Hutto Regional Wastewater Study

Final Report for
TWDB Contract No. 1148311255

Prepared by
K Friese & Associates, Inc.

Study Participants:

City of Hutto

where quality meets life
PFLUGERVILLE
TEXAS

WILLIAMSON
COUNTY
1848

JONAH
Special Utility
District

HUTTO ISD

HUTTO AREA

TEXAS
Hutto
ECONOMIC DEVELOPMENT CORPORATION

Texas Water Development Board
P.O. Box 13231, Capitol Station
Austin, Texas 78711-3231
November 2012

TEXAS WATER DEVELOPMENT BOARD

Hutto Regional Wastewater Study

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Hutto Regional Wastewater Study

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Executive Summary

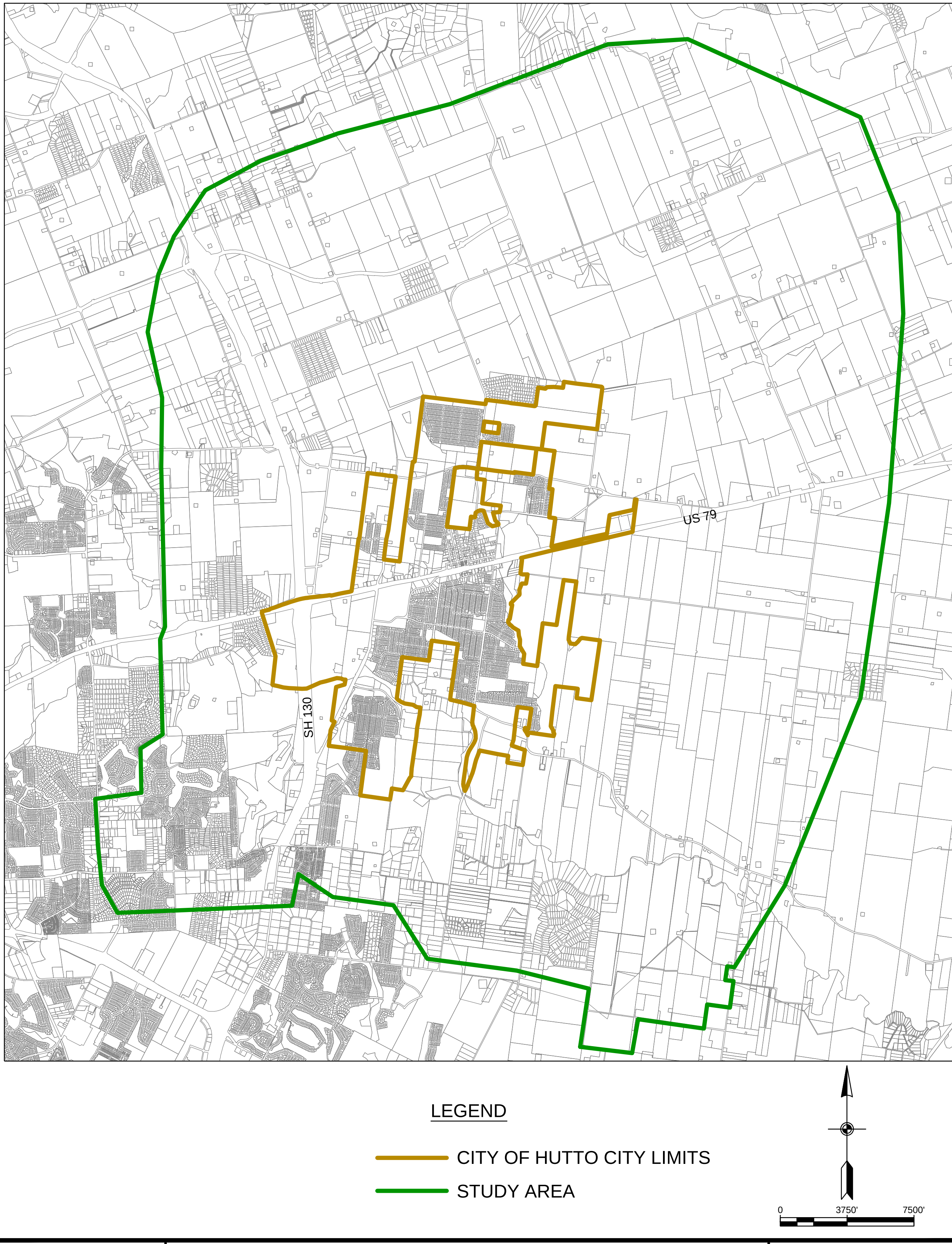
In March 2011, the City of Hutto, in conjunction with the City of Pflugerville, Jonah Water Special Utility District (Jonah SUD), Hutto Independent School District, Hutto Area Chamber of Commerce, Hutto Economic Development Corporation, and Williamson County, received planning grant assistance from the Texas Water Development Board (TWDB) to complete a regional wastewater study for the Hutto area. The study area for the master plan includes approximately 44,000 acres of land, around and including, Hutto, as shown in **Figure ES-1**. The purpose of the study is to assist Hutto and other participants with planning for growth throughout the study period from the present to 2040.

The City of Hutto's wastewater facilities include the Cottonwood Creek Wastewater Treatment Plant (WWTP), five lift stations and associated force mains and gravity mains from 4-inches to 33-inches in diameter. **Figure ES-2** depicts Hutto's wastewater facilities. The City of Pflugerville has wastewater collection system facilities just south of a portion of Hutto's existing system. This collection system delivers flow to Pflugerville's Central WWTP. Jonah SUD's existing customers within the study area are served by a combination of wholesale service from Hutto and onsite septic systems. Several areas within Hutto's certificate of convenience and necessity (CCN) but that are not presently served by Hutto's existing collection system also have onsite septic systems. It was assumed that these areas would be connected to the system in the future, as the system expands, due to the proximity of the septic system areas to existing collection system lines.

Population projections for the study area were determined in five year increments through 2040 based on information from TWDB, Capital Area Metropolitan Planning Organization 2035 Plan, City of Hutto Planning Department, City of Hutto 2008 Wastewater System Capital Improvement Program, the Economic Development Corporation, and the 2010 Census population for the city limits of Hutto. In 2010, the population of the study area was projected to be 27,615, while in 2040 it is projected to have grown to 84,542.

Pump testing was performed at each lift station to determine the actual pumping rates. Existing per capita wastewater flows were derived from this information in conjunction with Supervisory Control and Data Acquisition (SCADA) data and land use data. The flows calculated from the pump testing results and SCADA data analysis were compared to criteria published by the City of Hutto to aid in the design and construction of wastewater facilities. Based on this comparison, a flow of 75 gallon per day per capita and an inflow and infiltration value of 500 gallons per acre per day were selected as the design criteria to determine the wastewater flow generated by the projected population.

Flow projections for the study area were generated based on the population projections and the design criteria. Areas closer to existing wastewater facilities were assumed to connect to the system sooner than areas on the outskirts of the study area. A large portion of the study area (particularly the northern, eastern, and southern sections) is projected to be developed relatively sparsely in 2040. Therefore it was assumed that those areas will not be connected to centralized wastewater collection in 2040. The projected flow to the wastewater system is 1.24 million gallons per day (mgd) in 2010 and 4.79 mgd in 2040.



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HUTTO REGIONAL WASTEWATER STUDY

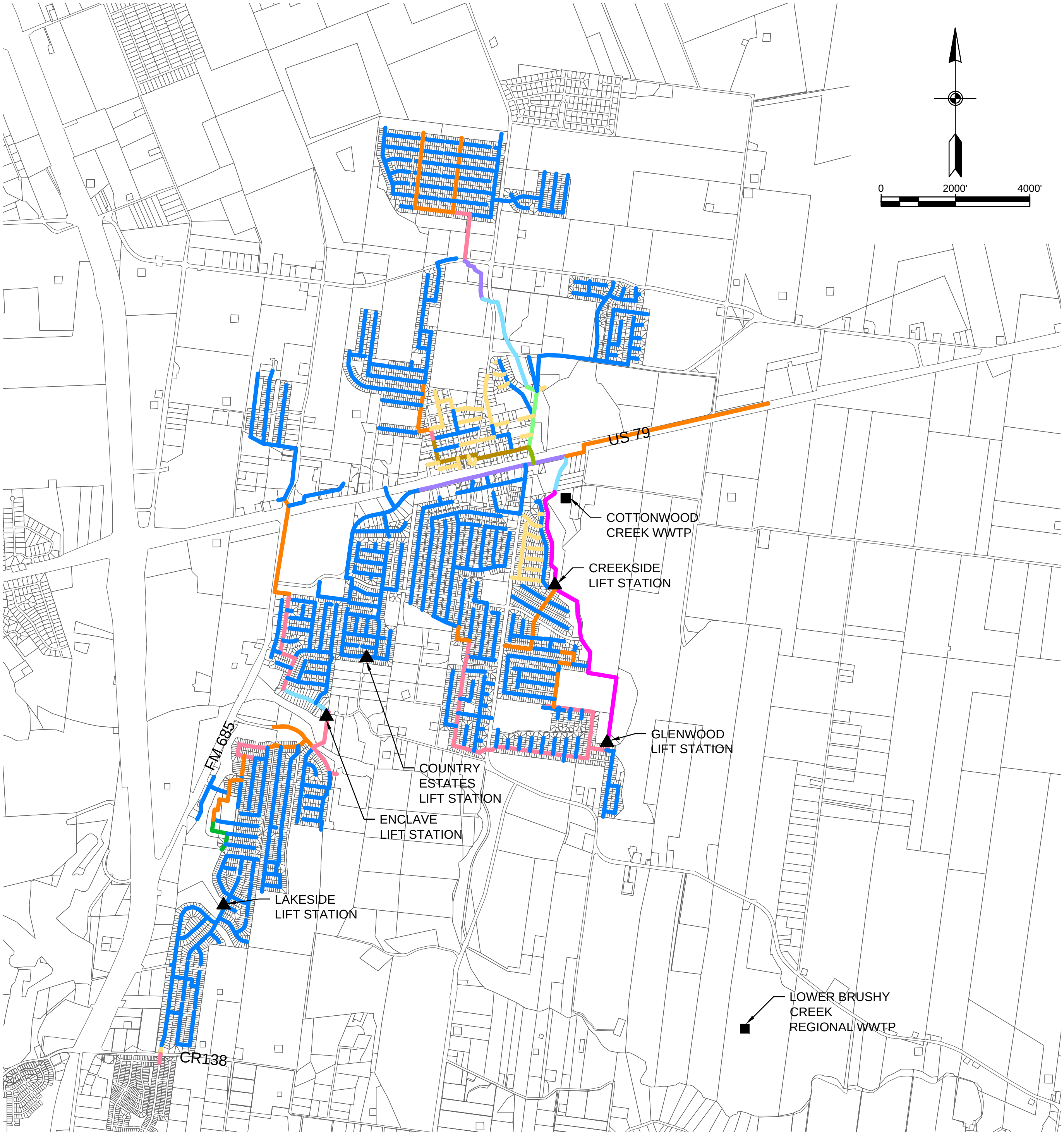
STUDY AREA

SCALE: 1" = 7500'

JUNE 4, 2012

FIGURE ES-1

File: X:\Projects\0204 - Hutto Master Plan\DWG\Exhibits\Figure ES-1_Study Area.dwg Layout: Layout1 (2) Plotted: 6/7/2012 4:01:19 PM Plotted by: Robert Kaylor Saved by: RKaylor



LEGEND

6" WWL	21" WWL	WWTP
8" WWL	24" WWL	LIFT STATION
10" WWL	27" WWL	
12" WWL	33" WWL	
15" WWL	FORCE MAIN	
18" WWL		

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HUTTO REGIONAL WASTEWATER STUDY

EXISTING WASTEWATER FACILITIES

SCALE: 1" = 4000'

JUNE 4, 2012

FIGURE ES-2

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The existing Cottonwood Creek WWTP was designed to treat 1.5 mgd. Comparing this to the flow projections above, it can be seen that additional treatment capacity is required in the near future. Three options for this additional treatment were evaluated. In addition, the conveyance improvements necessary to deliver the wastewater flow to the appropriate treatment location depending on plant capacity and population projections was determined. **Figure ES-3** shows the location of the Lower Brushy Creek WWTP and the associated conveyance improvements.

1. **Temporary service by the City of Pflugerville –** This option includes construction of a temporary 1,400 gallons per minute (gpm) lift station at the Enclave site and 10-inch force main to pump 0.5 mgd of flow to Pflugerville, expansion of the Cottonwood Creek WWTP to 1.9 mgd, and construction of the Lower Brushy Creek WWTP when Pflugerville no longer has the capacity to treat the flow from Hutto. An upgrade of the Enclave Lift Station and a portion of the Front Street gravity main is also required.

2. **Expansion of the Cottonwood Creek WWTP –** The Cottonwood Creek WWTP would be expanded in two phases of 2 mgd each, with the first expansion taking place in 2013 and the second expansion in 2024 for a total treatment capacity of 5.5 mgd after the second expansion. All sludge is assumed to be hauled to the Brushy Creek East Regional Facility in Round Rock. For this option, all existing lift stations and force mains must remain in service through 2040 with construction of a new lift station and force main to serve new development in the area between Brushy Creek and Cottonwood Creek. Several expansions of the Enclave Lift Station and installation of a new 18-inch force main are required for this option. In addition, almost 3,000 linear feet of gravity main in Front Street must be replaced and a third pump is needed at the Glenwood Lift Station.

3. **Construction of the Lower Brushy Creek WWTP –** Excess flow beyond the 1.5 mgd that Cottonwood Creek WWTP can treat would be conveyed to a new treatment plant at the Lower Brushy Creek site. This plant would also be constructed in two phases of 2 mgd each. The timing of the plant construction and expansion would be identical to that in Alternative 2, with the first phase built in 2013 and the expansion taking place in 2024.

Both Alternatives 1 and 3 include construction of the Brushy Creek Force Main and associated improvements at the Enclave Lift Station to pump flow to the Lower Brushy Creek WWTP when it is initially constructed. When the Lower Brushy Creek WWTP is expanded, it is assumed that the Brushy Creek Interceptor will be built parallel to the Brushy Creek Force Main and the Enclave Lift Station and Brushy Creek Force Main abandoned. In addition, once the Brushy Creek Interceptor is constructed, the Glenwood and Country Estates gravity mains will be constructed to the interceptor and those lift stations abandoned.

Capital Improvement Program (CIP) lists that identified timing and included the cost of each project were created for each alternative above. Costs were estimated in 2012 dollars and included a 20% contingency. A net present value analysis that considered both capital costs and operational and maintenance costs was also performed. In addition, annual costs for each alternative that included debt service and operational and maintenance costs were compared. The annual costs for Alternatives 2 and 3 were generally close such that there is no clear indication that one option is significantly advantageous over the other. **Table ES-1** includes the CIP costs and the net present values of each alternative.

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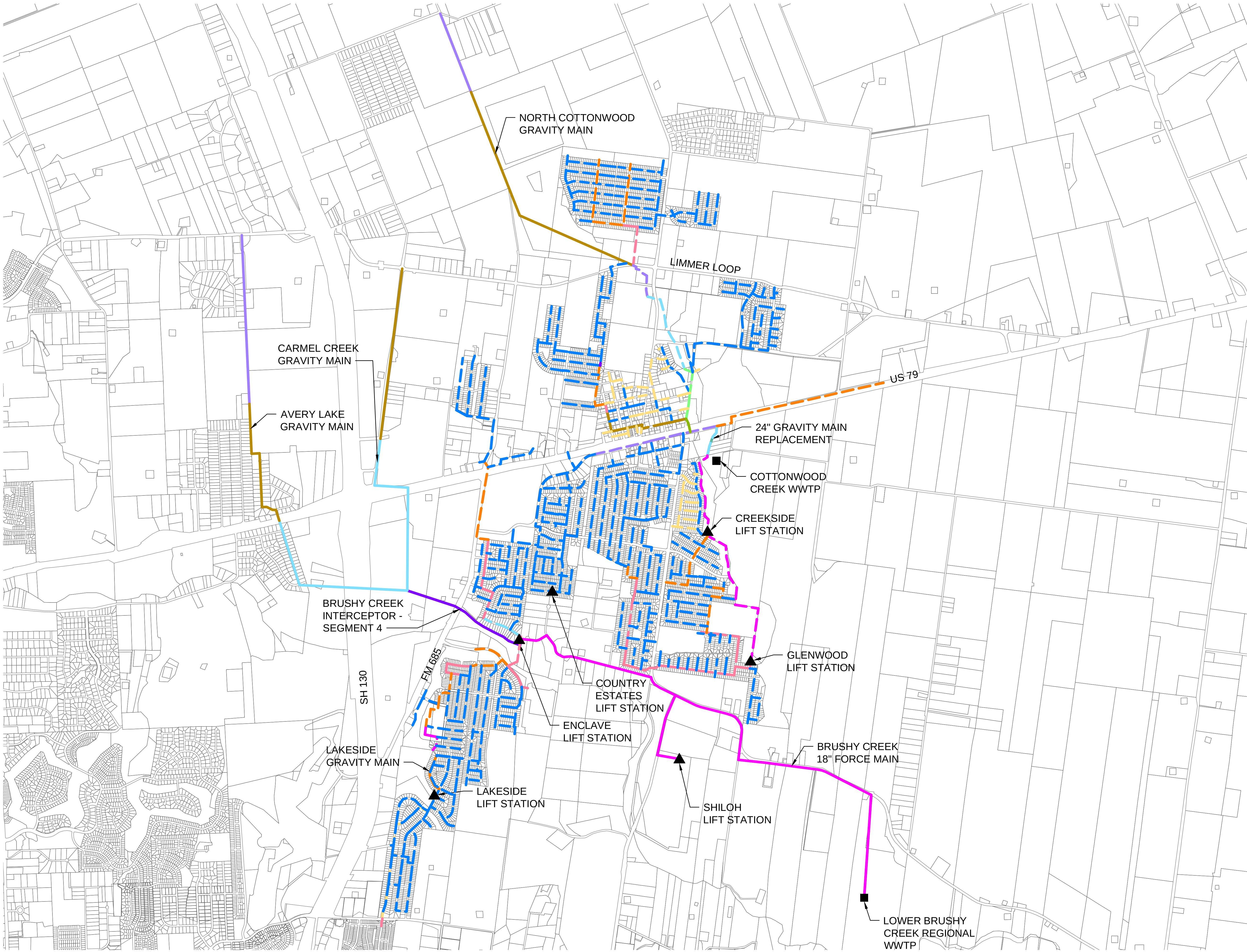

LEGEND

- 6" WWL
- 8" WWL
- 10" WWL
- 12" WWL
- 15" WWL
- 18" WWL
- 21" WWL
- 24" WWL
- 27" WWL
- 33" WWL
- 42" WWL
- FORCE MAIN
- EXISTING LINES
- FUTURE LINES
- WWTP
- LIFT STATION

CITY OF HUTTO

IMPROVEMENTS ASSOCIATED WITH CONSTRUCTION OF LOWER BRUSHY CREEK WWTP 2012-2020

FIGURE ES-3

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Table ES-1 CIP Costs and Net Present Values for Each Alternative

Alternative	Total CIP Cost	Net Present Value
Temporary Service from Pflugerville	$47.0 Million	$66.7 Million
Expansion of Cottonwood Creek WWTP	$37.4 Million	$57.7 Million
Construction of Lower Brushy Creek WWTP	$43.6 Million	$59.8 Million

Each alternative explored for the treatment and conveyance of the flow expected in the study area through 2040 has advantages and disadvantages. Temporarily sending flow to Pflugerville does delay the capital costs associated with additional treatment capacity and the associated conveyance improvements, however over the long run, this is a more expensive alternative. In addition, it includes temporary facilities that will only be in use for a short time and Pflugerville officials have indicated that their system may not have the capacity for the additional flow from Hutto.

Expansion of the Cottonwood Creek WWTP delays construction of the Lower Brushy Creek WWTP and associated collection system improvements beyond 2040, but 70% of the 2040 flow must be pumped to the treatment facilities. The Cottonwood Creek site has insufficient space to expand the treatment capacity beyond 5.5 mgd or to include sludge dewatering facilities for the full 5.5 mgd facilities.

In the Lower Brushy Creek WWTP alternative, only 2% of projected 2040 flow must be pumped to treatment facilities. The size of the site is large enough to encompass future plant expansions and there is room for sludge dewatering facilities. This option does include construction of the Brushy Creek Force Main that would only be used until the Brushy Creek Interceptor is built, however, it may be possible to repurpose this pipe to carry reclaimed effluent in the future.

Alternative 3 is recommended due to the following:

- the net present value and annual costs are similar to Alternative 2;
- there is a lower chance of overflows because the majority of flow is transmitted via gravity;
- and the site is large enough to allow for plant expansions and sludge handling options.

No reuse opportunities were identified by the study participants, however, it may be feasible in the future to use treated effluent to irrigate recreational fields and landscaping at schools or public parks in the study area. The study identified three force mains, Brushy Creek, Country Estates, and Glenwood, that will be abandoned as part of the improvements in Alternative 3 that could be used to deliver treated effluent from the treatment facilities to demand locations.

