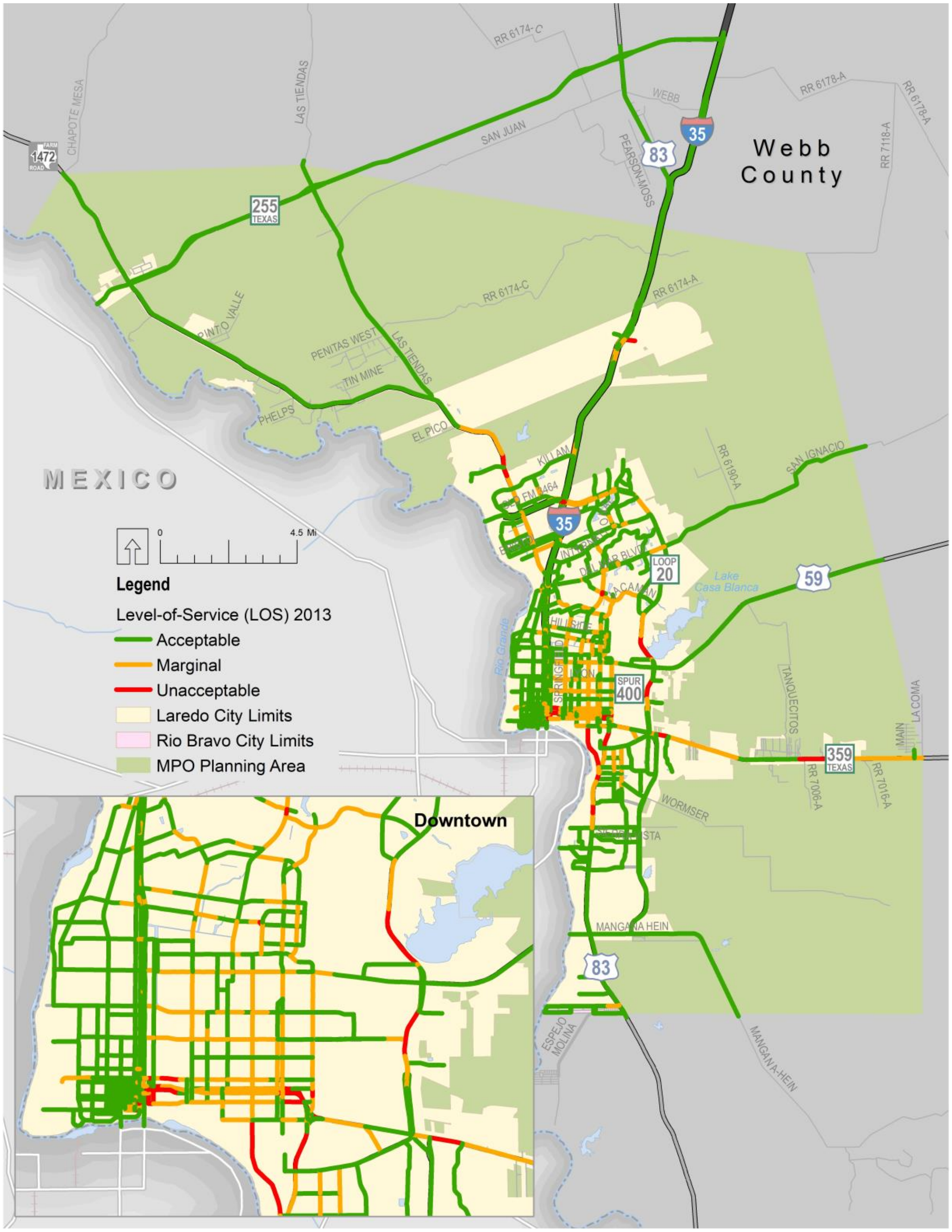
The process of projecting population and job growth for the year 2045 was presented in **Chapter 2: Regional Context**. According to forecasts the annual growth rate of people and jobs in the Laredo MPO region is 4.62 percent and 5.51 percent, respectively. Most of this growth is expected to occur in currently undeveloped areas. The forecasts for population and employment is shown in **Table 4-6**. Maps and additional details of these demographic forecasts are presented in **Chapter2: Regional Context**.

Table 4-6: Population and Employment Growth in the Laredo MPO Region, 2013-2045

Forecast Year	Forecast Population	Forecast Employment
2013	256,195	92,510
2018	286,442	105,267
2030	350,136	133,613
2040	413,907	166,083
2045	450,024	180,009
Annual Growth Rate (2013-2045)	4.62%	5.51%

Source: Laredo MPO Travel Demand Model

Figure 4-8: Existing Level of Service, 2013



Source: Laredo MPO Travel Demand Model

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

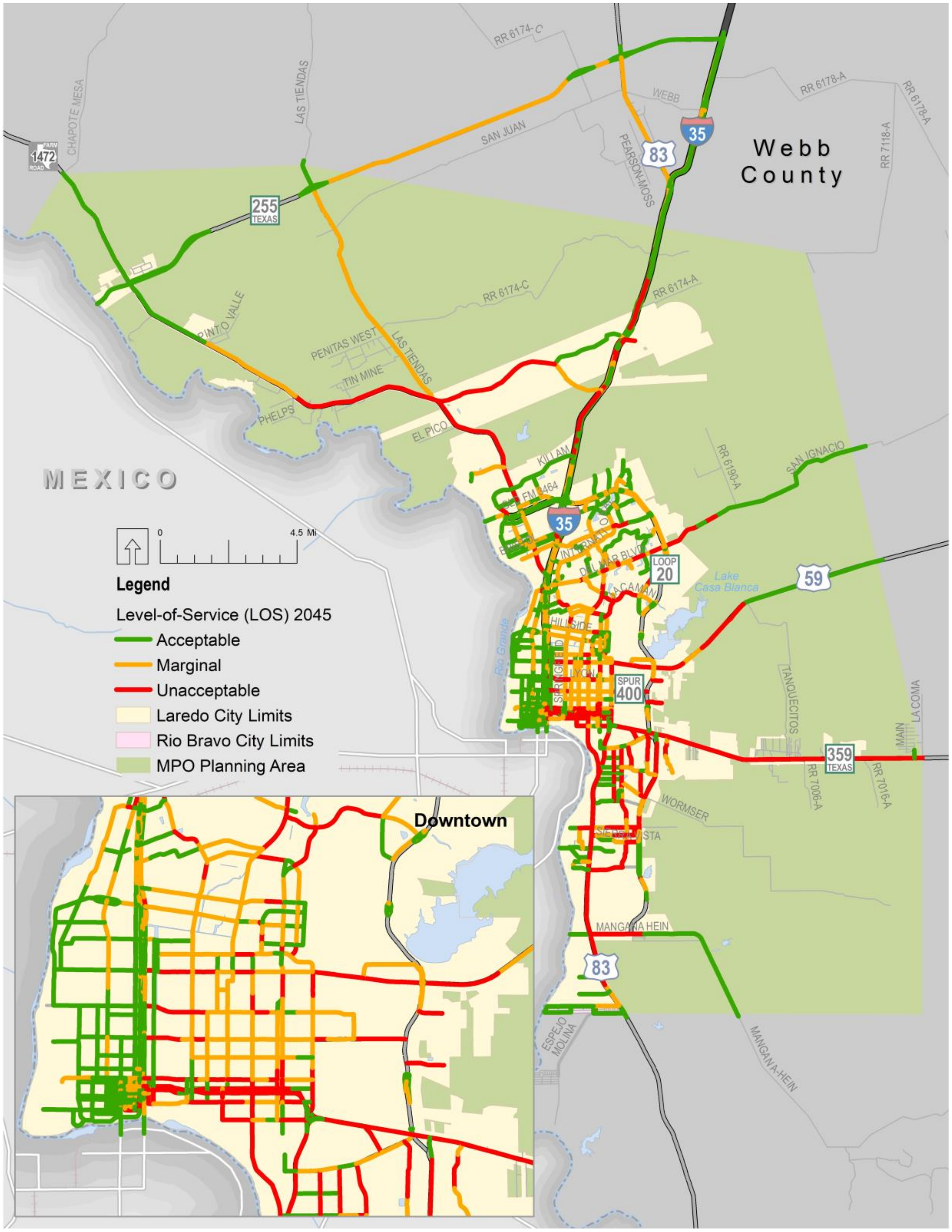
DRAFT

As development continues along the fringes of the city, the existing road network can absorb only so much of the increased demand. As shown in **Figure 4-12**, the area's congestion levels for the year 2045 will rise throughout the study area if no additional transportation investments are made beyond those that are currently committed in the current Transportation Improvement Program.

A comparison of congestion levels as measured by Level of Service (LOS) for the years 2013 and 2045 shows increased congestion on most of the major transportation corridors:

- Mines Rd from Loop 20 to beyond FM 3388 drops from acceptable and marginal LOS and a small segment rated unacceptable to congestion consistently rated as unacceptable. The new Hachar Pkwy, constructed as a 4-lane Principal Arterial in 2020 and 2022, is forecasted to be at LOS F by the year 2045.
- IH-35 is being expanded to 6 lanes and remains uncongested in its southern sections, but between Killam Industrial Blvd and Uniroyal Dr congestion increases to LOS F.
- The core area of Laredo on both sides of IH-35 is essentially built out, and population and employment growth in these areas is minimal. Forecasted congestion stays at acceptable and marginal LOS for the area west of IH-35, but the eastern side, LOS drops from predominantly acceptable to having significant areas of marginal LOS. The area north of the airport centered on McPherson Rd, Bartlett Ave, and Jacaman Rd will benefit from several committed network projects, but they will open land for forecast development and result in forecasted congestion at LOS F.
- Growth eastwards along Del Mar Blvd, US 59, and SH 59 to past Lake Casa Blanca is expected to increase congestion to unacceptable levels by the year 2045. For SH 359, the growth in external traffic drives some of this increased congestion.
- The combined segment of SH 359/US 83 (Guadalupe St and Chihuahua St) between US 83 and IH 35 is shown to operate at a marginal LOS in 2013, degrading to unacceptable LOS along their entire length by the year 2045. Congestion spills over to parallel streets providing access to IH-35, including Washington St, Park St, Lyon St, and US 59.
- Committed network projects Cuatro Vientos Blvd contribute to opening the area south of La Pita Mangana Rd to new development, particularly to housing. This growth contributes to degrading the LOS in this area of southern Laredo from mostly acceptable LOS in 2013 to mostly marginal and unacceptable in 2045. US 83 is shown to operate at LOS F for most of its length between Rio Bravo and the intersection with SH 359.

Figure 4-12: Future Level of Service, 2045



Source: Laredo MPO Travel Demand Model

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Roadway Crash Data

Beyond roadway conditions and traffic volumes, safety data was also reviewed to understand areas where safety improvements may be needed now and into the future. According to the TxDOT Crash Records Inventory System (CRIS), 21,606 crashes occurred within the Laredo MPO area from January 1, 2015 through December 31, 2017. **Table 4-7** shows the number and rate of fatalities and serious injuries along with the number of non-motorized fatalities and serious injuries. TxDOT provides the data to calculate these measures for the Laredo MPO area dating back to the year 2015. Currently, the Laredo MPO region is meeting TxDOT's safety performance targets, which are detailed in **Chapter 11: Performance Management**.

Table 4-7: Fatalities and Serious Injuries in the Laredo MPO Region 2016-2018

Year	Fatalities (No.)	Fatalities (Rate)	Serious Injuries (No.)	Serious Injuries (Rate)	Fatalities and Serious Injuries (Bike/Ped)
2015	12	0.78	87	5.63	15
2016	27	1.79	75	4.98	21
2017	15	1.00	73	4.87	16

Source: TxDOT, Crash Records Inventory System

Table 4-8 and **Figure 4-14** identify the top 20 intersections with crash occurrences in addition to fatal crash locations. The most crashes occurred at the junction of two of the busiest arterial roadways in Laredo, McPherson Road and Del Mar Boulevard. Another location with the total number of crashes over 200 is the intersection of IH 35 and US 83 (Matamoros Street). The intersection of IH 35 and US 83 is near the Juarez Lincoln Bridge, carries a huge amount of freight traffic, and links two of the busiest roadways in the region. The intersection of McPherson Road and Del Mar Road, meanwhile, is a complicated four-way intersection with curved right turn only lanes on McPherson Road northbound and Del Mar Boulevard eastbound and westbound, is near many entrance and access points for nearby retail and is geometrically irregular. Many of these intersections are close to schools, nursing homes, and health care facilities serving populations that are especially vulnerable to crashes and traffic hazards.

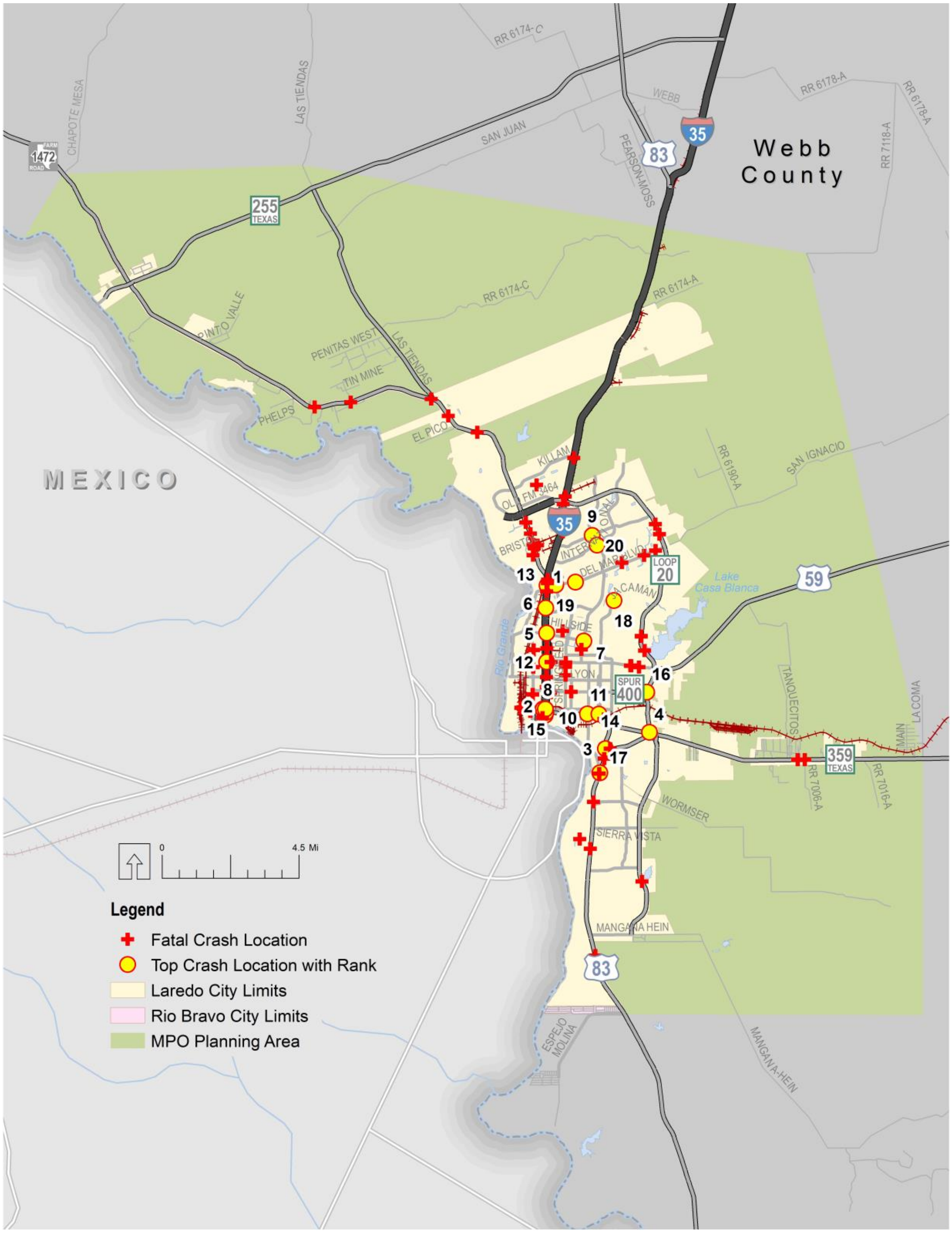
The locations of the 60 fatal crashes are scattered throughout the Laredo MPO region and in particular, the crashes are clustered around downtown Laredo and on the major arterials in the area. However, there are a few small but recognizable clusters of fatal crashes. Between 2016 and 2018 5 of the 60 fatal crashes took place on Mines Road (FM 1472) between I-69 and I-35, including 3 clustered around the intersection of Mines Road (FM 1472) and San Lorenzo Drive. There were also 3 fatal crashes on I-35 around the intersection with Del Mar Boulevard, 2 fatal crashes on US 59 near Casa Blanca Lake Road, 2 fatal crashes on the Bob Bullock Loop (Loop 20) at the intersection with E Corridor Road.

Table 4-8: Top 20 Crash Locations, 2016 to 2018

Intersection	Number of Crashes
1. McPherson Rd and Del Mar Blvd	297
2. IH 35 and US 83 (Matamoros St)	296
3. Ross St and US 83	191
4. Loop 20 (Bob Bullock Loop) and SR 359	165
5. IH 35 and Calton Rd	164
6. IH 35 and Mann Rd	163
7. McPherson Rd and Calton Rd	151
8. IH 35-BR and Victoria St	146
9. McPherson Rd and Shiloh Dr	144
10. IH 35 and Farragut St	143
11. US 83 and Bartlett Ave	124
12. IH 35 and US 59 (Lafayette St)	123
13. IH 35 and Del Mar Blvd	123
14. US 83 and N Meadow Ave	120
15. IH 35 and Victoria St	107
16. Loop 20 (Bob Bullock Loop) and Spur 400 (Clark Blvd)	104
17. US 83 and S Meadow Ave	103
18. N Bartlett Ave and Jacaman Rd	99
19. Springfield Ave and Del Mar Blvd	98
20. McPherson Rd and International Blvd	97

Source: TxDOT, Crash Records Inventory System

Figure 4-14: Top 20 Crash and All Fatal Crash Locations, 2016-2018



Source: TxDOT, Crash Records Inventory System

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Deaths and Injuries from Crashes

Of the total, 3,133 led to incapacitating injuries, 180 led to serious incapacitating injuries, 60 were fatal. The rate of serious injury at the intersections between 2016 and 2018 is low, meaning that the Laredo MPO region's road network is performing well by the standards of the performance measures adopted by TxDOT in 2019.

Manner of Collision in Crashes

To understand the causes of collisions, CRIS crash data was reviewed for manner of collision. This analysis encompassed crashed occurring between 2016 and 2018 within 150 feet of the top 20 most dangerous intersections as defined in the preceding sections. Because of different methods, the totals are not equivalent. **Table 4-9** shows total crashes between 2016 and 2018 at the top 20 most dangerous intersections in the Laredo MPO region by manner of collision.

Table 4-9: Manner of Collision for Crashes at Top 20 Crash Locations, 2016-2018

Manner of Collision	Total
Same Direction - One Straight-One Stopped	580
Same Direction - Both Going Straight-Rear End	442
Angle - Both Going Straight	260
Same Direction - Both Going Straight-Sideswipe	236
Opposite Direction - One Straight-One Left Turn	165
One Motor Vehicle - Going Straight	111
Same Direction - One Straight-One Left Turn	111
Angle - One Straight-One Left Turn	75
Same Direction - Both Left Turn	65
Same Direction - Both Right Turn	60
Angle - One Straight-One Right Turn	59
Same Direction - One Straight-One Right Turn	39
Opposite Direction - One Backing-One Stopped	20
One Motor Vehicle - Turning Left	19
Angle - One Right Turn-One Stopped	11
Opposite Direction - One Right Turn-One Left Turn	11
One Motor Vehicle - Turning Right	10
Opposite Direction - One Straight-One Backing	6
Opposite Direction - Both Going Straight	5
Same Direction - One Right Turn-One Stopped	4
Angle - One Straight-One Stopped	3
One Motor Vehicle - Backing	3
Angle - One Straight-One Backing	3
Opposite Direction - One Straight-One Stopped	2
Angle - Both Left Turn	2
Same Direction - One Left Turn-One Stopped	2
One Motor Vehicle - Other	1
Opposite Direction - Both Left Turns	1
Angle - One Left Turn-One Stopped	1
Opposite Direction - One Left Turn-One Stopped	1

In the most dangerous parts of the Laredo MPO region, the most common manners of collision by far are same direction collisions, usually with one vehicle travelling and one stopped or with both vehicles travelling straight. Out of each manner causing over 100 crashes, six involve vehicles traveling straight or only one vehicle, with one straight and one left turn being the only exception with 165 crashes between 2016 and 2018.

Summary of Crash Data And Recommendations

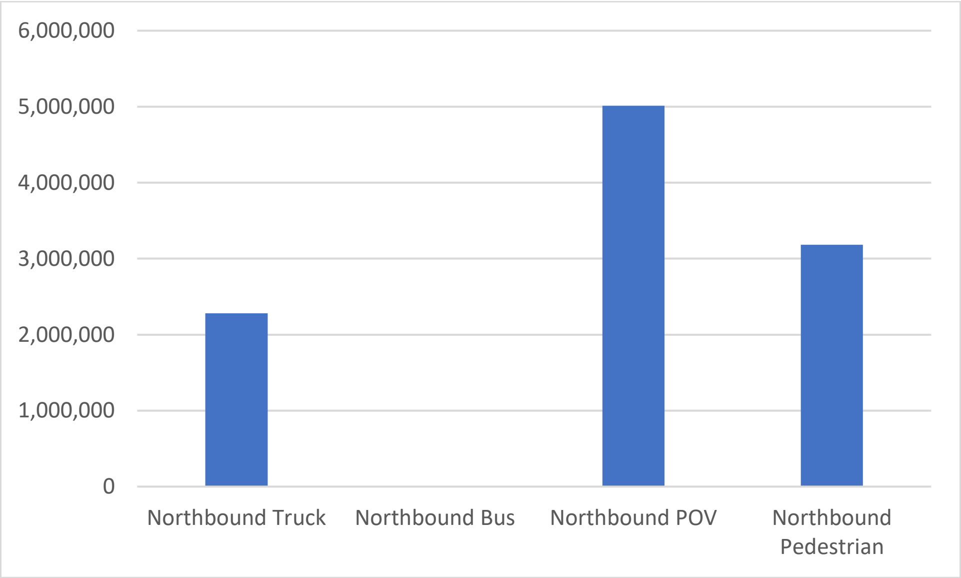
Available CRIS crash data shows that in recent years the roadway network in the Laredo MPO region is safe to travel on. Globally, even the most dangerous and highest volume roadways in the region suffer from serious injury and fatality rates that are lower than TxDOT's 2019 targets for five federal safety performance measures, and it is even safer on other roadways in the region. However, crashes are still frequent, with vehicles traveling in the same direction being the most likely to collide and left turns being a frequent cause of collisions. **This suggests that the steps that the City of Laredo, TxDOT, and US DOT can take to reduce the number of car collisions and ameliorate their severity are traffic calming measures, improved sight distances, lower speed limits, and improved signal timing.**

Border Crossing Conditions and Needs

Border traffic at the international bridge crossings is a significant concern in the Laredo MPO region and managing that congestion is important to maintaining the region's strong freight economic base and is important at a statewide and international trade level as well. According to the Laredo Development Foundation, the City of Laredo is the number one inland port on the US/Mexico border. The US only collects border crossing data for crossings entering the US; therefore, in the following graphs and charts, all border crossing data is for northbound crossings entering the US.

Figure 4-15 shows the distribution of truck, bus, person operated vehicle (POV), and pedestrian traffic for all bridge northbound crossings in 2018. Out of a total of 10.5 million northbound crossings, about 2.3 million were trucks, one thousand were buses, 5.0 million were privately owned vehicles and 3.1 million were pedestrians. **Figure 4-16** shows border traffic coming into the US from Mexico for all border crossings in the Laredo MPO region for years 2010 to 2018. In general, truck traffic has increased slightly over recent years, pedestrian traffic has gone up slowly since 2012, and POV traffic has gone up since a low point in 2012.

Figure 4-15: Total Bridge Crossings, 2018



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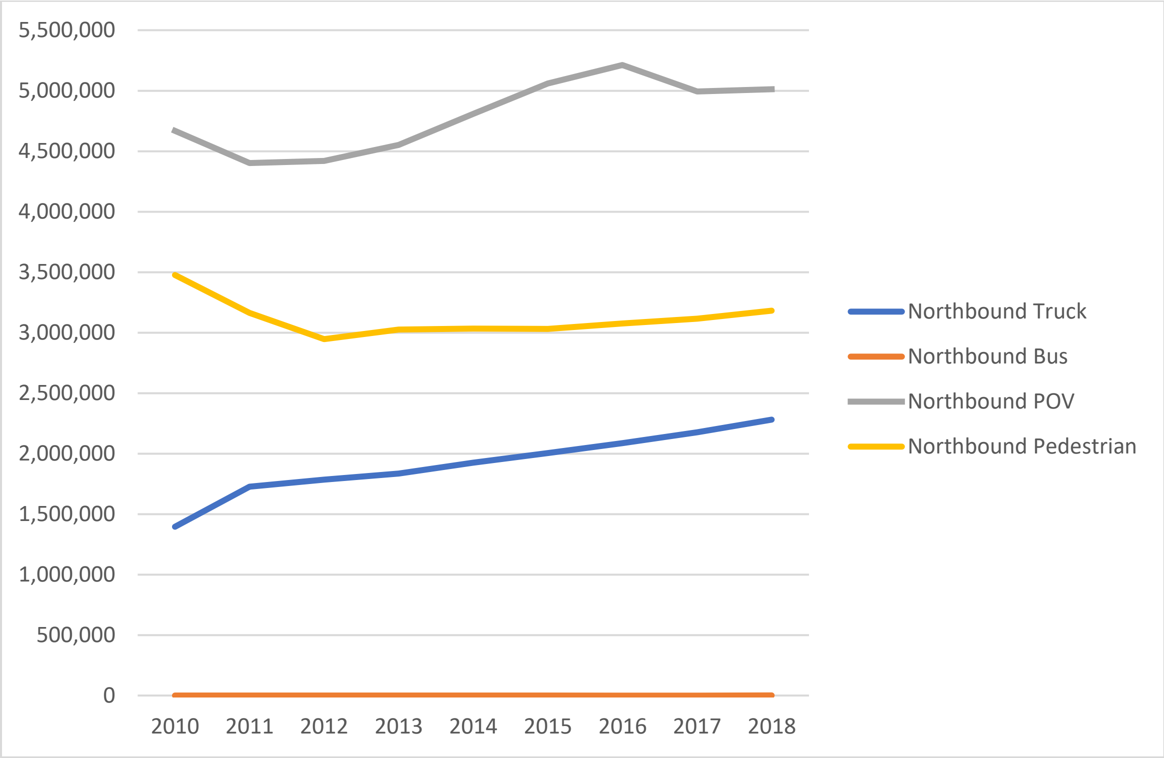
Source: City of Laredo, International Bridge System

Figure 4-16: Total Border Crossings, 2010 to 2018



Source: City of Laredo, International Bridge System

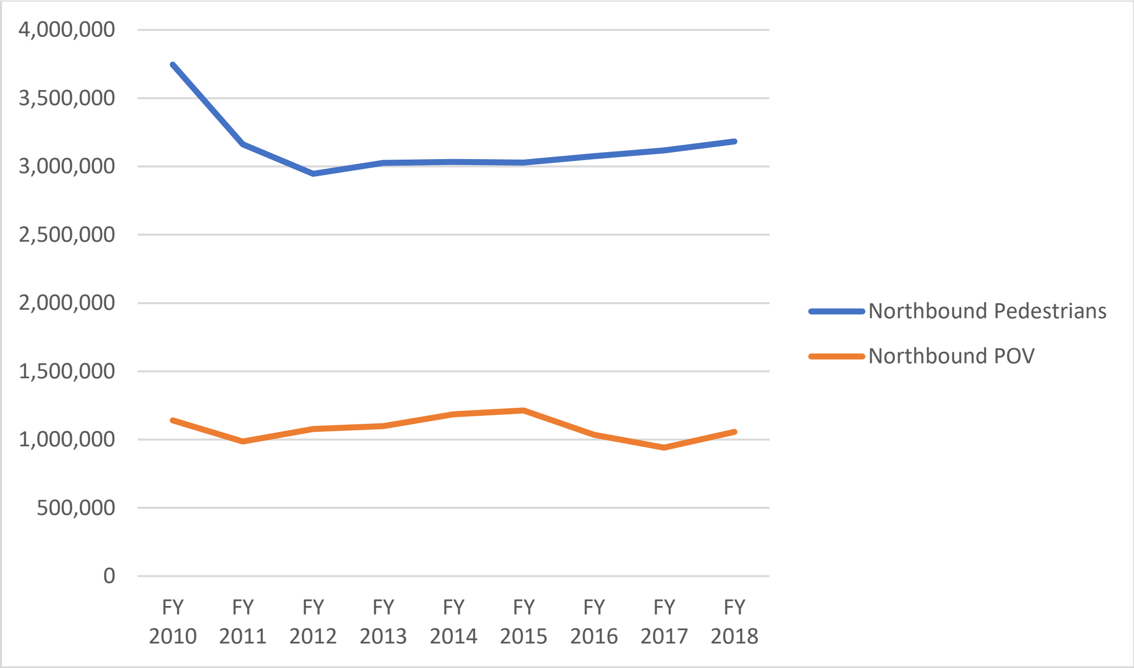
Increased population and trade will continue to be a concern in the Laredo MPO region, and so the international border crossings must be able to keep up with user demands. Because of this, it is important to understand the existing conditions of the crossings in order to identify potential improvements of the infrastructure. The following subsections describe existing border crossing characteristics as well as historical traffic conditions.

Gateway to the Americas (Bridge #1)

The Gateway to the Americas crossing, which is known locally as Bridge #1, is located in downtown Laredo on Convent Avenue near its intersection with US 83. The crossing is a tolled facility and handles privately owned vehicles (POV) and pedestrians. It is accessed southbound from Santa Maria Avenue and northbound via Convent Avenue. The City of Laredo owns the bridge facility while the General Services Administration owns the border station. The crossing is open 24 hours a day, seven days a week. The bridge itself is a four-lane facility with two lanes in each direction. Pedestrian accommodations occur on both sides of the bridge. The total length of the bridge is approximately 1,050 feet, and it operates 24 hours a day for pedestrians and POV. It was reconstructed in 1956 after being destroyed in 1954 by floods resulting from a hurricane in the Gulf of Mexico.

Figure 4-17 shows border traffic coming into the US and Mexico via the Gateway to the Americas Bridge in the past ten years (2010 to 2018). The bridge primarily serves as the main pedestrian crossing for the Laredo MPO region. Pedestrian northbound traffic is three times as heavy as non-commercial traffic.

Figure 4-17: Gateway to the Americas Bridge Crossings, 2010 to 2018



Source: City of Laredo, International Bridge System

At the Gateway to the Americas Bridge, pedestrian traffic fell greatly between 2010 and 2012, from approximately 3.75 million to a low of 2.95 million. In aggregate northbound pedestrian crossings are 15.05% lower in 2018 than in 2010 – however, there has been a slow and consistent rise in northbound pedestrian crossings from 2012 to 2018, averaging 1.34% per year. Northbound POV traffic has stagnated and is 7.39% lower than in 2010.

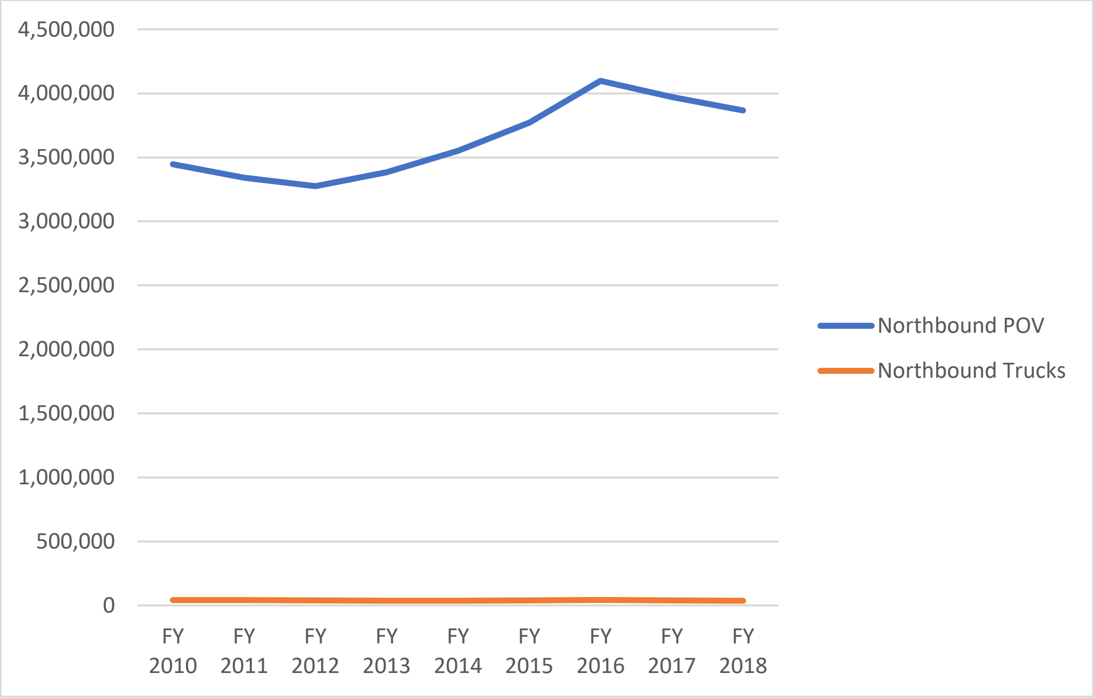
Growth in both northbound pedestrian and POV traffic at this bridge will depend on many factors, mostly upon continued economic and population growth in Laredo and Nuevo Laredo and on the structure of tolls. Because this bridge carries pedestrian and non-commercial vehicle traffic only, growth in traffic will not be determined by freight trends except insofar as it affects the broader economy. In 2045, northbound pedestrian traffic will shrink as low as 1.91 million (with a 2010 – 2018 growth trend) or grow to 4.56 million (with a 2012 – 2018 growth trend) and northbound POV traffic will fall to 824,033 with a 2010 – 2018 growth trend. POV traffic may be reduced if a future fifth international bridge crossing between Laredo and Nuevo Laredo is constructed, but because of the unique market for pedestrian travel between downtown Laredo and Nuevo Laredo the bridge serves pedestrian traffic is likely to increase long term. The Laredo MPO should plan for growth closer to the high scenario than the low scenario.

Juarez-Lincoln Bridge (Bridge #2)

The Juarez-Lincoln Crossing, known locally as Bridge #2, was a POV and buses only bridge but has since been opened to very small volumes of truck traffic. The crossing is tolled and is located in downtown Laredo on San Dario Avenue near its intersection with US 83, at the beginning of Interstate 35. Santa Ursula Avenue carries southbound traffic toward the crossing, while northbound traffic uses San Dario Avenue. The bridge is open continuously, 24 hours a day, seven days a week. The bridge itself is an eight-lane facility, four lanes in each direction, and has a non-commercial Automatic Vehicle Identification dedicated lane. The length of the bridge is approximately 1,010 feet and operates 24 hours a day for POVs. Intelligent traffic systems (ITS) are deployed on the northbound and southbound approaches to the bridge on the US side of the border. The bridge became operational in 1976 and is owned by the City of Laredo. The border station was completed in 1982 and is owned by the US General Services Administration.

Figure 4-18 shows border traffic coming into the US and Mexico via the Gateway to the Americas Bridge for the years 2010 to 2018. Compared with the other border crossings, the Juarez-Lincoln Bridge handles the most POV traffic.

Figure 4-18: Juarez-Lincoln Bridge Crossings, 2010 to 2018



Source: City of Laredo, International Bridge System

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Northbound POV traffic at the Juarez Lincoln Bridge declined from 2010 to 2012, rose substantially between 2012 and 2016, and then began to fall again between 2016 and 2018. Northbound POV traffic growth from 2012 to 2016 was 6.28% per year but overall growth between 2010 and 2018 was much lower, at 1.53% per year. Truck traffic, which makes up a very small part of overall traffic on the Juarez-Lincoln Bridge, is on the decline, falling 1.57% per year between 2010 and 2018.

The growth trend for northbound POV traffic at the Juarez Lincoln Bride in the future is likely to trend closer to the high growth seen from 2012 to 2016 in the near future than in the overall figure, as the 2010-2012 decline related to the Great Recession and the 2016-2018 decline related to disrupted operations related to bridge modernization. The relatively small amount of northbound truck traffic will continue to decline as the World Trade Bridge and a possible fifth border crossing bridge will continue to divert truck traffic from downtown Laredo. Under a high growth rate, northbound POV traffic at the Juarez Lincoln Bridge could grow from 3.87 million in 2018 to 5.83 million (with 2010-2018 growth rates) or to as high as 20.03 million (with 2012-2016 growth rates). While the traffic figures in the highest growth scenarios are not feasible due to capacity issues, the possibility of strong continued growth in northbound POV traffic at this bridge points to the need for more capacity improvements and a possible fifth bridge. Northbound truck traffic will fall to around 23,600 per day under the 2010 – 2018 growth rate. The Juarez-Lincoln Bridge's location near downtown Laredo and weak truck traffic mean that it is unlikely to see future growth in northbound truck traffic.

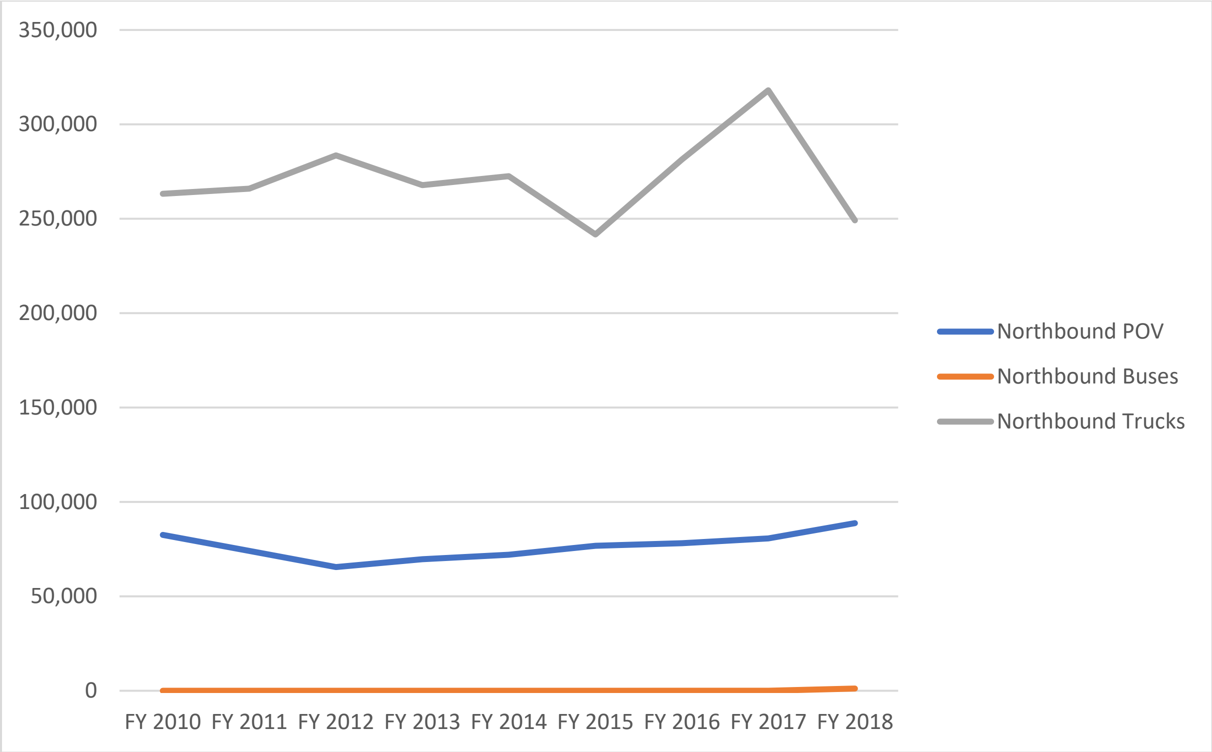
Laredo-Colombia Solidarity Bridge (Bridge #3)

The Laredo-Colombia Solidarity Bridge is located on FM 255 near its intersection with FM 1472, locally known as Mines Rd. It was completed in the summer of 1991 and is approximately 1,215 feet long. The crossing is a tolled facility that handles both commercial and non-commercial vehicles, as well as pedestrian traffic. For commercial traffic the bridge is open from 9:00am to 10:30pm Monday through Friday, from 10:00am to 4:00pm on Saturday, and from 12:00pm to 4:00pm on Sunday. For non-commercial traffic, bridge open hours are from 8:00am to 12:00am, 7 days a week.

The eight-lane bridge is the designated crossing within the Laredo MPO region for transporting hazardous materials between Mexico and the US. The City of Laredo owns the bridge facility while the General Services Administration owns the border station.

Figure 4-19 shows border traffic coming into the US and Mexico via the Laredo-Colombia Solidarity Bridge for the years 2010 to 2018. Northbound truck traffic is by far the most common use of this bridge.

Figure 4-19: Laredo-Colombia Solidarity Bridge Crossings, 2010 to 2018



Source: City of Laredo, International Bridge System

Northbound POV traffic at the Laredo Columbia Solidarity Bridge declined sharply from 2010 to 2012 before rising sharply from 2012 to 2018. Including the recessionary years of 2010 – 2012 annual average growth between 2010 and 2018 was only 0.95%, but between 2012 and 2018 it was 5.91%. Northbound truck traffic rose slightly from 2010 to 2012, fell again from 2012 to 2015, rose dramatically between 2015 and 2017, and then fell dramatically between 2017 and 2018. The dramatic recent fluctuations in northbound truck traffic give very different growth percentages depending on which years are considered (-1.64% annual growth for 2010 to 2015, -0.67% annual growth for 2010 to 2017, and -0.67% growth for 2010 to 2018).

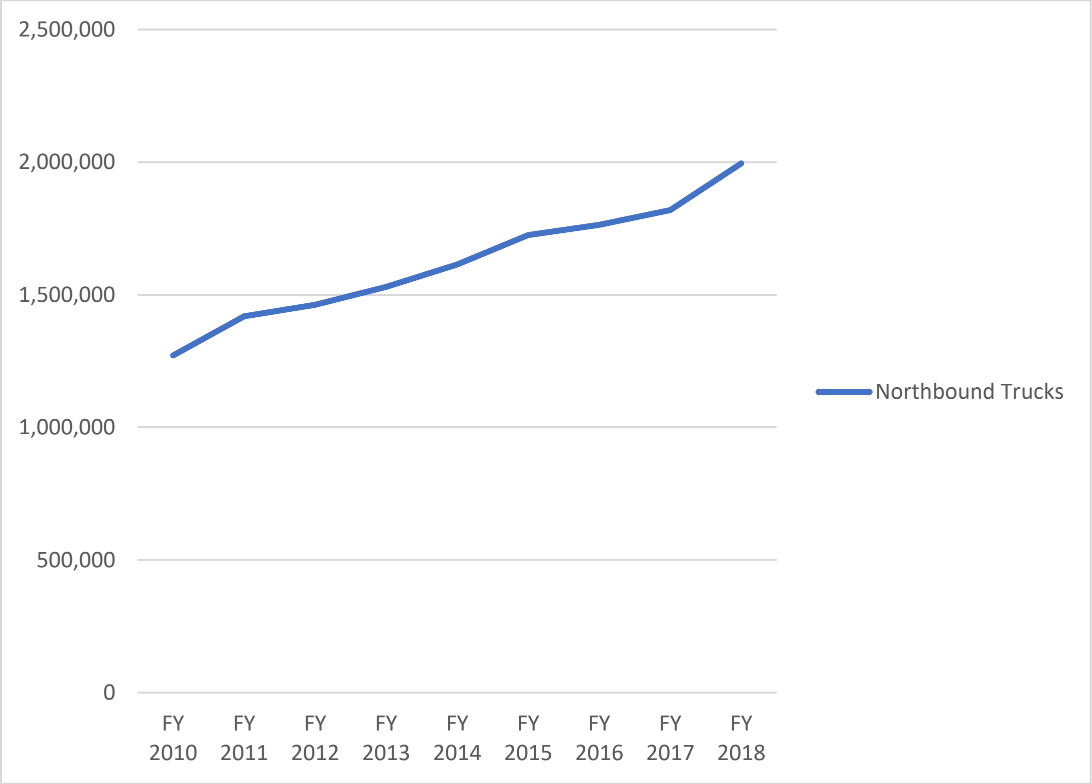
By 2045, northbound POV traffic will rise from 88,770 to 114,587 under the 2010 – 2018 annual growth rate of 0.97% but will rise to 418,374 under the 2012 – 2018 annual growth rate of 5.91%. This would add nearly over 300,000 vehicles to the daily bridge traffic – equivalent to more than truck traffic today. Meanwhile northbound truck traffic will fall to 159,393 in the low growth scenario (-1.64% for 2010 – 2015), fall to 207,750 in the medium growth scenario (-0.67% for 2010 – 2018), and rise to 548,982 in the high growth scenario (2.97% for 2010 – 2017). Overall northbound traffic on the Laredo Columbia Solidarity Bridge is likely to grow at a slower pace than at other bridges, and there is a clear trend showing a shift away from freight traffic and towards POV travel. This may be due to the increasing popularity of the World Trade Bridge for freight.

World Trade Bridge (Bridge #4)

The World Trade Crossing is located on Loop 20 near its intersection with FM 1472, locally known as Mines Rd. This eight-lane bridge is open to commercial vehicles only. The bridge is not intended for pedestrian traffic; the number of pedestrians crossing northbound from Mexico to the U.S. are actually the accompanying passengers other than the driver from freight trucks. The bridge and border station opened on April 15, 2000. The City of Laredo owns the bridge facility while the General Services Administration owns the border station. The tolled bridge has eight-lanes and is approximately 975 feet in length. It is the busiest international bridge in Texas, carrying over one-third of inbound trucks.

Figure 4-20 shows border traffic coming into the US from Mexico via the World Trade Bridge for the years 2010 to 2018. In particular, the World Trade Bridge serves as the primary commercial vehicle bridge in the region. From 2010 to 2018, commercial traffic in both directions has risen to almost 2 million. The hours for commercial traffic are from 8:00am to midnight Monday through Friday, from 8:00am to 4:00pm on Saturday, and from 10:00am to 2:00pm on Sunday.

Figure 4-20: World Trade Bridge Crossings, 2010 to 2018



Source: City of Laredo, International Bridge System

Northbound truck traffic at the World Trade Bridge has been growing at a consistent rate. The average growth rate per year of this traffic has been 7.12%. If northbound truck traffic rises at this consistent rate every year then there will be 12.8 million trucks crossing northward into the United States in 2045. While volumes are unlikely to ever reach this high level, this does call

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out the need for increased bridge capacity in the case that northbound truck traffic continues to grow at high rates.

Bridge Conditions and Needs

Bridges are the structures that carry a road across waterways, low-lying land, and other obstacles within the terrain. Bridge conditions are important to maintaining infrastructure and mobility in the region. The 2018 TxDOT Bridge Condition Report was reviewed to understand age and conditions of bridges within the region.

On January 22nd, 2019, the City of Laredo received public testimony and approved Resolution No. MPO 2019-01 adopting pavement, bridge, and travel time reliability performance measures and targets as established by TxDOT and the 2015 FAST act. The goals for bridge performance are shown below in **Table 4-10**.

Table 4-10: TxDOT / TEMPO Performance Goal and Measures

Performance Measure	Baseline	2020 Target	2022 Target
NHS Bridge Deck Condition			
% in “good” condition	50.6%	50.6%	50.4%
% in “poor” condition	0.9%	0.8%	0.8%

In the 2018 Report on Texas Bridges, the conditions of bridges are characterized according to their condition. **Table 4-11** details the terms used to characterize bridge conditions and the criteria that bridges must meet to be characterized. **Table 4-12** and **Table 4-13** show the number of bridges meeting each category in Webb County and throughout the State of Texas in 2018 for on-system and off-system bridges.

Table 4-11: Bridge Categories and Criteria

Bridge Category	Criteria for Bridge Category
Good or Better (GB)	• Meets all federal and State of Texas requirements
Structurally Deficient (SD)	• Restricted load-carrying capacity • Load-carrying capacity below as-built capacity • Closed • Over tops during flood events
Functionally Obsolete (FO)	• Fails to meet design criteria for one or all of the following: Deck geometry, load-carrying capacity, vertical or horizontal clearances, or roadway alignment.
Sub Standard for Load Only (SSLO)	• Original load-carrying capacity not designed to carry current legal roads • Recommended for load posting

Source: 2018 Report on Texas Bridges

Figure 4-12: On-System Bridge Conditions in Webb County and the State of Texas, 2018

Jurisdiction	Total	Good or Better	Structurally Deficient	Functionally Obsolete	Sub Standard Load Only
Webb County	267	251	0	16	0
State of Texas	35,548	31,577	203	3,703	65

Source: 2018 Report on Texas Bridges

Figure 4-13: Off-System Bridge Conditions in Webb County and the State of Texas, 2018

Jurisdiction	Total	Good or Better	Structurally Deficient	Functionally Obsolete	Sub Standard Load Only
Webb County	104	73	3	28	0
State of Texas	18,790	12,962	504	4,225	1,099

Source: 2018 Report on Texas Bridges

Of the 104 and 267 on-system and off-system bridges in Webb County, 251 (94.0%) and 73 (70.2%) are rated as "good or better". By this criterion, the bridges in the Laredo MPO region is meeting the City of Laredo's stated standards for bridges in "good" condition. However, 16 (6.2%) of on-system bridges and 28 (26.9%) of off-system bridges in each category are functionally obsolete, meaning that some or all of these bridges may have deficient deck geometries.

Under the Highway Bridge Program (HBP), both on-system and off-system bridges are eligible for programmed repair funding if they are structurally deficient or functionally obsolete and have a sufficiency rating of 80 or less. If they are structurally deficient or functionally obsolete and have a sufficiency rating of 50 or less, they qualify for programmed replacement funding. The lower the sufficiency rating of a bridge is, the higher priority funding for repair or replacement is.

Additionally, there are resources for local governments to improve off-system bridges. One is the Participation-Waived Project/Equivalent Match Project (PWP/EMP) program, which allows a local government to waive 10% of its cost participation requirement on an off-system bridge project if it uses the equivalent dollar amount to improve another deficient bridge structure. Another is the Economically Disadvantaged Counties (EDC) program, which allows counties to adjust their participation amounts in lieu of part or all of the cost of participation in the PWP/EWP program.

Regional Strategies

The Laredo MPO region has an extensive transportation infrastructure that is an indispensable asset to the regional and national economy. This infrastructure is the result of a large investment over many years and is relied upon by residents, visitors, and the business community to provide reliable transportation service. Based on the existing and future conditions analysis conducted above, several regional strategies have been identified to effectively utilize limited transportation resources and meet regional goals and objectives:

- Implementing system preservation and resiliency programs to maintain facilities including roadways, bridges, and stormwater facilities;
- Promoting alternative programs and modes of transportation through travel demand management;
- Utilizing transportation system management strategies to improve mobility, accessibility, and operational efficiency;
- Adopting land use and urban design elements that are more appropriate for a multimodal transportation environment.

Safety, security, and resiliency are also important factors that were integrated into the planning process. More details on these plans, policies, and initiatives are discussed in **Chapter 11**.

System Preservation and Resiliency Programs

Preserving existing facilities and proactively addressing resiliency and reliability of the transportation system is an important priority and guiding principle of the Laredo MPO. Bridge and roadway deterioration are closely related to use, especially by heavy trucks, which make up a significant component of regional traffic volumes. Adequate resources must be directed toward preservation efforts to continue to meet the challenge of keeping the transportation system in good condition.

Roadway Maintenance

The implementation of an effective roadway maintenance program requires expertise in management, engineering, and economics, and encompasses routine/corrective maintenance, preventive maintenance, and rehabilitation activities.

Roadway pavements require continual reinvestment to sustain their structural viability and to maximize the original financial investment made to build them. Roadways that lack proper maintenance experience increased failure rates, cause increases in costs overall, and contribute to safety hazards and property loss.

Roadway maintenance activities can be generally categorized into three areas:

- **Routine** - These activities are undertaken on a regular, ongoing basis and can be grouped into cyclic and reactive works efforts. Cyclic works are those undertaken on a regular pre-defined schedule, such as mowing, while reactive works are those undertaken in response to any deficiencies that may arise, such as pothole repairs.
- **Preventive** - These are projects undertaken at regular, somewhat longer intervals to preserve the structural integrity and resiliency of a road, such as crack sealing.
- **Special –** The activities include emergency work to repair unexpectedly damaged roads.

In the Laredo MPO region, TxDOT's Maintenance Division oversees the preservation, upkeep and restoration of all state-owned roadways. One of the five TxDOT budget categories, "Maintain It," focuses on preventive maintenance and rehabilitation. The goal of the "Maintain It" funds category is to minimize the costs over time of managing and maintaining the transportation system. These funds are used to preserve the structural integrity of transportation facilities and for some safety improvements. Work under this category includes reconstruction, resurfacing, signing, striping, and other routine or periodic maintenance.

The City of Laredo and Webb County undertake street maintenance and rehabilitation responsibilities of all non-state-owned roadways. Through scheduled routine maintenance, department staff and contractors fill potholes, mow the grass, clean out ditches, and perform other routine preventive maintenance activities. Both the city and county maintain Capital Improvement Programs, which include roadway paving, resurfacing, and reconstruction projects.

Pavement Management

TxDOT monitors the surface condition of all of its roadways in a Pavement Management and Information System (PMIS). Road conditions are rated on a five-class scale from "very poor" to "very good" that considers factors that include the smoothness of the ride and the structural integrity of the roadway.

Stormwater Management

TxDOT has taken steps to reduce the impact of stormwater pollutants on bodies of water through the *Stormwater Management Plan (SWMP)*. The SWMP provides minimum control measures and best management practices to implement programs, controls, and activities intended to reduce the discharge of pollutants in stormwater from reaching bodies of water. More locally, the City of Laredo Environmental Services Department provides the *Storm Water Management Guidance Manual* detailing best management practices for day to day activities and infrastructure intended to reduce and mitigate the impacts of stormwater runoff.

Bridge Maintenance and Rehabilitation

Bridges also require scheduled maintenance and inspection to ensure they can continue to safely carry increasing traffic volumes and higher numbers of loaded trucks. The SAFETEA-LU Technical Corrections Act, enacted June 6, 2008, changed the Federal Highway Bridge Replacement and Rehabilitation Program to the Highway Bridge Program and placed greater emphasis on the importance of proper and timely bridge preservation. Highway Bridge Program funds were used for replacement, rehabilitation, painting, performing systematic preventive maintenance, and seismic retrofitting to eligible bridges. The MAP-21 Act reconstructed core highway formula programs. Highway Bridge Program, along with other major programs, was incorporated into new core formula programs, such as National Highway Performance Program (NHPP), Surface Transportation Program (STP), and Highway Safety Improvement Program (HSIP). These remain under the FAST Act.

Based upon structural assessments, TxDOT determines condition ratings for bridges in the Laredo MPO region. Bridges are rated as being either in "Good or Better" condition, "Structurally Deficient" condition, "Functionally Obsolete" condition, or "Sub Standard for Load Only" condition. Currently, 6.2% of on system and 26.9% of off-system bridges in Webb County are functionally obsolete, meaning that the City of Laredo's goals for keeping bridge deficiency rates under 1% is failing. Bridges in the Laredo MPO region are available for HBP funding for repair and replacement based on condition rating and sufficiency rating. To determine needs and formulate a strategy for reaching City of Laredo goals, the Laredo MPO should study the sufficiency rating of its bridge inventory.

Travel Demand Management

With any good or service, a balance is typically achieved between supply and demand. For roadway transportation, the “supply” consists of all public roads that enable travel between origins and destinations, while the “demand”, of course, is people’s mobility requirements which are evidenced by their travel patterns. As previously discussed, simply increasing the “supply” alone is not a sustainable strategy. Travel demand management (TDM) seeks to improve system performance by decreasing or shifting the demand for travel, primarily for those trips made by single-occupant automobiles. TDM strategies are effective in influencing travel patterns and behavior, increasing vehicle occupancy, promoting and encouraging alternative transportation modes, and redistributing the timing of trips to reduce traveling peaks, thereby reducing the overall demand on the transportation system.

The following list of TDM strategies could be of benefit to the Laredo MPO region:

- **Telecommuting and Flexible Work Schedules –** With today’s communications technology, it is quite feasible and practical to work at or closer to home. This is an excellent tactic in reducing the number of vehicles on the road. Additionally, other flexible work options which enable employees to shift their work schedules to earlier or later parts of the days spreads out demand for travel, thereby reducing congestion.
- **Ridesharing –** Carpool, vanpool, and other ride-share programs result in fewer single-occupancy vehicle trips and less congestion on roadways. Carpools are typically informal, while vanpool programs are more likely to be a more formal agreement through a local transit agency. Park-and-ride lots can help to encourage not only public transit, but also both informal and formal ridesharing services.
- **Parking Management –** The cost and availability of parking can affect the choice of whether or not to drive a personal vehicle. Downtown areas and other employment centers are more likely to promote diversified transportation choices when parking is unavailable or too costly. Presently, the City of Laredo has an effective system of monitoring parking meters in their downtown areas.
- **Support for Transit –** Providing necessary support for transit ridership can be instrumental in encouraging people to use alternative modes of transportation. People value their time and the convenience of a vehicle; therefore, transit should provide frequent service and be accessible to multiple origins and destinations. Specific programs to encourage transit use include employer-provided, tax-free transit passes, and guaranteed ride-home programs.
- **Support for Intercity Bus and Commuter Vanpools –** The availability of facilities that support intercity buses and commuter vanpools provides commuters across the MPO region the option of alternative modes to single-occupant automobiles. Intercity buses and commuter vanpools increase vehicle occupancy and help in reducing the overall travel demand of the transportation system.

- **Support for Bicycling and Walking** – Bicycle and pedestrian facilities that offer safe, accessible, contiguous, and direct pathways are most ideal for bicyclists and pedestrians and can take some of the burden off of the roadway network.
- **School Considerations** – Schools generate a substantial amount of vehicular traffic when parents drive their children to and from school. Children even living within close proximity to schools may not walk or bike to school because parents do not feel that the environment is safe to do so. Programs such as Safe Routes to School (SRTS) and the Walking School Bus (which provides chaperoned walks to schools), are effective in providing safe and accessible walking environments. Previously funded by the SAFETEA-LU, the SRTS Program makes funding available for a wide variety of programs and projects, from building safer street crossings to establishing programs that encourage children and their parents to walk and bicycle safely to school. The current authorization bill the FAST Act does not provide specific funding for SRTS, but the SRTS programs and projects are eligible for Transportation Alternatives Program (TAP) and Surface Transportation Program (STP) funds. Better coordination between local governments and school districts can also help in selecting sites for new schools that are conducive to walking and bicycling.

Transportation System Management and Operational Efficiency

Transportation System Management (TSM) programs help to accommodate the safe and efficient movement of people and vehicles within the existing transportation system. They typically involve roadway improvements that increase capacity, optimize traffic operation, or apply traffic calming in residential areas. Furthermore, they generally may come at a relatively low cost, require minimal right-of-way, and often can be accomplished quickly. An example of a broad TSM program is the implementation of intelligent transportation systems (ITS) technologies. In particular, ITS can improve transportation safety and mobility and enhance efficiency through the integration of advanced communications technologies. The Laredo MPO recognizes the importance of best practices involving operational and management strategies for solving transport problems.

Intersection and Signal Improvements

Intersections are a significant component of traffic delay. The City of Laredo conducts traffic impact studies, signal warrant analyses, and traffic flow studies to improve the traffic operations at intersections throughout the city. Types of intersection improvements include intersection channelization projects, signal upgrades, realignments, and interchange construction. The City of Laredo continually coordinates with TxDOT to improve signal synchronization. In 2012, City of Laredo completed the ITS signal upgrade for improved signal synchronization of the 56 intersections in the downtown area to improve traffic operations. The Laredo MPO will continue to work to enhance traffic operations in the region by funding intersection improvements on regionally significant roadways.

Intelligent Transportation Systems

Intelligent transportation systems (ITS) include a broad range of wireless and wire line communications-based information and electronics technologies. These technologies improve transportation mobility, safety, and security of the transportation system infrastructure. ITS technology is employed by various agencies in the Laredo MPO region. In 2003, a four-county region including Webb, Duval, LaSalle, and Dimmit Counties, developed the Laredo Regional ITS Architecture and Deployment Plan with representatives from the City of Laredo, El Metro, Webb County, TxDOT, FHWA, US Border Patrol, and US Customs. This effort was a part of a TxDOT initiative to develop regional ITS architectures and deployment plans throughout the state for regions without ITS plans. In 2015, the City of Laredo Traffic Department developed the *City of Laredo ITS Master Plan* to identify ITS components, technology, and project concepts that have the potential to improve traveler safety, decrease traffic congestion, and generally manage the demand on the regional transportation system. South Texas Regional Advanced Transportation Information System (STRATIS).

STRATIS is the transportation management center administered by TxDOT's Laredo District and has been operational since February 2004. The mission of the program is "to provide best transportation and emergency management services through the use of our collective resources to maximize safety and mobility to the public". From STRATIS center, TxDOT has access to ITS implementations such as CCTV Cameras, Dynamic Message Signs (DMS), Highway Advisory Radio (HAR), and Video Image Vehicle Detection System (VIVIDS). TxDOT has also deployed nearly 30 miles of optic fiber cables around the City to provide communications to their roadside infrastructure. The deployed TxDOT optic fiber cables are on most of Loop 20 and Interstate 35 and several segments of US 59, SH 359, and FM 1472 within the Laredo MPO region. HAR is used by TxDOT to broadcast traveler information messages to drivers. DMSs provide up-to-date information about traffic flow conditions that helps drivers to make decisions about their trip. For instance, DMS boards on the I-35 southbound frontage road near Washington Street and Scott Street show the warning information of train obstruction to drivers to help them make better travel decisions. TxDOT also provides "Twitter" feeds about local traffic information.

The STRATIS system is connected to the City of Laredo Transportation Management Center (TMC) to share CCTV camera feeds and control. This connection also allows the City of Laredo

TMC to view messages that have been placed on the DMSs. TxDOT has also provided monitors to the City of Laredo 911 Dispatch Center to provide CCTV camera images to the center. The STRATIS center assists the local law enforcement agencies in detecting and responding to traffic incidents or any emergency incidents. These centers enable better communication and response times resulting in faster clearing of incidents, improved mobility and air quality, and reduced risk of further incidents.

The city of Laredo has implemented ITS solutions for traffic signals in the downtown area. ITS elements include new traffic signal control equipment and communication devices, video monitoring devices at major intersections, and dynamic message signs at major arterials, all of which will be operated from the TMC.

The city is currently experimenting a vehicle detection sensing system which utilizes a 3''x3''x3'' wireless devices to collect traffic information as a potential replacement over the traditional inducting loop and video detection. It could be a more accurate and cost-effective way to collect traffic information on arterials in the city.

International Bridges

The City of Laredo Bridge Department along with the General Services Administration (GSA) operates and manages four international bridges within the City of Laredo. Tolls for bridge crossing are collected in the form of cash, swipe cards, or automated vehicle identification (AVI) transponders. The city has installed Automatic Vehicle Identification (AVI) system at all bridges which identifies the vehicle automatically and deduct the proper toll amount from a pre-set account for toll collection. The AVI operates using an electronic sticker tag placed on the windshield inside the vehicle. As vehicle pass through the bridge, an overhead antenna reads the tag and automatically debits the correct toll amount from the prepaid AVI account of the user. All bridges are also equipped with CCTV cameras that transmit images to the Bridge Department and are also displayed on the Bridge Department's website for public access. Weigh-in-motion devices were also recently installed on Bridges III and IV, improving inspection operations at those crossings.

Several recently completed projects help improve the efficiency and security of border crossing through the international bridges. For instance, Multi-Protocol Reader System (MPRS) at all bridges is capable of reading different systems of tags; Digital Video Audit System (DVAS) at all bridges improves monitoring the border crossing activities; and Access Control System at all bridges is a system that controls access to and within the buildings, such as doors and gates. Future projects include the continuous upgrade to the toll collection system and weight-in-motion devices.

Land Use and Urban Design Strategies

Traffic Calming

Traffic calming efforts can include an array of programs, such as traffic law enforcement, public awareness and educational programs, as well as physical measures, which calm traffic flows and encourage safer roadways. In terms of transportation management, this usually includes a variety of infrastructure improvements that reduce the negative effect of vehicle use and improves conditions for non-motorized transportation. Further, these strategies can be effective in eliminating cut-through traffic on local or neighborhood streets. Some examples of traffic calming techniques utilized in transportation management include speed humps, roundabouts, traffic circles, and raised medians or islands that limit vehicular access and turning capabilities. The city of Laredo has employed various traffic calming techniques and will continue to do so as the need for such measures arises.

Access Management

Another technique to improve mobility and alleviate congestion is access management. Access management includes a broad set of techniques designed to improve roadway capacity, mobility, and safety by limiting the accessibility of vehicular traffic. This is accomplished by inhibiting the amount of conflict points, separating them, and removing turning vehicles and traffic buildup from through-vehicle movements. roadways.

Access management must be integrated into the roadway transportation system at every level of transportation planning. It is recommended that the Laredo MPO establish an access management classification system that is fully integrated with and informs Laredo's functional classification system for its roadways.

Land Use and Urban Design Considerations

How a city is planned in terms of the types of land uses has a direct effect on how the transportation system is developed. This is also true for how the transportation system is planned and how it can affect future land use. For instance, new or improved transportation infrastructure, combined with other services, enables a community to extend into new areas of development. Therefore, promoting smart and integrated land use and transportation development planning policies is vital for the overall health of a region.

A few best practices in integrating land use and urban design considerations with transportation systems include the following:

- **Grid street pattern** – A road system best serves the transportation needs of a region in a hierarchical, grid-like street pattern. A hierarchical structure of major thoroughfares, arterials, collectors, and local roads in a grid-like pattern more evenly distributes traffic volumes over multiple roads. It also offers connectivity benefits.
- **Complete Streets** – This concept seeks to convert roadways from auto-centric thoroughfares into people or community-oriented streets that accommodate the safe and efficient movement of all transportation users. The San Bernardo project is one example

of the Laredo MPO pursuing a complete street concept in that it is planned to be a "linear transit hub."

- **Context Sensitive Solutions** – Context sensitive solutions are concerned with involving all stakeholders and design professionals in a collaborative way to develop a transportation facility that not only provides for safety and efficient mobility for transportation users, but also blends into its physical and cultural context and preserves historic, natural, and other existing environmental resources. This type of approach focuses on considering the total context and community setting of transportation improvement projects.
- **Corridor Preservation –** Presently, the city of Laredo has identified major existing and future transportation corridors in the region within its thoroughfare plan. This is necessary in order to preserve future right-of-way and ensure a continuing and connected roadway system for future use.

The *Highway Safety Manual* by the American Association of State Highway and Transportation Officials (AASHTO) and the *Urban Street Design Guide* by the National Association of City Transportation Officials (NACTO) are referenced when the MPO seeks guidance on design criteria and standards. The Urban Street Design Guide provides a toolbox of the tactics and design criteria that cities can use to encourage safer, more livable, and economically thriving streets. The Highway Safety Manual provides information, techniques, and methodologies to quantify the safety-related effects of transportation decisions. Both manuals have been endorsed by TxDOT.

Chapter 5:
Transit

Introduction

To provide a comprehensive, multimodal transportation system, careful consideration should be given to investment decisions. Infusing monetary resources into roadways and infrastructure that primarily benefit personal vehicular transportation alone will not provide enough support for alternative transportation such as public transit, intercity buses, vanpools, bicycling, and walking. Given the rapid population growth facing the Laredo region, growing concerns about the environment and sustainability, and the recently adopted Viva Laredo Comprehensive Plan which calls for a better integrated multimodal network of travel options, there is a focused interest in actions that promote alternative transportation choices.

Public transit offers many societal, personal, and environmental advantages. It is the primary transportation option for individuals without access to their own automobile or those who are unable to drive. Personal benefits include cost savings, reduced stress from driving, and increased “down time.” The primary environmental benefit of public transit is a reduction in vehicle miles traveled, which results in lower fuel consumption and better air quality.

This chapter reviews the existing transit systems, facilities, and services in the region, operating costs, funding, and other transit performance factors; analyzes transit service gaps and identifies outstanding issues; and suggests strategies and policies to address the overall demand for public transit services through the 2045 planning horizon.

Regional Transit Services

Regional transit services include El Metro fixed-route and paratransit services in the city of Laredo and El Aguila, a rural transportation service in rural Webb County. In addition, Greyhound and Valley Transit operate intercity services to provide longer transit travel options outside of the region and a number of services also provide international transit services from Laredo into Mexico. Each of these services are further described below. 2017 data from the Federal Transit Administration’s National Transit Database, available data from these service providers and the most recently adopted 2016 Regional Transit Development Plan were used to provide additional information on each of these services.

El Metro Fixed Route Service

El Metro is the primary transit provider in the Laredo region, which operates 35 buses and maintains 945 bus stops for its 22 fixed bus routes. **Figure 6-1** presents the El Metro fixed route bus system.

Figure 0-1: El Metro System Map

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As of 2017, the average fixed route bus fleet age is 6.8 years. El Metro's bus fleet is presently powered mainly by compressed natural gas (CNG), which is more environmentally friendly and less expensive than regular gasoline and diesel fuel. In addition, all new model buses have bike racks, which are equipped to carry two bicycles.

El Metro's major transportation facility is the five-story Laredo Transit Center located in downtown Laredo at 1301 Farragut Street across from Jarvis Plaza. The transit center serves as a multimodal transportation terminal for the Laredo region and is the main point of transfer for all El Metro routes, El Aguila rural routes, and inter-city services like Valley Transit and Greyhound. It also houses El Metro's administrative offices and a public parking garage for downtown visitors. El Metro's Operations and Maintenance facility is currently located at 401 Scott Street and will be replaced by a new facility at the intersection of Jacaman Road and Bartlett Avenue in a $23 million-dollar project funded by a mixture of US Department of Transportation grants, sales tax proceeds generated within the City of Laredo, and an in-kind match in real estate and labor. Additionally, there is a park and ride lot located at the airport on Hillside Road; it was previously owned by El Metro but is now under the jurisdiction of the Laredo International Airport.

Since 2003, First Transit has administered the operational duties of El Metro, including operations at the downtown Laredo Transit Center. Currently, El Metro has an operating budget of approximately $14.5 million, and an annual ridership of approximately three million passengers.

Hours of Operation

The fixed route system operates Monday through Saturday from 6:00 AM until 10:00 PM. The first trip is later and last trip earlier on Sundays and major holidays. The peak hours are from 6:00 AM to 9:00 AM and 3:00 PM to 6:00 PM on weekdays.

Fares

El Metro fixed route bus fares are listed in **Table 6-1** and paratransit fares in **Table 6-2**. Electronic value cards can be purchased on the buses or at the ticket vending machines at the El Metro Transit Center and can store up to $20 worth of bus fares.

Table 6-1: Current El Metro Fare Structure – Fixed Route

Fare Type	Fare
Adults	$2.00
Students with I.D.	$1.50
Children 5 - 11 years of age	$0.50
Children under 5 years of age	Free
Senior Citizens (62+) / Disabled w/ Metro I.D. (Peak Hours)	$0.75
Senior Citizens (62+) / Disabled w/ Metro I.D. (Off-Peak Hours)	$0.50
Disabled (Peak Hours with El Metro ID)	$0.75
Disabled (Off Peak Hours with El Metro ID)	$0.50
Medicare Card Holder w/picture I.D.	$0.75
Transfers	$0.50

Source: El Metro, 2019

El Lift Paratransit Service

The El Lift Paratransit Service provides persons within the City of Laredo who are unable to utilize the El Metro fixed route system due to a disability, with shared, curb-to-curb public transportation. A total of 17 diesel-powered vans provide El Lift paratransit service and the average van fleet age is 7.3 years. Wheel chair lifts are provided on all vans as well as on all fixed route buses. To use El Lift, a personal doctor or social service agency must determine a person's eligibility. Eligible passengers must schedule trips in advance by calling El Lift customer service.

Hours of Operation

The demand response or El Lift system operates Monday through Saturday from 6:00 AM to 10:00 PM and on Sunday and major holidays from 7:00 AM to 8:30 PM.

Fares

The fare structure for El Lift is shown in **Table 6-2**.

Table 6-2: Current El Metro Fare Schedule - Paratransit

Fare Type	Fare
El Lift Paratransit (Regular for rides up to 7 miles)	$1.75
El Lift Paratransit (Plus for rides from 7.1 0 14 miles)	$2.00
El Lift Paratransit (Premium for rides 14.1 miles and over)	$2.25

Source: El Metro, 2019

Additionally, eligible El Lift passengers can purchase a 10-ride book for $7.50 to ride the El Lift van.

El Aguila Rural Transit Fixed Route Service

El Aguila is the designated rural public transit provider in Webb County and connects patrons living in the rural parts of Webb County to the City of Laredo's fixed route system at certain route stops and the transit center in downtown Laredo. El Aguila's fleet of 12 vehicles operated 209,456 miles and 14,071 hours annually and transported 70,581 annual passengers a year in 2017. El Aguila provides both fixed route and demand response services to the general public, including the elderly, persons with disabilities, students, and welfare-to-work participants. The six fixed routes serve these cities or areas: Rio Bravo, El Cenizo, Pueblo Nuevo, Aguilares, Mirando, Oilton, and Bruni. **Figure 6-3** shows the El Aguila fixed route bus system.

Hours of Operation

El Aguila rural fixed route service operates between 5:45 AM and 8:00 PM Monday through Saturday and from 7:30 AM to 6:45 PM on Sundays. The route connecting Rio Bravo, El Cenizo, Pueblo Nuevo, Aguilares, Mirando City, Oilton, and Bruni runs between 8:00 AM and 2:45 PM on Monday, Wednesday, and Friday.

Fares

The structure of fares is shown below in **Table 6-3**. Tickets can be purchased at Jarvis Plaza at 4801 Daughtery Street, Rio Bravo Meat (Rio Bravo), C & C Groceries (El Cenizo) or Los Compadres (El Cenizo).

Table 6-3: El Aguila Fare Structure

Description	Fares
Fixed Route	$1.50
Elderly/Disabled	$0.75 with discount/ID card
Demand Response	$1.00
Students at LCC	$0.50
Inter-City	$0.25

Source: El Aguila

El Aguila Rural Transit Demand Response Service

El Aguila provides both fixed route and demand response services to the general public, including the elderly, persons with disabilities, students, and welfare-to-work participants. This includes curb to curb service from private homes to medical facilities and medically related personal appointments.

Hours of Operation

El Aguila Rural Transit Demand Response services operate Monday through Friday from 7:00 AM to 5:00 PM throughout Webb County. El Aguila system routes are shown in **Figure 6-2**.

Fares

The fare for El Aguila Rural Transit Demand Response Service is currently priced at $1.00 each way for adults, $0.75 one way for seniors, and $0.50 for students. A discount card is issued for free of charge to first time riders.

Intercity Transportation Services

Greyhound Lines, Inc. is the largest provider of intercity bus transit services in the United States, with 3,800 destinations and 13,000 departures daily throughout North America. Within the Laredo region, Greyhound's Laredo station is co-located at the El Metro Transit Center. According to scheduling information, provided online through Greyhound's website, the highest frequency of passenger services occurs between Laredo and San Antonio, with approximately 10 one-way, non-stop trips per day. Other non-stop destinations from Laredo to major cities include Austin, Dallas, Houston, and McAllen. These services are provided through the Valley Transit Company and Americanos USA, which are operating subsidiaries in the Greyhound family of services. Besides providing passenger services, Greyhound also provides same-day and next-day package delivery, as well as charter services for businesses, conventions, schools, and other groups.

Within the Laredo region, several bus operators also provide international passenger bus service from Laredo to destinations across Mexico. These intercity bus operators providing international service include Turimex Internaccional (Grupo Senda), Tornado Bus Company, El Expresso Bus Company, El Conejo, and Omnibus Express.

Figure 0-2: El Aguila System Map

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Transit Performance

Metro and El Lift Performance

Transit Ridership

Transit utilization is determined by the level of ridership or passenger trips on a system. Passenger miles traveled is the sum of the distances ridden by each passenger in a transit system. Unlinked passenger trips refer to the total number of passengers who board public transit vehicles, regardless of how many vehicles it takes to reach a destination.

Table 6-4 presents annual passenger miles and unlinked trips for the years 2007 through 2012. There was slight decrease in passenger miles after 2009, continuing through 2015 when demand response passenger miles bottomed out at almost 250,000 and 2016 when fixed route passenger miles bottomed out at around 9.5 million. Ridership has recovered slightly since then, but the recency of past data makes it impossible to generalize about future trends. Fixed route unlinked trips have declined to under 3 million from a peak in the mid-2000s of over 4.3 million, while demand response passenger miles have fluctuated up and down in the mid to high 200,000s. This indicates that passengers are traveling longer distances within the system than in the past.

Table 6-4: Annual Passenger Miles and Unlinked Trips

Year	Fixed Route		Demand Response	
	Passenger Miles	Unlinked Trips	Passenger Miles	Unlinked Trips
2007	13,311,072	4,324,395	256,981	51,548
2008	14,451,730	4,358,456	273,540	50,199
2009	13,222,181	3,987,845	230,597	48,403
2010	11,166,761	3,365,703	214,969	52,368
2011	10,012,260	3,149,631	288,939	55,983
2012	10,121,410	3,183,633	265,053	52,440
2013	10,121,410	3,243,378	287,069	53,107
2014	10,322,701	3,184,119	261,299	51,966
2015	9,819,675	3,097,759	249,027	45,819
2016	9,534,915	3,007,941	261,492	47,529
2017	10,122,069	2,985,861	265,817	51,650

Source: National Transit Database, 2007-2017

Data from the El Metro 2017 Frequency Service Table and ridership data taken from El Metro in 2014 were reviewed to determine the service levels and ridership for the most heavily used routes in Laredo. Based on the above ridership levels, it is evident that the most popular routes during the weekdays are Route 1 – Santa Maria, Routes 2A and 2B – San Bernardo, Route 3 – Convent, Route 10 – Corpus Christi, and Route 4 – Springfield.

Route 1 serves downtown Laredo along Santa Maria Street between the Transit Center and the retail destinations of Mall del Norte and Target, while Route 2A operates in a similar fashion along the busy commercial corridor of San Bernardo and connects the Transit Center with Mall del Norte. Route 2B follows the same alignment as Route 2A along San Bernardo until it heads east on Hillside towards the park and ride lot near the airport and circles back to downtown via Calton Road. Similarly, Route 3 begins at the Transit Center downtown but heads in a mainly northwest direction, serving such destinations as the Laredo Medical Center, Laredo Main Library, and the Doctor's Hospital of Laredo. Route 4 also begins at the Transit Center downtown and travels in a mainly north/southern direction, serving the Springfield Avenue corridor. Route 10 connects the Laredo Transit Center with South Laredo in a north to south direction and is the main route serving South Laredo.

The routes with highest ridership have the high ridership for numerous reasons. Route 1, Route 2A, and Route 2B run along major arterials connecting the Laredo Transit Center to dense central neighborhoods and demand generating destinations, while Route 3 and Route 4 connect dense neighborhoods on less busy thoroughfares. Route 10 connects the Laredo Transit Center with an area of South Laredo that the 2016 El Metro Transit Development Plan identifies as having one of the largest clusters of highly transit dependent riders in the Laredo MPO region.

Fixed Route Ridership

Table 6-4 shows the 2017 frequency and 2014 ridership for each El Metro fixed route. Route 1 Santa Maria has the most riders with approximately 440,000 passenger-trips each year, which is 14 percent of the total ridership for the system. Route 2A San Bernardo/Social Security and Route 3 Convent carry the second and third highest ridership with approximately 295,000 (9 percent) and 220,000 (7 percent) annual passenger trips respectively for each route.

Table 6-4: Frequency and Ridership for El Metro Fixed Route Services, 2014

Route	Route Name	Approximate Frequency (in minutes)							2014 Ridership
		Weekday			Saturday		Sunday		
		Peak	Day	Eve	Day	Eve	Day	Eve	
1	Santa Maria	25	25	25-50	25	25-50	35-40	35-40	439,853
2A	San Bernardo	35	35	35-70	35	35-70	70	70	294,815
2B	San Bernardo	35	35	30-70	35	35-70	70	70	191,518
3	Convent	60	60	60	60	60	120	NA	220,220
4	Springfield	38	38	38	38	38	75	75	190,824
5	Tilden	70	70	70	70	70	140	-	63,275
6	Cedar	70	70	70	70	70	140	-	122,428
7	LCC	30	30	30	30	30	30	30	94,348
8A	Guadalupe/Lane	70	70	70	70	70	70	70	106,443
8B	Guadalupe/Villa Del Sol	90	90	90	90	90	-	-	41,798
9	Market	45	45	45-90	45	45-90	90	90	147,078
10	Corpus Christi	30	30	30	30	30	60	60	193,028
11	Gustavus/LEC	85	85	90	85	90	85	85	90,847
12A	Del Mar Express	20-35	75	75	75	75	75	75	129,618
12B	Shiloh Express	45	75	40-75	80	80	-	-	119,210
13	Heritage Park	75	75	90	85	90	85	85	67,271
14	Santa Rita	90	90	90	90	90	90	90	108,202
15	Main/Riverside	80	80	80	80	80	80	80	60,121
16	TAMIU	15-30	75	40-75	75	75	60	-	174,536
17	Mines Road	40-60	100	100	75	75	75	75	134,475
19	Santo Niño	80	80	80	80	80	80	80	99,736
20	Los Angeles	85	85	85	85	85	90	90	113,451

Source: El Metro 2017 Service Frequency Table and El Metro 2014 Ridership Data

Operating Costs and Funding Sources

In 2017, El Metro incurred approximately $14.5 million in operating expenses for its fixed route and demand response services. **Table 6-5** exhibits annual operating expenses and for El Metro's transit services from 2007 through 2017. Between 2007 and 2017 fixed route operating expenses grew by an average of 1.07% a year, and demand response operating expenses grew by 2.72% a year. If current trends continue to 2045 fixed route operating expenses could be as high as $16,263,861 and demand response operating expenses as high as $5,586,830.

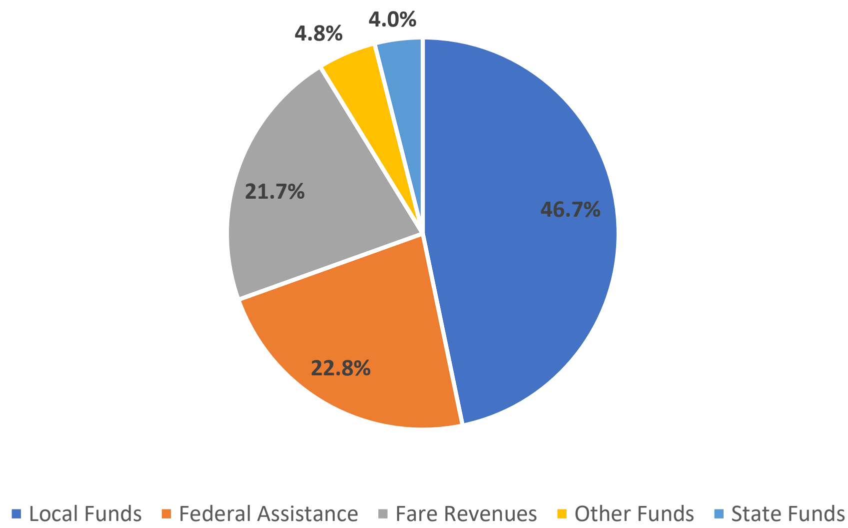
Table 6-5: Annual Operating Expenses

Year	Fixed Route Operating Expenses	Demand Response Operating Expenses
2007	$10,827,000	$2,015,000
2008	$10,985,000	$2,167,000
2009	$10,534,000	$2,106,000
2010	$10,753,000	$1,956,000
2011	$10,440,000	$1,936,000
2012	$11,173,000	$2,003,000
2013	$11,925,274	$2,142,420
2014	$11,996,967	$2,220,342
2015	$11,873,788	$2,389,147
2016	$12,087,791	$2,486,949
2017	$11,991,301	$2,564,093

Source: National Transit Database

El Metro's services are funded mostly through user fees (fares), sales tax, state funds, and federal funds, while a small percentage are covered by other funds such as advertising sales. **Figure 6-4** shows the specific breakdown by funding source.

Figure 0-4: El Metro Operating Cost Funding Sources, 2017



Source: National Transit Database

Local funding from City of Laredo taxes amount accounted for about $6.8 million of operating expenses in 2017, while federal funds accounted for $3.3 million and state funds covered only about $577,000. Fare revenues contributed a total of about $3.1 million for operating expenses in 2017. **Table 6-6** shows the amount of fare revenues collected each year from 2007 through

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

2017. Annual fare revenue growth for the fixed route system between 2007 and 2017 was 1.23%, and for the demand response system annual fare revenue growth was 2.11%.

Table 6-6: Annual Fare Revenues

Year	Fixed Route	Demand Response
2007	$2,775,000	$33,109
2008	$3,487,000	$34,272
2009	$3,201,000	$34,007
2010	$3,140,000	$44,983
2011	$3,244,000	$48,469
2012	$3,298,000	$42,980
2013	$3,367,797	$41,644
2014	$3,338,050	$42,036
2015	$3,240,096	$38,314
2016	$3,129,609	$36,999
2017	$3,117,455	$40,121

Source: National Transit Database

Service Performance Measures

Transit service performance measures provide insight on the operational status of a transit system. It is important to note that transit service performance measures are different from the performance measures required by the FAST Act. Service performance measures are useful as a basis for future strategic decision-making regarding route planning, fleet planning, budgeting, and scheduling. Three service performance measures are used to monitor the service performance of the transit agency: service effectiveness, service efficiency, and cost effectiveness.

Service effectiveness is measured by dividing annual passenger trips (APT) by vehicle revenue miles (VRM) and vehicle revenue hours (VRH). APT represents the number of passengers who board the operational revenue vehicles. Passengers would be counted each time they board the vehicles, regardless of how many vehicles they have boarded in the current trip. VRM and VRH are the total amount of miles and hours for all vehicles in a transit system when the vehicles are available to the general public. Higher numbers of the measures mean better service effectiveness.

It is a measure of transit utilization describing the level of ridership on a system given the level of service of a transit system. The service effectiveness from 2013 through 2017 is described in **Table 6-6**. For fixed route services, APT per VRM fell by 1.6% per year and APT per VRH fell by 2.04% per year. For fixed route services, the average APT per VRM for peer agencies is 1.19 and the average APT per VRH is 15.35, which El Metro outperforms. For demand response services APT per VRM rose by 1.31% per year and APT per VRH fell by 1.8% per year. Future changes to APT per VRM and APT per VRH going out to 2045 will be driven by changes in ridership.

Table 6-6: Service effectiveness in 2013 through 2017

Year		2013	2014	2015	2016	2017
Fixed Route	APT per VRM	1.92	2	1.8	1.8	1.8
	APT per VRH	21.89	21.4	20.7	20.4	20.1
Demand Response	APT per VRM	0.19	0.2	0.2	0.2	0.2
	APT per VRH	1.94	1.8	1.7	1.8	1.8

Source: National Transit Database

Service efficiency is calculated by dividing the operating expenses by vehicle revenue miles (VRM) and vehicle revenue hours (VRH). Lower numbers of the measures translate to better service efficiency. The service efficiency from 2013 through 2017 is described in **Table 6-7**. In recent years, these numbers fluctuated but stayed at a similar level. For fixed route services, operating expenses per VRM did not change and operating expenses per VRH rose by 0.1% per year. For fixed route services, El Metro outperforms peer agencies for operating expenses per VRM (which averages $7.42) but not for operating expenses per VRH (which averages $71.99). For demand response services, operating expenses rose by 6.3% per year and operating expenses per VRH rose by 5.17% per year. There is not a long-term trend that indicates whether service effectiveness for El Metro's fixed route services will increase or decrease going out to 2045, but service effectiveness for demand response services show a declining trend.

Table 6-7: Service Efficiency in 2013 through 2017

Year		2013	2014	2015	2016	2017
Fixed Route	Operating Expense per VRM	$7.06	$7.42	$7.05	$7.09	$7.06
	Operating Expense per VRH	$80.47	$80.64	$79.44	$81.90	$80.88
Demand Response	Operating Expense per VRM	$7.78	$8.37	$9.46	$9.61	$9.76
	Operating Expense per VRH	$78.14	$78.44	$88.89	$92.04	$94.30

Source: National Transit Database

The measures for cost effectiveness are operating expenses per APT and passenger mile traveled (PMT). PMT is the cumulative sum of a passenger who boards an operational revenue vehicle. Lower figures for the measures mean higher cost effectiveness. The service efficiency from 2013 through 2017 is described in **Table 6-8**. For fixed route services between 2013 and 2017, operating expenses per passenger mile fluctuated but did not change and operating expenses per passenger trip rose by 3.7% per year. For fixed route services, the average operating expenses per passenger mile is $5.41, which El Metro outperforms, and average operating expenses per unlinked passenger trip is $1.83, which El Metro also outperforms. For demand response services, operating expenses per passenger mile rose by 7.33% per year and operating expenses per passenger trip rose by 5.76% per year.

Table 6-8: Cost Effectiveness in 2013 through 2017

Year		2013	2014	2015	2016	2017
Fixed Route	Operating Expense Per Passenger Mile	$1.18	$1.16	$1.21	$1.27	$1.18
	Operating Expense per Unlinked Passenger Trip	$3.58	$3.77	$3.83	$4.02	$4.02
Demand Response	Operating Expense Per Passenger Mile	$7.46	$8.50	$9.59	$9.51	$9.65
	Operating Expense per Unlinked Passenger Trip	$40.34	$42.73	$52.14	$52.32	$49.64

Looking out to 2045, there is currently no trend that indicates that indicates a significant rise in operating expenses for fixed route service but operating expensive for demand response services has increased substantially since 2013. This represents a long-term threat to the financial sustainability of El Metro's demand response service, especially if El Metro wishes to expand it.

MAP-21 directed the USDOT to establish a set of performance measures to increase accountability and transparency of the federal highway and transit programs and to improve decision making through performance-based planning and programming. The FAST Act carries over these requirements for performance measures. The performance measures are being established in a series of rulemakings by the FHWA and FTA. The FTA published the Final Rule for Transit Asset Management (TAM) in July 2016 requiring public transportation providers to develop transit asset management plans for public transportation assets, including vehicles, facilities, equipment, and other infrastructure. The TAM final rule requires transit providers to set state of good repair performance targets. El Metro has accordingly set state of good repair performance targets that align with state targets described in Chapter 1.

El Metro collects and submits all public transit data to the TxDOT Public Transportation Division in the standard format described in *PTN-128 Reporting Manual: Data Collection and Performance Reporting*. In 2016, the *Transit Development Plan (TDP)* for El Metro was updated and includes service recommendations and updated performance measures. Ensuring regular updates of the TDP, 2016 Transit Development Plan provides updated performance measures and regular updates of the TDP provides for short term planning and performance monitoring of the transit system. A memorandum of understanding (MOU) has been developed to communicate performance data between the MPO, TxDOT, and the FTA.

El Aguila Performance

Transit Ridership

Transit utilization is determined by the level of ridership or passenger trips on a system. Unlinked passenger trips refer to the total number of passengers who board public transit vehicles, regardless of how many vehicles it takes to reach a destination.

Table 6-9 shows unlinked passenger trips for the El Aguila service. Overall fixed route passenger trips declined rapidly between 2014 and 2017 from almost 96,000 to under 69,000 while demand response passenger trips fell from almost 3,000 to slightly over 2,000. (The figure for unlinked passenger trips for 2015 is likely to be an erroneous outlier). There could be many reasons for this decline in ridership, including lower funding and a shrinking population of transit dependent riders in rural Webb County. Between 2014 and 2017, unlinked passenger trips on the fixed route system fell by an average of 1.07% a year, and unlinked passenger trips on the demand response system fell by 7.65% a year.

Table 6-9: El Aguila Passenger Trips

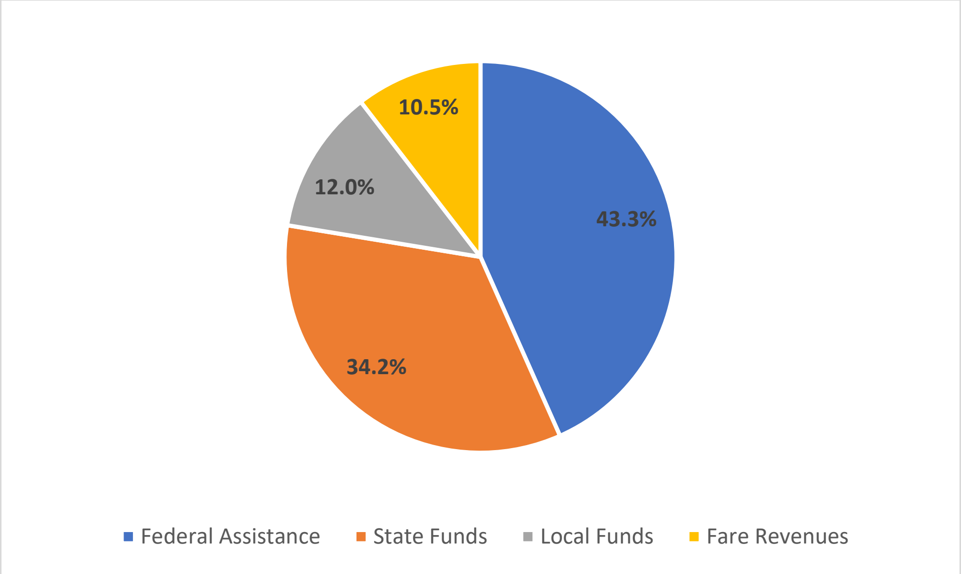
Year	Unlinked Passenger Trips – Fixed Route	Unlinked Passenger Trips – Demand Response
2014	95,898	2,904
2015	74,129	18,599
2016	77,811	2,691
2017	68,566	2,015

Source: National Transit Database

Operating Costs and Funding Sources

El Aguila's services are mostly through federal grants, state, and local tax funds. El Aguila's farebox recovery rate is 10.5%. **Figure 6-5** shows the specific breakdown by funding source.

Figure 6-5: El Aguila Operating Cost Funding Sources, 2017



Source: National Transit Database

El Aguila's operating costs total $853,871. Federal assistance to El Aguila is $370,153 (43.3%), funding from the State of Texas is $292,352 (34.2%), local funding is $102,094% (12.0). El Aguila's farebox recovery rate is 10.5%. Between 2014 and 2017 El Aguila's fixed route fare revenue fell by 2.26% a year, and El Aguila's demand response fare revenue fell by an average of 8.79% a year. **Table 6-9** shows the history of El Aguila's annual fare revenues from 2014 to 2017:

Table 6-9: El Aguila Annual Fare Revenues

Year	Fixed Route	Demand Response
2014	$89,454	$12,198
2015	$107,621	$16,509
2016	$91,036	$9,237
2017	$81,362	$7,910

Source: National Transit Database

Service Performance Measures

Transit service performance measures provide insight on the operational status of a transit system. It is important to note that transit service performance measures are different from the performance measures required by the FAST Act. Service performance measures are useful as a basis for future strategic decision-making regarding route planning, fleet planning, budgeting, and scheduling. Three service performance measures are used to monitor the service performance of the transit agency: service effectiveness, service efficiency, and cost effectiveness.

Service effectiveness is measured by dividing annual passenger trips (APT) by vehicle revenue miles (VRM) and vehicle revenue hours (VRH). APT represents the number of passengers who board the operational revenue vehicles. Passengers would be counted each time they board the vehicles, regardless of how many vehicles they have boarded in the current trip. VRM and VRH are the total amount of miles and hours for all vehicles in a transit system when the vehicles are available to the general public. Higher APT per VRM and APT per VRH mean better service effectiveness.

It is a measure of transit utilization describing the level of ridership on a system given the level of service of a transit system. The service effectiveness from 2013 through 2017 is described in **Table 6-10**. From 2014 to 2017, El Aguila remained minimally effective as a rural transit and paratransit service serving captive riders. APT per VRM increased 50% per year between 2014 and 2017 for fixed route services while APT per VRH fell 7.67% per year between 2014 and 2017. For demand response services, APT per VRM fell by 3.04% per year between 2014 and 2017 and APT per VRH fell by 11% per year between 2014 and 2017. Overall, the effectiveness of service for the El Aguila system is declining over time.

Table 6-10: Service effectiveness of the El Aguila System - 2014 through 2017

Year		2014	2015	2016	2017
Fixed Route	APT per VRM	0.12	0.35	0.13	0.36
	APT per VRH	8.41	6.29	6.54	5.83
Demand Response	APT per VRM	0.41	0.56	0.38	0.36
	APT per VRH	1.55	8.00	1.18	0.87

Source: National Transit Database

Service efficiency is calculated by dividing the operating expenses by vehicle revenue miles (VRM) and vehicle revenue hours (VRH). Lower numbers of the measures translate to better service efficiency. The service efficiency from 2014 through 2017 is described in **Table 6-11**. Between 2014 and 2017, fixed route operating expenses per VRM increased by 8% per year and operating expenses per VRH increased by 1.19% per year. For demand responsive services between 2014 and 2017, operating expenses per VRM increased by 0.8% per year and operating expense per VRH fell by 9.4% per year. This was due to a large fall in total operating expenses for the demand response service.

Table 6-11: Service efficiency of the El Aguila System – 2014 through 2017

Year		2014	20152015	20162016	2017
Fixed Route	Operating Expense per VRM	$3.09	$3.46	$3.45	$4.08
	Operating Expense per VRH	$63.17	$61.34	$59.94	$66.19
Demand Response	Operating Expense per VRM	$3.94	$3.32	$3.45	$4.08
	Operating Expense per VRH	52.43	47.75	31.79	32.69

The measures for cost effectiveness are operating expenses per APT and passenger mile traveled (PMT). Unfortunately, data on El Aguila's PMT is lacking. Lower numbers of the measures mean better cost effectiveness. Unfortunately, data on El Aguila's PMT is lacking so only operating expense per APT is analyzed here. The service efficiency from 2014 through 2017 is described in **Table 6-12**. Between 2014 and 2017, operating expenses per APT for fixed route services rose by 12.8% a year and for demand response services rose by 2.5% per year. The figure for demand response operating expenses per API in 2015 is an outlier and possibly based on poorly reported data.

Table 6-12: Service efficiency of the El Aguila System - 2014 through 2017

Year		2014	2015	2016	2017
Fixed Route	Operating Expense per APT	$7.51	$9.75	$9.17	$11.35
Demand Response	Operating Expense per APT	$33.80	$5.96	$26.89	$37.55

Defining Regional Transit Issues and Needs

Transit systems must receive adequate funding to provide quality service and attract ridership to increase revenue sources. In contrast, if funding is insufficient, service suffers and ridership decreases, which in turn causes revenue to drop. Securing funding adequate for meeting the needs of the system and keep ridership at healthy levels is crucial for managing a healthy transit system.

Among the more important issues that El Metro and El Aguila will be facing during the upcoming years include the following:

- **More customers**: Population projections show growth in regions with a large transit dependent population, including South Laredo.
- **More service needs**: Recent ridership surveys conducted during the *Laredo Transit Development Plan* process revealed concerns about frequency of service, slowness of buses, and the length of wait; suggested improvements included more frequent services and longer service hours
- **Higher costs**: While the dramatic spike in fuel cost during 2008 has subsided, fuel and other costs are expected to rise.
- **Less funding**: Decrease in federal and state operation funding assistance resulted from the fact that in 2010 census the population of the Laredo region increased to over 200,000. It is necessary to rely on more local funding sources.

These challenges are further underscored by the already weakened overall economic conditions which make finding other funding sources more difficult. New sources of revenue and other funding strategies will be needed to meet the transit demands in the future as well as maintain the existing transit service.

Captive and Choice Riders

Users of public transportation services can be divided into two general types of riders: captive riders and choice riders. Captive riders usually have no other choice but to use public transit and consist of people without access to other means of transportation, persons with disabilities, and individuals who are otherwise unable to transport themselves. For captive riders, transit is an integral component of the transportation system and enables access to jobs, education, medical care, and other needed services. In contrast, choice riders have other means of transportation at their disposal and may use transit for a variety of reasons, including cost savings, convenience, or environmental cognizance. Attracting additional choice riders is a challenge for many public transit systems in small to medium sized urban areas where roadway congestion or parking prices are not a significant problem or where a stigma or negative perception of transit is attached to using the system. In addressing future mobility issues, transit must offer a competitive alternative to the personal automobile.

Currently, the majority of the ridership of El Metro and El Aguila is made up of captive riders. Riders surveyed indicate that more residents of the Laredo MPO region would ride more frequently if El Metro and El Aguila service was more frequent and more convenient, linking riders with their destinations more efficiently. More direct connections to regional destinations could bolster ridership, especially as economic trends like a decline in carless households could lead to a decline in transit ridership.

Growing Elderly Population

As the population ages, it is imperative to consider additional transportation options for elderly individuals less able to operate their own vehicle. Public transit and special mobility services, such as demand-response paratransit services, will enable a growing elderly population to continue to engage in the community and receive needed medical and support services. However, the cost of specialized transportation services can be extensive. The Federal Transit Administration provides formula-based funding to states to assist private non-profit organizations in meeting the transportation needs of our senior citizens.

Asset Management and Replacement Needs

The assets and facilities owned by any public agency, including transit agencies, age out of their useful service lives over time. Because of this, El Metro needs to plan to prioritize and secure funding for the replacement of existing revenue vehicles, equipment assets, and existing facilities into the future.

The 2017 El Metro Transit Asset Management Plan (TAMP) evaluated revenue vehicles and equipment assets owned by El Metro on the basis of their Universal Life Benchmark (ULB), a measure of the useful service live of a vehicle evaluated in this case on the basis of mileage, and facilities owned by El Metro on the basis of the FTA's Transit Economics Requirements Model (TERM) scale, which scores transit facilities from as having (1) to excellent (5) condition. In January 2017, the Laredo MPO adopted performance targets requiring that 75% of vehicles and equipment should be within their ULB and that 75% of facilities have a TERM rating of 3 or higher.

As of 2017, 100% of vehicles and equipment owned by El Metro are within their ULB and 85% of facilities have a TERM rating of 3 or higher, so El Metro is currently meeting its performance targets. El Metro is facing budgetary challenges on doing so in the future. Currently, the needs to maintain a state of good repair are exceeding budget provided, and distance between asset failures is expected to decline.

Key Plans and Studies

The 2017 Viva Laredo Comprehensive Plan, the 2016 Laredo Transit Development Plan, and the 2011 Bus Rapid Transit Feasibility Study were all analyzed for key recommendations and policies to guide the development of the Laredo MPO region's future transit system.

Viva Laredo Comprehensive Plan

The Viva Laredo Comprehensive Plan was adopted by Laredo City Council on September 18th, 2017 and governs the city of Laredo's long-term land use and transportation planning, urban design and historic preservation, sustainability initiatives, and health and education planning. Chapter 4 of the plan (Mobility) evaluates the multi-modal transportation system's mobility, accessibility, and connectivity within the city.

A few notable trends and policies were identified by the Viva Laredo Comprehensive Plan:

- Laredo's transportation system is dominated by the use of single occupancy vehicles. In the mid-2010s, 86% of Laredo's workers commuted by private vehicle. Only 1.5% walk or 0.1% bike to work. In what is generally a lower income city, a disproportionate number of residents are made to travel to work by a relatively expensive mode.
- The driving costs of Laredo residents are estimated to be approximately 32% of median household income. This is over twice the 15% of median income threshold held to be affordable by the FHWA.
- Community concerns expressed by Laredo residents include expanding walkability and mixed-use zoning, addressing congestion, transit, rail, and airport investment, and improved bridges. Reducing congestion was foremost.

The stated goal for public transportation of the Viva Laredo plan is to make the transit system of the Laredo MPO region the most used citywide transit system in the State of Texas. Policies involve promoting route efficiency, transit quality, the reservation of right-of-way for future transit, the enhancement of local and regional bus service, the provision of bus station amenities, enhancement of the bike/ped network near transit stops, ITS implementation, transit-oriented development, and the consideration of a downtown streetcar.

Laredo Transit Development Plan

To enhance Laredo's transit system, the MPO completed the Laredo Transit Development Plan in 2016 to recommend improvements over a five-year period. Highlights of the plan's recommendations include the following:

- Consider fare increases and limited service reductions to address the recent ridership and fare revenue losses.
- Refine and optimize current bus schedules to provide reliable service for patrons.
- Stagger arrival times of routes with the most frequent services at the Transit Center in order to decrease bus congestion.
- Continue to recognize service expansion needs and consider the city's future planning efforts such as their thoroughfare and land use plans.
- Consider restructuring and consolidating routes that provide similar services. This is especially targeted at the San Bernardo corridor and includes a "Linear Hub" that reorganizes six current routes into two: one to serve local needs along San Bernardo and the other to provide express service on IH-35.
- Replace the current Downtown Trolley route with a new downtown circulation system.
- Initiate a major route restructuring study to determine the feasibility of the San Bernardo Linear Hub concept and other route improvements that would improve operational efficiency and level of service.
- Reduce expenditures for paratransit by establishing stricter eligibility requirements through an interview method and evaluate the feasibility of contracting paratransit services through taxicab operators.
- Consider recommended marketing strategies and prepare and implement such transit marketing programs. This resulted in the creation of the 2017 El Metro Marketing Plan.
- Provide real-time passenger trip planning service.
- Make certain capital improvements, including new bus stops and shelters and a new operations and maintenance facility.

Bus Rapid Transit Feasibility Study

The Bus Rapid Transit Feasibility Study was completed in 2011 to access the feasibility of implementing Bus Rapid Transit (BRT) service in Laredo and develop implementing strategies. The BRT goals, objectives, and performance measures were also identified. The existing conditions including transit network, roadway network, land use, socioeconomic conditions, and future travel and transit demand were reviewed. In addition to the review of existing conditions, inputs from stakeholders and Laredo MPO staff were also used to envision the different potential BRT scenarios. In the scenarios, existing bus routes are modified to work in tandem with new BRT routes. Different performance measures were evaluated, and the Preferred Transit Scenario was selected, and the phases of implementation and cost estimates were also developed. **Figure 6-6** shows the map of the preferred BRT scenario.

Figure 0-6: Preferred BRT Scenario

Source: 2011 Bus Rapid Transit Feasibility Study

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Best Practices and Strategies

A wide variety of best practices exists to ensure successful operation of a public transit system. To address the transit-related challenges of the Laredo region, the MPO will pursue the following "toolbox" of policies, strategies, and actions, along with recommendations presented in the *Laredo Transit Development Plan*.

Continually Evaluate Transit Operations and Improve Service

To promote a balanced transit system, it is necessary to continually assess overall system and route-level performance. Understanding the tradeoffs involved in changing the number of routes, the frequency of service, and the extent of service hours is important in making strategic decisions about allocating resources. A transit system should also continually evaluate its transit coverage as it relates to the region's growth from new development. As development occurs, a transit system should determine the feasibility of extending coverage to newly populated areas. Expanding system coverage to new areas may attract new riders, but at the same time may lower the level of service to areas or destinations in higher demand. As such, it is important to continually monitor the location of popular destinations and new development.

Extended service hours, higher service frequencies, additional routes, and expanded coverage areas are all more likely to be achieved through improved overall operational efficiency, more direct routes, better accessibility, and increased schedule reliability. In short, providing the broadest, most efficient, and most reliable service can greatly improve system operations and, in turn, increase ridership. Regular surveys of users and service studies can provide a cost-efficient way to allocate limited service hours. Furthermore, simple concepts, such as longer spacing between bus stops and transit priority at signalized intersections, can help improve transit speed.

El Metro will continue to employ best practices to increase operational efficiency in order to maximize services to the benefit of its users.

System Resiliency and Maintenance

Maintenance is an important activity for the operation of a transit system for the purpose of extending the useful life of vehicles, equipment, and facilities. Such maintenance is also critical to passenger comfort and transit service reliability. Vehicles in poor condition (e.g., torn seats, broken wheelchair lifts, or poor temperature control) affect the comfort of transit patrons. On-street boarding locations that fall into disrepair affect safety and accessibility. Vehicle breakdowns may cause severe hardships to transit patrons, affecting future ridership.

Examples of vehicle maintenance programs are the following:

- **Daily Service** - Pre-trip inspections prior to operating a vehicle in public service and post-trip inspections upon return to the operating facility are conducted by bus operators. Inspections can detect problems in areas such as lighting, tires, and safety equipment before failures occur while the vehicle is in service. The bus operators also monitor the operating condition of the vehicle throughout the operating day. All defects are

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documented on vehicle condition reports, and corrective action will be taken before the vehicle is returned to service.

- **Periodic Inspection** - These inspections are generally performed on a mileage basis and cover all major components of the vehicle. They are designed to provide maintenance personnel an opportunity to detect and repair damage or wear conditions before major repairs are necessary. They will include, at a minimum, inspection of suspension elements, leaks, belts, electrical connections, tire wear, and any noticeable problems. Additionally, the 2017 El Metro Transit Development Plan recommends that El Metro audits more than once per year the following:
    - Conditions of the vehicles as per above.
    - Age and anticipated remaining useful life of the vehicles.
    - Needed spare ratio for the maintenance of service.
    - Any successful reductions in maintenance costs or service failures.

    The findings can then be integrated into a report as part of a transit asset management plan to demonstrate the return on investment for any investments by El Metro.
- **Interval Related Maintenance** - Specific components are inspected on an interval basis to identify wear, alignment, or deterioration problems of parts or fluids. The interval maintenance program includes lubricating oils and filters, alignment, tires, steering components, engine, transmission, and brakes.
- **Standardization of Vehicle Replacement and Reduction in Spare Efforts –** In addition to vehicle replacement efforts that will be for more burdensome than in past years, El Metro maintains a "spare ratio" (the number of additional buses greater than those needed for maximum operation divided by the number of buses used during maximum operation) of 35% (12 spare buses for 35 buses in maximum use) for the fixed route fleet and 29% (4 spare vans for 14 vans in maximum service) – more than twice the Texas average and over the 20% industry standard for transit agencies. Based on current review, it is estimated that El Metro purchase 31 new fixed route vehicles through 2026 and 9 new paratransit vehicles through 2021. Additionally, spare reductions can be implemented, either through writing off older vehicles or by extending fixed or demand response service.

Improved Passenger Technology – El Metro currently faces problems with its passenger experience and technology, including a lack of functionality with the Google Maps Transportation Planning Tool, limited access to bus pass products, and a lack of information at bus stops. To improve on these issues, El Metro should consider implementing:

- A greater variety of pass products, including daily, monthly, and annual passes and student or employer pass programs implemented through partnerships.
- Providing route and scheduling information to Google to add to their transportation planning tool implemented via Google Maps.
- Updating information at flag pole stops on operating routes and on steps to access information about the transit system, improving shelter space at bus stops, and investing in a planning study to create an inventory of bus stops and their conditions.

Even with regular, routine maintenance, transit vehicles reach the end of their useful service life. Although El Metro preserves and maintains their bus fleet on an as-needed basis, they still must invest in new vehicles and equipment. El Metro has in recent years begun converting its bus fleet to compressed natural gas (CNG) vehicles, which have lifecycle and efficiency advantages over diesel buses that will improve system efficiency and lower operations and maintenance costs. Because of these advantages, the conversion of El Metro's bus fleet away from diesel buses and to CNG vehicles should be continued.

A new maintenance facility has been constructed at the site near the intersection of Bartlett Avenue and Jacaman Road. Other maintenance and system preservation projects include vehicle replacement for fixed route and paratransit services, bus lift replacements, maintenance equipment and general preventive maintenance.

Land Use and Development Considerations

Transit service is most effective where land development patterns are compact, densely populated, and include a mix of uses. Transit service also requires direct pedestrian connections between transit stops and origins and destinations. As such, considerations for pedestrians should coincide with development considerations for transit users.

The City of Laredo supports land use design standards, policies, and principles which promote more pedestrian and transit friendly developments and more sustainable growth patterns using the Viva Laredo mobility plan. Investments in a multimodal transportation system, which include enhancements to the transit system, are needed to support an increased quality of life for all citizens. The Laredo MPO references the American Association of State Highway and Transportation Officials (AASHTO) Highway Safety Manual and the National Association of City Transportation Officials (NACTO) Urban Street Design Guide as resources in developing design guidelines. This includes guidance on correct bus stop placement, bus stop amenities and topology, bus bay spacing needs, and facilities for bus turning movements that meet NACTO standards and are consistent with TxDOT requirements.

Improving Transit Amenities

Offering certain facilities and other amenities to transit users may greatly enhance the transit experience to further promote transit usage. Park-and-ride facilities in strategic locations can act as important anchors to the regional transit system, serving as satellite hubs for local, intercity, and regional transit services. Enhanced transit centers with amenities such as weather protection, passenger information, and vending machines provide additional incentives for regional and local riders. Furthermore, transit stops with bus shelters, signage, and passenger information enhance the attractiveness, comfort, and safety of the transit system. On the vehicles themselves, amenities such as bike racks and automated route information improve the experience of traveling customers. El Metro currently have the AVL-GPS system that show the real-time bus locations in all fixed-route buses online and bike racks on most fixed-route buses.

Integrating Transit Considerations with Designing Roadway Improvements

A transit system must be considered in conjunction with other modes in a multimodal transportation system. For example, a bus requires a roadway upon which to operate, which require adequate surfaces, conditions, and other design features which can accommodate large transit vehicles. Congested roadways with poorly engineered street systems and traffic signals degrade transit service. Lastly, transit users are also most likely pedestrians at some point during their trip, and therefore must also have adequate sidewalks, transit stops, safe street crossings, and proper lighting to safely and efficiently conduct their travel.

Intelligent Transportation Systems (ITS) for Transit

ITS enhancements should be considered when developing improvements for achieving increased efficiency of the transit system. For example, technology that enables signal preemption for buses increases the speed of transit service. Instant traveler information technology informs patrons more reliably when the next bus will arrive. Such investments may be more cost effective in order to increase the efficiency and attractiveness of the system.

Policy 4.12.4 of the Viva Laredo Mobility Plan is to “implement intelligent transportation systems (ITS) to reduce congestion and facilitate cross border travel”. Examples of an ITS improvement that could be used for congestion reduction include dynamic routing, in which variable message signs are used to reroute cars around overly congested or closed arterial streets, or pre-trip traveler information systems that allow travelers to plan their trips around present conditions. Freight mobility information systems can also be used to manage freight traffic at the five border crossings.

Coordination among Transit Entities

Transit service providers in a region should coordinate and collaborate as much as possible to reduce the occurrence of repeated services. In particular, each region is mandated by the federal government to produce a coordinated regional service plan. Coordination of existing services and general improvements to public transportation services in the South Texas Planning Region, of which Webb County is a part, are provided in the *South Texas Planning Region Public Transportation Coordination Plan*. Some of the recommendations and issues discussed relevant to the Laredo metropolitan planning area include:

- Increasing transfer points between El Aguila and El Metro
- Extending services to highly needed areas such as the colonias in the more rural areas
- Extending El Aguila routes to service destinations along the Bob Bullock Loop
- Providing new transit service to access major employment centers along Mines Road near Loop 20
- Providing vanpools along some major corridors may be a viable option as census data indicates a higher propensity to rideshare
- Offering Dial-a-Ride service for more rural areas and also for after-hour, fixed route service needs

- Targeting projects that uses Section 5310 funds for low-income individuals, persons with disabilities, and the elderly
- Identifying local funding sources to match federal spending in rural areas
- Establishing a mechanism such as a Memorandum of Agreement to enable different transit providers to enter into agreements to coordinate services and reduce duplication of services
- Establishing a forum, such as an internet webpage or telephone support, that provides a "one stop shop" for transit services offered in the region
- Providing a mentoring and support program initiated by El Aguila and El Metro for small transit operators that provide paratransit service

Enhanced Marketing

To attract additional ridership, transit service providers should develop a comprehensive marketing program to promote transit usage. The marketing program should advertise the extent of transit amenities and educate the region about the benefits of using mass transit. Moreover, the marketing program can target existing or potential customers such as college students and residents of new developments. El Metro Marketing Plan was updated in 2017 to build visibility, educate existing and potential riders, generate ridership, and build community support and partnership opportunities to expand the usage of transit in Laredo by attracting choice riders. Currently, less than 1% of El Metro's budget is spent on marketing – lower than the industry standard of 1% of budget. Strategies identified in the marketing plan include a tagline marketing campaign to address concerns or perceived issues associated with riding El Metro buses, plans to make El Metro brochures and tickets more widely available, information on El Metro buses on jury duty notices, employer and university pass programs, presentations to agencies and community groups, coordination with Uber and El Aguila, and continued campaigns.

Chapter 6:
Bicycle and Pedestrian

Introduction

Bicycle and pedestrian modes of transportation serve as an alternative, affordable means of transportation for a variety of purposes. Bicycle and pedestrian facilities that are safe, accessible, and interconnected are important to supporting a high quality of life. They also contribute to environmental and societal enhancements through reduced vehicle miles traveled, decreased roadway congestion, overall improved public health, an increased sense of community, improved mobility for those without access to a personal automobile, reduced air and noise pollution, and improved water quality.

Moreover, bicycle and pedestrian travel is consistent with the MTP's vision to "develop a transportation system that offers safe, efficient, affordable travel choice for people and goods, while supporting economic development and long-term quality of life." Bicycle/pedestrian travel is efficient, affordable, and available to segments of the population who do not or choose not to drive. It does not disrupt neighborhoods or have a negative impact on the environment; in fact, it can help to better improve neighborhood connectivity and promote healthy and sustainable communities. Every potential motorized trip which is taken by foot, improves environmental quality, improves individual health and fitness, reduces traffic congestion and delay and can contribute to a sustainable development pattern by delaying the need for additional roadway widening. Unfortunately, however, bicyclists and pedestrians are often overlooked when planning for transportation improvements and investments.

Regional Bicycle and Pedestrian Facilities

Existing Facilities

Presently, the Laredo region has only a few bicycle-only facilities, including existing bike lane along Clark Boulevard (Spur 400) between Bob Bullock Loop (Loop 20) and Arkansas Avenue and a cycle track along the northbound side of Bob Bullock Loop (Loop 20) from Shiloh Drive to just south of Sinatra Parkway.

Currently, the Zacate Creek Greenway provides a three-mile trail along Zacate Creek from Canal Street to Rio Grande River.

The Chacon Creek Hike and Bike Trailruns for 2.7 miles and connects the LCC South campus to the southern terminus of the existing Loop 20 trail. Along its path, it connects several parks including Santa Rita Park, Benavidez Park, Dryden Park, Villa Del Sol Park, and Eastwoods Park. This trail serves cyclists traveling between Texas A&M International University (TAMIU) to Laredo Community College's (LCC) South campus. Similarly, the completed segments of Manadas Creek Trail are located at North Central Park and San Isidro Park. It is part of the

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proposed 15-mile long hike and bike trail. It encourages non-motorized transportation use by providing connections between the parks and the surrounding neighborhoods **Table 6-1** shows the bike route name, limits, and type of the existing bicycle facilities.

Table 6-1: Existing Bicycle-Pedestrian Routes

Bike Route Name	Limits	Type
Loop 20	Shiloh Dr to South of Sinatra Pkwy	Cycle Track
Spur 400	N Arkansas Ave to Loop 20	Bike lane
Zacate Creek Greenway Trail	Canal St to Rio Grande River	Shared path
Manadas Creek Trail	At North Central Park and San Isidro Park	Shared path
Chacon Creek Trail	Rio Grande River to SH 359 and Haynes Recreation Center to Eastwoods Park	Shared path

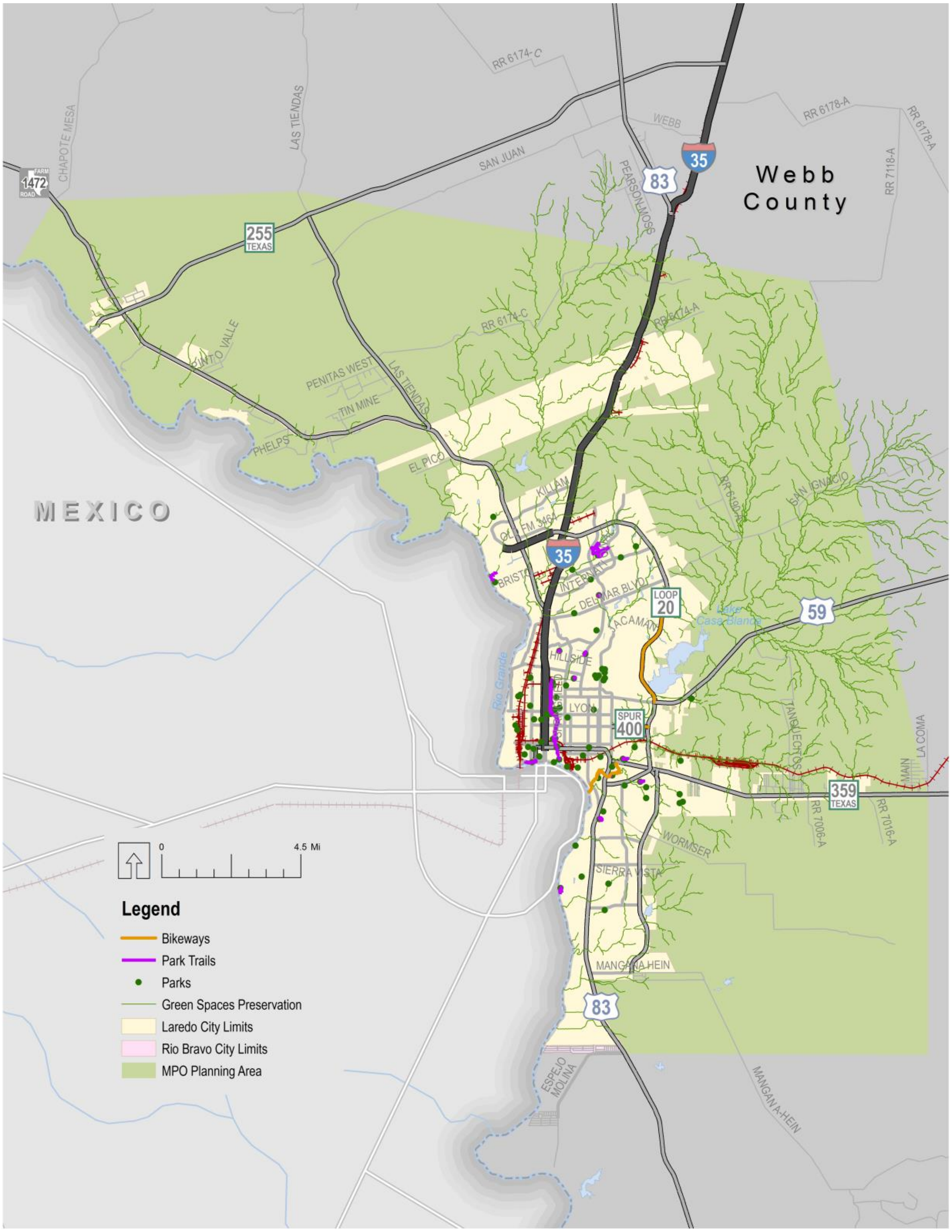
Figure 6-1 on the following page presents the area's existing bicycle routes and the locations parks and preserved green spaces. The Green Spaces Preservation Ordinance of 2004, which is intended to preserve vegetated stream buffers in the city of Laredo that have otherwise been destroyed, has largely been successful. Connecting parks and green space can serve as a framework for identifying where additional bicycle facilities could improve connectivity across the region.

Additionally, the region possesses many qualities that contribute to its ability to attract bicyclists and pedestrians, including a favorable climate, a flat landscape, and good connectivity through its local street network in the central city of Laredo. However, as in most regions, automobiles are the dominant form of transportation, and bicycling and walking may not be considered viable alternatives for many people in the area. This may be further exacerbated by the presence of unsafe crossings, missing segments in bicycle facilities and sidewalks, design of arterials and major roadways, and a lack of dedicated lanes to give the sense of a visible division between automobiles and bicyclists.

Future Proposed Network

The proposed future bicycle network for Laredo is shown in **Figure 6-2**. The purpose of Laredo's future bike network is to connect regional destinations, including school and university campuses, to each other and to major residential and commercial areas, including downtown Laredo. Priority routes include the Bob Bullock Loop, connecting downtown to North Laredo by bike, and connections to South Laredo, an area with high dependence on non-automobile transportation.

Figure 6-1: Existing Bicycle and Pedestrian Facilities, Parks, and Green Space Buffers



Source: CDM Smith

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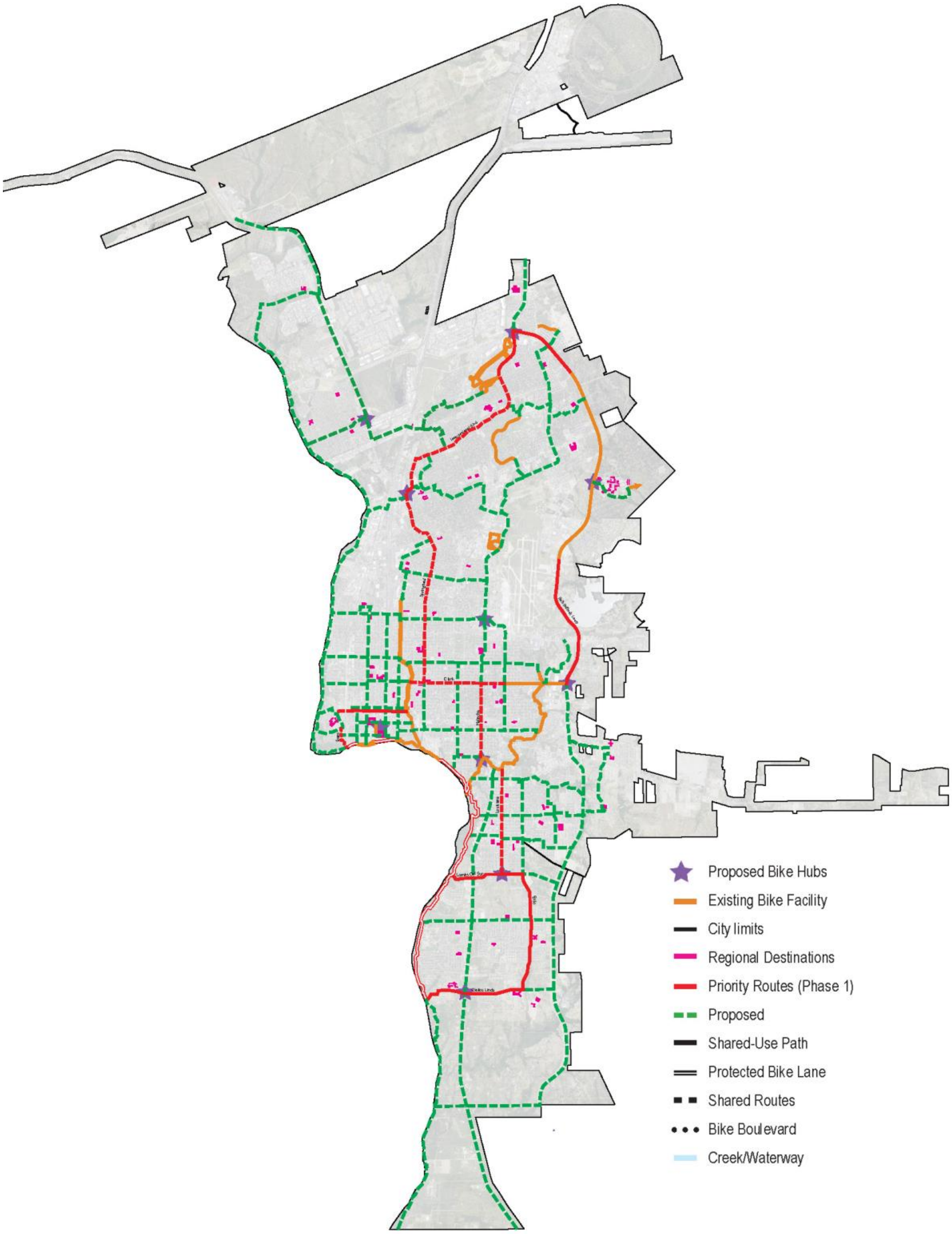
Laredo Urban Transportation Study

DRAFT

Figure 6-2: Proposed Future Bicycle Network for Laredo



Source: Viva Laredo, 2017

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Laredo Urban Transportation Study

DRAFT

Identifying Regional Bicycle and Pedestrian Needs

In the Laredo region, bicycling and walking are important means of transportation. On any given day, the urban core of the city is teeming with shoppers on foot and the presence of cyclists using the roadways and sidewalks for transportation is very evident. Visitors from Nuevo Laredo, students at Laredo Community College (LCC), and other residents that rely on walking and bicycling to meet their daily transportation needs require a safe experience during their travels.

To identify needs for this plan, available state and local bicycle and pedestrian data sources were used. The Viva Laredo Comprehensive Plan also contains challenges and opportunities for improvements to bicycle and pedestrian facilities that were reviewed to identify gaps and define needs from a regional perspective through the 2045 planning horizon.

Performance Data Challenges

Currently, there is limited data available on the performance of bicycle and pedestrian facilities including asset conditions and maintenance programming, however, there are best practices for bicycle and pedestrian facilities that the City of Laredo should consider. The FTA has developed a toolbox of performance measures that city governments, regions, and states can use to evaluate their bicycle and pedestrian systems. Localities can develop bicycle and pedestrian systems plans and asset management plans as part of their transportation plans or conduct asset studies and inventory studies to check their bicycle and pedestrian networks for completeness, safety, and reliability. In turn, these studies can be used to set new goals and evaluate progress towards existing goals.

Funding Challenges

Funding for proposed bicycle and pedestrian projects is often the last obstacle to their implementation. While the level of state and federal enhancement grants has varied over time, but in particular few federal funding opportunities for proposed bicycle and pedestrian projects have materialized in recent years. Currently, TxDOT has limited the use of its transportation alternatives (TA) funds to bicycle and pedestrian construction only, and future TA funding will be available after FY 2021, amounting to $13 million dollars available for small urban areas. This program provides 80% of construction funds with a 20% minimum required local match.

Establishing priorities is critical to the success of the bicycle and pedestrian element of this transportation plan. The MPO can pursue alternative funding sources, such as private sponsorship or the Laredo Development Foundation. Another option to consider is the development of a Tax Increment Reinvestment Zone. A Tax Increment Reinvestment Zone (TIRZ) is an economic development tool available to Texas cities to help finance public improvements that are needed to promote development or redevelopment in a specific geographic area. In 2017, Laredo City Council implemented a TIRZ in downtown Laredo and then in 2018 a second TIRZ at the Coves at Winfield, a $100 million-dollar mixed-use development in North Laredo. The downtown Laredo urban core is one area to consider for a

TIRZ. This area is bounded by Santa Maria Avenue, Moctezuma Street, Santa Ursula Avenue, and Water Street and sees the greatest amount of pedestrian traffic in the city.

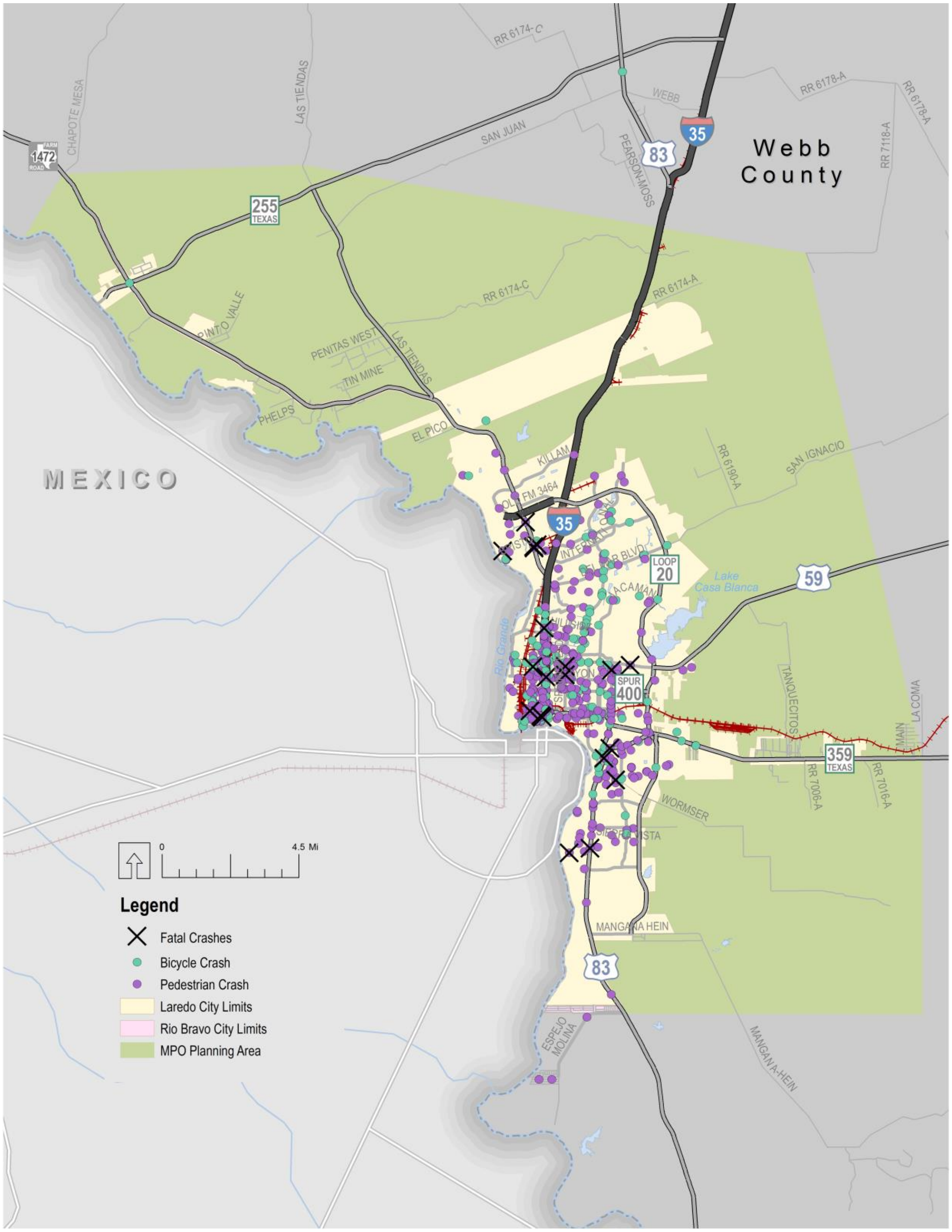
Gaps in the Regional Network

Currently, the pedestrian and bicycle network in Laredo suffers from large service gaps. While Downtown Laredo has an easy to navigate grid system, a built-out sidewalk network, and low speed limits making bicycling and walking safe and convenient, communities throughout the rest of Laredo have curvilinear streets, long distances between destinations, high speed limits, arterial roads, and other characteristics that make bicycling and walking difficult. For example, 1105 Houston Street in downtown Laredo has a walk score of 95 and a bike score of 65, but the Walmart Supercenter at 2320 Bob Bullock Loop has a walk score of 35 and a bike score of 50. According to the Housing + Transportation Index, Laredo's high location inefficiency and low average household income result in housing and transportation each consuming over a third each of an average Laredo household's budget.

The main pedestrian and bicycle gaps in Laredo's regional transportation network are between destinations like school campuses, shopping centers, and other major destinations including Laredo International Airport. Additionally, better connections are needed between transit stops and other destinations for last and first mile travel to transit connections. Non-motorized accessibility, including sidewalks and bicycle facilities including racks and shelters, would make walking and biking easier to use as active modes.

According to TxDOT's Crash Records Inventory System (CRIS), there are a total of 468 pedestrian related crashes, and a total of 162 bicycle related crashes that occurred within the Laredo MPO area during the years 2014 through 2018. The location of fatal crashes and bicycle and pedestrian crashes is shown in **Figure 6-3**. Among these crashes, 24 pedestrian fatalities were recorded, and one fatal bicycle related crash was recorded. Figure 6-2 shows the locations of bicycle and pedestrian related crashes. A high number of bicycle or pedestrian crashes occurred in the downtown area and near the Gateway to the Americas bridge, with other clusters in South Laredo near a cluster of public schools and around Mines Road, which hosts dangerous freight traffic. This cluster downtown is due to the very high numbers of pedestrians using the downtown sidewalk network. Locations with multiple crashes could indicate where the safety of bicyclists and pedestrians should be improved. At these locations, future roadway projects to improve bicycle and pedestrian safety should be advanced.

Figure 6-3: Bicycle and Pedestrian Crash Locations



Source: TxDOT Crash Records Inventory System

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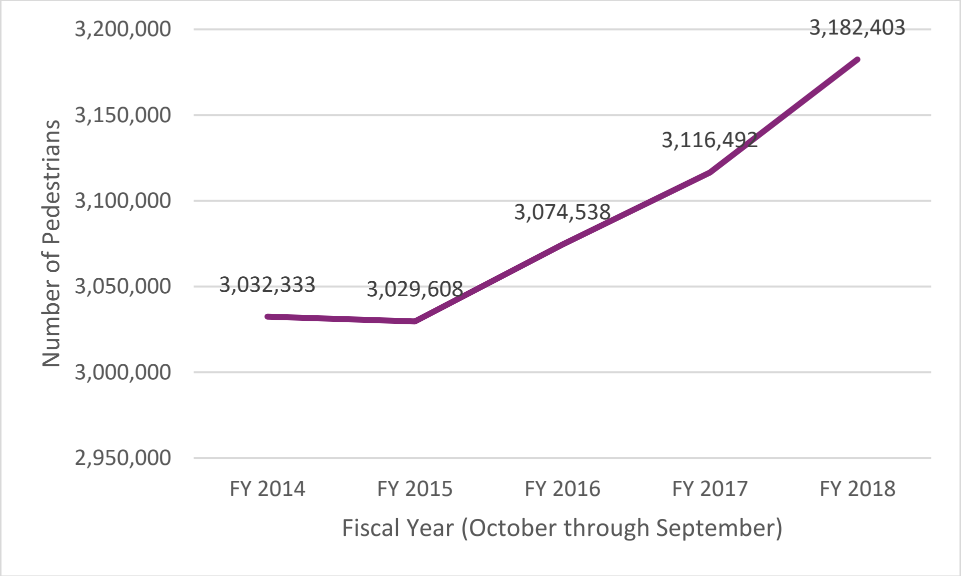
Large International Pedestrian Border Crossings

Over three million pedestrians crossed the border through the Gateway to the Americas Bridge (Bridge 1) in the downtown area from Nuevo Laredo during Fiscal Year (FY) 2018 (October 2017 through September 2018). Pedestrian crossings across the Gateway to the Americas Bridge (Bridge 1) for FY 2014 through FY 2018 is shown in **Figure 6-4**. Between 2014 and 2017, pedestrian bridge traffic at the Gateway to the Americas Bridge grew by 1.2% a year. If that average growth rate continued to 2045, 2045 pedestrian bridge traffic at the bridge would be 4,444,363 a year! This high number will cause a severe strain on currently existing pedestrian facilities serving border crossers.

Figure 6-4: Pedestrian Crossings as Gateway to the Americas (Bridge 1)



Source: City of Laredo

The needs for bicyclists are closely related to those of pedestrians. In general, bicyclists are made up of advanced, basic, and child users. As such, bicycle facilities should accommodate the needs of each level of users. Various bicycle facility options include shared lanes, paved shoulders, striped lanes, cycle tracks, shared-use paths, and signed routes. Shared lanes are usually wider outside lanes that provide additional room to accommodate bicyclists, while striped lanes are narrow lanes for the exclusive use of bicyclists and contain markings to indicate their designated use. Cycle tracks are bike lanes that are physically separated from the roadway. Shared-use paths are typically asphalt or concrete pathways that run adjacent to roadways and can be shared by both pedestrians and bicyclists. Signed routes are created in cases where no room exists to create additional space for bicyclists and are often on less congested streets with reduced traffic speeds. Basic and child bicyclists may feel more confident utilizing multi-use paths and striped lanes; while more advanced users may travel safely on shared lane facilities.

A bicycle transportation network should meet certain requirements to ensure that bicycling is safe, convenient, and efficient for both utilitarian travel and recreational purposes. Hazards include a lack of proper lighting, overhead and horizontal obstructions, vehicular traffic, drainage grates, and conflict with other users such as pedestrians. There are different types of treatments for bicycle traffic, such as paved shoulders, shared use paths, dedicated bicycle lanes, and cycle tracks which are also known as physically separated bicycle lanes. The selection of bikeway type should consider the intended travel purpose, interaction with vehicular traffic, and the available right-of-way. The bicycle network itself should be direct and provide adequate connections between popular destinations, as well as access to public transit routes.

Clear and consistent route signage not only assists bicyclists in way-finding, but also helps motorists be aware of the presence of bicyclists. Bicycle parking that is safe, secure, and convenient is critical at popular destinations. Ancillary facilities, such as showers and lockers at places of employment, are also important for those that travel to work by foot or bike.

Five critical components augment the success of a non-motorized transportation system: engineering, education, encouragement, enforcement, and evaluation. Proper engineering and design of roadways incorporating a multimodal environment are vital in promoting a successful pathway network. Educational programs that administer information about the correct and safe way of traveling by foot or bicycle and that make motorists aware of "sharing the road" with different types of transportation uses are imperative for transportation safety. This is further complemented by the enforcement of traffic laws that relate to the interaction between motorists and pedestrians and bicyclists. Evaluation helps analyze the effectiveness, extent, and cost of various efforts and programs, and provide guidance to what resources should be made available and the direction of policies in the future.

Bike share programs have been established in cities of varying sizes across the country. Dockless bike and scooter share companies like Lime and Bird are also increasingly popular in cities across the US. The City of Laredo is coordinating with Lime to bring the company's bike and scooter share services to the Laredo region. The increasing number of bike share programs and bicycle-related facilities and programs to encourage bicycle use indicates the increasing interest in seeking non-motorized transportation as a viable mode choice from different levels. Bicycle-friendliness and walkability have become the selling point in some real estate advertising, and some communities have even invested in bicycling and walking for economic growth purposes.

Regional Bicycle and Pedestrian Strategies

Based on the needs identified and a review of best practices concerning the proper planning of bicycle and pedestrian facilities, several strategies are recommended to advance bicycle and pedestrian transportation in the region.

Maintaining a Database of Bicycle and Pedestrian Facilities

To maintain awareness of bicycle and pedestrian needs, it is important for communities to maintain a database of pedestrian and bicycle facilities. This database should first involve creating an inventory of the existing system and contain information as to the conditions and features of the infrastructure. Besides facility conditions and other basic features, the database could also include the location of missing links in sidewalks and pathways, and the conditions of existing traffic operations and geometric conditions which impact a pedestrian or bicyclist's decision in using certain roadways. Criteria for determining bicycle and pedestrian levels of service could also be maintained to evaluate system performance. The database should be updated regularly to help in planning for future improvements to better accommodate bicyclists and pedestrians. The City of Laredo currently has a basic, regularly updated inventory of existing facilities.

Integrating Land Use and Transportation

Land use and transportation planning should be integrated to make communities livable and accessible for walking and bicycling. While in the downtown Laredo area, there is a strong established grid pattern to support bicycling and walking, much of Laredo's suburban development and new developments do not support a strong and connected bicycle and pedestrian network. Standards, policies, and guidelines should be developed in order to support a safe, walkable, and bicycle-friendly environment. Land uses most conducive to bicycling and walking are concentrated in mixed-use, dense, compact developments with a variety of connections to services and facilities.

In addition, pathways along an interconnected network of streets generally offer more direct travel to destinations than curvilinear and cul-de-sac streets. Street crossings should be well-designed, visible, and contain crosswalks and signal activation devices where appropriate. Street crossings that incorporate raised medians and innovative design features such as curb extensions, or bulb-outs, which act as extensions of the pedestrian network into the roadway, make crossing streets safer for pedestrians. Streets that provide visible interest and features such as street furniture and trees encourage more people to walk. Also, a sense of safety and security is achieved through street lighting, pedestrian signs, and other visibility-related design features.

Specific policies for land use and transportation considerations may include providing clearly defined, separate lanes for bicyclists to create a physical division between motorists and bicyclists. This helps to elevate the importance of bicycling as a legitimate form of transportation. Other examples include requiring public rights-of-way for the construction of pathways connecting cul-de-sacs between developments, encouraging schools to include pedestrian and bicycle accessibility issues in new school location decisions, and developing specific requirements for pedestrian and bicycle facilities in town centers, transit corridors, and employment centers.

Preserving Future Bicycle and Pedestrian Corridors

To further assist bicycle and pedestrian efforts, it is prudent to plan for and preserve future bicycle and pedestrian corridors. Strategies include requiring future development to set aside trail and pathway easements, incorporating bikeway right-of-way designations in transportation and master plans, identifying recreational trail corridors in park and community plans, and establishing pathways along utility easements and railroad corridors.

Incorporating Bicycle and Pedestrian Elements into Roadway Projects

Requiring that new roadways include bicycle and pedestrian elements would also improve non-automobile modes of transportation. The concept of the "complete street" is for the roadway to accommodate all road users, regardless of age, ability, or mode of transportation. Complete streets can be achieved through wider outer lanes, bike lanes, cycle tracks, wide paved shoulders, bicycle-friendly drainage infrastructure, sidewalks, dedicated bus lanes, comfortable and accessible transit stops, safe and frequent crossing opportunities, medians, pedestrian signals, and/or curb extensions. Additionally, coordination with TxDOT to ensure such accommodations on new or improved major roadways, bridges, underpasses, at-grade rail crossings, and highway interchanges could better support regional non-motorized transportation. In 2019, TxDOT will distribute $19.3 million dollars in funds for bicycle and pedestrian projects, including $10.6 million through the FAST Act and $8.7 million through the US Department of Transportation's Safe Routes to School Program.

Establishing the Future Bicycle Network by Function

Table 6-2 shows common treatments for installing bikeways. Additionally, the mobility section of the Viva Laredo plan identifies bikeway types appropriate for different road typologies.

Table 6-2: Five Common Types of Bikeway Treatments

Type	Description	Example
Paved Shoulders	• Adequate in rural areas • Benefits to drivers: space for evasive maneuvers, space for disabled vehicles to slow down or stop safely, and increased sight distance for through vehicles and for vehicles entering the roadway • Benefits to bicyclists and pedestrians: reduce passing conflicts between motor vehicles and bicyclists and pedestrians, making storm water discharge farther from the travel lanes, reducing splash and spray to pedestrians and bicyclists, and allowing bicyclists to ride at their own pace	 *(Austin, TX)*

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Type	Description	Example
Shared Lane Marking	• Known as “sharrow”, used to label a shared environment of automobiles and bicyclists • Encourages bicyclists to position themselves safely in lanes too narrow for vehicles to safely pass bicyclists in the same lane • Alerts drivers of the potential presence of bicyclists • Shown to increase the distance between bicyclists and parked cars to let bicyclists avoid getting “doored” • Serves to advertise bikeways to all road users without requiring additional right of way. **Considerations:** • Appropriate for low design speed and low volume roadways	 *(Austin, TX)*
Bike Lane	• A portion of the roadway that has been designated by striping, signage, and pavement markings for the preferential or exclusive use of bicyclists. • Allows bicyclists to ride at their own pace with little interference from vehicular traffic • Makes both bicyclists and drivers predict each other’s movement more easily **Considerations:** • A designated buffer space between bike lane and vehicular traffic or parked cars can be provided to further improve the safety of bicyclists • Appropriate for streets with posted speed under 35 MPH and should be 6’ in width • Careful study must be implemented to consider the interaction of bicycle traffic and vehicular traffic when installing bike lanes • Law enforcement should help prevent vehicle encroachment and double parking	 *(Austin, TX)*

Type	Description	Example
Cycle Track	• Providing physical separation between bicyclists and auto traffic or sidewalk by a physical barrier • Helps bicyclists of all skills ride in a more protective environment but requires wider right-of-way and more intricate engineering design at intersections **Considerations:** • Can be installed at the street level, the sidewalk level, or an intermediate level • Different pavement color or texture can be used to accentuate the right-of-way of cycle track • Correct type of separation (parking protection, painted buffer space, raised tracks) is context dependent	 *(Boulder, CO)*
Shared Use Path	• Best used where there are minimal driveways or cross streets • Helps bicyclists of all skills ride in a more protective environment but requires wider right-of-way **Considerations:** • Requires grade separation or exclusive signal operation at intersections with major roadways • Usually installed along waterways, railroad lines, limited access highways, or within parks and open space areas • Can be installed for mobility or recreational purposes	 *(Houston, TX)*

Source: National Association of City Transportation Officials, Viva Laredo, Oregon Department of Transportation, Austin Cycling Association, Pedestrian and Bicycle Information Center, and Houston Chronicle.

Coordinating Bicycle and Pedestrian Improvements with Health Outcomes

Obesity and lack of exercise have become a major concern that affects the wellbeing of our lives. As non-motorized modes of transportation, bicycling and walking are good means to exercising while traveling from one place to another. According to the County Health Rankings and Roadmaps, in 2019, 33.3% of the population of Webb County was obese. In addition, 25% of the population is physically inactive. Additionally, 23% of Webb County workers are burdened with long driving alone commutes, with 23% driving alone for 30 minutes or more to work.

In 2015, 29.0% of Texans were obese according to the Behavioral Risk Factor Surveillance System. On most health indicators, Webb County performs worse than the Texas and national averages. Obesity and long commutes are both correlated with a large range of poor health outcomes, including disease and poor sleep. A concerted effort to improve bicycle and pedestrian travel could lead to significant improvement in health outcomes in Webb County.

As a result of a collaborative effort among various community stakeholders in public health, the Healthy Eating Active Living (HEAL) Laredo Initiative has been developed in the region as a resource to combat the prevalence of obesity and diabetes in Laredo and the surrounding area. Through a coordinated, community-wide approach that includes outreach and health promotion efforts, along with targeted environmental and policy changes, the HEAL Laredo Initiative aims to mobilize the community toward a healthier lifestyle. Coordination with partners like this organization can offer the region greater partnership opportunities to support diversified funding of bicycle and pedestrian improvements and to better link transportation improvements and policies with health outcomes in the region.

Marketing and Encouraging Bicycling and Walking

Marketing non-motorized transportation facilities as strongly-valued community assets may encourage more people to bicycle and walk. In doing so, efforts should focus on bicycling and walking as practical, popular, and mainstream activities that all types of people can enjoy. “Selling points” could include that transportation can be more than just a means of traveling to destinations, but also a healthy, fun and recreational experience that can be done safely and at little or no cost. Materials, such as route maps and websites and mobile applications, can be created to promote bicycling and walking and inform people about bicycle-compatible roads, pedestrian-friendly areas, and other bicycle and pedestrian amenities and programs.

Educational/Safety Programs

To increase bicycle and pedestrian safety, educational programs can be implemented which teach basic pedestrian and bicycling safety skills. Youth can especially benefit from bicycling and safety education, since they are very likely to walk or bike to school or other destinations. Typically, college students are more likely to bike or walk, according to the report *Modes Less Traveled—Bicycling and Walking to Work in the United States: 2008–2012* by the U.S. Census Bureau and that many college towns have the highest shares of bicycle use in the U.S. They are also like to have higher trip generation rates. Students at Laredo Community College and Texas A&M International University could be the targets of such safety programs. Further, public awareness programs can educate motorists about the importance of sharing the roadway with non-vehicular traffic and other such safety considerations.

Bicyclist and Pedestrian Safety Projects

Schools can be considerable sources of traffic and congestion, as many parents drive their children to school. Cities should work with school districts to ensure that roadway improvements near schools are designed to minimize conflicts between pedestrians, bicyclists, and motorists by directing students to safer routes to schools. Further, school districts should be encouraged to consult with local governments about transportation circulation and to ensure safe and appropriate pedestrian and bicycle access. Safe Routes to School (SRTS) is a federal program that was implemented through SAFETEA-LU to encourage bicycle and pedestrian safety. It provides funds for pedestrian and bicycle improvements, including those related to safety and education. Under MAP-21, funding for bicycle and pedestrian projects was provided under the Transportation Alternatives Program (TAP). The FAST Act; however, eliminates the TAP and replaces it with Surface Transportation Block Grant (STBG) program funding for transportation alternatives (TA). These TA funds include all projects and activities that were previously eligible under TAP including pedestrian and bicycle facilities, recreational trails, and SRTS projects. Though the MAP-21 bill did not provide specific funding for SRTS, these projects are eligible for Transportation Alternatives Program (TAP) funds. The Laredo MPO should continue to pursue the development of bicyclist and pedestrian safety projects and programs for schools and surrounding neighborhoods that are in most need of bicycle and pedestrian infrastructure and programs.

Federal Funding Opportunities

Several US Department of Transportation programs provide funding to bicycle and pedestrian projects. These federal funding programs include:

- BUILD: Better Utilizing Investments to Leverage Development Transportation Discretionary Grants
- INFRA: Infrastructure for Rebuilding America Discretionary Grant Program
- TIFIA: Transportation Infrastructure Finance and Innovation Act (loans)
- FTA: Federal Transit Administration Capital Funds
- ATI: Associated Transit Improvement (1% set-aside of FTA)
- CMAQ: Congestion Mitigation and Air Quality Improvement Program
- HSIP: Highway Safety Improvement Program
- NHPP: National Highway Performance Program
- STBG: Surface Transportation Block Grant Program
- TA: Transportation Alternatives Set-Aside (formerly Transportation Alternatives Program)
- RTP: Recreational Trails Program
- SRTS: Safe Routes to School Program / Activities
- PLAN: Statewide Planning and Research (SPR) or Metropolitan Planning funds
- NHTSA 402: State and Community Highway Safety Grant Program
- NHTSA 405: National Priority Safety Programs (Nonmotorized safety)
- FLTTP: Federal Lands and Tribal Transportation Programs (Federal Lands Access Program, Federal Lands Transportation Program, Tribal Transportation Program, Nationally Significant Federal Lands and Tribal Projects

Figure 6-5 and **Figure 6-6** provides a summary of the bicycle and pedestrian project types that the federal programs provide funding opportunities.

Figure 6-5: Federal Funding Opportunities for Bicycle and Pedestrian Projects

Key: $ = Funds may be used for this activity (restrictions may apply). ~$ = Eligible, but not competitive unless part of a larger project. $* = See program-specific notes for restrictions.