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1 Introduction

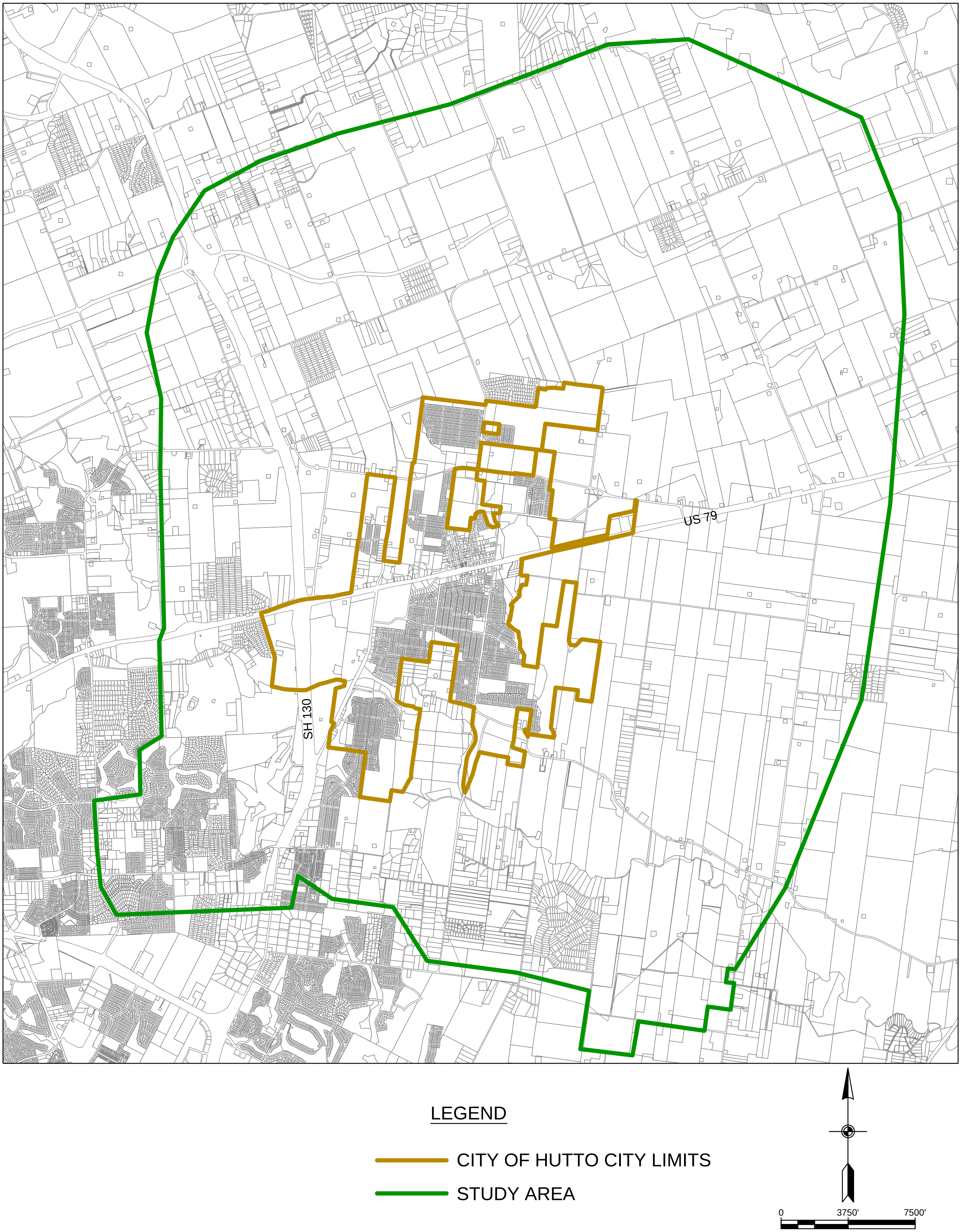
In March 2011, the City of Hutto, in conjunction with the City of Pflugerville, Jonah Water Special Utility District (Jonah SUD), Hutto Independent School District, Hutto Area Chamber of Commerce, Hutto Economic Development Corporation, and Williamson County, received planning grant assistance from the Texas Water Development Board (TWDB) to complete a regional wastewater study for the Hutto area. Hutto selected K Friese & Associates, Inc. as the Engineering Consultant for the study. Susan Roth Consulting, LLC served as the grant administrator for the study; she developed the scope of work for the project, secured the project partnerships, prepared the grant application, and coordinated the project meetings. The study area for the master plan includes approximately 44,000 acres of land, around and including, Hutto and is shown on the following page as **Figure 1-1 Study Area**.

The study area is located in one of the fastest growing regions of Williamson County. The population in the study area, primarily the City of Hutto, has dramatically increased and is approximately 15 times greater than it was 10 years ago. Since 2005, the population has more than doubled and is projected to continue increasing within the study area at historically high levels in the next 10 years due to future developments projected within and near the City of Hutto service area. In addition, State Highway 130 (SH 130), an alternate route to Interstate Highway 35, has accelerated growth in the area.

Jonah SUD, located north of Hutto, currently has a vast water service area of approximately 385 square miles and 90% of its customers are served by septic systems. Due to a recent certificate of convenience and necessity (CCN) exchange agreement between the City of Hutto and Jonah SUD, a few developments in this sector will have retail wastewater service provided by Jonah and wholesale service from the City of Hutto. This area is primed for growth and will need a plan in place for providing centralized wastewater service as opposed to constructing on-site septic facilities..

The existing Hutto wastewater system is comprised of gravity collection mains, lift stations and associated force mains, as well as a wastewater treatment plant (WWTP) located on Cottonwood Creek just south of Highway 79 permitted for 1.7 million gallons per day (mgd) annual average flow. In addition, Hutto has contracted with Pflugerville to accept and treat flow from a part of its service area, the Lakeside lift station, until 2020. The City of Pflugerville has been growing for some time and will continue to grow due to its close proximity to the Austin area. As a result of the anticipated growth, a regional wastewater plan is needed to identify the best possible means to provide wastewater service.

Planning for regional wastewater collection and treatment facilities is important at this time in order to provide the necessary treatment for the growing area, address infrastructure capacity issues and failing septic systems, and to develop a plan for efficient sharing of resources with the City of Pflugerville and Jonah SUD. The proposed planning study would provide a regional solution to serve the wastewater treatment needs in the area, while considering regional objectives such as beneficial reuse of effluent and protection of water quality.



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HUTTO REGIONAL WASTEWATER STUDY

STUDY AREA

SCALE: 1" = 7500'

JUNE 4, 2012

FIGURE 1-1

1.1 Purpose

This study will develop a Capital Improvements Program (CIP) list that will assist Hutto and the other grant participants with planning for future growth. Additionally, the study will examine methods to prolong the service life of existing infrastructure in order to potentially defer expenditures for a new WWTP and large wastewater interceptor along Brushy Creek.

1.2 Scope

The Scope of the study included the following tasks:

1. Data collection from the study participants,
2. Basin delineation,
3. Population projections,
4. Determination of wastewater flows,
5. Analysis of treatment options,
6. Analysis of wastewater conveyance for the treatment options
7. Identification of projects for CIP list,
8. Recommendation of treatment and conveyance alternatives, and
9. Summary of funding options.

Each of these tasks will be discussed in this report in the following sections.

2 Existing Wastewater Infrastructure

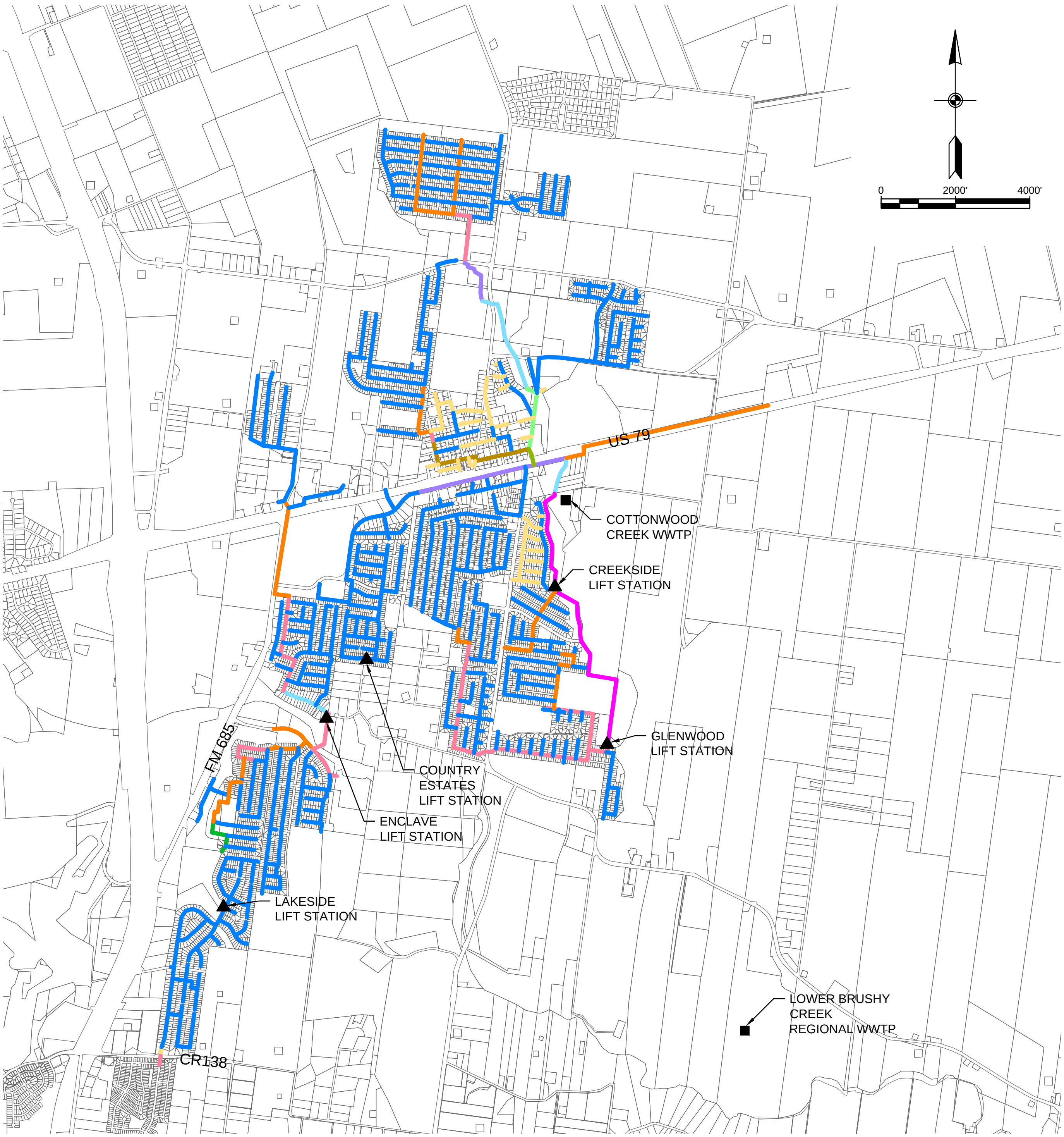
All of the wastewater flow in the City of Hutto's service area is currently treated at the Cottonwood Creek WWTP site. This site includes two treatment plants and an influent lift station. The site is permitted for a treatment capacity of 1.7 mgd, however Plant 1, which was designed for 0.2 mgd of treatment, was taken off-line several years ago and is not currently in service. Therefore, Hutto can presently treat 1.5 mgd of wastewater at the Cottonwood Creek site.

The existing wastewater infrastructure is shown in **Figure 2-1**. The collection system that delivers flow to the Cottonwood Creek site includes pipes from 4-inches in diameter to 33-inches, with the majority of the system being 8-inch diameter pipe in individual subdivisions. The system also includes five lift stations located south of Highway 79. The Lakeside Lift Station is located south of Brushy Creek and east of SH 130. Through a contractual agreement, flow from this station is pumped to Pflugerville for treatment and will be until the end of the contract term in 2020. The Enclave Lift Station pumps into dual 6-inch and 10-inch force mains that discharge to an 18-inch diameter gravity main along Front Street. The Country Estates Lift Station pumps into the same gravity main on Front Street through an 8-inch force main. The Glenwood Lift Station and Creekside Lift Station pump directly to the Cottonwood Creek WWTP influent lift station via dual 8-inch and 12-inch force mains and an 8-inch force main, respectively.

Several areas outside of the current Hutto service area have onsite septic systems. As the collection system is expanded to these outlying areas, they will be connected to the municipal system.

Pflugerville's collection system has infrastructure immediately south of County Road 138 (CR 138) east of SH 130. CR 138 is the boundary of Pflugerville's extra-territorial jurisdiction. The Lakeside force main pumps into this system and the flow is treated at Pflugerville's Central WWTP.

As mentioned in ***Section 1***, the majority of Jonah SUD's customers are served by onsite septic systems. Jonah does not presently have any wastewater collection system or treatment facilities. Jonah will evaluate the possibility of further wholesale service with treatment provided by Hutto when additional significant development has occurred in their service area to make a centralized collection and treatment system feasible.



LEGEND

6" WWL	21" WWL	■	WWTP
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HUTTO REGIONAL WASTEWATER STUDY

EXISTING WASTEWATER FACILITIES

SCALE: 1" = 4000'

JUNE 4, 2012

FIGURE 2-1

3 Basin Delineation

System maps and topographic data were examined to delineate wastewater sewersheds for the entire study area. The service area for each of the five existing lift stations was determined based on maps of the existing infrastructure. The remaining study area was divided into sewersheds based on drainage basins. **Figure 3-1 Sewersheds** shows the sewersheds in the study area.

The study area encompasses 22 sewersheds. Of these, eight sewersheds have infrastructure that service existing development, mostly within the city limits of Hutto. The five existing lift stations serve six of those sewersheds.

The Pecan Branch sewershed, located in the southwest corner of the study area, is served by Williamson County Water, Sewer, Irrigation and Drainage District No. 3 that treats the wastewater, and therefore does not contribute to the flow that Hutto must collect and treat.

The Coyote Trail sewershed is located between the city limits of Hutto and Brushy Creek. It drains to Brushy Creek, but is currently platted and developed as large lots with on-site septic systems. There is no indication that this area will redevelop during the study period, and until any redevelopment occurs, there is no reason to consider wastewater facilities to serve this area. However, if the age and condition of the septic systems is such that they are failing and a majority of the landowners in the area would like to participate in a collection system, then facilities could be constructed.

The Jonah sewershed includes more than 14,000 acres. As mentioned previously, the majority of existing development in this area is served by on-site septic systems. Although growth is predicted over the next 30 years, that growth is not projected to be centralized in any specific portion of the sewershed. In addition, this area drains to Mustang Creek, which is in the north portion of the study area and flows to the northeastern boundary of the study area.

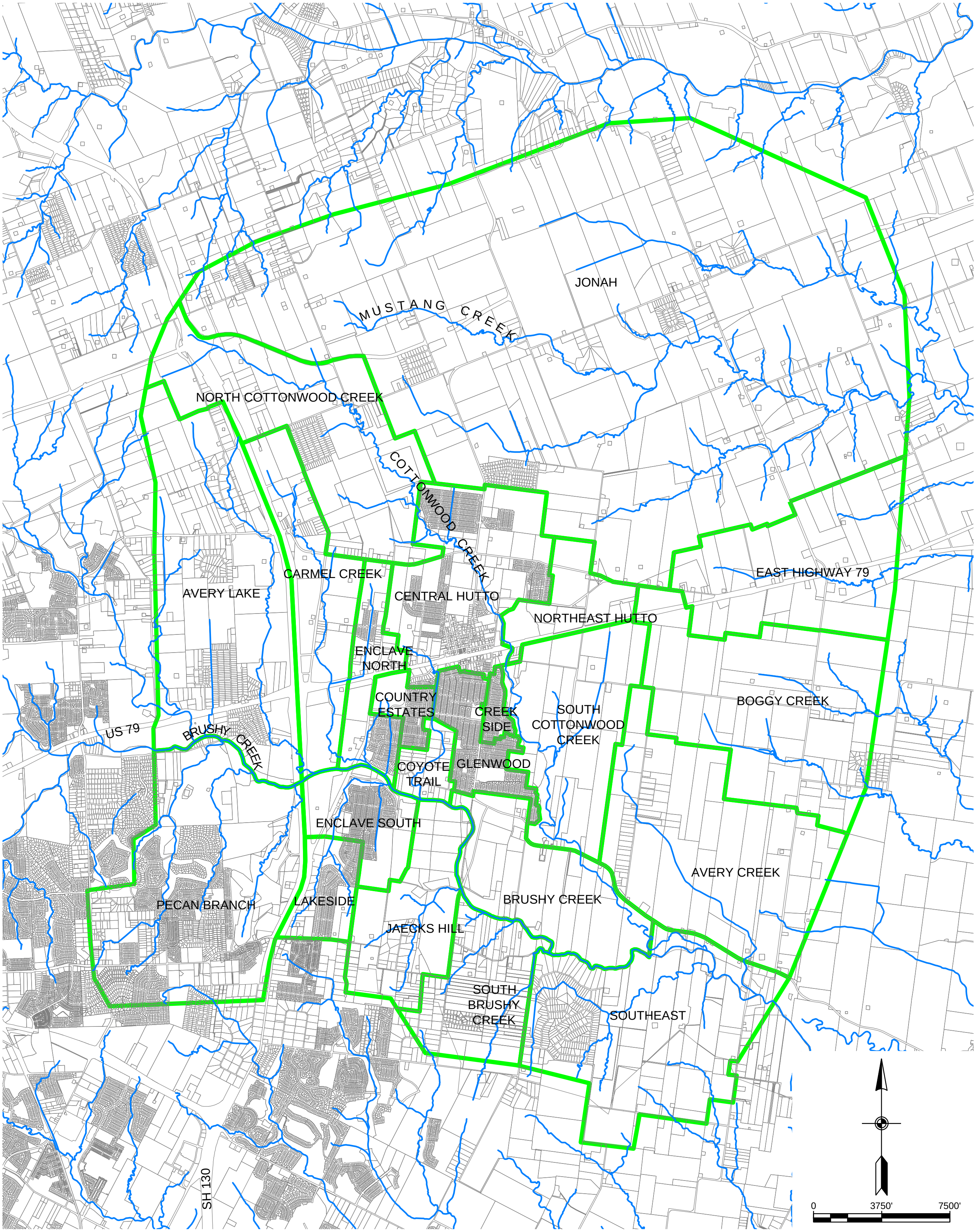
The three sewersheds on the eastern boundary of the study area, East Highway 79, Boggy Creek, and Avery Creek, also drain to the east away from Hutto. Three sewersheds on the southern boundary of the study area, Jaecks Hill, South Brushy Creek, and Southeast, drain to Brushy Creek.

Avery Lake and Carmel Creek sewersheds straddle SH 130 north of Brushy Creek. Both of these areas drain to Brushy Creek.

The North Cottonwood Creek sewershed is located in the northwestern portion of the study area just south of the Jonah sewershed. As its name implies, it drains to Cottonwood Creek upstream of the existing treatment plant.

The South Cottonwood Creek sewershed is located east of Cottonwood Creek and south of Highway 79. It, too, drains to Cottonwood Creek, but south of the existing treatment plant.

The Brushy Creek sewershed is located between Cottonwood Creek and Brushy Creek. Hutto owns land in this area where an additional treatment plant may be built.



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HUTTO REGIONAL WASTEWATER STUDY

SEWERSHEDS

SCALE: 1" = 7500'

JUNE 4, 2012

FIGURE 3-1

File: X:\Projects\0204 – Hutto Master Plan\DWG\Exhibits\Figure 3-1_Sewersheds.dwg Layout: Layout1 (2) Plotted: 6/7/2012 2:52:34 PM Plotted by: Robert Kaylor Saved by: RKaylor

4 Population Projections

Population was projected for each sewershed within the study area in five year increments from years 2010 to 2040. **Figure 4-1** shows the study area divided into three distinct areas: the city limits, the area outside of the city limits that was included in the City of Hutto 2008 Wastewater Capital Improvements Program (CIP), and the remaining study area for the regional wastewater study.

4.1 Data Sources

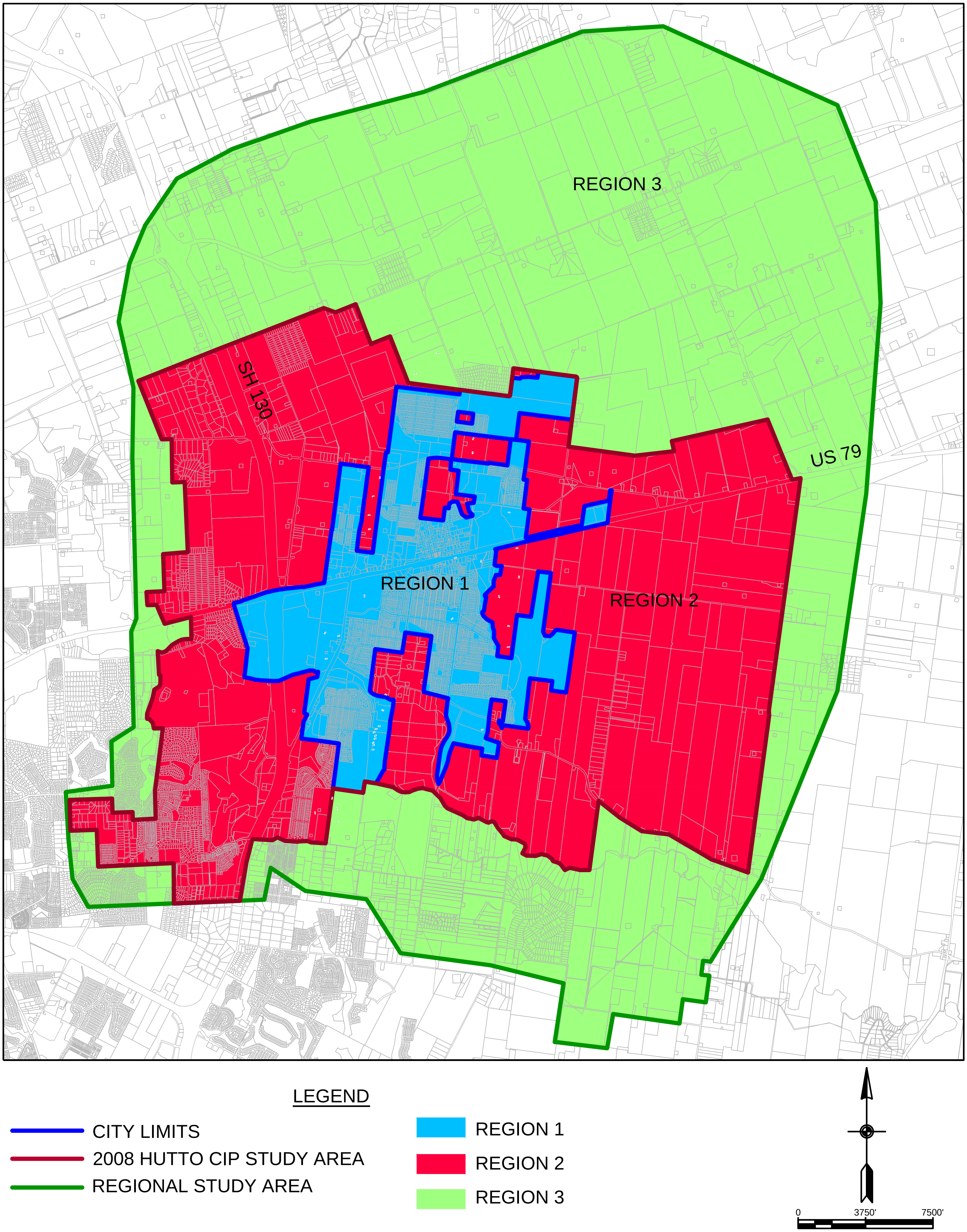
The following is a brief summary of the data sources used for projecting populations within the City Limits and the Study Area.

- Capital Area Metropolitan Planning Organization (CAMPO) – This data is distributed to Traffic Analysis Zones (TAZ), which are small geographic areas developed to analyze nodes of growth and activity. The data set includes population, number of households, typical household size, and employment information for 2005, 2008, 2010, 2015, 2025, and 2035.
- Texas Water Development Board (TWDB) – Projections for the City of Hutto were developed for the Region G Plan from 2010 to 2060 in ten year increments. TWDB also provides expected growth rates for 10 year periods from 2010 to 2060. The growth rates from the Region G plan are shown in **Table 4-1** below:

Table 4-1 TWDB Growth Rates

Year	Growth Rate
2010-2020	37%
2020-2030	32%
2030-2040	27%
2040-2050	23%
2050-2060	20%

- 2008 Wastewater System CIP Plan – Study performed by Hejl Lee & Associates, Inc. (HLA) which used the 2008 City of Hutto Wastewater Service Area as the study area, shown as “2008 Hutto CIP Study Area” in **Figure 4-1**, and divided it into sewersheds and determined land uses for each sewershed.
- City of Hutto Living Unit Equivalent (LUE) Projections – The City of Hutto developed the anticipated connections and the maximum connections expected for each sewershed identified in the 2008 CIP plan for each year from 2010 through 2030.
- 2010 Census – The US government performed a census in 2010 and released the results in early 2011. The City of Hutto population per the census is 14,698.
- Hutto Economic Development Corporation provided population projections for the regional study area.



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HUTTO REGIONAL WASTEWATER STUDY

COMPARISON OF STUDY AREAS

SCALE: 1" = 7500'

JUNE 4, 2012

FIGURE 4-1

4.2 Population Projections for 2010 to 2040

A combination of the above data was used to develop the population projections for the study area. An examination of aerial photography and subdivision plats within the Hutto City Limits indicated that the TWDB year 2010 projections most closely matched existing conditions. The TWDB population projections were adjusted to match the 2010 U.S. Census data and the corresponding growth rates through year 2040 were used for areas within the City Limits. The data obtained from CAMPO was determined to be the best available for the study area outside the Hutto City Limits. These projections were used at the TAZ level to develop the overall projections for the 2008 CIP Planning area and the regional study area. Appendix A contains the step by step procedure used in developing the projections.

Table 4-2 summarizes the population projections and the growth rates for the City Limits, the CIP Study Area and for the regional study area, while **Figure 4-2** compares the calculated population projections for the City Limits, the 2008 CIP Study Area and the Study Area to the TWDB projections and the 2010 census.

Table 4-2 Population Projections and Growth Rates

		2010	2015	2020	2025	2030	2035	2040
CITY LIMITS	POPULATION	14,698	17,417	20,111	23,039	25,943	28,591	30,762
	GROWTH RATE		19%	15%	15%	13%	10%	8%
CIP STUDY AREA	POPULATION	8,012	9,728	16,622	22,654	27,764	31,686	35,326
	GROWTH RATE		21%	71%	36%	23%	14%	11%
REGIONAL STUDY AREA	POPULATION	4,905	5,420	7,592	9,368	12,858	15,760	18,454
	GROWTH RATE		10%	40%	23%	37%	23%	17%
TOTAL	POPULATION	27,615	32,565	44,325	55,061	66,565	76,038	84,542
	GROWTH RATE		18%	36%	24%	21%	14%	11%

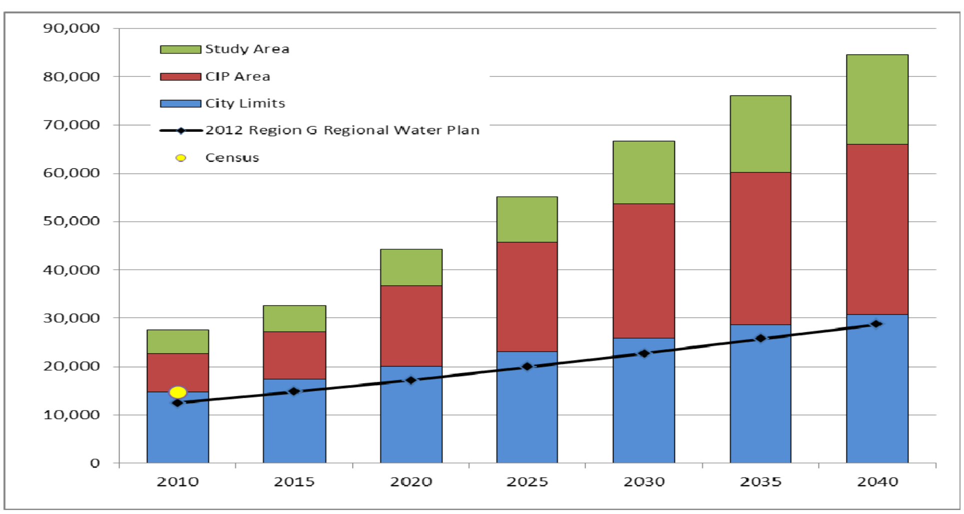


Figure 4-2 Population Projections Comparative

5 Determination of Wastewater Flows

Projected wastewater flow for the study period were developed using the population projections and unit flow values derived from lift station testing and SCADA data analysis. The scope included pump testing at each lift station to determine actual pumping rates. This data can be used with lift station SCADA data and land use data to derive existing per capita wastewater flows, which in turn can be used for capacity evaluation of existing facilities and planning for new facilities to accommodate growth in the service area.

Determination of actual per capita wastewater flows, versus use of standard design criteria flows, may avoid premature capacity expansions and oversizing of new facilities. For example, Texas Commission on Environmental Quality (TCEQ) regulations [30TAC §217.32(a)(3)] include a table with 75 to 100 gal/day/person as the design flow for a new municipal facility. Evaluation of actual unit flows establishes some certainty for system analysis and design.

The scope of work also provides for analysis of pumping data to investigate the significance of wet weather inflow/infiltration (extraneous non-wastewater flows) as a significant capacity factor, but constraints including lack of recent rainfall and SCADA data limited this evaluation, as discussed later.

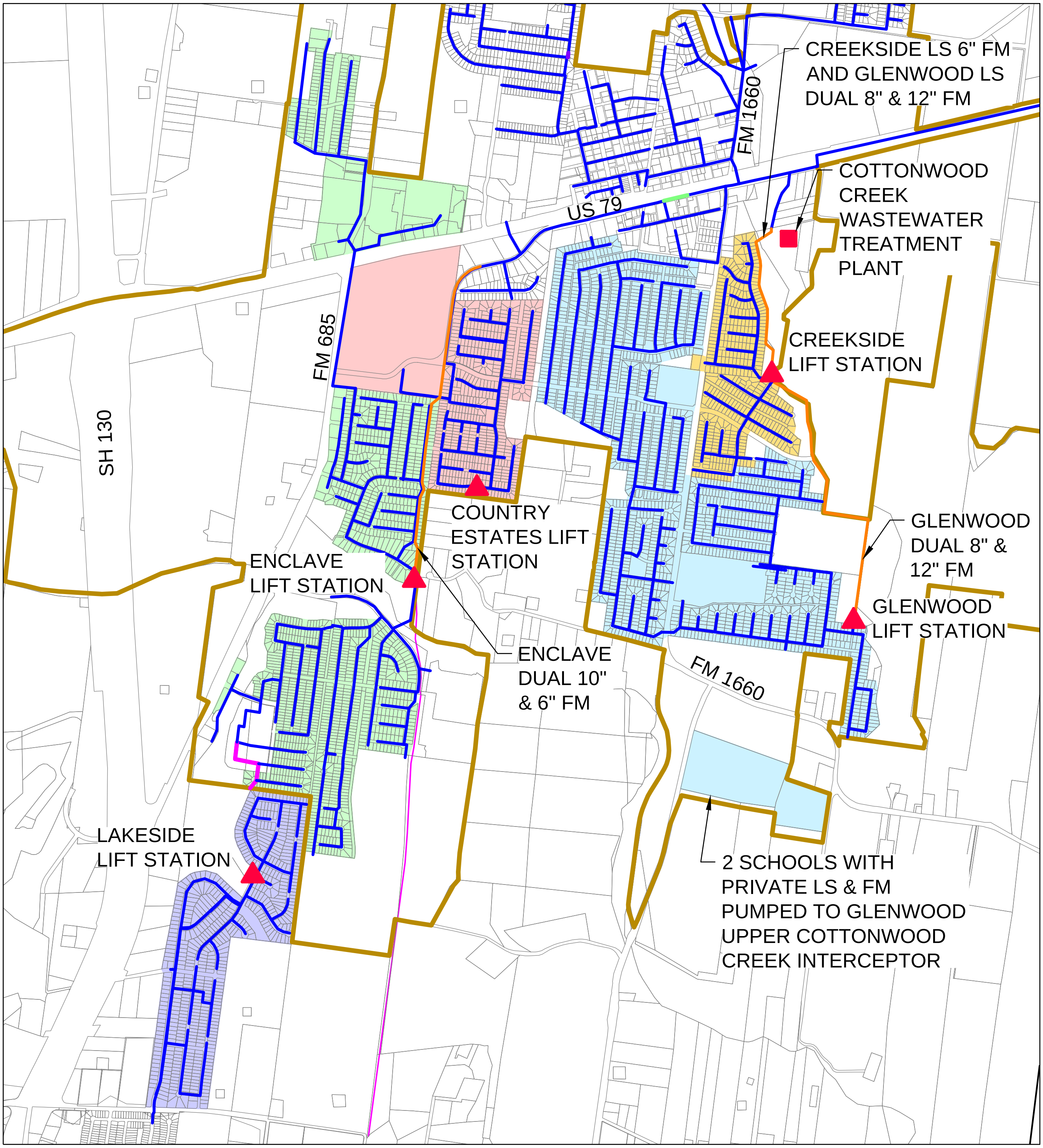
5.1 Existing Lift Stations

The City of Hutto has five lift stations in the collection system that pump to gravity lines delivering flows to the Cottonwood Creek WWTP. These lift stations are designated herein as: Enclave; Glenwood; Lakeside; Country Estates; and Creekside. Lift station locations and service areas are shown in **Figure 5-1 Lift Station Service Areas**.

Construction plans that were provided for the lift stations provide quite a bit of data, as shown in the following **Table 5-1**. Pump curves were also furnished, but in some cases the rated flow and head indicated on the pump curves do not match the flow and head called out for the pumps in the construction plan notes. Pump testing with this project was intended to confirm the current conditions.

Besides the lift station construction plans, the City also has a lift station monitoring program with equipment and operation provided by OmniSite Cellular Monitoring Solutions. This system uses cellular telemetry to monitor equipment status. Of special importance to the City is automatic alarms sent to the City's operators in the event of an equipment malfunction which could result in wastewater overflows without a prompt response.

Of interest for this study was OmniSite's logging of historical operational data. The OmniSite website allows downloading of the total daily run time for each pump. The reported data also includes each pump's total daily volume pumped, based on software input parameters for either (1) a fixed pumping rate or (2) a wet well operating volume. The pump testing for this project confirmed the current values for these OmniSite input variables, which indicated that some of the historical OmniSite data on daily pumpage volumes was not suitable for the unit wastewater flow analysis.



LEGEND

CITY LIMITS	LIFT STATIONS	ENCLAVE LS
GRAVITY MAIN	COUNTRY ESTATES LS	GLENWOOD LS
FORCE MAIN	CREEKSIDE LS	LAKESIDE LS

0 1250' 2500'

K✦FRIESE & ASSOCIATES, INC.
(FIRM # 6535)

1120 S. CAPITAL OF TEXAS HIGHWAY
THE SETTING II, SUITE 100
AUSTIN, TEXAS 78746
PH: 512-338-1704 FAX: 512-338-1784

HUTTO REGIONAL WASTEWATER STUDY

LIFT STATION SERVICE AREAS

SCALE: 1" = 2500'

JUNE 4, 2012

FIGURE 5-1

Table 5-1 Lift Station Data

Lift Station	Enclave	Glenwood	Lakeside	Country Estates	Creekside
CONSTRUCTION PLANS					
Wet Well Diameter (ft)	12	12	10	10	8
Top of Slab Elev	609.5	612.5	670.5	624.0	632.0
Influent Flowline Elev	598.08	595.6	657.0	611.0	621.0
High Level Alarm Elev	n/a	588.6	656.0	610.75	620.5
Lag On Elev	n/a	n/a	655.5	608	619.5
Lead On Elev	n/a	587.6	654.4	607	618.5
Pumps Off Elev	n/a	585.6	652	603.5	614.5
Low Level Alarm Elev	n/a	584.6	n/a	603	n/a
Bottom of Wet Well	581.0	583.6	650	602	613.0
Operating Range, ft	n/a	2.00	2.40	3.50	4.00
Influent Line Diameter	15	15	8	12	8
Force Main Diameter	6 & 10	8 & 12	8	8	6
OW&L swing check valve	yes	yes	no	yes	yes
PUMPING CAPACITY					
Number of Pumps	2	2	2	2	2
Rated Flow & Head (construction plan notes)	N/A	350 gpm at 73' TH	531 gpm at 160' TH	400 at 78' 632 at 115'	N/A
Rated Flow & Head (pump curves)	856 gpm at 98' TH	600 gpm at 117' TH	587 gpm at 104' TH	909 at 75' 1060 at 99'	N/A
OnmiSite Input Data P#1 gpm	337 gpm	300 gpm	Var. 350-620	413 gpm	250 gpm
OnmiSite Input Data P#2 gpm	337 gpm	300 gpm	Var. 240-600	413 gpm	250 gpm
Pump Testing - P#1 June 20-24, 2011	728 gpm	1138 gpm	535 gpm	575 gpm	466 gpm
Pump Testing - P#2 June 20-24, 2011	801 gpm	1205 gpm	457 gpm	579 gpm	476 gpm
Operating Range, ft June 2011 pump tests	3.51	2.68	1.95	2.24	2.91
Operating Volume, cu.ft. June 2011 pump tests	2,970	2,270	1,150	1,320	1,100

The OmniSite data does not have the feature of some other SCADA systems that report the date and time of each pump start and stop. Such historical start/stop data allows the calculation of the influent rate for each on/off pump cycle during the day, which can be used for development of diurnal flow patterns, peaking factors, and wet weather inflow and infiltration (I/I) flow spikes.

5.2 Pump Testing and Data Collection

Pumping rates were determined by using a level logger to record the wet well level every 5 seconds before, during, and after a pump run. The changing wet well level was converted to fill and drawdown rates in gallons per minute (gpm) based on the gallons per vertical foot determined by wet well diameter. The pumping rate is calculated as the sum of the fill and drawdown rates. For example, if the measured fill rate before and after a pump run is 600 gpm and the measured drawdown rate during pumping is 300 gpm, the pumping rate is 900 gpm.

The level logger was a HOBO Model U20-001-04 from Onset Computer Corporation which has a 0-13 ft range with 0.075% full-scale accuracy and 0.005 ft resolution. The HOBOware software was used to program the settings, launch and stop logging, and download the data. After starting each logging session, the logger was disconnected from the laptop computer and suspended in the wet well. The logger measures absolute pressure, so the barometric pressure data before and after submergence provides a datum to determine submergence depth.

Data collection was conducted the week of June 20-24, 2011. The level logger was installed at Lakeside on Monday morning, June 20, retrieved and downloaded the next morning, and then installed at Enclave on June 21 until the next morning. Level logging data was collected at Enclave for June 21-22, at Country Estates for June 22-23, and at Creekside for June 23-24. On Friday morning June 24, the logger was retrieved from Creekside LS and, due to the upcoming weekend, used at Glenwood to collect fill and drawdown level data for just two pump runs for each of the two pumps.

5.3 Data Analysis

The levels data collected from each lift station was exported by the HOBOware software as files in comma-separated values (csv) format for importing to Microsoft Excel for pumping rate analysis. Since the Glenwood LS data collected on Friday, June 24, only had four pump runs total, all four were analyzed for pumping rates. For the other four lift stations, three pump runs over the ±23 hours of data were selected for each pump, focusing on the initial pump runs after logger installation and the pump runs at minimum and maximum influent rates.

Two pumping rates were calculated for each pump run, one with fill and drawdown rates for approximately one minute before and after pump-start, and the other with drawdown and fill rates approximately one minute before and after pump stop. The reported pumping capacity for each pump is the average of the six calculated pumping rates (except four for Glenwood). Details of the pump test results are presented in Appendix B with a summary of the results in **Table 5-2**. The wet well level charts in Appendix C show the details of each of the 28 pumping rate calculations. Note that the previous **Table 5-1** with lift station data includes the pump testing results for comparison with pumping rates indicated on construction plans and pump curves.

Table 5-2 Pump Testing Results (GPM)

Lift Station		Pump #1	Pump #2
LS001	Enclave	728	801
LS002	Glenwood	1,133	1,196
LS003	Lakeside	535	457
LS004	Country Estates	575	579
LS005	Creekside	466	476
Note: Both Lakeside pumps are being refurbished; Lakeside test results are not valid after refurbished pumps are returned to Lakeside			

5.4 Lift Station Flows

The current pumping rates as determined from pump testing were used with daily pump run times as reported by the OmniSite data to calculate each lift station's daily pumpage volume. The results are shown in **Figures 5-2** to **5-6**. Each lift station had some special conditions that are discussed in more detail below.

5.4.1 *Enclave Lift Station*

The Enclave Lift Station has a second 10-inch force main to supplement its original 6-inch force main. The second force main was placed in service on May 16, 2011, and the resulting reduction in the discharge head conditions significantly increased the pumping rates, as reflected in reduced pump run times in the OmniSite data. Consequently, the pump testing pumping rates are applied to the OmniSite pump run times only after May 16. **Figure 5-2** shows that pump #1 consistently has slightly longer run times than pump #2, which is in keeping with pump #1's slightly lower pumping rate (730 gpm) compared to pump #1 (800 gpm). **Figure 5-2** also shows the highest flows occurring on Sundays, except for Monday, May 30, the Memorial Day holiday. This pattern is consistent with the wastewater treatment plant reported daily flows showing the highest flows on Sundays.

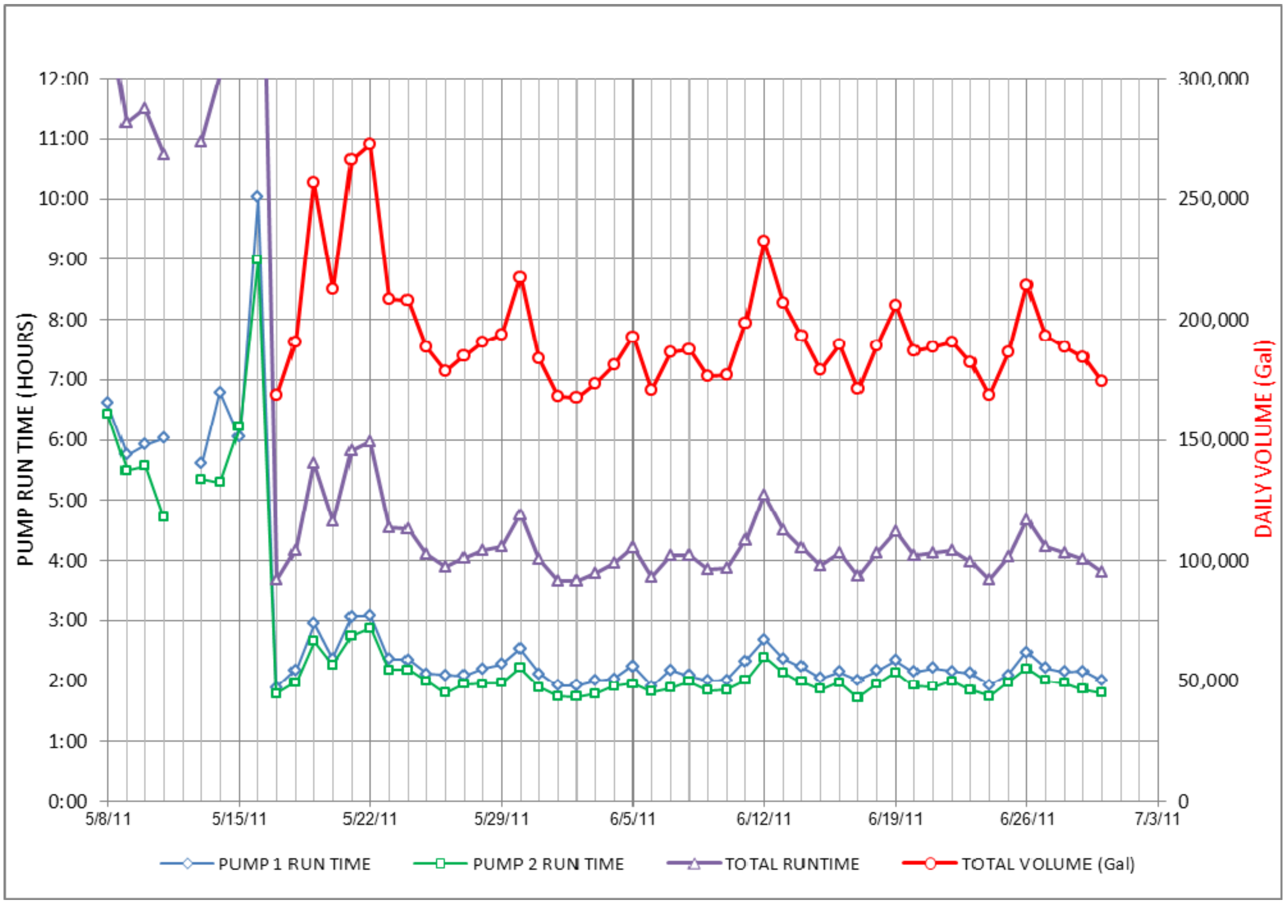


Figure 5-2 **Enclave Lift Station Pump Run Times and Pumping Volumes**

5.4.2 *Glenwood Lift Station*

It should be noted that the pump-on control level in the wet well at Glenwood is high enough to cause backwater in the influent line up to about the pipe's spring line, although the level logger data did not show a noticeable change in the calculated influent rate in this range. (Since the calculated influent rate assumes a constant gallons per vertical foot in the wet well, any significant storage in the influent line due to backwater from high wet well level shows up in the level logger charts as a reduced influent rate at the high wet well levels, which was not apparent in the Glenwood level logger data.) Also, Glenwood has air valves on the discharge header which activate at the end of each pump run. The function of the air valves has not been determined for this study, but the charts from the level logger data do not suggest that trapped air in the force mains (parallel 8" and 12" pipes) is causing a disruption in pumping capacity.

Figure 5-3 shows the Glenwood daily pump run times and pumpage volumes. The chart for June 6-8 shows that pump #2 run time almost doubled and pump #1 run time tripled, although there was no rain event to increase the influent rates from I/I. One possible explanation is a temporary reduction in pump #1 pumping capacity which caused enough rise in the wet well level during high flows to start pump #2 as the lag pump. More detailed SCADA data with each pump's start/stop times would be required to verify this guess as to cause. Also, note that **Figure**

5-3 shows Mondays as the highest flow day of the week, except for Tuesday, May 31, the day after the Memorial Day holiday. It appears that the OmniSite reporting date is one day after the actual data.