	Pedestrian and Bicycle Funding Opportunities U.S. Department of Transportation Transit, Highway, and Safety Funds															
Activity or Project Type	BUILD	INFRA	TIFIA	FTA	ATI	CMAQ	HSIP	NHPP	STBG	TA	RTP	SRTS	PLAN	NHTSA 402	NHTSA 405	FLTTP
Access enhancements to public transportation (includes benches, bus pads)	$	~$	$	$	$	$		$	$	$						$
ADA/504 Self Evaluation / Transition Plan									$	$	$		$			$
Bicycle plans				$					$	$		$	$			$
Bicycle helmets (project or training related)									$	$SRTS		$		$*		
Bicycle helmets (safety promotion)									$	$SRTS		$				
Bicycle lanes on road	$	~$	$	$	$	$	$	$	$	$		$				$
Bicycle parking	~$	~$	~$	$	$	$		$	$	$	$	$				$
Bike racks on transit	$	~$	$	$	$	$			$	$						$
Bicycle repair station (air pump, simple tools)	~$	~$	~$	$	$	$			$	$						$
Bicycle share (capital and equipment; not operations)	$	~$	$	$	$	$		$	$	$						$
Bicycle storage or service centers (example: at transit hubs)	~$	~$	~$	$	$	$			$	$						$
Bridges / overcrossings for pedestrians and/or bicyclists	$	~$	$	$	$	$*	$	$	$	$	$	$				$
Bus shelters and benches	$	~$	$	$	$	$		$	$	$						$
Coordinator positions (State or local)						$ 1 per State			$	$SRTS		$				
Crosswalks (new or retrofit)	$	~$	$	$	$	$*	$	$	$	$	$	$				$
Curb cuts and ramps	$	~$	$	$	$	$*	$	$	$	$	$	$				$
Counting equipment				$	$		$	$	$	$	$	$	$*			$
Data collection and monitoring for pedestrians and/or bicyclists				$	$		$	$	$	$	$	$	$*			$
Historic preservation (pedestrian and bicycle and transit facilities)	$	~$	$	$	$				$	$						$
Landscaping, streetscaping (pedestrian and/or bicycle route; transit access); related amenities (benches, water fountains); generally as part of a larger project	~$	~$	~$	$	$			$	$	$						$
Lighting (pedestrian and bicyclist scale associated with pedestrian/bicyclist project)	$	~$	$	$	$		$	$	$	$	$	$				$
Maps (for pedestrians and/or bicyclists)				$	$	$			$	$		$	$*			
Paved shoulders for pedestrian and/or bicyclist use	$	~$	$			$*	$	$	$	$		$				$

Figure 6-5: Federal Funding Opportunities for Bicycle and Pedestrian Projects

Key: $ = Funds may be used for this activity (restrictions may apply). ~$ = Eligible, but not competitive unless part of a larger project. $* = See program-specific notes for restrictions.

	Pedestrian and Bicycle Funding Opportunities U.S. Department of Transportation Transit, Highway, and Safety Funds															
Activity or Project Type	BUILD	INFRA	TIFIA	FTA	ATI	CMAQ	HSIP	NHPP	STBG	TA	RTP	SRTS	PLAN	NHTSA 402	NHTSA 405	FLTTP
Pedestrian plans				$					$	$		$	$			$
Recreational trails	~$	~$	~$						$	$	$					$
Road Diets (pedestrian and bicycle portions)	$	~$	$				$	$	$	$						$
Road Safety Assessment for pedestrians and bicyclists							$		$	$			$			$
Safety education and awareness activities and programs to inform pedestrians, bicyclists, and motorists on ped/bike safety									$SRTS	$SRTS		$	$*	$*	$*	
Safety education positions									$SRTS	$SRTS		$		$*		
Safety enforcement (including police patrols)									$SRTS	$SRTS		$		$*	$*	
Safety program technical assessment (for peds/bicyclists)									$SRTS	$SRTS		$	$*	$		
Separated bicycle lanes	$	~$	$	$	$	$	$	$	$	$		$				$
Shared use paths / transportation trails	$	~$	$	$	$	$*	$	$	$	$	$	$				$
Sidewalks (new or retrofit)	$	~$	$	$	$	$	$	$	$	$	$	$				$
Signs / signals / signal improvements	$	~$	$	$	$	$	$	$	$	$		$				$
Signed pedestrian or bicycle routes	$	~$	$	$	$	$		$	$	$		$				$
Spot improvement programs	$	~$	$	$			$	$	$	$	$	$				$
Stormwater impacts related to pedestrian and bicycle projects	$	~$	$	$	$		$	$	$	$	$	$				$
Traffic calming	$	~$	$	$			$	$	$	$		$				$
Trail bridges	$	~$	$			$*	$	$	$	$	$	$				$
Trail construction and maintenance equipment									$RTP	$RTP	$					
Trail/highway intersections	$	~$	$			$*	$	$	$	$	$	$				$
Trailside and trailhead facilities (includes restrooms and water, but not general park amenities; see program guidance)	~$*	~$*	~$*						$*	$*	$*					$
Training						$	$		$	$	$	$	$*	$*		
Training for law enforcement on ped/bicyclist safety laws									$SRTS	$SRTS		$			$*	
Tunnels / undercrossings for pedestrians and/or bicyclists	$	~$	$	$	$	$*	$	$	$	$	$	$				$

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

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Chapter 7:
Airport

Introduction

Airports are a key economic engine that ties a region to national and global markets and to support travel and tourism. It provides efficient long-distance transportation to move people and goods, and it is essential for a region's business activities, tourism, and trade. This chapter discusses the existing conditions of the Laredo International Airport, including the physical characteristics and operational statistics, forecast of future traffic, and strategies to improve the operations of the airport.

Overview of Existing Airport Facilities

The Laredo International Airport (LRD), illustrated in **Figure 7-1**, is the primary airport in the Laredo MPO region and provides air transportation services for both cargo and passengers. LRD is located on approximately 1,800 acres of the former Laredo Air Force Base in eastern Laredo and is generally bounded by U.S. 59 to the south, Lake Casa Blanca State Park and Loop 20 to the east, and Jacaman Road to the north. Because of its location in the heart of the Laredo MPO region, it is surrounded by developed land and expansion potential is limited. LRD is located near the center of the City of Laredo, slightly over seven miles from downtown Laredo itself.

LRD is owned and operated by the City of Laredo. Airport improvement projects are primarily funded through the Federal Aviation Association (FAA) Airport Improvement Program and local fund contributions.

LRD provides daily commercial passenger service daily commercial flights through three airlines. Commercial passenger service is provided by American Airlines with service to Dallas/Fort Worth, United Express with service to Houston Intercontinental Airport, and Allegiant which offers year-round scheduled service to Las Vegas, Nevada and seasonal service to Orlando-Sanford, Florida. Private fixed wing and helicopter service is also available.

Additionally, LRD is classified as a Foreign Trade Zone (FTZ) site, which is a federal designation that allows for exemption from many regular U.S. Customs rules and regulations, and which serves to benefit companies and trade. LRD's FTZ can currently accommodate aeronautical and industrial commercial trade. Additional information on freight services is provided in more detail in **Chapter 8**.

Figure 7-1: Location of Laredo International Airport

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Airport Characteristics

Physical Characteristics

LRD's airfield contains two parallel runways and one cross-wind runway. Taxiways connect the runways to the apron and terminal areas located on the west side of the airfield. The primary runway, Runway 17L/35R is approximately 8,200 feet long; while the secondary runway, Runway, 17R/35L is approximately 8,700 feet long. The cross-wind runway, Runway 14/32, is approximately 5,900 feet long. Further, LRD is aided by runway and taxiway lighting systems, an instrument landing system (ILS) for the Runway 17R/35L, an air traffic control tower in operation 18 hours on the weekdays and 12-13 hours on the weekends, and other navigational aids for operation under both visual flight rule (VFR) and instrument flight rule (IFR) conditions. The installed airport geographic information system (AGIS) helps the FAA collect airport data to develop electronic Airport Layout Plans.

The current passenger terminal is approximately 78,000 square feet and provides space for five airlines, five car rental agencies, a duty-free store, and government and federal inspection facilities. In particular, the passenger terminal has the potential to be expanded on surrounding available land. In fact, the Laredo International Airport Master Plan Update calls for the passenger terminal to be expanded by approximately 26,500 square feet with two additional gates in order to accommodate future demand.

LRD has a Federal Inspection Station that offers 24 hour/7 day a week federal inspection services, including custom, agriculture, and immigration services for the international aviation community. Additionally, the airport is serviced by three fixed base operators that provide general aviation services. Surrounding land on the city-owned airport property is available for lease, and other entities, such as the Laredo Police Department, are located on airport property. In addition, a former El Metro owned park and ride lot is near the airport entrance. The basic airport characteristics of LRD are summarized in **Table 7-1**.

Table 7-1: Airport Characteristics of the LRD

Characteristics	Laredo International Airport
Location ID	LRD
Year Built	1975 (converted from military to civilian airport)
Land Area (Acres)	Approximately 1,800
Ownership	City of Laredo (public)
Distance from Laredo city center	3 nautical miles northeast of Laredo, TX
Opening Hours	Opens 24/7 to the public
Roadway Access	Bob Bullock Loop (Loop 20)
Terminals	1
Commercial Airlines	Allegiant, American Airlines, and United Airlines
Aircraft Hangars	7
Runways	3
Taxiways	12
Fuel Types	100LL, JET A

Source: The National Flight Data Center (NFDC) of FAA and Laredo International Airport (LRD)

Physical Upgrades

Over the past 25 years, the City of Laredo and the FAA have invested over $230 million to upgrade the airport's infrastructure. This has included improvements to commercial passenger services as well as investments to improve air/freight trade. Notable projects that have been completed during this period include:

- A totally reconstructed Runway 17L/35R to accommodate heavy aircraft;
- A totally reconstructed runway 17R/35L to accommodate heavy aircraft;
- Rehabilitated Runway 14/32;
- Engineered Materials Arresting System (EMAS);
- New and reconstructed cargo aprons with capacity to simultaneously park an additional 20 large cargo aircraft;
- New and reconstructed taxiways, a new passenger terminal, and a new fuel farm;
- Constructed airside cargo warehouses;
- Airport Geographic Information System (AGIS);
- Constructed ARFF Station (fire station);
- Noise Abatement;
- Upgraded Federal Inspection Station (FIS);
- Rehabilitated general aviation aprons;
- Upgraded Runway 17R lights and electrical vault; and,
- Constructed cargo pads at cargo aprons
- Constructed an approximately 13,000 square feet of Federal Inspection Service Facility to clear private and cargo aircraft and house U.S. and Mexican Customs.

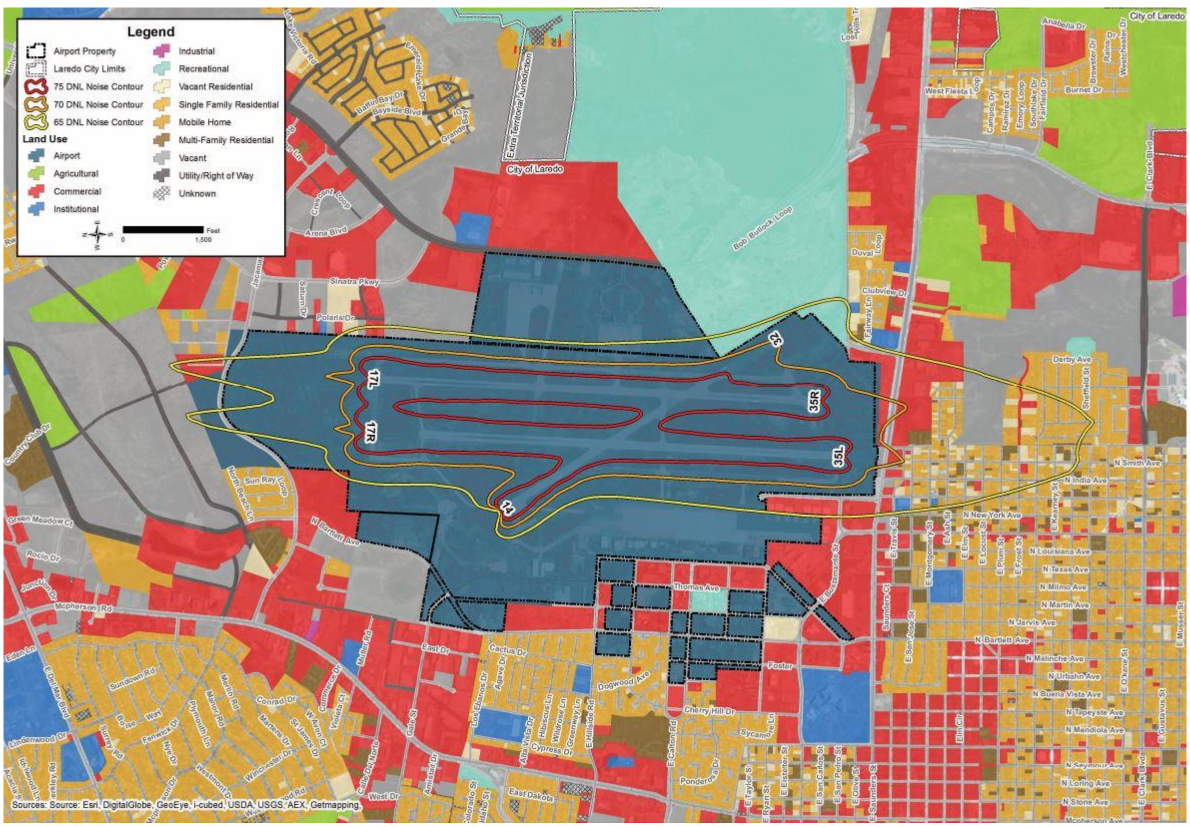
Most recently, in 2018, the Laredo International Airport received $7.5 million dollars in federal grant money for improvements to its cargo runway, specifically to rehabilitate the concrete of the cargo apron, and another $2 million dollars in federal grant money to implement noise mitigation using sound insulation.

It is worth noting that LRD is the only airport outside Republic of Mexico to have an operation of Mexican Customs. Products pre-inspected at the customs operation include auto parts, automotive, electronics, aerospace parts, cellphones, and gasoline. Freight trade plays a prominent role in LRD traffic.

Noise Impacts

LRD is the single largest generator of transportation-originated noise in the Laredo area. **Figure 7-2** shows the modeled 2019 daily noise contours of the area around LRD with land uses in the area. Noise levels are measured in day-night average sound level (DNL), the total accumulation of average sound throughout a 24-hour long period. A DNL of 65 dB is currently the federal standard for requiring mitigation. Noise mitigation is an important use for Airport Improvement Program (AIP) funds and may impact the funding available for other items from the AIP. The last Airport Noise Abatement Study was published in 2014. It provides noise analysis and land use compatibility information for 2013 base year noise as well as modeled 2019 noise impacts. Based on these findings, noise abatement and mitigation has been identified and federal funds (mentioned above) are being used for this purpose.

Figure 7-2: Noise Contours in LRD Area



Source: URS, 2014

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Laredo Urban Transportation Study

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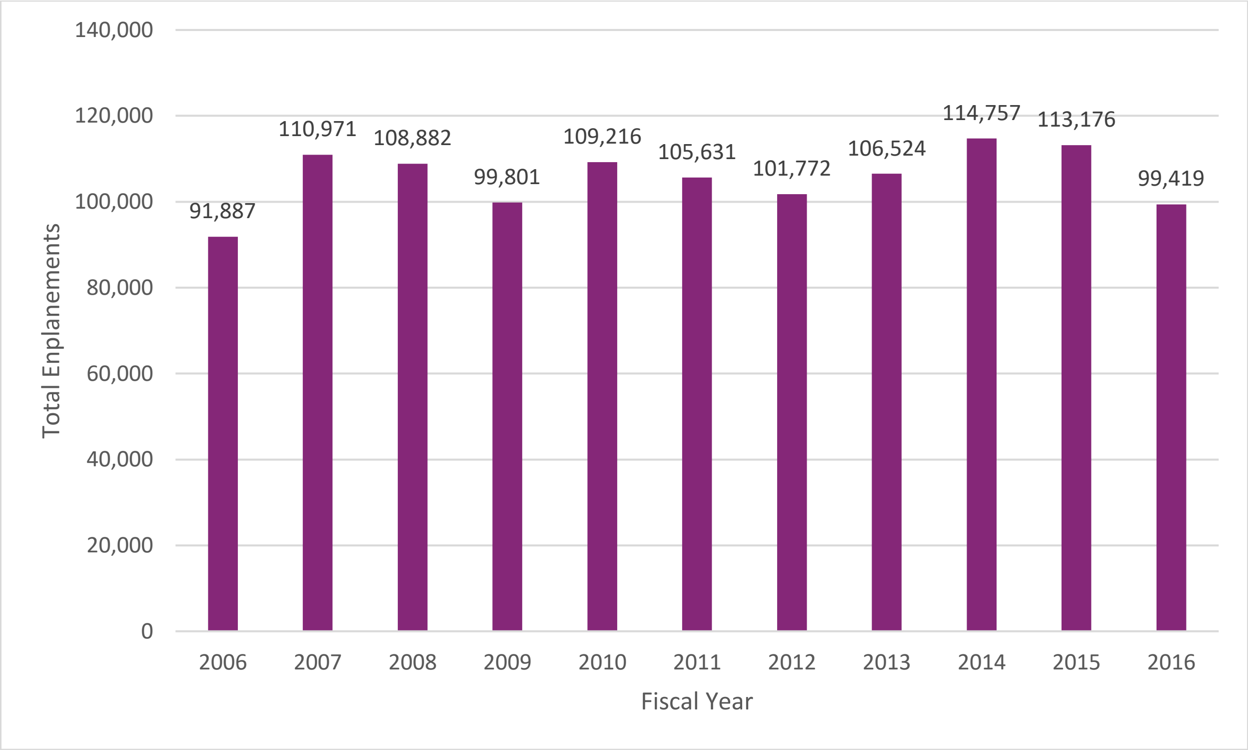
Operations

Passenger Operations

The FAA Terminal Area Forecast (TAF) Summary for Fiscal Years 2017-2045 provides historical and forecasted statistics on passenger demand and aviation activity at airports in the United States. **Figure 7-3** portrays the total number of enplanements at LRD for fiscal years 2007 through 2016 based on this TAF data. Enplanements are defined as the sum of originating and connecting passengers at an airport.

Between fiscal years 2007 and 2016, enplanements have fluctuated but remained relatively consistent. Since 2014, however, the total number of enplanements has decreased each year. The total number of enplanements in 2016 was 99,419. LRD is following the same trend as other small regional airports across the nation, which have exhibited stagnant and/or declining enplanements. If trends continue as they have historically (rates of growth from 2006-2016, or a 0.8% average rate of growth), in 2045 it is expected that there would be as many as 125,263 enplanements. This estimate is not substantially higher than peak enplanements over the 2006 – 2016 period. Since the number of enplanements at LRD drives demand for travel to and from LRD, the current enplanement trends indicate that passenger travel along corridors to and from the LRD will not substantially increase due to increases in enplanements.

Figure 7-3: Annual Enplanements 2006 - 2016

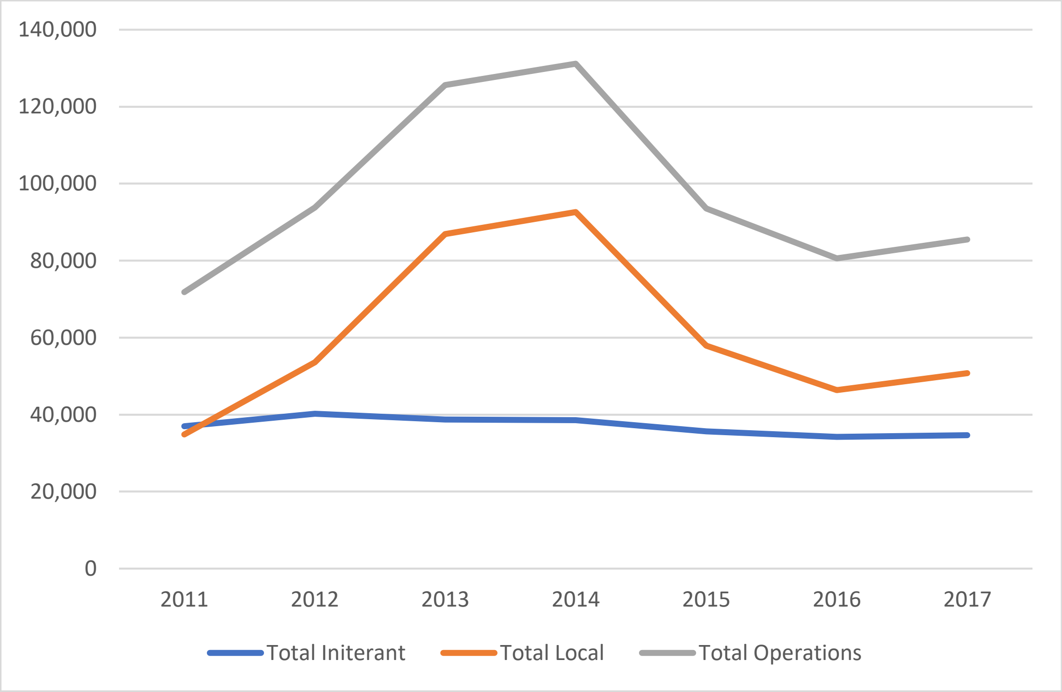


Source: FAA Air Traffic Activity Data System (ADATS)

Changes in annual operations between 2011 and 2016 are depicted in **Figure 7-4**. There are two types of airport operations that are important to look at in understanding operational trends: local and itinerant. Local operations are those operations performed by an aircraft that remain in the local traffic pattern, execute simulated instrument approaches or low passes at the airport, and where operations to or from the airport and a designated practice area are within a 20−mile radius of an air traffic control tower. Itinerant operations are operations performed by an aircraft that lands at an airport, arriving from outside the airport area, or departs an airport and leaves the airport area.

Local operations rose between 2011 and 2014 before falling again and in 2017 they were only slightly higher than in 2011. While local operations varied significantly between 2011 and 2016, itinerant operations minimally changed throughout the period, only declining slightly. Any long-term trend in the growth of operations from this data is therefore difficult to track. If operations rise substantially, it is possible that more noise mitigation may be required and higher levels of requisite funding for mitigation may be required.

Figure 7-4: Annual Operations 2011 – 2016

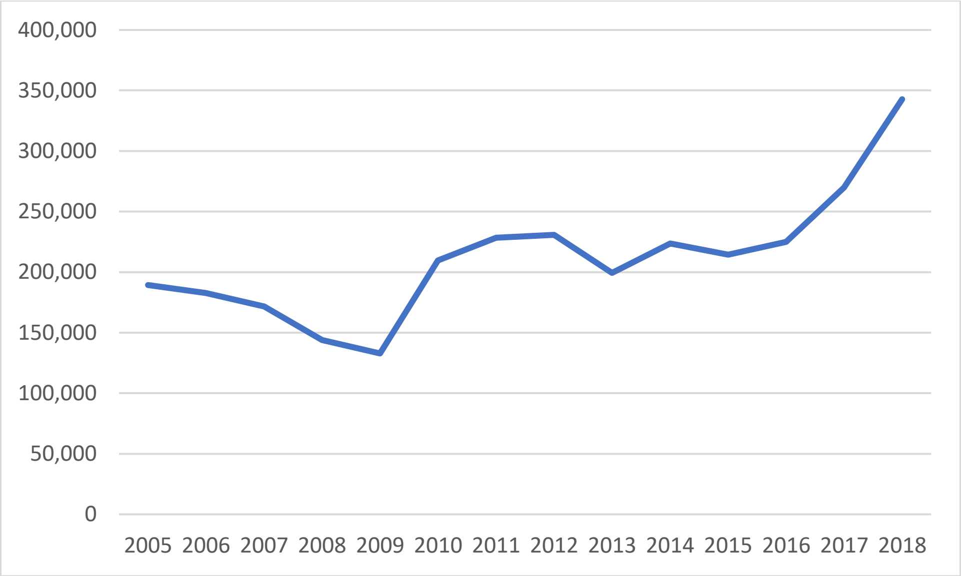


Source: FAA Air Traffic Activity Data System (ADATS)

Freight Operations

LRD serves air freight throughout the Laredo region, hosts 20 air cargo operators, and 597,000 square feet of storage space across 10 aircraft hangars, 15 air cargo facilities, and a federal express facility. Historic data on air cargo shipments in and out of LRD were reviewed and are shown in **Figure 7-5**.

Figure 7-5: Historic Air Cargo Data, 2005-2018 (Tons)



Despite a steep decline in air cargo during the recession and stagnation until 2015, air cargo significantly increased between 2015 and 2018 in Laredo, increasing by over 130,000 tons and averaging a 15.0% increase per year. While this growth rate may not hold through a long-range planning horizon, it points to the importance of LRD in trade and economic development in the region. Continued rises in the amount of air cargo being transported to or leaving LRD can substantially increase congestion and wear and tear along the main roads connecting freight routes to and from LRD.

Several improvements to freight operations are currently proposed. The *Airport Master Plan Update* calls for an expansion of LRD's storage space to 720,000 square feet, along with 246,000 square feet for expanding aircraft parking apron, 82,100 square feet of truck docking area, and 55,000 square feet of fuel farm and non-aviation commercial activities. As these improvements are implemented, the region must carefully review the impact these expansions will have on connecting roadways and freight movements.

Proposed Strategies

Continued investment in LRD is essential to maintain and enhance Laredo's ability to attract businesses and passengers. LRD was ranked as the 42nd largest all-cargo airport in the United States in 2017 by the FAA. It is also projected to have an increased in numbers of enplanements and aircraft operations in future years to 2045. Several strategies are therefore proposed to retain the competitiveness of LRD in the coming years. Strategies related to physical facility improvements, accessibility, and land use coordination are needed to improve airport operations, support economic development, and enhance travel and tourism and further discussed below.

Coordination of Airport Infrastructure Investments with Other Regional Transportation Needs

Continuous efforts are constantly being made to improve the operations of LRD. Based on current airport master planning efforts, the currently planned improvements for the next 20 years include the following projects:

- Extend Runway 17L/35R;
- Install Instrument Landing System (ILS) for Runway 17L/35R;
- Continue Reconstruction of West Side General Aviation/Air Cargo Apron;
- Expand West Side General Aviation/Air Cargo Apron;
- Construct New Airport Traffic Control Tower;
- Extend Taxiway G;
- Construct Connecting Taxiways;
- Construct Runway and Taxiway Shoulders;
- Expand Airport Terminal Building and Apron;
- Reconstruct Airport Perimeter Road;
- Construct Airport Maintenance Facility;
- Replace Localizer V-Ring Antenna with Log Periodics Antenna;
- Replace Mark 1F Transmitter with Mark 20 Transmitter;
- Construct Air Cargo Development Road;
- Acquire Land for Runway 17L Protection Zone;
- Expand Airport Terminal Building Parking Lot;
- Southwest and Northwest Air Cargo Development;
- Hotel Development.

A new airport maintenance facility which the airport currently lacks is also planned.

As mentioned earlier, FAA's Airport Improvement Program provides a primary federal source for funding LRD improvements. **Table 7-2** lists out the AIP grants that have been provided for development at LRD between 2014 and 2018. Major physical improvements include apron rehabilitation, perimeter fencing for security, and noise mitigation. While the Laredo MPO is not responsible for allocating funding for these projects, long-range planning to monitor physical airport investments, leverage funding opportunities, and to coordinate airport needs with other transportation improvements is important.

Of particular importance to the region with regard to these airport physical improvements is the need to coordinate airport improvements with other ongoing transportation improvements. If LRD continues to receive federal grants to make substantial improvements to its physical plant, then passenger and cargo traffic may continue to grow to high levels, potentially impacting levels of service and state of repair on roads connecting to LRD. The Laredo MPO is therefore committed to continuing to work with LRD and the City of Laredo to facilitate continued coordination between federal, state, and local transportation agencies and the airport.

Table 7-2: AIP Grants for Laredo International Airport, 2014-2017

Project Year	Federal AIP Funds	Project Description
2014	$2,890,905	Perimeter Fencing
2014	$4,202,381	Acquire equipment, rehab apron
2014	$4,000,000	Noise mitigation measures for residences within 65-69 DNL
2015	$7,596,816	Rehabilitate taxiway
2015	$6,000,000	Noise mitigation measures for residences within 65-69 DNL
2016	$5,000,000	Noise mitigation measures for residences within 65-69 DNL
2016	$7,819,990	Extend taxiway, install guidance signs, rehab apron, rehab taxiway
2017	$5,796,502	Install guidance signs, rehab apron, widen taxiway
2018	$3,625,107	Rehabilitate apron
2018	$2,000,000	Noise mitigation measures for residences
2018	$7,549,126	Rehabilitate apron

Coordinating Accessibility Needs

Safe and efficient access to and from the airport is essential to attracting passengers and enhancing travel and tourism. LRD is located approximately six-and-half-mile by roadway from the downtown area, and near the intersection of US 59 and Bob Bullock Loop. The main entrance is on the east side of the airport from Bob Bullock Loop and the parking lot is just in front of the terminal building.

While there are currently no El Metro fixed-route transit routes that directly serve the airport, the rise of transportation network companies, such as Uber and Lyft, has reached the Laredo region and passengers at the airport can coordinate rides with these providers independently. There are currently no designated facilities for these types of services, however they can play an integral role in providing enhanced and multimodal access to and from the airport. The Laredo MPO supports and is wiling to act as a facilitator with LRD, as needed, to support these additional accessibility options in the future.

Land Use Coordination

Land use around an airport is important to an airport. When preparing the future land use plans and allocating future population and employment growths, it is crucial to consider the impact of these developments on the airport. Well-planned developments around the airport would support its operations. Consideration of noise-sensitive land uses and locating those outside of the airport noise mitigation buffer areas identified will help to ensure that development proposed is consistent with airport operations and conditions. Further, recent and planned hotel development around the airport area would provide more convenient accommodations to further support travel and tourism. The Laredo MPO will continue to coordinate with LRD for developing an integrated land use and transportation plan around the airport.

Under Title 14 of the Code of Federal Regulations (CFR), all residential uses, schools, and outdoor performance venues are incompatible with a DNR of 65 dB or over. The City of Laredo and the FAA should adjust land use policies or provide noise mitigation work in accordance with these figures.

Chapter 8:
Freight and Goods Movement

Introduction

The Laredo regional economy relies significantly on the freight transportation system due to its unique geographic location, socioeconomic trends, and developmental characteristics. Increased trade with Mexico by the North American Free Trade Agreement (NAFTA), recently renegotiated in 2018 under the name United States-Mexico-Canada Agreement (USMCA), has resulted in increased demands for trucking, warehousing, and supporting industries in the Laredo region.

The Port of Laredo serves as a major national gateway connecting the U.S. with Mexico, making freight movement an extremely important local issue. Over time, increasing freight movement will require more infrastructure improvements and better connectivity between the national transportation system corridors and trade partners in order to increase synergies that reduce logistics costs of goods and services in final consumption markets. By being able to provide quick, affordable, and efficient goods movement, the Laredo MPO region is expected to attract more freight-dependent industries and benefit from trade related strategies.

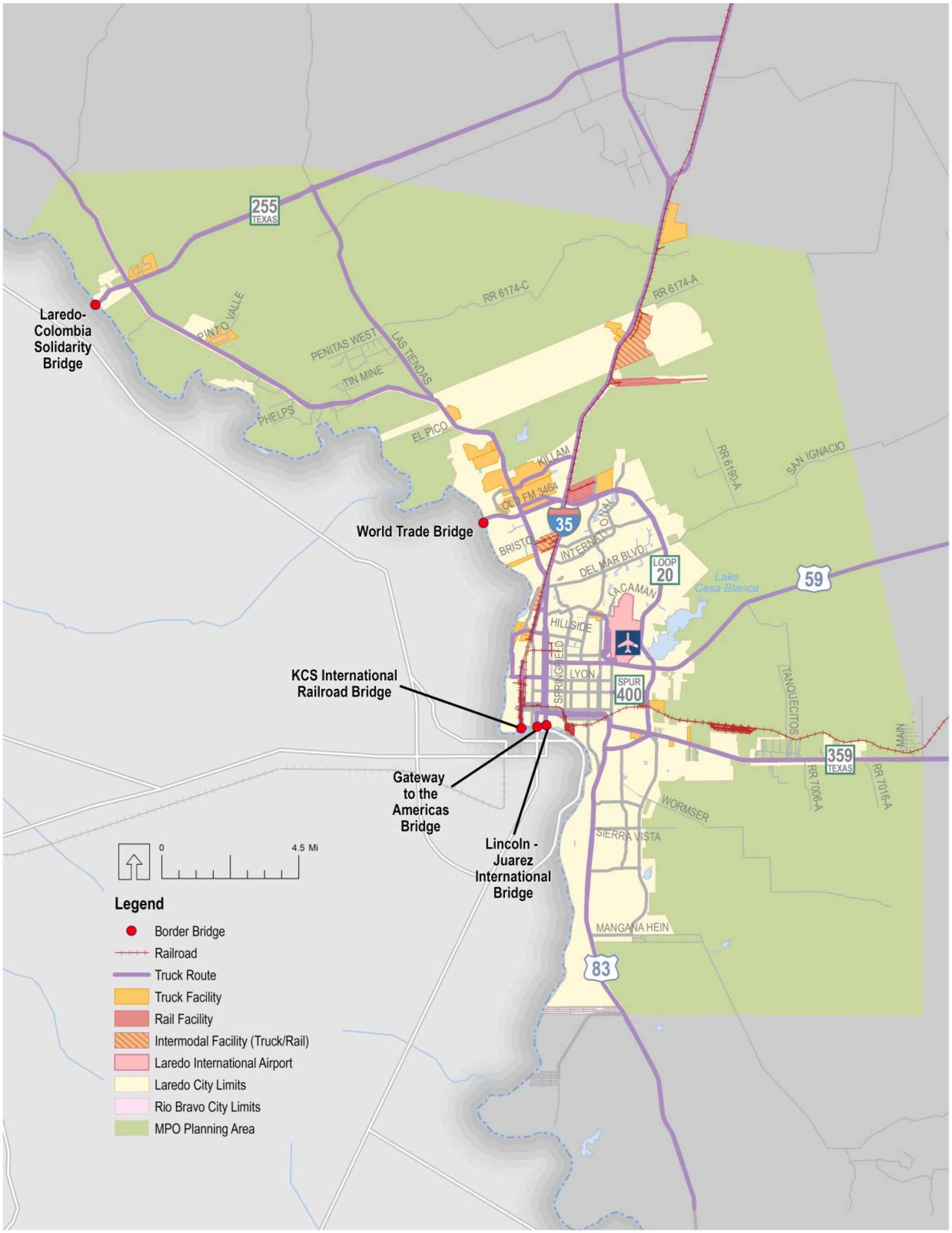
The purpose of this chapter is to provide a general understanding of freight activities in the Laredo MPO region and aid planners in making informed freight planning policies and investment decisions. This chapter addresses various aspects of freight transportation, including freight infrastructure, current and forecasted goods movement, identifies needs and challenges in the region, and provides best practices and strategies for addressing freight needs through the 2045 planning horizon.

It should be noted that at the time of this MTP development, a Regional Freight Master Plan has not been developed but is a key priority for the Laredo MPO. Given the high importance of freight to the region and national economy, the region's strategic location near the U.S. and Mexico border, and the impact freight has on transportation in the region, additional detailed master planning specific to this mode is desirable in the near-term to further focus freight transportation improvements in the region.

Freight Infrastructure

Laredo has a strong freight transportation system that serves the movement of goods and chiefly supports international trade between the U.S. and Mexico. The main freight transportation modes in the Laredo MPO region are highway and rail, however international bridges, air freight, and other intermodal facilities are also important to the freight infrastructure in the region. **Figure 8-1** shows the major freight transportation infrastructure, including transportation systems and facilities within the Laredo MPO region. The following sections provide further details on the major roadway and multimodal freight network in the region.

Figure 8-1: Regional Freight Infrastructure



Source: Laredo MPO

Freight Roadway Network

Laredo is the busiest truck freight gateway in Texas, and truck transportation is the most important mode serving the area for goods movement. The value of cargo moved by truck in 2016 represents about 72% of total cargo moved in the Laredo MPO region. Several roadway designations have been established that help to identify and prioritize freight roadway infrastructure from a federal, state, and local perspective.

National Highway Freight Network

As stated in **Chapter 4**, the FAST Act introduced the National Highway Freight Network (NHFN) to strategically direct federal resources and policies toward improved performance of highway portions of the freight transportation system. The NHFN includes four subsystems of roadways:

- **Primary Highway Freight System (PHFS):** The most critical highway portions of the US freight transportation system.
- **Other Interstate routes not on the PHFS:** The remaining Interstate highways not included on the PHFS. These routes provide important continuity and access to freight transportation facilities.
- **Critical Rural Freight Corridors (CRFCs):** Public roads not in an urbanized area that provide access and connection to important freight facilities
- **Critical Urban Freight Corridors (CUFCs):** Public roads in urbanized areas that provide access and connection to important freight and intermodal facilities

Within the Laredo MPO area, there are 19 miles of the PHFS as part of the NHFN. The other NHFN subsystems are not represented within the Laredo MPO region.

Roadways on the NHFN in the Laredo MPO region, shown on **Figure 8-2**, include: IH-35 from its Interstate Highway designation at Victoria Street; US 59 from IH-35 east to Bartlett Avenue; and the Bartlett Ave / Maher Avenue connection to the industrial area on the west side of the Laredo International Airport at Pappas Street.

Figure 8-2: National Highway Freight Network

Source: USDOT Bureau of Transportation Statistics

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

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Designated Truck Routes

The Laredo MPO region has also designated truck routes to help remove commercial freight traffic from roadways that are either inappropriate or unable to handle commercial freight trucks and to further facilitate safe and efficient local freight and goods movement. These truck routes consist of major transportation corridors and major arterials, as well as some local streets that provide access and connections to intermodal and industrial facilities within the region. The regional truck routes are shown on **Figure 8-1**. The primary truck routes that provide for the movement of goods are:

- Interstate: Interstate 35
- U.S. Highways: U.S. 59 and U.S. 83
- State Highways/Loops: SH 359, Loop 20 (including Cuatro Vientos Boulevard), SH 255, and Spur 260
- Farm-to-Market (FM) roads: FM 1472, FM 3338, and FM 3464/Milo Road, and
- Arterials: Killam Industrial Boulevard, Santa Isabel Avenue (a segment), Santa Maria Avenue (a segment), Anna Road, Calton Road (a segment), and Jefferson Street (westbound only).

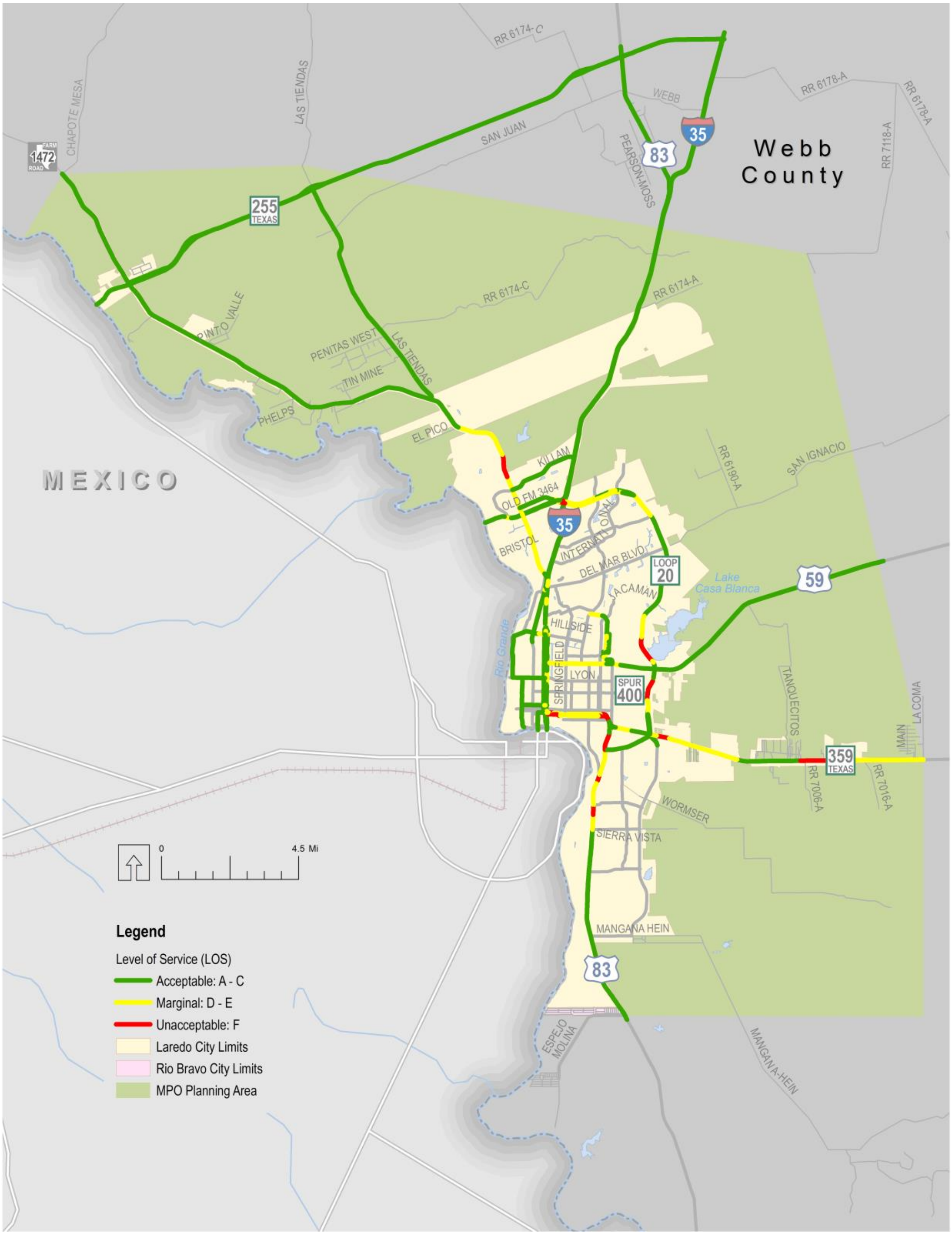
These designated truck routes mirror federally designated and important freight roadways in the region, specifically portions of I-35, US 59, Bartlett Avenue, and Maher Avenue which are critical for freight movements through the region and the United States.

As described in **Chapter 4: Roadways, Border Crossings, and Bridges**, level-of-service (LOS) is a measure of roadway congestion ranging in values from A to F. The LOS value of a roadway segment is based on the ratio of traffic volume to capacity, known as the VC ratio. For clarity, LOS ranges are grouped as LOS A, B, and C as acceptable congestion, LOS D and E as marginal, and LOS F as unacceptable. Truck route LOS for 2013 is shown on **Figure 8-3**. The most severe general locations with an unacceptable LOS of F for 2013 are located:

- Along Mines Road between Trade Center Boulevard and Interamerica Boulevard
- At the Uniroyal interchange and IH 35 approaching the interchange
- The at-grade crossing of Loop 20 at IH 35
- Sections of Loop 20 north and south of US 59
- SH 359 approaching Loop 20
- US 83 in southern Laredo
- The combined segment of SH 359/US 83 (Guadalupe St and Chihuahua St) between US 83 and IH 35

LOS was forecasted to the year 2045 using the travel demand model. Forecasted LOS is shown on **Figure 8-4**. As shown in the figure, congestion levels for the year 2045 will rise throughout the study area if no additional transportation investments are made beyond those that are currently committed in the current Transportation Improvement Program.

Figure 8-3: Truck Route Level of Service, 2013

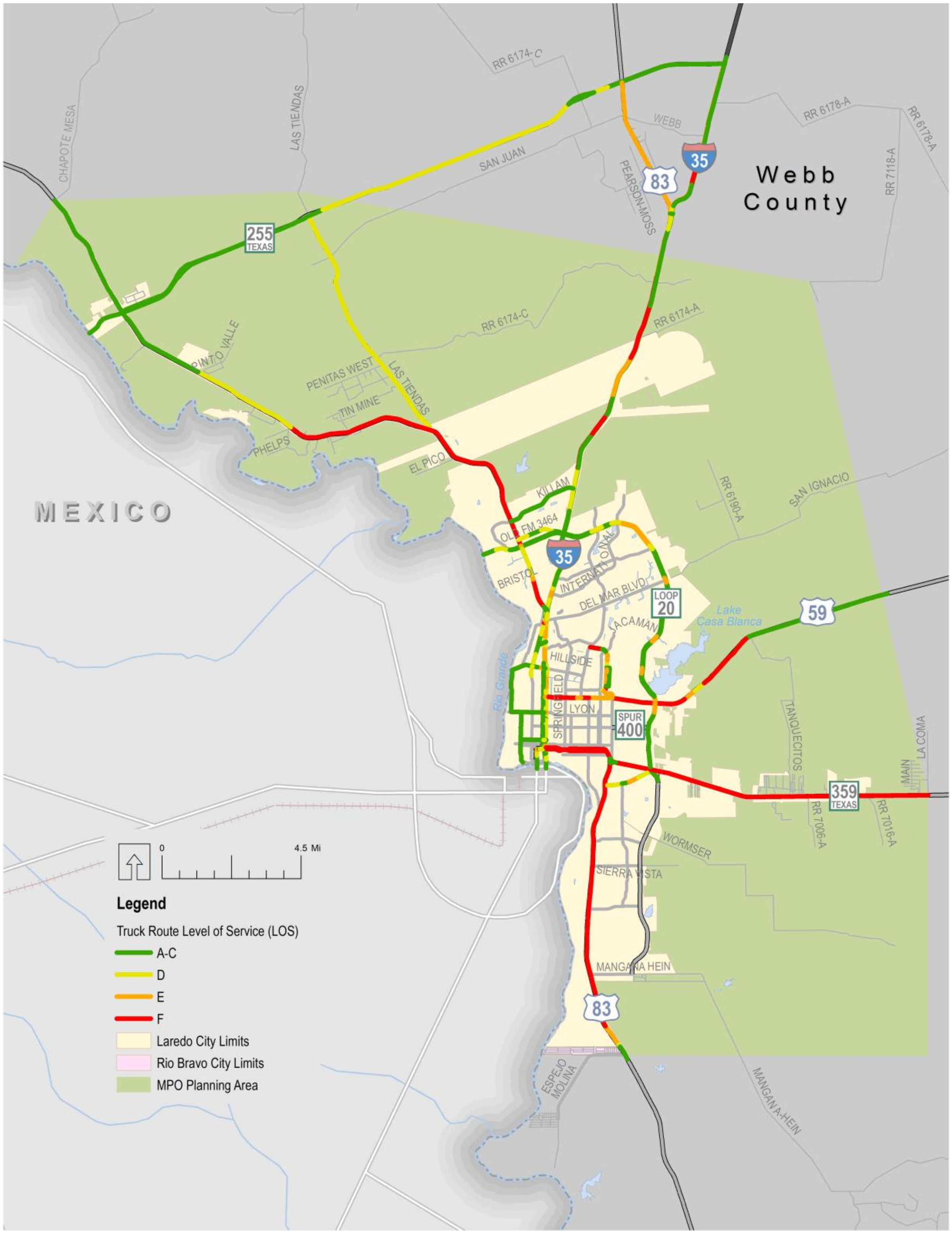


Source: Laredo MPO Travel Demand Model

LAREDO METROPOLITAN TRANSPORTATION PLAN
2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Figure 8-4: Truck Route Level of Service, 2045



Source: Laredo MPO Travel Demand Model

LAREDO METROPOLITAN TRANSPORTATION PLAN
2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Comparing LOS for the years 2013 and 2045 shows an increase in forecasted congestion in the year 2045 along many of the truck routes:

- Mines Rd from Loop 20 to beyond FM 3388 drops from acceptable and marginal LOS and a small segment rated unacceptable to congestion consistently rated as unacceptable.
- IH-35 is being expanded to 6 lanes and remains uncongested in its southern sections, but between Killam Industrial Blvd and Uniroyal Dr congestion increases to LOS F.
- Along US 59 and SH 359 to past Lake Casa Blanca is expected to increase congestion to unacceptable levels by the year 2045.
- The combined segment of SH 359/US 83 (Guadalupe St and Chihuahua St) between US 83 and IH 35 is shown to operate at a marginal LOS in 2013, degrading to unacceptable LOS along their entire length by the year 2045.
- US 83 is shown to operate at LOS F for most of its length between Rio Bravo and the intersection with SH 359.

Major Truck Facilities

As shown on **Figure 8-1**, there are several truck facilities in the region that support the freight trucking industry. These truck facilities provide a variety of services, from industrial parks to truck stops. Industrial parks provide such services as warehousing and storage or transferring and handling of freight cargo between trucks. Truck stops provide services to truck drivers, such as parking, rest areas, fueling, and maintenance. Most of the truck facilities within the region are located within the northside of the Laredo, many along Mines Road (FM 1472). A density of truck facilities is located near the intersection of Mines Road and Killam Industrial Boulevard including Killam Industrial Park, El Portal Industrial Park, Embarcadero, and R.M.R. Industrial Park. Two major truck facilities are adjacent to the Laredo Columbia Solidarity Bridge – the International Commerce Center and Las Minas Industrial Park. Major truck facilities along the northside of I-35 include La Barranca Industrial Park, Flying J, and Travel Centers of America.

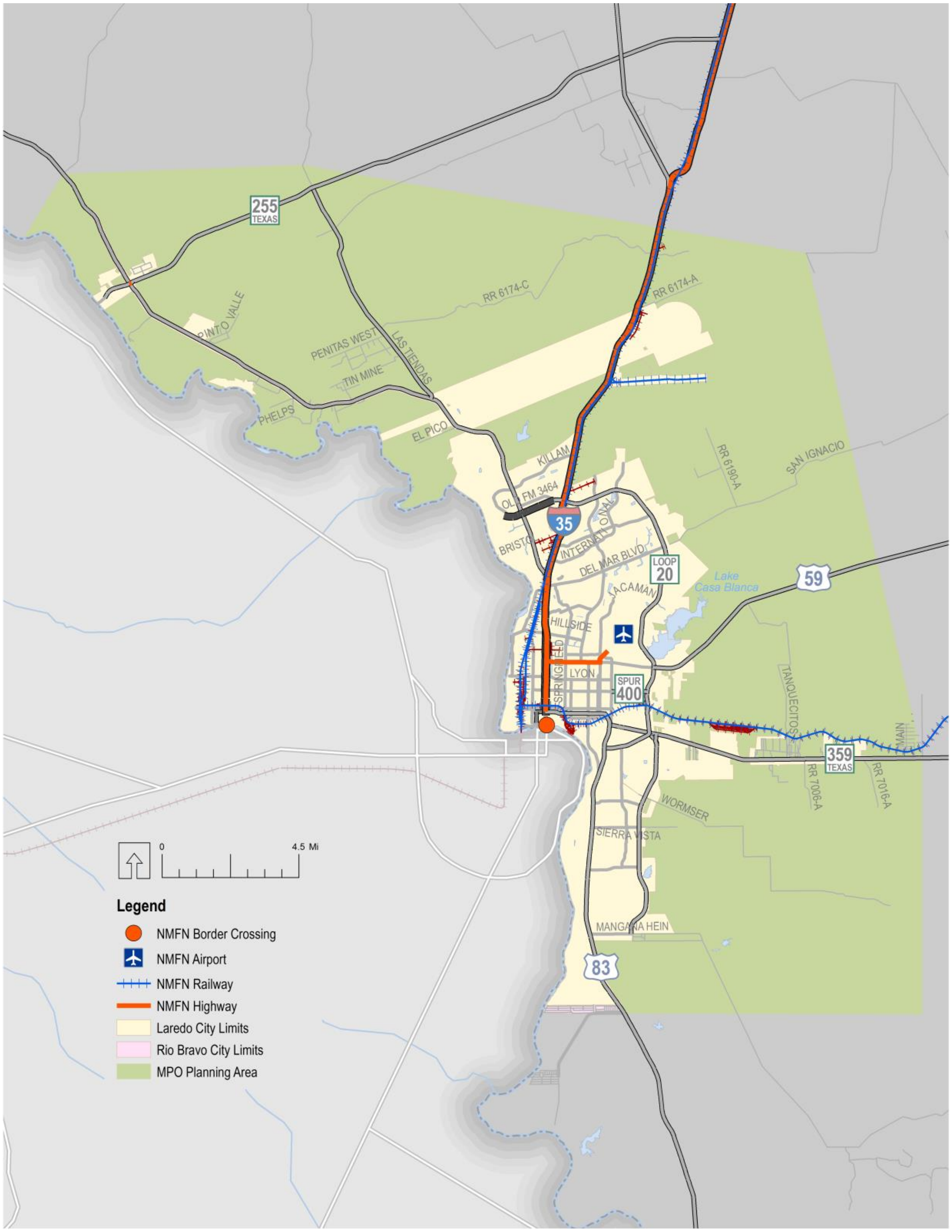
Multimodal Freight Network

National Multimodal Freight Network

In addition to the NHFN designation for important freight roadways, the FAST Act also provided for a new National Multimodal Freight Network (NMFN) designation for other important freight multimodal infrastructure. Components of the NMFN within the Laredo MPO area are shown on **Figure 8-5**. The purpose of the NMFN is to:

- Strategically direct resources toward improved system performance for the efficient movement of freight
- Inform freight transportation planning
- Assist in the prioritization of Federal investments
- Evaluate and support investments to achieve national goals

Figure 8-5: National Multimodal Freight Network



Source: USDOT Bureau of Transportation Statistics

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An Interim National Multimodal Freight Network (Interim NMFN) was established in 2016 for public comment, and the public comment period ended in February 2018. The Interim NMFN consists of the NHFN, the freight rail systems of Class I railroads, public ports of the United States that have total annual foreign and domestic trade of at least 2,000,000 short tons, the inland and intracoastal waterways of the United States, Great Lakes, the St. Lawrence Seaway, and coastal and ocean routes along which domestic freight is transported, the 50 airports located in the United States with the highest annual landed weight, and other strategic freight assets such as railroad connectors and border crossings.

NHFN components within the Laredo region include:

- *Highways*: 19 miles total consisting of the NHFN designations of I-35, US 59, Bartlett Avenue, and Maher Avenue, as discussed above
- *Railways*: 40 miles total consisting of Kansas City Southern (KCS) and Union Pacific (UP) railroads
- *Border Crossings*: Lincoln-Juarez/Bridge #2
- *Airports*: Laredo International Airport (LRD)

Railroad Network and Facilities

Class I Railroads

Rail is the only freight mode that relies almost exclusively on private funding for both infrastructure and operations. Rail is an important freight mode for the Laredo region. Of the seven Texas rail Ports of Entry (POEs) along the United States-Mexico international border, one is located within Laredo. This rail POE, the Texas Mexican Railway International Bridge, is the largest freight rail gateway in the US.

Railroads are classified by the US Surface Transportation Board based on their annual operating revenues. The railroad classification is determined by the following operating revenue thresholds:

- **Class 1** – $447, 621, 226 or more
- **Class 2** – Less than $447,621,226 and greater than $35,809,698
- **Class 3** – $35,809,698 or less

These revenue thresholds are periodically updated to account for the effect of inflation. The most recent update was in 2017.

Two major Class 1 railroads operate in the region:

- **Union Pacific (UP) Railroad** – UP Railroad operates the most extensive rail network in not only Texas, but also the US. UP Railroad operates between 15 and 20 trains per day through Laredo south of Loop 20, and 20 to 25 trains per day from the Texas Mexican Railway International Bridge to the city limits.
- **Kansas City Southern (KCS) Railroad –** KCS Railroad operates in the central US. KCS Railroad owns and indirectly operates Kansas City Southern de México (KCSM) in the central and northeastern states of México. KCS Railroad currently operates six to seven trains per day in the region.

The Texas Mexican Railway International Bridge is currently owned by KCS. It is a single-track bridge, and both UP and KCS Railroads share operation of it. According to the US Department of Transportation's border crossing entry data, 11.3 trains per day entered the Port of Laredo (the number of trains leaving was not recorded). More stringent screening and inspections could substantially decrease the total capacity.

Rail Yard Facilities

Railroad facilities within the region provide locations for storing, sorting, or loading and unloading freight cargo from railroad cars. UP Railroad owns and operates two rail yards, one located about four miles north of the IH 35 and Loop 20 interchange, south of the Unitec Industrial Park, and the second located north of the International Railroad Bridge yard, between Zaragosa and Moctezuma Streets.

The main KCS rail yard is located about two miles east of Loop 20 and has a capacity of 1,375-cars. On the Mexican side of the border, KCS-Mexico (KCSM) maintains the Sanchez yard, which is located 11 miles south and west of Nuevo Laredo. This rail yard contains 22 tracks, including two for car repairs and an intermodal terminal capable of handling 1,500 trucks per day.

Major Intermodal Facilities

Intermodal facilities within the Laredo MPO area are shown on the map on **Figure 8-1**. Intermodal facilities are cargo transfer points between one mode of freight transportation to another. In Laredo, intermodal facilities transfer freight loads from truck to rail, or from rail to truck. Typically, the freight cargo is packaged in a container, and the container is transferred from one mode to another. The use of the container allows the transfer to occur without any direct handling of the cargo. This method reduces cargo handling, and therefore improves security, reduces damages and losses, and allows a faster transport of freight. As the transfer point between rail and truck modes, intermodal facilities in the Laredo region are located at the nexus of the railroads and highways.

Three intermodal facilities are located at locations on the northside of Laredo where the railroad and I-35 meet:

- Tejas Industrial Park
- Unitec Industrial Park
- Del Mar Industrial Park

Two intermodal facilities are located on the eastside of Laredo where the railroad and Loop 20 meet:

- Tex-Mex Industrial Park
- Ponderosa Industrial Park

International Border Crossings

Five international bridges serving the border crossings between the US and Mexico are located within Laredo. Only three of these bridges, the Colombia-Solidarity Bridge, the World Trade Bridge, and the Texas Mexican Railway International Bridge, allow commercial traffic. The other two international bridges (Juarez-Lincoln International Bridge, Gateway to the Americas Bridge) are for passenger usage only. Additional detailed information regarding the international border crossings is provided in **Chapter 5: Roadways, Border Crossings, and Bridges**. According to the Laredo Economic Development Council, between the World Trade Bridge and Columbia alone, about 12,000 commercial trucks cross the bridges each day. This accounts for about 40% of the capacity of these bridges. As noted earlier in **Chapter 5**, the anticipated and continual rise in freight movements for the Laredo-Columbia-Solidarity and World Trade Bridge indicate existing freight congestion levels that are expected to continue to rise without additional investments to improve freight border crossings.

Air Freight

Air freight in Laredo is served by the Laredo International Airport (LRD), which has dedicated facilities to handle air freight. LRD is located approximately three and half miles from the center of the city, and six miles from the international border (straight distance). The airport has direct access to US 59 and Loop 20.

LRD currently has three runways, 597,000 square feet of storage space, and 20 air cargo operators, including Federal Express, UPS, Kallita Charters, McNeely Charters, Encore Air Cargo, IFL Group LCC, Northern Air Cargo, and USA Jets. **Table 8-1** shows the existing hanger and air cargo facilities in the airport.

Table 8-1: Storage Facilities in Laredo International Airport

Category	Storage Space (square feet)
10 Aircraft Hangars	207,000
15 Air Cargo Facilities	360,000
Federal Express Facility	30,000
Total Storage Space	597,000

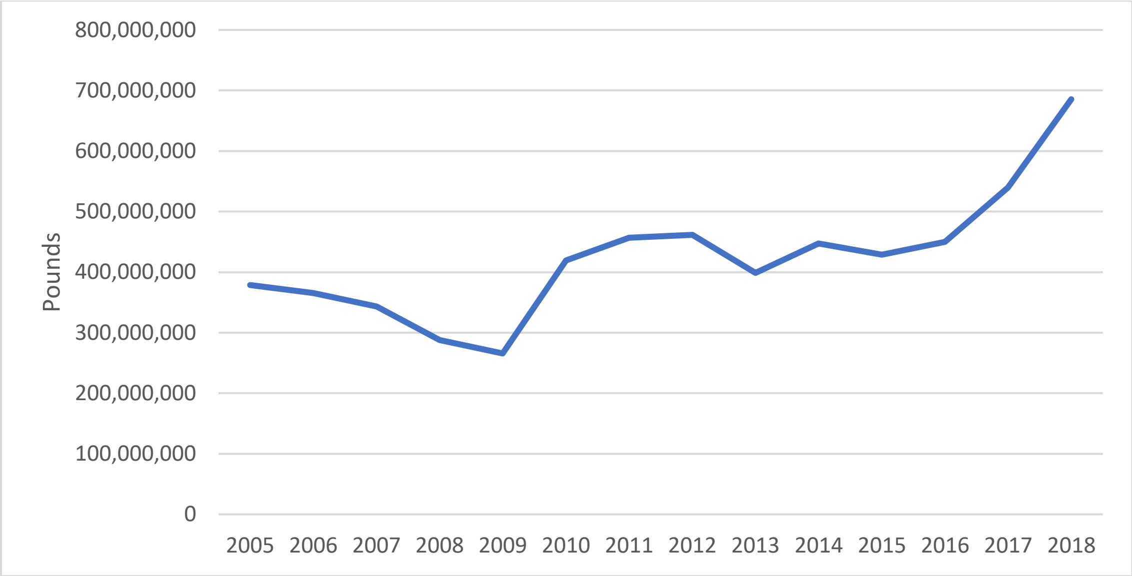
Source: Laredo International Airport

Detailed information and analysis on the LRD facilities and operations is provided in **Chapter 7: Airport**.

In the Laredo MPO region, air freight is becoming an increasingly important component of the transportation of goods. Air freight typically serves time-sensitive, high-value commodities such as documents and precision equipment. FedEx and UPS currently serve LRD on a scheduled basis, while non-scheduled operators include Northern Air Cargo, Ameristar, U.S.A Jet, and others. After stagnating in the aftermath of the recession, air cargo shipments by weight began to rise in 2016.

Figure 8-6 shows the historical air cargo shipments measured by air cargo aircraft gross landed weight in LRD from 2005 to 2018. Air cargo shipments have gone up by 6.2% annually since 2005. According to the information provided by LRD, approximately 90% of the air cargo business is related to the automobile industry.

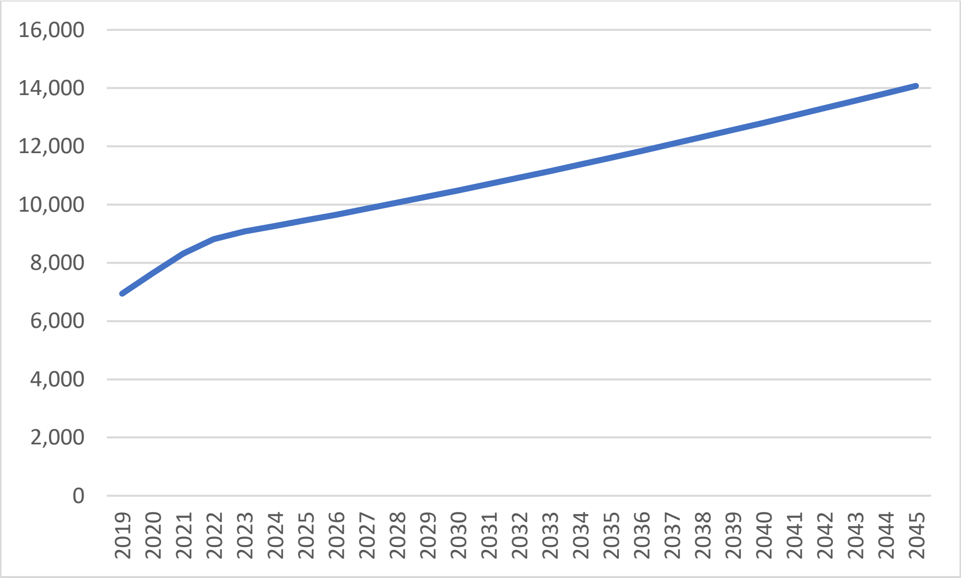
Figure 8-6: Air Cargo Aircraft Gross Landed Weight at LRD, 2005-2018



Source: Laredo International Airport via Laredo Development Foundation

The FAA forecasts that growth in air freight, measured in air carrier operations, between 2019 and 2045 will be 4.0 % annually. The result is based on the regression analysis of the historical activity and the FAA's Terminal Area Forecast Detail Report for 2019 to 2045. The future projections are presented on **Figure 8-7**.

Figure 8-7: Projected Air Carrier Operations at LRD, 2019-2045



Source: Terminal Area Forecast Detail Report, FAA

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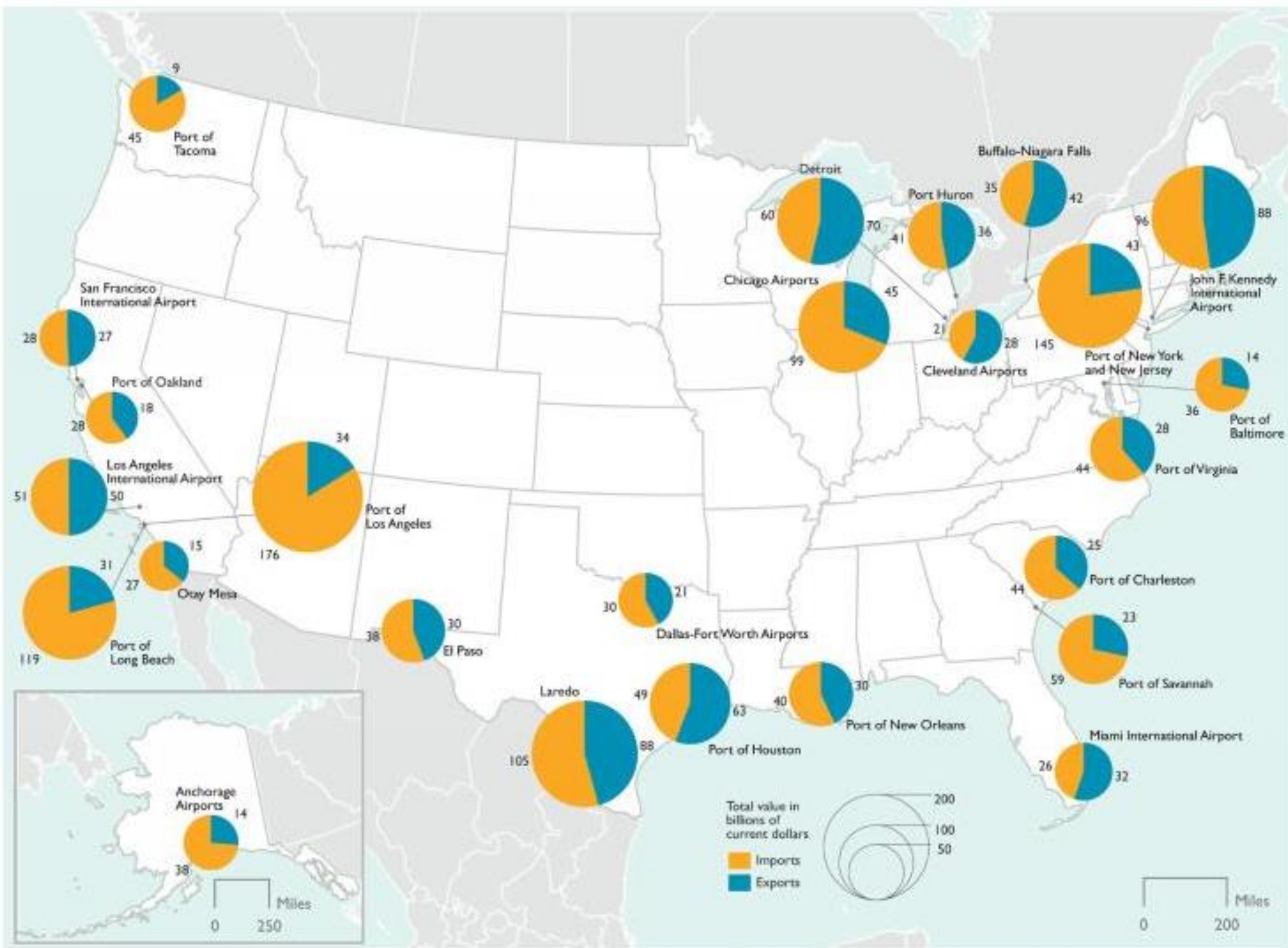
Goods Movements

In addition to the actual freight infrastructure, understanding the role of regional freight and goods movements is an important component in developing a comprehensive assessment of the transportation system for the 2020-2045 Laredo MTP.

Within the United States and according to the *2018 Transportation Statistics Annual Report*, Laredo is the top land-border crossing in the United States. As shown on **Figure 8-8**, inbound and outbound international freight movements by value of trade in Laredo are significantly larger than many of the other top U.S.-international freight gateways in the nation combined.

Figure 8-8: Top 25 U.S.- International Freight Gateways by Value of Shipments: 2016



Source: U.S. Department of Transportation Bureau of Transportation Statistics, 2018 Transportation Statistics Annual Report.

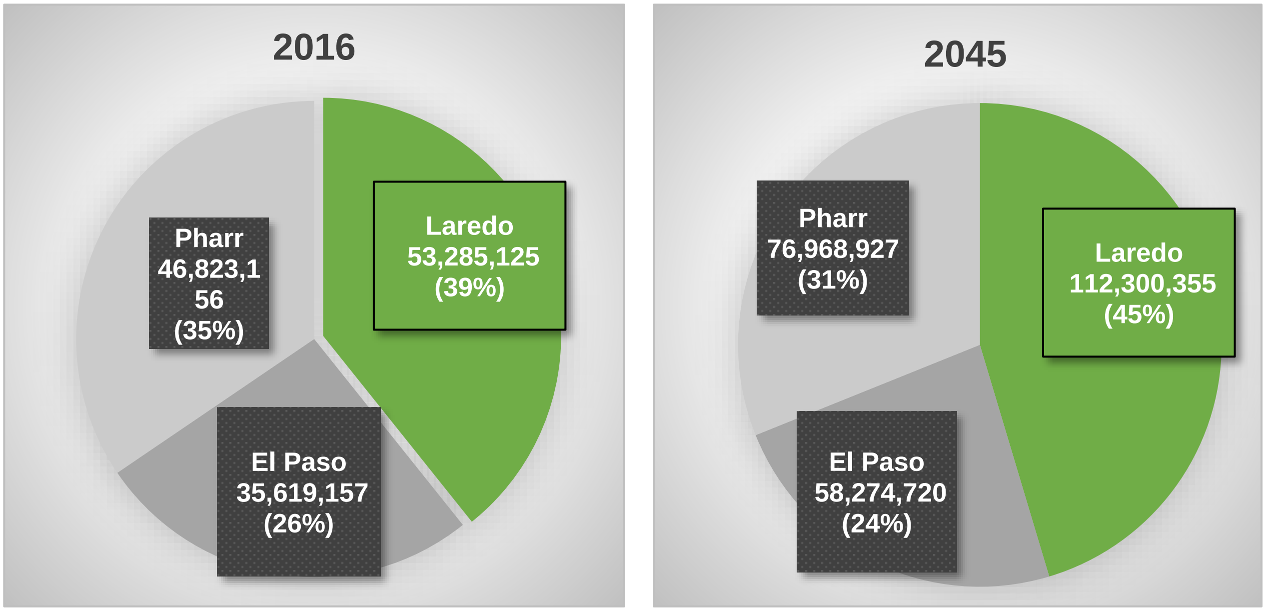
Within the state of Texas, there are three designated and significant border crossing districts – Laredo, El Paso, and Pharr. These major freight border districts provide the primary land access points for trade between the U.S. and Mexico and the Laredo district itself provided

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

approximately 39% of the total combined freight tonnage of all of the border districts in the state in 2016. Based on projected freight tonnage from the FHWA Freight Analysis Framework Version 4 (FAF4) and as shown on **Figure 8-9**, freight tonnage in this border district is expected to make up 45% of the combined freight tonnage within these three border districts in the state by 2045. It is clear that these existing trends and future projected share of growth within the Laredo District make the Laredo region particularly important to providing the infrastructure needed to meet existing and future freight demands in the state.

Figure 8-9: Combined Freight Tonnage for Texas Border Districts, 2016 and 2045

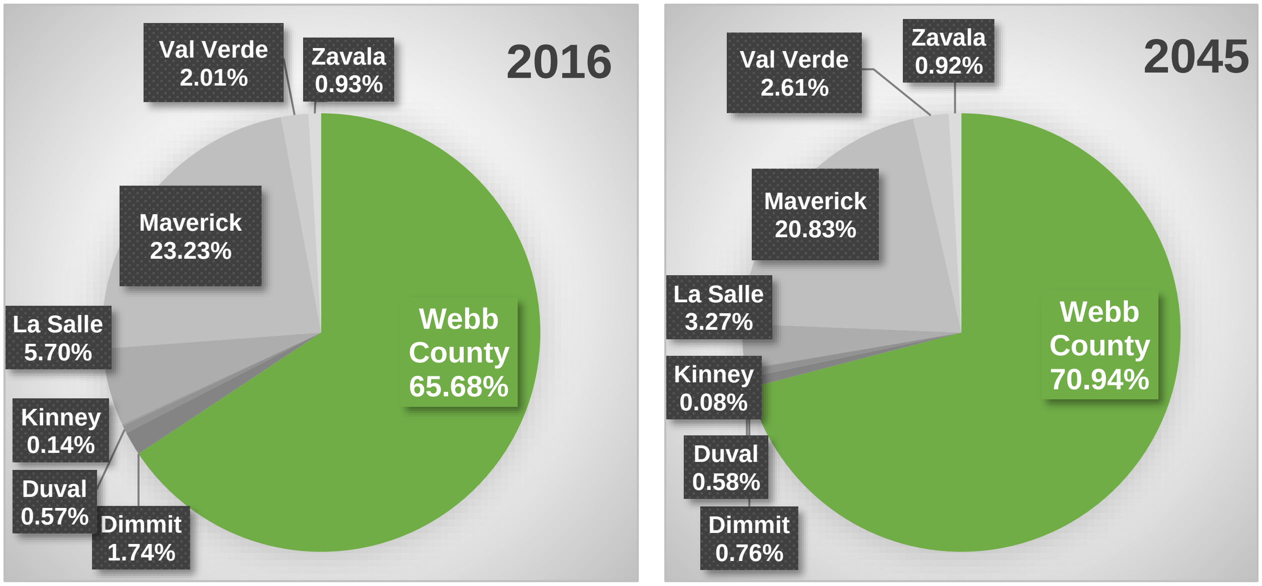


Source: TxDOT Border District Profiles, Texas Freight Mobility Plan, 2018.

The Laredo Border District itself includes areas within the Laredo MPO boundary – notably Webb County - and other counties outside of the MPO. Counties included in the Laredo Border District are: Dimmit, Duval, Kinney, La Salle, Maverick, Val Verde, Webb, and Zavala. Within the Laredo Border District, freight tonnage in Webb County makes up the most significant portion of total freight tonnage moved by a county in this border district in 2016 (65.68%) and is expected to continue to increase that share through 2045 (70.94%). **Figure 8-10**and **Table 8-2** provide 2016 and 2045 combined freight tonnage data for the Laredo Border District by County and highlight Webb County's contribution to these movements.

Notably, combined freight tonnage in the district is expected to more than double over current conditions by 2045 and Webb County is expected to grow by 128% between 2016 and 2045, a rate higher than the Laredo Border District as a whole. This growth in demand not only demonstrates the importance of freight within the regional economy, but the need to plan and develop road, rail, and border crossing infrastructure to meet these demands in the future.

Figure 8-10: Laredo Border District Combined Freight Tonnage, 2016 and 2045



Source: TxDOT Laredo Border District Profile, Texas Freight Mobility Plan, 2018.

Table 8-2: Laredo Border District Combined Freight Tonnage, 2016 and 2045

County	2016 Tonnage	2045 Tonnage	% Change
Webb County	**34,997,662**	**79,662,768**	**128%**
Dimmit	929,149	852,115	**-8%**
Duval	301,667	653,276	**117%**
Kinney	72,098	93,592	**30%**
La Salle	3,035,887	3,669,656	**21%**
Maverick	12,380,768	23,395,644	**89%**
Val Verde	1,071,808	2,934,691	**174%**
Zavala	496,086	1,038,613	**109%**
TOTAL:	**53,285,125**	**112,300,355**	**111%**

Source: TxDOT Laredo Border District Profile, Texas Freight Mobility Plan, 2018.

These high-level trends underscore the vital role that the Laredo region plays in facilitating economic development and freight goods movement within the state and at a national level. The following sections below provide further analysis and details on domestic and international freight and goods movement needs within the region itself that are expected to influence transportation needs now and into the 2045 planning horizon. Factors influencing these domestic and international trade in the region include freight flows (inbound and outbound), mode share, and commodities.

Domestic Trade Flows

According to FAF4 data, Laredo's top five domestic trading partners include locations in other parts of Texas, Michigan, and Illinois.

Table 8-3 shows the value of the amount traded with these regions along with four-year growth rates between 2012 and 2016. These trading partners reflect Laredo's role as the main Port of Entry for Mexican goods bound for the Eastern United States and Canada. In particular, Laredo serves as a key port of entry for distribution to important freight hubs in Texas, such as Houston, Dallas, and San Antonio and across the nation. Given the expected growth in freight tonnage anticipated through 2045, substantial increases in freight movements can be expected to increase bottlenecks along major freight corridors that provide access to these bubs and the national network – particularly along I-35 and US 58.

Table 8-3: Top Domestic Trading Partners in the U.S. (Millions of Dollars)

State	*Region*	*Annual Trade Value (Millions)*		*Annual Growth Rate (2012-2016)*
		2012	**2016**	
Texas	Houston-The Woodlands CSA*	$20,412.94	$18,484.61	-2.36%
	Dallas-Fort Worth CSA*	$16,861.10	$18,606.76	2.59%
	San Antonio CSA*	$5,121.38	$6,227.45	5.40%
Michigan	Detroit-Warren-Ann Arbor CSA*	$16,645.55	$17,090.58	0.67%
Illinois	Chicago-Naperville CSA*	$8,245.84	$9,644.80	4.24%
** CSA is defined as a Combined Statistical Area.*				

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

Inbound and Outbound Movements

Table 8-4 provides a summary of 2016 and 2045 trade values by inbound and outbound movement types and anticipated changes. According to FAF4 data, in 2016 a total of $33.4 billion dollars or 17.9 million tons of goods were transported inbound into the Laredo metropolitan statistical area from other destinations in the US via various modes including air, truck, rail, pipeline, and mail. A total of $17.5 billion dollars or 20.0 million tons of goods were transported outbound from Laredo to other destinations in the U.S. in 2016.