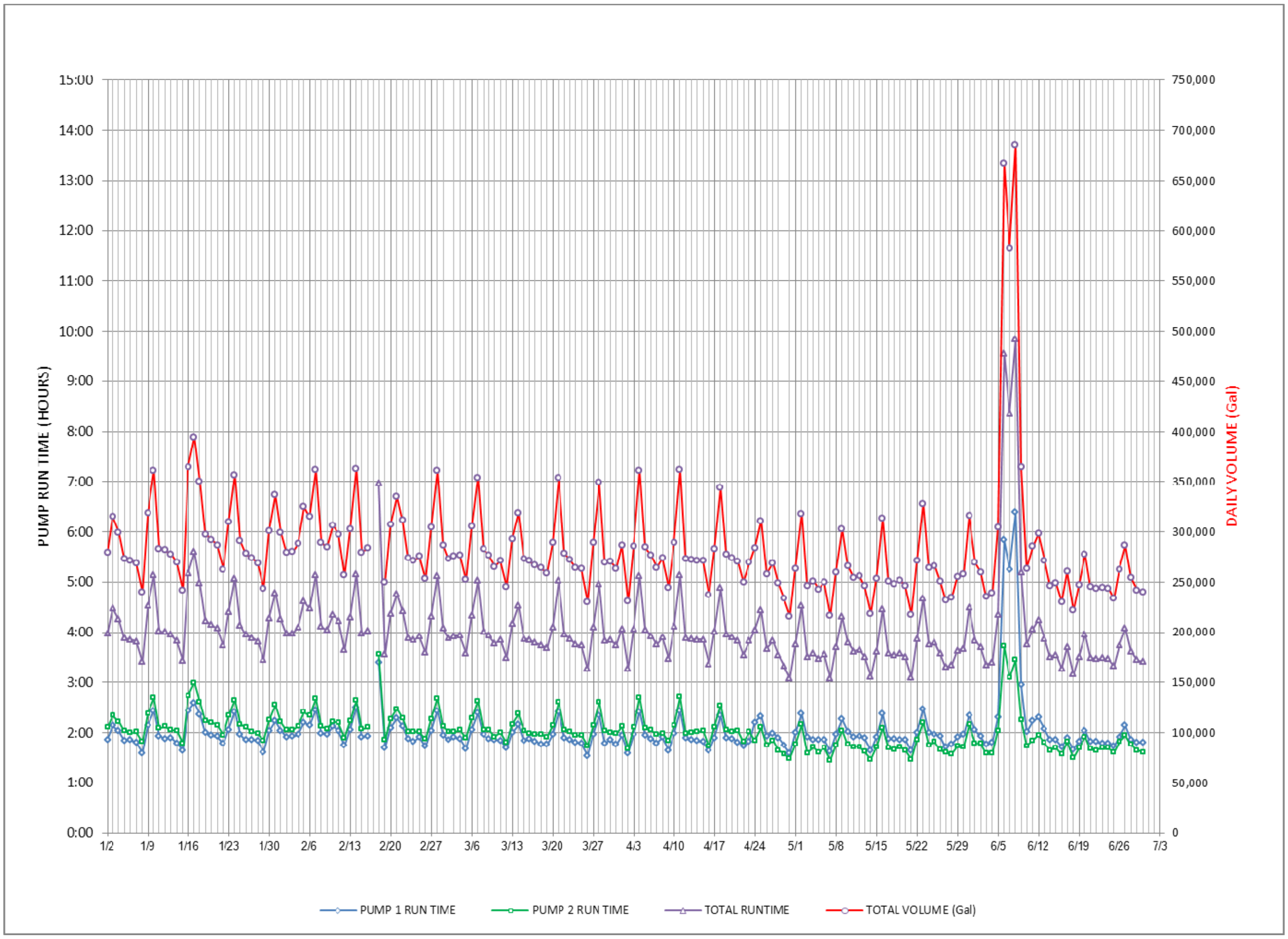


Figure 5-3 Glenwood Lift Station Pump Run Times and Pumping Volumes

5.4.3 *Lakeside Lift Station*

The pump run time data shown in **Figure 5-4** for Lakeside does not show a consistent difference in run times between the two pumps. This apparently relates to pump problems. The City indicated that, on the date of the pump testing, one pump had been pulled for repairs and replaced with a temporary pump. Since then the other pump has a temporary replacement. Only the run time data since the June 20-21 pump test has been used to calculated typical lift station daily flows.

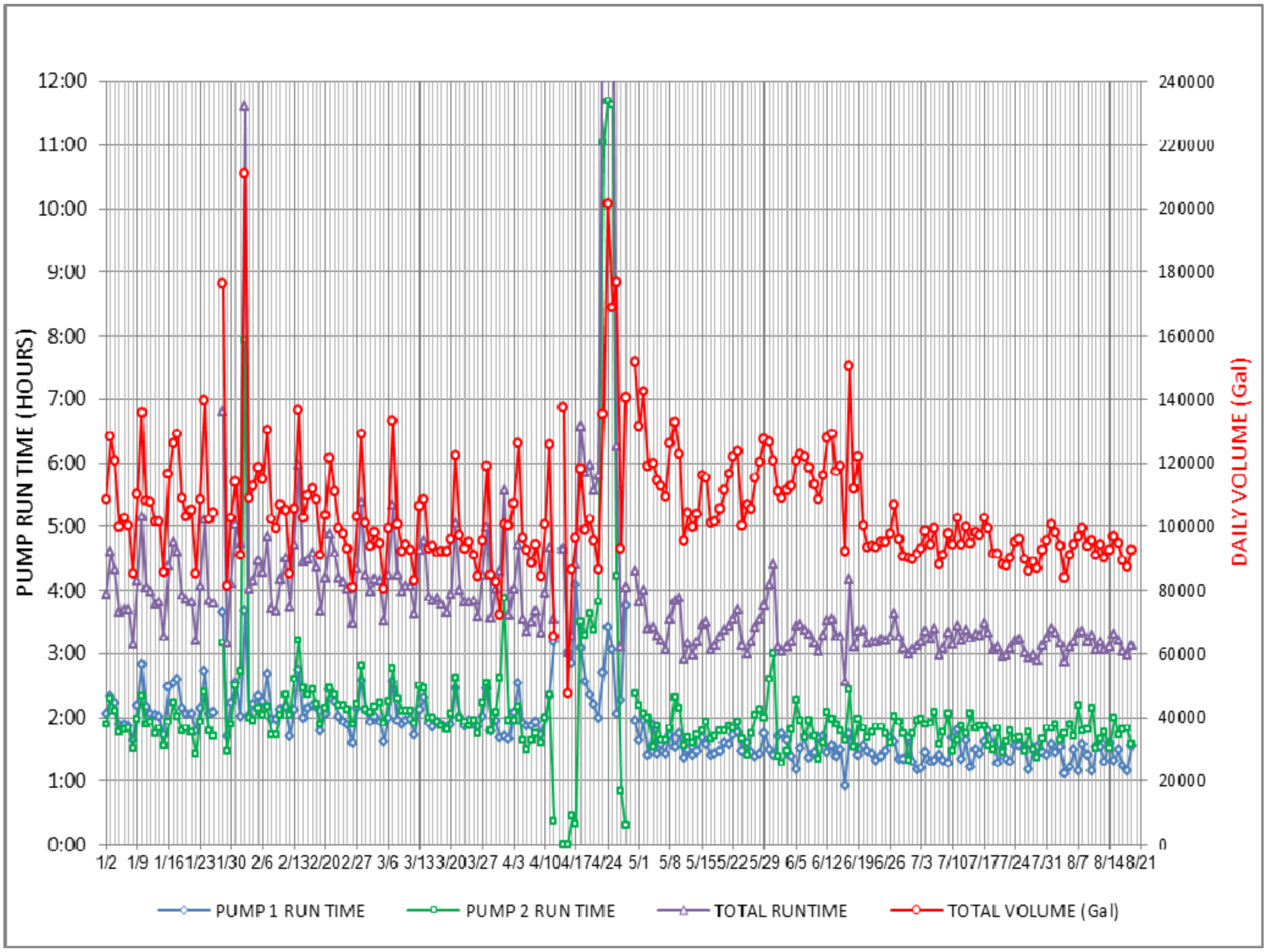


Figure 5-4 Lakeside Lift Station Pump Run Times and Pumping Volumes

5.4.4 *Country Estates Lift Station*

The daily pump run times (**Figure 5-5**) are very close for pump #1 and #2, which supports the pump testing results – 575 gpm for #1 and 579 gpm for #2. There are several outlier days with run times much shorter or longer than typical, sometimes consecutive days. It always applies to both pumps, and it is not consistently the same day of the week. It is not known if this reflects actual flows (maybe some individual customer in the service area for a high flow) or possibly something with the OmniSite system (high/low on consecutive days). Otherwise, the run time data is generally consistent since the start of the year. Also for Country Estates the OmniSite reporting date is one day out of sync with the actual data.

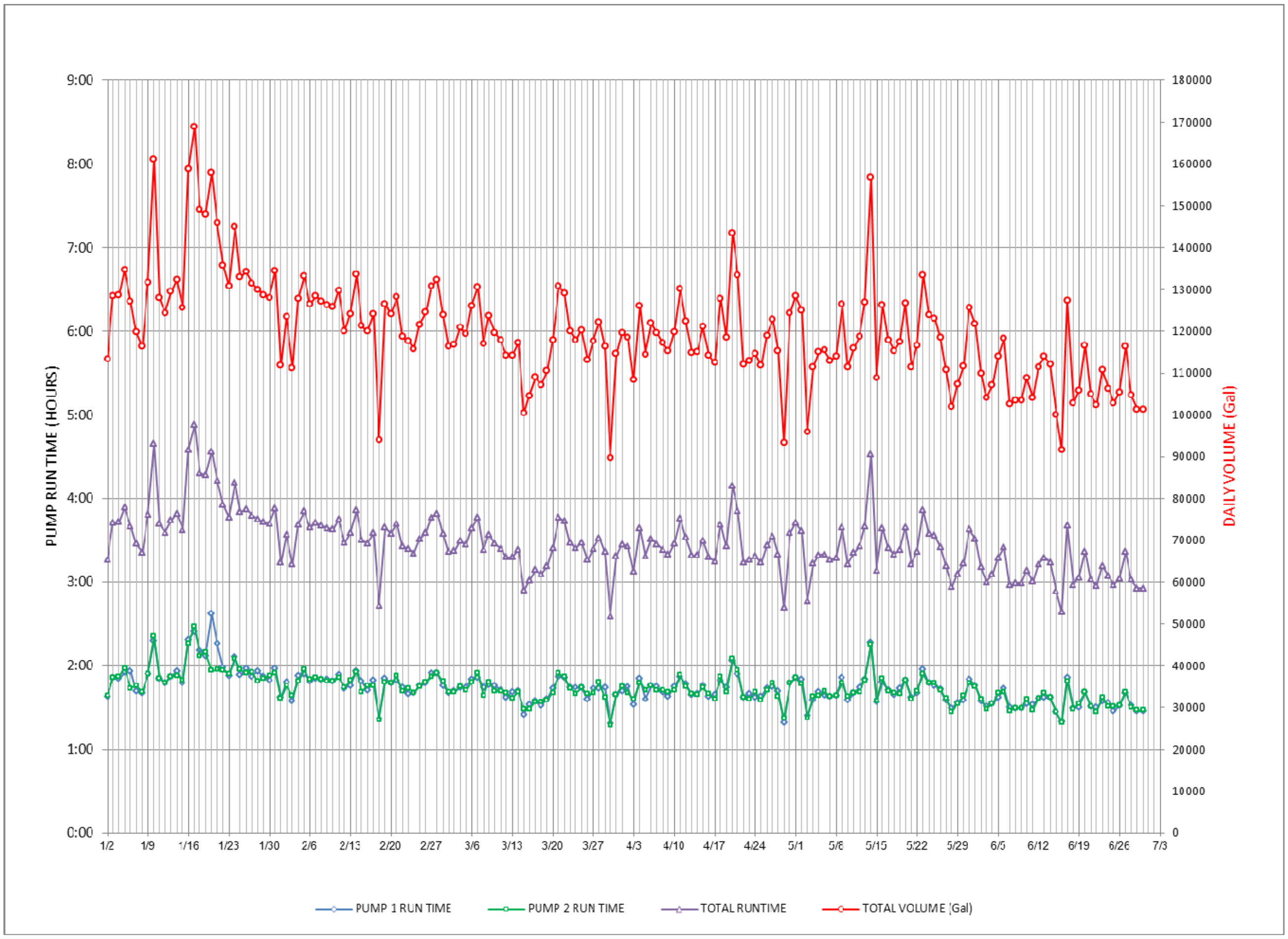


Figure 5-5 Country Estates Lift Station Pump Run Times and Pumping Volumes

5.4.5 *Creekside Lift Station*

As shown in **Figure 5-6**, Creekside Lift Station is similar to Country Estates Lift Station in that its two pumps have very close pumping rates and run times, and the operation has been fairly consistent since about March, except for two long run-time outliers and a high/low consecutive day episode. Since both pumps showed the same long run times on the two outlier days (both Thursdays, and neither had rain events), one pump temporarily losing capacity is not the expected cause. On both days the additional calculated pumpage volume is about 50,000 gal above normal, about double. The cause of this reported data is undetermined. It might also be noted that the reported data show Sundays as the high flow day of the week prior to March 13, and Mondays after March 13 (except for Memorial Day).

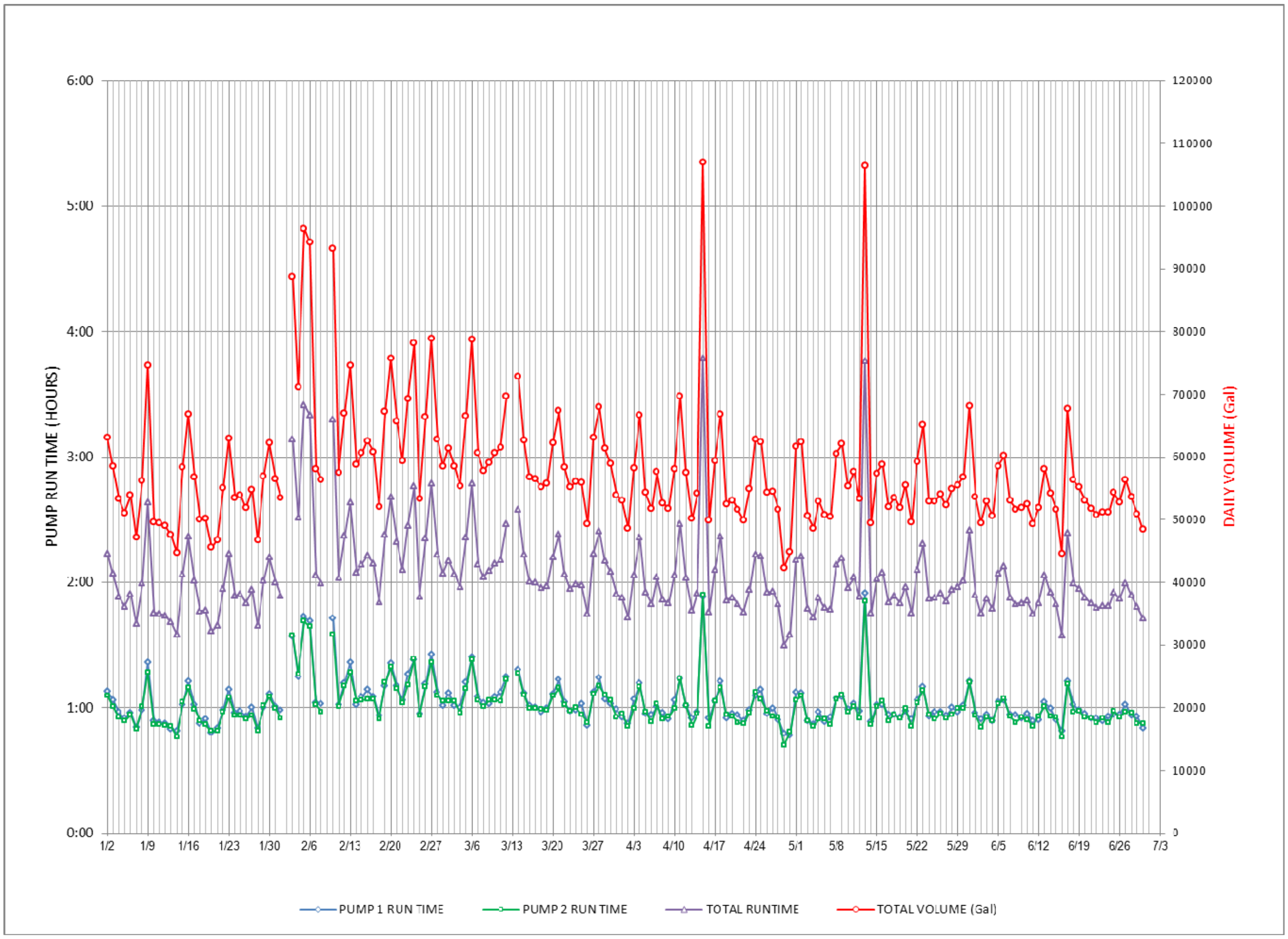


Figure 5-6 Creekside Lift Station Pump Run Times and Pumping Volumes

5.5 Wastewater Unit Flows

The OmniSite pump run time data and the pump testing results were used to estimate the current average daily flow for each lift station. On account of issues discussed above, the run time data was used selectively, such as only the data since recent pumping changes at Enclave and Lakeside. The other lift stations used 12 to 24 weeks of OmniSite run time data. The outliers were not included, and adjustments were made where needed for the lift stations with the data one day out of sync with the reporting date. **Table 5-3** shows the resulting typical dry weather average daily flow, as well as average weekend and weekday flows, for each lift station.

Table 5-3 Lift Station Flows and Wastewater Unit Flows

	Enclave		Glenwood		Lakeside		Country Estates		Creekside		**TOTALS**
	GPD	days	GPD	days	GPD	days	GPD	days	GPD	days	GPD
Mon	197,208	6	279,186	25	94,005	8	113,838	11	55,809	16	740,047
Tue	191,353	6	272,695	25	93,347	9	112,885	12	53,719	16	723,999
Wed	182,973	6	267,960	24	89,433	9	114,862	13	53,597	15	708,824
Thu	178,022	6	264,694	24	91,797	9	115,351	11	52,069	12	701,933
Fri	175,054	5	246,593	26	93,510	8	110,691	12	50,849	15	676,698
Sat	189,098	5	292,750	26	95,939	8	112,835	13	59,733	15	750,356
Sun	207,790	5	339,209	25	99,964	8	121,876	13	63,873	15	832,713
Weekend Avg	198,444		315,980		97,952		117,356		61,803		791,534
Weekday Avg	184,922		266,226		92,419		113,525		53,209		710,300
Full Week	188,785		280,441		94,000		114,620		55,664		733,510
Avg. Flow	131 gpm		195 gpm		65 gpm		80 gpm		39 gpm		509 gpm
Households	866		1382		503		395		354		3,500
Persons/HH	2.98		2.88		2.95		3.12		2.64		2.92
Population	2,580		3,981		1,484		1,233		934		10,212
GPD/HH	218		203		187		290		157		210
GPD/Capita	73		70		63		93		60		72

Note: Households assumes 90% occupancy
GPD = gallons per day , Avg = average, HH = Households

The Basin Delineation and Population Projections part of the project included a detailed review of the service area for each lift station. This effort provided a count of the number of households and occupancy per household for each service area. That information is included in **Table 5-3** and is used to calculate the wastewater unit flows. For the five lift station service areas combined, there are 3,500 households with an estimated population of 10,210 (2.92 people/household). The average daily flow is 733,500 gallons per day (gpd) (510 gpm) which corresponds to 210 gpd/household and 72 gpd/capita.

5.6 Diurnal Flow Patterns

The pump testing data was used to calculate the diurnal flow pattern over the ±23 hours of level logger data for the Enclave, Lakeside, Country Estates, and Creekside lift stations. Glenwood was not included due to the shortened Friday morning level logging duration. The lift station influent rate can be calculated from the pumping rate and the ratio of time-off to time-on for each on/off pump cycle. This method is used especially when there is a large amount of SCADA data available with all of the pump start and stop times. This data is not available from OmniSite records, but it is available from the pump testing data. Another method for determining influent rates is to use the level logger data in between pump runs, although this shows gaps when there is drawdown from a pump run. Both methods were used for this analysis. **Figures 4-7** shows the diurnal curve calculated for the Enclave Lift Station, which is typical of the other three stations. The diurnal curves for Lakeside, Country Estates and Creekside Lift Stations are included in

Appendix D. As expected the minimum flows occur overnight between about 2:00 am and 5:00 am. The flow increases rapidly after about 6:00 am to a minor morning peak, but the lift stations' daily peak flows occur in the evening. It should be noted that these results reflect one single weekday and should not be construed as typical or as a design criteria (e.g., for wastewater peaking factor).

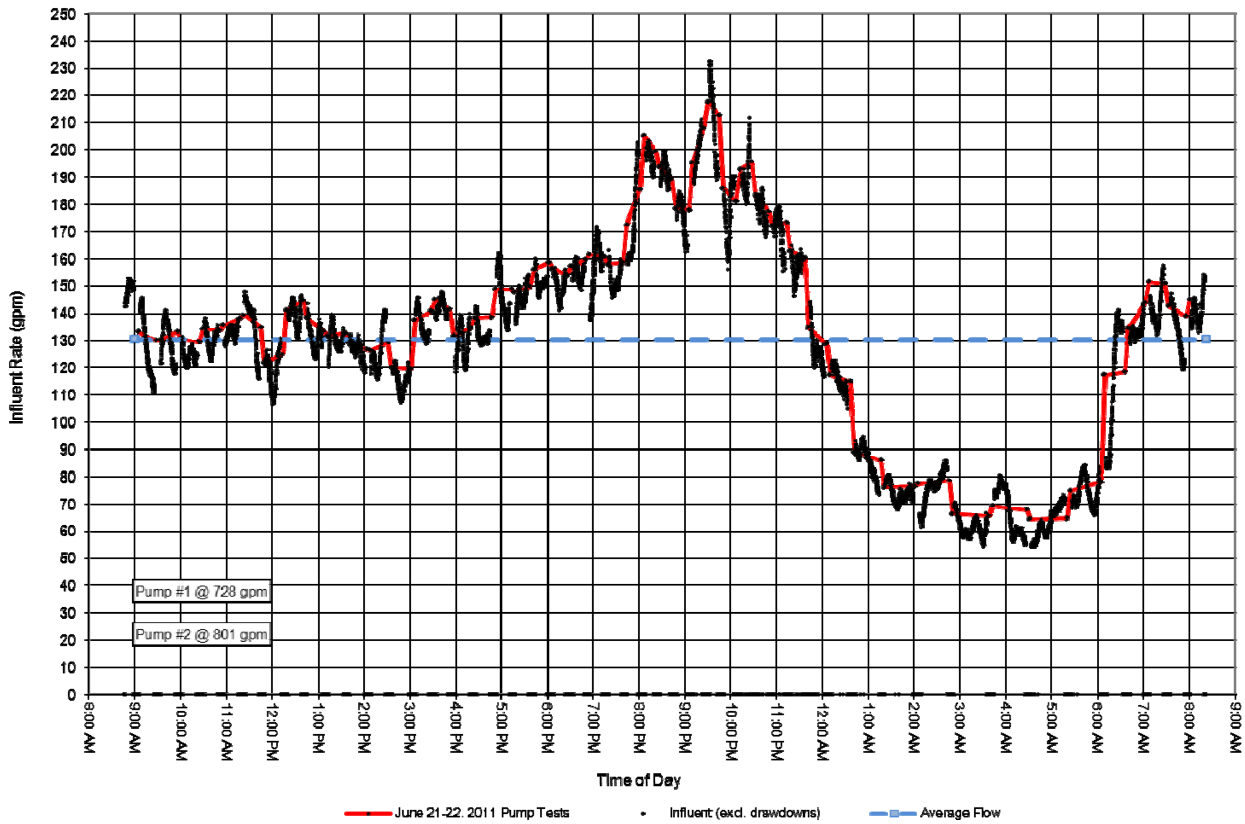


Figure 5-7 Enclave Lift Station Diurnal Curve

5.7 Coordination with OmniSite Monitoring

The pumping rate and wet well operating volume data determined from the June pump testing can be used to update these input data variables which the OmniSite SCADA system uses to report daily pumpage volumes. As shown in the preceding **Table 5-1** for Enclave, Glenwood, Country Estates, and Creekside lift stations, the OmniSite data shows a constant pumping rate (the same for each pump) which is considerably different than the pump testing results. For Lakeside lift station, the OmniSite data reports a different pumping rate for each pump which changes daily. The OmniSite system appears to use the input data for Lakeside wet well operating volume to calculate pumping rates from time-on/time-off data, although the methodology is not documented. It is recommended that the OmniSite local programming be updated with the pumping rate and operating volume results from the pump testing.

5.8 Wet Weather Flow

No wet weather occurred during the lift station testing, however, an examination of rainfall data shows an event of 5.6-inches of rain on September 8, 2010 in Hutto. The OminSite data for September 2010 was reviewed to determine if a correlation between wet weather flow and lift station pump run times could be determined. Since the data includes only daily run times, it is difficult to determine peak flows. The peak flow may be substantially higher than the daily average flow. Data from Enclave Lift Station was not analyzed because only the 6-inch force main was in service at the time and this had a significant effect on the capacity of the lift station. As mentioned previously, the reported dates for some of the lift stations appear to be one day off from the actual date. **Figures 5-8** to **5-11** show the pump run time data for the remaining lift stations.

From examining the daily pump run times, Glenwood Lift Station (**Figure 5-8**) and Creekside Lift Station (**Figure 5-9**) show a small increase in the flows due to the rainfall. Data from Country Estates Lift Station (**Figure 5-10**) indicates a significant I/I response. The information from Lakeside Lift Station (**Figure 5-11**) includes two dry weather days in September 2010 that have higher pump run times than the rainfall event date. However on closer examination, the higher run times are due to Pump 2. Pump 1 does not show any increase in run time for the rain event. Data could indicate that the service area for Lakeside Lift Station does not have any I/I concerns, but that there is a mechanical problem with Pump 2.

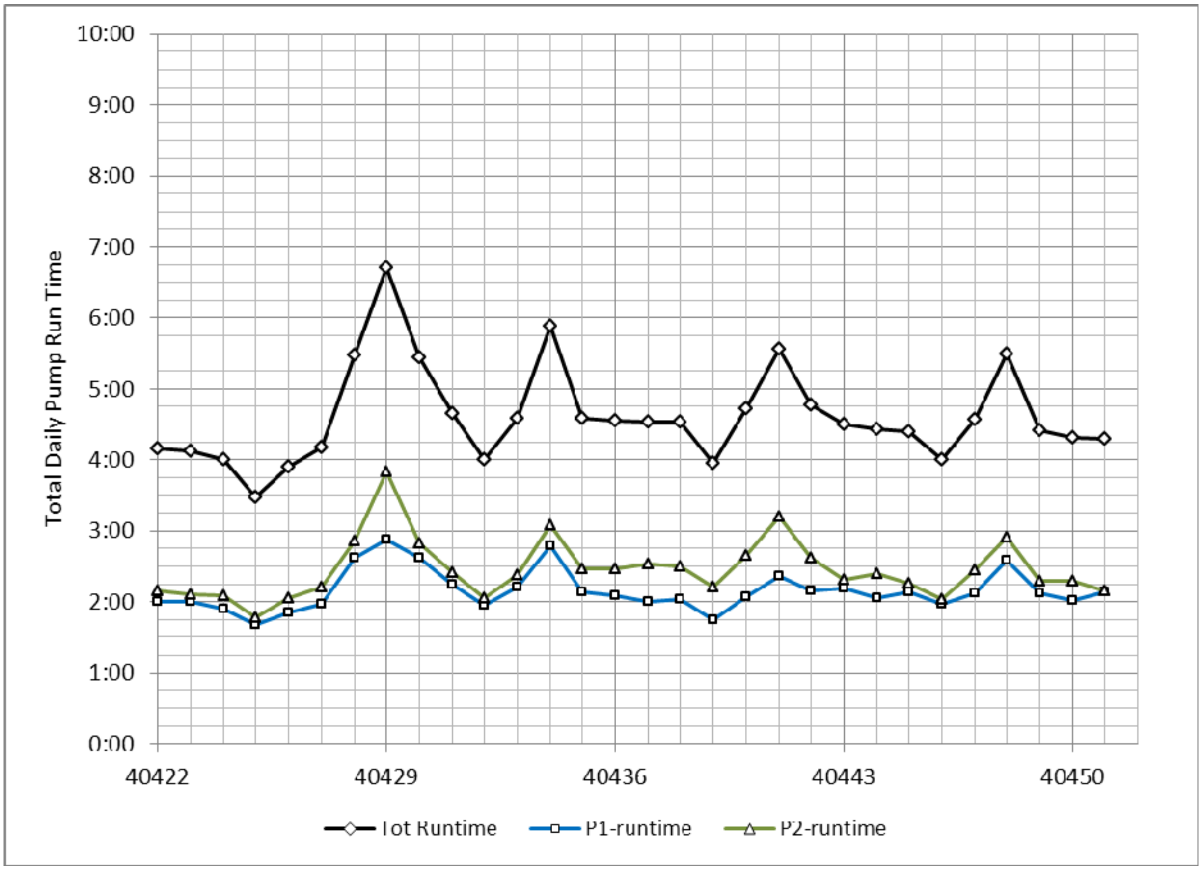


Figure 5-8 Glenwood Lift Station – September 2010

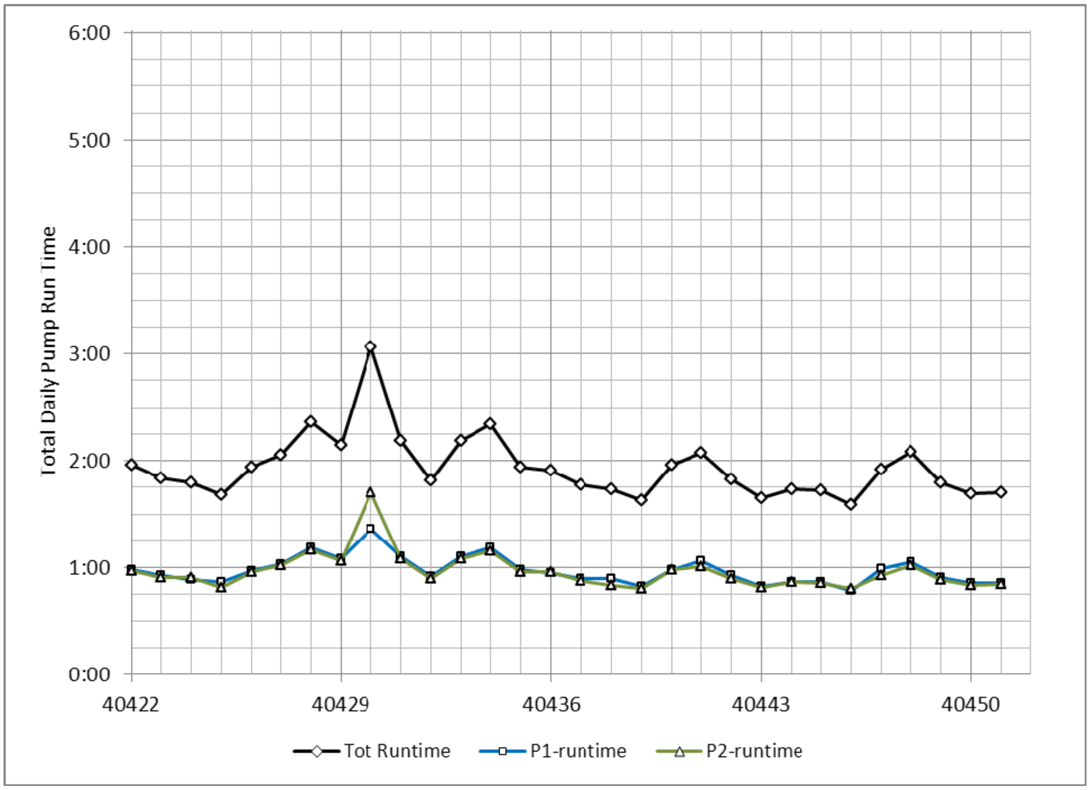


Figure 5-9 **Creekside Lift Station – September 2010**

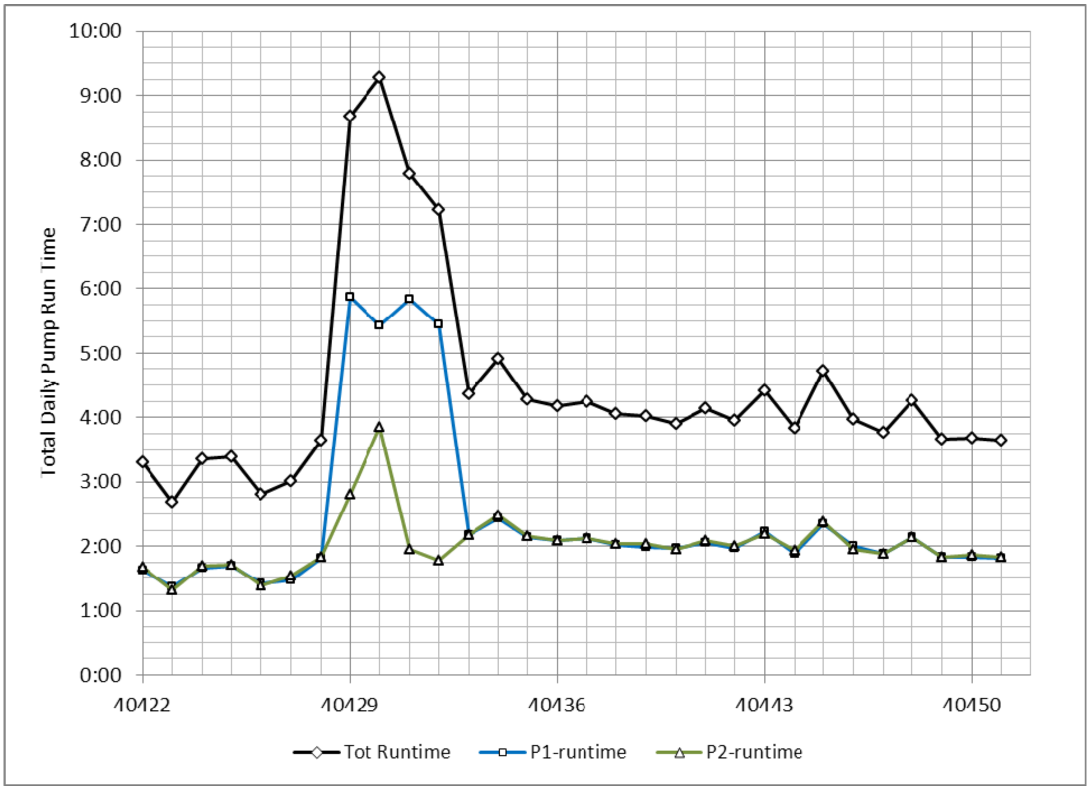


Figure 5-10 **Country Estates Lift Station – September 2010**

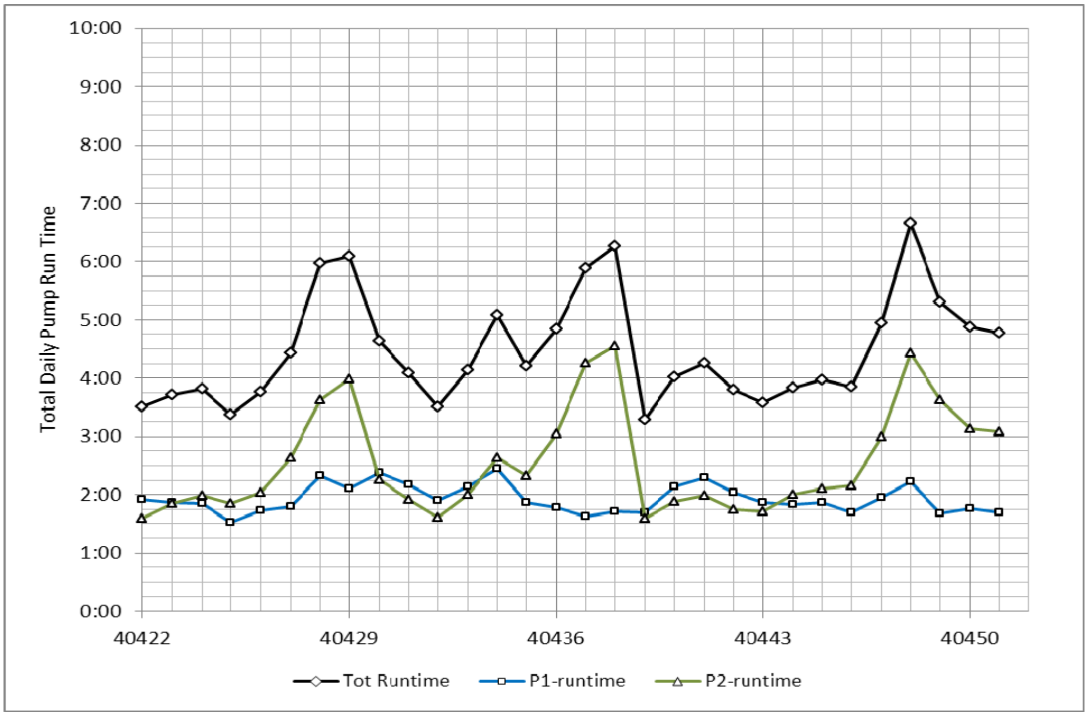


Figure 5-11 Lakeside Lift Station – September 2010

5.9 Unit Flow Design Criteria

As mentioned above and shown in **Table 5-2**, there is an average of 2.92 people per household and the average daily flow corresponds to 72 gpd/capita based on the analysis of the lift station flows and information on the service area for each lift station. The City of Hutto has published a Utility Criteria Manual that "is intended to assist engineers and the general public in the design and construction of water and wastewater facilities" (Section 1.1). **Table 5-4** includes the values for the relevant criteria from the manual as well as those values recommended based on the data from the pump station testing and data analysis.

Table 5-4 Design Criteria

Criteria	Average Value from Analysis	Utility Criteria Manual Value	Recommended Value
People per Household	2.92	3.5	3.1
Unit Flow (gpd per capita)	72	80	75
Flow from Residential Single Family Unit (gpd)	210	280	232.5
Inflow & Infiltration (gallons per acre per day)	N/A	500	500
Peaking Factor	N/A	$PF = \frac{18 + \sqrt{0.0206 * ADWF}}{4 + \sqrt{0.0206 * ADWF}}$	$PF = \frac{18 + \sqrt{0.0192 * ADWF}}{4 + \sqrt{0.0192 * ADWF}}$

Although current population data indicate an average of 2.92 people per household, a value of 3.1 people per household is recommended because it corresponds to the census data and ESRI information provided by the Economic Development Council report. A unit flow of 80 gpd/capita is conservative compared to the calculated average daily flow of 72 gpd/capita. The recommended value is 75 gpd/capita, which is slightly more conservative than the measured flow but not as conservative as the design criteria. The flow from a residential single family unit is calculated by multiplying the unit flow by the number of people per household.

The Utility Criteria Manual includes a value of 500 gallons per acre per day for I/I. Typical values for I/I in the region range from 750 gallons per acre per day to 1,000 gallons per acre per day. Based on Hutto's system age (relatively new), that portions of the older lines are being replaced through streetscape and other City projects, and the lift station responses to the September 8, 2010 storm, a I/I assumption of 500 gpd/acre appears reasonable.

The peaking factor formula is a derivation of population served in the area of interest, which is directly related to the assumed unit flow per person. The constant in the formula recommended in **Table 5-4** has been modified to correspond to the recommended unit flow of 75 gpd per capita. It should be noted that the constant in the peaking factor formula included in the City's Utility Criteria Manual is based on a unit flow of 70 gpd per capita, which does not match the unit flow of 80 gpd per capita specified in the Utility Criteria Manual.

6 Flow Projections

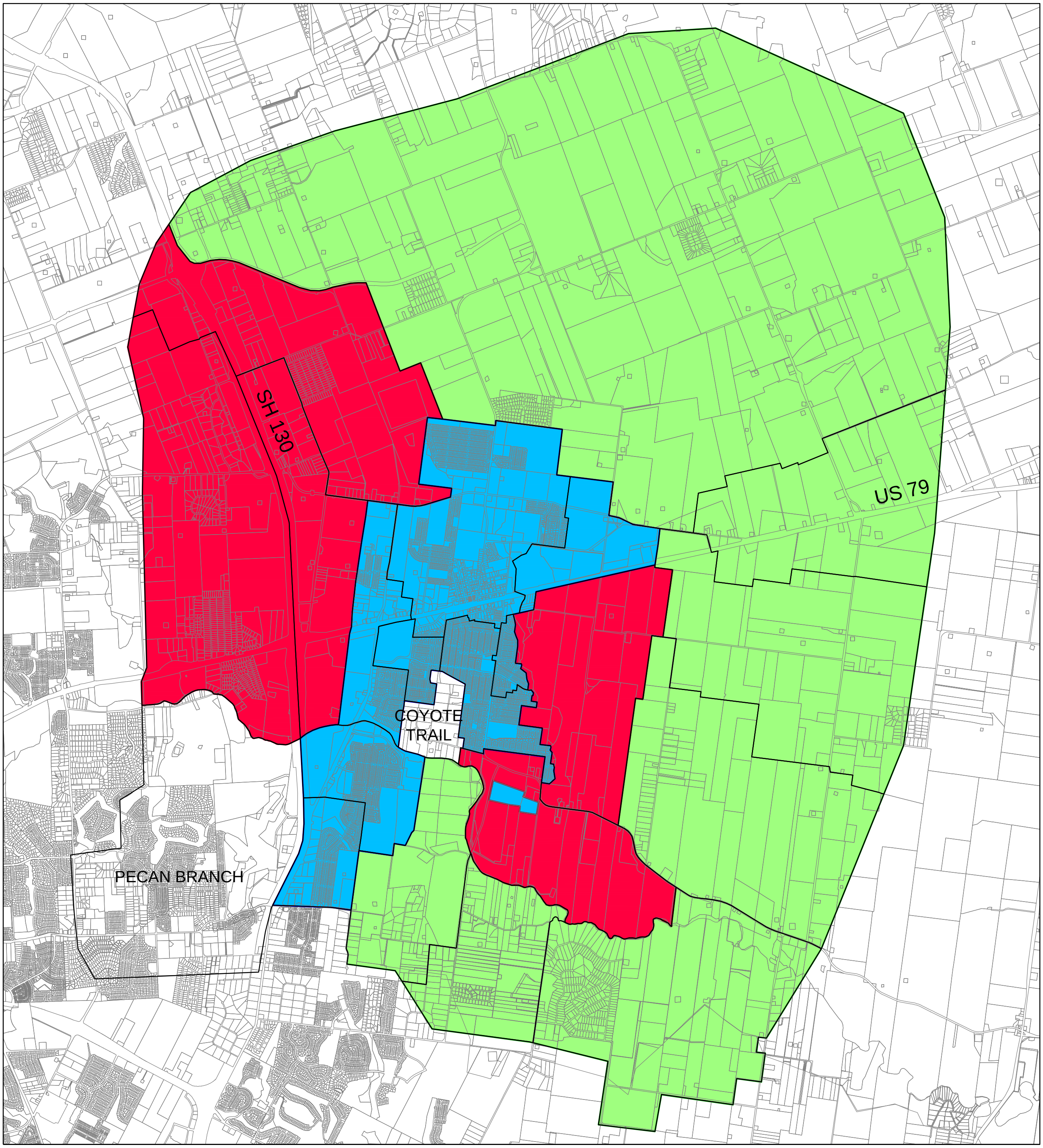
As discussed in ***Section 3***, the study area was divided into 22 sewersheds, each representing a drainage basin or lift station service area. The average daily flow was calculated for each sewershed by multiplying the population of the area by the unit flow of 75 gallons per day per person. **Figure 6-1** is a map of the study area that highlights the portions of the area with existing infrastructure, areas with near term expected growth, and the sewersheds not projected to be served during the study period. **Table 6-1** sums the projected flows for the three areas shown on **Figure 6-1**.

Table 6-1 Summary of Projected Flow in Study Area

Average Daily Flows in mgd	2010	2015	2020	2025	2030	2035	2040
Existing Serviced Areas	1.24	1.40	1.69	1.91	2.11	2.32	2.53
Areas with Near Term Expected Growth	0.40	0.59	1.03	1.48	1.84	2.07	2.26
Sewersheds Not Projected to be Served	0.22	0.23	0.26	0.29	0.48	0.64	0.79
Total Flow in Study Area	**1.85**	**2.22**	**2.98**	**3.68**	**4.43**	**5.04**	**5.58**

Again, as mentioned in ***Section 3***, two sewersheds, Coyote Trail and Pecan Branch, will not provide any wastewater flow to the system. Coyote Trail is platted with large lots that are currently served by onsite septic systems. The Pecan Branch sewershed is served by the William County Water, Sewer, Irrigation and Drainage District No. 3.