Table 8-4: Domestic Goods Movements, 2016 and 2045

Type	Trade Values ($ Billions)			Trade Value (Tons-Millions)		
	2016	2045	% Change	2016	2045	% Change
Inbound	33.4	52.5	**57.19%**	17.9	20.5	**14.53%**
Outbound	17.5	22	**25.71%**	20	24.7	**23.50%**

Both inbound and outbound domestic goods movements are anticipated to increase substantially in terms of trade value and tonnage by 2045. Notably, trade value as measured in tons is expected to increase for inbound domestic trade by almost 15% and by almost 24% for outbound domestic trade. As additional domestic goods are moved in and out of the Laredo region, there will be additional demands placed on the transportation network – both roadways and rail – to accommodate this increase in domestic goods movement. Should truck freight movements continue to be the predominant form of transportation for this trade, roadway networks in the region will continue to degrade in performance without additional investments and planning for transportation efficiency.

Goods Movement by Mode

Trucks the dominant mode for transporting domestic goods between Laredo and other locations in the U.S. **Table 8-5** shows the total value and weight of domestic freight by mode in 2016 and projected for 2045 and percentage they make up by mode. Trucks transported approximately 51.8 billion dollars or 44.9 million tons of goods in domestic trade in 2016. Rail carries the second highest value of the modes with approximately 650 million dollars and 1.3 million tons of goods moved. Meanwhile, pipelines (which transport liquids or gases long-distance through systems of pipes) transported approximately 281 million dollars or approximately 710,000 tons of goods and air 374 million dollars and 4.5 million tons of goods, respectively. In terms of percentages, trucks provide over 90% of domestic trade in the region whether measured in the dollar value of trade or tons of value transported.

Table 8-5: Domestic Freight Values by Mode, 2016 and 2045

Type	Trade Values ($ Billions)				Trade Value (Tons-Millions)			
	2016	% of Total	2045	% of Total	2016	% of Total	2045	% of Total
Truck	51.8	91.13%	67.6	86.86%	44.9	95.30%	47.4	92.26%
Air	0.37	0.65%	0.94	1.21%	0.0045	0.01%	0.0088	0.02%
Pipeline	0.62	1.09%	0.11	0.14%	0.71	1.51%	0.12	0.23%
Rail	0.65	1.14%	0.98	1.26%	1.3	2.76%	3.5	6.81%
Other Modes	3.4	5.98%	8.2	10.54%	0.2	0.42%	0.35	0.68%
Total	56.84	100.00%	77.83	100.00%	47.11	100.00%	51.38	100.00%

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

Table 8-6 shows the total changes in freight values by mode expected between 2016 and 2045. Value of domestic truck freight by dollars and tons is expected to continue rise, with tonnage expected to increase by 5.57%. Most notably for the surface transportation system, however, substantial increases in air freight modes are anticipated by 2045 – with tonnage almost doubling and values in dollars almost double what they were in 2016. Additionally, tonnage moved by rail is expected to more than double between 2016 and 2045.Similarly, "other modes", which include those transported by multiple modes or those not otherwise defined by mode are expected to more than double in terms of trade value and to increase in tonnage by 75% between 2016 and 2045.

Table 8-6: Domestic Freight Flow Changes by Mode, 2016 and 2045

Type	Trade Values ($ Billions)			Trade Value (Tons-Millions)		
	2016	2045	% Change	2016	2045	% Change
Truck	51.8	67.6	**30.50%**	44.9	47.4	**5.57%**
Air	0.37	0.94	**154.05%**	0.0045	0.0088	**95.56%**
Pipeline	0.62	0.11	**-82.26%**	0.71	0.12	**-83.10%**
Rail	0.65	0.98	**50.77%**	1.3	3.5	**169.23%**
Other Modes	3.4	8.2	**141.18%**	0.2	0.35	**75.00%**
Total	56.84	77.83	**36.93%**	47.11	51.38	**9.05%**

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

The changes or consistency in modes used for carrying freight now and into the future as well as the changes in freight moved by mode are significant factors in planning for the needs of the future freight transportation network. The continued reliance on trucks as the dominant mode for carrying freight means that major interstates and state roads will need to provide adequate levels of service to address roadway truck travel needs and provide on time reliability for freight movements. Additionally, the increase in air and rail modes in the future indicate that expansions of airport freight intermodal hubs may be required and that rail infrastructure in the region may need to be further modernized and greater intermodal connections may be needed to address these freight needs.

Commodities

Table 8-7 shows the top five total commodities of total domestic trade value of freight in 2016 and 2045 and **Table 8-8** shows anticipated changes in these domestic commodity values between 2016 and 2045. Fuel oils made up over 50% of domestic freight trade values by dollars in 2016 and almost 84% of trade value in tons in 2016.

In 2045, this is expected to decrease slightly, while other commodities such as electronics and machinery are anticipated to make up a greater share of the top domestic trade commodities in the region and are expected to make up a smaller percentage of total domestic trade commodities in the future. Similarly, fuel oil trade in general is expected to decrease during this same timeframe. Most of the domestic trade by these top five commodities are expected to decrease somewhat between 2016 and 2045, with the exception of electronics and machinery, which are expected to more than double in trade value dollars over this timeframe.

Table 8-7: Domestic Trade Values by Commodity, 2016 and 2045

Type	Trade Values ($ Billions)				Trade Value (Tons-Millions)			
	2016	% of Total	2045	% of Total	2016	% of Total	2045	% of Total
Fuel Oils	20.2	53.30%	16.7	36.07%	22.1	83.52%	18.4	75.47%
Electronics	5.5	14.51%	12.4	26.78%	0.28	1.06%	0.5	2.05%
Gasoline	4.2	11.08%	3.8	8.21%	2.9	10.96%	3.8	15.59%
Motorized Vehicles	4.2	11.08%	4.7	10.15%	0.74	2.80%	0.75	3.08%
Machinery	3.8	10.03%	8.7	18.79%	0.44	1.66%	0.93	3.81%
Total	37.9	100.00%	46.3	100.00%	26.46	100.00%	24.38	100.00%

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

Table 8-8: Domestic Trade Value Changes by Commodity, 2016 and 2045

Type	Trade Values ($ Billions)			Trade Value (Tons-Millions)		
	2016	2045	% Change	2016	2045	% Change
Fuel Oils	20.2	16.7	**-17.33%**	22.1	18.4	**-16.74%**
Electronics	5.5	12.4	**125.45%**	0.28	0.5	**78.57%**
Gasoline	4.2	3.8	**-9.52%**	2.9	3.8	**31.03%**
Motorized Vehicles	4.2	4.7	**11.90%**	0.74	0.75	**1.35%**
Machinery	3.8	8.7	**128.95%**	0.44	0.93	**111.36%**
Total	37.9	46.3	**22.16%**	26.46	24.38	**-7.86%**

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

Changes in domestic commodity flows have direct impacts on the transportation network, since weights and composition of commodities differ and may impact on the modes used, the distribution needs for transferring commodities to end uses, and types of vehicles (e.g., rail, truck, air,) needed to support freight demands.

International Trade Flows

Table 8-9 and **Table 8-10** show the import and export trade values for 2012 and 2016 between Laredo and foreign trading partners. According to the FAF4 data, Laredo's top foreign trade partner is Mexico, and total trade value accounts for 99 percent of the total international trade values in 2016. Although Mexico is overwhelmingly Laredo's largest trading partner there has also been significant growth in import trade value coming through Laredo from Southeast Asia and Oceania (62%) and from the rest of Latin America (35%). While Canada is not a top trading partner for the region, annual trade values for Canadian trade increased substantially from 2012 to 2016 (over 600%).

Table 8-9: Top Foreign Trading Import Partners (Millions of Dollars)

Country/Region	Annual Trade Value (millions)		Annual Growth Rate
	2012	2016	(2012-2016)
Mexico	$92,477.86	$111,161.12	5.05%
SE Asia and Oceania	$14.39	$49.99	61.84%
Eastern Asia	$48.90	$46.79	-1.08%
Europe	$39.35	$33.95	-3.43%
Rest of Americas	$3.58	$8.52	34.53%

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

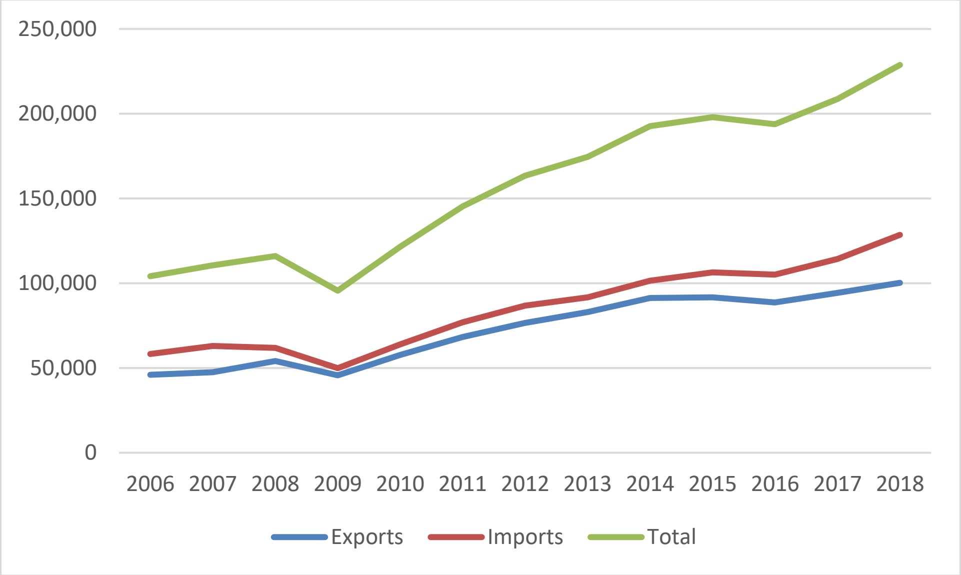
Table 8-10: Top Foreign Trading Export Partners (Millions of Dollars)

Country/Region	Annual Trade Value (millions)		Annual Growth Rate
	2012	2016	(2012-2016)
Mexico	$80,158.58	$91,466.29	3.53%
Canada	$1.79	$45.13	605.31%
Rest of Americas	$2.23	$5.46	36.21%
Europe	$2.80	$3.09	2.59%
Eastern Asia	$1.95	$2.07	1.54%

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

Figure 8-11 shows that US-Mexico trade value through the port of Laredo has steadily increased over the last 13 years, with an annual growth rate of 9.9 percent. In 2018, total combined exports to and imports from Mexico through the Port of Laredo totaled $228.7 billion.

Figure 8-11: U.S.-Mexico Trade Value, Through Port of Laredo in Millions of Dollars



Source: Bureau of Transportation Statistics. North American Transborder Data

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

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Existing and future international freight demands, by movement types (inbound and outbound movements), modes, and commodities were further examined to understand current and future goods demands that may impact the freight network in the region today and in 2045.

Inbound and Outbound Movements

Table 8-11 shows 2016 and 2045 international import and export values. In 2016 approximately 109.7 billion dollars or 24.2 million tons of goods were imported from foreign countries through Laredo into the U.S, and approximately 91.5 billion dollars or 37.6 million tons of goods from the U.S. were exported through Laredo to foreign countries. The total trade value of import goods is projected to increase from approximately 109.7 billion dollars in 2016 to 358.9 billion dollars in 2045, which translates to a growth of more than 300 percent. The total trade value of export goods is projected to grow from approximately 91.5 billion dollars in 2016 to 300.7 billion dollars in 2045. The total weights of import and export goods are also projected to grow in a similar way. The substantial amount of international trade values, in dollars and tons, and significant increases in international trade anticipated between 2016 and 2045 underscore the need for freight improvements in the region that will enhance the ability to move freight effectively and efficiently within the region and to other destinations statewide, nationally, and into Mexico and Central and South Americas.

Table 8-11: International Import and Export Trade Flows, 2016 and 2045

Type	Trade Values ($ Billions)			Trade Value (Tons-Millions)		
	2016	2045	% Change	2016	2045	% Change
Imports	109.7	358.9	**227.16%**	24.2	73.4	**203.31%**
Exports	91.5	300.7	**228.63%**	37.6	86.5	**130.05%**
Total	201.2	659.6	**227.83%**	61.80	159.90	**158.74%**

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

Goods Movement by Mode

Table 8-12 shows the total international trade values of goods transported by mode in 2016 and 2045. As with domestic goods movements, trucks provide the primary mode for transporting international goods, accounting for over 78% of the total value of goods movement by mode in 2016 and over 61 percent of the value in tons of international goods moved. By 2045, truck mode share for carrying international goods is expected to continue increase, and values of international trade by dollars and tons are expected to decrease for rail modes as a share of the goods moved. If these trends continue as predicted, it will place additional burdens on an already taxed freight roadway and not provide any additional mode shifts for moving these goods.

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Table 8-12: International Trade Values by Mode, 2016 and 2045

Type	Trade Values ($ Billions)				Trade Value (Tons-Millions)			
	2016	% of Total	2045	% of Total	2016	% of Total	2045	% of Total
Truck	156.3	78.13%	540.2	81.89%	37.8	61.16%	116.9	73.09%
Rail	36.7	18.35%	92.9	14.08%	22.4	36.24%	32.9	20.57%
Air	0.24	0.12%	1.9	0.29%	0.005	0.01%	0.033	0.02%
Other Modes	6.8	3.40%	24.7	3.74%	1.6	2.59%	10.1	6.32%
Total	200.0	100.00%	659.7	100.00%	61.8	100.00%	159.9	100.00%

Table 8-13 shows total changes in international trade values by mode between 2016 and 2045. Substantial increases in international trade values are expected between this timeframe. Most notably, air transportation is anticipated to grow by approximately 540 percent, railroad by approximately 47 percent, and trucks by more than 200 percent between 2016 and 2045. To meet this significant growth, additional investments are likely to be needed for logistics and distribution of air freight, to upgrade and modernize rail and intermodal facilities, and to address the impacts of additional truck freight volumes on the freight roadway network.

Table 8-13: International Trade Value Changes by Modes, 2016 and 2045

Type	Trade Values ($ Billions)			Trade Value (Tons-Millions)		
	2016	2045	% Change	2016	2045	% Change
Truck	156.3	540.2	**245.62%**	37.8	116.9	**209.26%**
Rail	36.7	92.9	**153.13%**	22.4	32.9	**46.88%**
Air (includes truck-air)	0.24	1.9	**691.67%**	0.005	0.033	**560.00%**
Other Modes	6.8	24.7	**263.24%**	1.6	10.1	**531.25%**
Total	200.0	659.7	**229.78%**	61.8	159.9	**158.77%**

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

Commodities

Table 8-14 shows the top five total commodities of international trade measured by value in 2016 and 2045. The top five outbound commodities include motorized vehicles, machinery, electronics, plastics/rubber, and base metals. These commodities represented 72 percent of the total international value of commodities in 2016. All these five commodities are expected to grow substantially by year 2045. It is projected that machinery will have the highest percentage of growth between 2016 and 2045 among these five – 282 percent, followed by electronics – 248 percent. Further, in 2045, these commodities are projected to account for 71 percent of all commodities traded in and through the region. With this substantial growth in commodities traded, additional logistics to effectively distribute these goods may be needed to further support efficient international goods movements.

Table 8-14: International Trade Values by Commodity, 2016 and 2045

Type	Trade Values ($ Billions)			Trade Value (Tons-Millions)		
	2016	2045	% Change	2016	2045	% Change
Motorized Vehicles	44.0	93.5	**112.50%**	7.1	15.5	**118.31%**
Electronics	41.6	144.8	**248.08%**	2.4	8.7	**262.50%**
Machinery	34.3	131.2	**282.51%**	4.6	15	**226.09%**
Plastics/rubber	14	44.5	**217.86%**	5.6	13.3	**137.50%**
Base Metals	4.7	11.8	**151.06%**	4.6	7.8	**69.57%**
Total	138.6	425.8	**207.22%**	24.3	60.3	**148.15%**

Source: Federal Highway Administration, Freight Analysis Framework 4, 2016

Defining Regional Freight Issues and Needs

In addition to technical analysis examining the performance of freight infrastructure and goods movement in the region described above, major state and regional plans were reviewed and regional public involvement was conducted, including stakeholder and focus group meetings, to further define freight issues and needs for the Laredo MPO region through the 2045 planning horizon.

Statewide and Regional Planning Efforts Reviewed

Two major planning initiatives were identified and reviewed for this MTP to ensure that strategies and recommendations for freight improvements in the region are consistent with ongoing planning efforts: the Texas Freight Mobility Plan and the Texas-Mexico Border Transportation Master Plan.

Texas Freight Mobility Plan

With the enactment of the FAST Act, each state is required to develop a freight plan that comprehensively addresses short- and long-term freight planning activities and investments. The latest 2018 Texas Freight Mobility Plan serves as a guide to address freight transportation needs by establishing goals and strategies to guide investment decisions and prioritize projects that align with the state's transportation and economic development goals. The plan outlines priorities for freight investments, identifies facilities that are critical for economic growth and the movement of goods, strategizes for enhanced economic growth and competitiveness, expands freight policies, ensures consistency with neighboring states and federal goals and objectives, and provides a realistic implementation plan.

The 2018 Texas Freight Mobility Plan identifies strategic recommendations for significant investments that will shape the state's future freight transportation demands as well as address current unmet needs. One of the strategic recommendations is the I-27 Extension from Lubbock to Laredo. The Ports-to-Plains (I-27) corridor from Laredo to Denver would be a catalyst to spur economic development in the state and support agricultural and energy sector development. The I-27 extension would provide the only major north-south corridor in Texas west of I-35, and it would intersect three major east-west routes: I-10, I-20 and I-40. Currently, nearly 125 miles between Amarillo and Lubbock are designated as I-27. The I-27 extension would upgrade approximately 500 miles from Lubbock to Laredo at a conceptual cost estimate of $5.2 billion. TxDOT has recommended more detailed study of the extension to determine whether an incremental improvement approach or a complete interstate facility approach would meet safety and mobility needs.

The 2018 Texas Freight Mobility Plan includes a 5-Year Freight Investment Plan that includes 515 projects that are fully funded. Within 5-Year Freight Investment Plan, there is one investment identified for the Laredo MPO area, shown in **Table 8-15**.

Table 8-15: 2018 Texas Freight Mobility Plan 5-Year Investment Plan, Projects in Laredo MPO

TIP/ Project Number	Facility	Location	Description	Project Category	Fiscal Year	Project Cost (Millions)	Priority
0018-06-183	I-35	0.5 mi South of US 59 - SL 20 to 0.50 mi East of I-35 / US 59 -SL 20	Construction of Direct Connector Interchange (Dc#5)	Alternate Routes	2019	$30.000	High

The 2018 Texas Freight Mobility Plan includes an Unconstrained Freight Investment Plan, this project list identifies projects for which funding has not been secured yet. For the Laredo MPO area, these projects are shown in **Table 8-16**.

Table 8-16: 2018 Texas Freight Mobility Plan Unconstrained Freight Investment Plan, Projects in Laredo MPO

TIP/ Project Number	Facility	Location	Description	Project Category	Fiscal Year	Project Cost (Millions)	Priority
2150-04-068	FM 1472	At Flecha Lane	Improve traffic signals	Safety		$0.087	High
2150-04-069	FM 1472	At Killam Blvd	Improve traffic signals	Safety		$0.423	High
0018-05-089	I-35	0.500 mi S of Uniroyal Interchange to 1.000 mi N of Uniroyal Interchange	Replacement of existing bridge	Asset Preservation	2022	$65.000	High
0018-06-136	I-35	Shiloh Drive to 0.25 Miles N. of US 59/ I-69W	Widen of Mainlanes and RR Grade Separation	Alternate Routes	2021	$54.000	High

TIP/ Project Number	Facility	Location	Description	Project Category	Fiscal Year	Project Cost (Millions)	Priority
0018-06-183	I-35	0.5 mi South of US 59 - SL 20 to 0.50 mi East of I-35 / US 59 - SL 20	Construction of Direct Connector Interchange (Dc#5)	Alternate Routes	2019	$30.000	High
0018-06-184	I-35	0.5 mi West of I-35 / US 59 - SL 20 to 0.50 mi South of US 59 - SL 20	For the Construction of Direct Connector Interchange (Dc#8)	Alternate Routes		$20.000	High
0018-06-185	I-35	0.50 mi East of I-35 / US 59 - SL 20 to 0.50 mi North of I-35 / US 59 - SL 20	For Construction of Direct Connector Interchange (Dc#3)	Alternate Routes		$30.000	High
0018-06-186	I-35	0.5 mi East of I-35 / US 59 - SL 20 to 0.5 mi North of I-35 / US 59 - SL 20	For Construction of Direct Connector Interchange (Dc#4)	Alternate Routes		$20.000	High
0018-06-187	I-35	0.5 mi South of US 59 - SL 20 to 0.5 mi East of I-35 / US 59 - SL 20	For Construction of Direct Connector Interchange (Dc#6)	Alternate Routes		$15.000	High
0086-14-073	SL 20	At Del Mar Blvd	Improve Traffic Signals	Safety		$0.084	High
0086-14-074	SL 20	At International Blvd	Improve traffic signals	Safety		$0.090	High
0086-14-075	US 59	At Del Mar Blvd	Construction of Interchange	Alternate Routes	2022	$24.100	High
0086-14-076	US 59	At Shiloh	Construction of Interchange	Alternate Routes	2022	$21.500	High
0086-14-077	US 59	At International Airport	Construction of Interchange	Alternate Routes	2024	$14.786	High
0086-14-078	US 59	0.50 mi S of Jacaman Rd to 0.50 mi N of Jacaman Rd	Construction of Interchange	Alternate Routes	2021	$19.691	High

TIP/ Project Number	Facility	Location	Description	Project Category	Fiscal Year	Project Cost (Millions)	Priority
0086-14-079	US 59	At University Blvd	Construction of Interchange	Alternate Routes	2022	$16.850	High
0542-01-086	US 59	7.496 mi W of FM 2895 to 2.076 mi E of SH 20	Profile Edgeline Markings, Profile Centerline Markings	Safety		$0.471	High

The 2018 Texas Freight Mobility Plan also identifies several railroad improvements for the Laredo MPO area, shown in **Table 8-17**. Theses recommended railroad improvements are not funded at this time.

Table 8-17: 2018 Texas Freight Mobility Plan Railroad, Projects in Laredo MPO

Project Name	Project Description	Estimated Cost (Millions)	Source / Sponsor	Class I Railroad Stakeholders
Laredo Grade Separations	Relieve congestion in downtown Laredo caused by the 14 at-grade crossings along the existing Texas-Mexico approach to the existing Laredo rail bridge	TBD	TxDOT Rail Division	KCS, UP
Laredo Bridge double track	Double track bridge at Laredo to improve rail traffic flows to/from Mexico.	TBD	TxDOT Rail Division	KCS, UP
2nd ML from Laredo Bridge to Pt Laredo	2nd main line from Laredo rail bridge to Pt Laredo to facilitate additional movements to and from the border	0.07	TxDOT Rail Division	UP

Texas-Mexico Border Transportation Master Plan

TxDOT, in collaboration and partnership with the Border Trade Advisory Committee, is working with U.S. and Mexican agencies and stakeholders to develop the Border Transportation Master Plan (BTMP). The master plan will identify the cross-border challenges of moving people and goods and will include analysis of existing transportation systems--roadway, transit, pedestrian, pipeline, airport, maritime, and rail. The plan will analyze current and future transportation and will include a prioritized list of transportation investment strategies that support binational, state, regional, and local economic competitiveness and improve the impacts of cross-border trade and transportation. The purpose of the BTMP is to facilitate coordination and collaboration between Texas and Mexico on binational planning, programming, and the implementation of policies, programs, and projects (a) at border crossings and (b) support the facilities and the multimodal transportation system that serves the Texas-Mexico border. Key objectives of the study include:

- Conduct a binational analysis of the existing transportation systems (roadway, transit, pedestrian, pipeline and rail, etc.) and analyses of current and future transportation needs.
- Assess all ports-of-entry (POE) support facilities that facilitate the cross-border movement of people and goods.
- Develop an extensive and collaborative binational public and private-sector stakeholder engagement.

The development of the BTMP has initiated in April 2019 and will be completed in about 12 to 18 months.

Regional Freight Focus Group Meetings and Public Input

The Laredo region experiences many challenges to the efficient movement of freight and goods through the transportation system. In November 2018, the Laredo MPO held a focus group meeting that served as a forum for regional carriers, shippers, and members of the international trade industry focused on issues related to the transportation system's capacity, accessibility, and reliability for freight and goods movement and economic development, both as existing and for the future. The focus group meeting, public outreach activities, and data analysis have led to the identification of several regional challenges to freight and goods movement, discussed below.

System Capacity

Capacity issues are the most critical challenge to the international gateways, and Laredo will be no exception. The freight flow forecasts presented above indicate that freight growth will continue to add capacity burdens on an already congested network.

Several existing and future challenges and recommendations were noted as part of public outreach and focus group meetings related to system capacity:

- Land use barriers (including zoning restrictions, development interests, lack of land availability, and livability factors) are influencing the lack of new freight facilities in the Laredo MPO area.
- Property owners on the south side of Laredo are more willing to subdivide land for development than on the north side of Laredo, but most of the freight related zoning changes are being made on the north side of Laredo. This could be remedied with changes to zoning on the south side of Laredo.
- There are two railyards, one on the north side of Laredo and one on the south side of Laredo. In particular, providing development adjacent to the south side railyard that would be compatible with multimodal freight development could greatly increase freight efficiency.
- ITS solutions should be considered to assist the efficient movement of freight.
- Loop 20, as a means to divert truck traffic from I-35, is not complete and not continuous. There is a lack of direct connection to I-35 that needs to be better addressed.
- Laredo should find ways to obtain more funding for improvements to I-69/US 59, which would not just impact Laredo, but would provide greater capacity to important freight connections across the state.

- The UP trains in the downtown area block traffic at the rail crossings. Emergency vehicles and other vehicles are often delayed waiting for trains to cross.
- I-69 as it ties into Loop 20 and connects to I-35 should be examined. Mobility might be increased with another lane on I-35 to San Antonio.

Border/Ports-of-Entry

Border crossing wait times is another factor that exacerbates highway and rail congestion. Heightened security practices instituted over the last decade coupled with growing demand have increased travel times and delay. A non-delayed border crossing should normally take only 10 minutes. Some of the public outreach and focus group comments related to border/port-of-entry challenges and opportunities:

- Peak hour congestion lasts until about 6 PM from the north to the south of Laredo due to travel to and from Mexico.
- High levels of congestion have been observed at Laredo's international bridges.
- If trucks entered at the Columbia Bridge, and had pre-clearance and did not have to go through Laredo they could travel on SH 255 and pass through going north, avoiding Laredo. Capacity improvements at the Columbia Bridge are possible as well as there is room to widen the bridge.

Mexico Trade and Relationship

As Laredo's top trading partner, Mexico's economic performance affects Laredo's freight transportation network. Some of the public outreach and focus group comments related to border/port-of-entry challenges and opportunities:

- Mexico's growing economy with auto and other manufacturing industries makes freight in Laredo increase. When Mexico prospers, this area prospers, and the region needs to be prepared for those changes.
- Mexican drayage companies complain that they operate only 3 crossings per day, and while they would like to operate more, current congestion levels are too high.
- Mexican ports are looking to implement regulations requiring cleaner air, similar to ports in U.S. and this should be coordinated.
- Building infrastructure strictly based on current traffic counts does not consider the rate of infrastructure growth in Mexico relative to the Del Rio and Eagle Pass ports.
- Bi-national movement of cargo is high and has more of an impact on truck traffic than some of the local development.
- Consideration of a new international commercial bridge that connects Loop 20 to Mexico is being discussed to address border crossing freight volumes and congestion and should be noted.

Best Practices and Strategies for Freight and Goods Movements

Based on the technical performance review of the freight system in the region, a review of statewide and regional planning efforts, and feedback received as part of focus group meetings held as part of this MTP update, several best practices and strategies are recommended to guide future freight investment decisions through the 2045 planning horizon. Some potential strategies that could help improve the freight movement include:

Develop a Regional Freight Master Plan

The development of a Laredo Freight Master Plan is an essential planning exercise needed in the short-term to more comprehensively address freight challenges today and to better coordinate future plans. A freight master plan would lay out Laredo's vision for freight by integrating the interests of relevant stakeholders into a framework for evaluating future plans and policies affecting Laredo's freight network.

Ideally, the plan would prioritize goals for the performance of Laredo's freight network and would identify and conceptualize future improvements, ranging from operational improvements (lane reconfiguration, ITS, etc.) to projects to enhance capacity (new roadways and bridges) and demand management strategies like congestion pricing, tolling, and transportation demand management strategies. This planning project should be done in coordination with TxDOT's freight and border master planning efforts to ensure that regional plans are consistent with statewide plans and priorities as well.

Coordination of Land Use Decisions and Safety Improvements with Freight and Goods Movement Demands

The integration of freight planning into Laredo's land use plan and zoning code is an important strategy to better help concentrate freight uses to maximize the efficiency of goods movement and to plan safe, and vibrant communities in the region. The efficient flow of freight corridors can be negatively impacted by certain land uses, and in turn freight traffic can have a harmful effect on the same land uses due to pollution and congestion. Provision for new freight specific zones into the zoning code may be considered, which could effectively ban certain sensitive uses, like schools or new communities, from areas adjacent to freight corridors and clusters of freight movements and/or help to create incentive zoning for freight improvements into more clustered areas rather than in dispersed locations throughout the region. Zoning changes could be done concurrently or be driven by the freight master plan. Given challenges noted in public and stakeholder outreach regarding the limitations of continued growth in the northern area of the region, additional consideration on creating freight zones or hubs in other areas in the region should be given so that future freight proposals are collocated with adjacent freight roadway routes and rail yards/terminals and provide a buffer between proposed new freight uses in other areas of the region and existing or other planned residential and general commercial growth.

Additionally, where non-compatible uses between freight and other uses are already a dominating issue within the region, consideration of improvements to better separate freight truck movement from transit users, pedestrians, and bicyclists should also be considered for enhancing safety and reducing crashes. Improvements, such as pedestrian bridges or separated bicycle use paths may be considered not only as an improvement to those modes, but as a safety improvement to reduce harmful crashes between modes. Similarly, transit modes may be desirable around freight concentrated areas to provide access to jobs and improvements to accessible bus stops and sidewalk connections is required to make these transit improvements and provide safe access for users. Making these types of improvements as part of a wholistic and connected network to provide alternative and safe access instead of as standalone projects to solve one particular locational challenge is recommended to maximize these safety benefits.

Implement Technological and Operational Improvements

With the importance of freight and goods movements to the regional, statewide, national and international economies, providing technology and operational improvements will be an essential element in developing a comprehensive and efficient freight network into the future. The continued implementation of Intelligent Transportation Systems (ITS) improvements to provide real-time information on incidents, weather, congestion and other traffic congestions are needed.

In addition, a number of cities across the nation are beginning to look at other technological solutions to effectively moving freight and goods in the future. Of particular note is the concept of “freight platooning”. This involves grouping vehicles into platoons to increase capacity and improve operations for freight and other traffic. Platoons effectively decrease the distances between trucks using electronic or mechanical coupling and allows trucks to accelerate or brake simultaneously, Automated highway systems will be needed to bring this type of strategy to reality and this may require larger investments in the future to provide new or retrofitted vehicles.

Several other non-technological operational strategies may also serve to improve operational efficiency into the future, such as:

- Routing restrictions and other modifications for heavy truck loads;
- The improvement of truck and container traffic management at terminals at freight and rail terminals;
- The adjustment of signalization near freight terminals to optimize flow;
- Curb space management strategies for freight delivery areas;
- The establishment of dedicated truck-only routes where freight traffic is significant and where there are available parallel facilities for local traffic movements;
- The creation of emergency management and incident response systems for truck routes to keep flow high after accidents.

Address System Capacity Issues

Addressing system capacity issues now and into the future will be an essential strategy for effective and efficient freight and goods movement that supports continued economic vitality and provides a safe, and connected network. Incorporating a combination of demand management strategies, considering planning for creating greater modal balance in moving freight, and roadway and rail capacity enhancement strategies will be needed to address these challenges. Several supportive strategies for this that may considered are highlighted below.

Demand Management Strategies and Potential for Modal Shifts

- The implementation of tolls or congestion pricing during peak periods;
- The implementation of off-peak delivery for freight;
- The reduction of demand for truck freight through shifting freight traffic to rail. Expected benefits include lower congestion and lower concentrations of pollutants along freight corridors.

Capacity Enhancement Strategies

- The creation of truck-only lane facilities along freight corridors;
- The creation of truck parking around freight corridors;
- The widening of access roads to rail intermodal yards to improve the efficiency of rail to truck freight conversion;
- The construction of grade separated railroad crossings;
- The improvement of landside access to airports;
- The reconfiguration of freight terminals to provide for greater freight throughput and access.
- The construction of additional border crossings between Laredo and Nuevo Laredo, including a proposed fifth additional bridge on the south side of Laredo.

Chapter 9: Safety, Security, and Resiliency

Introduction

While the previous chapters benchmarked and assessed performance by each mode of transportation, this chapter considers other factors applying to all modes that should be evaluated when planning for improvements in the region – safety, security, and resiliency. The safety, security, and resiliency of the regional transportation system has increasingly become a crucial component of the metropolitan planning process. MPOs are responsible for coordinating and communicating with federal, state, and local agencies and officials involved with the planning of the safety, security, and resiliency of the transportation system for both motorized and nonmotorized users.

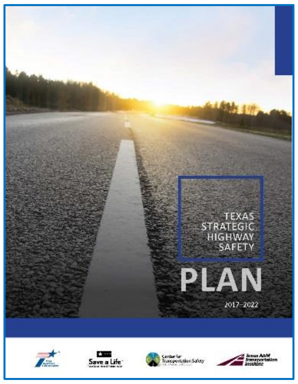
The purpose of this chapter is to discuss transportation safety, security, resiliency, and environmental considerations, and to provide an overview of related issues, plans, programs, and ongoing efforts that are being coordinated to protect the transportation network, infrastructure, users of the transportation system, modes of travel, and transport of goods in the Laredo region.

Safety

Safety may be defined as the freedom from unintentional harm. When planning for transportation system safety, it is important to consider how the system can operate efficiently while maintaining the safety of all system users. The MPO and partner agencies work to ensure the overall safety of the multimodal transportation system.

TxDOT Strategic Highway Safety Plan

The Laredo MPO coordinates closely with the TxDOT Strategic Highway Safety Plan (SHSP) and other safety related initiatives and activities to ensure that the MPO's work is consistent with and supports statewide efforts.



The SHSP is the federally required statewide safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. The SHSP was produced by reviewing national crash initiatives and emphasis areas from key publications and professional organizations, examining Fatal Analysis Reporting System (FARS) crash data, and consulting with various stakeholders throughout Texas. Under the FAST Act, regular updates to the SHSP are required. The most recent version of the SHSP was published in 2017. It includes the following seven emphasis areas: distracted driving; impaired driving; intersection safety; older road users; pedestrian safety; roadway and lane departures, and speeding.

The long-term vision of the 2017 Texas SHSP is to achieve zero fatalities and serious injuries on Texas roadways. In the interim, the current SHSP establishes five targets to be achieved over the next five years or by the end of 2022. These safety targets defined in the SHSP serve as the statewide performance targets for the federally required performance measures. Further details on safety performance management is in **Chapter 10: Performance Management**.

Regional Crash Analysis

The Laredo MPO emphasizes the use of transportation safety data for use in evaluating safety issues and planning for the implementation of safety improvements. MAP-21 and the subsequent FAST Act both highlight the use of a data driven approach to planning for safety. TxDOT manages and makes available the Crash Record Information System (CRIS). CRIS data is information from crash reports submitted by law enforcement responding to crashes. The data includes the crash location, contributing factors, driver, vehicle, and vulnerable road user characteristics. The Laredo MPO performed a crash analysis using the TxDOT CRIS data to benchmark crash rates by crash types and to determine the top 10 crash locations within the region.

According to the TxDOT CRIS data, 21,173 crashes occurred within the Laredo MPO area between the years 2016 and 2018. The number and rate of fatalities and serious injuries along with the number of non-motorized fatalities and serious injuries was determined from the CRIS data. Currently, the Laredo MPO region is meeting adopted safety performance targets. Additional details on the safety performance targets are in **Chapter 10: Performance Management.**

A spatial analysis using GIS was used to determine the top 20 intersection locations by crash occurrences. The most crashes occurred at the intersection of McPherson Road and Del Mar Boulevard, two of the busiest arterial roadways in Laredo. For detailed information on the regional crash analysis, reference **Chapter 4: Roadways, Border Crossings, and Bridges**.

Safety Committees

Several committees within the Laredo region consider, advise, and shape policies for transportation safety. Two such committees are the City of Laredo Transportation and Traffic Safety Advisory Committee and the City of Laredo Public Safety Advisory Committee.

- The City of Laredo Transportation and Traffic Safety Advisory Committee is an active committee of 10 residents appointed by the mayor and city council. The Safety Advisory Committee advises the city council and city manager on issues related to transportation and traffic safety, policies and efforts to enhance safety, and urban planning. The Safety Advisory Committee meets once per month to discuss current safety issues and considerations.
- The City of Laredo Public Safety Advisory Committee is composed of four city council members, the city manager, and the police chief. The Public Safety Advisory Committee

provides guidance on city policies, programs, and initiatives involving public safety considerations.

Security

While safety is freedom from unintentional harm, security may be defined as the freedom from intentional harm and natural disasters. Security of critical infrastructure is increasingly important for the Laredo MPO area. Planning for transportation security includes preventing, managing, and responding to threats against the regional transportation system. These threats could include a variety of events, such as natural disasters, terrorism, or hazardous spills, all of which endanger the lives of people and important transportation infrastructure. As our world becomes increasingly dependent on technology and data, the integrity of data and how to protect data from attack is important. Cybersecurity will be discussed at a high level and the commitment the region has made to ensure the integrity of information and data systems.

Border Control

The City of Laredo International Bridge System includes four roadway border crossings and one railway border crossing between the US and Mexico. As Laredo is a premier trade hub between Mexico and the US, maintaining secure and efficient border crossings is critical to the regional economy. The US Customs and Border Protection Agency (CBP) is responsible for securing the country's border at and between the border crossings. The CBP facilitates the legal flow of trade and travel across the country's borders by preventing the illegal entry of people and goods, including terrorists and terrorist weapons, while simultaneously enforcing numerous U.S. laws. Within the CBP, the Office of Border Patrol and the Office of Field Operations play key roles in securing the border and the Laredo port of entry. In the Office of Border Patrol, the agents are responsible for securing the borders between the ports of entry; whereas, the Office of Field Operations is responsible for securing the ports of entry.

Intelligent Transportation Systems and Cybersecurity

Intelligent Transportation Systems (ITS) technologies advance transportation safety, security, and mobility by integrating innovative communications technologies into transportation infrastructure and vehicles. ITS encompasses a broad range of both wireless and traditional communications-based information and electronic technologies. The use of ITS enables transportation operators to make informed and coordinated decisions that lead to more efficient travel. Within the Laredo region, ITS has been implemented through TxDOT, the City of Laredo, and El Metro.

TxDOT ITS

TxDOT has implemented various ITS technologies to monitor traffic safety and security across the region. These ITS technologies include dynamic message signs (DMS), closed-circuit television (CCTV) cameras, lane control signals, highway advisory radios, speed detectors, and video image vehicle detection systems (VIVDS). Additionally, a railroad coordination system called the Wireless Advisory Railroad Network (WARN) is in place to inform drivers of closures at railroad crossings.

The TxDOT Laredo District operates the South Texas Regional Advance Transportation Information System (STRATIS), which serves as a traffic management center (TMC) for the region. Working in cooperation with local agencies, TxDOT provides a data connection between STRATIS and the City of Laredo TMC for sharing of CCTV camera feeds and control. This system also allows the City of Laredo TMC to view messages placed on the DMS by TxDOT. Further, TxDOT also provides the City of Laredo 911 Dispatch Center with its CCTV camera images.

City of Laredo ITS

The City of Laredo has implemented a variety of ITS technologies to enable more efficient travel on the region's roadways and international border crossings. The City of Laredo has implemented CCTV cameras on arterial streets, synchronized traffic signal systems, improved vehicle detection capabilities, and a TMC connected to the TxDOT STRATIS.

Along the international border crossings, the City of Laredo has installed cameras linked to an online system that posts images of the Laredo side and the Mexico side of crossings at the four bridges to show the current traffic at the border crossings. This camera system allows the public to make better informed decisions when planning cross border travel. The system can be viewed at: http://www.ci.laredo.tx.us/bridgesys/Cameras/bridge4cam.html. Some of the international bridges also have an ITS technology for the electronic payment of border crossing tolls through an automatic vehicle identification system.

El Metro ITS

The urban transit agency within the City of Laredo, El Metro, has implemented the ITS technology of electronic fare payment on all buses. In addition, El Metro has implemented automated vehicle location (AVL) and security cameras to the transit fleet. AVL identies the spatial location of buses along transit routes. AVL data is used to communicate wait times at bus stops tocustomers via Real Time or Goggle Transit.

Cybersecurity

Cybersecurity is the protection of computer and internet-connected systems from theft and damage to hardware, software, and electronic data. With increasing deployments of ITS technologies, ensuring the security of these systems is important. Disruptions to the services ITS technologies provide can cause impactful disruptions to the regional transportation system. The MPO understands the importance of maintaining cybersecurity to ensure the integrity of transportation related data information systems.

In May 2019, the City of Laredo suffered a cyberattack, affecting Laredo MPO staff. The cyberattack was a ransomware attack. Ransomware is a type of virus that blocks the computer's information until the user pays a certain amount of money (ransom). The affected server was quickly isolated, and authorities were immediately contacted. The recovery process took several weeks, and the Federal Bureau of Investigation (FBI) is currently investigating the cyberattack. No personal or financial information was obtained during the cyberattack.

South Texas Development Council

The South Texas Development Council (STDC) is a council of governments that coordinates regional planning for Webb, Starr, Zapata, and Jim Hogg Counties. The STDC Department of Homeland Security acts as a coordinator for emergency management and response within the South Texas region, assisting local jurisdictions and administering funds from state to local governments. The Department of Homeland Security is aided by the South Texas Homeland Security Advisory Committee, serving as an advisory role to address issues related to homeland security, terrorism, disaster planning, regional response issues, communication, and training.

The STDC Department of Homeland Security is a key leader in the development of two regional plans related to security and disaster mitigation: The Interoperability Plan and the Regional Action Mitigation Plan. The Interoperability Plan sets a framework for communication and coordination between agencies to ensure communication is interoperable for emergency operations. The Regional Action Mitigation Plan identifies mitigation strategies for natural hazards along the Rio Grande border, including hurricanes, drought, flooding, hazardous material release, fuel pipeline breaches, dam failures, wildfires, hail, tornadoes, and extreme heat.

Resiliency and Environmental Considerations

The risks associated with climate change and extreme weather events such as flooding, severe heat, and intense storms have emerged as significant concerns for transportation system resiliency and reliability. Resiliency may be defined as the ability of the transportation system to return to acceptable operation after an event. Transportation systems are already experiencing costly climate related impacts, causing disruption and damage to roads, bridges, rail systems, and other transportation infrastructure. In the future, these impacts are expected to intensify in magnitude, duration, and frequency. Preparing for the uncertainties in a changing climate is essential to ensure the safety and security of the population which the transportation system serves.

The past two federal transportation authorization bills, MAP-21 and the FAST Act, have addressed the issue of improving the condition and resiliency of transportation assets. The FAST Act, however, requires transportation agencies to take resiliency into consideration during the transportation planning processes. The updated metropolitan and statewide transportation planning regulations require that the MTP assess capital investment and other strategies that reduce the vulnerability of the existing transportation infrastructure to natural disasters.

Climate Change and Natural Disasters

The Texas climate is changing. Average annual rainfall is increasing, but it tending to be distributed less evenly throughout the year, so the soil is becoming drier. Rainstorms are becoming more intense, and floods are becoming more severe. The sea level is rising about 0.13 inches per year and the rate of rise is increasing. In the future, storms are likely to become more severe, deserts may expand, and summers are likely to become increasingly hot and dry, creating problems for agriculture, the economy, and human health.

The climate is changing because the earth is warming. Humans have increased the amount of carbon dioxide in the air by 40 percent since the late 1700s. Other heat-trapping greenhouse gases are also increasing. These heat-trapping greenhouse gases have warmed the surface and atmosphere of the earth about one degree over the course of the last 50 years. As the atmosphere warms, evaporation increases, which increases humidity, average rainfall, and the frequency of heavy rainstorms in many places (and contributes to drought in others).

Potential extreme events that could impact the Laredo MPO area over the next 25 years are:

- **Tropical storms and hurricanes –** The wind speeds, rainfall rates, and storm surge of hurricanes and tropical storms are likely to increase as the climate continues to warm. People may move away from vulnerable coastal communities and stress the infrastructure of communities that receive them.
- **Rainstorms** – The amount of rainfall during the wettest days of the year is likely to continue to increase over the next several decades, which would increase flooding.
- **Dam overflow** – with increased rainfall in shorter periods, the Amistad Dam in Del Rio may reach its capacity. Outflow from the dam may cause flooding on the Rio Grande, impacting communities well downstream. Additionally, the six dams along the Rio Grande River have been evaluated in a safety study by the International Boundary and Water Commission. The Amistad Dam but has issues with naturally occurring sinkholes and other “urgent” or “high priority” issues but was found to be safe for normal operations. Extreme events and dam failures can impact Laredo with flooding, evacuation from vulnerable communities, and availability of drinking water.
- **Water resources** - As warmer temperatures increase evaporation and water use by plants, soils are likely to continue to become drier. Average rainfall is likely to decrease during winter, spring, and summer. Drier soils will increase the need for farmers to irrigate their crops, but enough water might not be available.
- **Agriculture** - Increasing droughts and higher temperatures are likely to interfere with farms and ranches. Hot weather causes livestock to eat less, grow more slowly, and produce less milk, and it can threaten their health. Reduced water availability would create challenges for ranchers, as well as farmers who irrigate crops.
- **Wildfires and Landscape Change** - Higher temperatures and drought are likely to increase the severity, frequency, and extent of wildfires, which could harm property, live-lihoods, and human health. The combination of more fires and drier conditions may expand deserts and otherwise change parts of the landscape.
- **Hot weather and air pollution** - Certain people are especially vulnerable, including children, the elderly, and the sick. High air temperatures can cause heat stroke and dehydration and affect people’s cardiovascular and nervous systems. Warmer air can also increase the formation of ground-level ozone, a key component of smog. Poverty is a resilience and mitigation issue for hot weather and air pollution, since poorer households are less able to afford air conditioning and other means of relief.
- **Manmade Disasters** – As a gateway between the US and Mexico, a lot of goods travel along the Laredo transportation system. Crashes and incidents involving hazardous materials can result in a manmade disaster threating the public. Since the Rio Grande River is the source of drinking water for the City of Laredo, any incident in which

hazardous materials contaminate the river may also impact the operations of the water treatment plant and its capacity to produce safe drinking water.

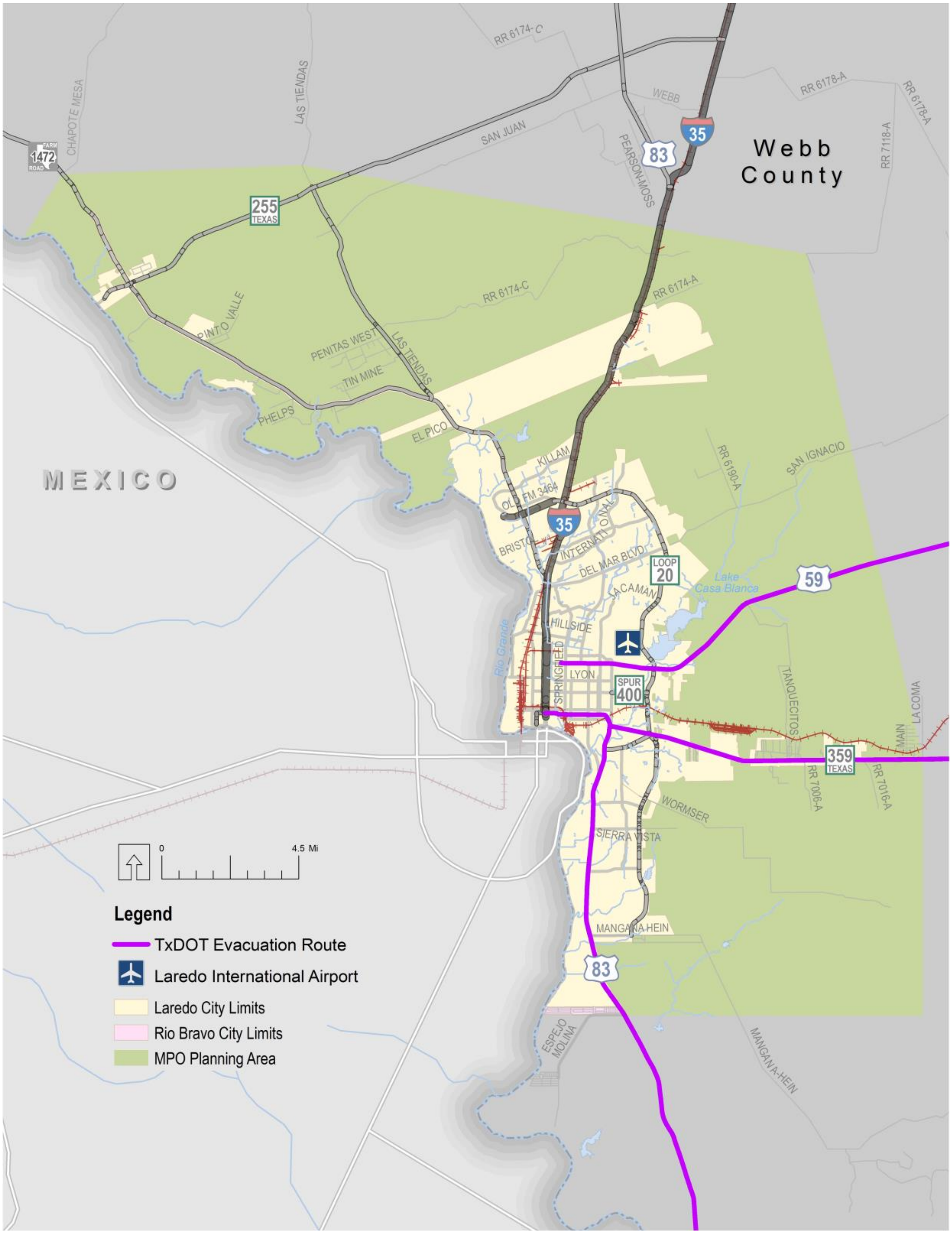
The Laredo MPO recognizes these threats and will continue to coordinate with partner agencies to plan and prepare for a resilient future.

Emergency Evacuation and Hazardous Materials Routes

In preparation for potential disaster scenarios, TxDOT has designated evacuation routes in the event of hurricanes. Given the inland geographic position of Laredo, the region serves as an evacuation point for Gulf Coast communities such as Brownsville and Corpus Christi. US 59, US 83, and SH 359 serves as statewide evacuation routes from the Gulf Coast to the Laredo region, as shown in **Figure 9-1**.

The transport of hazardous materials (HAZMAT) also poses a threat to the safety and security of the general public. Incidents involving HAZMAT can pose a manmade threat to the public. The Federal Motor Carrier Safety Administration (FMCSA) Hazardous Materials (HM) Program develops programs to reduce the number of transportation incidents involving hazardous materials that could potentially harm the public and the environment. Within the Laredo MPO area, SH 255 (Camino Columbia Toll Road) from the Columbia-Solidarity Bridge (Bridge III) to I-35 is the designated HAZMAT route. The El Pico and the Jefferson water treatment plants are both downstream of this HAZMAT route and inspection facility, posing an issue with the drinking water supply in case of an event releasing contaminants into the river.

Figure 9-1: Designed Emergency Evacuation Routes



Source: TxDOT

Flood Vulnerability Assessment

In December 2017, the Federal Highway Administration (FHWA) published the *Vulnerability Assessment and Adaptation Framework, 3rd Edition*. The *Framework* serves as a guide for MPOs and other transportation agencies to evaluate vulnerability of transportation infrastructure and systems to extreme weather and climate effects. The *Framework* serves to assist transportation agencies and MPOs to integrate climate adaptation considerations into the decision-making process. The Laredo MPO has applied the guidelines provided by the FHWA *Framework* to conduct a high-level evaluation of the region for vulnerability of the transportation system to flooding. The FHWA is currently working to develop tools and collect the necessary data for MPOs and agencies to conduct in-depth, comprehensive vulnerability assessments.

The FHWA *Framework* consists of the following steps:

Set objectives and define study area

↓

Compile data

↓

Assess vulnerability

↓

Identify, Analyze, and prioritize adaptation options

↓

Incorporate assessment results into decision-making

Laredo MPO Area Flood Vulnerability Assessment

For the purposes of this 2020-2045 Laredo MTP, the Laredo MPO assessed regional vulnerability to flooding through a process informed by the FHWA *Framework* and is discussed below. As future analytical tools and data becomes available, the Laredo MPO will conduct further detailed and comprehensive analyses.

Objective and Study Area

The objective of this vulnerability assessment is to identify transportation infrastructure vulnerable to flooding within the Laredo MPO area at a systems-level using a GIS approach.

Compile Data

Using a GIS approach for this vulnerability assessment, GIS data was compiled for FEMA Special Flood Hazard Areas (SFHA), TxDOT roadways, Webb County roadways, City of Laredo roadways, Texas railroads, bridges, and airports.

Assess Vulnerability

An indicator-based vulnerability assessment approach was applied to the Laredo region to determine vulnerable transportation infrastructure from available data. This approach provides a big picture understanding of system-wide vulnerabilities and identifies where additional resources could be used to further distinguish asset-specific vulnerabilities.

Using a GIS approach, transportation infrastructure located within the FEMA SFHA were identified. The FEMA SFHA are areas within the 100-year floodplain. These transportation assets are at risk for disruption during extreme flooding events, as shown in **Figure 9-2**. No airports within the region are located within the SFHA. Multiple segments of roadways and railroads are located within the SFHA.

A different GIS approach was used to assess the risk of bridges from flooding. Using National Bridge Inventory (NBI) data, bridges at risk for flooding was determined. **Figure 9-3** shows the maps of bridges at risk for flooding within the Laredo MPO area, and **Table 9-1** shows the counts of bridges at risk for flooding in the region. The bridge flood ratings are defined as:

- **Critical:** The bridge has flooded at a frequency of at least once every 3 years or less.
- **Concern:** The bridge has flooded at a frequency of at least once every 3 to 10 years.
- **Slight Concern:** The bridge has flooded at a frequency of at least once every 11 to 100 years.
- **Remote Concern:** The bridge has flooded at a frequency of at least once every 100 years or greater.

Table 9-1: Bridge Flood Ratings in Laredo MPO Area

Bridge Flood Rating	Number of Bridges
Critical	0
Concern	52
Slight Concern	47
Remote Concern	45

Figure 9-2: Vulnerable Transportation Infrastructure within Floodplains

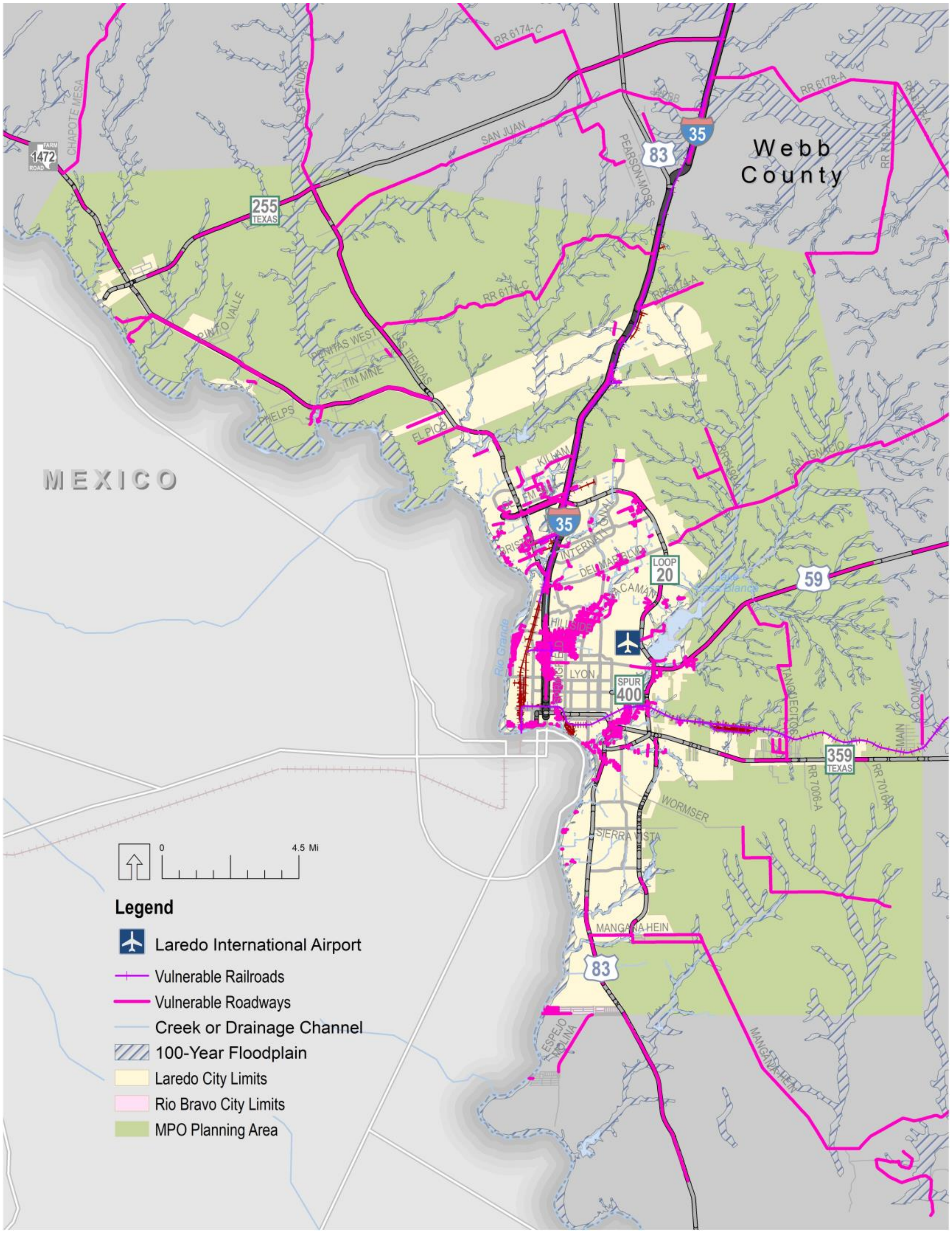


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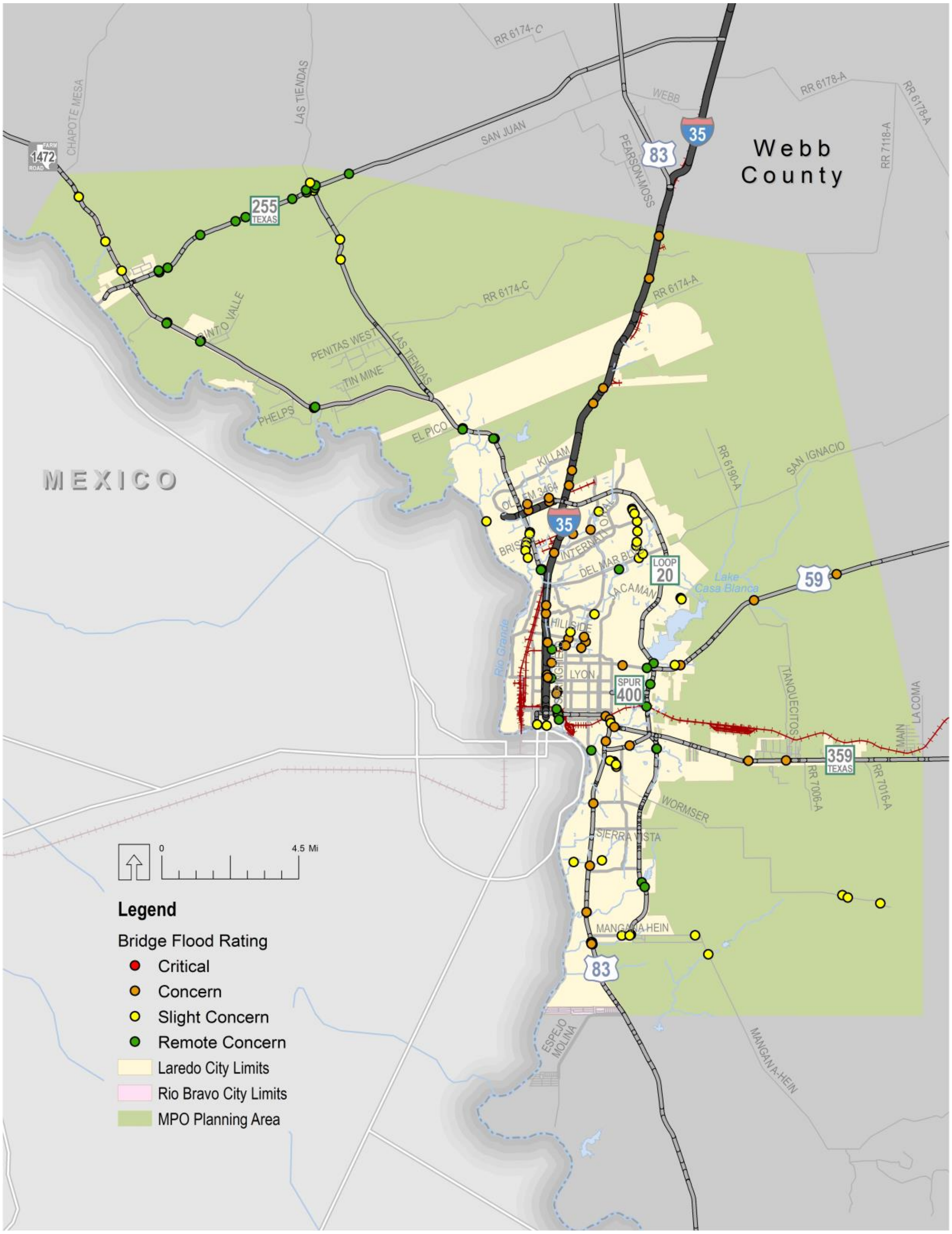
Figure 9-3: Bridges at Risk of Flooding



Source: National Bridge Inventory

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Laredo Urban Transportation Study

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Identify, Analyze, and Prioritize Adaptation Options

After identifying vulnerabilities through a system-level analysis, adaptation strategies were developed to address vulnerabilities within the region. Potential adaptation strategies to address vulnerabilities to climate change and extreme weather events include:

- Engineer new transportation assets that can withstand environmental conditions expected in the future.
- Retrofit existing assets to accommodate future environmental conditions expected in the future.
- Increase redundancy of the transportation system to avoid disruptions and provide alternative means/routes of travel.
- Relocate transportation assets to avoid damage.
- Program maintenance schedules at a higher frequency.
- Improve operations plans during emergency situations.

Incorporate Assessment Results into Decision-making

The metropolitan transportation planning process provides a key opportunity for transportation agencies to proactively identify strategies that address risk and promote resiliency at the transportation system level. Resiliency to climate change and extreme weather events should be considered during the decision-making process, when options are considered for transportation investments. The results of a vulnerability assessment provide the Laredo MPO with useful information to avoid making investments in particularly vulnerable areas or to build resiliency into project design.

Environmental Mitigation

Some of the projects recommended in this MTP will have an impact on the environmental assets of the region. Transportation projects sometimes require land acquisition in order to construct a new facility or widen an existing facility. As a result, transportation improvements may have an impact on the natural environmental. As the population continues to grow, the region will face the challenge to strike an acceptable balance between urban development, mobility, and economic development with the desire for a high quality of life that includes clean air and water, environmental preservation, and recreation and tourism opportunities.

To reduce the impacts of transportation improvements, potential environmental mitigation activities must be developed in consultation with federal, state, tribal, wildlife, land management, and regulatory (resource) agencies. The Laredo MPO is committed to minimizing and mitigating the negative effects of transportation projects on the natural and built environment in order to preserve natural environment and the region’s quality of life. Accordingly, the MPO recognizes that not every project will require the same type or level of mitigation.

Some projects, such as new roadways and new interchanges, involve major construction with considerable disturbance to the environment. Others, like intersection improvements, street lighting, and resurfacing projects, involve minor construction and minimal disturbance to the environment. The mitigation efforts used for a project should depend upon how severe the impact on environmentally sensitive area is expected.

The National Environmental Policy Act (NEPA) suggests mitigation in the following five steps:

1. **AVOIDING THE IMPACT ALTOGETHER** by not taking a certain action or parts of an action.
2. **MINIMIZING IMPACTS** by limiting the degree or magnitude of the action and its implementation.
3. **RECTIFYING THE IMPACT** by repairing, rehabilitating, or restoring the affect environment.
4. **REDUCING OR ELIMINATING THE IMPACT** over time by preservation and maintenance operations during the life of the action.
5. **COMPENSATING FOR THE IMPACT** by replacing or providing substitute resources or environments.

Source: (Source: 40 CFR 1508.20)

Effective mitigation starts at the beginning of the environmental process, not at the end. Mitigation must be included as an integral part of the alternative's development and analysis process. **Table 9-2** below details possible mitigation measures that could be considered when dealing with environmental impacts. Many of the measures are considered by the Laredo MPO and project partners during the project development phase. As projects are selected and programmed, additional project level evaluations of impacts are required. Impacts at the project level should be minimized through an alternative's analysis process.

Table 9-2: Potential Environmental Mitigation Activities

Resource	Mitigation Measures
Agricultural areas	Mitigation sequencing requirements involving avoidance, minimization, compensation (could include preservation, creation, restoration, in-lieu fees); design exceptions and variances; environmental compliance monitoring.
Ambient air quality	Transportation control measures, transportation emission reduction measures, adoption of local air quality mitigation fee program, development of energy efficient incentive programs; adoption of air quality enhancing design guidelines.
Cultural Resources	Avoidance, minimization; landscaping for historic properties; preservation in place of excavation for archeological sites; Memoranda of Agreement with the Texas Historical Commission and the TxDOT Environmental Division; design exceptions and variances; environmental compliance monitoring.
Endangered and threatened species	Avoidance, minimization; time of year restrictions; construction sequencing; design exceptions and variances; species research; species fact sheets; Memoranda of Agreement for species management; environmental compliance monitoring.
Forested and other natural areas	Avoidance, minimization; replacement property for open space easements to be of equal fair market value and of equivalent usefulness; design exceptions and variances; environmental compliance monitoring.
Neighborhoods, communities, homes and businesses	Impact avoidance or minimization; context sensitive solutions for communities (appropriate functional and/or aesthetic design features).
Parks and recreation areas	Avoidance, minimization, mitigation; design exceptions and variances; environmental compliance monitoring.
Wetlands or water resources	Avoidance, minimization; design exceptions and variances; environmental compliance monitoring.

Stormwater Mitigation

Stormwater is defined as rainfall runoff that flows across the ground and impervious surfaces such as roads, parking lots, and buildings. Stormwater includes overland water flow and the water flow in ditches. When measures are not taken to reduce or mitigate the stormwater from surface transportation, the transportation system is at risk to disruption and damages to assets.

Urbanization, including transportation activities, increases stormwater volume and velocity by increasing the volumes of stormwater runoff from an increasing amount of impervious surfaces. Rapid runoff from impervious surfaces increases the risk of flooding. Stormwater runoff can increase flooding, soil erosion, sedimentation, stream bank erosion and channel enlargement, and pollution of waterways.

For the State of Texas, the TxDOT Hydraulic Design Manual: Storm Water Management provides guidelines to reduce or mitigate the impacts of storm water from surface transportation. This manual provides recommended stormwater management measures that are both structure and nonstructural including:

- Erosion control to minimize erosion and sediment transport,
- Stormwater detention and retention systems to reduce peak runoff rates and improve water quality, Sedimentation and filtration systems to remove debris, suspended solids, and insoluble pollutants, and
- Vegetation buffers to reduce transport of pollutants.

The manual recommends several best management practices to mitigate stormwater quantity and quality including detention and retention ponds, rock filter dams, silt fences, and vegetation to filter and slow the flow of water. The NACTO Urban Street Stormwater Guide provides a supplementary manual that augments the guidelines of the TxDOT manual.

As the Laredo MPO area continues to urbanize and experience development pressures, the stormwater impacts of surface transportation become increasingly important to reduce and mitigate through policies and design standards.

Air Quality

Air quality is an important factor in long-range transportation planning. The National Ambient Air Quality Standards (NAAQS) are federal standards that set allowable concentrations and exposure limits for certain pollutants. Primary standards are intended to protect public health, while secondary standards protect public welfare. Air quality standards have been established for the following six pollutants: ozone, carbon monoxide, particulate matter, nitrogen dioxide, lead, and sulfur dioxide. If monitored levels of any of these pollutants violate the NAAQS, then the Environmental Protection Agency (EPA), in cooperation with the State of Texas, will designate the contributing area as “nonattainment”.

The Laredo MPO area is currently designated as an attainment area, meaning that the area meets applicable air quality standards. Most federal air quality regulations apply only to areas designated as nonattainment under the air quality standards of the Clean Air Act. The Laredo MPO recognizes the importance of air quality standards and is cognizant of the importance of maintaining the region’s attainment status.

Environmental Committees

The City of Laredo Citizens Environmental Advisory Committee is an active committee advocating for environmental protection and resiliency within the region. The committee is composed of nine members appointed by the city council and mayor. The major responsibility of the committee is to function as liaison between residents and local government officials on regional environmental issues and concerns.

Related Planning Processes

Several planning processes related to resiliency and preparedness for disasters exist at both the state and local level. At a statewide level, TxDOT developed the Statewide Freight Resiliency Plan in 2011. At the local level, the City of Laredo has two important plans in place to respond to emergency situations caused by natural and manmade disasters: The Pre-Disaster Mitigation Plan and the Emergency Management Plan.

- The TxDOT Statewide Freight Resiliency Plan (2011) provides a comprehensive framework for identifying key freight infrastructure corridors and strategies to ensure a resilient freight network across the state. The plan provided an assessment of ten primary corridors of the Texas highway freight transportation system. The assessment measures the robustness and redundancy of the freight transportation system corridors and any potential constraints. Four of the assessed corridors are part of the Laredo freight highway system: I-35, US 59, US 281, Port-to-Plains (portions of US 83, I-35).
- The City of Laredo Pre-Disaster Mitigation Plan to serve as a blueprint for the prevention of hazards and emergency situations. Particularly, it seeks to make areas more resistant to disasters and sustain fewer losses by reducing the risks of loss of life and property damage associated with various disasters.
- The City of Laredo's Emergency Management Plan is a standard plan required of all local jurisdictions or regions in the State of Texas. The plan outlines the general approach to emergency operations and provides guidance for emergency management activities. It provides for organization and designated responsibilities to mitigate, prepare, respond to, or recover from incidents or emergency situations.

Identifying Needs – Community Input

In addition to the safety, security, and resiliency measures taken in the Laredo region, input was sought from stakeholders through a series of focus group meetings held to inform this 2020-2045 Laredo MTP. The Laredo MPO held a focus group meeting on safety, security, and resiliency with regional stakeholders on November 14, 2018. The focus group meeting served as a forum for public and private agencies involved in the environmental sustainability, safety, and security of residents to discuss how the transportation system can best address emergency response and preparedness issues, border control and security, and environmental and resiliency issues for the next 25 years. Key discussion topics on areas for improvement for the region included:

- The need for redundant roadways to serve as evacuation routes during emergency events.
- The need to use technology to better inform the general public on risks and risk prevention.
- The need for improved multiagency emergency response coordination.
- The need for roadway standards and building regulations that can support a resilient and sustainable future population.

Additional details on the focus group meetings held to inform this 2020-2045 Laredo MTP are in **Chapter 3: Vision, Goals, and Objectives.**

Recommended Strategies

Based on the initiatives in the region, best practices, guidance from FHWA, and community input received for this MTP update, the following are recommended strategies for improved safety, security, and resiliency in the Laredo MPO region.

Safety Strategies

The major strategy for improving safety in the region is to implement programs and projects that will reduce transportation fatalities and serious injuries by supporting comprehensive, system-wide, multimodal, data-driven, and proactive regional transportation planning processes that integrate safety into transportation decision-making. The Laredo MPO will continue to benchmark safety conditions and prioritize implementation of programs and projects that will achieve safety performance targets (as described in **Chapter 10: Performance Management**) while maintaining a long-term vision to achieve zero fatalities and serious injuries on roadways.

The MPO can play an important role in safety education and messaging for the region. A strategy to improve safety through education and messaging is to provide education outreach through classes and messaging for bicycling safety, pedestrian safety, and driver behavior on multimodal roadways. The FHWA-sponsored Safe Routes to School program is an example of an integrated approach which includes emphases on infrastructure design, operations, and education. The development of a Safe Routes to School program for Laredo could help implement safer routes of travel for walking and bicycling in the region.

As a region with an economy driven by international trade and the freight transportation industry, conflicts between freight traffic and residential vehicular, pedestrians, and bicycling is a real safety concern. The integration of these safety considerations into land use planning and other planning efforts is an important strategy for safety.

ITS Security Strategies

Developing and implementing ITS solutions enables transportation operators to make informed and coordinated decisions that lead to more secure and efficient travel. Increased coordination for multimodal ITS solutions to improve the security of the transportation is important.

As disruptions to the services that ITS technologies provide can cause impactful disruptions to the regional transportation system, protecting the region from cyberattacks has become increasingly important as well. The MPO's regional transportation partners share data and information electronically daily to support a more secure transportation system. Each of the MPO's regional partners, however, manage their own internal policy with regards to cybersecurity. A strategy for regional coordination in achieving a more secure transportation system is to open communication with regional partners regarding the importance of maintaining a cybersecurity policy and conducting appropriate training with employees to ensure the integrity of transportation related data information systems.

Resiliency Strategies

The transportation system is essential to economic prosperity and quality of life. In order to play this critical role, infrastructure must be resilient to a multitude of hazards and risks. To plan for a resilient transportation system, the Laredo MPO is committed to continued consultation with agencies and officials responsible for natural disaster risk reduction.

This chapter presented a brief, high-level vulnerability assessment of the region to flooding risks. Another strategy for improved resiliency is to develop a comprehensive vulnerability assessment of the region to understand the vulnerabilities of the transportation system to the impacts of climate change and extreme weather events. FHWA and other federal and state agencies have been supporting efforts for assessing regional vulnerability to climate change and extreme weather events. Opportunities such as the FHWA Climate Resilience Pilot Program fund planning processes to assess regional vulnerability and resiliency.

For example, the Capital Area MPO (CAMPO) received funding from FHWA to conduct a vulnerability assessment using the FHWA Framework. The study focused on five climate impacts: flooding, drought, extreme heat, wildfire, and extreme cold and ice. CAMPO evaluated these impacts on 10 critical assets, including key roadway and transit facilities, and ranked risk as low, moderate, or high for each climate impact at each location as shown in **Figure 9-4**

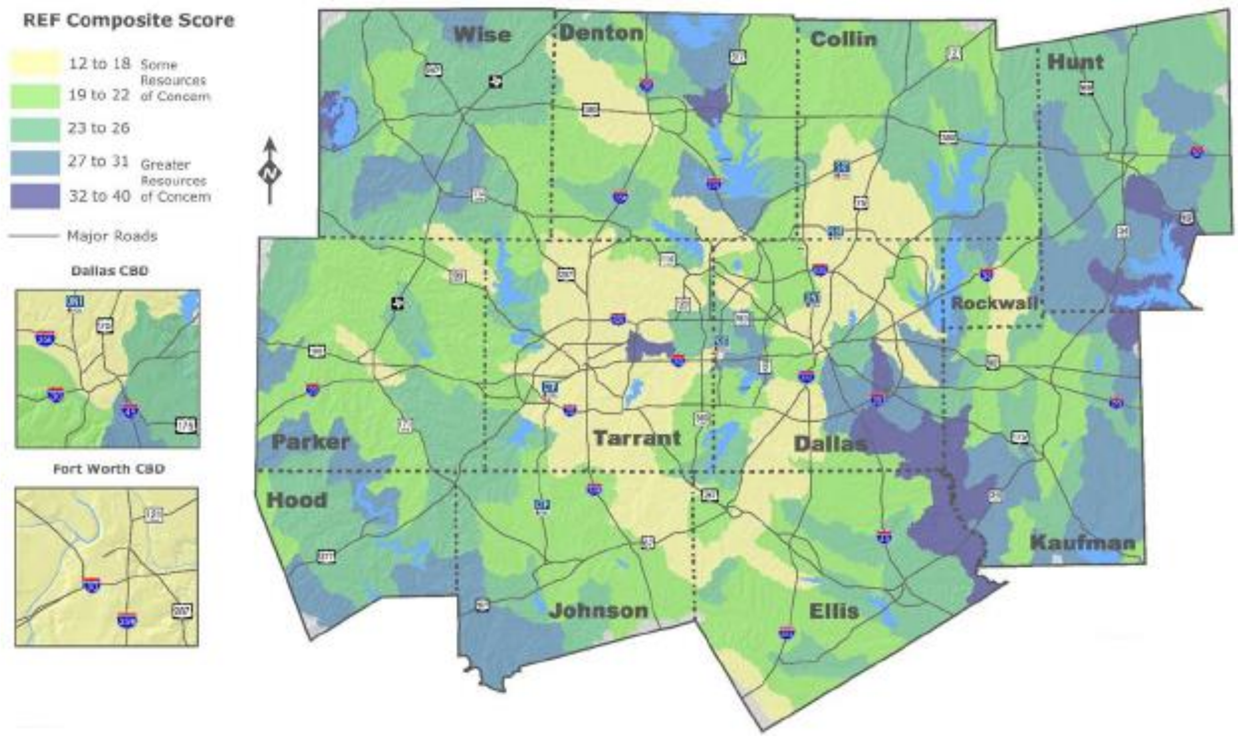
Figure 9-4: CAMPO Vulnerability Assessment Example

Table 15 Risk Rating Summary

ID	Asset	Flooding	Drought	Heat	Wildfire	Extreme Cold
2	MetroRail Red Line at Boggy Creek	Moderate-High	Inconclusive	Moderate	None	Low-Moderate
3	SH 71E at SH 21	High	Moderate-High	Low-Moderate	Moderate-High	Low-Moderate
4	I-35 at Onion Creek Parkway	Low	None	None	Moderate-High	Low-Moderate
5	US 290W/SH 71 - Y at Oak Hill	Moderate	Moderate	None	High	Low
6	Loop 360/RM 2222	Moderate	Moderate	None	High	Low-Moderate
7	FM 1431 at Brushy Creek/Spanish Oak Creek	None	Moderate	Low	Moderate-High	Low
8	US 281 and SH 29 Intersection	Moderate-High	Low	Low	Moderate	Low
9	US 183 north of Lockhart	Low-Moderate	High	Low-Moderate	Moderate-High	Low-Moderate
10	SH 80 (San Marcos Highway) at the Blanco River	Moderate	Low	Low	Moderate	Low

Another resiliency study example, The North Central Texas Council of Governments (NCTCOG) developed a "regional ecosystem framework" that used composite scores to represent the combine score of vulnerability scores for 10 natural resources. A higher score indicates that the resources of relatively high concern may be present and that additional review, documentation, and consultation with the applicable agency may be needed. The composite scores were used as a preliminary screening tool for regional vulnerability identification as shown in **Figure 9-5**.