Table 6-2 includes a breakdown of the sewersheds in each of the three areas highlighted in **Figure 6-1**.



LEGEND

EXISTING SERVICED AREAS

AREAS WITH NEAR TERM EXPECTED GROWTH

NOT PROJECTED TO BE SERVED

0 3750' 7500'

K✦FRIESE
& ASSOCIATES, INC.
(FIRM # 6535)
1120 S. CAPITAL OF TEXAS HIGHWAY
THE SETTING II, SUITE 100
AUSTIN, TEXAS 78746
PH: 512-338-1704 FAX: 512-338-1784

HUTTO REGIONAL WASTEWATER STUDY

FLOW PROJECTION AREAS

SCALE: 1" = 7500'

JUNE 4, 2012

FIGURE 6-1

File: X:\Projects\0204 - Hutto Master Plan\DWG\Exhibits\Figure 6-1_Flow Projection Areas.dwg Layout: Layout1 (2) Plotted: 6/7/2012 3:09:31 PM Plotted by: Robert Kaylor Saved by: RKaylor

Table 6-2 Flow Projections Broken Down by Sewershed

	2010	2015	2019	2025	2030	2035	2040
Sewersheds with Existing Service							
Central Hutto	0.40	0.50	0.65	0.75	0.85	0.96	1.06
Country Estates	0.11	0.13	0.15	0.15	0.15	0.15	0.15
Creekside	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Enclave North	0.10	0.12	0.13	0.16	0.18	0.20	0.22
Enclave South	0.13	0.16	0.19	0.23	0.26	0.30	0.33
Glenwood	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Lakeside	0.07	0.07	0.13	0.18	0.21	0.24	0.26
Northeast Hutto	0.02	0.02	0.03	0.04	0.06	0.08	0.10
Sub-Total Flow	**1.24**	**1.40**	**1.69**	**1.91**	**2.11**	**2.32**	**2.53**
Areas of Near Term Growth							
Avery Lake	0.16	0.30	0.56	0.78	0.88	0.92	0.96
Brushy Creek	0.05	0.05	0.07	0.09	0.11	0.13	0.15
Carmel Creek	0.07	0.07	0.16	0.22	0.25	0.28	0.30
North Cottonwood Creek	0.05	0.05	0.09	0.13	0.17	0.22	0.25
South Cottonwood Creek	0.07	0.12	0.16	0.27	0.42	0.53	0.59
Sub-Total Flow	**0.40**	**0.59**	**1.03**	**1.48**	**1.84**	**2.07**	**2.26**
Sewersheds on Outskirts of Study Area							
Avery Creek	0.02	0.03	0.03	0.03	0.05	0.08	0.10
Boggy Creek	0.01	0.01	0.01	0.01	0.02	0.02	0.03
East Highway 79	0.01	0.01	0.01	0.01	0.02	0.03	0.04
Jaecks Hill	0.02	0.02	0.02	0.03	0.04	0.04	0.05
Jonah	0.10	0.10	0.11	0.12	0.25	0.34	0.43
South Brushy Creek	0.03	0.03	0.04	0.05	0.06	0.08	0.09
Southeast	0.03	0.03	0.04	0.04	0.04	0.05	0.05
Sub-Total Flow	**0.22**	**0.23**	**0.26**	**0.29**	**0.48**	**0.64**	**0.79**
Total Flow in Study Area	**1.85**	**2.22**	**2.98**	**3.68**	**4.43**	**5.04**	**5.58**

	2010	2015	2020	2025	2030	2035	2040
Sewersheds with Existing Service							
Central Hutto	0.40	0.50	0.65	0.75	0.85	0.96	1.06
Country Estates	0.11	0.13	0.15	0.15	0.15	0.15	0.15
Creekside	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Enclave North	0.10	0.12	0.13	0.16	0.18	0.20	0.22
Enclave South	0.13	0.16	0.19	0.23	0.26	0.30	0.33
Glenwood	0.32	0.32	0.32	0.32	0.32	0.32	0.32

Lakeside	0.07	0.07	0.13	0.18	0.21	0.24	0.26
Northeast Hutto	0.02	0.02	0.03	0.04	0.06	0.08	0.10
Sub-Total Flow	**1.24**	**1.40**	**1.69**	**1.91**	**2.11**	**2.32**	**2.53**
Areas of Near Term Growth							
Avery Lake	0.16	0.30	0.56	0.78	0.88	0.92	0.96
Brushy Creek	0.05	0.05	0.07	0.09	0.11	0.13	0.15
Carmel Creek	0.07	0.07	0.16	0.22	0.25	0.28	0.30
North Cottonwood Creek	0.05	0.05	0.09	0.13	0.17	0.22	0.25
South Cottonwood Creek	0.07	0.12	0.16	0.27	0.42	0.53	0.59
Sub-Total Flow	**0.40**	**0.59**	**1.03**	**1.48**	**1.84**	**2.07**	**2.26**
Sewersheds on Outskirts of Study Area							
Avery Creek	0.02	0.03	0.03	0.03	0.05	0.08	0.10
Boggy Creek	0.01	0.01	0.01	0.01	0.02	0.02	0.03
East Highway 79	0.01	0.01	0.01	0.01	0.02	0.03	0.04
Jaecks Hill	0.02	0.02	0.02	0.03	0.04	0.04	0.05
Jonah	0.10	0.10	0.11	0.12	0.25	0.34	0.43
South Brushy Creek	0.03	0.03	0.04	0.05	0.06	0.08	0.09
Southeast	0.03	0.03	0.04	0.04	0.04	0.05	0.05
Sub-Total Flow	**0.22**	**0.23**	**0.26**	**0.29**	**0.48**	**0.64**	**0.79**
Total Flow in Study Area	**1.85**	**2.22**	**2.98**	**3.68**	**4.43**	**5.04**	**5.58**

7 Analysis of Treatment Options

In 2015 the projected flow for the City's wastewater system will exceed the 1.5 mgd average flow for which the existing Cottonwood Creek Wastewater Treatment Plant was designed (as shown in **Figure 7-1** below).

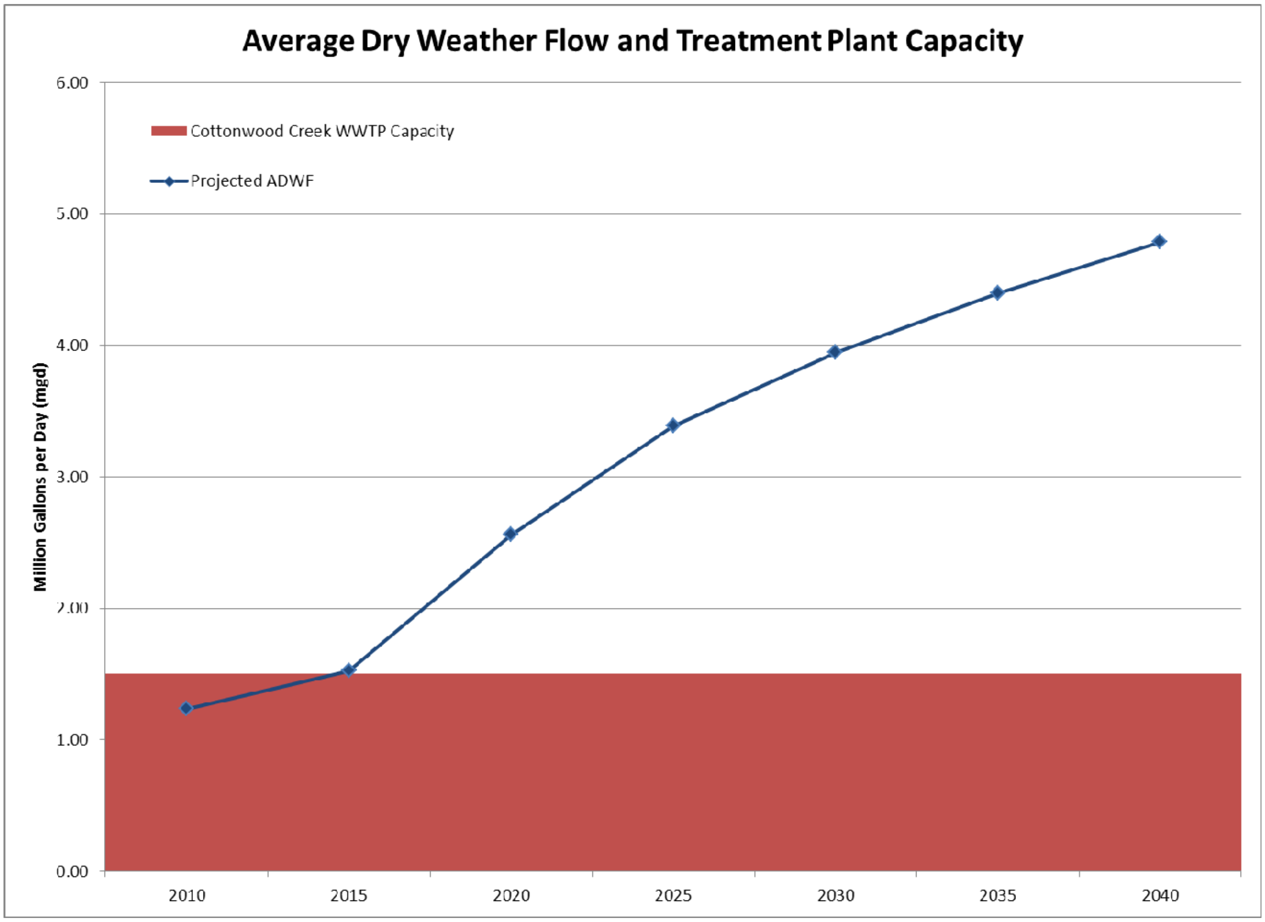


Figure 7-1 Projected Average Dry Weather Flow in Hutto Wastewater Service Area

Several regional treatment alternatives were initially identified and discussed at both public meetings and meetings between individual participants. These alternatives include:

1. Temporary service by the City of Pflugerville with expansion of the Cottonwood Creek WWTP and construction of the Lower Brushy Creek WWTP
2. Expansion of the Cottonwood Creek WWTP
3. Construction of the Lower Brushy Creek WWTP
4. Regional treatment of the Jonah sewershed

Alternatives 1 through 3 are discussed in this report. Alternative 4 was not selected for further evaluation for the following reasons:

- Population growth in the Jonah SUD service area is projected to be relatively small

during the study period compared to the size of the area.
- Several smaller "sub-sewersheds" make up the larger Jonah sewershed.
- It is anticipated that if centralized wastewater service were provided, it would initially consist of smaller treatment facilities serving the sub-sewersheds. Regionalized collection and treatment would occur when development sufficient to support such a system has taken place.

7.1 Location of Cottonwood Creek Wastewater Treatment Plant

The Cottonwood Creek Plant is located on the east bank of Cottonwood Creek just south of Highway 79. This plant currently treats flow from all of Hutto's wastewater service area with the exception of flow to the Lakeside Lift Station, which is currently conveyed to the City of Pflugerville for treatment.

It should be noted that only three sewersheds, North Cottonwood Creek, Central Hutto, and Northeast Hutto, which make up 30% of the average flow expected in 2040, naturally drain to this location. The area south of Highway 79 and the areas west of CR 179 drain to Brushy Creek and are currently served by four lift stations: Enclave, Country Estates, Creekside, and Glenwood, that pump the flow to the Cottonwood Creek Plant.

7.2 Location of Proposed Lower Brushy Creek Plant

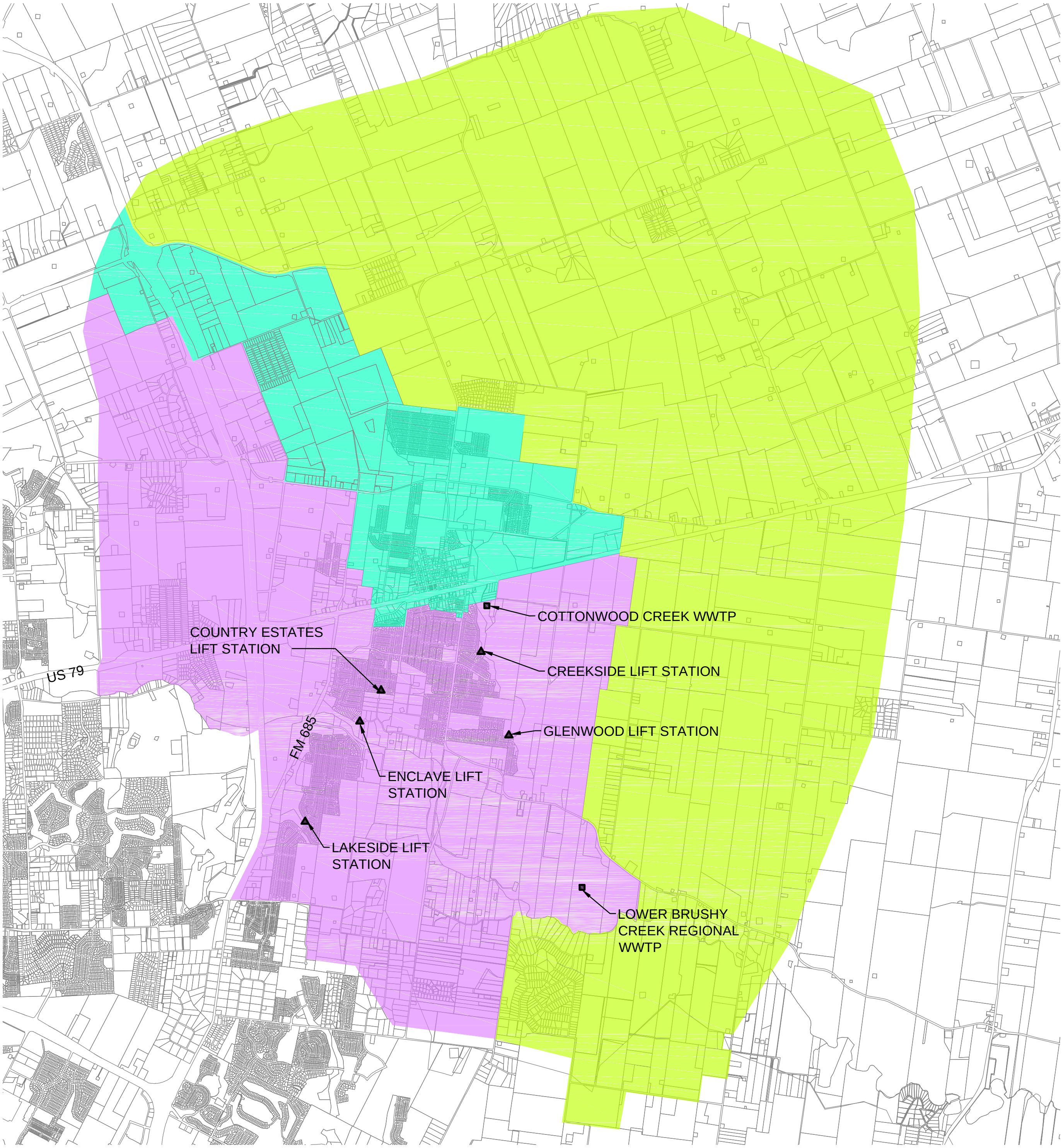
The proposed Lower Brushy Creek Plant site is located near the confluence of Brushy Creek and Cottonwood Creek. A much larger percentage of the master plan study area naturally drains to this site. As mentioned in ***Section 3***, there are a handful of sewersheds on the northern and eastern edge of the study area that drain to the east; however it is assumed that these areas will not be served by 2040.

Figure 7-2 shows the three drainage basins that comprise the study area: area that flows to the Cottonwood Creek WWTP, area that flows to the Lower Brushy Creek WWTP site, and the area that drains to the eastern boundary of the study area. Also shown are the locations of both WWTP sites.

7.3 Treatment Alternative No. 1 – Send Flow to Pflugerville for Treatment

The study participants have discussed the possibility of sending approximately 0.5 mgd of flow from the Enclave Lift Station to the Pflugerville Central Wastewater Treatment Plant for treatment. Analysis of this option was conducted by the study team, while Pflugerville investigated the improvements that would be required of the Pflugerville infrastructure. It was assumed that Pflugerville would treat the 0.5 mgd from the Enclave Lift Station until 2020, after that time Hutto would treat all flow in the study area.

In this scenario, the Cottonwood Creek Wastewater Treatment Plant is projected to treat 1.2 mgd in 2015 and 1.86 mgd in 2020. The proposed Lower Brushy Creek Wastewater Treatment Plant must be in service when Pflugerville stops accepting and treating flow from Hutto in 2020.



LEGEND

DRAINS TO COTTONWOOD CREEK WWTP

DRAINS TO LOWER BRUSHY CREEK WWTP

DRAINS TO EASTERN EDGE OF STUDY AREA

0 3750' 7500'

K✦FRIESE & ASSOCIATES, INC.
(FIRM # 6535)
1120 S. CAPITAL OF TEXAS HIGHWAY
THE SETTING II, SUITE 100
AUSTIN, TEXAS 78746
PH: 512-338-1704 FAX: 512-338-1784

HUTTO REGIONAL WASTEWATER STUDY

DRAINAGE BASINS

SCALE: 1" = 7500'

JUNE 4, 2012

FIGURE 7-2

File: X:\Projects\0204 - Hutto Master Plan\DWG\Exhibits\Figure 7-1_Drainage Basins.dwg Layout: Layout1 (2) Plotted: 6/5/2012 10:38:20 AM Plotted by: Robert Kaylor Saved by: RKaylor

This option does delay the capital expenditures that would be required for a 2.0 mgd treatment capacity expansion to 2018, however it also requires that the existing Cottonwood Creek plant be upgraded to treat additional flow by 2015.

Table 7-1 Average daily flows to be treated at each plant if 0.5 mgd is treated by Pflugerville (in mgd)

	2010	2015	2020	2025	2030	2035	2040
Pflugerville	0.07	0.57	0.63	0.00	0.00	0.00	0.00
Cottonwood Creek WWTP	1.16	1.20	1.86	1.46	1.16	1.33	1.50
Lower Brushy Creek WWTP	0.00	0.00	0.00	1.66	2.78	3.06	3.29

7.4 Treatment Alternative No. 2 – Expand Cottonwood Creek Wastewater Treatment Plant

A second option is to expand the existing Cottonwood Creek Wastewater Treatment Plant to treat all the flow expected in the study area during the study time period. The total average daily flow projected in 2040 is 4.79 mgd. As mentioned previously, the existing Cottonwood Creek plant was designed for an average flow of 1.5 mgd, therefore in order to treat the total flow expected additional treatment units must be built at the site. Additional units will be constructed in 2 phases of 2 mgd each. Construction on the first expansion would begin in 2013, while construction on the second phase would start in 2024. It is assumed that all sludge will continue to be hauled to the Brushy Creek East Regional Facility in Round Rock.

7.5 Treatment Alternative No. 3 – Construct Lower Brushy Creek Wastewater Treatment Plant

As mentioned previously, the total average daily flow projected for the Hutto wastewater system in 2040 is 4.79 mgd. The Cottonwood Creek plant was designed to treat 1.5 mgd. Under this alternative excess flow would be conveyed to a new treatment plant at the Lower Brushy Creek site. In 2040 the existing plant would be treating flow from the three sewersheds that naturally drain to it (North Cottonwood Creek, Central Hutto, and Northeast Hutto) as well as flow from the Creekside sewershed. The flow from those four sewersheds equals 1.5 mgd in 2040. The remainder of the flow (3.29 mgd) would be treated at the proposed Lower Brushy Creek plant.

The Lower Brushy Creek Plant would also be constructed in 2 phases of 2 mgd each. The timing of the construction of each phase would be similar to that described above with the first phase beginning in 2013 and the second phase in 2024.

A Preliminary Engineering Report for the Lower Brushy Creek Regional Wastewater Treatment Plant was completed by Camp Dresser & McKee (CDM) in 2008 for the Lower Colorado River Authority. This report was used as a basis for evaluating Alternative 3 and only limited analysis of treatment requirements was performed under this study.

8 Cottonwood Creek Wastewater Treatment Plant Expansion Options (Alternatives 1 and 2)

One of the objectives of Alternative 1 is to delay the expenditures associated with the treatment and conveyance improvements required for the projected flows. This is accomplished through a small capacity expansion of the existing Cottonwood Creek WWTP, with the Lower Brushy Creek WWTP then delayed until 2020. Alternative 2 considers a larger expansion of the Cottonwood Creek facility to 5.5 mgd.

8.1 Data Collection and Review

The following list of data was made available by Brazos River Authority (BRA):

- Rainfall data from Oct 2009 to May 2011 (daily rainfall data was provided by BRA)
- Average and 2-hour peak effluent flows (continuous flow records of the plant effluent during wet weather periods was not available; only the peak 2 hour flows for each day were available; also, there is no meter at the influent lift station so influent flows were not available)
- Influent and effluent water quality – biochemical oxygen demand (BOD), chemical oxygen demand, total suspended solids (TSS), nutrients, fats, oils, and grease
- Calculations for existing WWTPs (the equipment supplier's calculations were provided as the engineer's calculations were not available)
- Operation and Maintenance (O&M) Manuals for existing WWTPs
- Construction Plans (plans for the smaller, out-of-service plant were limited)
- Pump curves for influent lift station pumps
- Summary of plant operating data – mixed liquor suspended solids (MLSS) levels, dissolved oxygen maintained in the aeration basins, criteria and frequency of changing flow scenarios in WWTP, etc.
- Volume of sludge hauled from the Cottonwood Creek WWTP and estimated percent dry solids.
- Record of any major equipment failures, replacements, major repairs.

The following additional data was obtained from HLA in August 2011:

- Preliminary Engineering Report dated December 2005 and entitled "1.7 mgd Expansion", by HLA.
- Proposed flow diagram for the 0.2 mgd treatment train and the proposed (at the time) 1.5 mgd treatment train, dated January 19, 2005.
- Cottonwood Creek WWTP Facility Drawing, showing property lines and ownership as of February 17, 2005.