Figure 9-5: NCTCOG Regional Ecosystem Framework Example



The Laredo MPO can apply for similar funding programs or collaborate with partner agencies to identify and access funding sources and climate data, provide expertise of vulnerabilities in the area, and strategize around resiliency options. These potential partners include municipalities, local planning agencies, consultants, universities, other sectors, and Federal and State agencies. The Laredo MPO can also benefit from working with local stakeholders who have on-the-ground insight into vulnerabilities, and from coordinating with other planning efforts such as hazard mitigation planning or other sectors such as water management.

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Chapter 10:
Financial Plan and Recommended Improvements

Introduction

Federal planning regulations require that the financial plan in Metropolitan Transportation Plans be “financially constrained,” meaning that the estimated cost for all transportation improvements presented in the plan cannot exceed the amount of “reasonably expected” revenues projected from identified funding sources. This requirement ensures that the plan is based upon realistic assumptions and is not merely a “wish list.”

This chapter discusses the long-range financial constraints and opportunities in the Laredo MPO region over the next 25 years. The Laredo MPO cooperated with Technical Committee members and TxDOT staff to conduct a detailed analysis of what funds are to be reasonably expected, how these funds can be allocated, and how and when the selected projects will be financed. Undoubtedly, actual funding availability in the next 25 years which this MTP covers will largely hinge on future actions, public directives, and transportation planning related bills initiated at the federal and state levels.

Project Sources

Projects included within the fiscally constrained MTP project list were identified from the following sources:

- TxDOT Unified Transportation Plan (UTP) 2020
- Existing Regional Plans and Projects
- Travel Demand Modeling
- Agency and Public Call for Projects

TxDOT Unified Transportation Program 2020

The Unified Transportation Program (UTP) is the TxDOT ten-year programming document to authorize and guide transportation project development and construction on the statewide multimodal transportation network. The UTP authorizes projects for construction, development, and planning activities. Projects included within the UTP are multimodal including roadways, aviation, rail, public transportation, and waterways.

The UTP is updated annually and adopted annually by the Texas Transportation Commission prior to August 31. At the time of the preparation of this 2020-2045 MTP, the 2020 UTP was the current adopted document.

In preparing the fiscally constrained project list, the UTP was used to identify programmed projects through the year 2030. The MPO coordinated with TxDOT to identify projects to program between 2031 through 2045. The MPO has discretion over projects funded by TxDOT funding categories 2 (Metropolitan and Urban Area Corridor Projects) and 7 (Metropolitan Mobility/Rehabilitation).

TxDOT organizes UTP funds into 12 funding categories that address specific project types. **Table 12-1** describes these funding categories.

Table 12-1: TxDOT Funding Categories

Category Name		Category Description
1	Preventative Maintenance and Rehabilitation	Category 1 addresses preventive maintenance and rehabilitation of the existing state highway system, including pavement, signs, traffic signals, and other infrastructure assets.
2	Metropolitan and Urban Area Corridor Projects	Category 2 addresses mobility and added capacity projects on urban corridors to mitigate traffic congestion, as well as traffic safety and roadway maintenance or rehabilitation. Projects must be located on the state highway system. Funds are allocated to each MPO by formula, and MPOs select projects for this category. Common project types include roadway widening (both freeway and non-freeway), interchange improvements, and roadway operational improvements.
3	Non-Traditionally Funded Transportation Projects	Category 3 is for transportation projects that qualify for funding from sources not traditionally part of the State Highway Fund, including state bond financing (such as Proposition 12 and Proposition 14), the Texas Mobility Fund, pass-through financing, regional revenue and concession funds, and local funding. Common project types include new-location roadways, roadway widening (both freeway and nonfreeway), and interchange improvements.
4	Statewide Connectivity Corridor Projects	Category 4 addresses mobility on major state highway system corridors, which provide connectivity between urban areas and other statewide corridors. Projects must be located on the designated highway connectivity network which includes the Texas Highway Trunk System, the National Highway System (NHS), connections to major sea ports or border crossings, the National Freight Network, and hurricane evacuation routes.
5	Congestion Mitigation and Air Quality Improvement	Category 5 addresses attainment of National Ambient Air Quality Standard in non-attainment areas. Each project is evaluated to quantify its air quality improvement benefits. Funds cannot be used to add capacity for single-occupancy vehicles. Common project types include interchange improvements, local transit operations, and bike and pedestrian infrastructure.

LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Category Name		Category Description
6	Bridges	Category 6 addresses bridge improvements through the following subprograms: • Highway Bridge Program – for the replacement or rehabilitation of eligible bridges on and off the state highway system that are considered functionally obsolete or structurally deficient. • Railroad Grade Separation program – for elimination of at-grade highway-railroad crossings through the construction of highway overpasses or railroad underpasses, and rehabilitation or replacement of deficient railroad underpasses on the state highway system. • Bridge Maintenance and Improvement Program – (for rehabilitation of eligible bridges on the state highway system.
7	Metropolitan Mobility / Rehabilitation	Category 7 addresses transportation needs within the boundaries of MPOs with populations of 200,000 or greater — known as transportation management areas (TMAs). This funding can be used on any roadway with a functional classification greater than a local road or rural minor collector. Common project types include roadway widening (both freeway and non-freeway), new-location roadways, and interchange improvements.
8	Safety	Category 8 addresses highway safety improvements through the Highway Safety Improvement Program (HSIP), the Safety Bond Program, the Systemic Widening Program, the Federal Railway Set-Aside, and the Road to Zero (RTZ) program. Common Category 8 project types include new medians and shoulders; signals, lighting and signs; guard rails; and rumble strips
9	Transportation Alternatives Set-Aside Program	Category 9 handles the federal Transportation Alternatives (TA) Set-Aside Program. These funds may be awarded for the following activities: • Construction of sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic-calming techniques, lighting and other safety-related infrastructure, and transportation projects to achieve compliance with the Americans with Disabilities Act. • Construction of infrastructure-related projects that provide safe routes for non-drivers. • Conversion and use of abandoned railroad corridors for trails for pedestrian, bicyclists, or other nonmotorized transportation users. • Construction of infrastructure-related projects to improve the ability of students to walk and bicycle to school.
10	Supplemental Transportation Projects	Addresses projects that do not qualify for funding in other categories, such as state park roads, landscaping, and handicap accessible curb ramps at on-system intersections.
11	District Discretionary	Category 11 addresses TxDOT district transportation needs through the following sub-programs: District Discretionary, Energy Sector, and Border Infrastructure. Common Category 11 project types include roadway maintenance or rehabilitation, added passing lanes (Super 2), and roadway widening (non-freeway).

Category Name		Category Description
12	Strategic Priority	Category 12 addresses projects with specific importance to the state, including those that improve: • Congestion and connectivity • Economic opportunity • Energy sector access • Border and port connectivity • Efficiency of military deployment routes or retention of military assets in response to the Federal Military Base Realignment and Closure Report • The ability to respond to both man-made and natural emergencies Common project types include roadway widening (both freeway and non-freeway), interchange improvements, and new-location roadways.

The Laredo MPO coordinated with the TxDOT Laredo District to collect the list of projects programmed within the UTP that are located within the Laredo MPO area. **Figure 10-1** shows a map and **Table 10-2** shows the list of projects TxDOT has programmed within the Laredo MPO area under the current UTP. The projects within the UTP are located on facilities that are part of the state highway system. Improvements are primarily focused on Interstate Highway (IH) 35, United States Route (US) 59, US 83, State Loop (SL) 20, State Highway (SH) 359, and Farm-to-Market Road (FM) 1472 (locally named Mines Road). The roadway improvements within the UTP include capacity improvements (lane additions to highways, upgrading highways to interstate standards), interchange improvements (converting intersections into free flow interchanges), preventative maintenance and rehabilitation, and safety improvements (such as raised medians and channelizing islands).

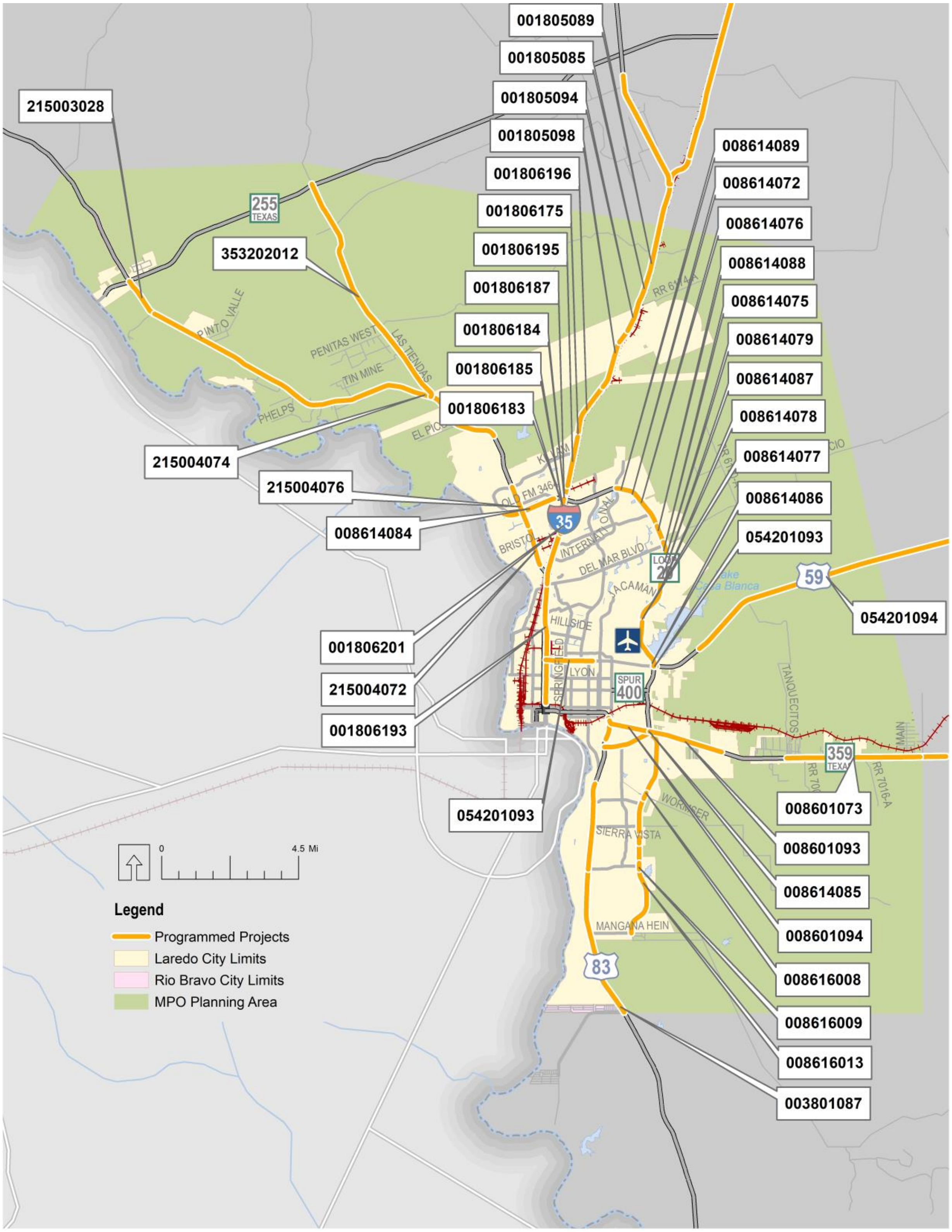
Please note that the table shows funding categories for Plan Authority (PA) and Develop Authority (DA). Plan authority and develop authority are the earliest phases of project scoping and funding, prior to the assignment of a project to the 12 funding categories.

Plan authority projects have been scoped in general terms and can remain in the plan authority stage for up to 10 years. Once funding has been generally identified, a project the receives develop authority status within the UTP. Projects may remain in the development stage for up to seven years while the following is being completed:

- PS&E (Plans, Specifications and Estimates)
- Right-of-Way (ROW) acquisition
- Local agreements (if required)
- Environmental clearance (NEPA)
- Public involvement

Finally, the project will receive construct authority with all sources of funding for implementation identified. At this point, the project will be assigned funding from the 12 funding categories.

Figure 10-1: Map of TxDOT UTP Programmed Projects



LAREDO METROPOLITAN TRANSPORTATION PLAN 2020-2045 UPDATE
Laredo Urban Transportation Study

DRAFT

Table 10-2: List of TxDOT UTP Programmed Projects

CSJ	Facility	Limits	Description	Funding Category	Letting Year	Total Funds
BU 59						
054201093	BU 59	From Buena Vista Ave To IH 35	Resurface Existing Highway	1	2024	$1,031,501
FM 1472						
215003028	FM 1472	From SH 255 To 1.355 Mi S of SH 255	Resurface Existing Highway	1	2020	$104,409
215004074	FM 1472	From 1.355 Mi S of SH 255 To 0.281 Mi N of Pan American Blvd	Resurface Existing Highway	1	2020	$1,070,193
215004076	FM 1472	From Big Bend Blvd Northbound to Killam Industrial Blvd Northbound	Rehabilitate Existing Roadway	11	2020	$3,340,000
215004072	FM 1472	From 0.123 Mi S of Loop 20 To 0.4 Mi N of IH 35	Resurface Existing Highway	1	2024	$574,146
FM 3338						
353202012	FM 3338	From FM 1472 To SH 255	Widen Road - Add Lanes	DA	2024	$45,000,000
IH 35						
001806136	IH 35	From Shiloh Dr to 0.25 Mi N of US 59/IH 69 W	Interchange Improvement (New or Update)	2, 4, 12	2020	$54,000,000
001806183	IH 35	From 0.5 Mi S of US 59 To 0.5 Mi E of IH 35	Interchange Improvement (Construction of Direct Connector)	4	2020	$30,000,000
001806195	IH 35	From 0.42 Mi N of Loop 20 To 0.787 Mi N of Tres Equis Bridge	Preventive Maintenance	1	2020	$209,178
001806198	IH 35	From 0.38 Mi S of US 59/ IH 35 To 0.80 Mi N of US 59/ IH 35	Widen Road - Add Lanes	11	2020	$5,000,000
001806201	IH 35	At San Isidro	Safety Improvement - Wrong Way Driver Advanced Tech	8	2020	$58,045
001805085	IH 35	From 1.19 Mi S of Carrier Rd To 1.20 Mi N of US 83	Resurface Existing Highway	1	2021	$2,714,168
001805089	IH 35	From 0.5 Mi S of Uniroyal Interchange To 2.68 Mi N of	Replacement of Existing Bridge	4	2021	$65,000,000

CSJ	Facility	Limits	Description	Funding Category	Letting Year	Total Funds
		Uniroyal Interchange				
001806175	IH 35	From Loop 20 Concrete Section To 1.15 Mi S of Carrier Rd	Resurface Existing Highway	1	2021	$729,670
001806192	IH 35	From Scott Street To 0.403 Mi N of Shiloh Rd	Resurface Existing Highway	1	2022	$2,779,612
001806194	IH 35	From Del Mar Blvd To 0.222 Mi N of Shiloh Rd	Resurface Existing Highway	1	2022	$2,779,612
001806193	IH 35	From Scott Street To Del Mar Blvd	Resurface Existing Highway	1	2023	$1,521,857
001805098	IH 35	From 1.353 Mi S of Carriers Rd To Uniroyal Interchange	Widen of Carriers Dr Bridge	DA	2024	$22,000,000
001806196	IH 35	From 0.25 Mi N of US 59 TO 1.353 Miles South of Carrier	Widen United Ave Overpass	DA	2024	$22,000,000
001806184	IH 35	From 0.50 Mi W of IH 35 To 0.5 Mi S of US 59	Interchange Improvement (Construct Direct Connectors)	12	2026	$22,000,000
001806185	IH 35	From 0.5 Mi E of IH 35 To 0.5 Mi N of US 59	Interchange Improvement (Construct Direct Connectors)	12	2026	$35,000,000
001806187	IH 35	From 0.5 Mi S of US 59 To 0.5 Mi E of IH 35	Interchange Improvement (Construct Direct Connectors)	DA	2026	$18,000,000
US 59 / IH 69 W / Loop 20						
008614075	US 59	From 0.5 Mi S of Del Mar Blvd To 0.5 Mi N of Del Mar Blvd	Interchange Improvement (New or Update)	2	2022	$24,100,000
008614076	US 59	From 0.5 Mi S of Shiloh Rd to 0.5 Mi N of Shiloh Rd	Interchange Improvement (New or Update)	2	2022	$21,500,000
008614077	US 59	From 0.50 Mi S of International Airport To 0.5 Mi N of International Airport	Interchange Improvement (New or Update)	2, 10	2024	$14,785,990
008614078	US 59	From 0.5 Mi S of Jacaman to 0.5 Mi N of Jacaman	Interchange Improvement (New or Update)	2, 12	2021	$19,691,424

CSJ	Facility	Limits	Description	Funding Category	Letting Year	Total Funds
008614079	US 59	From 0.5 Mi S of University Blvd to 0.5 Mi N of University Blvd	Interchange Improvement (New or Update)	2	2022	$16,850,000
008614084	IH 69W	From World Trade Bridge General Services Administration Facilities to IH 35	Widen Road - Add Lanes	11	2020	$15,000,000
008614085	SS 260	From SH 359 To US 83 (Zapata Hwy)	Resurface Existing Highway	1	2022	$1,632,745
008614086	US 59	From US 59 To 0.4 Mi N of Airport	Reconstruct Existing Roadway – Upgrade US 59 to Freeway Standards (Loop 20)	12	2023	$15,600,000
008614087	US 59	From 0.4 Mi N of Airport To 0.14 Mi N of Del Mar	Reconstruct Existing Roadway – Upgrade US 59 to Freeway Standards (Loop 20)	10, 12	2023	$34,100,000
008614088	US 59	From 0.36 Mi S of University To 0.51 Mi S of Shiloh	Reconstruct Existing Roadway – Upgrade US 59 to Freeway Standards (Loop 20)	2, 10	2023	$20,000,000
008614089	US 59	From 0.51 Mi S of Shiloh T International Blvd	Reconstruct Existing Roadway – Upgrade US 59 to Freeway Standards (Loop 20)	2	2023	$31,500,000
008616008	SL 20	From 2.77 Mi S of SH 359 To 2.39 Mi S of SH 359	Interchange Improvement (New or Update)	DA	2026	$22,000,000
008616009	SL 20	From 0.1 Mi S of Cielito Lindo Rd to 0.1 Mi N of Cielito Lindo Rd	Interchange Improvement (New or Update)	DA	2026	$22,000,000
008616010	SL 20	From 0.1 Mi S of Sierra Vista Rd To 0.1 Miles N of Sierra Vista Rd	Interchange Improvement (New or Update)	DA	2026	$22,000,000
008616013	SL 20	From SH 359 To Mangana Hein	Resurface Existing Highway	1	2021	$801,960
SH 359						
008601093	SH 359	From Loop 20 To RR 6086	Safety Improvement - Install Raised Median	8	2020	$1,353,740

CSJ	Facility	Limits	Description	Funding Category	Letting Year	Total Funds
008601094	SH 359	From US 83 To Loop 20	Safety Improvement - Install Raised Median	8	2020	$688,677
008601073	SH 359	From 4.06 Mi E of Loop 20 To 8.935 Miles E of Loop 20	Widen Road - Add Lanes	12	2024	$18,000,000
008602023	SH 359	From 8.935 Mi E of Loop 20 To 9.830 Mi E of Loop 20	Widen Road - Add Lanes	DA	2024	$6,000,000
US 83						
003801090	US 83	From Market St To Chacon Bridge	Preventive Maintenance	1	2020	$398,469
003801089	US 83	From Palo Blanco Northbound to Cielito-Lindo Blvd Northbound	Resurface Existing Highway	1	2022	$776,149
003801087	US 83	From Cielito-Lindo Blvd Northbound to Espejo Molina Rd Northbound	Preventive Maintenance	PA	2029	$238,550

Regional Plans and Studies

Regional plans and studies were used to identify projects for potential inclusion within the MTP. These regional plans and studies identified transportation issues and projects to fulfil identified needs. The 2015-2040 Laredo MTP (preceding MTP) was reviewed to identify previously unfunded projects for potential inclusion in this 2020-2045 Laredo MTP. The 2019-2022 Laredo Transportation Improvement Program (TIP) was used to identify typical funding amounts awarded to the Laredo MPO for transit capital projects, maintenance, and operations.

The City of Laredo's 2017 Comprehensive Plan, *Viva Laredo*, was reviewed for transportation projects as well. The Viva Laredo *Bike Master Plan* as well as the El Metro Transit Development Plan was utilized to identify priority bicycle routes and other multimodal improvements that could potentially be funded through TxDOT Category 9 (Transportation Alternatives Set-Aside Program) discretionary funds.

The City of Laredo's 2015 Congestion and Delay Study was used to identify any recommendations and projects relating to operational improvements to increase efficiency on the roadways without physical capacity improvements.

A variety of feasibility studies for new roadways throughout the region were collected and reviewed for inclusion in the unconstrained project list. For example, feasibility studies for River Road and Vallecillo Road were provided to the MPO and evaluated for potential inclusion in the recommended projects list.

Travel Demand Model

Using the existing and committed (E+C) transportation network, the regional travel demand model was updated as part of this 2020-2045 MTP to the forecast year 2045. The travel demand model projects future Level-of-Service (LOS) on the roadway network in the year 2045.

This future year LOS assessment was used as a tool to identify roadways that were functioning at LOS values of E (congested) and F (severely congested) in the year 2045. Projects were identified that would help prevent future failing LOS values. The projects identified through the travel demand model are all capacity adding projects such as roadway widenings and new roads.

Agency and Public Call for Projects

In addition to recommending projects based on technical analysis, the MPO also coordinated a Call for Projects with agencies and the public from December 10, 2018 through January 31, 2019 (72 days) All Laredo MPO member organizations wishing to submit projects for inclusion in the 2045 MTP were requested to complete a Candidate Project Submission Package. Agencies were encouraged to submit an unlimited number of projects for evaluation. The public Call for Projects involved a simplified submission form, which was reviewed and coordinated with appropriate public agency sponsors for further consideration. Through the Call for Projects, the Laredo MPO received two projects submissions from the public and no project submissions from agencies. Additional coordination was conducted with public agencies, such as TxDOT, the County, City, and El Metro, and through the Technical Advisory Committee (TAC) to obtain additional suggestions and verify identified projects from local and regional planning efforts and based on local knowledge.

Revenue Projections

The first step in the process of demonstrating financial constraints is to determine what revenues can be reasonably expected over the life of the plan. Most regional roadway projects are financed through federal and state funds which are primarily derived from taxes on fuel and fees from vehicle registration. Transit projects are also funded through federal, state, and local sources, as well as revenue received through fare collection.

TxDOT Funding

The MPO has worked with the TxDOT-Laredo District to determine the expected levels of funding for the fiscal years included in this plan. Both the 2020-2030 Unified Transportation Plan (UTP) and the Transportation Revenue Estimator and Needs Determination System (TRENDS) database from the Texas A&M Transportation Institute (TTI) to were used to project the reasonable revenues by each TxDOT funding category. TRENDS is a scenario planning model that forecasts revenues and expenses for TxDOT. It is updated regularly to include the latest cash forecasts and letting schedules from TxDOT. The Laredo MPO coordinated with the TxDOT Laredo District to confirm that projections were reasonable.

The annual average amount and the sum of the amounts of available funding through TxDOT by category from 2020 to 2045 are presented in **Table 12-3.**

Table 12-3: Roadway and Bicycle/Pedestrian Funding Revenue

Category	Annual Average Amount	FY 2020 to 2045 Projected Amounts
1	$1,556,144	$38,903,598
2	$7,365,687	$184,142,184
3	$0	$0
4	$0	$0
5	$0	$0
6	$0	$0
7	$5,011,428	$125,285,710
8	$4,968,345	$124,208,635
9	$685,502	$17,137,542
10	$5,259,601	$131,490,028
11	$112,917	$2,822,924
12	$16,475,880	$411,896,995

Transit Funding Revenue

The Laredo MPO coordinated with El Metro to determine funding programs for which transit funding is available for the Laredo region. **Table 12-4** shows a description of each of the Federal Transit Administration (FTA) programs from which funding is available for the Laredo region.

Table 12-4: FTA Funding Categories

Program Name	Program Description
Urbanized Area Formula Grants – 5307	The Urbanized Area Formal Grants program provides funding to public transit systems in Urbanized Areas (UZA) for public transportation capital, planning, job access and reverse commute projects, as well as operating expenses in certain circumstances.
Enhanced Mobility of Seniors & Individuals with Disabilities - 5310	The program provides formula funding to states for the purpose of assisting private nonprofit groups in meeting transportation needs of the elderly and persons with disabilities.
Formula Grants for Rural Areas - 5311	The Formula Grants for Rural Areas program provides capital, planning, and operating assistance to states to support public transportation in rural areas with populations less than 50,000, where many residents often rely on public transit to reach their destinations.

Table 12-5 contains the annual average amount of funding anticipated for the various FTA funding categories, along with the amount projected for all the fiscal years 2020-2045 included in this plan. The projected amount is based on the amount of funding awarded for transit improvements through the past four Laredo MPO Transportation Improvement Programs (TIP).

Table 12-5: Transit Funding Revenue

Category	Source	Annual Average Amount	FY 2020 to 2045 Projected Amounts
Section 5307 - Urbanized Formula	FTA	$3,401,493	$85,037,325
	TxDOT	$576,518	$14,412,950
	Local	$11,420,702	$285,517,550
	Total	$15,398,713	$384,967,825
Section 5310 - Seniors and People with Disabilities	FTA	$168,202	$4,205,050
	TxDOT	$0	$0
	Local	$42,051	$1,051,275
	Total	$210,253	$5,256,325
Section 5339 - Bus and Bus Facilities	FTA	$437,379	$10,934,475
	TxDOT	$0	$0
	Local	$77,185	$1,929,625
	Total	$514,564	$12,864,100
Total		$96,741,180	$32,247,060
Local-Only		$34,619,814	$11,539,938

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Project Evaluation

During the planning process, a long list of projects was identified for the Laredo region from the variety of sources described in this chapter. The Laredo MPO has a set of adopted objective and subjective evaluation criteria that is used to prioritize transportation improvements in the reality of limited funding availability for all transportation needs. The evaluation criteria align with the goals, objectives, and performance measures, and performance targets identified within this MTP. The MPO coordinated with the TxDOT Laredo District to determine the reasonably expected funding revenues available to program roadway projects under the MPO's discretion. The MPO also coordinated with El Metro to determine the reasonably expected funding revenues available to program transit funds.

Integrating Project Improvements

The full list of identified projects was categorized into four major types of improvements based on project description and how projects related to goals and objectives of the MTP. They included:

- Reducing Conflicts
- Enhancing Capacity and Operations
- Providing New Roadways to Support Regional Mobility
- Integrating Multimodal Connectivity

Table 10-6: Alignment of Goals and Objectives with Project Evaluation Groups

Goal	Project Category
Goal 1: Provide a transportation network that is safe and secure for all transportation modes and all system users.	• Reduce Conflicts • Multimodal
Goal 2: Sustain the region's existing transportation assets and infrastructure over the planning horizon.	• Capacity and Operations
Goal 3: Promote an efficient Network and system operations to maintain travel time reliability and reduce congestion in moving people and goods within and throughout the region.	• Reduce Conflicts • Capacity and Operations • New Roadways • Multimodal
Goal 4: Foster continued economic vitality by providing an effective and efficient freight network and supporting access to jobs and major destinations in the region.	• Reduce Conflicts • Capacity and Operations • New Roadways
Goal 5: Develop an integrated and connected transportation network that encourages vibrant, affordable, and equitable communities.	• Multimodal

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Project Evaluation Criteria

To prioritize the future transportation needs of Laredo region, the MPO has developed a series of project evaluation criteria to objectively score projects and to align project evaluations with the goals, objectives, performance measures, and targets for the MTP. While the criteria attempt to quantify the potential benefits and effects of each project, they are not the sole determinant in establishing regional investment priorities. Rather, these criteria serve as a tool to help discuss the merits of each project and evaluate them on an equal playing field.

Project evaluation criteria were developed and adopted as part of the 2040 MTP development and were reviewed for alignment with established goals, objectives, and performance measures for the 2045 MTP and for adherence to FAST Act regulations. These evaluation criteria are consistent with all federal regulations and the established goals, objectives, and performance measures for the region and are carried over from the 2040 MTP with changes to address recently adopted performance measures from TxDOT and to align with updated regional goals, objectives, and performance measures for the 2045 MTP.

Objective Project Evaluation

Objective Project Evaluation Criteria is scored by the Laredo MPO based on technical performance data determined for each criterion. Objective Project Evaluation Criteria is shown below.

Congestion – 100 Points

If the project is a non-motorized mode, the project is automaticity given 50 points total to indicate an "average" rating and as to not disproportionately penalize non-motorized improvements over roadway projects. These projects provide enhancements as alternative modes to address congestion.

Current Congestion

Does the project specifically address a currently congested facility; or in the case of a new alignment roadway, does it specifically address a "parallel" facility that is congested? (New "parallel" facility for currently congested facility = 50 points).

- *Current Level of Service = E or F: 50 points*
- *Current Level of Service = D: 40 points*
- *Current Level of Service = C: 30 points*
- *Current Level of Service = B: 20 points*
- *Current Level of Service = A: 0 points*

Future Congestion

Does the project specifically address a facility that is expected to become congested at the end of the MTP planning horizon (currently 2045), or in the case of a new alignment roadway, does it specifically address a "parallel" facility that is projected to be congested?

- *Future Level of Service = E or F: 0 points*
- *Future Level of Service = D: 5 points*
- *Future Level of Service = C: 10 points*
- *Future Level of Service = B: 20 points*
- *Future Level of Service = A: 30 points*

Congestion Management Process

New roadways are automatically given 10 points (half). This criterion is focused on projects that are part of the congestion management program, but if the proposed project further alleviates an existing congestion management facility, the project receives an automatic 10-point rating.

Is this project a product of the congestion management process?

- *Yes: 20 Points*
- *Indirectly: 10 Points (Does the project support/relieve CMP facilities?)*
- *No: 0 Points*

Safety and Operations: 100 Points

Safety

Does the project specifically address a safety issue? Could it serve to improve safety performance measures, as defined by the MPO's adopted TxDOT measures for improvements to the number or rate of fatal or serious injuries, and non-motorized crashes?

- *Yes, directly: 60 Points*
- *Yes, indirectly: 30 Points*
- *No: 0 Points*

Yes, directly: Access Management, Frontage Road Conversion, Intersection Improvements, Bicycle/Pedestrian Facilities (some), Center Turn Lane, Lighting, Median, Realignment, Traffic Signal, Widen Lanes; located in an area where crash data support a safety improvement to address TxDOT adopted performance measures.

Yes, indirectly: Reconstruction/Rehabilitation/Repair/Resurface, Upgrade to Freeway.

No: Added Capacity, Drainage, Landscaping, Museum, Visitor Center, New Roadway.

Operational Efficiency

Does this project include elements that specifically improve the operational efficiency of the transportation system? Does this project specifically improve travel time reliability or truck travel time reliability, as measured by adopted TxDOT performance measures?

- *Yes, directly: 30 Points*
- *Yes, indirectly: 15 Points*
- *No: 0 Points*

Yes, directly: Upgrade Interchange/Intersection Improvement, Center Turn Lane, Add Turn lanes, Drainage, Frontage Road Conversion, Realignment, Signals, Traffic Flow Improvements, Median

Yes, indirectly: New Roadway, Additional Travel Lanes

No: Bicycle/Pedestrian Facilities, Landscaping, Lighting, Museum, Visitor Center, Reconstruction/Rehabilitation/Repair/Resurface

Environmental Considerations

Does this project address the safe transportation of hazardous material? Does this project address facilities located in a floodplain zone, improve emergency access, or facilitate movement on a statewide evacuation route?

For non-motorized improvements, such as bike-ped, these projects when off road can serve as remediation for previous hazardous materials sites and at minimum do not increase safety issues regarding hazardous materials. As such an automatic ten-point allocation is given to these modes.

- *Yes: 10 Points*
- *No: 0 Points*

Yes: Project located on a Hazmat route, on a floodplain vulnerability route, the statewide evacuation route, or improve emergency access on a congested local roadway?

No: Project not located on any of these designated facilities.

Project Cost: 50 Points

Cost Reasonableness

Is the project cost per future vehicle mile of travel (VMT from "build" alternative from travel demand model) a reasonable amount?

Non-motorized do not have an equivalent to VMT and are expected to help total VMT in the region by providing alternative access. Additionally, these non-motorized bicycle-pedestrian improvements have more limited state and federal funding sources available. These bike-ped improvements are less costly in general than roadway improvements and do not rely on alternative funding sources. As such, an automatic median point ranking is given to these types of projects.

- *$75 or less per VMT: 30 points*
- *Between $75 and $125 per VMT: 20 points*
- *Between $125 and $500 per VMT: 10 points*
- *More than $500 per VMT: 0 points*

Does this project include non-traditional funding sources and enhanced cost sharing?

- *Yes: 20 Points*
- *No: 0 Points*

Modal Impact: 150 Points

Does this project specifically promote the use of or access to an alternative mode of transportation?

- *Transit: 25 points*
- *Bicycling: 25 points*
- *Walking: 25 points*
- *Air Travel: 25 points*
- *Rail Travel: 25 points*
- *Freight: 25 Points*

Subjective Project Evaluation

Following the objective project evaluation, the top scoring projects for each project evaluation group (reduce conflicts, capacity and operations, new roadways, and multimodal) were advanced to the subjective evaluation. The subjective evaluation is performed by the Laredo MPO Technical Committee. During the subjective evaluation exercise in September 2019, the Technical Committee was provided worksheets to score projects within each project evaluation group. The Subjective Evaluation Criteria includes:

Community and Environmental Impacts: 20 Points

- *Does this project impact community vitality and the environment in a positive manner? (0 – 10 points)*
- *Does this project improve aesthetics of the community? (0 – 10 points)*

Public Acceptance: 80 Points

- *Does the project have explicit community support? (0 – 50 points)*
- *Is the project consistent with local and regional goals and objectives? (0 – 30 points)*

Recommended Projects

Following the objective and subjective project evaluations, the scores for the projects were assessed and ranked. The project evaluation groups (Reducing Conflicts, Enhancing Capacity and Operation, Providing New Roadways to Support Regional Mobility, Integrating Multimodal Connectivity) were used to determine a recommended project list that included a variety of projects that would address competing goals and objectives of the MTP. The top scoring projects within each project evaluation group were identified as recommended projects. The recommended projects reflect a mix of the strategies to address the regional goals, objectives, adopted performance targets, and congestion management strategies. Funding constraints are always a consideration when meeting the transportation needs of the region.

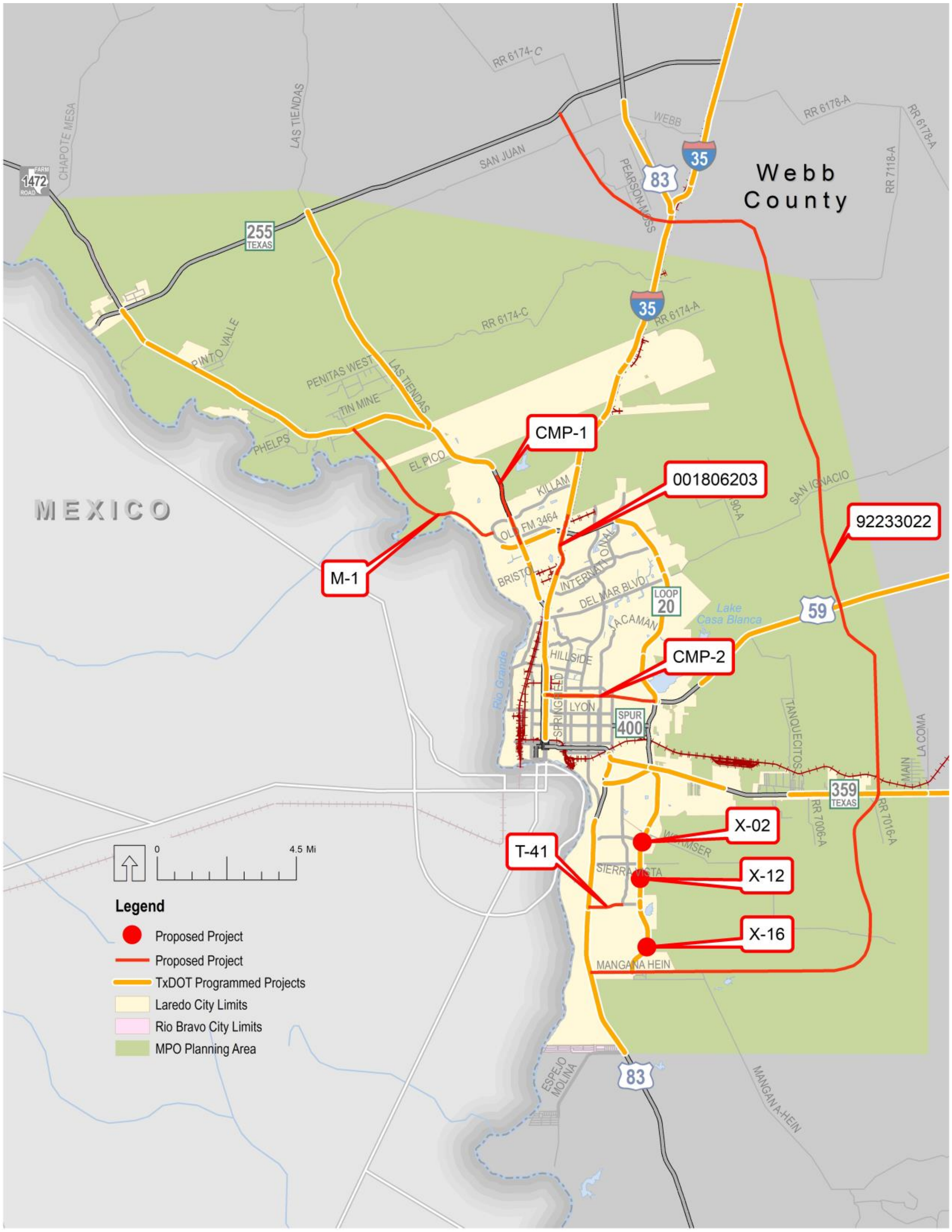
Recommended TxDOT Category 2 and Category 7 Projects

The Laredo MPO has discretion over funding available through TxDOT Category 2 (Metropolitan and Urban Area Corridor Projects) and Category 7 (Metropolitan Mobility and Rehabilitation) funds. **Table 10-7** shows the recommended projects eligible for TxDOT Category 2 and Category 7 funds with the rank from the project evaluation indicated, and **Figure 10-2** shows these projects on a map. The projects recommended are intended to complete the build out of Loop 20 with needed interchanges, provide a feasibility study for the proposed Outer Loop, provide new roads in areas where access is needed (frontage road along IH 35 and River Road to parallel Mines Road (FM 1472), improve congestion through operations management, and integrate multimodal considerations through roadway construction (consider the addition of bus bays and bicycle lanes when widening roads).

Table 10-7: Recommended Projects Eligible for TxDOT Category 2 and Category 7 Funds

ID	Facility	Limits	Description	Cost Estimate	Evaluation Rank	Justification
Reducing Conflicts						
X-02	Loop 20 (Cuatro Vientos)	At Lomas Del Sur Blvd	Construct overpass and ramps	$60,606,000	1	Complete Loop 20
X-12	Loop 20 (Cuatro Vientos)	At Cielito Lindo/Sierra Vista	Construct overpass and ramps	$73,593,000	2	Complete Loop 20
X-16	Loop 20 (Cuatro Vientos)	At future minor arterial (1 mile north of Mangana Hein Rd)	Construct overpass and ramps	$73,593,000	3	Complete Loop 20
Providing New Roadways to Support Regional Mobility						
92233022	Laredo Outer Loop	From Proposed International Bridge 5 to SH 255	Outer Loop Feasibility Study and Schematic	$1,255,781	4	Study the feasibility of the Outer Loop
01806203	IH 35	From Shiloh Dr to 0.25 Mi N of US 59/IH 69 W	New frontage road and railroad grade separation	$25,000,000	5	Needed capacity for regional mobility
M-1	River Road	River Bank Rd To Vidal Cantu Blvd	New two-lane roadway, addition of sidewalks and on-street bicycle facilities to be considered	$21,000,000	6	Regional need identified, runs parallel to Mines Rd
Enhancing Capacity and Operation						
CMP-1	FM 1472	From Loop 20 To Pan American Blvd	Replace all traffic signal hardware and provide optimized traffic signal timing	$526,500	7	Operational congestion management
CMP-2	BU 59 (Saunders St)	From I-35 To Loop 20	Replace all traffic signal hardware and provide optimized traffic signal timing	$842,400	8	Operational congestion management
Integrating Multimodal Connectivity						
T-41	Cielito Lindo	From US 83 To Ejido Ave	Upgrade consistently to 6 lanes principal arterial with center turn lanes; Include bicycle facilities as recommended by the 2017 Viva Laredo Bike Master Plan (recommends shared use path)	$6,819,109	9	Technical recommendation + Viva Laredo recommendation

Figure 10-2: Recommended Projects Eligible for TxDOT Category 2 and Category 7 Funds



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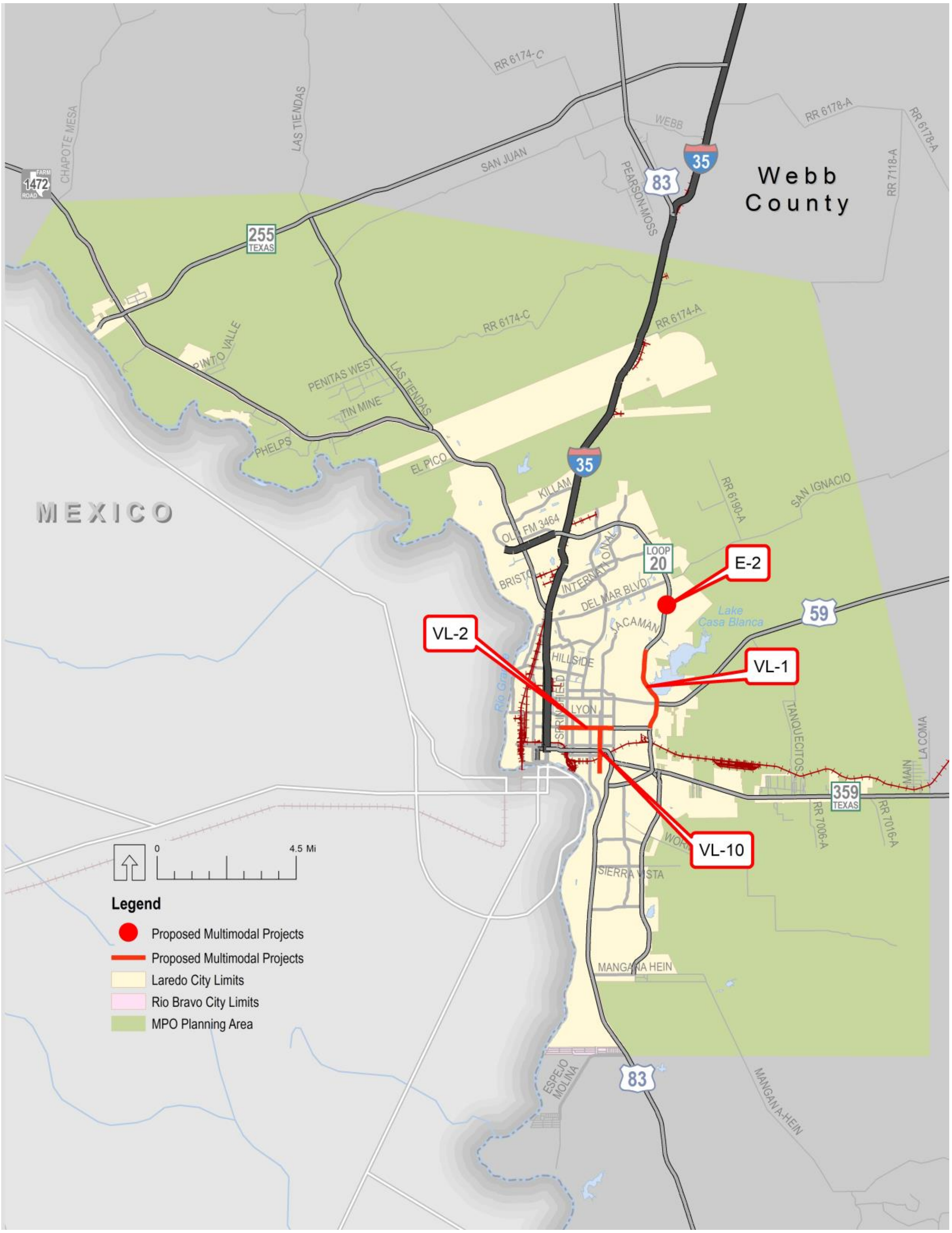
Recommended TxDOT Category 9 Projects

TxDOT Category 9 funds handle the federal Transportation Alternatives (TA) Set-Aside Program. These funds may be awarded for bicycle-pedestrian projects. The funds for Category 9 are designated for these specific purposes and have separate eligibility and funding requirements. The TxDOT Public Transportation Division requires an application process to allocate these funds through a call for projects process. The Laredo MPO recommends that the projects shown in **Table 10-8** and **Figure 10-3** be submitted for consideration of TxDOT Category 9 funds.

Table 10-8: Recommended Projects Eligible for TxDOT Category 9 Funds

ID	Facility	Limits	Description	Cost Est.	Group	Justification
VL-1	Loop 20	From Sinatra Pkwy to Clark Blvd	Bicycle facility - Priority Phase 1 Shared Bike Route in Viva Laredo	$106,236	Multimodal	Viva Laredo Bike Master Plan Recommendation, connects to existing bicycle facility
VL-2	Clark Blvd	From Arkansas Ave To Zacate Creek	Bicycle facility - Priority Phase 1 Shared Bike Route in Viva Laredo	$70,824	Multimodal	Viva Laredo Bike Master Plan Recommendation, connects to existing bicycle facility
VL-10	Malinche Ave	From Chacon Creek to Clark Blvd	Bicycle facility - Priority Phase 1 Shared Bike Route in Viva Laredo	$53,118	Multimodal	Viva Laredo Bike Master Plan Recommendation, connects to existing bicycle facility
E-2	University Blvd	At Loop 20	Multimodal hub - park-n-ride transit facility for 75 parking spaces plus bike hub facility	$2,762,323	Multimodal	El Metro TDP Recommendation, location near residential area and TAMIU

Figure 10-3: Recommended Projects Eligible for TxDOT Category 9 Funds



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Laredo Urban Transportation Study

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Funded Project List

Although the preceding section described recommended projects, a funding gap exists. Funds available to the Laredo MPO are less than required to program all recommended projects. This section of the chapter describes the funding revenues that the MPO has discretion over and the projects that the MPO programs with those available funds through the year 2045.

Funded TxDOT Projects

As mentioned previously in this chapter, the Laredo MPO has discretion over Category 2 and Category 7 TxDOT funds. **Table 10-9** demonstrates the total amount of funds available to the MPO to program projects through TxDOT Category 2 and Category 7 funds.

Table 10-5: Funding Amounts Available through TxDOT Category 2 and Category 7 Funds

Category	Programmed Amount TxDOT UTP 2020-2030	Projected Funds Available 2031-2045
2	$129,497,414	$138,542,184
7	$0	$78,385,710

The TxDOT UTP is an annually updated document that programs projects on a ten-year horizon. Through the revenue projections analysis, TxDOT will have the available funds shown in **Table 10-10** below to program through the year 2045 given the current financial outlook. Ultimately, TxDOT will program projects beyond the years of the current 2020-2030 UTP using the performance-based Decision Lens tool to prioritize projects.

Table 10-10: Projected TxDOT Funding

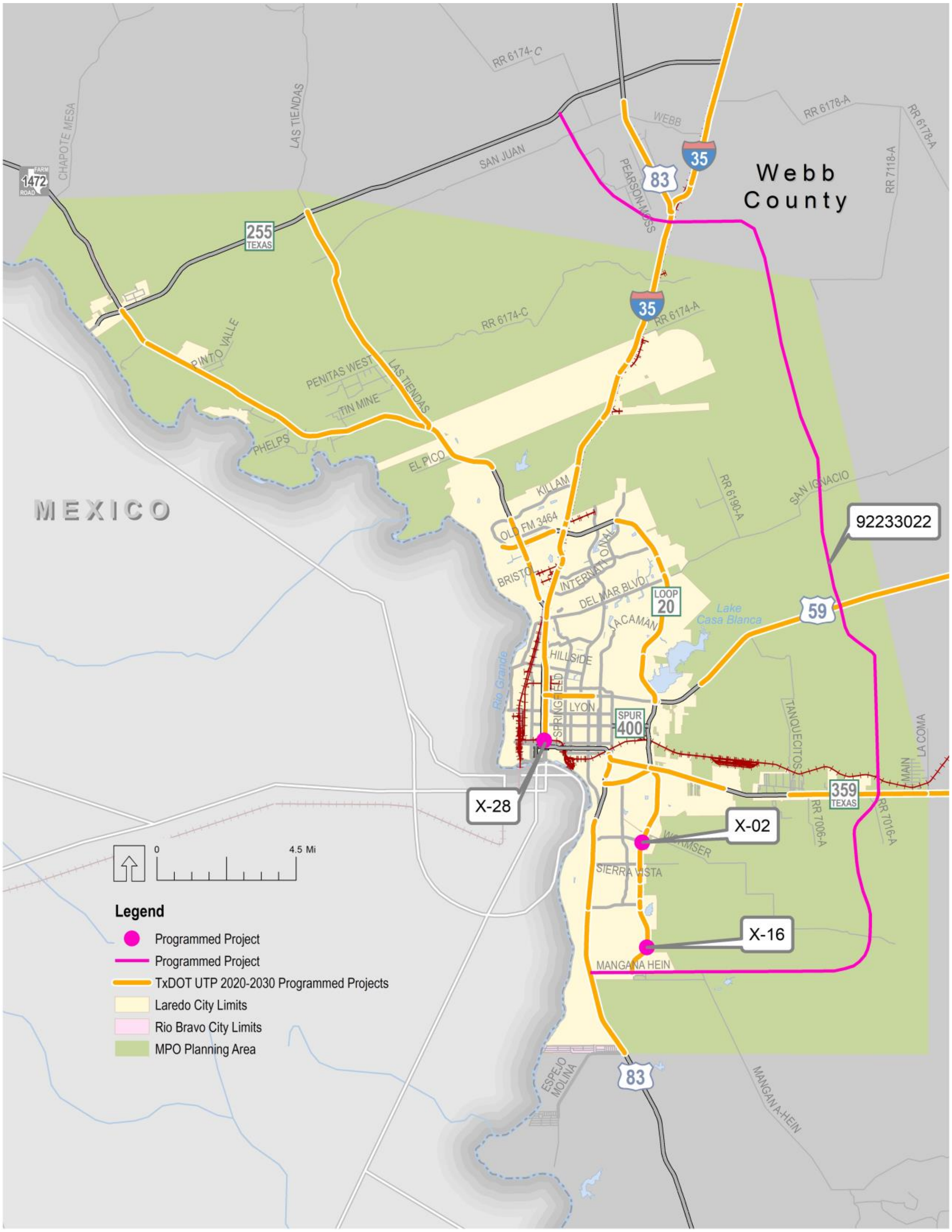
Category	Programmed Amount TxDOT UTP 2020-2030	Projected Funds Available 2031-2045
1	$17,123,669	$29,269,716
2	$129,497,414	$138,542,184
3	$0	$0
4	$122,000,000	$0
5	$0	$0
6	$0	$0
7	$0	$78,385,710
8	$2,100,462	$80,208,635
9	$0	$10,937,542
10	$14,430,000	$118,490,028
11	$23,340,000	$1,822,924
12	$156,200,000	$309,896,995

With the available TxDOT Category 2 and Category 7 funds available, the Laredo MPO can program four additional projects through 2045. These projects were the top scoring projects from the project evaluation process. These programmed projects are listed in **Table 10-11** and displayed in **Figure 10-4**.

Table 10-11: Category 2 and Category 7 Programmed Projects

ID	Facility	Limits	Description	TxDOT Fund Category	Letting Year	Est. Year of Expenditure Cost
X-02	Loop 20 (Cuatro Vientos)	At Lomas Del Sur Blvd	Construct overpass and ramps	2	2036	$42,853,811
X-16	Loop 20 (Cuatro Vientos)	At future minor arterial (1 mile north of Mangana Hein Rd)	Construct overpass and ramps	7	2041	$52,138,213
X-28	Santa Ursula Rd (IH 35 Southbound Frontage Road)	At KCS Railroad	Construct overpass and ramps	2	2041	$52,138,213
92233022	Laredo Outer Loop	From Proposed International Bridge 5 to SH 255	Outer Loop Feasibility Study and Schematic	7	2042	$3,095,143

Table 10-9: Category 2 and Category 7 Programmed Projects



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Funded Transit Projects

Table 10-12 shows the comparison of projected revenue from FTA funding and the programmed amount of project cost, demonstrating that the MTP is financially constrained regarding transit projects.

Table 10-12: Transit Financial Constraint

Category	FY 2019 to 2045 Projected Amount of Revenue	Programmed Amount of Project Costs
5307	$400,366,538	$400,366,538
5310	$5,466,578	$5,466,578
5311	$13,378,742	$13,378,742

The total cost, the programmed federal and state amount of funding, and other amount of funding of transit projects by different FTA category are summarized in **Table 10-13** through **Table 10-15**.

Table 10-13: Category 5307 Transit Projects

Year	Project	Total Cost	FTA Programmed Amount	TxDOT & Local Amount
2020	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2021	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2022	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2023	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2024	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2025	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2026	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2027	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2028	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2029	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2030	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2031	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2032	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2033	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2034	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2035	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2036	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2037	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2038	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2039	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2040	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2041	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2042	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2043	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2044	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220
2045	Operations and Maintenance	$15,398,713	$3,401,493	$11,997,220

Table 10-14: Category 5310 Transit Projects

Year	Project	Total Cost	FTA Programmed Amount	TxDOT & Local Amount
2020	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2021	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2022	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2023	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2024	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2025	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2026	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2027	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2028	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2029	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2030	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2031	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2032	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2033	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2034	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2035	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2036	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2037	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2038	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2039	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2040	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2041	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2042	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2043	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051

Year	Project	Total Cost	FTA Programmed Amount	TxDOT & Local Amount
2044	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051
2045	Funds for Transportation for Seniors and People with Disabilities	$210,253	$168,202	$42,051

Table 10-15: Category 5339 Transit Projects

Year	Project	Total Cost	FTA Programmed Amount	TxDOT & Local Amount
2020	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2021	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2022	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2023	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2024	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2025	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2026	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2027	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2028	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2029	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2030	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2031	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2032	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2033	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2034	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2035	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2036	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2037	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2038	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2039	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2040	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2041	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2042	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2043	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220

Year	Project	Total Cost	FTA Programmed Amount	TxDOT & Local Amount
2044	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220
2045	Bus and van replacements, Facility improvements	$15,398,713	$3,401,493	$11,997,220

Other Unfunded Needs

The MPO has determined that the following projects are needed for congestion relief, economic development, and improved safety. However, current funding forecasts leave these projects without an identified funding source. Should additional funding be made available through either federal, state, local, or other sources, these projects will be developed and advanced accordingly. These projects are considered as "illustrative" and are outside the financial constraint of this plan. **Table 10-16** describes the details of these projects.

Table 10-16: Illustrative Projects List

ID	Facility	Limits	Project Description	Cost Est.
5	Loop 20 (Cuatro Vientos)	To US 83 near the City of Rio Bravo	Extend existing 2-lane roadway	$12,210,000
6	US 59	From Laredo city limit To Duval County line	Upgrade to IH 69 design standards	$156,140,000
7	Green Ranch Pkwy	From FM 1472 To IH 35	Construct new roadway with 2 lanes	$34,410,000
8	Laredo Outer Loop	From IH 35 To US 83	Construct new roadway with 4 lanes	$300,810,000
10	FM 1472 (Mines Rd)	From SH 255 To Killam Industrial Blvd	Widen from 4 lanes to 6 lanes	$76,590,000
001805904	IH 35	From 0.5 mi N of Uniroyal Dr to 0.5 mi north of US 83	Widen from 4 lanes to 6 lanes	$25,530,000
001806155	Shiloh Dr	At Railroad	Construct overpass	$38,850,000
001806203	IH 35	From Shiloh Dr to 0.25 Mi N of US 59/IH 69 W	New frontage road and RR grade separation	$25,000,000
092233039	Laredo Outer Loop	From SH 359 To US 59	Construction of a new location non-freeway	$150,405,000
092233108	Laredo Outer Loop	AT SH 359	Construction of an interchange	$32,000,000
092233182	Laredo Outer Loop	US 59	Construction of a new location non-freeway	$150,405,000
092233183	Laredo Outer Loop	AT US 59	Construction of an interchange	$32,000,000
B-02	US 59	At Zacate Creek	Replace bridge	$14,430,000
B-03	Convent Ave	At Rio Grande River	Rehabilitate bridge	$6,660,000

ID	Facility	Limits	Project Description	Cost Est.
B-04	Sanchez St	At Zacate Creek	Replace bridge	$1,110,000
B-05	Mangana-Hein Rd	At Becerra Creek	Replace bridge	$1,110,000
B-06	Wormser Rd	At Dolores Creek	Replace bridge	$1,110,000
B-07	Las Tiendas Rd	At Tejones Creek to Isabel Creeks and Palito Blanco Arroyo	Replace bridge	$2,220,000
B-08	-	At Juárez-Lincoln Bridge	Construct new bus facility	$44,400,000
C-1	New Road	From Union Pacific Blvd to IH 35	Add new roads and new connector	$744,854
C-2	McPherson Rd	From Saunders (US 59) to Loop 20	Convert to complete Streets	$28,100,725
CMP-1	FM 1472	From Loop 20 To Pan American Blvd	Replace all traffic signal hardware and provide optimized traffic signal timing	$405,000
CMP-2	BU 59 (Saunders St)	From I-35 To Loop 20	Replace all traffic signal hardware and provide optimized traffic signal timing	$648,000
E-1	Clark	at Loop 20	Multimodal hub - park-n-ride transit facility for 75 parking spaces plus bike hub facility	$2,124,864
E-2	University Blvd	At Loop 20	Multimodal hub - park-n-ride transit facility for 75 parking spaces plus bike hub facility	$2,124,864
M-1	River Road	From River Bank Rd to Vidal Cantu Blvd	New 2 lane roadway	$21,000,000
P-01	Santa Maria Ave	At KCS Railroad	Construct overpass	$11,100,000
P-02	Dorel Dr	From W of Loop 20 to Cheyenne Dr	Construct the remaining segment of Dorel Dr to make it into a continuous roadway from SH 359 to Loop 20	$1,890,000
R-05	US 83 (Chihuahua)	IH 35 to SH 359	Widen from 2 lanes to 3 lanes	$26,640,000
R-06	US 83 (Guadalupe)	From IH 35 To SH 359	Widen from 2 lanes to 3 lanes	$26,640,000
T-1	Hachar Pkwy	From FM 1472 To IH 35	Widen to 6 lanes and add interchange at IH 35	$53,100,651
T-10	Fasken Blvd	From Mines Rd To IH 35	Build new 2 lane minor arterial and IH 35 ramp	$9,365,784

ID	Facility	Limits	Project Description	Cost Est.
T-11	Del Mar Blvd	From IH 35 To Loop 20	Widen to 6 lanes, Upgrade traffic signal hardware and traffic signal timing for three intersections between Springfield and San Dario (recommendation from CMP). Per 2016 TDP, add 5 bus bays as part of roadway improvement at (1) Del Mar and Bartlett, (2) Del Mar and JB Alexander Highschool, (3) Del Mar and King Arthurs Court, (4) Del Mar and Laguna Del Mar, and (5) Del Mar and W Village Blvd as recommended from El Metro 2016 TDP	$19,644,172.80
T-12	San Ignacio Rd	From Loop 20 To 2.37 mi East	Upgrade to 4 lanes minor arterial	$11,167,931
T-13	Shiloh Dr	From McPherson Rd To Start of 4 ln section E of Woodridge Dr	Widen to 4 lanes	$6,199,148
T-14	Bartlett/University	From Bartlett To Casa Verde	Extend existing roads for connectivity, make 4 lanes undivided minor arterial	$14,385,810
T-15	Jacaman Rd	From McPherson Rd To Loop 20	Upgrade to 6 lane minor arterial with center turn lanes	$9,320,074
T-16	McPherson Rd	From Gale To Del Mar Blvd	Widen to 6 lanes	$7,072,016
T-17	Gale	From McPherson Rd To Bartlett Ave	Upgrade to 4 lanes minor arterial with center turn lanes for consistency	$2,529,065
T-18	Hillside Rd	From IH 35 To Bartlett Ave	Upgrade to 4 lanes minor arterial with center turn lanes	$8,943,452
T-19	Calton Rd	From N San Bernardo Ave To Overpass	Widen to 4 lanes	$0
T-2	FM 1472	From Hachar Pkwy To 5 mi west	Widen to 6 lanes	$12,945,586
T-20	Calton Rd	From IH 35 To McPherson Rd	Widen to 6 lanes	$5,526,476
T-21	Calton Rd	From McPherson Rd To Thomas Ave	Widen to 4 lanes minor arterial	$2,886,626
T-22	Springfield Ave	From Lane Ave To Del Mar Blvd	Widen to 4 lanes; Include bicycle facilities as recommended by the 2017 Viva Laredo Bike Master Plan (recommends shared bike route)	$21,989,353
T-23	N Santa Maria Rd	From Del Mar Blvd to Industrial Blvd	Widen to 4 lanes, Upgrade traffic signal hardware and traffic signal timing for three intersections between Industrial and Del Mar (recommendation from CMP)	$1,057,218.90
T-24	Industrial Blvd	From CPL Rd To N Santa Maria Rd	Widen to 4 lanes	$436,513

ID	Facility	Limits	Project Description	Cost Est.
T-25	CPL Ave extension	From Flecha Ln To CPL Rd	Extend existing road and connector for diversion	$11,768,700
T-26	Dogwood Rd	From E Bustamante St To Calton Rd	Widen to 4 lanes	$2,291,694
T-27	Bartlett Ave	From US 59 To Bartlett Split	Upgrade to 6 lanes principal arterial	$10,397,268
T-28	Thomas Ave	From E Bustamante St To Bartlett Ave	Widen to 4 lanes	$7,202,468
T-29	Washington/Corpus Christi	From IH 35 To Arkansas Ave	Widen to 4 lanes	$11,949,549
T-3	FM 3338	From FM 1472 To SH 255	Upgrade to 4 lane divided principal arterial to increase speed for a diversion	$23,469,699
T-30	US 83	From @ SH 359 To	Reconfigure interchange with direct connectors	$26,118,398
T-31	Arkansas Ave	From SH 359 To US 59	Widen to 4 lanes	$10,312,625
T-32	Market St	From IH 35 To US 59	Widen to 4 lanes minor arterial with center turn lanes, upgrade connections	$14,404,936
T-33	Bartlett/Malinche	From E Bustamante St To Zapata Hwy	Upgrade to 6 lanes divided principal arterial, build bridge, Willow connector to 1-way	$13,816,190
T-34	Meadow Ave	From US 59 To US 83	Widen to 4 lanes. Per 2016 TDP, add bus bay at Meadow Ave and Boulanger St as recommended from El Metro 2016 TDP	$20,461,557
T-35	SH 359	From US 83 To E study area boundary	Widen to 6 lane consistent as principal arterial with center turn lanes	$48,052,239
T-36	SH 359 Reliever	From Loop 20 To E study area boundary	Add reliever and connectors	$96,086,222
T-37	Cuatro Vientos/Ejido	From Cielito Lindo To US 83	Upgrade to 4 lanes expressway, connectors, and add 1 ln each way to Ejido	$298,794,472
T-38	SH 359 Reliever/Ave Los P & Wormser	From Developer Rd - 2045-V To 2 mi east	Add reliever and connectors	$60,631,151
T-39	Boomtown St	From SH 359 To Zapata Hwy	Widen to 4 lanes	$2,291,694
T-4	SH 255	From FM 1472 To IH 35	Upgrade to 4 lane expressway to increase speed for a diversion	$114,806,354
T-40	La Pita Mangana	From W of SH 359 To E of Concord Hills	Upgrade consistently to 4 lanes minor arterial with center turn lanes	$15,168,834

ID	Facility	Limits	Project Description	Cost Est.
T-41	Cielito Lindo	From US 83 To Ejido Ave	Upgrade consistently to 6 lanes principal arterial with center turn lanes; Include bicycle facilities as recommended by the 2017 Viva Laredo Bike Master Plan (recommends shared use path)	$5,245,469
T-42	SH 359	From E of Arkansas Ave to 3 miles east	Upgrade to EXP	$34,128,040
T-43	Fasken Blvd	From Loop 20 To 0.5 mi east	Widen to 4 lanes	$2,564,515
T-44	Fairfield Rd	From Loop 20 To 0.3 mi east	Widen to 4 lanes	$1,636,925
T-5	Reliever Rd 5	From FM 1472 To IH 35	Build new 4 lane divided principal with ramps at IH 35 for a diversion	$77,198,863
T-6	FM 1472	From Hachar Pkwy to A F Muller Blvd	Widen to 6 lanes to match rest of Mines Rd	$16,017,413
T-7	Vellecillo Dr	From FM 1472 To IH 35	Build new 4 lane undivided principal arterial with Sara Rd extension and ramps at IH 35 for a diversion	$26,998,038
T-8	Eastside Connectors	From Uniroyal Dr To Independence Blvd	Build new roads & extensions to relieve Uniroyal Dr	$36,715,864
T-9	Mines Rd	From A F Muller Blvd To IH 35	Widen to 8 lanes	$20,122,685
VL-1	Loop 20 (Bob Bullock)	From Sinatra Pkwy to Clark Blvd	Bicycle facility. Identified as priority route (Phase I) Shared Bike Route in Viva Laredo Bicycle Master Plan	$81,720
VL-10	Malinche Ave	From Chacon Creek to Clark Blvd	Bicycle facility. Identified as priority route (Phase I) Shared Bike Route in Viva Laredo Bicycle Master Plan	$40,860
VL-11	Springfield Ave	From Del Mar Blvd to Michigan Ave	Bicycle facility. Identified as priority route (Phase I) Shared Bike Route in Viva Laredo Bicycle Master Plan	$6,810
VL-12	Michigan Ave	From Springfield Ave To International Blvd	Bicycle facility. Identified as priority route (Phase I) Shared Bike Route in Viva Laredo Bicycle Master Plan	$13,620
VL-13	International Blvd	From Michigan Ave To San Isidro Pkwy	Bicycle facility. Identified as priority route (Phase I) Shared Bike Route in Viva Laredo Bicycle Master Plan	$81,720
VL-14	International Blvd	From San Isidro Pkwy to Loop 20 (Bob Bullock)	Bicycle facility. Identified as priority route (Phase I) Shared Use Path in Viva Laredo Bicycle Master Plan	$261,000

ID	Facility	Limits	Project Description	Cost Est.
VL-15	Loop 20 (Bob Bullock)	From International Blvd To Shiloh Dr	Bicycle facility. Identified as priority route (Phase I) Shared Use Path in Viva Laredo Bicycle Master Plan	$391,500
VL-2	Clark Blvd	From Arkansas Ave To Zacate Creek	Bicycle facility. Identified as priority route (Phase I) Shared Bike Route in Viva Laredo Bicycle Master Plan	$54,480
VL-3	Washington St	From Zacate Creek to Victoria St	Bicycle facility. Identified as priority route (Phase I) Shared Use Path in Viva Laredo Bicycle Master Plan	$391,500
VL-4	Evans Rd	From Ainsworth Rd To Rio Grande River	Bicycle facility. Identified as priority route (Phase I) Shared Bike Route in Viva Laredo Bicycle Master Plan	$6,810
VL-5	Rio Grande Path	From Evans Rd To Cielito Lindo Blvd	Bicycle facility. Identified as priority route (Phase I) Protected Bike Lane in Viva Laredo Bicycle Master Plan	$894,700
VL-6	Cielito Lindo Blvd	From Rio Grande To US 83	Bicycle facility. Identified as priority route (Phase I) Shared Use Path in Viva Laredo Bicycle Master Plan	$65,250
VL-7	Ejido Ave	From Cielito Lindo Blvd To Lomas Del Sur	Bicycle facility. Identified as priority route (Phase I) Shared Use Path in Viva Laredo Bicycle Master Plan	$587,250
VL-8	Lomas Del Sur	From Rio Grande To Ejido Ave	Bicycle facility. Identified as priority route (Phase I) Shared Use Path in Viva Laredo Bicycle Master Plan	$391,500
VL-9	Louisiana Ave	From Lomas Del Sur To Chacon Creek	Bicycle facility. Identified as priority route (Phase I) Shared Bike Route in Viva Laredo Bicycle Master Plan	$54,480
X-01	US 83	From SH 359 to Prop. Outer Loop To	Widen from 4 lanes to 7 lanes	$72,150,000
X-03	Loop 20 (Cuatro Vientos)	From SH 359 to Prop. Outer Loop To	Widen 4 lanes to 6 lanes	$53,280,000
X-04	Loop 20	From World Trade Bridge to IH 35	Add 1 lane in each direction	$9,990,000
X-05	Interstate 35	From Shiloh Dr To Loop 20	Widen 4 lanes to 6 lanes	$54,390,000
X-08	Interstate 35	At Loop 20 To	Construct ramp from IH 35 Northbound to Loop 20 Eastbound	$35,520,000
X-11	US 83	At San Rio Blvd To	Construct overpass and ramps	$11,100,000

ID	Facility	Limits	Project Description	Cost Est.
X-15	US 59	From 2.0 miles east of Loop 20 to Prop. Outer Loop To	Widen 2 lanes to 7 lanes	$81,030,000
X-22	Prop. Outer Loop Spur	From Loop 20 To Prop. Outer Loop	Construct new roadway with 2 lanes	$114,330,000
X-24	Clark Blvd (Spur 400)	From Loop 20 To Prop. Outer Loop	Construct new roadway with 5 lanes	$139,860,000
X-25	US 83	At Proposed Outer Loop	Construct ramps- Northbound US 83 to Eastbound Outer Loop and Westbound Outer Loop to Southbound US 83	$71,040,000
X-26	Market St	At KCS Railroad	Construct overpass	$11,100,000
X-27	Corpus Christi St	At KCS Railroad	Construct overpass	$11,100,000
X-28	IH 35 SB Frontage Rd (Santa Ursula)	At KCS Railroad	Construct overpass	$11,100,000
X-29	San Bernardo (Bus. Interstate 35)	At KCS Railroad	Construct overpass	$11,100,000
X-30	IH 35 NB Frontage Rd (Santa Ursula)	At KCS Railroad	Construct overpass	$11,100,000
X-31	Chicago St	At UP Railroad	Construct overpass	$11,100,000
X-32	Scott St	At UP Railroad	Construct overpass	$11,100,000
X-33	Sanchez St	At UP Railroad	Construct overpass	$11,100,000
X-34	Seymour Ave	At KCS Railroad	Construct overpass	$11,100,000

Chapter 11:
Performance Management

Introduction

The Laredo MPO recognizes the importance of transportation performance tracking, goal setting, and measurement to provide greater accountability and transparency and to achieve a more efficient and effective investment of transportation resources. To date, the MPO has met all federal deadlines requiring adoption of performance measures. The Laredo MPO has adopted performance measures associated with Safety (PM1), Bridge and Pavement Condition (PM2), Roadway System Performance (PM3), and Transit Asset Management (TAM).

Background

Transportation performance management is a strategic approach that uses system data to make investment and policy decisions to achieve national performance goals. Monitoring progress toward achieving these national performance goals is accomplished by establishing performance targets for key performance measures. Using a performance-based approach, decision-makers can apply key information and data to understand the consequences of investment decisions across transportation modes.

The development and implementation of performance measures for MPOs serves as a means to assess how the transportation system is functioning and operating. Performance measures can inform the decision-making process and improve accountability for the efficient and effective implementation of programs and projects. Performance measures serve the following functions for the Laredo MPO:

- During the **Plan Development** process, performance measures provide a framework to benchmark performance and the effects of alternatives. This performance data is used to define transportation projects and can help inform decision-making between trade-offs and help communicate the anticipated impacts of different investment strategies.
- Performance measures support **Plan Implementation** by emphasizing the Laredo MPO guiding principles and integrating them into budgeting, program structure, project selection, and implementation policies.
- System performance relative to the vision and guiding principles of the Laredo MTP can be tracked and reported to support **Accountability** for plan implementation and results.

Federal Legislation

In 2012, MAP-21 directed the United States Department of Transportation (USDOT) to establish a set of performance measures to increase the accountability and transparency of the federal highway and transit programs and improve project decision-making through performance-based planning and programming by a rulemaking process. After national performance measures are established through a rulemaking, the state departments of transportation (DOTs) and transit providers must:

- Establish performance targets that reflect the national measures.
- Report on progress towards achieving those targets.
- Develop performance-based plans for safety and asset management.
- Implement a performance-based approach to planning and programming.

The FAST Act of 2015 continues the performance management and performance-based planning and programming introduced by MAP-21 with minor changes. As part of performance management, recipients of federal aid highway funds will make transportation investments to achieve performance targets that make progress toward national goals (**Table 11-1**).

Table 11-1: National Performance Management Goals

Goal Area	National Goal
Safety	To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
Infrastructure Condition	To maintain the highway infrastructure asset system in a state of good repair.
Congestion Reduction	To achieve a significant reduction in congestion on the National Highway System (NHS).
System Reliability	To improve the efficiency of the surface transportation system.
Freight Movement and Economic Vitality	To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
Environmental Sustainability	To enhance the performance of the transportation system while protecting and enhancing the natural environment.
Reduced Project Delivery Delays	To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

In a series of rulemakings, FHWA and FTA have established national performance measures in areas such as Safety (PM1), Pavement and Bridge Condition (PM2), Roadway System Performance (PM3), and Transit Asset Management (TAM). *The Final Rule on Statewide and Nonmetropolitan Transportation Planning and Metropolitan Transportation Planning* (May 27, 2016) established the requirement that states, MPOs, and transit providers use performance measures to document expectations for future performance. Each state or transit provider will have one year after the final rulemaking for each set of performance measures to establish performance targets. MPOs are required to establish performance targets within 180 days after the state or transit provider has established performance targets.

The USDOT has published the following rules which establish national performance measures for which state DOTs, transit providers, and MPOs must establish performance targets:

- Safety Performance Management Final Rule (PM1).
- Pavement and Bridge Condition Performance Management Final Rule (PM2).
- Travel Time Reliability Final Rule (PM3).
- Transit Asset Management Final Rule (TAM).

In accordance with the rulemakings, the Texas Department of Transportation (TxDOT) and each Texas MPO must publish a System Performance Report for applicable performance measures in their respective statewide and metropolitan transportation plans and programs. The System Performance Report presents the condition and performance of the transportation system with respect to required performance measures, and documents performance targets and progress achieved in meeting the targets in comparison with previous reports.

This System Performance Report for the 2020-2045 Laredo MTP is included for the required Safety (PM1), Bridge and Pavement Condition (PM2), Roadway System Performance (PM3), and Transit Asset Management (TAM) performance measures and targets to meet the FHWA and FTA requirements. The remaining performance goals listed in Table 11-1 do not have established federal-level performance targets. This Laredo MTP therefore addresses these goals by including related criteria within the project selection process.

Safety Performance Management

Safety performance management is intended to ensure that safety improvements guide funding priorities to advance the national goal for safe roadways. The FHWA established the safety performance measures (PM1) to carry out the Highway Safety Improvement Program (HSIP), effective April 14, 2016. The five safety performance measures to evaluate fatalities and serious injuries on all public roads are:

1. Number of fatalities.
2. Rate of fatalities per 100 million vehicle miles traveled.
3. Number of serious injuries.
4. Rate of serious injuries per 100 million vehicle miles traveled.
5. Number of combined bicycle and pedestrian fatalities and serious injuries.