Information and data that was requested but was not available included the following:

- Design report for the 0.2 mgd treatment train
- TCEQ inspection visit reports (However, BRA reported there were no problems cited)

8.2 Plant History

Two treatment plants and an influent lift station are currently located on the existing plant site. The plant discharges into Cottonwood Creek, which flows north to south and is located on the site running along its western side. Although the total site area is about 15 acres, approximately 2.25 acres is on the west site of the creek and it is estimated that another 2.25 acres cannot be used along the east side of the creek, thus leaving about 10.5 acres for treatment facilities, access drives and buffer zones. It should be noted that the City of Hutto owns the properties on the east and west sides of the existing plant site.

The treatment facilities were built in five phases. The original plant was constructed in 1981 and included a lift station, bar screen, one facultative lagoon and two stabilization ponds.

In 1991, the City decommissioned the ponds and constructed a 0.1 mgd extended air WWTP as the first phase of Plant 1. The facilities consisted of common wall, reinforced concrete tanks and equipment provided by Process Engineered Equipment Company (PEECO). The basins were rectangular including the clarifier. Plant 1 also included a lift station on the northern edge of the site.

It appears from the documents gathered that one of the decommissioned treatment ponds, or a portion of it, was converted to an emergency overflow pond, which remained in service until about 2006, at which time it was filled in due to concerns about public safety.

The City of Hutto sold the WWTP to the Lower Colorado River Authority-Brazos River Authority (LCRA-BRA) Water Alliance in 1998, and the following year, the Alliance expanded Plant 1 by constructing a 0.1 mgd mirror image of the first phase adjacent to (and structurally connected to) its east wall.

In 2003-4, the first phase of Plant 2 was constructed. It consisted of a 0.75 mgd plant that was constructed to the east of Plant 1. Phase I of Plant 2 consisted of rectangular aeration basins and two octagonal clarifiers. According to the HLA preliminary engineering report and the design calculations provided by the equipment supplier (Enviroquip), the expansion was designed to operate in the extended aeration mode of activated sludge. The project also included the filling of the decommissioned lagoons south of Plants 1 and 2, and improvements to the existing lift station. These improvements consisted of replacing the existing pumps with three 1,200 gpm submersible pumps (according to HLA's preliminary engineering report).

The construction plans for Phase I of Plant 2 show that Plant 2 was designed to run in parallel with the older Plant 1, and this was confirmed by HLA. For example, a sludge pump was added at Plant 1 to transfer sludge from Plant 1 to the digester at Plant 2. However, BRA's operators report that due to the high labor costs associated with Plant 1, it was taken off line shortly after Phase I of Plant 2 was put into operation. For a while, the operators exercised the positive displacement blowers, but this is no longer done.

The second phase of Plant 2 was constructed by the LCRA-BRA Water Alliance in 2006-7. This phase increased the capacity of the Plant 2 to 1.5 mgd by constructing a second sludge holding tank, a second chlorine contact tank, a third centrifugal blower, and by changing the mode of operation for Plant 2 from extended aeration to single stage nitrification. The second phase of Plant 2 also included the abandonment of the original influent lift station on the northern edge of the site and the abandonment and filling of the emergency overflow pond. The replacement lift station was built in the southwest corner of the filled pond. This station includes three 2,200 gpm submersible ABS pumps (according to information in the O&M Manual for the expanded plant). The HLA preliminary engineering report states that the lead pump is equipped with a variable frequency drive.

8.3 Current Permit

The permit currently in force for the Hutto Wastewater Treatment Facility (Texas Pollutant Discharge Elimination System Permit No. WQ 0011324001) was issued on February 19, 2009. The permit is scheduled to expire on December 1, 2013.

The permit stipulates an average annual flow limit of 1.7 mgd. Thus, the permit appears to have been based on the capacity of both Plants 1 and 2. Unless Plant 1 were to be put back in operation, the average annual flow that could be treated would be limited to 1.5 mgd, the capacity of Plant 2 only.

The average flow during any 2-hour period (2-hour peak) is not to exceed 3,896 gpm, which is equivalent to 5.61 mgd, or a flow of 3.3 times the average annual flow limit in the permit (peaking factor).

The permit has both daily average effluent concentration limits and loading limits, which are as follows:

Table 8-1 Effluent limitations in current permit

	Daily Avg (mg/L)	Daily Avg. (lbs/day)	7-day Avg (mg/L)	Daily Max (mg/L)	Single Grab (mg/L)
CBOD5	7	99	12	22	32
TSS	12	170	20	40	60
NH3-N	1.5	21	5	10	15
mg/L = milligrams per liter, lbs = pounds, CBOD = carbonaceous biochemical oxygen demand					

It is important to note that both Plant 1 and Plant 2 were designed based on effluent limits less strict than those in the permit. The calculations prepared by the equipment suppliers indicate the plants were designed for average limits of 10-15-3, or 10 mg/L BOD5, 15 mg/L TSS and 3 mg/L ammonia nitrogen. In addition, Chapter 217.154, Table F-1 indicate that the types of plants designed (Plant 1: extended aeration – enhanced secondary; and Plant 2: activated sludge with nitrification and wastewater temperatures greater than 15 degrees C) indicate the applicable permit effluent sets are 10-15- 3, 2 or 1.

As will be shown later, the effluent from Plant 2 has been meeting the limits in the current permit, even though they are stricter than both the design effluent values and the values applicable according Chapter 217 of the TCEQ rules. However, these stricter limits must be considered in evaluating the capacity of the plant as flows and BOD loads approach the design values.

The current permit for the existing plant does not include a phosphorus limit. However, in recent negotiations with TCEQ, it has been reported that the permit for the proposed Lower Brushy Creek Plant will include a total limit of 33 pounds of total phosphorus per day, but no concentration limit (mg/L). The 33 pounds per day limit is equivalent to a 1 mg/L limit at the proposed final flow capacity of the Lower Brushy Creek Plant, which is 4 mgd. As will be noted later in this report, any process change or expansion of the existing plant will require a permit amendment, and that will likely involve the addition of a phosphorus limit.

8.4 Wastewater Flows at the WWTP

Daily effluent flows have ranged from 0.71 to 3.0 mgd over the 20-month period beginning October 1, 2009 and ending May 31, 2011, with the highest daily flows generally coinciding with storm events.

Calculated annual average flows since January 2007 are shown in **Figure 8-1**. The largest annual average flow calculated was 1.2 mgd, which is plotted at October 4, 2010 on the chart. At that point, the annual average flow had reached 71% of the permitted annual average flow. For the 12 month period ending May 31, 2011, the average annual flow was 1.0 mgd, or 59% of the permitted average annual flow of 1.7 mgd.

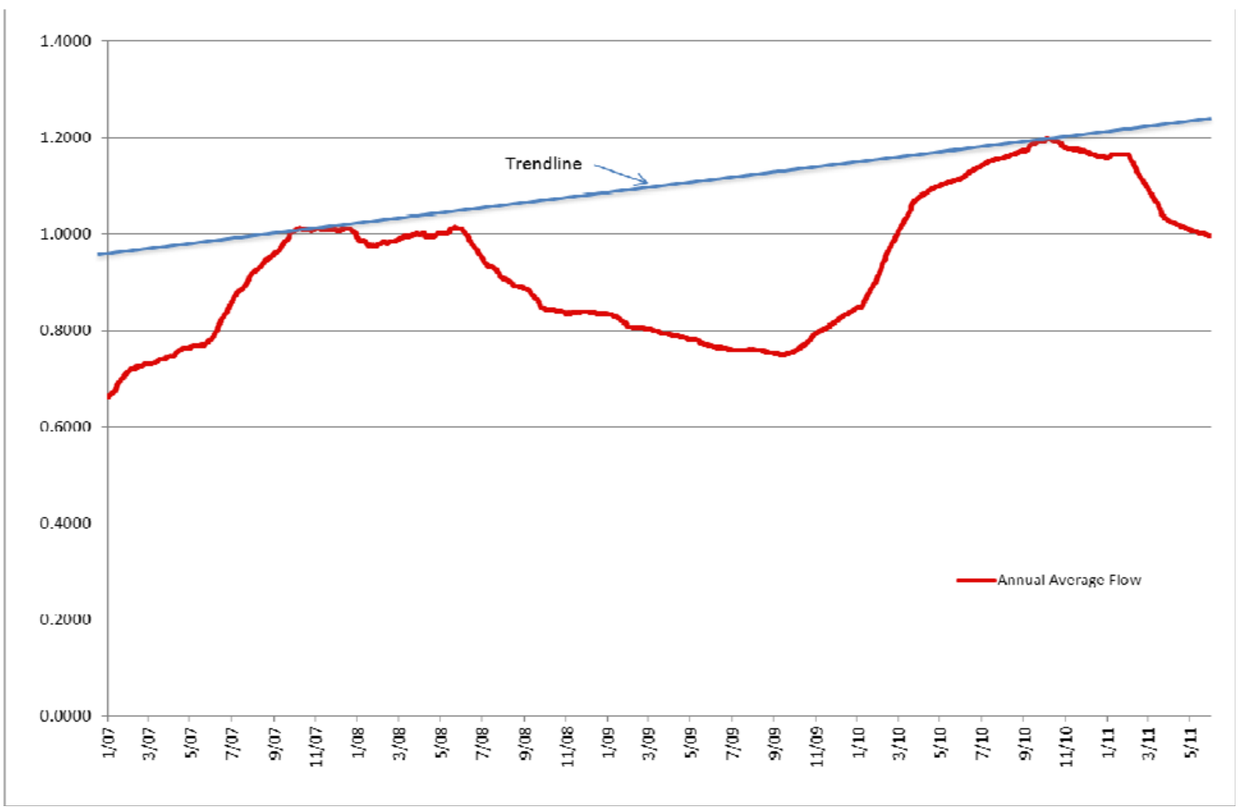


Figure 8-1 Annual Average Flow for 12 Previous Months

The peaks that appear in **Figure 8-1** correspond to periods of wet weather. Each point on the annual average curve is based on the average of the flows for the preceding 12 months. So the annual average flow that occurs on October 4, 2010 corresponds to flows for the period from October 5, 2009 to October 4, 2010. This period begins with the rainfall events occurring in October 2009, after a sustained dry period, and ends shortly after the rainfall event associated with Tropical Storm Hermine in October 2010. This pattern demonstrates that annual average wastewater flows are significantly affected by I/I. The difference in annual average flows in a wet period are about 0.38 mgd higher than those in a dry period, or wet periods increase annual average flows by about 50%.

A trend line drawn through the two peaks in **Figure 8-1** indicates that average annual flows have increased by about average of 6.3% per year since January 1, 2007.

Peak 2-hour flows have coincided with storm events. Most of the storm events in the last 20 months have contributed in causing peak 2-hour flows of less than 4.2 mgd or about 2900 gpm, which is equivalent to 74% of the permitted 2-hour flow rate. However, the two largest storms during the last 20 months caused higher peak flows at the plant.

In October 2009, over 12 inches of rain was recorded at the Cottonwood Creek WWTP. A total rainfall of 4.6 inches on October 3rd and 4th contributed in causing a peak 2 hour flow of 2,805 gpm, within the range of most storm related peak flows observed. However, a smaller, 2.50-inch rain on October 26th contributed to even higher flows at the plant. The peak 2-hour flow was recorded at 3,282 gpm, or 84% of the permitted peak 2-hour flow. The daily flow on October 26, 2009 was 2.327 mgd, which is 137% of the permitted average annual flow, but the average flow for the month of October 2009 was 1.12 mgd, only 66% of the permitted average annual flow of 1.7 mgd.

An even higher flow event occurred on September 8, 2010 due to Tropical Storm Hermine. A total rainfall of 5.6 inches on that day contributed in causing a peak 2 hour flow of 4264 gpm, which was equivalent to 109% of the permitted peak 2-hour flow. The daily flow on September 8th (2.48 mgd) was 146% of the permitted average annual flow, but the average flow for the month of September 2010 was 1.19 mgd, only 70% of the permitted average annual flow of 1.7 mgd.

As with the average annual flow pattern, the peak 2-hour flows indicate there are significant I/I problems in the collection system, which have caused flows approaching 75% of the permitted 2-hour flow on a regular basis. Two storms during the last 20 months have caused higher 2-hour peaks (84% and 109% of the permit limit). Collection system improvements and/or equalization may be required in order to postpone a plant expansion driven by 2-hour peak flows.

The permit requirements state that whenever the average annual flow for the WWTP reaches 75% of the permitted flow for three consecutive months, the permittee must begin engineering and financial planning for the expansion (or upgrading) of its wastewater treatment facilities. Whenever the flow for the WWTP reaches 90% of the design flow for three consecutive months, the permittee must begin construction of the planned expansion (or upgrading).

Based on the flow data summarized above, average annual flows were in the range of 1.0 mgd, or 59% of the permitted average annual flow of 1.7 mgd as of May 31, 2011. However, 2011 has been a dry year. The return of wet weather could cause average annual flows to increase by about 0.38 mgd based on recent trends.

As discussed in ***Section 5.8***, lift station data analysis indicated a wet weather I/I response from the Country Estates Lift Station. Only small increases in flow due to wet weather were seen at the other lift stations analyzed. The City of Hutto is replacing many of the older lines in the collection system through streetscape and redevelopment projects. This replacement effort should continue, as well as a more detailed analysis of wet weather flows in the Country Estates Lift Station service area, to minimize wet weather flows and maximize the service life of the existing treatment facilities.

As noted earlier, the capacity of the currently operating Plant 2 is only 1.5 mgd. Also, as shown in the next section, wastewater strengths have been increasing, and this could require a re-rating of the existing treatment plant downwards.

8.5 Influent Wastewater Characteristics

The Cottonwood Creek WWTP receives wastewater primarily from residential customers (approximately 80% of total flows). The remaining wastewater is primarily from commercial customers and schools. BRA's operators reported that the Cottonwood Creek WWTP does not accept septic haulage and that there are no industrial dischargers served by the system.

BRA's operators reported that there appear to have been some discharges of a substance that has been causing corrosion of the pump rails and ductile iron piping in the submersible lift stations. The same substance appears to be upsetting the nitrification process in the plant. Unfortunately, the discharges occur irregularly and for relatively short periods, making it difficult to identify the substance and its source.

According to the design calculations prepared by PEECO and Enviroquip for Plants 1 and 2, respectively, these plants were designed for the following influent concentrations:

- Influent BOD 200 mg/L
- Influent TSS 200 mg/L
- Influent Total Kjeldahl Nitrogen(TKN) 30 mg/L

CDM analyzed influent data from the Cottonwood Creek WWTP as part of their preliminary design work on the Lower Brushy Creek Regional WWTP. According to CDM's report, influent concentrations were significantly higher than those used in the design of the existing plant. Based on their review of the data, CDM suggested that the new Lower Brushy Creek Regional WWTP should be designed according to the following influent concentrations:

- Influent BOD 280 mg/L
- Influent TSS 210 mg/L
- Influent TKN 45 mg/L

- Ammonia nitrogen 40 mg/L
- Total phosphorus 10 mg/L

CDM estimated the total phosphorus levels by using a typical P/BOD ratio of 7 mg/L to 200 mg/L.

More recent data (October 2009 to May 2011) was analyzed as part of this study for the Cottonwood Creek WWTP and influent levels were found to be as follows:

- Influent BOD 233 mg/L avg / 358 mg/L max.
- Influent TSS 227 mg/L avg / 534 mg/L max.
- Influent TKN 40 mg/L avg. / 73 mg/L max.
- Ammonia nitrogen 40 mg/L avg. / 55 mg/L max.

The more recent data would indicate that the influent BOD has not risen to the levels that CDM had recommended for the design for the Lower Brushy Creek Regional WWTP. However, the recent data includes the wet weather periods during 2007 and from October 2009 to September 2010, which would have tended to dilute wastewater strength. Based on trends in other Texas towns and cities, using an average influent BOD level of 250 mg/L would be prudent.

Increases in the influent BOD, TKN and ammonia nitrogen levels over time will reduce the volume of wastewater that can be treated in a WWTP compared to the original design flow. For example, Plant 2 was designed for an average flow of 1.5 mgd and an influent BOD of 200 mg/L. This equates to a BOD load of 2,502 pounds (lbs) per day and the resulting aeration basin loading was 30.1 lbs of BOD/day per 1000 cubic feet (cf) of aeration volume. If the influent BOD concentration rises to 250 mg/L, then Plant 2's average flow capacity drops to 1.20 mgd based on the original design loading of 30.1 lbs of BOD/day per 1000 cf of aeration volume.

If the loading were increased to TCEQ's maximum BOD loading rate of 35 lbs of BOD per 1000 cf of aeration tank volume, then an average of 2,909 lbs of BOD per day could be treated in Plant 2. If the wastewater strength is 250 mg/L, then the plant could handle an average flow of 1.39 mgd, assuming the there was sufficient aeration capacity available.

Detailed calculations of the impact of higher strength wastewater on the flow capacities of the existing Cottonwood Creek WWTP will be discussed in the assessment section that follows. These calculations have been based on the following influent concentrations, which were based on the review of the CDM design recommendations and a more recent review of influent data:

- Influent BOD 250 mg/L
- Influent TSS 240 mg/L
- Influent TKN 45 mg/L
- Ammonia nitrogen 40 mg/L
- Total phosphorus 10 mg/L

8.6 Effluent Characteristics

As noted above, the Cottonwood Creek WWTP's effluent limits are lower than the limits assumed when Plants 1 and 2 were designed. In this section, the actual performance of Plant 2 will be compared with both the original design assumptions and the limits in the current permit.

WWTP laboratory data from October 2009 to May 2011 was reviewed and found effluent levels to be as follows:

Constituent	Average	Maximum
Effluent CBOD	**2.3 mg/L**	**>13.9 mg/L**
Effluent TSS	**4.0 mg/L**	**18 mg/L**
Ammonia-N	**0.61 mg/L**	**4.2 mg/L**

Comparing the information in the table above with the current (2009) permit indicates that Plant 2 has not exceeded the permit limits, with the exception of the one report of a CBOD level "> 13.9 mg/L". Ignoring that one report, the next highest maximum effluent CBOD was 7.5 mg/L, well below the single grab limit of 32 mg/L.

Thus, even though the permit limits are stricter than those used in the original design, Plant 2 is complying with the current limits. As the flows begin to approach the design capacity of the plant, the operators may find it more challenging to maintain the current effluent quality, but there is still quite a lot of room for some loss of effluent quality without exceeding the current permit limits. Using Plant 2 to treat flows in excess of 1.5 mgd (the original design capacity of Plant 2) could make staying within permit limits increasingly more difficult for the operators.

8.7 Plant Operations

Below are some of the key operating conditions for the period from January 2010 through May 2011:

- The MLSS maintained in the aeration basins ranged from 2220 mg/L to 5280 mg/L with an average of 3945 mg/L; the volatile portion was about 82%.
- Solids in the return activated sludge (RAS) averaged 7810 mg/L (0.78%) and the volatile portion was 80%.
- The average solids level in Digester 1 was 1.53% with a maximum solids level of 1.8%; the volatile portion was about 72%.
- The average solids level in Digester 2 was 1.87% with a maximum solids level of 2.5%; the volatile portion was about 74%.

Partially digested sludge is withdrawn from the bottom of the two sludge holding basins and hauled by tank truck to the Brushy Creek East Plant located west of Hutto. BRA dewaters the sludge and it is then hauled to the Williamson County RDL landfill, or to the Austin Community Landfill.

According to information provided by BRA, sludge is withdrawn from the digesters of the Hutto Plant 2 at between 1.2% and 2.0% solids, with the average at 1.67% solids (for period from

August 2009 to July 2010).

The sludge haulage and disposal records for the period between September 2008 and December 2010 indicate that the wet sludge volume that was hauled from the Hutto plant to the Brushy Creek East plant was an average of about 200,000 gallons per month during 2008, about 232,000 gallons per month during 2009, and 266,000 gallons per month during 2010. The average load size is about 5500 gallons. The amount of wet sludge hauled is an average of about 0.8% of the wastewater flow through the plant.

According to a BRA Annual Sludge Disposal Report filed with TCEQ on August 31, 2010, Hutto's sludge is about 6% of the total sludge that is dewatered at the Brushy Creek East WWTP. From August 2009 to July 2010 about 215 dry tons of solids were reported to be from the Cottonwood Creek WWTP. Comparing these results with wastewater flow rates, about 0.56 dry tons of solids are produced for every million gallons of WW flow through the Cottonwood Creek WWTP. Assuming that the influent BOD is about 250 mg/L, then the average sludge produced by the plant is about 0.54 pounds of dry solids per pound of influent BOD, after some VSS reduction occurs in the sludge holding basins.

8.8 Assessment of the Existing WWTP Facilities

BRA provided information on the conditions of the existing WWTP facilities as part of the study and this information was used to assess the facilities.

8.8.1 *Influent Lift Station*

BRA has reported that clogging of the submersible pumps is a frequent problem, which is caused primarily by disposable wipes that customers are flushing down their toilets.

During large storm events, the wet well surcharges even when all three pumps are operating. It is possible that short-term wet weather peak flows exceed the plant's peak 2-hour permitted flow.

As described below, the Plant 2 headworks was designed to screen and degrit flow for both Plant 1 and Plant 2. However, it appears that the existing pumps in the influent lift station do not have adequate capacity to do this.

8.8.2 *Plant 1*

As noted above, Plant 1 was taken off-line in about 2004, and the blowers have not been exercised for a number of years.

BRA has reported that the existing screen required frequent cleaning and that the 1-inch openings allow rags to pass into the other basins where they catch on the clarifier chains. The positive displacement (PD) blowers also require more maintenance than centrifugal blowers and BRA warns that bringing the PEECO plant back on line will increase labor costs substantially.

BRA has also reported that the existing PD blowers at Plant 1 generate higher noise levels than the larger 150 hp centrifugal blowers at Plant 2. The Plant 1 blowers are closer to an existing subdivision west of Cottonwood Creek. In their 2005 preliminary engineering report, HLA suggested replacing the existing PD blowers with centrifugal blowers if Plant 1 is brought back on line. Other sound control options suggested included construction of a concrete block wall on two or three sides of the blowers, and construction of a solid wood fence along the west side of the plant.

8.8.3 *Plant 2*

BRA's operators have reported that Plant 2 is operating well and there have been no problems identified during recent TCEQ inspections. As mentioned above, discharges of an unidentified substance have recently been upsetting the nitrification process in the plant, as well as causing corrosion of the pump rails and the ductile iron piping in the influent lift stations.

An examination of the plans for Plant 2 indicates that the headworks were intended to handle the influent flow for both Plant 1 and Plant 2. A preliminary review of the information available on the automatic mechanical screen (Headworks Inc/Mahr screens) indicates the existing screen could handle about 12 mgd peak flow, assuming the screen is clean. With the screen partially clogged, the screen will handle a flow in the range of 8 mgd. Plant 2 includes a back-up manually cleaned screen mounted in a parallel channel.