Safety performance targets are provided annually by the States to FHWA for each safety performance measure. Current statewide safety targets address calendar year 2019 and are based on an anticipated five-year rolling average (2015-2019). Texas statewide safety performance targets for 2019 are included in **Table 11-2**. The Laredo MPO adopted the Texas statewide safety performance targets on January 22, 2019.

Table 11-2: Safety (PM1) Performance Conditions and Adopted Performance Targets

2019 Safety Targets	Number of Fatalities (FARS / CRIS / ARF DATA)	Rate of Fatalities (FARS / CRIS / ARF DATA	Number of Serious Injuries (FARS / CRIS DATA)	Serious Injury Rate (CRIS DATA)	Total Number of Bicycle & Pedestrian Fatalities and Serious Injuries (FARS / CRIS DATA)
2015	3,582	1.39	17,110	6.63	2,036
2016	3,776	1.39	17,602	6.49	2,301
2017	3,726	1.36	17,546	6.39	2,148
2018	3,891	1.46	18,130	6.64	2,309
2019	3,980	1.47	18,367	6.60	2,394
2019 Target as a 5-Year Average	3,791	1.414	17,751	6.550	2,237.6

The values in **Table 11-3** display safety performance within the Laredo MPO area. Safety performance for the fatality rate was better than the target value for 2016 and 2017 but rose in 2018 to exceed the target. Performance for the serious injury rate has been significantly better than the target for each year and has a declining trend.

Table 11-3: Safety (PM1) Performance in the Laredo MPO Area

Year	Fatalities (No.)	Fatalities (Rate)	Serious Injuries (No.)	Serious Injuries (Rate)	Fatalities and Serious Injuries (Bike/Ped)
2015	12	0.78	87	5.63	15
2016	27	1.79	75	4.98	21
2017	15	1.00	73	4.87	16

The Laredo MPO recognizes the importance of linking goals, objectives, and investment priorities to stated performance objectives, and that establishing this link is critical to the achievement of national transportation goals and statewide and regional performance targets. As such, the Laredo MTP-2045 planning process directly reflects the goals, objectives, performance measures, and targets as they are available and described in other State and public transportation plans and processes, the Texas Strategic Highway Safety Plan (SHSP), the Texas Highway Safety Improvement Program (HSIP), the current statewide Texas Transportation Plan 2040 (TTP), and the Laredo MPO Transportation Improvement Program FY 2019-2022 (TIP).

To support progress towards approved highway safety targets, the 2020-2045 Laredo MTP includes investments for safety improvements. The fiscally constrained 2020-2045 Laredo MTP recommends $2,100,462 of investments in safety projects and programs through Category 8 Safety funds allocated to the TxDOT Laredo District from FY 2020-2045. These funded safety projects are expected to contribute to the achievement of the safety performance targets.

Pavement and Bridge Condition Performance Management

The FHWA published the Pavement and Bridge Condition Performance Management Final Rule which established performance measures to evaluate the condition of pavement and bridges on the National Highway System (NHS) and the Interstate System in relation to the State of Good Repair (SGR), effective May 20, 2017. This second FHWA performance measure rule (PM2) established six performance measures:

1. Percent of Interstate pavements in good condition.
2. Percent of Interstate pavements in poor condition.
3. Percent of non-Interstate National Highway System (NHS) pavements in good condition.
4. Percent of non-Interstate NHS pavements in poor condition.
5. Percent of NHS bridges by deck area classified as in good condition.
6. Percent of NHS bridges by deck area classified as in poor condition.

Pavement Condition Measures

The pavement condition measures represent the percentage of lane-miles on the Interstate or non-Interstate NHS that are in good condition or poor condition. FHWA established five metrics to assess pavement condition: International Roughness Index (IRI), cracking percent, rutting, faulting, and Present Serviceability Rating (PSR). For each metric, a threshold is used to establish good, fair, or poor condition.

Pavement condition is assessed using these metrics and thresholds. A pavement section is in good condition if three metric ratings are good, and in poor condition if two or more metric ratings are poor. Pavement sections that are not good or poor are considered fair.

The pavement condition measures are expressed as a percentage of all applicable roads in good or poor condition. Pavement in good condition suggests that no major investment is needed. Pavement in poor condition suggests major reconstruction investment is needed due to either ride quality or a structural deficiency.

Bridge Condition Measures

The bridge condition measures represent the percentage of bridges, by deck area, on the NHS that are in good condition or poor condition. The condition of each bridge is evaluated by assessing four bridge components: deck, superstructure, substructure, and culverts. FHWA created a metric rating threshold for each component to establish good, fair, or poor condition. Every bridge on the NHS is evaluated using these component ratings. If the lowest rating of the four metrics is greater than or equal to seven, the structure is classified as good. If the lowest rating is less than or equal to four, the structure is classified as poor. If the lowest rating is five or six, it is classified as fair.

To determine the percent of bridges in good or in poor condition, the sum of total deck area of good or poor NHS bridges is divided by the total deck area of bridges on the NHS. Deck area is computed using structure length and either deck width or approach roadway width. Good condition suggests that no major investment is needed. Bridges in poor condition are safe to drive on; however, they are nearing a point where substantial reconstruction or replacement is needed.

Pavement and Bridge Targets

Pavement and bridge condition performance is assessed and reported over a four-year performance period. The first performance period began on January 1, 2018 and runs through December 31, 2021. The second four-year performance period will cover January 1, 2022, to December 31, 2025, with additional performance periods following every four years.

The PM2 rule requires states and MPOs to establish two-year and four-year performance targets for each PM2 measure. Current two-year targets represent expected pavement and bridge condition at the end of calendar year 2019, while the current four-year targets represent expected condition at the end of calendar year 2021.

States establish targets as follows:

- Percent of Interstate pavements in good and poor condition – four-year targets.
- Percent of non-Interstate NHS pavements in good and poor condition – two-year and four-year targets.
- Percent of NHS bridges by deck area in good and poor condition – two-year and four-year targets.

MPOs establish four-year targets for each measure by either agreeing to program projects that will support the statewide targets or setting quantifiable targets for the MPO's planning area that differ from the state targets.

TxDOT established current statewide two-year and four-year PM2 targets on June 21, 2018. The Laredo MPO adopted the Texas statewide PM2 targets on January 22, 2019. **Table 11-4** presents statewide baseline performance for each PM2 measure as well as the current two-year and four-year statewide targets established by TxDOT.

On or before October 1, 2020, TxDOT will provide FHWA a detailed report of pavement and bridge condition performance covering the period of January 1, 2018, to December 31, 2019. TxDOT and the Laredo MPO will have the opportunity at that time to revisit the four-year PM2 targets.

Table 11-4: Pavement and Bridge Condition Performance Targets

Performance Measure	Baseline	2-Year 2020 Target	4-year 2022 Target
Pavement on Interstate Highway (IH)			
% in "good" condition	N/A	N/A	66.40%
% in "poor" condition	N/A	N/A	0.33%
Pavement on Non-Interstate Highway (NHS)			
% in "good" condition	54.40%	52.00%	52.33%
% in "poor" condition	13.80%	14.30%	14.30%
NHS Bridge Deck Condition			
% in "poor" condition	0.88%	0.80%	0.80%
% in "good" condition	50.63%	50.58%	50.42%

The values in **Table 11-5** display bridge performance within the Laredo MPO area from the 2018 Report on Texas Bridges.

Table 11-5: Bridge Performance in the Laredo MPO Area

Jurisdiction	Good or Better	Structurally Deficient	Functionally Obsolete	Substandard Load Only
Webb County On-System	94.01%	0.00%	5.99%	0.00%
State of Texas On-System	88.83%	0.57%	10.42%	0.18%
Webb County Off-System	94.01%	0.00%	5.99%	0.00%
State of Texas Off-System	88.83%	0.57%	10.42%	0.18%

The Laredo MPO recognizes the importance of linking goals, objectives, and investment priorities to stated performance objectives, and that establishing this link is critical to the achievement of national transportation goals and statewide and regional performance targets. As such, the 2020-2045 Laredo MTP planning process directly reflects the goals, objectives, performance measures, and targets as they are available and described in other State and public transportation plans and processes; specifically, the current statewide Texas Transportation Plan 2040 (TTP) and the Laredo MPO Transportation Improvement Program FY 2019-2022 (TIP).

To support progress towards TxDOT's statewide pavement and bridge performance targets, the 2020-2045 Laredo MTP includes investments that will maintain pavement and bridge condition performance. Investments in pavement and bridge condition could include pavement replacement and reconstruction, bridge replacement and reconstruction, new bridge and pavement capacity, and system resiliency projects that improve NHS bridge components.

The fiscally constrained 2020-2045 Laredo MTP recommends $17,123,669 of investments for pavement and bridge condition through Category 1 Preventative Maintenance and

Rehabilitation and Category 6 Bridges funds allocated to the TxDOT Laredo District. The funded projects are expected to contribute toward achieving pavement and bridge condition performance targets.

Roadway System Performance Management

The FHWA published the Travel Time Reliability Final Rule (PM3), which established performance measures to evaluate the performance of the NHS and freight movement on the Interstate System, effective May 20, 2017. This performance measure rule established three roadway system performance measures applicable to the Laredo MPO:

National Highway System Performance:

1. Percent of person-miles on the Interstate system that are reliable.
2. Percent of person-miles on the non-Interstate NHS that are reliable.

Freight Movement on the Interstate:

3. Truck Travel Time Reliability Index (TTTR).

National Highway System Performance Measures

The two system performance measures assess the reliability of travel times on the Interstate or non-Interstate NHS system. The performance metric used to calculate reliability is the Level of Travel Time Reliability (LOTTR). LOTTR is defined as the ratio of longer travel times (80^{th} percentile) to a normal travel time (50^{th} percentile) over all applicable roads during four time periods (AM peak, Mid-day, PM peak, and weekends) over the hours of 6 AM to 8 PM.

The LOTTR ratio is calculated for each segment of applicable roadway, essentially comparing the segment with itself for the four time periods. A segment is deemed to be reliable if its LOTTR is less than 1.5 during all four time periods. If one or more time periods has a LOTTR of 1.5 or above, that segment is unreliable.

The measures are expressed as the percent of person-miles traveled on the Interstate or non-Interstate NHS system that are reliable, requiring several data calculations to convert from LOTTR to person-miles. Person-miles considers the number of people traveling in buses, cars, and trucks over these roadway segments. To determine total person miles traveled, the vehicle miles traveled (VMT) on each segment is multiplied by average vehicle occupancy. To calculate the percent of person miles traveled that are reliable, the sum of the number of reliable person miles traveled is divided by the sum of total person miles traveled.

Freight Movement Performance Measures

The Freight Movement performance measure assesses reliability for trucks traveling on the Interstate system. A TTTR ratio is generated by dividing the 95th percentile truck travel time by a normal travel time (50^{th} percentile) for each segment of the Interstate system over five time periods throughout weekdays and weekends (AM peak, Mid-day, PM peak, weekend, and overnight) that cover all hours of the day. For each segment, the highest TTTR value among the five time periods is multiplied by the length of the segment. The sum of all length-weighted segments is then divided by the total length of Interstate to generate the TTTR Index.

The difference in the travel time measured and the time periods between the LOTTR and the TTTR reflect the differences between passenger vehicle travel and truck travel.

Performance Targets

Performance for the PM3 measures is assessed and reported over a four-year performance period. For the PM3 measures, the first performance period began on January 1, 2018 and will end on December 31, 2021. TxDOT reported baseline PM3 performance and targets to FHWA and will report updated performance information at the midpoint and end of the performance period. The second four-year performance period will cover January 1, 2022, to December 31, 2025, with additional performance periods following every four years. These 2-year and 4-year periods for freight are different from the periods specified for pavement and bridge condition (Table 11-4) because of the dates that the two performance targets were established.

The PM3 rule requires state DOTs and MPOs to establish two-year and four-year performance targets for each PM3 measure. For all targets, the current two-year and four-year targets represent expected performance at the end of calendar years 2019 and 2021, respectively.

States establish targets as follows:

- Percent of person-miles on the Interstate system that are reliable – two-year and four-year targets.
- Percent of person-miles on the non-Interstate NHS that are reliable – four-year targets.
- Truck Travel Time Reliability – two-year and four-year targets.

MPOs establish four-year targets for the System Performance and Freight Movement by establishing targets by either agreeing to programs and projects that will support the statewide targets or setting quantifiable targets for the MPO’s planning area that differ from the state targets.

TxDOT enlisted the Texas Transportation Institute (TTI) to establish a statewide methodology and recommend future year travel time reliability performance targets for all MPOs within Texas. The Laredo MPO adopted the TxDOT statewide PM3 targets on January 22, 2019. **Table 11-5** presents statewide baseline performance for each PM3 measure as well as the current two-year and four-year statewide targets established by TTI for TxDOT.

TxDOT will provide FHWA on or before October 1, 2020 a detailed report of PM3 performance covering the period of January 1, 2018 to December 31, 2019. TxDOT and the Laredo MPO will have the opportunity at that time to revisit the four-year PM3 targets.

Table 11-5: Travel Time Reliability Performance Targets

Performance Measure	Baseline	2020 Target	2022 Target
Interstate Highway (IH) Level of Travel Time Reliability	79.60%	61.20%	56.60%
Non-Interstate Highway (NHS) Travel Time Reliability			55.40%
Truck Travel Time Reliability	1.5	1.7	1.79

The Laredo MPO recognizes the importance of linking goals, objectives, and investment priorities to stated performance objectives, and that establishing this link is critical to the achievement of national transportation goals and statewide and regional performance targets. As such, the 2020-2045 Laredo MTP planning process directly reflects the goals, objectives, performance measures, and targets as they are available and described in other State and public transportation plans and processes; specifically, the Texas Freight Mobility Plan, the current statewide Texas Transportation Plan 2040 (TTP), and the Laredo MPO Transportation Improvement Program FY 2019-2022 (TIP).

To support progress towards TxDOT's statewide PM3 targets, the 2020-2045 Laredo MTP devotes resources to projects that will address passenger and highway freight reliability and delay. The fiscally constrained 2020-2045 Laredo MTP recommends $346,489,438 of investments for travel time reliability improvements through Category 2 Metropolitan and Urban Area Corridor Projects and Category 4 Statewide Connectivity Corridor Projects funds allocated to the TxDOT Laredo District. The funded projects are expected to contribute toward achieving travel time reliability performance targets.

Transit Asset Management

MAP-21 and later the FAST Act mandated the Federal Transit Administration (FTA) to develop a rule establishing a strategic and systematic process of operating, maintaining, and improving public capital assets effectively through their entire life cycle. Under the Transit Asset Management (TAM) Final Rule, the FTA established four performance measures to approximate the State of Good Repair for four categories of transit capital assets (**Table 11-6**). These performance measures will help El Metro to quantify the condition of their assets and help facilitate target setting that supports local funding prioritization.

Table 11-6: Transit Asset Management Performance Measures

Asset Category	FTA established Performance Measure
Rolling Stock	Percent of revenue vehicles exceeding Useable Life Benchmark (ULB)
Facilities	Percent of facilities rated under 3.0 on the Transit Economic Requirements Model (TERM) scale
Equipment	Percent of non-revenue service vehicles exceeding ULB
Infrastructure	Percent of track segments under performance restriction (Not applicable to the Laredo MPO)

In January 2017, the Laredo MPO Policy Advisory Committee adopted the Transit Asset Management Performance Targets listed in **Table 11-7**. These performance targets are applicable to El Metro.

The Laredo MPO, TxDOT, and El Metro have signed an MOU defining roles and responsibilities related to the performance-based planning and programming process in compliance with the FAST Act.

Performance Measure	Performance Target
% of revenue vehicles met or exceeded useful life benchmark (ULB)	75% of vehicles should be within their ULB
% of equipment assets met or exceeded useful life benchmark (ULB)	75% of equipment should be within their ULB
% of assets/facilities with condition rating below 3.0 on FTA TERM Scale	75% of facilities rated on an FTA TERM scale of 3.0 or above

To support progress towards the TAM targets, the 2020-2045 Laredo MTP devotes resources to projects that will invest in transit assets. The fiscally constrained 2020-2045 Laredo MTP recommends $12,864,100 of investments for TAM through Category 5339 Buses and Bus Facility funds allocated to the El Metro through FTA. The funded projects are expected to contribute toward achieving the TAM targets.

18 APPENDIX I
Regional Impact Fee Resources

HARLINGEN WATERWORKS SYSTEM
Impact Fee Schedule

Water Impact Fees:

Inside City Limits		Outide City Limits	
Meter Size		**Meter Size**	
3/4"	$1,044.00	3/4"	$1,160.00
1"	$2,610.00	1"	$2,900.00
1 1/2"	$8,351.00	1 1/2"	$9,279.00
2"	$10,438.00	2"	$11,598.00
3"	$23,486.00	3"	$26,096.00
4"	$62,630.00	4"	$69,589.00
6"	$130,480.00	6"	$144,978.00
8"	$208,768.00	8"	$231,964.00
10"	$339,248.00	10"	$376,942.00

Wastewater Impact Fees:

Inside City Limits		Outide City Limits	
Meter Size		**Meter Size**	
3/4"	$1,599.00	3/4"	$1,777.00
1"	$3,998.00	1"	$4,442.00
1 1/2"	$12,794.00	1 1/2"	$14,215.00
2"	$15,992.00	2"	$17,769.00
3"	$35,981.00	3"	$39,979.00
4"	$95,950.00	4"	$106,611.00
6"	$199,896.00	6"	$222,107.00
8"	$319,834.00	8"	$355,371.00
10"	$519,729.00	10"	$577,477.00

SCHEDULE 1

Maximum assessable utility fee based on date of final plat recordation.

TABLE A.

Maximum assessable utility impact fee if date of final plat recordation is prior to September 1, 2003 for which no replatting is necessary.

Meter Size (*inches*)	WATER Maximum Fee (pre-credit)	WATER Maximum Fee (post-credit)	WASTEWATER Maximum Fee (pre-credit)	WASTEWATER Maximum Fee (post-credit)
3/4	$ 640.00	$ 320.00	$ 725.00	$ 362.50
1	$ 1,120.00	$ 560.00	$ 1,268.75	$ 634.38
1 1/2	$ 2,560.00	$ 1,280.00	$ 2,900.00	$ 1,450.00
2	$ 4,480.00	$ 2,240.00	$ 5,075.00	$ 2,537.50
3	$ 10,240.00	$ 5,120.00	$ 11,600.00	$ 5,800.00
4	$ 17,920.00	$ 8,960.00	$ 20,300.00	$ 10,150.00
6	$ 40,960.00	$ 20,480.00	$ 46,400.00	$ 23,200.00
8	$ 64,000.00	$ 32,000.00	$ 72,500.00	$ 36,250.00
10	$ 96,000.00	$ 48,000.00	$ 108,750.00	$ 54,375.00

Maximum Assessable Fee (post-credit) is 50% of the Maximum Fee (pre-credit).

TABLE B.

Maximum assessable utility impact fee if date of final plat recordation is between September 1, 2003 and November 9, 2008 for which no replatting is necessary.

Meter Size (*inches*)	WATER Maximum Fee (pre-credit)	WATER Maximum Fee (post-credit)	WASTEWATER Maximum Fee (pre-credit)	WASTEWATER Maximum Fee (post-credit)
3/4	$ 2,832.97	$ 1,416.49	$ 1,412.18	$ 706.09
1	$ 4,816.04	$ 2,408.02	$ 2,400.70	$ 1,200.35
1 1/2	$ 9,348.76	$ 4,674.38	$ 4,660.16	$ 2,330.08
2	$ 15,014.68	$ 7,507.34	$ 7,484.40	$ 3,742.20
3	$ 30,312.68	$ 15,156.34	$ 15,110.24	$ 7,555.12
4	$ 47,310.44	$ 23,655.22	$ 23,512.65	$ 11,756.33
6	$ 94,337.56	$ 47,168.78	$ 47,025.30	$ 23,512.65
8	$ 151,087.76	$ 75,543.88	$ 75,268.72	$ 37,634.36
10	$ 434,292.76	$ 217,146.38	$ 216,485.84	$ 108,242.92

Maximum Assessable Fee (post-credit) is 50% of the Maximum Fee (pre-credit).

TABLE C.

Maximum assessable utility impact fee if date of final plat recordation is between November 10, 2008 and November 19, 2013 for which no replatting is necessary.

Meter Size (*inches*)	Meter Type	WATER Maximum Fee (pre-credit)	WATER Maximum Fee (post-credit)	WASTEWATER Maximum Fee (pre-credit)	WASTEWATER Maximum Fee (post-credit)
3/4	Simple	$ 3,255.36	$ 1,627.68	$ 411.04	$ 205.52
1	Simple	$ 5,534.12	$ 2,767.06	$ 698.76	$ 349.38
1 1/2	Simple	$ 10,742.68	$ 5,371.34	$ 1,356.44	$ 678.22
2	Simple	$ 17,253.40	$ 8,626.70	$ 2,178.52	$ 1,089.26
2	Compound	$ 17,253.40	$ 8,626.70	$ 2,178.52	$ 1,089.26
2	Turbine	$ 21,810.92	$ 10,905.46	$ 2,753.96	$ 1,376.98
3	Compound	$ 34,832.36	$ 17,416.18	$ 4,398.12	$ 2,199.06
3	Turbine	$ 52,085.76	$ 26,042.88	$ 6,576.64	$ 3,288.32
4	Compound	$ 54,364.52	$ 27,182.26	$ 6,864.36	$ 3,432.18
4	Turbine	$ 91,150.08	$ 45,575.04	$ 11,509.12	$ 5,754.56
6	Compound	$ 108,403.48	$ 54,201.74	$ 13,687.64	$ 6,843.82
6	Turbine	$ 199,553.56	$ 99,776.78	$ 25,196.76	$ 12,598.38
8	Compound	$ 173,510.68	$ 86,755.34	$ 21,908.44	$ 10,954.22
8	Turbine	$ 347,346.92	$ 173,673.46	$ 43,857.96	$ 21,928.98
10	Compound	$ 499,046.68	$ 249,523.34	$ 63,012.44	$ 31,506.22
10	Turbine	$ 542,668.52	$ 271,334.26	$ 68,520.36	$ 34,260.18
12	Turbine	$ 716,179.20	$ 358,089.60	$ 90,428.80	$ 45,214.40

Maximum Assessable Fee (post-credit) is 50% of the Maximum Fee (pre-credit).

TABLE D.

Maximum assessable utility impact fee if date of final plat recordation is between November 20, 2013 and November 30, 2020 for which no replatting is necessary.

Meter Size (*inches*)	Meter Type	WATER Maximum Fee (pre-credit)	WATER Maximum Fee (post-credit)	WASTEWATER Maximum Fee (pre-credit)	WASTEWATER Maximum Fee (post-credit)
3/4	Multi-Jet (Simple)	$ 2,589.39	$ 1,294.70	$ 324.28	$ 162.14
1	Multi-Jet (Simple)	$ 4,401.96	$ 2,200.99	$ 551.28	$ 275.64
2	Ultrasonic	$ 21,491.94	$ 10,746.01	$ 2,691.52	$ 1,345.76
3	Ultrasonic	$ 43,242.81	$ 21,621.49	$ 5,415.48	$ 2,707.74
4	Ultrasonic	$ 86,226.69	$ 43,113.51	$ 10,798.52	$ 5,399.26
6	Ultrasonic	$ 138,014.49	$ 69,007.51	$ 17,284.12	$ 8,642.06
8	Ultrasonic	$ 241,590.09	$ 120,795.51	$ 30,255.32	$ 15,127.66
10-12	Ultrasonic	$ 474,635.19	$ 237,318.51	$ 59,440.52	$ 29,720.26

Maximum Assessable Fee (post-credit) is 50% of the Maximum Fee (pre-credit).

TABLE E.

Maximum assessable utility impact fee if date of final plat recordation is on or after December 1, 2020 for which no replatting is necessary.

Meter Size (*inches*)	Meter Type	WATER Maximum Fee	WASTEWATER Maximum Fee
3/4	Multijet	$ 1,754.00	$ 2,899.00
1	Multijet	$ 2,929.18	$ 4,841.33
1 1/2	Multijet	$ 5,840.82	$ 9,653.67
2	Ultrasonic	$ 14,610.82	$ 24,148.67
3	Ultrasonic	$ 29,239.18	$ 48,326.33
4	Ultrasonic	$ 58,460.82	$ 96,623.67
6	Ultrasonic	$ 93,540.82	$ 154,603.67
8	Ultrasonic	$ 163,700.82	$ 270,563.67
12	Ultrasonic	$ 321,560.82	$ 531,473.67

2017 Impact Fee Program

Effective July 1, 2017

Schedule 1 & 2 Rates

Facility Type	Service Unit	Schedule 1 Rate (Actual Cost per Service Unit)	Schedule 2 Rate (Proposed Collection Rate per Service Unit)
Water	5/8" water meter equivalent	$3,024.00	$828.00
Sewer	5/8" water meter equivalent	$835.00	$418.00
Roadways	Vehicle Miles (afternoon peak)		
Service Area A		$506.00	$253.00
Service Area B		$714.00	$312.50
Service Area C		$1,246.00	$312.50
Service Area D		$0.00	$0.00
Service Area E		$4,572.00	$312.50
Service Area F		$3,648.00	$312.50
Service Area G		$1,178.00	$312.50
Service Area H		$3,848.00	$312.50
Service Area I		$3,288.00	$312.50
Service Area J		$0.00	$0.00

BPUB's My Account portal is currently unavailable due to maintenance. Some online tools and links may be temporarily inaccessible. Customers may still submit one-time payments online and look up account balances. Customers who wish to perform additional account functions, such as new service requests or updates to existing services, should contact Customer Service at 956-983-6121 or email at customerservice@brownsville-pub.com. Customers may also schedule an in-person appointment. We apologize for any inconvenience this may cause.

Impact Fees

An impact fee is a fee that is imposed on a new or proposed development project to pay for all or a portion of the costs of providing public services to the new development. Impact fees help fund and pay for the construction or needed expansion of offsite capital improvements that are necessary to serve the new development. These fees are implemented to help reduce the economic burden on existing rate payers. Current water and wastewater impact fees are calculated at 74.58% of the total maximum assessable amount. Current impact fees are noted as follows:

Zone 1				
Meter Size	ESU	Water Impact Fee	Wastewater Impact Fee	Combined Total
5/8x3/4"	1	$300.00	$500.00	$800.00
1"	2.5	$750.00	$1,250.00	$2,000.00
1 1/2"	5	$1,500.00	$2,500.00	$4,000.00
2"	8	$2,400.00	$4,000.00	$6,400.00
3"	15	$4,500.00	$7,500.00	$12,000.00
4"	25	$7,500.00	$12,500.00	$20,000.00
6"	50	$15,000.00	$25,000.00	$40,000.00
8"	80	$24,000.00	$40,000.00	$64,000.00
10"	115	$34,500.00	$57,500.00	$92,000.00
12"		Information Upon Request		
ZONE 2 & 3				
Meter Size	ESU	Water Impact Fee	Wastewater Impact Fee	Combined Total
5/8x3/4"	1	$600.00	$1,000.00	$1,600.00
1"	2.5	$1,500.00	$2,500.00	$4,000.00
1 1/2"	5	$3,000.00	$5,000.00	$8,000.00
2"	8	$4,800.00	$8,000.00	$12,800.00

3"	15	$9,000.00	$15,000.00	$24,000.00
4"	25	$15,000.00	$25,000.00	$40,000.00
6"	50	$30,000.00	$50,000.00	$80,000.00
8"	80	$48,000.00	$80,000.00	$128,000.00
10"	115	$69,000.00	$115,000.00	$184,000.00

First Reading
October 13, 2020
Item No. 7.7

Second Reading
October 27, 2020
Item No. 7.13

ORDINANCE NO. 2020-O0136

AN ORDINANCE AMENDING TITLE II BUILDINGS; DEVELOPMENT; PROPERTY MAINTENANCE, OF THE CITY OF LUBBOCK CODE OF ORDINANCES, BY ADDING CHAPTER 41, IMPACT FEES; ESTABLISHING WATER, WASTEWATER, AND ROADWAY IMPACT FEES PER SERVICE UNIT; ESTABLISHING PROCEDURES FOR THE ASSESSMENT, COLLECTION, COMPUTATION, EXPENDITURE, REFUND AND GENERAL ADMINISTRATION OF IMPACT FEES; PROVIDING FOR THE ESTABLISHMENT OF ACCOUNTS FOR IMPACT FEES; ESTABLISHING AN APPEAL PROCEDURE; ESTABLISHING EFFECTIVE DATES; PROVIDING A PENALTY; PROVIDING A SAVINGS CLAUSE; AND PROVIDING FOR PUBLICATION.

WHEREAS, Chapter 395, Texas Local Government Code (the Statute) provides the requirements and procedures for the adoption of land use assumptions, a capital improvements plan, and Impact Fees; and

WHEREAS, after notice of a public hearing was given as required by the Statute, the City Council held a public hearing on May 28, 2020 and continued on June 23, 2020, and by Resolution No 2020-R0211 approved the land use assumptions and capital improvements plan; and

WHEREAS, the Capital Improvement Advisory Committee (CIAC) of the City of Lubbock, created pursuant to the Statute, filed its written comments on the proposed Impact Fees before the fifth business day before the date of the public hearing on the imposition of the Impact Fees; and

WHEREAS, after notice of a public hearing was given as required by the Statute, the City Council held a public hearing on October 6, 2020, to discuss the imposition of the Impact Fees by this ordinance with an effective date six months after the adoption of the ordinance; and

WHEREAS, the City Council finds it to be in the best interest of the citizens of the City of Lubbock to adopt and approve the ordinance for Impact Fees herein; **NOW, THEREFORE:**

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF LUBBOCK:

SECTION ONE. **THAT** the Code of Ordinances, City of Lubbock, Texas is hereby amended by adding a Chapter to Article II, Buildings; Development; Property

Maintenance, to be numbered Chapter 41, Impact Fees, which said Chapter shall read as follows:

ARTICLE 41.01 GENERAL PROVISIONS

41.01.001 Purpose.

This Chapter is intended to assure the provision of adequate public facilities to serve New Development in the City by requiring each such development to pay its share of the costs of such improvements necessitated by and attributable to such New Development.

41.01.002. Definitions.

Terms defined herein are specific to this Chapter and shall not be construed as conflicting with similar terms in other parts of the Code.

1. *Assessment* means the determination of the amount of the Maximum Impact Fee per service unit which can be imposed on New Development pursuant to this Chapter.

2. *Capital Improvement* means any water supply, treatment, and distribution; wastewater collection and treatment, or roadway that has a life expectancy of three or more years and is owned and operated by or on behalf of the City including the City's share of costs for infrastructure and associated improvements designated on a City's master plan but constructed by another entity.

3. *Capacity Plans* means a plan recommended by Capital Improvements Advisory Committee and approved by the City Council that identifies capital improvements or facility expansions for which Impact Fees may be assessed. This is the equivalent of the capital improvements plans as described in the Texas Local Government Code 395.

4. *Capital Improvement Advisory Committee* (CIAC) means the advisory committee created in compliance with the Texas Local Government Code Sec. 395.058.

5. *City* means the City of Lubbock, Texas.

6. *City Council* means the City Council of the City of Lubbock, Texas.

7. *City Manager* means the City Manager of the City of Lubbock, Texas, or his or her designee.

8. *Credit* means an amount equal to 50 percent (50%) of the total projected cost of implementing the capital improvements plans in accordance with Sec. 395.014 of the Texas Local Government Code. (*Credit* is not an *offset or reduction*, defined below.)

9. *Effective date* means June 1, 2021, except for Sections 41.02.003(a)&(b) which shall be effective June 1, 2022.

10. *Facility Expansion* means the expansion of the capacity of an existing facility that serves the same function as an otherwise necessary new capital improvement, in order that the existing facility may serve New Development. The term does not include the repair, maintenance, modernization, or expansion of an existing facility to better serve existing development.

11. *Final plat approval* means the point at which the Owner has complied with all conditions of approval in compliance with the City of Lubbock Code of Ordinances and the plat has been released for filing with the County. This term applies to both original plats and replats.

12. *Impact Fee* means a charge or assessment imposed as set forth in this Chapter against New Development in order to generate revenue for funding or recouping the costs of Capacity Improvements or facility expansions necessitated by and attributable to the New Development.

The term includes amortized charges, lump-sum charges, capital recovery fees, contributions in aid of construction and any other fee that functions as described by this Chapter. The term is inclusive of both the maximum assessable Impact Fee and the Impact Fee collection rate as herein described. The term does not include:

a. Dedication of land for public parks or payment in lieu of the dedication to serve park needs;

b. Dedication of rights-of-way or easements or construction or dedication of on-site or off-site water distribution, wastewater collection or drainage facilities, or streets, sidewalks, or curbs if the dedication or construction is required by a valid ordinance and is necessitated by and attributable to the new development;

c. Lot or acreage fees to be placed in trust funds for the purpose of reimbursing developers for oversizing or constructing water or sewer mains or lines; or

d. Other pro rata fees for reimbursement of water or sewer mains or lines extended by the City.

An item included in the Capacity Plans may not be required to be constructed except in accordance with Section 395.019(2) of the Texas Local Government Code, and an Owner may not be required to construct or dedicate facilities and to pay impact fees for those facilities.

13. *Land Use Assumptions* means a description of the service area and projections of changes in land uses, densities, intensities, and population in the service area over at least a 10-year period.

14. *Land Use Vehicle-Mile Equivalency Table* or *LUVMET* are tables set forth in the Impact Fee Study that provide the standardized measure of consumption or use of roadway facilities attributable to a New Development. The LUVMET expresses the number of service units consumed by each individual land use application as vehicle miles per development unit based on regionalized Lubbock values.

15. *Maximum Assessable Impact Fee* means the Impact Fee that is established for each service area computed by calculating the total projected costs of capital improvements necessitated by and attributable to New Development and subtracting a credit in accordance with the Texas Local Government Code Sec. 395.015. The Maximum Impact Fee shall be established and reflected in **Sec. 41.02.003** of this Chapter. The City may adopt an Impact Fee collection rate that is less than this amount, but in no instance shall the Impact Fee exceed the Maximum Assessable Impact Fee except by amendment of this Chapter.

16. *New Development* means a project involving the subdivision of land and/or the construction, reconstruction, redevelopment, conversion, structural alteration, relocation, or enlargement of any structure, or any use or extension of the use of land which has the effect of increasing the requirements for capital improvements, measured by an increase in the number of service units.

17. *Owner* means an owner of real property, or an agent, employee, applicant or representative thereof who is authorized to act on the real property owner's behalf, or a person who is subject to and/or has paid an Impact Fee.

18. *Offset* means the amount of a reduction of an Impact Fee reflecting the value of any construction of, contributions to, or dedications of a system facility agreed to or required by the city as a condition of development approval, pursuant to rules herein established or pursuant to administrative guidelines which value shall be credited on an actual cost basis against capital improvements. (*Offset* is not a "*credit*", defined above).

19. *Recoupment* means the imposition of an Impact Fee that shall be paid to the City for Capacity Improvements which the City has previously oversized to serve New Development.

20. *Reduction* means an amount of the Maximum Assessable Impact Fee that can be reduced in compliance with **Sec. 41.02.003(c)** of this Chapter.

21. *Roadway Facilities* means an arterial that has been designated on the adopted Master Thoroughfare Plan of the City, together with all necessary appurtenances (excluding rights-of-way). The term includes the City's share of costs for roadways and associated improvements designated on the federal or Texas highway system, including local matching funds and costs related to utility line relocation and the establishment of curbs, gutters, sidewalks, drainage appurtenances, and rights-of-way.

22. *Service Area* means the area within the corporate boundaries of the City to be served by the capital improvements or facilities expansions specified in the capacity improvements plan. The map of City of Lubbock service areas adopted is contained within the Impact Fee Study, and incorporated herein.

a. For Water and Wastewater Impact Fees: one (1) service area covers the corporate limits of the City of Lubbock.

b. For Roadway Impact Fees: the term means the geographic area(s) within the City's corporate limits, which:

i. Do not exceed six miles, and

ii. In which Roadway Impact Fees shall be assessed for the cost of New Development.

23. *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, and based on historical data and trends applicable to the City during the previous ten (10) years. (For water and wastewater this is measured by meter size and for roadway this equals one vehicle mile of travel in the afternoon peak hour of traffic and is also referred to as a "vehicle mile").

24. *Site-Related Facility* means an improvement or facility which is for the primary use or benefit of a New Development, or which is for the primary purpose of safe and adequate provision of roadway, water, or wastewater facilities to serve the New Development, and which is not included in the capital improvements plan.

25. *System-Related Facility* is designated in the capacity improvements plan for purpose of Impact Fees. This term may include a capital improvement, which is located off-site, within, or on the perimeter of the development site.

26. *Wastewater Facility* includes, but is not limited to, a wastewater interceptor or main,

lift station or other facility or improvement used for providing wastewater collection and treatment included within the City's collection system for wastewater as illustrated on the City's master plan. This term includes land, easements, or structures associated with such facilities. This term excludes a site-related facility.

27. *Water Facility* includes, but is not limited to, a water interceptor or main, pump station, storage tank, or other facility or improvement used for providing water supply, treatment, and distribution service included within the City's water storage or distribution system as illustrated on the City's master plan. This term includes, but is not limited to, land, easements, or structures associated with such facilities. This term excludes site-related facilities.

ARTICLE 41.02 STUDY AND FEES ADOPTED

41.02.001. Study Adopted.

The Impact Fee Study dated October 6, 2020 is hereby approved, adopted, and incorporated herein for all purposes consistent with this Chapter.

41.02.002. Service Areas.

For Water and Wastewater Impact Fees the City is included as one (1) service area. For Roadway Impact Fees, the City is hereby divided into eight (8) service areas as shown on the official service area map identified within the adopted study. The official service area maps, which, together with all explanatory matter thereon, are hereby adopted by reference and declared to be a part of this chapter.

41.02.003. Impact Fees Adopted.

(a) A Wastewater Impact Fee shall be assessed and charged against New Development in the service area as set forth below.

Meter Size (Based on Water Meter)	Maximum Impact Fee	Collection Rate
1"	$562	$0
1.5"	$1,124	$0

2”	$1,798	$0
3”	$3,934	$0
4”	$6,744	$0
6”	$14,050	$0
8”	$26,976	$0
10”	$42,712	$0

(b) A Water Impact Fee shall be assessed and charged against New Development in the service area as set forth below.

Water Meter Size	Maximum Impact Fee	Collection Rate
1”	$576	$0
1.5”	$1,152	$0
2”	$1,843	$0
3”	$4,032	$0
4”	$6,912	$0
6”	$14,400	$0
8”	$27,648	$0
10”	$43,776	$0

(c) A Roadway Impact Fee shall be assessed and charged against New Development in the service areas as set forth below. The number of service units applicable are identified in the LUVMET table contained within the adopted study.

Service Area	Maximum Fee Per Service Unit (per Vehicle-Mile)	Collection Rate Per Single Family	Collection Rate For Non-Single Family***
A	$878	$439.00	$439.00
B	$655	$327.50	$327.50
C	$825	$412.50	$412.50
D	$639	$319.50	$319.50
E	$994	$497.50	$497.50
F	$1,178	$589.00	$589.00
G	$23	$0	$0
H	$77	$0	$0

***** Impact Fee Reductions for Collection Rates.**

Roadway Impact Fees: Service Areas G & H shall receive a one hundred percent (100%) discount from the Maximum Impact Fee rate shown above in **Sec. 41.02.003(c)** for all land uses.

Roadway Impact Fees: All other Service Areas shall receive a fifty percent (50%) discount from the Maximum Impact Fee rate shown above in **Sec. 41.02.003(c)** for all land uses.

ARTICLE 41.03 REQUIREMENT AND ASSESSMENT

41.03.001. Impact Fees Required.

No final plat for New Development shall be released for recordation and no building permit shall be issued without the assessment and payment of applicable Impact Fees pursuant to this Chapter. Except as otherwise provided in this Chapter, no building permit shall be issued until the owner has paid the City of Lubbock all applicable Impact Fees due.

41.03.002. City Contribution on Projects Subject to Impact Fees.

The City shall be responsible for the cost delta of approved projects funded by collected impact fees in an amount ratable to the amount of impact fees collected by Service Area.

41.03.003. Assessment of Impact Fees

(a) Assessment of the Impact Fees for any New Development shall be based on the applicable Impact Fees per service unit in the applicable Service Area in effect at the time of assessment. No act by the City is required to assess Impact Fees.

(b) For a New Development which has received final plat approval before the effective date, assessment of Impact Fees shall occur on the effective date and shall be the amount of the Maximum Impact Fee. No Impact Fees shall be paid by New Development if the building permit is issued within one year after the effective date of the Chapter, except as provided for in **Sec. 41.05.001(b)** of this Chapter.

(c) For land that is not required to be platted at time of the application for a building permit or water meter, assessment of Impact Fees shall be assessed at the time of application for building permit or water meter and shall be the amount of the Maximum Assessable Impact Fee per Service Unit then in effect.

(d) For a New Development which has received final plat approval on or after the effective date of this Chapter, assessment of Impact Fees shall be assessed at the time of final approval of the final plat.

(e) After assessment of the Impact Fees attributable to a New Development, or execution of an agreement for payment of Impact Fees, additional Impact Fees or increases in fees may not be assessed against the tract unless, the number of service units to be developed on the tract increases. In the event of the increase in the number of service units, the Impact Fees to be assessed are limited to the amount attributable to the additional service units.

(f) The City Engineer, or his or her designee, shall compute the Impact Fees for New Development. The total amount of Impact Fees assessed for the New Development shall be attached to the development application, and payment of the Impact Fees shall be required as a condition of approval.

ARTICLE 41.04 CREDITS AND OFFSETS

41.04.001. Credits and Offsets Against Impact Fees.

The City may offset the improvements or funding for construction of any system facility included on the identified capacity plans that is required or agreed to by the City, pursuant to rules established in this section and administrative guidelines. Any agreements entered into hereunder shall be subject to the approval of the City Council of the City of Lubbock.

(a) *General credit.* The City shall apply against assessed Impact Fees a credit equal to fifty percent (50%) of the total projected cost of implementing the capacity plan. This credit is already reflected in the Maximum Assessable Impact Fee.

(b) *Offsets by developer.* Before Impact Fees can be reduced by offsets authorized under this section, the owner of the property shall apply for offsets based on actual costs with the City. Unless an agreement specifies otherwise, an offset associated with a plat shall be applied when the first building permit is submitted and to each subsequent building permit application to reduce the Impact Fees due until the amount associated with the offset is exhausted.

(c) *Roadway offsets.* Any construction of, contributions to, or dedications of roadway facilities that are system-related facilities included on the identified capacity plans and that are agreed to or required by the City as a condition of development approval shall be offset against roadway facilities impact fees otherwise due from the development.

(d) *Water offsets.* Any construction of, contributions to, or dedications of water facilities that are system-related facilities included on the identified capacity plans and that are agreed to or required by the City as a condition of development approval shall be offset against water facilities impact fees otherwise due from the development.

(e) *Wastewater offsets.* Any construction of, contributions to, or dedications of wastewater facilities that are system-related facilities included on the identified capacity plans and that are agreed to or required by the City as a condition of development approval shall be offset against roadway facilities impact fees otherwise due from the development.

(f) *No offsets for rights-of-way or easements.* Rights-of-way and easements are not included in the study, and no offsets shall be granted for the dedication of rights-of-way or easements. Rights-of-way and easements are dedicated as required by the ordinances of the City, necessitated by and attributable to a New Development, and do not exceed the amount required for infrastructure improvements that are roughly proportionate to the New Development.

(g) *Master planned projects.* Master planned projects, including subdivisions containing multiple phases, and whether approved before or after the effective date of the impact fee regulations, may apply for offsets against impact fees for the entire project based upon improvements or funds toward construction of system facilities, or other capital improvements supplying excess capacity. Offsets shall be spent within the same Service Area utilizing a methodology approved by the City and be approved in an agreement.

ARTICLE 41.05 COLLECTION AND EXEMPTIONS

41.05.001. Collection of Impact Fees.

(a) Impact Fees shall be collected and paid at the time of issuance of a building permit or, application for a water meter, for a New Development.

(b) For a New Development that received final plat approval before the effective date, Impact Fees may not be collected on any service unit for which a valid building permit is issued within one year after the effective date of this Chapter; ***except*** additional Impact fees shall be assessed in accordance with **Sec. 41.03.002(e)** of this Chapter when:

1. A subsequent application(s) for a building permit is submitted more than one year after the effective date of this Chapter; and

2. The number of services units to be developed increases.

(c) For land that does not have to be platted, an Impact Fee may not be collected on any service unit for which a valid building permit is issued within one year after the effective date.

(d) The City shall compute the Roadway Impact Fees to be paid and collected for the New Development in the following manner:

1. Determine the number of development units for each land use category in the New Development using the land use equivalency table (LUVMET) then in effect.

2. Multiply the number of development units for each land use category in the New Development by the vehicle miles (per development unit) for each such land use category also found in land use equivalency table (LUVMET) then in effect to determine the number of service units attributable to the New Development.

3. The amount of Roadway Impact Fees to be collected shall be determined by multiplying the number of service units for the New Development by the Roadway Impact Fee per service unit for the applicable service area and applicable land use and shall be collected with the issuance of a building permit.

4. The amount of the Roadway Impact Fees to be collected shall be calculated as described in **Sec. 41.02.003(c)** of this Chapter.

5. If an agreement as described in **Sec. 41.04.001** of this Chapter providing for offsets is entered, the amount of the offsets based on actual costs shall be deducted from the Roadway Impact Fees as calculated above.

(e) Where an application for a building permit is for a "shell" or speculative building, the amount of the Roadway Impact Fee shall be calculated assuming that the entire building will be used as either "General Office", "Light Industrial", or "Shopping Center" as shown in the land use equivalency table (LUVMET). Where a subsequent application for a building permit is made for the finish-out of the shell building, or portion thereof, for the ultimate use, an additional Roadway Impact Fee shall be assessed and collected if the ultimate use is different from "General Office", "Light Industrial", or "Shopping Center".

(f) An applicant may submit an alternative service unit computation based upon a trip generation study as defined by the Institute of Transportation Engineers for the proposed land use not included in the land use equivalency table (LUVMET).

(g) The City may enter into a payment agreement for Impact Fees based on administrative guidelines. All Impact Fees shall be paid prior to the issuance of a building permit.

(h) The City shall compute the Water and Wastewater Impact Fees by water meter size. The amount of Water and Wastewater Impact Fees shall be collected as set forth in **Sec. 41.02.003(a) & (b)** of this Chapter.

41.05.002. Impact Fee Exemptions.

(a) Pursuant to Texas Local Government Code Chapter 395, a public school district is not required to pay an Impact Fee imposed under this Chapter unless the board of trustees of the district consents to the payment of the fees by entering a contract with the City imposing the fees.

(b) Roadway Impact Fees will not be collected in Service Areas G and H.

(c) No additional Roadway Impact Fee shall be assessed for existing, occupied buildings that:

1. Are not being demolished;
2. Have a change of use; and
3. The total square footage is modified by less than 1,000 additional square feet.

(d) Affordable housing. Development that qualifies as affordable housing under 42 U.S.C. § 12745, as amended, and is participating in an affordable housing development program, is exempt from roadway impact fee collection. An applicant for affordable housing exemption shall make application for same by letter to the City Engineer or his/her designee. The letter shall describe the development, its location and number of housing units, and shall include written verification from the responsible agency that the subject property is an active participant in an affordable housing development program as described above. If the fee is not paid and the affordable housing is not built or the development subsequently is not qualified as affordable housing, the City shall assess and collect the roadway impact fee that was applicable at the time of the issuance of the building permit(s) for the development.

(e) The City of Lubbock may spend funds from any lawful source to pay for all or part of the capital improvements or facility expansions to reduce the amount of impact fees.

41.06 ADMINISTRATION

41.06.001. Administration of Impacts Fees

(a) The Impact Fees collected within each service area may be used to finance, pay for or to recoup the costs of any capital improvements identified in the capacity plans for the service area, including the construction contract price, surveying and engineering fees.

(b) Impact Fees may be used to pay for the contract services of an independent qualified engineer or financial consultant preparing or updating the capacity plans who is not an employee of the political subdivision.

(c) Impact Fees also may be used to pay the principal sum and interest and other finance costs on bonds, notes or other obligations issued by or on behalf of the City to finance such capital improvements in the capacity plans.

(d) The City's Finance Department shall establish an account to which interest is allocated for each Service Area which interest earned on the Impact Fees shall be considered funds of the account and shall be used solely for the purposes authorized in this Chapter.

(e) The City's Finance Department shall maintain and keep financial records for Impact Fees which shows the source and disbursement of all fees collected in or expended from each Service Area to be provided in the semiannual report to the Capital Improvements Advisory Committee.

(f) The City will present the financial records for Impact Fees to the Capital Improvements Advisory Committee twice a year and shall be open for public inspection.

41.06.002. Impact Fees as Additional and Supplemental Regulation

Impact Fees established by this Chapter are additional and supplemental to, and not in substitution of, any other requirements imposed by the City on the development of land or the issuance of building permits or certificates of occupancy. Such Impact Fees are intended to be consistent with and to further the policies of Plan Lubbock 2040, the Master

Thoroughfare Plan, Water Master Plan, Wastewater Master Plan, the Land Development Code, and other City policies, ordinances and resolutions by which the City seeks to ensure the provision of adequate public facilities in conjunction with the development of land. This Chapter shall not affect, in any manner, the permissible use of property, density of development, design, and improvement standards and requirements, or any other aspect of the development of land or provision of public improvements subject to the zoning and subdivision regulations or other regulations and policies of the City, which shall be operative and remain in full force and effect without limitation with respect to all such development.

41.06.003. Update to Plans and Revision of Fees.

The City shall update its Land Use Assumptions and Capacity plan based in accordance with Texas Local Government Code Chapter 395.

The collection rates in **Sec. 41.02.003** of this Chapter may be amended without revising the Land Use Assumptions and Capacity Plans at any time provided the public hearing process is followed as outlined in Texas Local Government Code Chapter 395 and collection rates do not exceed the Maximum Assessable Impact Fees. Any update to the collection rate or Impact Fee Ordinance shall require a public hearing following the process outlined with Texas Local Government Code Chapter 395, including a collection rate review by the CIAC. The City Council shall provide the CIAC with a minimum of sixty (60) days to review the requested ordinance changes. Any change to the impact fee collection rate shall go into effect six (6) months from the adoption date of the new collection rates.

41.06.004. Refunds, Rebates and Appeals

(a) *Refunds.* Upon payment of an Impact Fee any portion that is not expended in the Service Area within ten (10) years from the date of payment shall be refunded to the record owner of the property at the time the refund is paid in accordance with the Texas Local Government Code Sec. 395.025. Impact Fees shall be accounted for and expended on a first-in, first-out basis.

(b) *Rebates.* In the event that after six (6) months of paying an Impact Fee, no vertical construction has occurred, and a modified or new application has not been filed, the City shall, upon written request, rebate that amount to the record owner of the property for which the Impact Fee was paid. No interest shall be paid on the rebate. If no written request for rebate pursuant to this subsection has been filed within this period, no rebate shall become due.

(c) *Appeals.* The Owner for New Development may appeal the applicability or amount of the Impact Fee or the availability of Offsets or Refunds to the City Manager or his/her designee using the following:

1. *Burden of proof.* The burden of proof shall be on the owner to demonstrate that the owner is entitled to relief.

2. *Notice of appeal.* Within 30 days following the decision being appealed, the owner shall submit to the City Manager or his/her designee a written notice of appeal that states the basis for the appeal with particularity. To the extent the owner relies on any studies or other documents as evidence that the owner is entitled to relief, the owner shall submit such studies and documents with the notice of appeal.

3. *Resolution of appeal.* The City Manager or his/her designee will respond to the appeal within 30 days of receipt of completed appeal packet as described above.

4. *Consideration of Appeal by City Council.* Following the determination of the City Manager, the owner may petition the City Council. The petition of appeal to City Council shall be filed within 30 days of the City Manager or his/her designee's written decision on the appeal submitted in accordance with **Sec. 41.06.004(c)(2),** above. To the extent that the City Council's action on the appeal requires the owner to pay an impact fee, the owner shall promptly pay the impact fee within five (5) business days after the City Council's action on the appeal. The City Council's action on the appeal shall constitute the City's final decision on the matter appealed.

SECTION TWO. THAT the effective date of this ordinance shall be June 1, 2021, except for Sections 41.02.003(a)&(b) which shall have an effective date of June 1, 2022.

SECTION THREE. THAT violation of any provision of this Ordinance shall be deemed a misdemeanor punishable by a fine not to exceed applicable fines in accordance with Section 1.01.004 of the City Code of Ordinances.

SECTION FOUR. THAT should any paragraph, sentence, clause, phrase or work of this Ordinance be declared unconstitutional or invalid for any reason, the remainder of this Ordinance shall not be affected thereby.

SECTION FIVE. THAT the City Secretary is hereby authorized to cause publication of the descriptive caption of this Ordinance as an alternative method provided by law.

AND IT IS SO ORDERED.

Passed by the City Council on first reading this 13th day of October, 2020.

Passed by the City Council on second reading this 27th day of October, 2020.

DANIEL M. POPE, MAYOR

ATTEST:

Rebecca Garza, City Secretary

APPROVED AS TO CONTENT:

For Jesica McEachern, Assistant City Manager

APPROVED AS TO FORM:

Kelli Leisure, Assistant City Attorney

AsPassed_AmendOrd.ImpactFees
10.28.20

19 APPENDIX J

Water Utility Cost of Service: 20-Year 3% Forecast

CITY OF LAREDO
WATER UTILITY COST OF SERVICE FORECAST

Water Utility Cash Flow Forecast Summary
Scenario: **2022 05 27 Master Plan -- 3.0% Annual Water Adjustments**

		Test Year 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Revenues and Expenses -- CASH BASIS										
	Water Revenues										
	Water Rate Revenue										
W.1	Residential	$ 21,539,876	$ 22,664,807	$ 23,811,646	$ 25,016,516	$ 26,282,351	$ 27,612,238	$ 29,009,417	$ 30,477,294	$ 32,019,445	$ 33,639,629
W.2	Res. Irrigation	2,503,482	2,634,227	2,767,519	2,907,556	3,054,678	3,209,245	3,371,633	3,542,237	3,721,474	3,909,781
W.3	Commercial	14,958,597	15,739,817	16,536,251	17,372,986	18,252,059	19,175,613	20,145,899	21,165,282	22,236,245	23,361,399
W.4	Com. Irrigation	7,271,294	7,651,041	8,038,183	8,444,916	8,872,228	9,321,163	9,792,814	10,288,330	10,808,920	11,355,851
W.5	Outside	5,197	5,468	5,744	6,035	6,340	6,661	6,998	7,352	7,724	8,115
W.6	Fire Hydrant	850,298	894,706	939,978	987,540	1,037,510	1,090,008	1,145,162	1,203,108	1,263,985	1,327,943
W.7	Unitec	136,157	143,267	150,517	158,133	166,134	174,541	183,373	192,651	202,399	212,641
		47,264,900	49,733,333	52,249,839	54,893,681	57,671,301	60,589,469	63,655,296	66,876,254	70,260,193	73,815,359
	Non-Rate Revenues	9,853,222	9,869,091	9,885,278	9,901,789	9,918,630	9,935,807	9,953,329	9,971,200	9,989,429	10,008,023
	Total Revenues	**57,118,122**	**59,602,424**	**62,135,118**	**64,795,470**	**67,589,931**	**70,525,277**	**73,608,625**	**76,847,455**	**80,249,622**	**83,823,381**
	Increase		4.3%	4.2%	4.3%	4.3%	4.3%	4.4%	4.4%	4.4%	4.5%
	Water Cost of Service										
	Operating Expenses										
UB	Utility Billing	5,715,293	5,906,074	6,104,128	6,309,795	6,523,439	6,745,444	6,976,215	7,216,185	7,465,812	7,725,582
WT	Water Treatment	9,821,824	10,342,287	10,899,350	11,496,053	12,135,715	12,821,957	13,558,731	14,350,353	15,201,539	16,117,439
WD	Water Distribution	5,613,886	5,837,626	6,071,672	6,316,578	6,572,935	6,841,369	7,122,546	7,417,174	7,726,005	8,049,841
WPC	Water Pollution Control	533,451	549,027	565,275	582,230	599,930	618,418	637,737	657,935	679,061	701,170
A	Administration	4,974,414	5,107,764	5,224,124	5,345,197	5,471,220	5,602,450	5,739,155	5,881,623	6,030,160	6,185,092
GIS	GIS	445,841	461,338	477,470	494,269	511,770	530,010	549,028	568,867	589,569	611,184
ENG	Engineering	1,497,905	1,551,610	1,607,629	1,666,087	1,727,120	1,790,869	1,857,487	1,927,137	1,999,992	2,076,238
AM	Asset Management	312,851	324,485	336,649	349,371	362,685	376,625	391,228	406,534	422,584	439,424
	Total Operating Expenses	28,915,465	30,080,212	31,286,296	32,559,581	33,904,816	35,327,143	36,832,129	38,425,809	40,114,724	41,905,969
	Net Revenues for Transfers, Contingencies and Debt Service (1)	**28,202,657**	**29,522,212**	**30,848,822**	**32,235,889**	**33,685,115**	**35,198,134**	**36,776,496**	**38,421,646**	**40,134,898**	**41,917,412**
	Debt Service										
	Current Debt -- 1st Lien, Subordinate, COs	19,877,981	19,802,106	19,755,362	18,948,393	19,840,910	18,972,229	18,458,415	18,402,479	18,400,500	18,406,478
	2022 Senior Lien Revenue Debt	**-**	**5,936,808**	**5,937,216**	**5,936,841**	**5,937,591**	**5,939,216**	**5,936,216**	**5,934,591**	**5,937,841**	**5,936,091**
	2024 Senior Lien Revenue Debt	**-**	**-**	**-**	**5,354,103**	**5,351,375**	**5,355,375**	**5,355,875**	**5,352,875**	**5,356,125**	**5,355,375**
	Additional Future Debt	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Total Debt Service (2)	19,877,981	25,738,914	25,692,578	30,239,337	31,129,876	30,266,820	29,750,506	29,689,945	29,694,466	29,697,944
	Net Revenues for Transfers and Contingencies	8,324,677	3,783,298	5,156,244	1,996,553	2,555,239	4,931,314	7,025,990	8,731,701	10,440,433	12,219,468
	Transfers and Contingencies	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550
	Total Cost of Service	**56,566,995**	**63,592,676**	**64,752,424**	**70,572,467**	**72,808,242**	**73,367,513**	**74,356,185**	**75,889,303**	**77,582,739**	**79,377,463**
	Net Revenues	**551,127**	**(3,990,252)**	**(2,617,306)**	**(5,776,997)**	**(5,218,311)**	**(2,842,236)**	**(747,560)**	**958,151**	**2,666,883**	**4,445,918**
	Percent of COS	1.0%	-6.7%	-4.2%	-8.9%	-7.7%	-4.0%	-1.0%	1.2%	3.3%	5.3%
	Debt Coverage (1)/(2)	**1.42**	**1.15**	**1.20**	**1.07**	**1.08**	**1.16**	**1.24**	**1.29**	**1.35**	**1.41**

CITY OF LAREDO
WATER UTILITY COST OF SERVICE FORECAST

Water Utility Cash Flow Forecast Summary
Scenario: **2022 05 27 Master Plan -- 3.0% Annual Water Adjustments**

		2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
	Revenues and Expenses -- CASH BASIS										
	Water Revenues										
	Water Rate Revenue										
W.1	Residential	$ 35,341,794	$ 37,130,089	$ 39,008,872	$ 40,982,720	$ 43,056,446	$ 45,235,102	$ 47,523,998	$ 49,928,713	$ 52,455,106	$ 55,109,334
W.2	Res. Irrigation	4,107,616	4,315,461	4,533,824	4,763,235	5,004,255	5,257,470	5,523,498	5,802,987	6,096,618	6,405,107
W.3	Commercial	24,543,486	25,785,386	27,090,126	28,460,887	29,901,008	31,413,999	33,003,547	34,673,527	36,428,007	38,271,264
W.4	Com. Irrigation	11,930,457	12,534,138	12,088,647	12,600,213	13,237,784	13,907,616	14,611,341	15,350,675	16,127,419	16,943,466
W.5	Outside	8,526	8,957	9,410	9,887	10,387	10,913	11,465	12,045	12,654	13,295
W.6	Fire Hydrant	1,395,136	1,465,730	1,539,896	1,617,815	1,699,676	1,785,680	1,876,036	1,970,963	2,070,694	2,175,471
W.7	Unitec	223,400	234,704	246,580	259,057	272,166	285,937	300,406	315,606	331,576	348,354
		77,550,416	81,474,467	84,517,356	88,693,815	93,181,722	97,896,717	102,850,291	108,054,515	113,522,074	119,266,291
	Non-Rate Revenues	10,026,988	10,046,333	10,066,065	10,086,191	10,106,720	10,127,660	10,149,018	10,170,803	10,193,024	10,215,690
	Total Revenues	**87,577,404**	**91,520,800**	**94,583,421**	**98,780,006**	**103,288,442**	**108,024,376**	**112,999,308**	**118,225,318**	**123,715,098**	**129,481,981**
	Increase	4.5%	4.5%	3.3%	4.4%	4.6%	4.6%	4.6%	4.6%	4.6%	4.7%
	Water Cost of Service										
	Operating Expenses										
UB	Utility Billing	7,996,011	8,277,649	8,571,080	8,876,925	9,195,845	9,528,545	9,875,774	10,238,333	10,617,075	11,012,909
WT	Water Treatment	17,103,682	18,166,424	19,312,392	20,548,945	21,884,134	23,326,767	24,886,481	26,573,829	28,400,360	30,378,723
WD	Water Distribution	8,389,532	8,745,986	9,120,168	9,513,108	9,925,901	10,359,715	10,815,797	11,295,476	11,800,169	12,331,389
WPC	Water Pollution Control	724,318	748,567	773,983	800,635	828,600	857,956	888,790	921,194	955,267	991,115
A	Administration	6,346,766	6,515,551	6,691,841	6,876,058	7,068,649	7,270,094	7,480,905	7,701,629	7,932,849	8,175,191
GIS	GIS	633,761	657,355	682,023	707,828	734,833	763,111	792,735	823,787	856,352	890,522
ENG	Engineering	2,156,072	2,239,707	2,327,369	2,419,300	2,515,760	2,617,025	2,723,393	2,835,183	2,952,735	3,076,415
AM	Asset Management	457,102	475,670	495,184	515,703	537,290	560,014	583,948	609,171	635,767	663,826
	Total Operating Expenses	43,807,245	45,826,910	47,974,041	50,258,501	52,691,011	55,283,226	58,047,824	60,998,601	64,150,573	67,520,089
	Net Revenues for Transfers, Contingencies and Debt Service (1)	**43,770,159**	**45,693,890**	**46,609,380**	**48,521,505**	**50,597,431**	**52,741,151**	**54,951,484**	**57,226,717**	**59,564,525**	**61,961,891**
	Debt Service										
	Current Debt -- 1st Lien, Subordinate, COs	18,401,738	18,331,328	16,597,879	16,607,197	16,644,534	16,642,510	16,633,655	16,607,622	12,908,113	8,221,455
	2022 Senior Lien Revenue Debt	**5,939,091**	**5,938,731**	**5,939,013**	**5,937,187**	**5,938,198**	**5,936,390**	**5,936,788**	**5,939,333**	**5,938,552**	**5,934,584**
	2024 Senior Lien Revenue Debt	**5,355,500**	**5,351,375**	**5,352,750**	**5,354,250**	**5,355,625**	**5,351,750**	**5,352,375**	**5,352,125**	**5,355,625**	**5,352,625**
	Additional Future Debt	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
	Total Debt Service (2)	29,696,329	29,621,434	27,889,642	27,898,634	27,938,357	27,930,650	27,922,818	27,899,080	24,202,290	19,508,664
	Net Revenues for Transfers and Contingencies	14,073,830	16,072,456	18,719,738	20,622,871	22,659,074	24,810,501	27,028,666	29,327,637	35,362,235	42,453,227
	Transfers and Contingencies	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550
	Total Cost of Service	**81,277,124**	**83,221,894**	**83,637,233**	**85,930,685**	**88,402,918**	**90,987,426**	**93,744,192**	**96,671,231**	**96,126,413**	**94,802,303**
	Net Revenues	**6,300,280**	**8,298,906**	**10,946,188**	**12,849,321**	**14,885,524**	**17,036,951**	**19,255,116**	**21,554,087**	**27,588,685**	**34,679,677**
	Percent of COS	7.2%	9.1%	11.6%	13.0%	14.4%	15.8%	17.0%	18.2%	22.3%	26.8%
	Debt Coverage (1)/(2)	**1.47**	**1.54**	**1.67**	**1.74**	**1.81**	**1.89**	**1.97**	**2.05**	**2.46**	**3.18**

CITY OF LAREDO
WATER UTILITY COST OF SERVICE FORECAST

Water Utility Cash Flow Forecast Summary
Scenario: **2022 05 27 Master Plan -- 3.0% Annual Water Adjustments**

		Test Year 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Total Accounts										
	Total Accounts	**78,538**	**80,109**	**81,711**	**83,345**	**85,012**	**86,712**	**88,447**	**90,215**	**92,020**	**93,860**
	New Accounts		1,571	1,602	1,634	1,667	1,700	1,734	1,769	1,804	1,840
	Avg. Annual Growth Rate		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Annual Water Consumption										
W.1	Residential	6,408,739,136	6,536,913,918	6,667,652,197	6,801,005,241	6,937,025,345	7,075,765,852	7,217,281,169	7,361,626,793	7,508,859,329	7,659,036,515
W.2	Res. Irrigation	794,128,662	810,011,235	826,211,460	842,735,689	859,590,403	876,782,211	894,317,855	912,204,212	930,448,296	949,057,262
W.3	Commercial	2,569,476,086	2,620,865,607	2,673,282,920	2,726,748,578	2,781,283,550	2,836,909,221	2,893,647,405	2,951,520,353	3,010,550,760	3,070,761,775
W.4	Com. Irrigation	1,314,849,509	1,341,146,499	1,367,969,429	1,395,328,818	1,423,235,394	1,451,700,102	1,480,734,104	1,510,348,786	1,540,555,762	1,571,366,877
W.5	Outside	520,000	530,400	541,008	551,828	562,865	574,122	585,604	597,317	609,263	621,448
W.6	Fire Hydrant	138,100,000	140,862,000	143,679,240	146,552,825	149,483,881	152,473,559	155,523,030	158,633,491	161,806,161	165,042,284
W.7	Unitec	9,810,000	10,006,200	10,206,324	10,410,450	10,618,659	10,831,033	11,047,653	11,268,606	11,493,979	11,723,858
	Total System	**11,235,623,392**	**11,460,335,860**	**11,689,542,578**	**11,923,333,429**	**12,161,800,098**	**12,405,036,100**	**12,653,136,822**	**12,906,199,558**	**13,164,323,549**	**13,427,610,020**

CITY OF LAREDO
WATER UTILITY COST OF SERVICE FORECAST

Water Utility Cash Flow Forecast Summary
Scenario: **2022 05 27 Master Plan -- 3.0% Annual Water Adjustments**

		2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
	Total Accounts										
	Total Accounts	**95,737**	**97,652**	**99,605**	**101,597**	**103,629**	**105,702**	**107,816**	**109,972**	**112,172**	**114,415**
	New Accounts	1,877	1,915	1,953	1,992	2,032	2,073	2,114	2,156	2,199	2,243
	Avg. Annual Growth Rate	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Annual Water Consumption										
W.1	Residential	7,812,217,246	7,968,461,590	8,127,830,822	8,290,387,439	8,456,195,187	8,625,319,091	8,797,825,473	8,973,781,983	9,153,257,622	9,336,322,775
W.2	Res. Irrigation	968,038,408	987,399,176	1,007,147,159	1,027,290,102	1,047,835,904	1,068,792,623	1,090,168,475	1,111,971,845	1,134,211,281	1,156,895,507
W.3	Commercial	3,132,177,011	3,194,820,551	3,258,716,962	3,323,891,301	3,390,369,127	3,458,176,510	3,527,340,040	3,597,886,841	3,669,844,578	3,743,241,469
W.4	Com. Irrigation	1,602,794,215	1,634,850,099	1,667,547,101	1,700,898,043	1,734,916,004	1,769,614,324	1,805,006,611	1,841,106,743	1,877,928,878	1,915,487,455
W.5	Outside	633,877	646,555	659,486	672,675	686,129	699,852	713,849	728,126	742,688	757,542
W.6	Fire Hydrant	168,343,129	171,709,992	175,144,192	178,647,076	182,220,017	185,864,418	189,581,706	193,373,340	197,240,807	201,185,623
W.7	Unitec	11,958,335	12,197,502	12,441,452	12,690,281	12,944,087	13,202,968	13,467,028	13,736,368	14,011,096	14,291,318
	Total System	**13,696,162,221**	**13,970,085,465**	**14,249,487,174**	**14,534,476,918**	**14,825,166,456**	**15,121,669,785**	**15,424,103,181**	**15,732,585,245**	**16,047,236,949**	**16,368,181,688**

20 APPENDIX K
Alternative Water Utility Cost of Service: 20-Year 6% Forecast

CITY OF LAREDO
WATER UTILITY COST OF SERVICE FORECAST

Water Utility Cash Flow Forecast Summary

Scenario: **2022 05 27 Master Plan -- 6.0% Annual Water Adjustments**

		Test Year 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Revenues and Expenses -- CASH BASIS										
	Water Revenues										
	Water Rate Revenue										
W.1	Residential	$ 21,539,876	$ 23,271,408	$ 25,161,046	$ 27,204,123	$ 29,413,098	$ 31,801,441	$ 34,383,718	$ 37,175,676	$ 40,194,341	$ 43,458,122
W.2	Res. Irrigation	2,503,482	2,704,730	2,924,354	3,161,811	3,418,551	3,696,137	3,996,263	4,320,760	4,671,605	5,050,940
W.3	Commercial	14,958,597	16,161,077	17,473,357	18,892,193	20,426,239	22,084,850	23,878,140	25,817,044	27,913,388	30,179,956
W.4	Com. Irrigation	7,271,294	7,855,813	8,493,705	9,183,394	9,929,086	10,735,327	11,607,036	12,549,527	13,568,549	14,670,315
W.5	Outside	5,197	5,614	6,070	6,563	7,096	7,672	8,295	8,969	9,697	10,485
W.6	Fire Hydrant	850,298	918,651	993,246	1,073,897	1,161,098	1,255,379	1,357,316	1,467,530	1,586,693	1,715,533
W.7	Unitec	136,157	147,102	159,046	171,961	185,924	201,021	217,344	234,993	254,074	274,705
		47,264,900	51,064,396	55,210,824	59,693,943	64,541,092	69,781,828	75,448,113	81,574,499	88,198,349	95,360,055
	Non-Rate Revenues	9,853,222	9,869,091	9,885,278	9,901,789	9,918,630	9,935,807	9,953,329	9,971,200	9,989,429	10,008,023
	Total Revenues	**57,118,122**	**60,933,487**	**65,096,103**	**69,595,732**	**74,459,721**	**79,717,636**	**85,401,441**	**91,545,700**	**98,187,778**	**105,368,078**
	Increase		6.7%	6.8%	6.9%	7.0%	7.1%	7.1%	7.2%	7.3%	7.3%
	Water Cost of Service										
	Operating Expenses										
UB	Utility Billing	5,715,293	5,906,074	6,104,128	6,309,795	6,523,439	6,745,444	6,976,215	7,216,185	7,465,812	7,725,582
WT	Water Treatment	9,821,824	10,342,287	10,899,350	11,496,053	12,135,715	12,821,957	13,558,731	14,350,353	15,201,539	16,117,439
WD	Water Distribution	5,613,886	5,837,626	6,071,672	6,316,578	6,572,935	6,841,369	7,122,546	7,417,174	7,726,005	8,049,841
WPC	Water Pollution Control	533,451	549,027	565,275	582,230	599,930	618,418	637,737	657,935	679,061	701,170
A	Administration	4,974,414	5,107,764	5,224,124	5,345,197	5,471,220	5,602,450	5,739,155	5,881,623	6,030,160	6,185,092
GIS	GIS	445,841	461,338	477,470	494,269	511,770	530,010	549,028	568,867	589,569	611,184
ENG	Engineering	1,497,905	1,551,610	1,607,629	1,666,087	1,727,120	1,790,869	1,857,487	1,927,137	1,999,992	2,076,238
AM	Asset Management	312,851	324,485	336,649	349,371	362,685	376,625	391,228	406,534	422,584	439,424
	Total Operating Expenses	28,915,465	30,080,212	31,286,296	32,559,581	33,904,816	35,327,143	36,832,129	38,425,809	40,114,724	41,905,969
	Net Revenues for Transfers, Contingencies and Debt Service (1)	**28,202,657**	**30,853,275**	**33,809,807**	**37,036,152**	**40,554,905**	**44,390,493**	**48,569,312**	**53,119,891**	**58,073,054**	**63,462,108**
	Debt Service										
	Current Debt -- 1st Lien, Subordinate, COs	19,877,981	19,802,106	19,755,362	18,948,393	19,840,910	18,972,229	18,458,415	18,402,479	18,400,500	18,406,478
	2022 Senior Lien Revenue Debt	**-**	**5,936,808**	**5,937,216**	**5,936,841**	**5,937,591**	**5,939,216**	**5,936,216**	**5,934,591**	**5,937,841**	**5,936,091**
	2024 Senior Lien Revenue Debt	**-**	**-**	**-**	**5,354,103**	**5,351,375**	**5,355,375**	**5,355,875**	**5,352,875**	**5,356,125**	**5,355,375**
	Additional Future Debt	**-**	**-**	**-**	**-**	**-**	**4,722,734**	**9,445,468**	**11,735,279**	**17,889,145**	**25,617,255**
	Total Debt Service (2)	19,877,981	25,738,914	25,692,578	30,239,337	31,129,876	34,989,554	39,195,974	41,425,224	47,583,610	55,315,199
	Net Revenues for Transfers and Contingencies	8,324,677	5,114,361	8,117,229	6,796,815	9,425,029	9,400,939	9,373,338	11,694,667	10,489,444	8,146,909
	Transfers and Contingencies	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550
	Total Cost of Service	**56,566,995**	**63,592,676**	**64,752,424**	**70,572,467**	**72,808,242**	**78,090,247**	**83,801,653**	**87,624,582**	**95,471,884**	**104,994,718**
	Net Revenues	**551,127**	**(2,659,189)**	**343,679**	**(976,735)**	**1,651,479**	**1,627,389**	**1,599,788**	**3,921,117**	**2,715,894**	**373,359**
	Percent of COS	1.0%	-4.4%	0.5%	-1.4%	2.2%	2.0%	1.9%	4.3%	2.8%	0.4%
	Debt Coverage (1)/(2)	**1.42**	**1.20**	**1.32**	**1.22**	**1.30**	**1.27**	**1.24**	**1.28**	**1.22**	**1.15**

CITY OF LAREDO
WATER UTILITY COST OF SERVICE FORECAST

Water Utility Cash Flow Forecast Summary
Scenario: **2022 05 27 Master Plan -- 6.0% Annual Water Adjustments**

		2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
	Revenues and Expenses -- CASH BASIS										
	Water Revenues										
	Water Rate Revenue										
W.1	Residential	$ 45,762,144	$ 48,077,708	$ 50,510,440	$ 53,066,268	$ 55,751,421	$ 58,572,443	$ 61,536,209	$ 64,649,941	$ 67,921,228	$ 71,358,042
W.2	Res. Irrigation	5,318,726	5,587,853	5,870,599	6,167,651	6,479,734	6,807,609	7,152,074	7,513,969	7,894,175	8,293,621
W.3	Commercial	31,780,008	33,388,077	35,077,513	36,852,435	38,717,169	40,676,257	42,734,476	44,896,841	47,168,621	49,555,353
W.4	Com. Irrigation	15,448,092	16,229,766	15,652,923	16,315,322	17,140,877	18,008,206	18,919,421	19,876,744	20,882,507	21,939,162
W.5	Outside	11,040	11,598	12,185	12,802	13,449	14,130	14,845	15,596	16,385	17,214
W.6	Fire Hydrant	1,806,485	1,897,894	1,993,927	2,094,820	2,200,817	2,312,179	2,429,175	2,552,091	2,681,227	2,816,897
W.7	Unitec	289,269	303,906	319,284	335,439	352,412	370,245	388,979	408,661	429,340	451,064
		100,415,764	105,496,801	109,436,871	114,844,737	120,655,881	126,761,069	133,175,179	139,913,843	146,993,483	154,431,353
	Non-Rate Revenues	10,026,988	10,046,333	10,066,065	10,086,191	10,106,720	10,127,660	10,149,018	10,170,803	10,193,024	10,215,690
	Total Revenues	**110,442,752**	**115,543,134**	**119,502,936**	**124,930,929**	**130,762,601**	**136,888,728**	**143,324,196**	**150,084,646**	**157,186,507**	**164,647,043**
	Increase	4.8%	4.6%	3.4%	4.5%	4.7%	4.7%	4.7%	4.7%	4.7%	4.7%
	Water Cost of Service										
	Operating Expenses										
UB	Utility Billing	7,996,011	8,277,649	8,571,080	8,876,925	9,195,845	9,528,545	9,875,774	10,238,333	10,617,075	11,012,909
WT	Water Treatment	17,103,682	18,166,424	19,312,392	20,548,945	21,884,134	23,326,767	24,886,481	26,573,829	28,400,360	30,378,723
WD	Water Distribution	8,389,532	8,745,986	9,120,168	9,513,108	9,925,901	10,359,715	10,815,797	11,295,476	11,800,169	12,331,389
WPC	Water Pollution Control	724,318	748,567	773,983	800,635	828,600	857,956	888,790	921,194	955,267	991,115
A	Administration	6,346,766	6,515,551	6,691,841	6,876,058	7,068,649	7,270,094	7,480,905	7,701,629	7,932,849	8,175,191
GIS	GIS	633,761	657,355	682,023	707,828	734,833	763,111	792,735	823,787	856,352	890,522
ENG	Engineering	2,156,072	2,239,707	2,327,369	2,419,300	2,515,760	2,617,025	2,723,393	2,835,183	2,952,735	3,076,415
AM	Asset Management	457,102	475,670	495,184	515,703	537,290	560,014	583,948	609,171	635,767	663,826
	Total Operating Expenses	43,807,245	45,826,910	47,974,041	50,258,501	52,691,011	55,283,226	58,047,824	60,998,601	64,150,573	67,520,089
	Net Revenues for Transfers, Contingencies and Debt Service (1)	**66,635,507**	**69,716,225**	**71,528,895**	**74,672,427**	**78,071,590**	**81,605,503**	**85,276,373**	**89,086,045**	**93,035,934**	**97,126,954**
	Debt Service										
	Current Debt -- 1st Lien, Subordinate, COs	18,401,738	18,331,328	16,597,879	16,607,197	16,644,534	16,642,510	16,633,655	16,607,622	12,908,113	8,221,455
	2022 Senior Lien Revenue Debt	**5,939,091**	**5,938,731**	**5,939,013**	**5,937,187**	**5,938,198**	**5,936,390**	**5,936,788**	**5,939,333**	**5,938,552**	**5,934,584**
	2024 Senior Lien Revenue Debt	**5,355,500**	**5,351,375**	**5,352,750**	**5,354,250**	**5,355,625**	**5,351,750**	**5,352,375**	**5,352,125**	**5,355,625**	**5,352,625**
	Additional Future Debt	**28,479,518**	**28,479,518**	**28,479,518**	**28,479,518**	**28,479,518**	**28,479,518**	**28,479,518**	**28,479,518**	**28,479,518**	**28,479,518**
	Total Debt Service (2)	58,175,847	58,100,952	56,369,160	56,378,152	56,417,875	56,410,168	56,402,336	56,378,598	52,681,808	47,988,182
	Net Revenues for Transfers and Contingencies	8,459,660	11,615,272	15,159,734	18,294,275	21,653,715	25,195,334	28,874,036	32,707,446	40,354,126	49,138,772
	Transfers and Contingencies	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550	7,773,550
	Total Cost of Service	**109,756,642**	**111,701,412**	**112,116,751**	**114,410,204**	**116,882,436**	**119,466,944**	**122,223,710**	**125,150,749**	**124,605,931**	**123,281,822**
	Net Revenues	**686,110**	**3,841,722**	**7,386,184**	**10,520,725**	**13,880,165**	**17,421,784**	**21,100,486**	**24,933,896**	**32,580,576**	**41,365,222**
	Percent of COS	0.6%	3.3%	6.2%	8.4%	10.6%	12.7%	14.7%	16.6%	20.7%	25.1%
	Debt Coverage (1)/(2)	**1.15**	**1.20**	**1.27**	**1.32**	**1.38**	**1.45**	**1.51**	**1.58**	**1.77**	**2.02**

CITY OF LAREDO
WATER UTILITY COST OF SERVICE FORECAST

Water Utility Cash Flow Forecast Summary
Scenario: **2022 05 27 Master Plan -- 6.0% Annual Water Adjustments**

		Test Year 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
	Total Accounts										
	Total Accounts	**78,538**	**80,109**	**81,711**	**83,345**	**85,012**	**86,712**	**88,447**	**90,215**	**92,020**	**93,860**
	New Accounts		1,571	1,602	1,634	1,667	1,700	1,734	1,769	1,804	1,840
	Avg. Annual Growth Rate		2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Annual Water Consumption										
W.1	Residential	6,408,739,136	6,536,913,918	6,667,652,197	6,801,005,241	6,937,025,345	7,075,765,852	7,217,281,169	7,361,626,793	7,508,859,329	7,659,036,515
W.2	Res. Irrigation	794,128,662	810,011,235	826,211,460	842,735,689	859,590,403	876,782,211	894,317,855	912,204,212	930,448,296	949,057,262
W.3	Commercial	2,569,476,086	2,620,865,607	2,673,282,920	2,726,748,578	2,781,283,550	2,836,909,221	2,893,647,405	2,951,520,353	3,010,550,760	3,070,761,775
W.4	Com. Irrigation	1,314,849,509	1,341,146,499	1,367,969,429	1,395,328,818	1,423,235,394	1,451,700,102	1,480,734,104	1,510,348,786	1,540,555,762	1,571,366,877
W.5	Outside	520,000	530,400	541,008	551,828	562,865	574,122	585,604	597,317	609,263	621,448
W.6	Fire Hydrant	138,100,000	140,862,000	143,679,240	146,552,825	149,483,881	152,473,559	155,523,030	158,633,491	161,806,161	165,042,284
W.7	Unitec	9,810,000	10,006,200	10,206,324	10,410,450	10,618,659	10,831,033	11,047,653	11,268,606	11,493,979	11,723,858
	Total System	**11,235,623,392**	**11,460,335,860**	**11,689,542,578**	**11,923,333,429**	**12,161,800,098**	**12,405,036,100**	**12,653,136,822**	**12,906,199,558**	**13,164,323,549**	**13,427,610,020**

CITY OF LAREDO
WATER UTILITY COST OF SERVICE FORECAST

Water Utility Cash Flow Forecast Summary
Scenario: **2022 05 27 Master Plan -- 6.0% Annual Water Adjustments**

		2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
	Total Accounts										
	Total Accounts	**95,737**	**97,652**	**99,605**	**101,597**	**103,629**	**105,702**	**107,816**	**109,972**	**112,172**	**114,415**
	New Accounts	1,877	1,915	1,953	1,992	2,032	2,073	2,114	2,156	2,199	2,243
	Avg. Annual Growth Rate	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%	2.00%
	Annual Water Consumption										
W.1	Residential	7,812,217,246	7,968,461,590	8,127,830,822	8,290,387,439	8,456,195,187	8,625,319,091	8,797,825,473	8,973,781,983	9,153,257,622	9,336,322,775
W.2	Res. Irrigation	968,038,408	987,399,176	1,007,147,159	1,027,290,102	1,047,835,904	1,068,792,623	1,090,168,475	1,111,971,845	1,134,211,281	1,156,895,507
W.3	Commercial	3,132,177,011	3,194,820,551	3,258,716,962	3,323,891,301	3,390,369,127	3,458,176,510	3,527,340,040	3,597,886,841	3,669,844,578	3,743,241,469
W.4	Com. Irrigation	1,602,794,215	1,634,850,099	1,667,547,101	1,700,898,043	1,734,916,004	1,769,614,324	1,805,006,611	1,841,106,743	1,877,928,878	1,915,487,455
W.5	Outside	633,877	646,555	659,486	672,675	686,129	699,852	713,849	728,126	742,688	757,542
W.6	Fire Hydrant	168,343,129	171,709,992	175,144,192	178,647,076	182,220,017	185,864,418	189,581,706	193,373,340	197,240,807	201,185,623
W.7	Unitec	11,958,335	12,197,502	12,441,452	12,690,281	12,944,087	13,202,968	13,467,028	13,736,368	14,011,096	14,291,318
	Total System	**13,696,162,221**	**13,970,085,465**	**14,249,487,174**	**14,534,476,918**	**14,825,166,456**	**15,121,669,785**	**15,424,103,181**	**15,732,585,245**	**16,047,236,949**	**16,368,181,688**

21 APPENDIX L
Estrada Hinojosa May 2022 Utility Debt Presentation

For discussion purposes

May 23, 2022

City of Laredo, Texas

Laredo Utility Debt – 2022 Water System

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INVESTMENT BANKERS

Dallas • Austin • Chicago • Houston • Los Angeles • Miami • New York • San Antonio

Waterworks and Sewer System

Waterworks & Sewer System Overview

Waterworks & Sewer System Debt Outstanding			
Series	Outstanding	Amount Callable	Call Date
WW & SS Rev Bds New Ser 2020A	$ 54,470,000	$ 43,340,000	3/1/2031
WW & SS Rev Bds Taxable New Ser 2020B	45,265,000	37,245,000	3/1/2029
WW & SS Rev Bds New Ser 2020	48,560,000	34,800,000	3/1/2030
WW & SS Rev Bds New Ser 2019	44,545,000	37,595,000	3/1/2028
WW & SS Rev Ref Bds Taxable New Ser 2019A	28,415,000	19,445,000	3/1/2028
WW & SS Rev Bds New Ser 2017	16,450,000	14,570,000	3/1/2027
WW & SS Rev Imp & Ref Bds New Ser 2016	72,535,000	64,655,000	3/1/2026
WW & SS Rev Ref Bds New Ser 2016	5,930,000	1,310,000	3/1/2026
Sub WW & SS Rev Bds Ser 2015	4,400,000	3,755,000	3/1/2026
Sub WW & SS Rev Bds Ser 2015A	3,640,000	3,095,000	3/1/2026
Sub WW & SS Rev Bds Ser 2015B	17,390,000	14,710,000	3/1/2026
WW & SS Rev Bds New Ser 2015	13,020,000	11,880,000	3/1/2025
WW & SS Rev Bds New Ser 2014	7,725,000	7,230,000	3/1/2024
WW & SS Rev Bds New Ser 2013	450,000	-	Non-Callable
WW & SS Rev Ref Bds New Series 2013	6,300,000	4,425,000	3/1/2023
WW & SS Rev Bds New Ser 2012	-	-	Non-Callable
Sub WW & SS Rev Bds Ser 2012	34,495,000	34,495,000	3/1/2022
Sub WW & SS Rev Bds Ser 2009	1,345,000	1,345,000	3/1/2020
Sub WW & SS Rev Bds Ser 2008	372,000	372,000	3/1/2020
Sub WW Rev Bds Ser 2002	113,000	113,000	3/1/2020
Sub SS Rev Bds Ser 2002	159,000	159,000	3/1/2020
	$ 405,579,000	$ 334,539,000	

Waterworks & Sewer Net Revenues for DS			
Fiscal Year	2019	2020	2021
Water System	$ 22,840,740	$ 21,157,507	$ 26,184,607
Sewer System	15,191,260	15,234,038	19,190,884
Available for DS	$ 38,032,000	$ 36,391,545	$ 45,375,491

Ratings	
S&P	AA-
Moody's	Aa3

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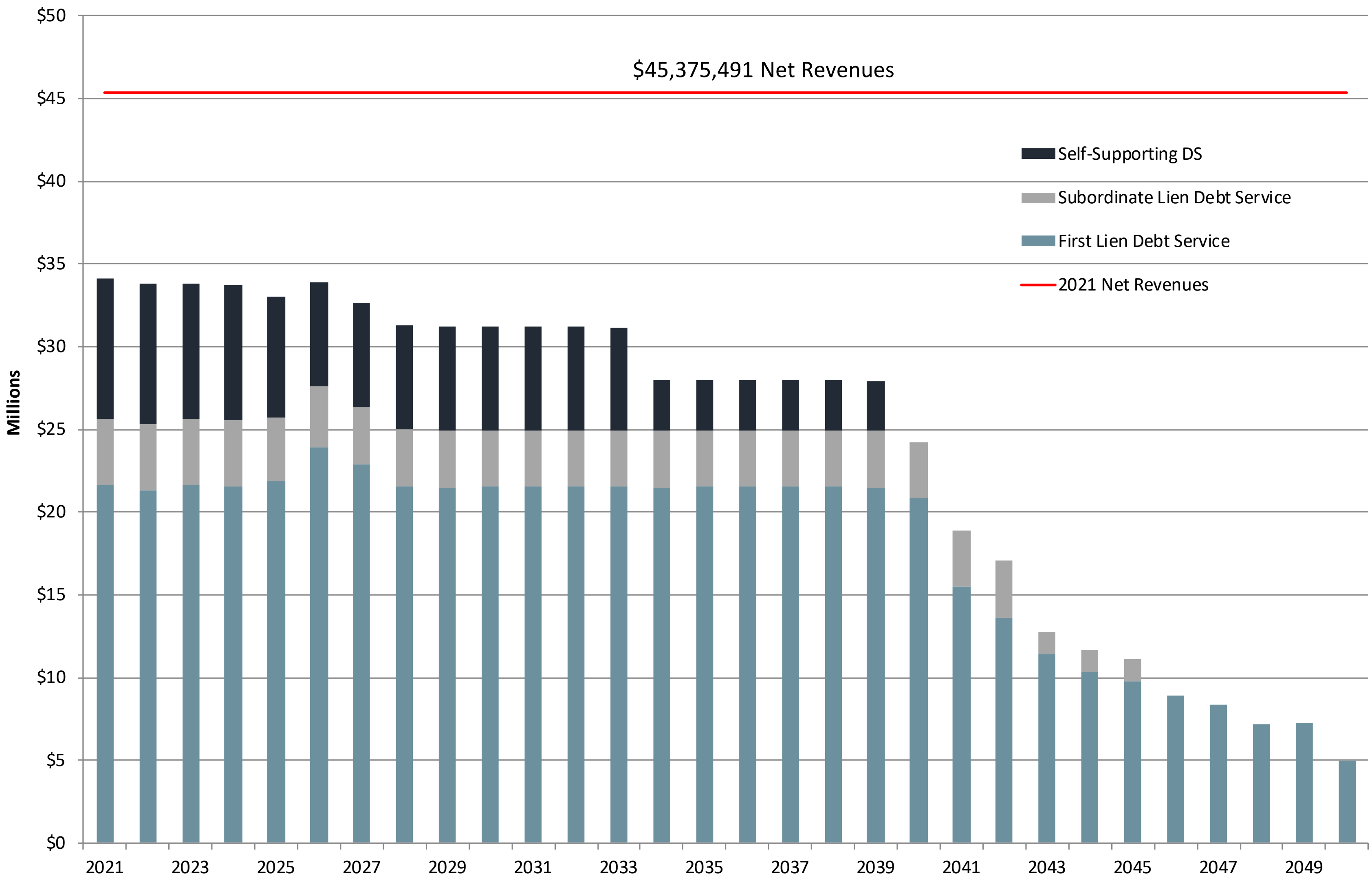
Waterworks & Sewer System Debt Outstanding



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For Discussion Purposes

Combined Utility System Pro-Forma – Current

Net Revenues Available for Debt Service [FYE 2021]: $45,375,491

Fiscal Year Ended 9/30	Net Revenues Available for Debt Service [1]	**Total First Lien Revenue Debt**	**Total Combined First Lien Revenue Debt**	1.25x Required Coverage Ratio [1]	**Total Subordinate Lien Revenue Debt**	**Total Combined First Lien & Subordinate Lien Revenue Debt**	1.25x Required Coverage Ratio [1]	**Plus: C.O.'s Self-Supporting Debt**	**Grand Total Debt Service**	1.10x Desired Coverage Ratio [1]	Fiscal Year Ended 9/30
2021	$ 45,375,491	$ 21,653,651	$ 21,653,651	2.10x	$ 3,993,210	$ 25,646,861	1.77x	$ 8,506,971	$ 34,153,832	1.33x	2021
2022	45,375,491	21,294,262	21,294,262	2.13x	3,994,895	25,289,157	1.79x	8,476,990	33,766,147	1.34x	2022
2023	45,375,491	21,634,098	21,634,098	2.10x	3,995,686	25,629,784	1.77x	8,136,105	33,765,889	1.34x	2023
2024	45,375,491	21,565,912	21,565,912	2.10x	3,992,810	25,558,722	1.78x	8,154,831	33,713,553	1.35x	2024
2025	45,375,491	21,875,787	21,875,787	2.07x	3,865,925	25,741,712	1.76x	7,296,182	33,037,894	1.37x	2025
2026	45,375,491	23,899,464	23,899,464	1.90x	3,696,482	27,595,946	1.64x	6,279,049	33,874,995	1.34x	2026
2027	45,375,491	22,855,884	22,855,884	1.99x	3,494,858	26,350,742	1.72x	6,275,381	32,626,123	1.39x	2027
2028	45,375,491	21,517,573	21,517,573	2.11x	3,495,253	25,012,826	1.81x	6,278,545	31,291,371	1.45x	2028
2029	45,375,491	21,509,666	21,509,666	2.11x	3,419,865	24,929,531	1.82x	6,270,756	31,200,287	1.45x	2029
2030	45,375,491	21,512,278	21,512,278	2.11x	3,419,832	24,932,110	1.82x	6,261,585	31,193,695	1.45x	2030
2031	45,375,491	21,522,782	21,522,782	2.11x	3,427,218	24,950,000	1.82x	6,262,601	31,212,601	1.45x	2031
2032	45,375,491	21,512,068	21,512,068	2.11x	3,422,196	24,934,264	1.82x	6,260,056	31,194,320	1.45x	2032
2033	45,375,491	21,512,329	21,512,329	2.11x	3,424,899	24,937,228	1.82x	6,187,749	31,124,977	1.46x	2033
2034	45,375,491	21,507,929	21,507,929	2.11x	3,425,236	24,933,165	1.82x	3,043,125	27,976,290	1.62x	2034
2035	45,375,491	21,519,010	21,519,010	2.11x	3,423,076	24,942,086	1.82x	3,039,500	27,981,586	1.62x	2035
2036	45,375,491	21,521,158	21,521,158	2.11x	3,418,371	24,939,529	1.82x	3,030,125	27,969,654	1.62x	2036
2037	45,375,491	21,527,345	21,527,345	2.11x	3,421,206	24,948,551	1.82x	3,029,625	27,978,176	1.62x	2037
2038	45,375,491	21,517,691	21,517,691	2.11x	3,416,901	24,934,592	1.82x	3,027,500	27,962,092	1.62x	2038
2039	45,375,491	21,509,070	21,509,070	2.11x	3,420,706	24,929,776	1.82x	3,018,629	27,948,405	1.62x	2039
2040	45,375,491	20,825,208	20,825,208	2.18x	3,427,609	24,252,817	1.87x	-	24,252,817	1.87x	2040
2041	45,375,491	15,481,672	15,481,672	2.93x	3,412,795	18,894,467	2.40x	-	18,894,467	2.40x	2041
2042	45,375,491	13,642,741	13,642,741	3.33x	3,416,307	17,059,048	2.66x	-	17,059,048	2.66x	2042
2043	45,375,491	11,456,573	11,456,573	3.96x	1,330,778	12,787,351	3.55x	-	12,787,351	3.55x	2043
2044	45,375,491	10,298,611	10,298,611	4.41x	1,331,849	11,630,460	3.90x	-	11,630,460	3.90x	2044
2045	45,375,491	9,785,895	9,785,895	4.64x	1,327,367	11,113,262	4.08x	-	11,113,262	4.08x	2045
2046	45,375,491	8,923,426	8,923,426	5.08x	-	8,923,426	5.08x	-	8,923,426	5.08x	2046
2047	45,375,491	8,370,755	8,370,755	5.42x	-	8,370,755	5.42x	-	8,370,755	5.42x	2047
2048	45,375,491	7,215,455	7,215,455	6.29x	-	7,215,455	6.29x	-	7,215,455	6.29x	2048
2049	45,375,491	7,224,976	7,224,976	6.28x	-	7,224,976	6.28x	-	7,224,976	6.28x	2049
2050	45,375,491	4,996,292	4,996,292	9.08x	-	4,996,292	9.08x	-	4,996,292	9.08x	2050
		$ 531,189,561	$ 531,189,561		$ 82,415,330	$ 613,604,891		$ 108,835,305	$ 722,440,196		
		Avg. Sen Lien	**$ 17,706,319**	2.56x	**Average Combined**	**$ 20,453,496**	2.22x	**Average All-In**	**$ 24,081,340**	1.88x	

(1) Coverage Ratio Calculation based on Net Revenue Available for Debt Service [FYE 2021] figure of $45,375,491.

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Water System Proposed CIP (2023-2027)[1]

Project	Proposed Water CIP Projects (FY23-FY27) - $163mm	2022 Tranche	Future Issuance	Other Funding Source
1	Phase A of 5 Year Neighborhood waterlines identified for replacement	$ 20,000,000	$ 9,765,000	$ -
2	JWTP to Lyon PS_New	20,000,000	-	-
3	Connect Hendricks to mid-sized JWTP	13,908,000	-	-
4	Along Loop 20 from Bianka Ln to Cielito Lindo Blvd	7,665,000	-	-
5	Along Loop 20 from Clark Blvd to Hwy 359	7,416,000	-	-
6	Barlett; MHOC to Bartlett	6,773,625	-	-
7	Hendricks PS Retrofit	5,795,000	-	-
8	Along Loop 20 from Hwy 359 to Los Presidentes Ave	5,666,000	-	-
9	Looping in Colonias Area	-	-	2,903,000
10	Hendricks to Lyon	-	4,795,000	-
11	Additional 12" Transmission for Looping	-	10,050,000	-
12	Milmo to Sierra Vista	-	11,935,000	-
13	Along various alignments: S Ejido Ave to Bianka Ln to Sierra Vista PS	-	7,335,000	-
14	From Logan Ave and E Lane St to Milmo PS providing add'l water	-	13,919,000	-
15	New, larger pumps to provide standby capacity	-		3,145,000
16	JWTP header and yard piping	-	1,504,000	-
17	Along Loop 20 in Sierra Vista service area	-	2,672,000	-
18	Build new .05 MG EST	-	4,515,000	-
19	Recoat existing EST	-		1,844,000
20	Along Loop 20 in Milmo service area	-	1,455,000	-
21	Feasibility Study for targeted groundwater sites	-	-	200,000
22	Field tests for targeted groundwater sites	-	-	250,000
	Total	**$ 87,223,625**	**$ 67,945,000**	**$ 8,342,000**

[1] Issuance timing and allocation preliminary, subject to change.

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Combined System Pro-Forma: Post 2022 Water Issuance (Growth)

Par Amount: $ 92,820,000
Project Fund: $ 87,223,625
Delivery Date: 8/1/2022
TIC: [2] 4.81%

Net Revenues Available for Debt Service [FYE 2021]: $45,375,491

Fiscal Year Ended 9/30	Net Revenues Available for Debt Service [1]	Revenue Growth (Water)	**Total First Lien Revenue Debt**	2022 WW&SS Senior Lien Revenue Debt Service	**Total Combined First Lien Revenue Debt - Post Issuance**	1.25x Required Coverage Ratio [1]	**Total Subordinate Lien Revenue Debt**	**Total Combined First Lien & Subordinate Lien Revenue Debt**	1.25x Required Coverage Ratio [1]	**Plus: C.O.'s Self-Supporting Debt**	**Grand Total Debt Service**	1.10x Desired Coverage Ratio [1]	Fiscal Year Ended 9/30
2021	45,375,491	-	$ 21,653,651	$ -	$ 21,653,651	2.10x	$ 3,993,210	$ 25,646,861	1.77x	$ 8,506,971	$ 34,153,832	1.33x	2021
2022	45,375,491	-	21,294,262	-	21,294,262	2.13x	3,994,895	25,289,157	1.79x	8,476,990	33,766,147	1.34x	2022
2023	46,184,595	3.0%	21,634,098	5,936,808	27,570,907	1.68x	3,995,686	31,566,593	1.46x	8,136,105	39,702,698	1.16x	2023
2024	47,017,973	3.0%	21,565,912	5,937,216	27,503,128	1.71x	3,992,810	31,495,938	1.49x	8,154,831	39,650,769	1.19x	2024
2025	47,876,352	3.0%	21,875,787	5,936,841	27,812,627	1.72x	3,865,925	31,678,552	1.51x	7,296,182	38,974,734	1.23x	2025
2026	48,760,482	3.0%	23,899,464	5,937,591	29,837,055	1.63x	3,696,482	33,533,537	1.45x	6,279,049	39,812,586	1.22x	2026
2027	48,760,482	3.0%	22,855,884	5,939,216	28,795,100	1.69x	3,494,858	32,289,958	1.51x	6,275,381	38,565,339	1.26x	2027
2028	48,760,482	-	21,517,573	5,936,591	27,454,164	1.78x	3,495,253	30,949,417	1.58x	6,278,545	37,227,962	1.31x	2028
2029	48,760,482	-	21,509,666	5,934,591	27,444,257	1.78x	3,419,865	30,864,122	1.58x	6,270,756	37,134,878	1.31x	2029
2030	48,760,482	-	21,512,278	5,937,841	27,450,119	1.78x	3,419,832	30,869,951	1.58x	6,261,585	37,131,536	1.31x	2030
2031	48,760,482	-	21,522,782	5,936,091	27,458,873	1.78x	3,427,218	30,886,091	1.58x	6,262,601	37,148,692	1.31x	2031
2032	48,760,482	-	21,512,068	5,939,091	27,451,158	1.78x	3,422,196	30,873,354	1.58x	6,260,056	37,133,410	1.31x	2032
2033	48,760,482	-	21,512,329	5,938,731	27,451,059	1.78x	3,424,899	30,875,958	1.58x	6,187,749	37,063,707	1.32x	2033
2034	48,760,482	-	21,507,929	5,939,013	27,446,942	1.78x	3,425,236	30,872,178	1.58x	3,043,125	33,915,303	1.44x	2034
2035	48,760,482	-	21,519,010	5,937,187	27,456,197	1.78x	3,423,076	30,879,273	1.58x	3,039,500	33,918,773	1.44x	2035
2036	48,760,482	-	21,521,158	5,938,198	27,459,355	1.78x	3,418,371	30,877,726	1.58x	3,030,125	33,907,851	1.44x	2036
2037	48,760,482	-	21,527,345	5,936,390	27,463,735	1.78x	3,421,206	30,884,941	1.58x	3,029,625	33,914,566	1.44x	2037
2038	48,760,482	-	21,517,691	5,936,788	27,454,478	1.78x	3,416,901	30,871,379	1.58x	3,027,500	33,898,879	1.44x	2038
2039	48,760,482	-	21,509,070	5,939,333	27,448,403	1.78x	3,420,706	30,869,109	1.58x	3,018,629	33,887,738	1.44x	2039
2040	48,760,482	-	20,825,208	5,938,552	26,763,760	1.82x	3,427,609	30,191,369	1.62x	-	30,191,369	1.62x	2040
2041	48,760,482	-	15,481,672	5,934,584	21,416,256	2.28x	3,412,795	24,829,051	1.96x	-	24,829,051	1.96x	2041
2042	48,760,482	-	13,642,741	5,937,192	19,579,933	2.49x	3,416,307	22,996,240	2.12x	-	22,996,240	2.12x	2042
2043	48,760,482	-	11,456,573	5,938,875	17,395,448	2.80x	1,330,778	18,726,226	2.60x	-	18,726,226	2.60x	2043
2044	48,760,482	-	10,298,611	5,939,375	16,237,986	3.00x	1,331,849	17,569,835	2.78x	-	17,569,835	2.78x	2044
2045	48,760,482	-	9,785,895	5,935,250	15,721,145	3.10x	1,327,367	17,048,512	2.86x	-	17,048,512	2.86x	2045
2046	48,760,482	-	8,923,426	5,936,000	14,859,426	3.28x	-	14,859,426	3.28x	-	14,859,426	3.28x	2046
2047	48,760,482	-	8,370,755	5,936,000	14,306,755	3.41x	-	14,306,755	3.41x	-	14,306,755	3.41x	2047
2048	48,760,482	-	7,215,455	5,934,750	13,150,205	3.71x	-	13,150,205	3.71x	-	13,150,205	3.71x	2048
2049	48,760,482	-	7,224,976	5,936,625	13,161,601	3.70x	-	13,161,601	3.70x	-	13,161,601	3.70x	2049
2050	48,760,482	-	4,996,292	5,936,000	10,932,292	4.46x	-	10,932,292	4.46x	-	10,932,292	4.46x	2050
2051	48,760,482	-	-	5,937,250	5,937,250	8.21x	-	5,937,250	8.21x	-	5,937,250	8.21x	2051
2052	48,760,482	-	-	5,934,750	5,934,750	8.22x	-	5,934,750	8.22x	-	5,934,750	8.22x	2052
			$ 531,189,561	$ 178,112,714	$ 709,302,275		$ 82,415,330	$ 791,717,605		$ 108,835,305	$ 900,552,910		
			Avg. Sen Lien	**Avg First Lien**	**$ 23,247,676**	2.10x	**Average Combined**	**$ 25,994,853**	1.88x	**Average All-In**	**$ 29,622,697**	1.65x	

[1] Coverage Ratio Calculation based on Net Revenue Available for Debt Service [FYE 2021] figure of $45,375,491 + 3% revenue growth from existing water rate increases. Preliminary, subject to change.
[1] Assumed rate (CM + 50bps) for illustration purposes. Preliminary, subject to change.

For Discussion Purposes

Water System Pro-Forma - Post 2022 Water Issuance (Growth)

Par Amount:	$ 92,820,000
Project Fund:	$ 87,223,625
Delivery Date:	8/1/2022
TIC: [2]	4.81%

Water System Net Revenues Available for Debt Service [FYE 2021]: $26,184,607

Fiscal Year Ended 9/30	Water Net Revenues Available for Debt Service [1]	Water Rev Grwth (3%)	**Total First Lien Revenue Debt**	2022 WW&SS Senior Lien Revenue Debt Service	**Total Combined First Lien Revenue Debt - Post Issuance**	1.25x Required Coverage Ratio [1]	**Total Subordinate Lien Revenue Debt**	**Total Combined First Lien & Subordinate Lien Revenue Debt**	1.25x Required Coverage Ratio [1]	**Plus: C.O.'s Self-Supporting Debt**	**Grand Total Debt Service**	1.10x Desired Coverage Ratio [1]	Fiscal Year Ended 9/30
2021	$ 26,184,607	-	$ 12,634,232	$ -	$ 12,634,232	2.07x	$ 922,560	$ 13,556,793	1.93x	$ 5,329,805	$ 18,886,598	1.39x	2021
2022	26,184,607	-	12,536,146	-	12,536,146	2.09x	921,522	13,457,668	1.95x	6,416,237	19,873,905	1.32x	2022
2023	26,970,145	3.0%	12,598,556	5,936,808	18,535,364	1.46x	923,578	19,458,942	1.39x	6,279,970	25,738,912	1.05x	2023
2024	27,779,250	3.0%	12,516,407	5,937,216	18,453,622	1.51x	920,837	19,374,459	1.43x	6,318,117	25,692,576	1.08x	2024
2025	28,612,627	3.0%	12,641,747	5,936,841	18,578,588	1.54x	856,417	19,435,005	1.47x	5,450,229	24,885,234	1.15x	2025
2026	29,471,006	3.0%	14,305,828	5,937,591	20,243,418	1.46x	687,887	20,931,305	1.41x	4,847,195	25,778,500	1.14x	2026
2027	30,355,136	3.0%	13,644,246	5,939,216	19,583,461	1.55x	478,817	20,062,278	1.51x	4,849,166	24,911,444	1.22x	2027
2028	30,355,136		13,130,466	5,936,591	19,067,056	1.59x	480,241	19,547,297	1.55x	4,847,710	24,395,007	1.24x	2028
2029	30,355,136		13,124,448	5,934,591	19,059,039	1.59x	434,385	19,493,424	1.56x	4,843,645	24,337,069	1.25x	2029
2030	30,355,136		13,131,424	5,937,841	19,069,264	1.59x	434,362	19,503,626	1.56x	4,834,714	24,338,340	1.25x	2030
2031	30,355,136		13,132,841	5,936,091	19,068,931	1.59x	438,966	19,507,897	1.56x	4,834,670	24,342,567	1.25x	2031
2032	30,355,136		13,135,453	5,939,091	19,074,544	1.59x	433,275	19,507,819	1.56x	4,833,009	24,340,828	1.25x	2032
2033	30,355,136		13,124,514	5,938,731	19,063,244	1.59x	437,313	19,500,557	1.56x	4,769,500	24,270,057	1.25x	2033
2034	30,355,136		13,118,708	5,939,013	19,057,721	1.59x	436,045	19,493,765	1.56x	3,043,125	22,536,890	1.35x	2034
2035	30,355,136		13,133,174	5,937,187	19,070,361	1.59x	434,521	19,504,882	1.56x	3,039,500	22,544,382	1.35x	2035
2036	30,355,136		13,181,660	5,938,198	19,119,858	1.59x	432,747	19,552,605	1.55x	3,030,125	22,582,730	1.34x	2036
2037	30,355,136		13,177,209	5,936,390	19,113,599	1.59x	435,675	19,549,274	1.55x	3,029,625	22,578,899	1.34x	2037
2038	30,355,136		13,172,847	5,936,788	19,109,634	1.59x	433,307	19,542,942	1.55x	3,027,500	22,570,442	1.34x	2038
2039	30,355,136		13,153,341	5,939,333	19,092,674	1.59x	435,656	19,528,330	1.55x	3,018,629	22,546,959	1.35x	2039
2040	30,355,136		12,470,427	5,938,552	18,408,979	1.65x	437,686	18,846,665	1.61x	-	18,846,665	1.61x	2040
2041	30,355,136		7,791,937	5,934,584	13,726,521	2.21x	429,517	14,156,038	2.14x	-	14,156,038	2.14x	2041
2042	30,355,136		6,706,728	5,937,192	12,643,920	2.40x	431,164	13,075,083	2.32x	-	13,075,083	2.32x	2042
2043	30,355,136		5,226,746	5,938,875	11,165,621	2.72x	432,539	11,598,160	2.62x	-	11,598,160	2.62x	2043
2044	30,355,136		4,430,480	5,939,375	10,369,855	2.93x	433,662	10,803,517	2.81x	-	10,803,517	2.81x	2044
2045	30,355,136		4,172,674	5,935,250	10,107,924	3.00x	429,580	10,537,504	2.88x	-	10,537,504	2.88x	2045
2046	30,355,136		3,678,356	5,936,000	9,614,356	3.16x	-	9,614,356	3.16x	-	9,614,356	3.16x	2046
2047	30,355,136		3,125,740	5,936,000	9,061,740	3.35x	-	9,061,740	3.35x	-	9,061,740	3.35x	2047
2048	30,355,136		3,126,200	5,934,750	9,060,950	3.35x	-	9,060,950	3.35x	-	9,060,950	3.35x	2048
2049	30,355,136		3,133,900	5,936,625	9,070,525	3.35x	-	9,070,525	3.35x	-	9,070,525	3.35x	2049
2050	30,355,136		2,014,500	5,936,000	7,950,500	3.82x	-	7,950,500	3.82x	-	7,950,500	3.82x	2050
2051	30,355,136	-	-	5,937,250	5,937,250	5.11x	-	5,937,250	5.11x	-	5,937,250	5.11x	2051
2052	30,355,136	-	-	5,934,750	5,934,750	5.11x	-	5,934,750	5.11x	-	5,934,750	5.11x	2052
			$ 304,470,934	$ 178,112,714	$ 482,583,648		$ 13,572,257	$ 496,155,905		$ 86,642,471	$ 582,798,376		
			Avg. Sen Lien	**Avg First Lien**	**$ 15,690,388**	1.93x	**Average Combined**	**$ 16,142,797**	1.88x	**Average All-In**	**$ 19,030,879**	1.60x	

[1] Coverage Ratio Calculation based on Water System Net Revenue Available for Debt Service [FYE 2021] figure of $26,184,607 + 3% revenue growth from existing water rate increases. Preliminary, subject to change.
[2] Assumed rate (CM + 50bps) for illustration purposes. Preliminary, subject to change.

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Combined System Pro-Forma: Post Full 5-Year Water CIP (Growth)

			Total
Par Amount:	$ 92,820,000	$ 83,015,000	$ 175,835,000
Project Fund:	$ 87,223,625	$ 76,287,000	$ 163,510,625
Delivery Date:	8/1/2022	8/1/2024	
TIC: (2)	4.81%	5.05%	

Net Revenues Available for Debt Service [FYE 2021]: $45,375,491

Fiscal Year Ended 9/30	Net Revenues Available for Debt Service (1)	Revenue Growth (Water)	Total First Lien Revenue Debt	2022 WW&SS Senior Lien Revenue Debt Service	2024 WW&SS Senior Lien Revenue Debt Service	Total Combined First Lien Revenue Debt - Post Issuance	1.25x Required Coverage Ratio (1)	Total Subordinate Lien Revenue Debt	Total Combined First Lien & Subordinate Lien Revenue Debt	1.25x Required Coverage Ratio (1)	Plus: C.O.'s Self-Supporting Debt	Grand Total Debt Service	1.10x Desired Coverage Ratio (1)	Fiscal Year Ended 9/30
2021	45,375,491	-	$ 21,653,651	$ -	$ -	$ 21,653,651	2.10x	$ 3,993,210	$ 25,646,861	1.77x	$ 8,506,971	$ 34,153,832	1.33x	2021
2022	45,375,491	-	21,294,262	-	-	21,294,262	2.13x	3,994,895	25,289,157	1.79x	8,476,990	33,766,147	1.34x	2022
2023	46,184,595	3.0%	21,634,098	5,936,808	-	27,570,907	1.68x	3,995,686	31,566,593	1.46x	8,136,105	39,702,698	1.16x	2023
2024	47,017,973	3.0%	21,565,912	5,937,216	-	27,503,128	1.71x	3,992,810	31,495,938	1.49x	8,154,831	39,650,769	1.19x	2024
2025	47,876,352	3.0%	21,875,787	5,936,841	5,354,103	33,166,730	1.44x	3,865,925	37,032,655	1.29x	7,296,182	44,328,837	1.08x	2025
2026	48,760,482	3.0%	23,899,464	5,937,591	5,351,375	35,188,430	1.39x	3,696,482	38,884,912	1.25x	6,279,049	45,163,961	1.08x	2026
2027	48,760,482	3.0%	22,855,884	5,939,216	5,355,375	34,150,475	1.43x	3,494,858	37,645,333	1.30x	6,275,381	43,920,714	1.11x	2027
2028	48,760,482	-	21,517,573	5,936,591	5,355,875	32,810,039	1.49x	3,495,253	36,305,292	1.34x	6,278,545	42,583,837	1.15x	2028
2029	48,760,482	-	21,509,666	5,934,591	5,352,875	32,797,132	1.49x	3,419,865	36,216,997	1.35x	6,270,756	42,487,753	1.15x	2029
2030	48,760,482	-	21,512,278	5,937,841	5,356,125	32,806,244	1.49x	3,419,832	36,226,076	1.35x	6,261,585	42,487,661	1.15x	2030
2031	48,760,482	-	21,522,782	5,936,091	5,355,375	32,814,248	1.49x	3,427,218	36,241,466	1.35x	6,262,601	42,504,067	1.15x	2031
2032	48,760,482	-	21,512,068	5,939,091	5,355,500	32,806,658	1.49x	3,422,196	36,228,854	1.35x	6,260,056	42,488,910	1.15x	2032
2033	48,760,482	-	21,512,329	5,938,731	5,351,375	32,802,434	1.49x	3,424,899	36,227,333	1.35x	6,187,749	42,415,082	1.15x	2033
2034	48,760,482	-	21,507,929	5,939,013	5,352,750	32,799,692	1.49x	3,425,236	36,224,928	1.35x	3,043,125	39,268,053	1.24x	2034
2035	48,760,482	-	21,519,010	5,937,187	5,354,250	32,810,447	1.49x	3,423,076	36,233,523	1.35x	3,039,500	39,273,023	1.24x	2035
2036	48,760,482	-	21,521,158	5,938,198	5,355,625	32,814,980	1.49x	3,418,371	36,233,351	1.35x	3,030,125	39,263,476	1.24x	2036
2037	48,760,482	-	21,527,345	5,936,390	5,351,750	32,815,485	1.49x	3,421,206	36,236,691	1.35x	3,029,625	39,266,316	1.24x	2037
2038	48,760,482	-	21,517,691	5,936,788	5,352,375	32,806,853	1.49x	3,416,901	36,223,754	1.35x	3,027,500	39,251,254	1.24x	2038
2039	48,760,482	-	21,509,070	5,939,333	5,352,125	32,800,528	1.49x	3,420,706	36,221,234	1.35x	3,018,629	39,239,863	1.24x	2039
2040	48,760,482	-	20,825,208	5,938,552	5,355,625	32,119,385	1.52x	3,427,609	35,546,994	1.37x	-	35,546,994	1.37x	2040
2041	48,760,482	-	15,481,672	5,934,584	5,352,625	26,768,881	1.82x	3,412,795	30,181,676	1.62x	-	30,181,676	1.62x	2041
2042	48,760,482	-	13,642,741	5,937,192	5,352,875	24,932,808	1.96x	3,416,307	28,349,115	1.72x	-	28,349,115	1.72x	2042
2043	48,760,482	-	11,456,573	5,938,875	5,355,875	22,751,323	2.14x	1,330,778	24,082,101	2.02x	-	24,082,101	2.02x	2043
2044	48,760,482	-	10,298,611	5,939,375	5,356,250	21,594,236	2.26x	1,331,849	22,926,085	2.13x	-	22,926,085	2.13x	2044
2045	48,760,482	-	9,785,895	5,935,250	5,353,750	21,074,895	2.31x	1,327,367	22,402,262	2.18x	-	22,402,262	2.18x	2045
2046	48,760,482	-	8,923,426	5,936,000	5,353,000	20,212,426	2.41x	-	20,212,426	2.41x	-	20,212,426	2.41x	2046
2047	48,760,482	-	8,370,755	5,936,000	5,353,500	19,660,255	2.48x	-	19,660,255	2.48x	-	19,660,255	2.48x	2047
2048	48,760,482	-	7,215,455	5,934,750	5,354,750	18,504,955	2.63x	-	18,504,955	2.63x	-	18,504,955	2.63x	2048
2049	48,760,482	-	7,224,976	5,936,625	5,356,250	18,517,851	2.63x	-	18,517,851	2.63x	-	18,517,851	2.63x	2049
2050	48,760,482	-	4,996,292	5,936,000	5,352,625	16,284,917	2.99x	-	16,284,917	2.99x	-	16,284,917	2.99x	2050
2051	48,760,482	-	-	5,937,250	5,353,375	11,290,625	4.32x	-	11,290,625	4.32x	-	11,290,625	4.32x	2051
2052	48,760,482	-	-	5,934,750	5,352,875	11,287,625	4.32x	-	11,287,625	4.32x	-	11,287,625	4.32x	2052
2053	48,760,482	-	-		5,355,500	5,355,500	9.10x	-	5,355,500	9.10x	-	5,355,500	9.10x	2053
2054	48,760,482	-	-		5,355,625	5,355,625	9.10x	-	5,355,625	9.10x	-	5,355,625	9.10x	2054
			$ 531,189,561	$ 178,112,714	$ 160,621,353	$ 869,923,627		$ 82,415,330	$ 952,338,957		$ 108,835,305	$ 1,061,174,262		
			Avg. Sen Lien	Avg First Lien		$ 27,887,808	1.75x	Average Combined	$ 30,634,986	1.59x	Average All-In	$ 34,262,830	1.42x	

(1) Coverage Ratio Calculation based on Net Revenue Available for Debt Service [FYE 2021] figure of $45,375,491 + 3% revenue growth from existing water rate increases. Preliminary, subject to change.
(2) Assumed rate 2022 (CM + 50bps) and 2024 (CM + 75bps) for illustration purposes. Preliminary, subject to change.

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Water System Pro-Forma - Post Full 5-Year Water CIP (Growth)

	2022	2024	Total
Par Amount:	$ 92,820,000	$ 83,015,000	$ 175,835,000
Project Fund:	$ 87,223,625	$ 76,287,000	$ 163,510,625
Delivery Date:	8/1/2022	8/1/2024	
TIC: (2)	4.81%	5.05%	

Water System Net Revenues Available for Debt Service [FYE 2021]: $26,184,607

Fiscal Year Ended 9/30	Water Net Revenues Available for Debt Service (1)	Water Rev Grwth (3%)	Total First Lien Revenue Debt	2022 WW&SS Senior Lien Revenue Debt Service	2024 WW&SS Senior Lien Revenue Debt Service	Total Combined First Lien Revenue Debt - Post Issuance	1.25x Required Coverage Ratio (1)	Total Subordinate Lien Revenue Debt	Total Combined First Lien & Subordinate Lien Revenue Debt	1.25x Required Coverage Ratio (1)	Plus: C.O.'s Self-Supporting Debt	Grand Total Debt Service	1.10x Desired Coverage Ratio (1)	Fiscal Year Ended 9/30
2021	$ 26,184,607	-	$ 12,634,232	$ -	$ -	$ 12,634,232	2.07x	$ 922,560	$ 13,556,793	1.93x	$ 5,329,805	$ 18,886,598	1.39x	2021
2022	26,184,607	-	12,536,146	-	-	12,536,146	2.09x	921,522	13,457,668	1.95x	6,416,237	19,873,905	1.32x	2022
2023	26,970,145	3.0%	12,598,556	5,936,808	-	18,535,364	1.46x	923,578	19,458,942	1.39x	6,279,970	25,738,912	1.05x	2023
2024	27,779,250	3.0%	12,516,407	5,937,216	-	18,453,622	1.51x	920,837	19,374,459	1.43x	6,318,117	25,692,576	1.08x	2024
2025	28,612,627	3.0%	12,641,747	5,936,841	5,354,103	23,932,690	1.20x	856,417	24,789,107	1.15x	5,450,229	30,239,336	0.95x	2025
2026	29,471,006	3.0%	14,305,828	5,937,591	5,351,375	25,594,793	1.15x	687,887	26,282,680	1.12x	4,847,195	31,129,875	0.95x	2026
2027	30,355,136	3.0%	13,644,246	5,939,216	5,355,375	24,938,836	1.22x	478,817	25,417,653	1.19x	4,849,166	30,266,819	1.00x	2027
2028	30,355,136		13,130,466	5,936,591	5,355,875	24,422,931	1.24x	480,241	24,903,172	1.22x	4,847,710	29,750,882	1.02x	2028
2029	30,355,136		13,124,448	5,934,591	5,352,875	24,411,914	1.24x	434,385	24,846,299	1.22x	4,843,645	29,689,944	1.02x	2029
2030	30,355,136		13,131,424	5,937,841	5,356,125	24,425,389	1.24x	434,362	24,859,751	1.22x	4,834,714	29,694,465	1.02x	2030
2031	30,355,136		13,132,841	5,936,091	5,355,375	24,424,306	1.24x	438,966	24,863,272	1.22x	4,834,670	29,697,942	1.02x	2031
2032	30,355,136		13,135,453	5,939,091	5,355,500	24,430,044	1.24x	433,275	24,863,319	1.22x	4,833,009	29,696,328	1.02x	2032
2033	30,355,136		13,124,514	5,938,731	5,351,375	24,414,619	1.24x	437,313	24,851,932	1.22x	4,769,500	29,621,432	1.02x	2033
2034	30,355,136		13,118,708	5,939,013	5,352,750	24,410,471	1.24x	436,045	24,846,515	1.22x	3,043,125	27,889,640	1.09x	2034
2035	30,355,136		13,133,174	5,937,187	5,354,250	24,424,611	1.24x	434,521	24,859,132	1.22x	3,039,500	27,898,632	1.09x	2035
2036	30,355,136		13,181,660	5,938,198	5,355,625	24,475,483	1.24x	432,747	24,908,230	1.22x	3,030,125	27,938,355	1.09x	2036
2037	30,355,136		13,177,209	5,936,390	5,351,750	24,465,349	1.24x	435,675	24,901,024	1.22x	3,029,625	27,930,649	1.09x	2037
2038	30,355,136		13,172,847	5,936,788	5,352,375	24,462,009	1.24x	433,307	24,895,317	1.22x	3,027,500	27,922,817	1.09x	2038
2039	30,355,136		13,153,341	5,939,333	5,352,125	24,444,799	1.24x	435,656	24,880,455	1.22x	3,018,629	27,899,084	1.09x	2039
2040	30,355,136		12,470,427	5,938,552	5,355,625	23,764,604	1.28x	437,686	24,202,290	1.25x	-	24,202,290	1.25x	2040
2041	30,355,136		7,791,937	5,934,584	5,352,625	19,079,146	1.59x	429,517	19,508,663	1.56x	-	19,508,663	1.56x	2041
2042	30,355,136		6,706,728	5,937,192	5,352,875	17,996,795	1.69x	431,164	18,427,958	1.65x	-	18,427,958	1.65x	2042
2043	30,355,136		5,226,746	5,938,875	5,355,875	16,521,496	1.84x	432,539	16,954,035	1.79x	-	16,954,035	1.79x	2043
2044	30,355,136		4,430,480	5,939,375	5,356,250	15,726,105	1.93x	433,662	16,159,767	1.88x	-	16,159,767	1.88x	2044
2045	30,355,136		4,172,674	5,935,250	5,353,750	15,461,674	1.96x	429,580	15,891,254	1.91x	-	15,891,254	1.91x	2045
2046	30,355,136		3,678,356	5,936,000	5,353,000	14,967,356	2.03x	-	14,967,356	2.03x	-	14,967,356	2.03x	2046
2047	30,355,136		3,125,740	5,936,000	5,353,500	14,415,240	2.11x	-	14,415,240	2.11x	-	14,415,240	2.11x	2047
2048	30,355,136		3,126,200	5,934,750	5,354,750	14,415,700	2.11x	-	14,415,700	2.11x	-	14,415,700	2.11x	2048
2049	30,355,136		3,133,900	5,936,625	5,356,250	14,426,775	2.10x	-	14,426,775	2.10x	-	14,426,775	2.10x	2049
2050	30,355,136		2,014,500	5,936,000	5,352,625	13,303,125	2.28x	-	13,303,125	2.28x	-	13,303,125	2.28x	2050
2051	30,355,136	-	-	5,937,250	5,353,375	11,290,625	2.69x	-	11,290,625	2.69x	-	11,290,625	2.69x	2051
2052	30,355,136	-	-	5,934,750	5,352,875	11,287,625	2.69x	-	11,287,625	2.69x	-	11,287,625	2.69x	2052
2053	30,355,136	-	-		5,355,500	5,355,500	5.67x	-	5,355,500	5.67x	-	5,355,500	5.67x	2053
2054	30,355,136	-	-		5,355,625	5,355,625	5.67x	-	5,355,625	5.67x	-	5,355,625	5.67x	2054
			$ 304,470,934	$ 178,112,714	$ 160,621,353	$ 643,205,000		$ 13,572,257	$ 656,777,257		$ 86,642,471	$ 743,419,728		
			Avg. Sen Lien	Avg First Lien		$ 20,330,521	1.49x	Average Combined	$ 20,782,929	1.46x	Average All-In	$ 23,671,012	1.28x	

(1) Coverage Ratio Calculation based on Water System Net Revenue Available for Debt Service [FYE 2021] figure of $26,184,607 + 3% revenue growth from existing water rate increases. Preliminary, subject to change.
(2) Assumed rate 2022 (CM + 50bps) and 2024 (CM + 75bps) for illustration purposes. Preliminary, subject to change.

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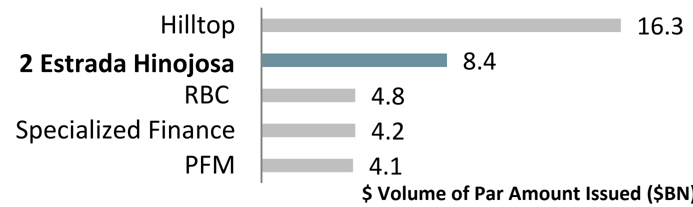
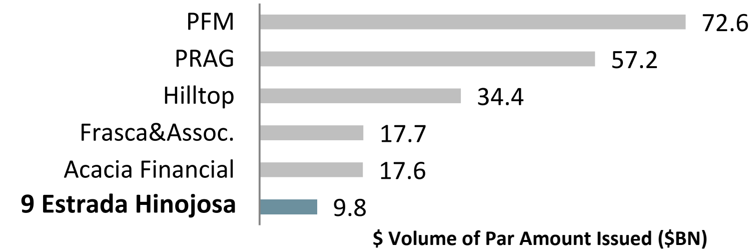
  - ✓ 449 transactions totaling $38.8 billion

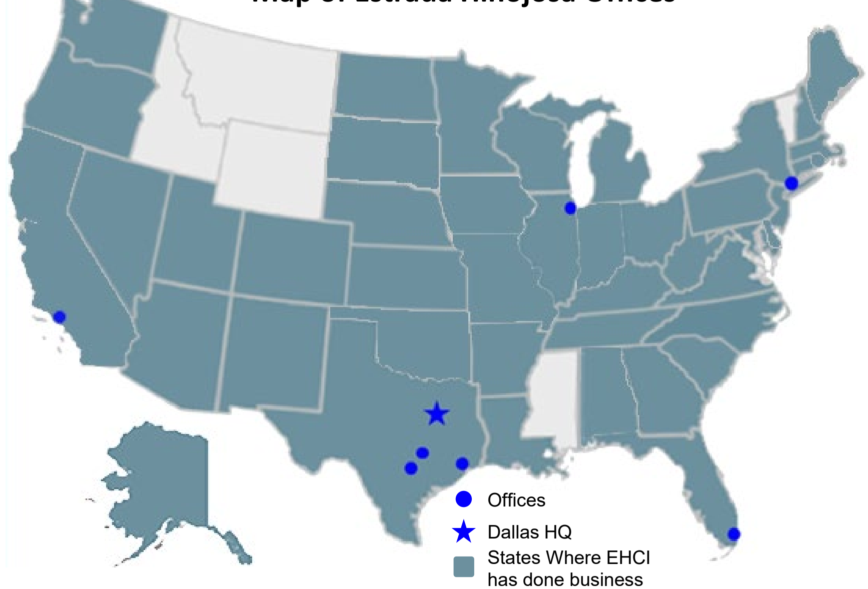
2021 Texas Financial Advisory Rankings (Par Amount)*

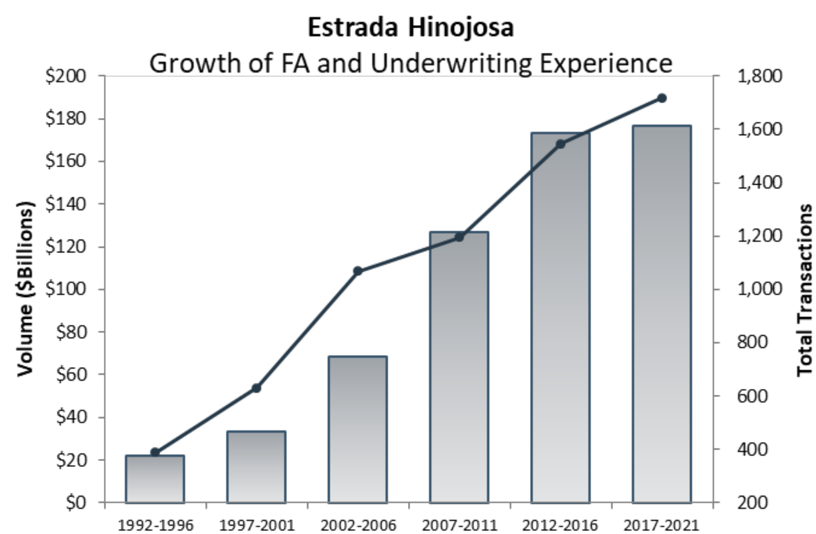


2021 U.S. Financial Advisory Rankings (Par Amount)*



Map of Estrada Hinojosa Offices





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22 Appendix M

TCEQ Chapter 210 Regulations

Effective: December 29, 2016

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Permanent Rule Change

Rule Project No. 2015-028-210-OW
HB 1902: Graywater and Alternative Onsite Water Reuse

Chapter 210
Use of Reclaimed Water
Subchapter F

Chapter 285
On-Site Sewage Facilities
Subchapter H

1. Purpose. This change transmittal provides the pages that reflect changes and additions to the Texas Commission on Environmental Quality (commission) Volume of Permanent Rules.

2. Explanation of Change. On December 7, 2016, the commission adopted the amendments to §§210.81 - 210.85. Amended §§210.82 - 210.85 were adopted *with changes* to the proposed text as published in the July 22, 2016, issue of the *Texas Register* (41 TexReg 5366) and were republished. The amendment to §210.81 was adopted *without change* and was not republished.

   The commission also adopted the amendment to §285.80 and new §285.81 *with changes* to the proposed text as published in the July 22, 2016, issue of the *Texas Register* (41 TexReg 5377) and were republished. The repeal of §285.81 was adopted *without change* and was not republished.

3. Effects of Change. The rulemaking implements House Bill 1902, 84th Texas Legislature, 2015, relating to the regulation and use of graywater and alternative onsite water.

HISTORY PAGE

CHAPTER 210
USE OF RECLAIMED WATER

Rule Project No. 2015-028-210-OW
HB 1902: Graywater and Alternative Onsite Water Reuse
Amendments to: §§210.82 - 210.85
Date Adopted: December 7, 2016
Date Filed with the Secretary of State: December 9, 2016
Date Published in the *Texas Register*: December 23, 2016
Date Effective: December 29, 2016

Rule Project No. 2009-005-309-PR
Bacteria Effluent Limitations and Monitoring in Domestic Water Quality Permits
Amendment to: §210.33
Date Adopted: November 4, 2009
Date Filed with the Secretary of State: November 6, 2009
Date Published in the *Texas Register*: November 20, 2009
Date Effective: November 26, 2009

Rule Project No. 2003-056-317-WT
HB 2661: Graywater Use
New: §§210.81 - 210.85
Date Adopted: December 15, 2004
Date Filed with the Secretary of State: December 17, 2004
Date Published in the *Texas Register*: December 31, 2004
Date Effective: January 6, 2005

Rule Log No. 2003-004-210-WT
Quadrennial Review of Chapter 210
Date Adopted: June 20, 2003
Date Filed with the Secretary of State: June 23, 2003
Date Published in the *Texas Register*: July 4, 2003
Date Effective: June 23, 2003

Rule Log No. 2002-042-210-WT
Special Requirements for Use of Industrial Reclaimed Water
Repeal of: §§210.51 - 210.55
New: §§210.51 - 210.60
Date Adopted: November 20, 2002
Date Filed with the Secretary of State: November 21, 2002
Date Published in the *Texas Register*: December 6, 2002
Date Effective: December 11, 2002

Rule Log No. 98047-210-WT

Use of Reclaimed Water (Rules Review of Chapter 210)
Date Adopted: July 28, 1999
Date Filed with the Secretary of State: July 29, 1999
Date Published in the *Texas Register*: August 13, 1999
Date Effective: July 29, 1999

Rule Log No. 96156-210-WT
Reclaimed Industrial Wastewater
New: §§210.51 - 210.55
Date Adopted: April 16, 1997
Date Filed with the Secretary of State: April 21, 1997
Date Published in the *Texas Register*: April 29, 1997
Date Effective: May 12, 1997

Rule Log No. 95121-210-WT
Wastewater Reuse and Request
New: §§210.1 - 210.9, 210.21 - 210.25, 210.31 - 210.36, and 210.41 - 210.46
Date Adopted: January 8, 1997
Date Filed with the Secretary of State: January 21, 1997
Date Published in the *Texas Register*: January 31, 1997
Date Effective: February 12, 1997

INDEX

CHAPTER 210
USE OF RECLAIMED WATER

SUBCHAPTER A: GENERAL PROVISIONS

SUBCHAPTER B: GENERAL REQUIREMENTS FOR THE PRODUCTION, CONVEYANCE, AND USE OF RECLAIMED WATER

SUBCHAPTER C: QUALITY CRITERIA AND SPECIFIC USES FOR RECLAIMED WATER

SUBCHAPTER D: ALTERNATIVE AND PRE-EXISTING RECLAIMED WATER SYSTEMS

SUBCHAPTER E: SPECIAL REQUIREMENTS FOR USE OF INDUSTRIAL RECLAIMED WATER

SUBCHAPTER F: USE OF GRAYWATER AND ALTERNATIVE ONSITE WATER

SUBCHAPTER A: GENERAL PROVISIONS
§§210.1 - 210.9
Effective February 12, 1997

§210.1. Applicability.

This chapter applies to the reclaimed water producer, provider, and user. If the entity which is the producer of the reclaimed water is the same as the user, then the use of reclaimed water is permissible only if the use occurs after the wastewater has been treated in accordance with the producer's wastewater permit and the permit provides for an alternative means of disposal during times when there is no demand for the use of the reclaimed water. This chapter does not apply to treatment or disposal of wastewater permitted by the commission in accordance with the requirements of Chapter 305 of this title (relating to Consolidated Permits), or to the user of such treated wastewater identified in the producer's wastewater discharge permit authorizing disposal by irrigation. This chapter does not apply to those systems authorized under Chapter 285 of this title (relating to On-Site Wastewater Treatment) which utilizes surface irrigation as an approved disposal method.

Adopted January 8, 1997 Effective February 12, 1997

§210.2. Purpose and Scope.

(a) The purpose of this chapter is to establish general requirements, quality criteria, design, and operational requirements for the beneficial use of reclaimed water which may be substituted for potable water and/or raw water. As defined and specified in this chapter, the requirements must be met by producers, providers, and/or users of reclaimed water. Specific use categories are defined with corresponding reclaimed water quality requirements. These criteria are intended to allow the safe utilization of reclaimed water for conservation of surface and ground water; to ensure the protection of public health; to protect ground and surface waters; and to help ensure an adequate supply of water resources for present and future needs.

(b) The commission has defined other types of reclaimed water activity in separate regulations, including §309.20 of this title (relating to Land Disposal of Sewage Effluent) and §297.1 of this title (relating to Definitions). These regulations do not modify those definitions. The term reclaimed water is limited in scope for the purpose of this rule as defined in §210.3 of this title (relating to Definitions).

(c) Approval by the executive director of a reclaimed water use project under this chapter does not affect any existing water rights. If applicable, a reclaimed water use authorization in no way affects the need of a producer, provider and/or user to obtain a separate water right authorization from the commission.

(d) Reclaimed water projects approved under this chapter do not require a new or amended waste discharge permit from the commission except as provided in §210.5 of this title (relating to Permits Required). Persons who desire to develop projects not specifically authorized by this chapter may seek authorization pursuant to provisions of Subchapter D or apply for a new or amended waste discharge permit under Chapter 305 of this title (relating to Consolidated Permits).

Adopted January 8, 1997 Effective February 12, 1997

§210.3. Definitions.

The following words and terms when used in this chapter shall have the following meanings unless the context clearly indicates otherwise.

(1) Beneficial use--An economic use of wastewater in accordance with the purposes, applicable requirements, and quality criteria of this chapter, and which takes the place of potable and/or raw water that could otherwise be needed from another source. The use of reclaimed water in a quantity either less than or the economically optimal amount may be considered a beneficial use as long as it does not constitute a nuisance.

(2) BOD_5--Five-day biochemical oxygen demand.

(3) $CBOD_5$--Five-day carbonaceous biochemical oxygen demand.

(4) CFU--Colony forming units.

(5) Domestic wastewater**--**Waste and wastewater from humans or household operations that are discharged to a wastewater collection system or otherwise enters a treatment works. Also, this includes waterborne human waste and waste from domestic activities such as washing, bathing, and food preparation, including greywater and blackwater, that is disposed in an on-site wastewater system as defined in Chapter 285 of this title (relating to On-Site Wastewater Treatment).

(6) DRASTIC--A classification system for comparing land units on the basis of their vulnerability to ground-water pollution, a detailed description of which is found in Appendix 1 of this chapter.

Figure: 30 TAC §210.3(6)

APPENDIX 1

DRASTIC - An Approach to Ground-Water Pollution Potential Mapping

DRASTIC was developed as a tool for comparing land units on the basis of their vulnerability to ground-water pollution. Artificial classification of natural systems, including aquifers, has been used for years. A system for ranking ground-water pollution potential which took into consideration a relatively large number of parameters had not been developed, however. Through a consensus process, a group sponsored by the National Water Well Association and the Robert S. Kerr Environmental Research Laboratory developed the methodology described in limited detail here.

DRASTIC is a systematic approach for assessing the ground-water pollution potential of hydrogeologic settings. The DRASTIC system is a methodology which involves delineation of hydrogeologic settings and data analysis to develop a single index number which represents the sensitivity of that setting to ground-water pollution potential. The system to some degree depends on subjective, but skilled judgement by the user (Texas Water Commission, 1989).

Hydrogeologic settings are delineated based on seven parameters which are used to develop an index number for each setting. The parameters have been organized to create the acronym DRASTIC.

DRASTIC stands for:

- D - Depth to water
- R - Annual recharge
- A - Aquifer media
- S - Soil media
- T - Topography
- I - Vadose zone impact
- C - Hydraulic conductivity

After index numbers are developed, maps can be constructed to present a graphic display of the pollution potential. Two maps can be generated using the DRASTIC methodology, a map depicting general vulnerability to ground-water pollution and another specifically aimed at pollution from certain agricultural practices.

A generic contaminant is used for this methodology. The contaminant is introduced at the land surface as a solid or liquid and travels to the aquifer with recharge waters derived from precipitation. Mobility of the contaminant is assumed to be equal to that of groundwater and attenuation processes are assumed to go on in the soil, Vadose zone and aquifer.

Parameters used in the DRASTIC system are divided into ranges with corresponding ratings. Rating values depend on the impact of the factor on contamination potential. The general and agricultural DRASTIC evaluations use the same ranges and rating values, but the weighting of parameters changes. Weighting represents an attempt to define the relative importance of each factor in its ability to affect pollution transport to and within the aquifer and it creates the differences between the general and agricultural indices (Texas Water Commission, 1989).

Two pollution potential numbers, one for generalized pollution sources and one for pollution due to agricultural activities, are derived for each hydrogeologic setting. The formula for the index number is:

I = (Dr x Dw) + (Rr x Rw) + (Ar x Aw) + (Sr x Sw) + (Tr x Tw) + (Ir x Iw) + (Cr x Cw)

I = DRASTIC index number
D, R, A, S, T, I, C - parameters
r - rating
w - weight

Maps are labeled with designations for the hydrogeologic settings and pollution potential numbers and the indices are then divided into ranges for color coding of the final maps.

More detailed information may be found in *DRASTIC: A standardized system for evaluating ground water pollution potential using hydrogeologic settings*: U.S. Environmental Protection Agency, EPA/600/2-87/035, authored by L. Allen, T. Bennett, J. H. Lehr, R. J. Petty and G. Hackett.

(7) Edwards Aquifer--That portion of an arcuate belt of porous, water bearing, predominantly carbonate rocks known as the Edwards and Associated Limestones in the Balcones Fault Zone trending from west to east to northeast in Kinney, Uvalde, Medina, Bexar, Comal, Hays, Travis, and Williamson counties; and composed of the Salmon Peak Limestone, McKnight Formation, West Nueces Formation, Devil's River Limestone, Person Formation, Kainer Formation, Edwards Formation, and Georgetown Formation. The permeable aquifer units generally overlie the less-permeable Glen Rose Formation to the south, overlie the less-permeable Comanche Peak and Walnut formations north of the Colorado River, and underlie the less-permeable Del Rio Clay regionally. (See Chapter 213 of this title (relating to Edwards Aquifer).)

(8) Edwards Aquifer Recharge zone--Generally, that area where the stratigraphic units constituting the Edwards Aquifer crop out, and including the outcrops of other geologic formations in proximity to the Edwards Aquifer, where caves, sinkholes, faults, fractures, or other permeable features would create a

potential for recharge of surface waters into the Edwards Aquifer. The recharge zone is identified as that area designated as such on official maps located in the offices of the commission and the Edwards Underground Water District. (See Chapter 213 of this title (related to Edwards Aquifer).)

(9) Food crop--Any crops intended for direct human consumption.

(10) Initial holding pond--An impoundment which first receives reclaimed water from a producer at the quality levels established by this chapter, not including subsequent holding ponds.

(11) Geometric mean**--**The n^{th} root of the product of all measurements made in a particular period of time, for example in a month's time, where *n* equals the number of measurements made. In the alternative, the geometric mean can also be computed as the antilogarithm of the sum of the logarithm of each measurement made. Where any measurement using either computation method equals zero, it must be substituted with the value of one.

(12) l--Liter.

(13) Landscape impoundment--Body of reclaimed water which is used for aesthetic enjoyment or which otherwise serves a function not intended to include contact recreation.

(14) Leak detection system--A system or device designed, constructed, maintained, and operated with a pond that is capable of immediately detecting a release of leachate or reclaimed water that migrates through a liner. The system may typically include a leachate collection system along with either leak detection sensors or view ports.

(15) Municipal wastewater--Waste or wastewater discharged into a publicly owned or a privately owned sewerage treatment works primarily consisting of domestic waste.

(16) mg/l--Milligram per liter.

(17) NTU--Nephelometric turbidity units.

(18) Nuisance--Any distribution, storage, or use of reclaimed water, in such concentration and of such duration that is or may tend to be injurious to or which adversely affects human health or welfare, animal life, vegetation, or property, or which interferes with the normal use and enjoyment of animal life, vegetation, or property.

(19) On-channel pond--An impoundment wholly or partially within a definite channel of a stream in which water flows within a defined bed and banks, originating from a definite source or sources. The water may flow continuously or intermittently, and if intermittently, with some degree of regularity, dependent on the characteristics of the source or sources.

(20) Permit or permitted--A written document issued by the commission or executive director in accordance with Chapter 305 of this title (relating to Consolidated Permits) which, by its conditions, may authorize the permittee to construct, install, modify, or operate, in accordance with stated limitations, a specified facility for waste discharge, including a wastewater discharge permit.

(21) Pond system--Wastewater facility in which primary treatment followed by stabilization ponds are used for secondary treatment and in which the ponds have been designed and constructed in accordance with applicable design criteria. (See Chapter 317 of this title (relating to the Design Criteria for Sewerage Systems).)

(22) Producer--A person or entity that produces reclaimed water by treating domestic wastewater or municipal wastewater, in accordance with a permit or other authorization of the Agency, to meet the quality criteria established in this chapter.

(23) Provider--A person or entity that distributes reclaimed water to a user(s) of reclaimed water. For purposes of this chapter, the reclaimed water provider may also be a reclaimed water producer.

(24) Reclaimed water--Domestic or municipal wastewater which has been treated to a quality suitable for a beneficial use, pursuant to the provisions of this chapter and other applicable rules and permits.

(25) Restricted landscaped area--Land which has vegetative cover to which public access is controlled in some manner. Access may be controlled by either legal means (e.g. state or city ordinance) or controlled by some type of physical barrier (e.g., fence or wall). Example of such areas are: golf courses; cemeteries; roadway rights-of-way; median dividers.

(26) Restricted recreational impoundment--Body of reclaimed water in which recreation is limited to fishing, boating and other non-contract recreational activities.

(27) Single grab sample--An individual sample collected in less than 15 minutes.

(28) Spray irrigation--Application of finely divided water droplets using artificial means.

(29) Subsequent holding pond--A pond or impoundment which receives reclaimed water from an initial holding pond where the quality of the water changes after management in the initial holding pond, due to factors which may include:

(A) the addition of water occurs such as contributions from surface water or ground water sources, but not including contributions of reclaimed water, domestic wastewater, or municipal wastewater;

(B) some type of utilization of the reclaimed water for a beneficial use occurs; or

(C) commingling of reclaimed water with surface water runoff where it occurs between storage in an initial holding pond and the subsequent holding pond.

(30) Surface irrigation--Application of water by means other than spraying so that contact between the edible portion of any food crop and the irrigation water is prevented.

(31) Type I reclaimed water use--Use of reclaimed water where contact between humans and the reclaimed water is likely.

(32) Type II reclaimed water use--Use of reclaimed water where contact between humans and the reclaimed water is unlikely.

(33) Unrestricted landscaped area--Land which has had its plant cover modified and access to which is uncontrolled. Examples of such areas are: parks; school yards; greenbelts; residences.

(34) User--Person or entity utilizing reclaimed water for a beneficial use, in accordance with the requirements of this chapter. A reclaimed water user may also be a producer or a provider.

Adopted January 8, 1997 Effective February 12, 1997

§210.4. Notification.

(a) Before providing reclaimed water to another for a use allowable under this chapter, the reclaimed water provider shall notify the executive director and obtain written approval to provide the reclaimed water. The notification shall include:

(1) a description of the intended use of the reclaimed water, including quantity, quality, origin, and location and purpose of intended use;

(2) a clear indication of the means for compliance with this chapter, including documentation that a user will be apprised of their responsibilities under this chapter as a part of the water supply contract or other binding agreement;

(3) evidence in a water supply contract or other binding agreement of the provider's authority to terminate reclaimed water use that is noncompliant with this chapter; and

(4) an operation and maintenance plan that is required under ordinance or is to be a part of the water supply contract or other binding agreement, where applicable, and which shall contain, as a minimum, the following:

(A) a labeling and separation plan for the prevention of cross connections between reclaimed water distribution lines and potable water lines;

(B) the measures that will prevent unauthorized access to reclaimed water facilities (eg., secured valves);

(C) procedures for monitoring reclaimed water transfers and use;

(D) steps the user must utilize to minimize the risk of inadvertent human exposure;

(E) schedules for routine maintenance;

(F) a plan for carrying out provider employee training and safety relating to reclaimed water treatment, distribution, and management; and

(G) contingency plan for remedy of system failures, unauthorized discharges, or upsets.

(b) If the provider is not the producer, a description of the origin of the reclaimed water, its quality based upon the parameters contained in the underlying waste discharge permit(s), and a signed agreement from the producer authorizing the transfer of the reclaimed water to the provider. If applicable, a reclaimed water provider or user may need to obtain a separate water right authorization from the commission.

(c) A producer who chooses to use reclaimed water for a beneficial use only within the boundaries of a wastewater treatment facility permitted by the commission, may do so without notification otherwise required by this section. In such instances, the producer is still required to comply with all applicable requirements of this chapter pertaining to the reclaimed water use.

(d) If effluent is to be used for irrigation within the Edwards Aquifer recharge zone, plans and specifications for the disposal system must be submitted to the executive director for review and approval prior to construction of the facility in accordance with Chapter 213 of this title (relating to Edwards Aquifer).

(e) Major changes from a prior notification for use of reclaimed water must be approved by the executive director. A major change includes:

(1) a change in the boundary of the approved service area not including the conversion of individual lots within a subdivision to reclaimed water use;

(2) the addition of a new producer;

(3) major changes in the intended use, such as conversion from irrigation of a golf course to residential irrigation; or

(4) changes from either Type I or Type II uses to the other.

Adopted January 8, 1997 Effective February 12, 1997

§210.5. Authorization for the Use of Reclaimed Water.

(a) Prior to discharging any reclaimed water to the waters in the state, the provider or user shall obtain a permit from the commission in accordance with the requirements of Chapter 305 of this title (relating to Consolidated Permits) except as provided for by §210.22(g) of this title (relating to General Requirements).

(b) The executive director may require a reclaimed water user to apply for and obtain a permit to utilize reclaimed water if the reclaimed water use poses potential or actual adverse impacts upon human health, soil and ground water resources, or aquatic life.

(c) For purposes of this chapter, no permit issued pursuant to Chapter 305 of this title (relating to Consolidated Permits) will be required for additional treatment required to meet the quality standards of §210.33 of this title (relating to Quality Standards for Using Reclaimed Water), unless such additional treatment results in a discharge of wastewater into waters in the state.

(d) A reclaimed water provider or user who accepts effluent meeting the Type II quality criteria and that must also meet the Type I quality criteria for a proposed use must provide additional treatment for the proposed new use. The additional manner of treatment must be authorized by the executive director. The provider or user must notify and be granted an authorization from the executive director prior to engaging in such activity. Examples of such additional treatment may include processes for disinfection or filtration of the reclaimed water. Such authorization may be granted by the executive director after review of the proposed plans and specifications submitted to the executive director for the additional treatment. This request for authorization may be submitted to the executive director along with the notification required by §210.4 of this title (relating to Notification).

(e) If a provider or user elects to treat reclaimed water supplied by the provider or producer, respectively, to a quality better than the minimum standards of this chapter for the same use, such treatment does not require a permit or other additional authorization by the executive director.

(f) Any sewage sludge generated as a result of reclaimed water treatment undertaken pursuant to this section shall be managed in accordance with the requirements of Chapter 312 of this title (relating to Sludge Use, Disposal and Transportation).

Adopted January 8, 1997 Effective February 12, 1997

§210.6. Responsibilities.

The producer of reclaimed water will not be liable for misapplication of reclaimed water by users, except as provided in this section. Both the reclaimed water provider and user have, but are not limited to, the following responsibilities:

(1) The reclaimed water producer shall:

(A) transfer reclaimed water of at least the minimum quality required by this chapter at the point of delivery to the user for the specified use;

(B) sample and analyze the reclaimed water and report such analyses in accordance with §210.34 and §210.36(b) of this title (relating to Sampling and Analysis and Record keeping and Reporting, respectively); and

(C) notify the executive director in writing within five (5) days of obtaining knowledge of reclaimed water use not authorized by the executive director's reclaimed water use approval.

(2) The reclaimed water provider shall:

(A) assure construction of reclaimed water distribution lines or systems in accordance with this chapter and in accordance with §210.25 of this title (relating to Special Design Criteria for Reclaimed Water Systems);

(B) transfer reclaimed water of at least the minimum quality required by this chapter at the point of delivery to the user for the specified use;

(C) notify the executive director in writing within five (5) days of obtaining knowledge of reclaimed water use not authorized by the executive director's reclaimed water use approval; and

(D) not be found in violation of this chapter for the misuse of the reclaimed water by the user if transfer of such water is shut off promptly upon knowledge of misuse regardless of contract provisions.

(3) The reclaimed water user shall:

(A) use the reclaimed water in accordance with this chapter; and

(B) maintain and provide records as required by §210.36(a) of this title (relating to Recordkeeping and Reporting).

Adopted January 8, 1997 Effective February 12, 1997

§210.7. Transfer and Conveyance of Reclaimed Water.

Reclaimed water transferred from a provider to a user shall be done on a demand only basis in order that the water is not provided during times it cannot be beneficially used in accordance with this chapter. The reclaimed water user may refuse delivery of such water at any time. However, this section is not intended to change any obligation the user may have by contract or ordinance. All reclaimed water transferred to a user must be of at least the treatment quality for the use specified in §210.32 of this title (relating to Specific Uses of Reclaimed Water).

Adopted January 8, 1997 Effective February 12, 1997

§210.8. Restrictions.

This chapter does not convey or alter any property right and does not grant any exclusive privilege.

Adopted January 8, 1997 Effective February 12, 1997

§210.9. Enforcement.

If a person or entity fails to comply with the terms of this chapter, the executive director may require the entity to apply for and obtain a permit or permit amendment. The commission may also issue an enforcement order requiring remedial measures and the assessment of administrative penalties pursuant to §26.019 and §26.136 of the Texas Water Code. The commission may also seek civil penalties and injunctive relief in a court of competent jurisdiction as provided by §26.123 of the Texas Water Code.

Adopted January 8, 1997 Effective February 12, 1997

SUBCHAPTER B: GENERAL REQUIREMENTS FOR THE PRODUCTION, CONVEYANCE, AND USE OF RECLAIMED WATER
§§210.21 - 210.25
Effective February 12, 1997

§210.21. Applicability.

This subchapter establishes general requirements applicable to producers, providers, and users of reclaimed water. This subchapter also establishes requirements and specifications for transfer, storage, and irrigation using reclaimed water and design criteria of reclaimed water systems. Additionally, this subchapter establishes requirements and specifications necessary to minimize discharges of waste into or adjacent to waters in the state.

Adopted January 8, 1997 Effective February 12, 1997

§210.22. General Requirements.

(a) Reuse of untreated wastewater is prohibited.

(b) Food crops that may be consumed raw by humans shall not be spray irrigated. Food crops including orchard crops that will be substantially processed prior to human consumption may be spray irrigated. Other types of irrigation that avoid contact of reclaimed water with edible portions of food crops are acceptable.

(c) There shall be no nuisance conditions resulting from the distribution, the use, and/or storage of reclaimed water.

(d) Reclaimed water shall not be utilized in a way that degrades ground water quality to a degree adversely affecting its actual or potential uses.

(e) Reclaimed water managed in ponds for storage must be prevented from discharge into waters in the state, except for discharges directly resulting from rainfall events or in accordance with a permit issued by the commission. All other discharges are unauthorized. If any unauthorized overflow of a holding pond occurs causing discharge into or adjacent to waters in the state, the user or provider, as appropriate, shall report the noncompliance. A written submission of such information shall also be provided to the TNRCC regional office and to the Austin Office, Water Enforcement Section (MC-149), within five (5) working days of becoming aware of the overflow. The written submission shall contain a description of the noncompliance and its cause; the potential danger to human health or safety, or the environment; the period of noncompliance, including exact dates and times; if the noncompliance has not been corrected, the anticipated time it is expected to continue; and, steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance, and to mitigate its adverse effects.

Adopted January 8, 1997 Effective February 12, 1997

§210.23. Storage Requirements for Reclaimed Water.

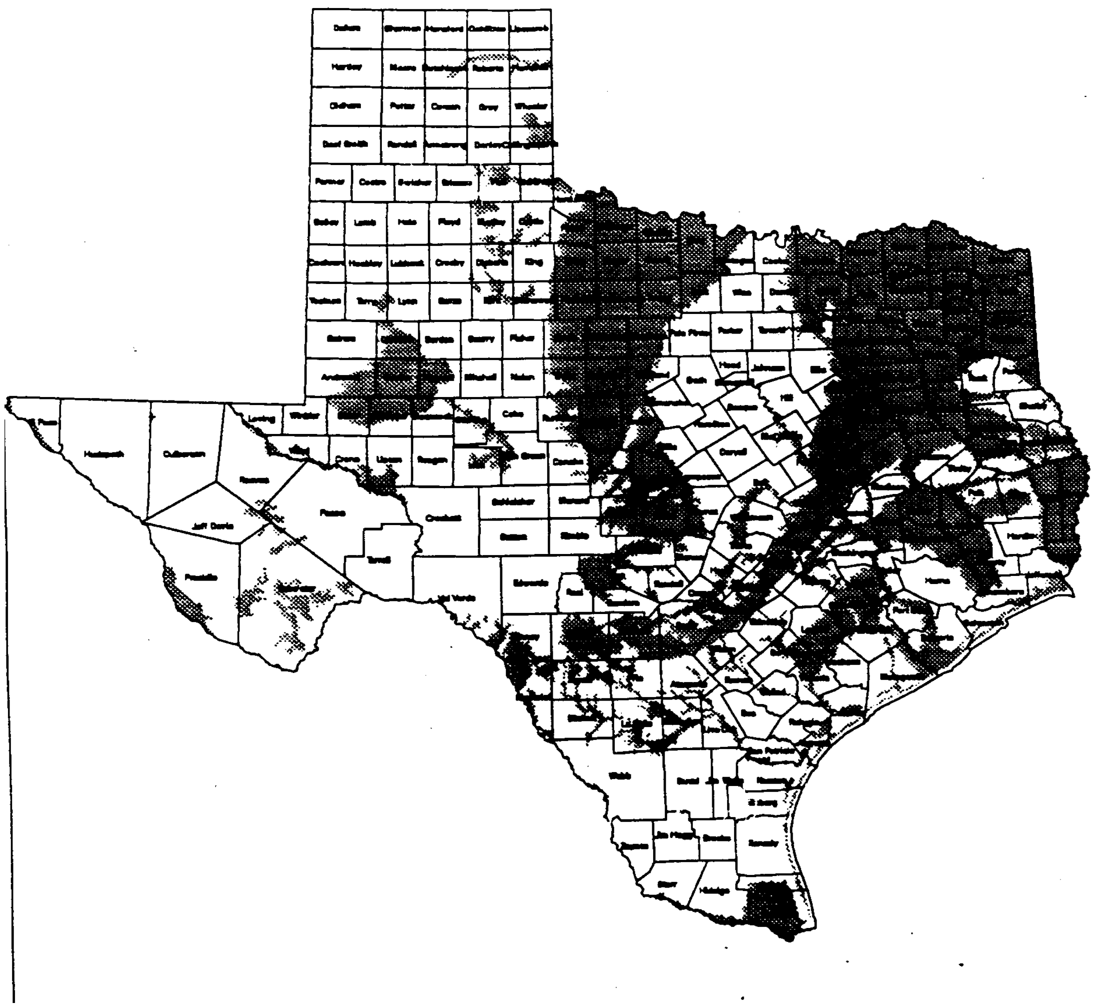
(a) Except for authorized on-channel ponds, storage facilities for retaining reclaimed water prior to use shall not be located within the floodway.

(b) Except as provided by subsection (e) of this section, all initial holding ponds must be lined in accordance with either subsection (c) or (d) of this section, as appropriate.

(c) All initial and subsequent holding ponds containing Type I and Type II effluent, located within the recharge zone of the Edwards Aquifer, as defined in Chapter 213 of this title (relating to Edwards Aquifer), and all initial holding ponds containing Type II effluent, located in a vulnerable area as defined by a rating of 110 or greater on the statewide "*Ground-Water Pollution Potential - General, Municipal, and Industrial Sources*" (DRASTIC) map (as shown in Figure 1 of this chapter), shall conform to the following requirements:

FIGURE 1: 30 TAC §210.23(c)

DRASTIC Pollution Potential Index
of 110 or Greater



(1) The ponds, whether constructed of earthen or other impervious material, shall be designed and constructed so as to prevent groundwater contamination;

(2) Soils used for pond lining shall be free from foreign material such as paper, brush, trees, and large rocks;

(3) All soil liners must be of compacted material, at least 24 inches thick, compacted in lifts no greater than 6 inches thick and compacted to 95% of Standard Proctor Density. In-situ clay soils meeting the soils liner requirements shall be excavated and re-compacted a minimum of 6 inches below planned grade to assure a uniformly compacted finished surface.

(4) Soil liners must meet the following particle size gradation and Atterberg limits:

(A) 30% or more passing a number 200 mesh sieve; and

(B) a liquid limit of 30% or greater; and a plasticity index of 15 or greater and have a permeability less than or equal to 1 X 10^{-7} cm/sec;

(5) Synthetic membrane linings shall have a minimum thickness of 40 mils with a leak detection system. In situ liners at least 24 inches thick meeting a permeability less than or equal to 1 X 10^{-7} cm/sec are acceptable alternatives;

(6) Certification shall be furnished by a Texas Registered Professional Engineer that the pond lining meets the appropriate criteria prior to utilization of the facilities; and

(7) Soil embankment walls shall have a top width of at least five feet. The interior and exterior slopes of soil embankment walls shall be no steeper than one foot vertical to three feet horizontal unless alternate methods of slope stabilization are utilized. All soil embankment walls shall be protected by a vegetative cover or other stabilizing material to prevent erosion. Erosion stops and water seals shall be installed on all piping penetrating the embankments.

(d) All initial holding ponds designed to contain Type I effluent, located outside of the recharge zone of the Edwards Aquifer, and Type II effluent, located in areas in the state not identified in subsection (c) of this section shall conform to the following requirements:

(1) The ponds, whether constructed of earthen or other impervious materials, shall be designed and constructed so as to prevent groundwater contamination;

(2) Soils used for pond lining shall be free from foreign material such as paper, brush, trees, and large rocks;

(3) All soil liners must be of compacted material having a permeability less than or equal to 1×10^{-4} cm/sec, at least 24 inches thick, compacted in lifts no greater than 6 inches each;

(4) Synthetic membrane linings shall have a minimum thickness of 40 mils. In situ liners at least 24 inches thick meeting a permeability less than or equal to 1×10^{-4} cm/sec are acceptable alternatives;

(5) Certification shall be furnished by a Texas Registered Professional Engineer that the pond lining meets the appropriate criteria prior to utilization of the facilities; and

(6) Soil embankment walls shall have a top width of at least five feet. The interior and exterior slopes of soil embankment walls shall be no steeper than one foot vertical to three feet horizontal unless alternate methods of slope stabilization are utilized. All soil embankment walls shall be protected by a vegetative cover or other stabilizing material to prevent erosion. Erosion stops and water seals shall be installed on all piping penetrating the embankments.

(7) An alternative method of pond lining which provides equivalent or better water quality protection than provided under this section may be utilized with the prior approval of the executive director.

(8) A specific exemption may be obtained from the executive director if, after the review of data submitted by the reclaimed water provider or user, as appropriate, the executive director determines containment of the reclaimed water is not necessary, considering:

(A) soil and geologic data, and ground water data, including its quality, uses, quantity and yield; and

(B) adequate demonstration that impairment of ground water for its actual or potential use will be prevented.

(e) Reclaimed water may be stored in leak-proof, fabricated tanks.

(f) Subsequent holding ponds utilized for the receipt and storage of reclaimed water of a quality that could cause or causes a violation of a surface water quality standard or impairment of ground water for its actual or intended use will also be subject to the storage requirements of this section.

§210.24. Irrigation Using Reclaimed Water.

(a) The reclaimed water user shall provide reasonable control of the application rates for reclaimed water applied to irrigation areas. These controls shall encourage the efficient use of reclaimed water and avoid excessive application of reclaimed water that results in surface runoff or excessive percolation below the root zone.

(b) The reclaimed water provider or user, as applicable shall determine and document typical irrigation demands for the proposed use based on type of vegetation and land area to be irrigated. As one alternative, a typical method for determining irrigation needs is shown in Table 1 of this section. However, other alternative methods may be used.

Figure: 30 TAC §210.24(b)

TABLE 1
WATER BALANCE EXAMPLE
(All Units are Inches of Water per Acre of Irrigated Area)

	a	b	Ri	c	d			e	f	g
Month	Average Precipi-tation	Average Runoff	Average Infil-trated Rainfall	Evapo-Transp-iration	Required Leaching	Total Water Needs (5)+(6)	Effluent Needed in Root Zone (7)-(4)	Evapo-ration from Reservoir Surface	Effluent to be Applied to Land (8)/K	Consumption from Reservoir (9)+(10)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Jan.	2.11	0.40	1.71	0.80	0.00	0.80	0.00	0.02	0.00	0.02
Feb.	2.43	0.57	1.86	1.20	0.00	1.20	0.00	0.01	0.00	0.01
Mar.	2.02	0.36	1.66	2.80	0.20	3.00	1.34	0.09	1.58	1.67
Apr.	3.19	1.03	2.16	3.40	0.22	3.62	1.46	0.05	1.72	1.77
May	4.19	1.74	2.45	6.10	0.64	6.74	4.29	0.10	5.05	5.15
June	3.30	1.10	2.20	6.50	0.76	7.26	5.06	0.20	5.95	6.15
July	2.20	0.45	1.75	6.70	0.87	7.57	5.82	0.34	6.85	7.19
Aug.	2.12	0.41	1.71	4.60	0.51	5.11	3.40	0.34	4.00	4.34
Sept.	3.58	1.30	2.28	5.10	0.50	5.60	3.32	0.19	3.91	4.10
Oct.	3.09	0.96	2.13	4.10	0.35	4.45	2.32	0.14	2.73	2.87
Nov.	2.23	0.46	1.77	2.10	0.06	2.16	0.39	0.07	0.46	0.53
Dec.	2.34	0.52	1.82	1.00	0.00	1.00	0.00	0.03	0.00	0.03
	32.80	9.30	23.50	44.40	4.11	48.51	27.40	1.58	32.25	33.83

Table 1 Footnotes

a. Up-to date rainfall and evaporation data sets are available from the Texas Natural Resources Information System.

b. Runoff should be determined by an acceptable method such as the Soil Conservation Service method found in SCS Technical Releases No. 55. For calculation purposes only, a CN value of 74 was assumed for good pasture with Class "C" soils.

c. Suggested source of values is the "Bulletin 6019, Consumptive Use of Water by Major Crops in Texas", Texas Board of Water Engineers.

d. In low rainfall areas, this is the required leaching to avoid salinity build-up in the soil where:

$$L = \frac{Ce}{Cl-Ce}(E - Ri)$$

Ri = Infiltrated rainfall

Ce = Electrical conductivity of effluent

C1 = Maximum Allowable Conductivity of Soil Solution (Table 3)

E = Evapotranspiration

For calculation purposes only, Ce is measured to be 1.5 millimhos/cm @ 25^o and C1 is 10.0 (Bermuda Grass)

e. Net evaporation from reservoir surface. For the purpose of calculation, an assumption must be made as to the ratio of irrigated land area to reservoir surface area. For this example problem, the necessary reservoir area was assumed to be 17% of the irrigated area. If, after all calculations are made, the reservoir dimensions do not seem reasonable, then a new assumption must be made and the calculations repeated. Values in column (9) are adjusted to be inches per irrigated acre.

f. K is the irrigation efficiency which for this example is taken to be 0.85.

g. The total of this column together with the expected annual volume of effluent will determine the acreage of irrigated land required.

(c) The reclaimed water provider shall be responsible for conducting periodic audits of appropriate controls implemented by reclaimed water users. Other typical irrigation operational considerations that must be addressed include the following:

(1) Irrigation of Food Crops.

(A) Irrigation of edible crops that will be peeled, skinned, cooked, or thermally processed before consumption is allowed. Direct contact of the reclaimed water with such crops is allowed.

(B) Irrigation of citrus fruit is allowed. Direct contact of the reclaimed water with citrus is allowed.

(C) Irrigation of edible crops that will not be peeled, skinned, cooked, or thermally processed before consumption is allowed if an indirect application method is used which will preclude the direct contact with the reclaimed water. For instance, a ridge and furrow, drip irrigation, or a subsurface distribution system may be used to irrigate such above ground crops. However, these methods would not be suitable for crops such as carrots or radishes.

(D) Irrigation of edible crops that will not be peeled, skinned, cooked, or thermally processed before consumption that allows for direct contact of the reclaimed water on the crop is prohibited.

(2) Irrigation of pastures used by animals milked for human consumption shall be conducted in a manner to avoid contact of reclaimed water with such animals.

(3) Irrigation of landscaped areas:

(A) Application of reclaimed water on public access facilities shall be controlled by agreement with the reclaimed water provider or by local ordinance.

(B) Reclaimed water may not be used to fill swimming pools, hot tubs, wading pools, or other structures designed for contact recreation.

(d) General irrigation requirements.

(1) A provider or user designing or operating an irrigation system using reclaimed water is responsible for ensuring that reclaimed water overflow, crop stress, and undesirable soil contamination by a salt does not occur. To prevent such occurrences, the provider or user is required to consider, evaluate, and respond appropriately to the following factors as the need arises:

(A) Precipitation inputs to the water balance should utilize the average monthly precipitation based on past rainfall records.

(B) The consumptive use requirements (evapotranspiration losses) of the crop system should be developed on a monthly basis. The method of determining the consumptive use requirement shall be documented by the provider or user as a part of the water balance study and the records of the study maintained for possible commission review.

(C) A leaching requirement, calculated as shown in Table 1 of this section, shall be included in the water balance study when the total dissolved solids concentration of the reclaimed water presents the potential for developing excessive soil salinity buildup due to the long term operation of the irrigation system.

(2) The irrigation site must be maintained with a vegetative cover or be under cultivation during times when reclaimed water is being applied.

(3) The irrigation practices shall be designed so as to prevent incidental ponding or standing water except where local farming conditions and the accepted irrigation delivery systems and cropping patterns are such that, as an unavoidable consequence of such conditions, systems, and patterns, there will be standing water.

(4) Irrigation application rates and application times shall be developed so as to minimize "wet grass" conditions in unrestricted landscaped areas during the periods the area could be in use.

(5) Irrigation systems shall be designed so that the irrigation spray does not reach any privately-owned premises outside the designated irrigation area or reach public drinking fountains.

(6) There shall be no application of effluent when the ground is water saturated or frozen.

(7) Distribution systems must be designed to prevent operation by unauthorized personnel.

(8) Irrigation operations shall be managed in a manner to minimize the inadvertent contact of reclaimed water with humans.

(9) Operational or tailwater controls shall be provided to preclude discharge of reclaimed water from irrigation sites.

Adopted January 8, 1997 Effective February 12, 1997

§210.25. Special Design Criteria for Reclaimed Water Systems.

(a) All hose bibs and faucets shall be painted purple and designed to prevent connection to a standard water hose. Hose bibs shall be located in locked, below grade vaults which shall be clearly labeled as being of non-potable quality. As an alternative to the use of locked, below grade vaults with standard hose bibs services, hose bibs may be placed in a non-lockable service box which can only be operated by a special tool so long as the hose bib is clearly labeled as non-potable water, in accordance with subsection (b) of this section.

(b) One of the following requirements must be met by the user or provider, for any area where reclaimed water is stored or where there exist hose bibs or faucets:

(1) Signs having a minimum size of eight inches by eight inches, as shown in Figure 1, shall be posted at all storage areas and on all hose bibs and faucets reading, in both English and Spanish, "Reclaimed Water, Do Not Drink" or similar warning.

FIGURE 1: 30 TAC §210.25(b)(1)

DO NOT DRINK THE WATER

NO TOMAR EL AGUA

(2) The area shall be secured to prevent access by the public.

(c) Reclaimed water piping shall be separated from potable water piping by a horizontal distance of at least nine feet. Where the nine foot separation distance cannot be achieved, the reclaimed water piping must meet the line separation requirements of Chapter 290 of this title (relating to Water Hygiene).

(d) Where a reclaimed water line parallels a sewer line, the reclaimed water line shall be constructed in accordance with subsection (e) or (f) of this section. The horizontal separation distance shall be three feet (outside to outside) with the reclaimed water line at the level of or above the sewer line. Reclaimed water lines which parallel sewer lines may be placed in the same benched trench. Where a reclaimed water line crosses a sewer line, the requirements of §290.44(e)(5)(B) of this title (relating to Location of Water Lines) shall be followed, with "reclaimed water line" substituted in §290.44(e) of this title (relating to Location of Water Lines) for "water line."

(e) Reclaimed water lines which transport reclaimed water under pressure shall be sized according to acceptable engineering practices for the needs of the reclaimed water users. The designer shall consider methods to prevent or maintain lines to mitigate the effect of the deposition of solids in such lines. Pipe specified for reclaimed water force mains shall be of a type having an expected life at least as long as that of the lift station and shall be suitable for the reclaimed water being pumped and operating pressure to which it will be subjected. All pipe shall be identified in the technical specifications with appropriate American Society for Testing and Materials, American National Standard Institute, or American Water Works Association (AWWA) standard numbers for both quality control (dimensions, tolerance, and installation such as bedding or backfill). All pipes and fittings shall have a minimum working pressure rating of 150 pounds per square inch. Final plans and specifications shall describe required pressure testing for all installed reclaimed water force mains. Minimum test pressure shall be 1.5 times the maximum design pressure. Allowable leakage rates shall be determined as described in §317.2(d)(4) of this title (relating to Pressure Sewer Systems).

(f) Gravity flow reclaimed water lines shall meet the requirements of §317.2 (a) of this title (relating to General Requirements) and §317.2(c) of this title (relating to High Velocity Protection). The designer shall consider methods to prevent high velocity scour or maintain line fluid velocity to mitigate the effects of the deposition of solids in the gravity conveyance.

(g) All exposed piping and piping within a building shall be either purple pipe or painted purple. All buried piping installed after the effective date of these rules shall be one of the following: manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple. All exposed piping should be stenciled in white with a warning reading "NON-POTABLE WATER." All exposed or buried reclaimed water piping constructed at a wastewater treatment facility is exempt from the color coding requirements of this section.

(h) When applicable, in accordance with §317.1(a)(3) - (4) of this title, (relating to General Provisions), the design of distribution systems which will convey reclaimed water to a user shall be submitted to the executive director and must receive an approval. The design of the distribution systems must meet the requirements of Chapter 317 of this title (relating to Design Criteria for Sewerage Systems). Where a municipality is the plan review authority for certain sewer systems which transport primarily domestic waste, in accordance with §317.1(a)(5) of this title, in lieu of the commission, design submittal will not be subject to submittal to the commission and instead must be approved by the municipality. Materials shall be submitted for approval by the executive director in accordance with the Texas Engineering Practice Act (Article 3271a, Vernon's Annotated Texas Statutes).

(i) All ground level and elevated storage tanks shall be designed, installed, and constructed in accordance with current AWWA standards with reference to materials to be used and construction practices to be followed, except for health-based standards strictly related to potable water storage and contact practices, where appropriately less restrictive standards may be applied.

Adopted January 22, 1997 Effective February 12, 1997

SUBCHAPTER C: QUALITY CRITERIA AND SPECIFIC USES FOR RECLAIMED WATER
§§210.31 - 210.36
Effective November 26, 2009

§210.31. Applicability.

This subchapter applies to the reclaimed water producer, the reclaimed water provider and the reclaimed water user. This subchapter sets the specific uses, the quality standards, as well as the monitoring, record keeping, and reporting standards for reclaimed water.

Adopted January 8, 1997 Effective February 12, 1997

§210.32. Specific Uses of Reclaimed Water.

Numerical parameter limits pertaining to specific reclaimed water use categories are contained in §210.33 of this title (relating to Quality Standards for Using Reclaimed Water). These limits apply to reclaimed water before discharge to initial holding ponds or a reclaimed water distribution system. It shall be the responsibility of the reclaimed water producer to establish that the reclaimed water meets the quality limits at the sample point for the intended use in accordance with the monitoring requirements identified in §210.34 of this title (relating to Sampling and Analysis).

(1) Type I Reclaimed Water Use. This type of use includes irrigation or other uses in areas where the public may be present during the time when irrigation takes place or other uses where the public may come in contact with the reclaimed water. The following types of uses would be considered Type I uses:

(A) Residential irrigation, including landscape irrigation at individual homes.

(B) Urban uses, including irrigation of public parks, golf courses with unrestricted public access, school yards, or athletic fields.

(C) Use of reclaimed water for fire protection, either in internal sprinkler systems or external fire hydrants.

(D) Irrigation of food crops where the applied reclaimed water may have direct contact with the edible part of the crop, unless the food crop undergoes a pasteurization process.

(E) Irrigation of pastures for milking animals.

(F) Maintenance of impoundments or natural water bodies where recreational activities, such as wading or fishing, are anticipated even though the water body was not specifically designed for such a use.

(G) Toilet or urinal flush water.

(H) Other similar activities where the potential for unintentional human exposure may occur.

(2) Type II Reclaimed Water Use. This type of use includes irrigation or other uses in areas where the public is not present during the time when irrigation activities occur or other uses where the public would not come in contact with the reclaimed water. The following are examples of uses that would be considered Type II uses.

(A) Irrigation of sod farms, silviculture, limited access highway rights of way, and other areas where human access is restricted or unlikely to occur. The restriction of access to areas under irrigation with reclaimed water could include the following:

(i) The irrigation site is considered to be remote.

(ii) The irrigation site is bordered by walls or fences and access to the site is controlled by the owner/operator of the irrigation site.

(iii) The irrigation site is not used by the public during the times when irrigation operations are in progress. Such sites may include golf courses, cemeteries, and landscaped areas surrounding commercial or industrial complexes. The "syringing" or "wetting" of greens and tees on golf courses shall be allowable under Type II so long as the "syringing" is done with hand-held hoses as opposed to automatic irrigation equipment. The public need not be excluded from areas where irrigation is not taking place. For example, irrigation of golf course fairways at night would not prohibit the use of club house or other facilities located a sufficient distance from the irrigation.

(iv) The irrigation site is restricted from public access by local ordinance or law with specific standards to achieve such a purpose.

(B) Irrigation of food crops where the reclaimed water is not likely to have direct contact with the edible part of the crop, or where the food crop undergoes pasteurization prior to distribution for consumption.

(C) Irrigation of animal feed crops other than pasture for milking animals.

(D) Maintenance of impoundments or natural water bodies where direct human contact is not likely.

(E) Soil compaction or dust control in construction areas where application procedures minimize aerosol drift to public areas.

(F) Cooling tower makeup water. Use for cooling towers which produce significant aerosols adjacent to public access areas may have special requirements.

(G) Irrigation or other non-potable uses of reclaimed water at a wastewater treatment facility.

(3) Any Type I reclaimed water may also be utilized for any of the Type II uses identified in paragraph (2) of this section.

Adopted January 8, 1997 Effective February 12, 1997

§210.33. Quality Standards for Using Reclaimed Water.

The following conditions apply to the types of uses of reclaimed water. At a minimum, the reclaimed water producer shall only transfer reclaimed water of the following quality as described for each type of specific use:

(1) for Type I reclaimed water uses, reclaimed water on a 30-day average shall have a quality of:

Figure: 30 TAC §210.33(1)

BOD_5 or $CBOD_5$	5 mg/l
Turbidity	3 NTU
Fecal coliform or *E. coli*	20 CFU/100 ml*
Fecal coliform or *E. coli*	75 CFU/100 ml**
Enterococci	4 CFU/100 ml*
Enterococci	9 CFR/100 ml**

* 30-day geometric mean

** maximum single grab sample

(2) for Type II reclaimed water use, reclaimed water on a 30-day average shall have a quality of:

(A) for a system other than pond system:

Figure: 30 TAC §210.33(2)(A)

BOD_5	20 mg/l
or $CBOD_5$	15 mg/l
Fecal coliform or *E. coli*	200 CFU/100 ml*
Fecal coliform or *E. coli*	800 CFU/100 ml**
Enterococci	35 CFU/100 ml*
Enterococci	89 CFU/100 ml**

* 30-day geometric mean

** maximum single grab sample

(B) for a pond system:

Figure: 30 TAC §210.33(2)(B)

BOD_5	30 mg/l
Fecal coliform or *E. coli*	200 CFU/100 ml*
Fecal coliform or *E. coli* (not to exceed)	800 CFU/100 ml**
Enterococci	35 CFU/100 ml*
Enterococci	89 CFU/100 ml**

* 30-day geometric mean

** maximum single grab sample

§210.34. Sampling and Analysis.

The reclaimed water producer shall sample the reclaimed water prior to distribution to a user to assure that the water quality is in accord with the intended contracted use. Analytical methods shall be in accord with those specified in Chapter 319 of this title (relating to Monitoring and Reporting). The minimum sampling and analysis frequency for reclaimed water for the applicable parameters identified in §210.33 of this title (relating to Quality Standards for the Use of Reclaimed Water) is as follows:

(1) Type I Reclaimed Water Uses twice per week.

(2) Type II Reclaimed Water Uses once per week.

Adopted January 8, 1997 Effective February 12, 1997

§210.35. Guidelines for Certain Distribution Systems.

The commission recommends that a provider or user maintain a plan to carry out periodic fecal coliform sampling within certain reclaimed water distribution piping systems. Such a plan does not need the approval or review of the commission. This periodic sampling should occur in instances where residential irrigation, including landscape irrigation at individual homes occurs, or where specific urban uses such as irrigation of public parks, school yards, or athletic fields occurs. The plan should specify activities by the provider or user to respond to human health threats if undesirable fecal coliform test results or trends are detected.

Adopted January 8, 1997 Effective February 12, 1997

§210.36. Record Keeping and Reporting.

The reclaimed water provider and user shall maintain records on site for a period of five years.

(1) Records to be maintained by the provider include:

(A) copies of notifications made to the commission concerning reclaimed water projects.

(B) as applicable, copies of contracts made with each reclaimed water user (this requirement does not include reclaimed water users at residences that have separate distribution lines for potable water).

(C) records of volume of water delivered to each reclaimed water user per delivery (this requirement does not apply to reclaimed water users at residences that have separate distribution lines for potable water).

(D) reclaimed water quality analyses.

(2) The reclaimed water provider or producer shall report to the commission on a monthly basis the following information on forms furnished by the executive director. Such reports are due to the commission by the 20th day of the month following the reporting period.

(A) volume of reclaimed water delivered to a user or provider.

(B) quality of reclaimed water delivered to a user or provider reported as a monthly average for each quality criteria except those listed as "not to exceed" which shall be reported as individual analyses.

SUBCHAPTER D: ALTERNATIVE AND PRE-EXISTING RECLAIMED WATER SYSTEMS
§§210.41 - 210.46
Effective February 12, 1997

§210.41. Applicability of Alternate Reclaimed Water Proposals.

In the event a reclaimed water provider or user proposes to design, construct, or operate a reclaimed water system or to utilize reclaimed water in a manner other than authorized in these rules, the provisions of this subchapter shall apply.

Adopted January 8, 1997 Effective February 12, 1997

§210.42. Request to Executive Director.

(a) If a reclaimed water provider or user proposes to design, construct, or operate a reclaimed water system or to utilize reclaimed water in a manner other than authorized in these rules, the provider or user shall file a request with the executive director, in addition to the notification filed pursuant to §210.4 of this title (relating to Notification), identifying the alternative proposal and requesting approval by the executive director.

(b) The request shall be in writing and shall include information necessary or useful in assisting the executive director in acting on the request for approval of the alternate reclaimed water proposal.

Adopted January 8, 1997 Effective February 12, 1997

§210.43. Action on Alternative Reclaimed Water Proposals.

The executive director shall review an alternate reclaimed water proposal filed under §210.42 of this title (relating to Request to Executive Director). Within 60 days, the executive director shall identify in writing to the requestor any additional information necessary for the executive director to act on the request, and provide the requestor sufficient time to provide such information. Following the receipt of such information, the executive director shall act on the request, either granting or denying the proposal, in whole or in part. If no additional information is requested, the executive director shall act on the request within 60 days, either granting or denying the proposal, in whole or in part.

Adopted January 8, 1997 Effective February 12, 1997

§210.44. Pre-existing Reclaimed Water Systems.

A reclaimed water system not already authorized by a commission permit or other written approval, existing on the effective date of these rules, where construction began prior to June 25, 1990, is authorized under this chapter if the provider or user of such a system provides a detailed description of the system to the executive director pursuant to the notification procedures of §210.4 of this title (relating to Notification) and the system is approved by the executive director. Such notification must occur within ninety (90) days of the effective date of these rules. The system is authorized unless the executive director requests additional information pursuant to §210.45 of this title (relating to Actions on Pre-existing Reclaimed Water Systems) or denies such authorization pursuant to the provisions of §210.46 of this title (relating to Denial of Request).

Adopted January 8, 1997 Effective February 12, 1997

§210.45. Action on a Pre-existing Reclaimed Water System.

(a) The executive director may request a reclaimed water user to submit additional information concerning a pre-existing reclaimed water system to be authorized under this subchapter. The additional information may be requested in order to evaluate the potential for significant water quality problems or potential for significant risks to the health or safety of the public, including the need of a project to conform to one or more of the requirements of this chapter. Such request shall be provided in writing to the proposed reclaimed water user within 60 days of the receipt of the notification and shall provide the proposed user not less than 30 days to provide such additional information.

(b) Following the receipt of such information, the executive director shall act on the request, either granting or denying the proposal, in whole or in part. If no additional information is requested, the executive director shall act on the request within 60 days, either granting or denying the proposal, in whole or in part.

Adopted January 8, 1997 Effective February 12, 1997

§210.46. Denial of Request.

The executive director shall not grant an alternate reclaimed water proposal or grant authorization to a pre-existing reclaimed water system which could pose a significant threat to water quality or which represents a significant risk to human health or safety.

Adopted January 22, 1997 Effective February 12, 1997

SUBCHAPTER E: SPECIAL REQUIREMENTS FOR USE OF INDUSTRIAL RECLAIMED WATER §§210.51 - 210.60 Effective December 11, 2002

§210.51. Applicability, Purpose, and Scope.

(a) A person proposing to use industrial wastewater as industrial reclaimed water may obtain authorization under this subchapter if all of the requirements of the subchapter are met. The purpose of this subchapter is to establish the applicable requirements for industrial reclaimed water use which may be used instead of potable water or raw water. As defined and specified in this subchapter, the requirements must be met by the producers, providers, and users of industrial reclaimed water. These requirements are intended to allow the safe utilization of reclaimed water for conservation of surface water and groundwater, to ensure the protection of public health, to protect surface water and groundwater from contamination, and to help ensure an adequate supply of water resources for present and future needs.

(b) This subchapter establishes the following requirements for producers, providers, and users of industrial reclaimed water:

(1) general requirements applicable to producers, providers, and users;

(2) requirements and specifications for transfer, storage, irrigation, and other end uses;

(3) requirements and specifications necessary to minimize the impact of discharge of waste into or adjacent to water in the state;

(4) specific uses of industrial reclaimed water;

(5) standards for the quality of industrial reclaimed water;

(6) standards for monitoring and recordkeeping; and

(7) payment of fees.

(c) The requirements of this subchapter to obtain an authorization do not apply to the end use of industrial reclaimed water when the end use is authorized by permit, including, but not limited to, a Texas Pollutant Discharge Elimination System permit or a Texas Land Application permit, or by commission rules other than those in this subchapter. The end uses of industrial wastewater that are subject to the requirements of this subchapter include landscape irrigation, dust suppression, soil compaction, impoundment maintenance, or industrial wastewater that is otherwise land applied for a beneficial purpose. When a use of industrial reclaimed water is regulated under Chapter 335 of this title (relating to Industrial Solid Waste and Municipal Hazardous Waste), that use shall comply with the requirements of Chapter 335 of this title in addition to the requirements of this subchapter.

(d) Internal recycling systems, closed loop systems, and systems that use industrial wastewater as makeup water within a facility are not subject to the requirements of this subchapter.

(e) The use of industrial wastewater as industrial reclaimed water as authorized by this subchapter does not require an amendment of any issued industrial wastewater discharge permit to recognize the activity authorized under this subchapter. Effluent limitations in the industrial wastewater discharge permit remain in effect for and during industrial reclaimed water use activities.

(f) Industrial reclaimed water projects approved under this subchapter do not require a new or amended permit from the commission except as provided by §210.5 of this title (relating to Authorization for the Use of Reclaimed Water). To develop projects not specifically authorized by this subchapter, a person may seek authorization for a new or amended waste discharge permit under Chapter 305 of this title (relating to Consolidated Permits).

(g) Nothing in this subchapter shall alter any requirement to obtain a water right authorization.

Adopted November 20, 2002 Effective December 11, 2002

§210.52. Definitions.

The following words and terms, when used in this subchapter, have the following meanings unless the context clearly indicates otherwise.

(1) Blowdown--The discharge of recirculating water for the purpose of discharging materials contained in the water, the further buildup of which would cause concentration in amounts that could damage or impair machinery, equipment, or systems.

(2) CFR--Code of Federal Regulations.

(3) Commingled wastewater--Industrial wastewater that contains any amount of domestic wastewater.

(4) Containing--When the pollutant(s) of concern are measured at levels that exceed the minimum analytical level.

(5) Discharge--The release or disposal of waste into or adjacent to any water in the state that in itself or in conjunction with any other discharge or activity causes, continues to cause, or will cause pollution of any of the water in the state.

(6) Dioxins and furans--Tetra, penta, hexa, hepta, and octa-chlorinated dibenzo dioxins and furans.

(7) End use--Landscape irrigation, soil compaction, dust suppression, impoundment maintenance, or industrial wastewater that is otherwise land applied in accordance with all applicable regulations.

(8) Industrial reclaimed water--Any industrial wastewater which has been treated, if necessary, to a quality suitable for land application for beneficial use.

(9) Industrial wastewater--A non-domestic or non-municipal wastewater.

(10) Land application--The discharge of waste adjacent to water in the state.

(11) MGD--Million gallons per day.

(12) Minimum analytical level (MAL)--The lowest concentration at which a particular substance can be quantitatively measured in the matrix of concern (i.e., wastewater) with a defined precision level, using approved analytical methods.

(13) Non-contact cooling water--Water used for cooling which does not come into direct contact with any raw material, intermediate product, waste product, by-product, or finished product.

(14) On-site--The use of industrial reclaimed water within the boundaries of the industrial facility or within the boundaries of property that is contiguous to the facility and owned or operated by the producer.

(15) Once-through cooling water--Water passed through main cooling condensers in one or two passes for the purpose of removing waste heat.

(16) Playa lake--A shallow (generally less than one meter deep), isolated, naturally ephemeral approximately circular lake located in an enclosed basin in the High Plains and West Central Plains areas of the state.

(17) POTW--Publicly-owned treatment works.

(18) Priority pollutants--The pollutants as listed in 40 CFR Part 122, Appendix D, Tables 2 and 3, plus 2,3,7,8-Tetrachlorodibenzo-p-dioxin and asbestos.

(19) Process wastewater--Any water which, during manufacturing or processing, comes into direct contact with or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product.

(20) Producer--A person who produces industrial reclaimed water as identified in this subchapter.

(21) SU--Standard units.

(22) Tail water--The runoff of irrigation water from the lower end of an irrigated field.

Adopted November 20, 2002 Effective December 11, 2002

§210.53. Wastes Eligible for Coverage.

(a) Level I eligibility. A producer is eligible for Level I authorization if the producer uses any of the following wastes on-site and has a primary disposal method as an alternative to reuse and an end use listed in §210.56(b) of this title (relating to Authorization Requirements):

(1) air conditioner condensate; compressor condensate; steam condensate; or condensate that forms externally on steam lines and is not process wastewater;

(2) washwater from washing whole fruits and vegetables;

(3) non-contact cooling water;

(4) once through cooling water;

(5) water treatment filter backwash;

(6) water from routine external washing of buildings, conducted without the use of detergents or other chemicals;

(7) water from routine washing of pavement conducted without the use of detergents or other chemicals and where spills or leaks of toxic or hazardous waste have not occurred (unless spilled material has been removed);

(8) cooling tower blowdown with a total dissolved solids concentration less than 2,000 milligrams per liter; or

(9) wastewater with measured effluent concentrations at or below threshold levels listed in the figure contained in this paragraph that is not a waste source listed in §210.54(a) of this title (relating to Wastes Not Eligible for Coverage). For all other priority pollutants in 40 CFR Part 122 Appendix D, Tables II and III, the threshold level is set at the minimum analytical level.

Figure: 30 TAC §210.53(a)(9)

Threshold Levels for Industrial Reclaimed Water					
Table 1					
Parameter	**Threshold (mg/l)**	**MAL (mg/l)**	**Parameter**	**Threshold (mg/l)**	**MAL (mg/l)**
Conventionals & Nonconventionals			**Metals**		
Total Organic Carbon	55	-	Copper, total	0.030	0.010
Oil and Grease	10	-	Lead, total	0.015	0.005
Total Dissolved Solids	2000	-	Manganese	0.05	--
Nitrate Nitrogen	10	-	Mercury, total	0.0002	0.0002
Metals			Nickel, total	0.030	0.010
Antimony, total	0.09	0.03	Selenium, total	0.030	0.010
Arsenic, total	0.030	0.010	Silver, total	0.006	0.002
Barium, total	0.030	0.010	Thallium, total	0.030	0.010
Beryllium, total	0.015	0.005	Zinc, total	0.015	0.005
Cadmium, total	0.003	0.001	Cyanide,	0.200	---

(b) Level II eligibility. A producer is eligible to apply for Level II authorization for any of the following:

(1) industrial reclaimed water containing pollutant concentration levels which exceed threshold levels listed in the figure contained in subsection (a)(9) of this section, but which is not a listed waste in §210.54(a) of this title;

(2) industrial reclaimed water that contains any amount of domestic wastewater;

(3) the proposed end use of industrial reclaimed water is not on-site;

(4) the proposed end use is not listed in §210.56(b)(2) of this title; or

(5) the disposal method proposed as an alternative to reuse is not listed in §210.56(b)(1) of this title.

§210.54. Wastes Not Eligible for Coverage.

(a) The following wastes are not eligible for authorization under this subchapter regardless of effluent quality or end use:

(1) wastewater containing radioactive material regulated under Texas Health and Safety Code, Chapter 401;

(2) wastewater containing dioxin and furans;

(3) wastewater containing pesticides;

(4) wastewater classified as or which is characteristically hazardous as defined by 40 Code of Federal Regulations (CFR) Part 261;

(5) process wastewater regulated under 40 CFR Parts 400 - 471 with the following exceptions:

(A) Part 405 - dairy products processing;

(B) Part 406 - grain mills;

(C) Part 407 - canned and preserved fruits and vegetables;

(D) Part 408 - canned and preserved seafood processing;

(E) Part 409 - sugar processing;

(F) Part 411 - cement manufacturing;

(G) Part 417 - soap and detergent manufacturing;

(H) Part 423 - steam electric power generating;

(I) Part 434 - coal mining;

(J) Part 436 - mineral mining and processing;

(K) Part 454 - gum and wood chemicals manufacturing; and

(L) Part 460 - hospital;

(6) septic tank waste, chemical toilet waste, grit trap waste, or grease trap waste;

(7) barge cleaning washwater;

(8) air scrubber wastewater;

(9) any wastewater where a permit by rule authorized under Chapter 321 of this title (relating to Control of Certain Activities by Rule) or commission-issued general permit for land application is available; or

(10) remediated/contaminated groundwater generated from facilities where process wastewater is prohibited for use as listed in paragraph (5) of this subsection.

(b) Producers who could otherwise be eligible to obtain authorization under this chapter, but who do not implement all required applicable conditions of this authorization must apply for and obtain permit coverage.

(c) Discharges into or adjacent to water in the state shall not be authorized under this chapter where prohibited by applicable rules including, but not limited to, Chapter 213 of this title (relating to Edwards Aquifer); Chapter 311 of this title (relating to Watershed Protection); and Chapter 335 of this title (relating to Industrial Solid Waste and Municipal Hazardous Waste).

(d) Any user proposing to irrigate or store wastewater within the boundaries of a playa lake may not obtain authorization under this subchapter and must obtain a Texas Pollutant Discharge Elimination System discharge permit for authorization to discharge into a playa lake.

Adopted November 20, 2002 Effective December 11, 2002

§210.55. Application Requirements for Authorization.

(a) Level I authorization. Producers eligible for Level I authorization under this subchapter are authorized to use industrial reclaimed water without any notification or approval by the executive director. Effluent sampling is not required for wastes listed in §210.53(a)(1) - (8) of this title (relating to Wastes Eligible for Coverage) with the exception of cooling tower blowdown which must meet the 2,000 milligrams per liter threshold level for total dissolved solids.

(b) Level II authorization. Producers requesting Level II authorization for industrial reclaimed water activities under this subchapter must submit a complete application to the executive director on a form approved by the executive director to request authorization. The use of industrial reclaimed water shall not begin until written authorization is received from the executive director. The application shall include, at a minimum, the following information:

(1) the legal names and addresses of the user, provider, and producer;

(2) contact representative for the applicant and telephone number;

(3) specific description of the producer's and user's facility location including physical address;

(4) specific description of the proposed industrial reclaimed water use site (if different than the producer's site);

(5) the proposed end use for the industrial reclaimed water;

(6) description of the waste source of the industrial reclaimed water;

(7) the primary disposal method which would be used as an alternative to re-use;

(8) the volume of industrial reclaimed water proposed for end use and the frequency of application;

(9) effluent testing results;

(10) the location of the producer's and user's site in relation to the Edwards Aquifer, if applicable, and;

(11) liner certification, if applicable.

(c) If the end use is not on-site, the producer shall also provide all information described in §210.4 of this title (relating to Notification).

Adopted November 20, 2002 Effective December 11, 2002

§210.56. Authorization Requirements.

(a) Requirements in other subchapters.

(1) Paragraphs (2) - (6) of this subsection do not apply to commingled water. The commingled wastewater is subject to all requirements of §§210.1 - 210.9 of this title (relating to Applicability; Purpose and Scope; Definitions; Notification; Authorization for the Use of Reclaimed Water; Responsibilities; Transfer and Conveyance of Reclaimed Water; Restrictions; and Enforcement), §§210.21 - 210.25 of this title (relating to Applicability; General Requirements; Storage Requirements for Reclaimed Water; Irrigation Using Reclaimed Water; and Special Design Criteria for Reclaimed Water Systems), and §§210.31 - 210.36 of this title

(relating to Applicability; Specific Uses of Reclaimed Water; Quality Standards for Using Reclaimed Water; Sampling and Analysis; Guidelines for Certain Distribution Systems; and Record Keeping and Reporting).

(2) Except as specified in this subchapter, the requirements for a reclaimed water producer, provider, and user described in Subchapters A - D of this chapter (relating to General Provisions; General Requirements for the Production, Conveyance, and Use of Reclaimed Water; Quality Criteria and Specific Uses For Reclaimed Water; and Alternative and Pre-Existing Reclaimed Water Systems) apply to a producer, provider, and user of industrial reclaimed water.

(3) A producer, provider, or user of industrial reclaimed water is not required to treat industrial water or hold a permit for treatment and disposal as described in §210.1 and §210.5(a) of this title.

(4) A producer who uses industrial reclaimed water on-site only is not required to comply with §210.4 of this title. The producer must comply with all applicable requirements of this subchapter pertaining to the industrial reclaimed water use.

(5) The requirements of §210.25(e), (f), and (h) of this title do not apply to the producer, provider, or user of industrial reclaimed water used on-site only.

(6) The requirements of §§210.22(a) and (e) and 210.31 - 210.36 of this title, do not apply to the producer, provider, or user of industrial reclaimed water.

(b) General requirements. Producers required to obtain Level I authorization to use industrial reclaimed water under this subchapter must comply with the following:

(1) have an authorized means of disposal as an alternative to reuse, which includes one or more of the following:

(A) have authority to discharge under a permit;

(B) have authority to route to a publicly-owned treatment works (POTW); or

(C) have the ability to recycle the industrial reclaimed water in a manner that does not discharge into or adjacent to water in the state;

(2) have an end use which includes one or more of the following and is on-site:

(A) irrigation, including landscape irrigation;

(B) fire protection;

(C) dust suppression and soil compaction;

(D) maintenance of impoundments;

(E) irrigation of non-food crops, including, but not limited to, sod farms and silviculture; and

(F) irrigation of pastures for milking animals.

(3) If the producer's facility is within the service area of a POTW, the producer must provide notice to the POTW of the producer's intent to use industrial wastewater under this subchapter.

(4) The distribution, use, and storage of industrial reclaimed water may not cause or result in nuisance conditions.

(5) The producer, provider, and user also shall comply with all applicable rules under Chapter 335 of this title (relating to Industrial Solid Waste and Municipal Hazardous Waste).

(c) Eligible Level I authorizations not able to meet §210.56(b). If the producer is eligible for Level I authorization but cannot meet the requirements of subsection (b) of this section, the producer shall submit an application for a Level II authorization to use reclaimed water.

(d) Industrial reclaimed limitations for Level II authorizations.

(1) The producer shall comply with the limitations and monitoring frequencies outlined in subparagraphs (A) - (C) of this paragraph for an authorization request which has been approved by the executive director:

(A) total organic carbon is limited to 55 milligrams per liter and shall be monitored once per month by grab sample;

(B) pH is limited to a minimum of 6.0 standards units (su) and a maximum of 9.0 su and shall be monitored once per week by grab sample; and

(C) the executive director may include additional limitations or increased monitoring frequencies based on information provided by the applicant, or any other available information.

(2) Sampling shall be conducted only if industrial reclaimed water use occurs during the monitoring period. If industrial reclaimed water use occurs less than the specified frequency, samples shall be obtained during use.

(e) General or individual permits. Level II authorization does not change any general or individual permit limits or requirements for an industrial wastewater discharge activity.

(f) Irrigation requirements.

(1) The provider or user shall comply with all requirements regarding irrigation in §210.24 of this title, as well as the requirements of this subchapter.

(2) Irrigation practices shall be designed and managed to prevent contamination of groundwater or surface water and to prevent the occurrence of nuisance conditions. Tail water control facilities shall be provided, where necessary, to prevent the discharge of any industrial reclaimed water from irrigated lands into or adjacent to water in the state.

(3) No industrial reclaimed water may be land applied when the ground is frozen or saturated or during rainfall events.

(4) When applying industrial reclaimed water to land, a buffer area must be maintained around water wells to prevent the possibility of waste transport to groundwater via the well or well casing. Industrial reclaimed water shall not be applied within 250 feet of a private water well (used for domestic or irrigation use) or 500 feet of a public water supply well.

(5) The user shall provide adequate maintenance of the irrigation facilities to ensure that the facilities are in good working condition.

(g) Storage requirements.

(1) All industrial reclaimed water retention, holding, and transfer ponds shall be operated in such a manner as to maintain a minimum freeboard of two feet.

(2) Ponds shall not be used for disposal.

(h) Liner requirements. Under Level I and Level II authorizations, industrial reclaimed water is considered equivalent to Type I reclaimed water. The producer, provider, or user shall comply with liner requirements outlined in §210.23 of this title.

(i) Off-site use.

(1) Any proposed use of industrial reclaimed water which is not considered on-site must comply with the requirements in the following sections in addition to the applicable requirements of this subchapter:

(A) §210.4 of this title;

(B) §210.6 of this title;

(C) §210.7 of this title; and

(D) §210.25 of this title.

(2) If the producer provides domestic water or wastewater services to the public such as at a university, hospital, hotel, or similar institution then all exposed or buried piping receiving industrial reclaimed water constructed within the boundaries of the industrial facility is exempt from the color coding requirements of §210.25 of this title.

(j) Authorization to use industrial reclaimed water. Authorization to use industrial reclaimed water is separate from the general and individual permit requirements for wastewater discharges under Chapter 205 and Chapter 305 of this title (relating to General Permits for Waste Discharges; and Consolidated Permits).

Adopted November 20, 2002 Effective December 11, 2002

§210.57. Sampling and Record Keeping Requirements.

(a) Level I authorizations. No additional sampling or monitoring is required by the producer, user, or provider other than the requirements already established in this subchapter.

(b) Level II authorizations.

(1) Sampling.

(A) The producer shall sample the reclaimed water after final treatment, if any, but before distribution to a provider or user and analyze such samples to assure that the water quality meets the limitations required by the authorization. The producer shall sample for the parameters listed in §210.56(d) of this title (relating to Authorization Requirements) and any additional parameters required by the executive director in the authorization.

(B) If any of the sample results exceed the limitations in the authorization, the producer may not use the wastewater, may not route the industrial wastewater to a user or provider, and shall use the means of disposal instead of reuse. The producer has the option to provide additional treatment to meet the limitations and, if the limitations are met, the water may be used as industrial reclaimed water.

(C) Analytical methods for the analyses shall meet the requirements specified in Chapter 319 of this title (related to General Regulations Incorporated into Permits).

(D) Monitoring samples and measurements shall be taken at times and in a manner so as to be representative of the monitored activity.

(2) Recordkeeping requirements.

(A) The producer shall maintain records of notifications made to the executive director under this subchapter concerning industrial reclaimed water use.

(B) The producer shall maintain records of all monitoring activities. These records shall be readily available for inspection by the executive director for a minimum period of five years. Records of monitoring activities shall include:

(i) date, time, and place of sample or measurement;

(ii) identity of individual who collected the sample or made the

measurement;

(iii) date of analysis;

(iv) identity of the individual and laboratory who performed the analysis;

(v) the technique or method of analysis; and

(vi) the results of the analysis or measurement.

(C) The user shall maintain an operating log which records irrigation activities and shall be readily available for inspection by the executive director for a minimum period of five years. The operating log shall record irrigation activities which include:

(i) the volume of industrial reclaimed water used for irrigation each day; and

(ii) the actual surface area wetted each day.

Adopted November 20, 2002 Effective December 11, 2002

§210.58. Existing Authorizations.

(a) A person who has obtained executive director written approval to use industrial reclaimed water under this subchapter is authorized to continue as currently authorized.

(b) If a person is no longer authorized under a Level I authorization, the producer shall obtain authorization for the reuse of industrial wastewater within 180 days of the effective date of this subchapter.

Adopted November 20, 2002 Effective December 11, 2002

§210.59. Executive Director Denial or Suspension Authorization.

(a) The executive director may deny or suspend an authorization request to use industrial reclaimed water under this subchapter based on potential or actual adverse impact to the environment or on close proximity to a public park, school, recreational area, spring, aquifer, water supply well, surface water supply intake, water treatment plant intake, potable water storage facility, sewage treatment plant, or other location of concern. A determination of potential adverse impact may arise from consideration of such factors as, but not limited to, proposed flow rate, production rate, industrial reclaimed water quality, nature of the groundwater, soils, or geology of the disposal area. In making a determination of potential adverse impacts, the executive director may also consider such other factors, as he deems appropriate.

(b) The following requirements apply to suspensions of authorizations.

(1) The suspension issued under this subchapter will include a statement that requires the executive director to provide written notice to a person stating that the executive director intends to suspend a person's authority to use reclaimed water under the authorization, including:

(A) a brief statement of the basis for this decision under this subsection;

(B) a statement by the executive director of whether the person shall immediately cease the use of industrial reclaimed water; and

(C) a deadline for obtaining authorization under Texas Water Code (TWC), Chapter 26.

(2) The executive director may require the person whose authorization to use reclaimed water is suspended to apply for and obtain an individual permit.

(3) The executive director may suspend authorization to use industrial reclaimed water under an existing authorization issued under this subchapter for the following reasons:

(A) the quantity of industrial reclaimed water used, the type of waste or reclaimed water, or the type of operation does not comply with this chapter;

(B) the use, irrigation, or discharge causes a violation of the Texas Surface Water Quality Standards; or

(C) the wastewater used as industrial reclaimed water contains pollutants that cause or contribute to significant adverse effects on water quality. In making this determination, the executive director shall consider the following factors:

(i) the location of the end use for industrial reclaimed water;

(ii) the volume of wastewater used as industrial reclaimed water;

(iii) the quantity and nature of pollutants contained in the wastewater used as industrial reclaimed water;

(iv) whether the use of industrial reclaimed water would adversely affect groundwater quality, inconsistent with the policy specified in TWC, §26.401; and

(v) other factors relating to the protection of water quality.

(c) The compliance history of the producer, provider, and user will be evaluated prior to approval of any Level II authorization under this subchapter. Authorization may be suspended or denied or additional requirements may be established based on the evaluation of compliance history as outlined in Chapter 60 of this title (relating to Compliance History).

§210.60. Fees.

Each application submitted to the executive director for Level II authorization under this subchapter shall include a fee of $100.

Adopted November 20, 2002 Effective December 11, 2002

SUBCHAPTER F: USE OF GRAYWATER AND ALTERNATIVE ONSITE WATER
§§210.81 - 210.85
Effective December 29, 2016

§210.81. Applicability.

(a) This subchapter applies to graywater and alternative onsite water generated and used at a private residence, commercial facility, industrial facility, institution, or agriculture facility regardless of the disposal method for other wastewater.

(b) This subchapter does not apply to reclaimed water which is regulated by Subchapters A - E of this chapter (relating to General Provisions; General Requirements for the Production, Conveyance, and Use of Reclaimed Water; Quality Criteria and Specific Uses for Reclaimed Water; Alternative and Pre-Existing Reclaimed Water Systems; and Special Requirements for Use of Industrial Reclaimed Water).

(c) This subchapter does not regulate the design, construction, or operation of on-site sewage facilities (OSSFs) but instead regulates the design, construction, and operation of alternative water reuse systems, combined reuse systems, and graywater reuse systems that may be located at a site that uses an OSSF. The design, construction, and operation of OSSFs are regulated by Chapter 285 of this title (relating to On-Site Sewage Facilities).

(d) An existing graywater system shall comply with the requirements of this subchapter as they existed on the date installation was completed. The previous version of this subchapter is continued in effect for this purpose.

(e) This subchapter does not authorize the diversion or impoundment of state water, as defined in Chapter 297 of this title (relating to Water Rights, Substantive).

Adopted December 7, 2016 Effective December 29, 2016

§210.82. Definitions and General Requirements.

(a) Definitions. For the purposes of this subchapter, the following terms have the following meanings.

(1) Alternative onsite water--rainwater, air-conditioner condensate, foundation drain water, stormwater, swimming pool backwash and drain water, or reverse osmosis reject water. Cooling tower blowdown is regulated by Subchapter E

of this chapter (relating to Special Requirements for Use of Industrial Reclaimed Water); therefore, for the purposes of this subchapter, all references to alternative onsite water do not include cooling tower blowdown. Reverse osmosis reject water generated at industrial facilities, commercial facilities, and institutions is regulated by Subchapter E of this chapter; therefore, for the purposes of this subchapter, all references to alternative onsite water do not include reverse osmosis reject water generated at industrial facilities, commercial facilities, and institutions. Reverse osmosis reject water generated at private residences and agriculture facilities may be used in accordance with this subchapter.

(2) Alternative water reuse system--a system designed and constructed to store and distribute one or more sources of alternative onsite water. An alternative water reuse system shall not contain, store, or distribute any graywater.

(3) Combined reuse system--a system designed and constructed to store and distribute graywater and one or more sources of alternative onsite water.

(4) Graywater-- wastewater from showers, bathtubs, handwashing lavatories, sinks that are used for disposal of household or domestic products, sinks that are not used for food preparation or disposal, and clothes-washing machines. Graywater does not include wastewater from the washing of material, including diapers, soiled with human excreta or wastewater that has come into contact with toilet waste.

(5) Graywater reuse system--a system designed and constructed to store and distribute graywater only. A graywater reuse system shall not contain, store, or distribute any source of alternative onsite water.

(b) Alternative water reuse systems. The following requirements apply to alternative water reuse systems used at a private residence, industrial facility, commercial facility, institution, or agriculture facility.

(1) Water from an alternative water reuse system may be reused for beneficial purposes including but not limited to landscape irrigation, gardening, composting, foundation stabilization, and toilet and urinal flushing. An alternative water reuse system may store and use either a single source or a combination of sources of alternative onsite water, and in any volume.

(2) Reverse osmosis reject water generated at an industrial facility, commercial facility, or an institution is prohibited from being stored and used in an alternative water reuse system. Reverse osmosis reject water generated by an industrial facility, commercial facility, or an institution is regulated by Subchapter E of this chapter.

(3) Reuse of water from an alternative water reuse system does not require authorization from the commission if used in accordance with this subchapter. The property owner is responsible for ensuring that the alternative water reuse system is properly operated and maintained to comply with the requirements of this subchapter.

(4) Water from an alternative water reuse system must be applied at a rate that will not result in ponding or pooling, or cause runoff across the property lines or onto any paved surface.

(5) Water from an alternative water reuse system shall not be applied using a spray distribution system except in accordance with the following conditions.

(A) Water from the spray distribution system must be applied at times when people and pets are not actively using the distribution area.

(B) Water from the spray distribution system must not be applied during rainfall events, when the ground is frozen, or within 24 hours after one-half inch or more of rain.

(C) Water from the spray distribution system must be applied at a rate to prevent ponding, puddling, or runoff.

(D) Water from the spray distribution system must not be sprayed or allowed to drift off the property.

(E) The spray distribution system must not be connected to a potable or raw water irrigation system unless suitable backflow prevention is provided to protect the potable or raw water system.

(F) The spray distribution system must be inspected and repaired as needed to prevent discharges to water in the state or off the property.

(6) The storage and use of water from an alternative water reuse system must not create a nuisance, threaten human health, or damage the quality of surface water or groundwater.

(7) Swimming pool backwash and drain water cannot be used within five days of adding chemicals for shock or acid treatment.

(8) Water from an alternative water reuse system that is used for toilet or urinal flushing must meet the following requirements. Property owners may

refer to the regulatory guidance document that is required by the Texas Health and Safety Code, §341.039, for assistance in complying with these requirements.

(A) For residential toilet or urinal flushing, *Escherichia coli* (*E. coli)* must be less than 14 most probable number (MPN) or colony-forming units (CFU) per 100 milliliters for 30-day geometric mean and less than 240 MPN or CFU per 100 milliliters maximum single grab sample. For industrial, commercial, or agricultural toilet or urinal flushing, *E. coli* must be less than 2.2 MPN or CFU per 100 milliliters for 30-day geometric mean and less than 200 MPN or CFU per 100 milliliters maximum single grab sample.

(B) Total suspended solids must be less than 10.0 milligrams per liter for 30-day geometric mean and less than 30.0 milligrams per liter maximum single grab sample.

(C) All exposed piping and piping carrying alternative onsite water within a building must be either purple pipe or painted purple; all buried piping must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple; and all exposed piping must be stenciled in yellow with a warning reading "NON-POTABLE WATER." An alternative water reuse system that stores only rainwater, commonly referred to as a rainwater harvesting system, and uses the water for potable purposes in accordance with §290.44 of this title (relating to Water Distribution) is exempt from this subparagraph.

(9) An alternative water reuse system cannot have a physical connection to an organized wastewater collection system or an on-site sewage facility (OSSF). When the system reaches capacity, it is allowed to overflow onto the ground only if the overflow is caused by inflow of rainwater or stormwater. Overflow under these conditions is exempt from the requirement of paragraph (4) of this subsection.

(10) An alternative water reuse system may be subject to backflow prevention requirements in §290.44 of this title to protect public water supply systems from cross-contamination.

(c) Graywater reuse systems and combined reuse systems. The following requirements apply to all graywater reuse systems and combined reuse systems.

(1) Construction of a graywater reuse system or a combined reuse system, including storage and distribution systems, must comply with this subchapter and any requirements of the local permitting authority.

(2) Water from a graywater reuse system or a combined reuse system must be applied at a rate that will not result in ponding or pooling and will not cause runoff across the property lines or onto any paved surface.

(3) The storage and use of water from a graywater reuse system or a combined reuse system must not create a nuisance, threaten human health, or damage the quality of surface water or groundwater.

(4) A graywater reuse system or combined reuse system may be subject to backflow prevention requirements in §290.44 of this title to protect public water supply systems from cross-contamination.

Adopted December 7, 2016 Effective December 29, 2016

§210.83. Residential Use of Graywater and Alternative Onsite Water.

(a) An authorization from the commission is not required for the residential use of graywater and alternative onsite water from a graywater reuse system or a combined reuse system when the total combined average is less than 400 gallons per day and the water is used in accordance with this subchapter. Unless directed by the executive director, an authorization from the commission is not required for the residential use of graywater and alternative onsite water from a graywater reuse system or a combined reuse system when the total combined average is greater than or equal to 400 gallons per day and the water is used in accordance with this subchapter.

(b) The graywater and alternative onsite water must originate from a private residence.

(c) Water from a graywater reuse system or a combined reuse system may only be used at the private residence for the following purposes:

(1) to minimize foundation movement and cracking;

(2) for gardening;

(3) for composting;

(4) for landscaping; or

(5) for toilet or urinal flushing.

(d) Graywater reuse systems and combined reuse systems are not authorized to overflow onto the ground under any circumstance.

(1) Graywater reuse systems must be designed and constructed so that the storage tank required by subsection (e) of this section overflows to an organized wastewater collection system or an on-site sewage facility (OSSF) unless prohibited by Chapter 285, Subchapter H of this title (relating to Disposal of Graywater). The graywater must enter the organized wastewater collection system or OSSF through either one air gap or two backflow valves or backflow preventers.

(2) Combined reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system or an OSSF, unless prohibited by Chapter 285, Subchapter H of this title, prior to entering the storage tank required by subsection (e) of this section. Graywater must be diverted to the organized wastewater collection system or OSSF during periods of non-use of the system or if the storage tank required by subsection (e) of this section reaches 80% capacity. The graywater must enter the organized wastewater collection system or the OSSF through either one air gap or two backflow valves or backflow preventers.

(3) Combined reuse systems that store stormwater, rainwater, and/or foundation drain water must have an automatic shutoff system to stop the inflow of stormwater, rainwater, and foundation drain water into the combined reuse system. The automatic shutoff system must activate when the storage tank required by subsection (e) of this section reaches 80% capacity.

(e) Except as authorized by subsection (j) of this section, graywater reuse systems and combined reuse systems must store the water in tanks and the tanks must:

(1) be clearly labeled as non-potable water;

(2) restrict access, especially to children;

(3) eliminate habitat for mosquitoes and other vectors;

(4) be able to be cleaned; and

(5) meet the structural requirements of §210.25(i) of this title (relating to Special Design Criteria for Reclaimed Water Systems).

(f) Graywater reuse systems and combined reuse systems must use piping that meets the piping requirement of §210.25 of this title.

(g) Water from a graywater reuse system or a combined reuse system shall not be applied using a spray distribution system except in accordance with the following conditions.

(1) Water from the spray distribution system must meet the following limits: *Escherichia coli* (*E. coli*) must be less than 14 most probable number (MPN) or colony-forming units (CFU) per 100 milliliters for 30-day geometric mean and less than 240 MPN or CFU per 100 milliliters maximum single grab sample.

(2) Water from the spray distribution system must be applied at times when people and pets are not actively using the distribution area.

(3) Water from the spray distribution system must not be applied during rainfall events, when the ground is frozen, or within 24 hours after one-half inch or more of rain.

(4) Water from the spray distribution system must be applied at a rate to prevent ponding, puddling, or runoff.

(5) Water from the spray distribution system must not be sprayed or allowed to drift off property.

(6) The spray distribution system must not be connected to a potable or raw water irrigation system unless suitable backflow prevention is provided to protect the potable or raw water system.

(7) The spray distribution system must be inspected and repaired as needed to prevent discharges to water in the state or off property.

(h) The property owner is responsible for ensuring that the graywater reuse system or combined reuse system is properly operated and maintained to achieve the following requirements. Monitoring and recordkeeping for *E. coli* and total suspended solids is not required. Property owners may refer to the regulatory guidance document that is required by the Texas Health and Safety Code, §341.039, for assistance in complying with these requirements.

(1) Graywater and alternative onsite water shall be treated to remove debris such as lint, leaves, twigs, and branches prior to entering the storage tank by use of a 50 mesh screen.

(2) Swimming pool backwash and drain water cannot be used within five days after adding chemicals for shock or acid treatment.

(3) Water from a graywater reuse system or a combined reuse system that is used for toilet or urinal flushing must meet the following requirements.

(A) *E. coli* must be less than 14 MPN or CFU per 100 milliliters for 30-day geometric mean and less than 240 MPN or CFU per 100 milliliters maximum single grab sample.

(B) Total suspended solids must be less than 10.0 milligrams per liter for 30-day geometric mean and less than 30.0 milligrams per liter maximum single grab sample.

(C) All exposed piping and piping carrying graywater and/or alternative onsite water within a building must be either purple pipe or painted purple; all buried piping must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple; and all exposed piping must be stenciled in yellow with a warning reading "NON-POTABLE WATER."

(i) Builders of private residences are encouraged to:

(1) install plumbing in new housing to collect graywater and alternative onsite water from all allowable sources, taking into consideration end-use requirements and maintaining sufficient blackwater waste flow; and

(2) design and install a subsurface distribution system around the foundation of new housing to minimize foundation movement or cracking.

(j) Property owners who have been disposing of wastewater from residential clothes-washing machines, otherwise known as laundry graywater, directly onto the ground prior to January 6, 2005, may continue disposing of laundry graywater under the following conditions.

(1) The disposal area must not create a nuisance or threaten human health.

(2) Surface ponding must not occur in the disposal area.

(3) The disposal area must support plant growth or be sodded with vegetative cover.

(4) The disposal area must have limited access and use by residents and pets.

(5) Laundry graywater that has been in contact with human or animal waste must not be disposed onto the ground surface.

(6) Laundry graywater must not be disposed onto an area where the soil is wet.

(7) A lint trap must be affixed to the end of the discharge line.

(8) The system has not been altered after January 6, 2005, has not created a nuisance, and does not discharge graywater from any source other than clothes-washing machines.

Adopted December 7, 2016 Effective December 29, 2016

§210.84. Industrial, Commercial, or Institutional Use of Graywater and Alternative Onsite Water.

(a) For the purposes of this section, alternative onsite water does not include reverse osmosis reject water, as this source of water is regulated by Subchapter E of this chapter (relating to Special Requirements for Use of Industrial Reclaimed Water).

(b) An authorization from the commission is not required for the use of graywater and alternative onsite water from a graywater reuse system or a combined reuse system at an industrial facility, commercial facility, or institution. Treatment required by this section does not require authorization from the commission.

(c) The graywater and alternative onsite water must be generated and used onsite.

(d) Graywater reuse systems and combined reuse systems are not authorized to overflow onto the ground under any circumstances.

(1) Graywater reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system, on-site sewage facility (OSSF), authorized outfall in a wastewater discharge permit, or authorized disposal area in a Texas Land Application Permit (TLAP). The graywater must be diverted to the organized wastewater collection system, OSSF, authorized outfall in a wastewater discharge permit, or authorized disposal area in a TLAP during periods of non-use of the graywater reuse system or if the system reaches maximum capacity. The graywater must enter the organized wastewater system or OSSF through either one air gap or two backflow valves or backflow preventers.

(2) Combined reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system, OSSF, authorized outfall in a wastewater discharge permit, or authorized disposal area in a TLAP prior to entering the combined reuse system. Graywater must be diverted to the organized wastewater collection system, OSSF, authorized outfall in a wastewater discharge permit, or authorized disposal area in a TLAP during periods of non-use of the system or if the combined reuse system reaches 80% capacity. The graywater must enter the organized wastewater collection system or the OSSF through either one air gap or two backflow valves or backflow preventers.

(3) Combined reuse systems that store stormwater, rainwater, and/or foundation drain water must have an automatic shutoff system to stop the inflow of stormwater, rainwater, and foundation drain water into the combined reuse system. The automatic shutoff system must activate when the combined reuse system reaches 80% capacity.

(e) Water from a graywater reuse system or a combined reuse system may be used onsite for the following activities.

(1) Process water. Water from a graywater reuse system or a combined reuse system that is used for process water must be treated to a standard that allows the water to be used in operational processes.

(2) Landscape maintenance. Water from a graywater reuse system or a combined reuse system that is used for landscape maintenance must meet the following limits.

(A) If the water will be applied in areas with public access, the water must meet the following limits:

(i) *Escherichia coli* (*E. coli*), 20 most probable number (MPN) or colony-forming units (CFU) per 100 milliliters (ml), 30-day geometric mean; or

(ii) *E. coli* (not to exceed), 75 MPN or CFU per 100 ml, single grab sample.

(B) If the water will be applied in areas with restricted access to the public, the water must meet the following limits:

(i) *E. coli*, 200 MPN or CFU per 100 ml, 30-day geometric mean; or

(ii) *E. coli* (not to exceed), 800 MPN or CFU per 100 ml, single grab sample.

(3) Dust control. Water from a graywater reuse system or a combined reuse system that is used for dust control must meet the *E. coli* limits in paragraph (2)(B) of this subsection.

(4) Toilet or urinal flushing. Water from a graywater reuse system or a combined reuse system that is used for toilet or urinal flushing must meet the following requirements.

(A) *E. coli* must be less than 2.2 MPN or CFU per 100 ml for 30-day geometric mean and less than 200 MPN or CFU per 100 ml maximum single grab sample.

(B) Total suspended solids must be less than 10.0 milligrams per liter for 30-day geometric mean and less than 30.0 milligrams per liter maximum single grab sample.

(C) All exposed piping and piping carrying graywater and/or alternative onsite water within a building must be either purple pipe or painted purple; all buried piping installed after January 6, 2005, must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple; and all exposed piping must be stenciled in yellow with a warning reading "NON-POTABLE WATER."

(5) Other uses. Water from a graywater reuse system or a combined reuse system that is used for other similar activities must:

(A) meet the *E. coli* limits in paragraph (2)(A) of this subsection if used in a way that the public may come into contact with the water; or

(B) meet the *E. coli* limits in paragraph (2)(B) of this subsection if used in a way that the public will not come into contact with the water.

(f) Water from a graywater reuse system or a combined reuse system that is required to meet the *E. coli* limits in subsection (e) of this section must be monitored for *E. coli* at least monthly. These records must be maintained at the site and be readily available for inspection by the commission for a minimum of five years.

§210.85. Agricultural Use of Graywater and Alternative Onsite Water.

(a) An authorization from the commission is not required for the use of graywater and alternative onsite water from a graywater reuse system or a combined reuse system for agricultural purposes. Treatment required by this section does not require authorization from the commission.

(b) The graywater and alternative onsite water must be generated and used onsite.

(c) Graywater reuse systems and combined reuse systems are not authorized to overflow onto the ground under any circumstances.

(1) Graywater reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system or on-site sewage facility (OSSF), unless prohibited by Chapter 285, Subchapter H of this title (relating to Disposal of Graywater). The graywater must be diverted during periods of non-use of the graywater reuse system or if the system reaches maximum capacity. The graywater must enter the organized wastewater collection system or OSSF through either one air gap or two backflow valves or backflow preventers.

(2) Combined reuse systems must be designed and constructed so that 100% of the graywater can be diverted to an organized wastewater collection system or OSSF, unless prohibited by Chapter 285, Subchapter H of this title prior to entering the combined reuse system. Graywater must be diverted to the organized wastewater collection system or OSSF during periods of non-use of the system or if the combined reuse system reaches 80% capacity. The graywater must enter the organized wastewater collection system or the OSSF through either one air gap or two backflow valves or backflow preventers.

(3) Combined reuse systems that store stormwater, rainwater, and/or foundation drain water must have an automatic shutoff system to stop the inflow of stormwater, rainwater, and foundation drain water into the combined reuse system. The automatic shutoff system must activate when the combined reuse system reaches 80% capacity.

(d) Water from a graywater reuse system or a combined reuse system may be used for the following activities.

(1) Process water. Water from a graywater reuse system or a combined reuse system that is used for irrigation and other agricultural purposes may be treated to a standard that allows the water to be used in operational processes.

(2) Landscape maintenance. Water from a graywater reuse system or a combined reuse system that is used for landscape maintenance must meet the following limits.

(A) If the water will be applied in areas with public access, the water must meet the following limits:

(i) *Escherichia coli* (*E. coli*), 20 most probable number (MPN) or colony-forming units (CFU) per 100 milliliters (ml), 30-day geometric mean; or

(ii) *E. coli* (not to exceed), 75 MPN or CFU per 100 ml, single grab sample.

(B) If the water will be applied in areas with restricted access to the public, the water must meet the following limits:

(i) *E. coli*, 200 MPN or CFU per 100 ml, 30-day geometric mean; or

(ii) *E. coli*, 800 MPN or CFU per 100 ml, single grab sample.

(3) Dust control. Water from a graywater reuse system or a combined reuse system that is used for dust control must meet the *E. coli* limits in paragraph (2)(B) of this subsection.

(4) Irrigation of fields. Water from a graywater reuse system or a combined reuse system that is used to irrigate fields where edible crops are grown or fields that are pastures for milking animals, the water must meet the *E. coli* limits in paragraph (2)(A) of this subsection. *E. coli* limits do not apply to graywater and alternative onsite water that is used to irrigate fields other than those where edible crops are grown or fields that are pastures for milking animals.

(5) Toilet or urinal flushing. Water from a graywater reuse system or a combined reuse system that is used for toilet or urinal flushing must meet the following requirements.

(A) *E. coli* must be less than 2.2 MPN or CFU per 100 ml for 30-day geometric mean and less than 200 MPN or CFU per 100 ml maximum single grab sample.

(B) Total suspended solids must be less than 10.0 milligrams per liter for 30-day geometric mean and less than 30.0 milligrams per liter maximum single grab sample.

(C) All exposed piping and piping carrying graywater and/or alternative onsite water within a building must be either purple pipe or painted purple; all buried piping must be either manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple; and all exposed piping must be stenciled in yellow with a warning reading "NON-POTABLE WATER."

(6) Other uses. Water from a graywater reuse system or a combined reuse system that is used for other similar activities must:

(A) meet the *E. coli* limits in paragraph (2)(A) of this subsection if used in a way that the public may come into contact with the water; or

(B) meet the *E. coli* limits in paragraph (2)(B) of this subsection if used in a way that the public will not come into contact with the water.

(e) Water from a graywater reuse system or a combined reuse system that is required to meet the *E. coli* limits in subsection (d) of this section must be monitored for *E. coli* at least monthly. These records must be maintained at the site and be readily available for inspection by the commission for a minimum period of five years.

22 Appendix N
Social Media, Website, Public Presentations, and Survey Summary

Social Media Links

Facebook - https://www.facebook.com/LaredoWater

Instagram - https://www.instagram.com/laredowater/

Twitter - https://twitter.com/LaredoWater

YouTube - https://www.youtube.com/@laredowater8432

Website - https://laredowater.org/

Presentations - https://laredowater.org/presentations/

Survey Summary - https://laredowater.org/survey/