An analysis of the capacity of the aerated grit chamber was not possible, but it is probable that it could also handle up to 8 or 10 mgd peak flow, but probably with some loss of grit removal efficiency. Although a more thorough investigation would be needed to verify these capacities, it appears that the headworks could handle the influent flow to both Plant 1 and Plant 2 (up to 8 mgd or possibly as high as 10 mgd peak flow).

However, the firm pumping capacity of the existing lift station is only about 4200 gpm, or about 6 mgd. For influent flows above 6 mgd, a second lift station would be required as it is doubtful that larger pumps could be installed in the existing lift station. The 24-inch influent piping to the Plant 2 headworks has a 12-inch blind flange connection available for an additional force main.

Plant 2 was designed and constructed in accordance with TCEQ's requirements using the influent assumptions for the original design, and there is no excess capacity above 1.5 mgd, except as noted above for the headworks.

8.9 Increasing Treatment Capacity

The existing site is large enough to consider an expansion of the treatment plant. In fact, in their 2006 preliminary engineering report, HLA had suggested a mirror image of Plant 2 could be built on the existing site, thus increasing the total capacity of the WWTP to 3.2 mgd, assuming the 0.2 mgd Plant 1 were returned to service. A number of alternatives were evaluated that would increase the capacity enough to delay construction of the Lower Brushy Creek Plant to 2020 if a portion of flow is treated by Pflugerville through 2020 (Alternative 1). In addition, the possibility of expanding the existing plant to a capacity of 5.5 mgd to delay construction of the

Lower Brushy Creek Plant beyond 2040 was also examined (Alternative 2).

8.9.1 *Increasing to Capacity of 1.95 mgd (Alternative 1)*

An often-used method for increasing the capacity of an extended aeration plant is to convert it to a conventional activated sludge plant with nitrification. TCEQ rules allow for a higher loading of 35 pounds of BOD5/day per 1000 cubic feet of aeration tank volume. This alternative is based on changing to conventional activated sludge and using the existing Plant 1 tankage for aeration and sludge holding. A new clarifier and chlorine contact tank is proposed because the existing clarifier and chlorine contact tank in Plant 1 cannot handle any additional flow.

With this alternative, the capacity of Plant 1 would be 0.56 mgd, so the total capacity of the Cottonwood Creek Plant would be increased to 1.95 mgd (taking into account the higher influent BOD and the resulting reduction in flow capacity for Plant 2). A summary of the principal improvements are listed below:

- A second lift station to provide flow to the headwork's of Plant 2 for subsequent transfer to Plant 1.
- Removal of equipment from existing clarifiers and filling the hopper with concrete.
- Removal of existing coarse bubble diffusers from aeration tank and installation of fine bubble diffuser system in the existing aeration tanks, clarifier and chlorine contact basins.
- New 52-feet diameter clarifier
- New 29,900 gallon rectangular chlorine contact tank
- Removal of existing PD blowers and aeration piping and replacement with centrifugal blowers and larger aeration piping.

The costs to implement this alternative is estimated at $1.36 million, which is equivalent to $2.43 per gallon of treatment plant capacity added over the capacity of the existing Plant 2.

8.9.2 *Phased Expansion to 5.5 mgd (Alternative 2)*

If Hutto decides to expand treatment capacity at the existing plant site, the expansion can be done in 2 phases of 2 mgd each for a total capacity at the site of 5.5 mgd. Construction on the first phase would need to start in 2013. This expansion would consist of the following improvements:

- Utilizing the City's Public Works yard for the plant expansion.
- A 36-inch effluent outfall to handle 4 mgd of effluent.
- An on-site influent lift station with a capacity of 16 mgd.
- Headworks.
- Activated sludge treatment including aeration tanks and blowers, clarifiers, RAS pumping station, and an alum feed system.
- Sludge holding tanks and decanting mechanisms.
- Ultra-violet disinfection basin and system.

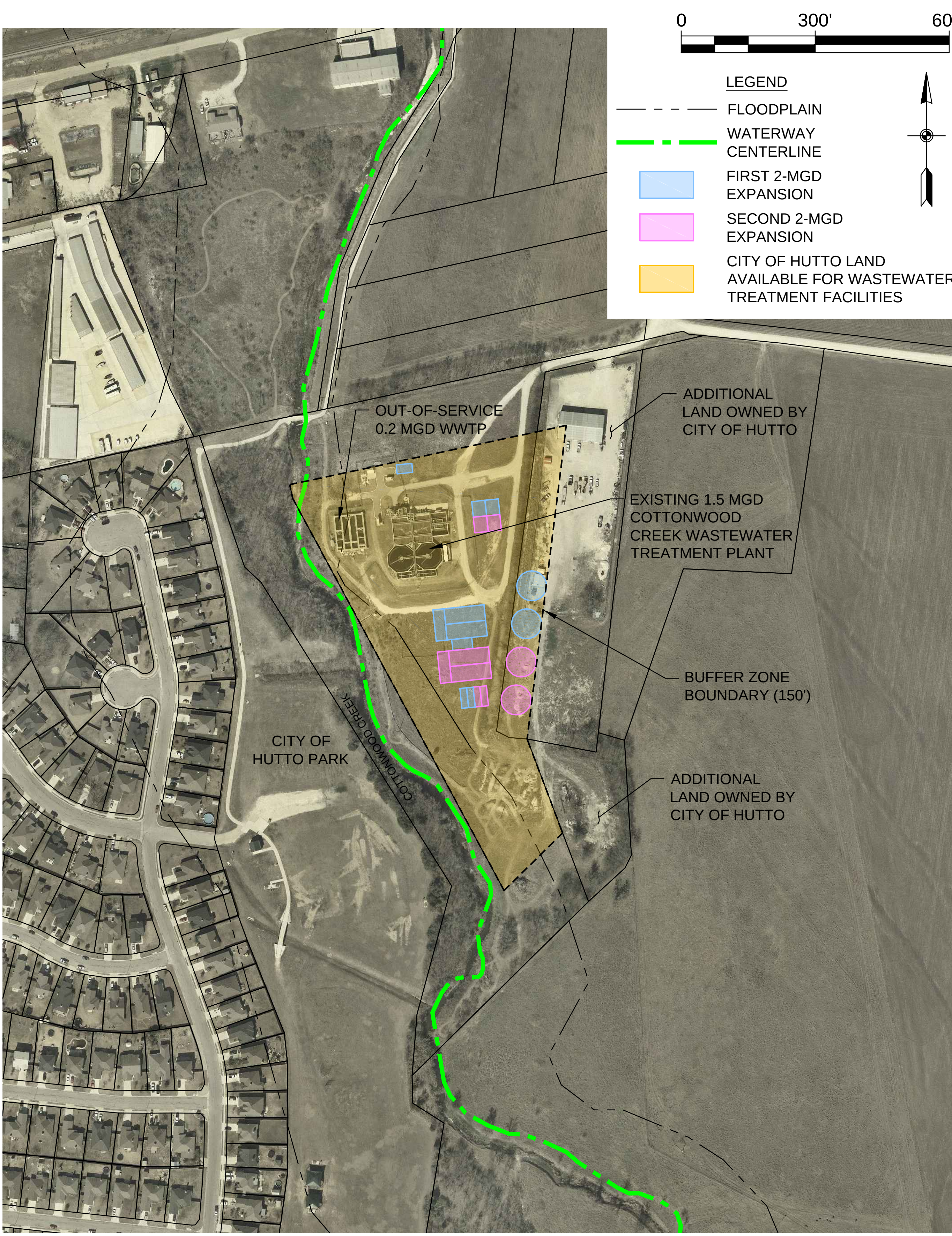
- Odor control measures consisting of RAS recycle to influent lift station, carbon adsorption system, and enclosure over sludge holding tanks.
- Electrical and instrumentation including SCADA system as well as expansion and extension of existing power supply.
- Metal building for office, laboratory, and restrooms.

Construction on the second 2 mgd expansion must begin in 2024 and will consist of the following improvements:

- Extension of the influent force main to the Phase 2 headworks.
- Headworks.
- Activated sludge treatment including aeration tanks and blowers, clarifiers, RAS pumping station, and an alum feed system.
- Sludge holding tanks and decanting mechanisms.
- Ultra-violet disinfection basin and system.
- Odor control measures consisting of RAS recycle to influent lift station, carbon adsorption system, and enclosure over sludge holding tanks.
- Electrical and instrumentation including SCADA system as well as expansion and extension of existing power supply.
- Improvements or expansion of metal building for office, laboratory, and restrooms.

It should be noted that there is not sufficient room at this site to dewater the sludge for the full 5.5 mgd treatment expansion. It is assumed that sludge will be hauled to the Brushy Creek East Wastewater Facility. **Figure 8-2** shows the proposed layout for expanding the Cottonwood Creek WWTP to 5.5 mgd. Treatment facilities at this site cannot be expanded beyond 5.5 mgd unless Hutto purchases additional property.

The cost of the treatment improvements to implement this alternative is estimated at $20 million, which is equivalent to $5 per gallon of treatment plant capacity over the capacity of the existing Plant 2.



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HUTTO REGIONAL WASTEWATER STUDY

EXPANSION OF EXISTING COTTONWOOD CREEK WWTP SITE TO 5.5 MGD

SCALE: 1" = 300'

JUNE 4. 2012

FIGURE 8-2

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9 Analysis of Wastewater Conveyance

For each of the options discussed in ***Section 7***, the conveyance of the wastewater from the sewersheds to the appropriate treatment plant depending on plant capacity and population projections was analyzed.

9.1 Alternative No. 1 – Send Flow to Pflugerville

Presently, flow from the Lakeside Lift Station is pumped to the City of Pflugerville's Central WWTP. The contract between Hutto and Pflugerville stipulates that this flow will be accepted until 2020. The possibility of sending up to an additional 0.5 mgd of wastewater flow to the City of Pflugerville was discussed in ***Section 7.3***. This would allow Hutto to delay construction of the proposed Lower Brushy Creek WWTP to 2018, but would require upgrades to the existing Cottonwood Creek WWTP. Below is a list of the improvements necessary to convey the projected wastewater flow to the treatment facilities. These proposed improvements are shown on **Figure 9-1** and **Figure 9-2**.

- To pump the additional 0.5 mgd to Pflugerville, a second 1,400 gpm lift station at the Enclave site and the associated 10-inch diameter force main to the Pflugerville acceptance point must be constructed in 2012.
- In 2012, the existing Enclave Lift Station must be upgraded to pump a firm capacity of 1,500 gpm to the existing Front Street gravity main.
- In 2012, the existing 18-inch interceptor from Highway 79 to the Cottonwood Creek WWTP must be upgraded to 24-inches, and 415 linear feet of 18-inch gravity main in Front Street must be upgraded to 27-inches.
- Construction will begin on Segments 1 and 2 of the Carmel Creek Interceptor and Segment 4 of the Brushy Creek Interceptor to serve the East Williamson County Higher Education Center expected to be developed on County Road 108 in 2012.
- The Avery Lake gravity main was assumed to be built in 2015 to serve development projected in the Avery Lake sewershed.
- In 2018, construction should begin on the Brushy Creek Force Main that will transmit flow from the Enclave Lift Station to the proposed Lower Brushy Creek WWTP. In addition, the improvements necessary at the Enclave Lift Station to pump to the Brushy Creek Force Main must be made at the same time. The 12-inch Lakeside gravity main to transmit the Lakeside sewershed flow to the Enclave Lift Station will also be built at this time.
- In 2020, all three segments of the North Cottonwood Creek Interceptor are proposed to be built to serve the development expected in the North Cottonwood Creek sewershed. At the same time the third segment of the Carmel Creek Interceptor will also be built.
- In 2027, the Brushy Creek Interceptor will be built. This will allow the flow from the Enclave Lift Station to be transmitted via gravity flow to the Lower Brushy Creek WWTP. The Enclave Lift Station and Brushy Creek Force Main will be decommissioned at this time.
- In 2030, the Glenwood and Country Estates gravity mains will be built to connect those sewersheds to the Brushy Creek Interceptor, decommissioning those two lift stations.

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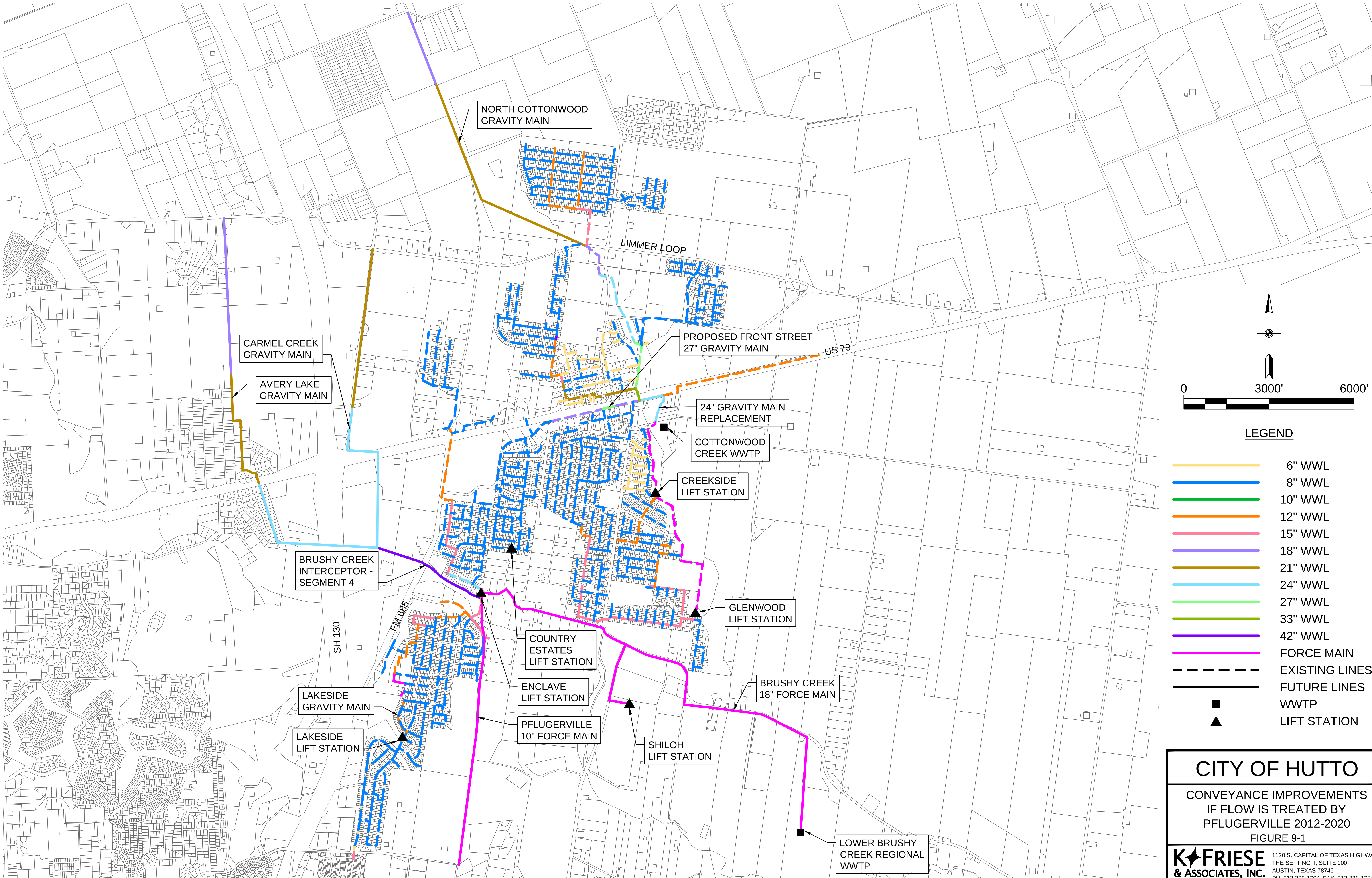

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CONVEYANCE IMPROVEMENTS
IF FLOW IS TREATED BY
PFLUGERVILLE 2012-2020

FIGURE 9-1

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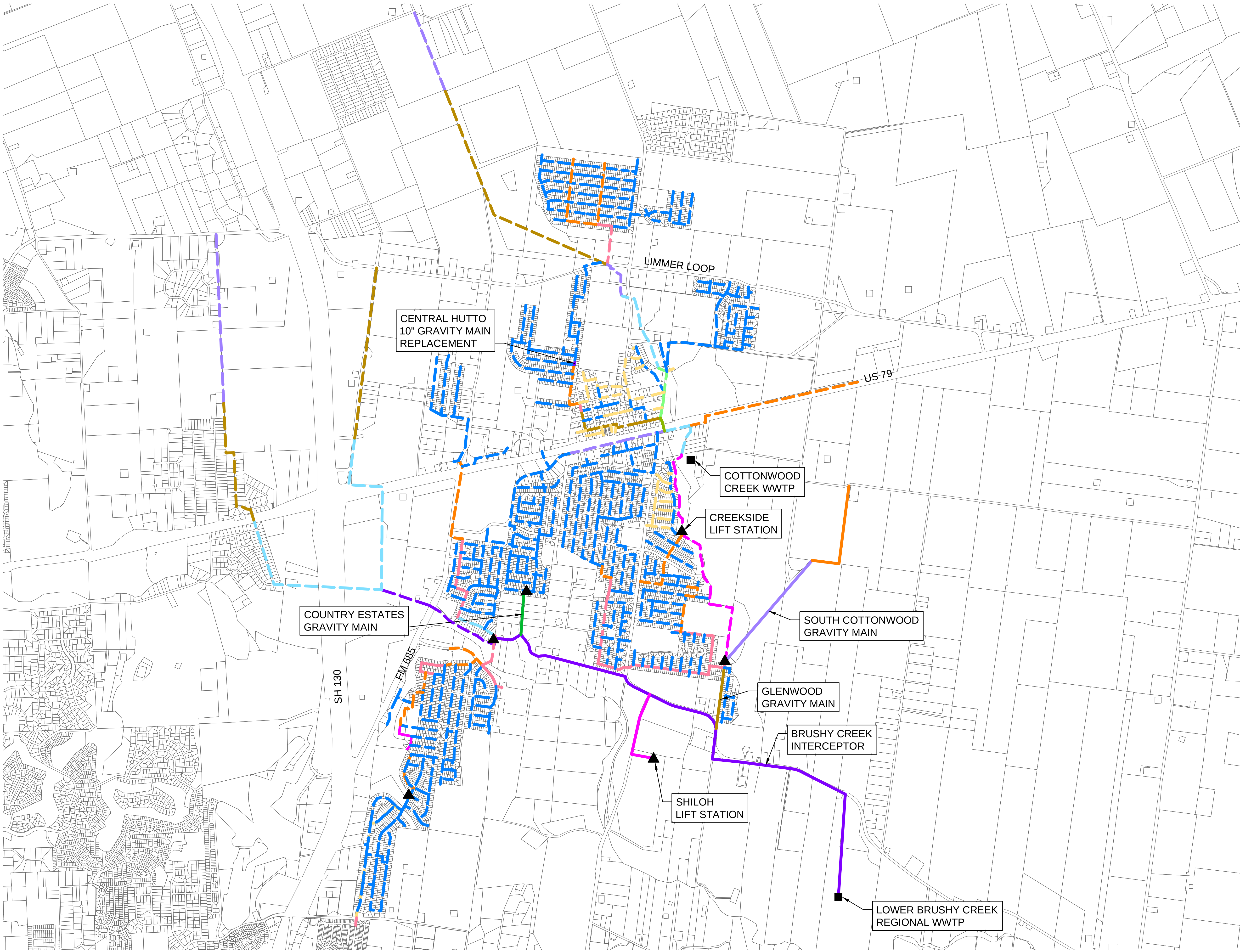
File: X:\Projects\0204 - Hutto Master Plan\DWG\Exhibits\0204_WW-Mains_2020-40_Figure 8-2.dwg Layout: Small Plotted: 12/5/2012 10:33:56 AM Plotted by: Robert Kaylor Saved by: RKaylor



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CONVEYANCE IMPROVEMENTS
IF FLOW IS TREATED BY
PFLUGERVILLE 2020-2040

FIGURE 9-2

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- The South Cottonwood Creek Interceptor will be built to serve the development expected in the South Cottonwood Creek sewershed in 2030.
- A small portion (80 linear feet) of the Central Hutto gravity main must be increased from an 8-inch diameter pipe to a 10-inch diameter pipe in 2030 to convey the flow expected without surcharging the pipe.

9.2 Alternative No. 2 – Expand Cottonwood Creek Wastewater Treatment Plant

Section 7.4 discussed expanding the existing Cottonwood Creek WWTP to a capacity of 5.5 mgd to treat all flow expected in the study area in 2040. Because of the location of the existing WWTP, much of the flow must be pumped to the treatment facilities. The list below includes the conveyance projects needed to treat all the flow at the existing Cottonwood Creek WWTP. **Figure 9-3** depicts those improvements.

- In 2012, the existing 18-inch interceptor from Highway 79 to the Cottonwood Creek WWTP must be upgraded to 36-inches.
- Construction will begin on Segments 1 and 2 of the Carmel Creek Interceptor and Segment 4 of the Brushy Creek Interceptor to serve the East Williamson County Higher Education Center expected to be developed on County Road 108 in 2012.
- In 2013, the Enclave Lift Station must be upgraded to a firm capacity of 1800 gpm. It was assumed that a new lift station would be built at this time at this site to handle all the flow expected at this station through 2040. In addition, almost 3,000 linear feet of gravity main in Front Street must be replaced to accept the flow from the Enclave Lift Station and associated force main.
- A new lift station and force main must be built to pump flow from the Brushy Creek sewershed to the Cottonwood Creek plant. The timing of these facilities is dependent on development in the sewershed, but a construction date of 2015 was assumed.
- The increase in flow at the Enclave Lift Station necessitates several phased improvements including adding a third pump and building a new 18-inch force main in 2016, replacing one of the pumps in 2024, replacing another of the pumps in 2030.
- The 12-inch Lakeside gravity main to transmit the Lakeside Lift Station flow to the Enclave Lift Station will be built in 2018.
- The Avery Lake gravity main was assumed to be built in 2020 to serve development projected in the Avery Lake sewershed.
- In 2020, all three segments of the North Cottonwood Creek Interceptor are proposed to be built to serve the development expected in the North Cottonwood Creek sewershed. At the same time the third segment of the Carmel Creek Interceptor will also be built.
- A third pump is needed at the Glenwood Lift Station in 2025.
- The South Cottonwood Creek Interceptor will be built to serve the development expected in the South Cottonwood Creek sewershed in 2025.
- A small portion (80 linear feet) of the Central Hutto gravity main must be increased from an 8-inch diameter pipe to a 10-inch diameter pipe in 2030 to convey the flow expected without surcharging the pipe.

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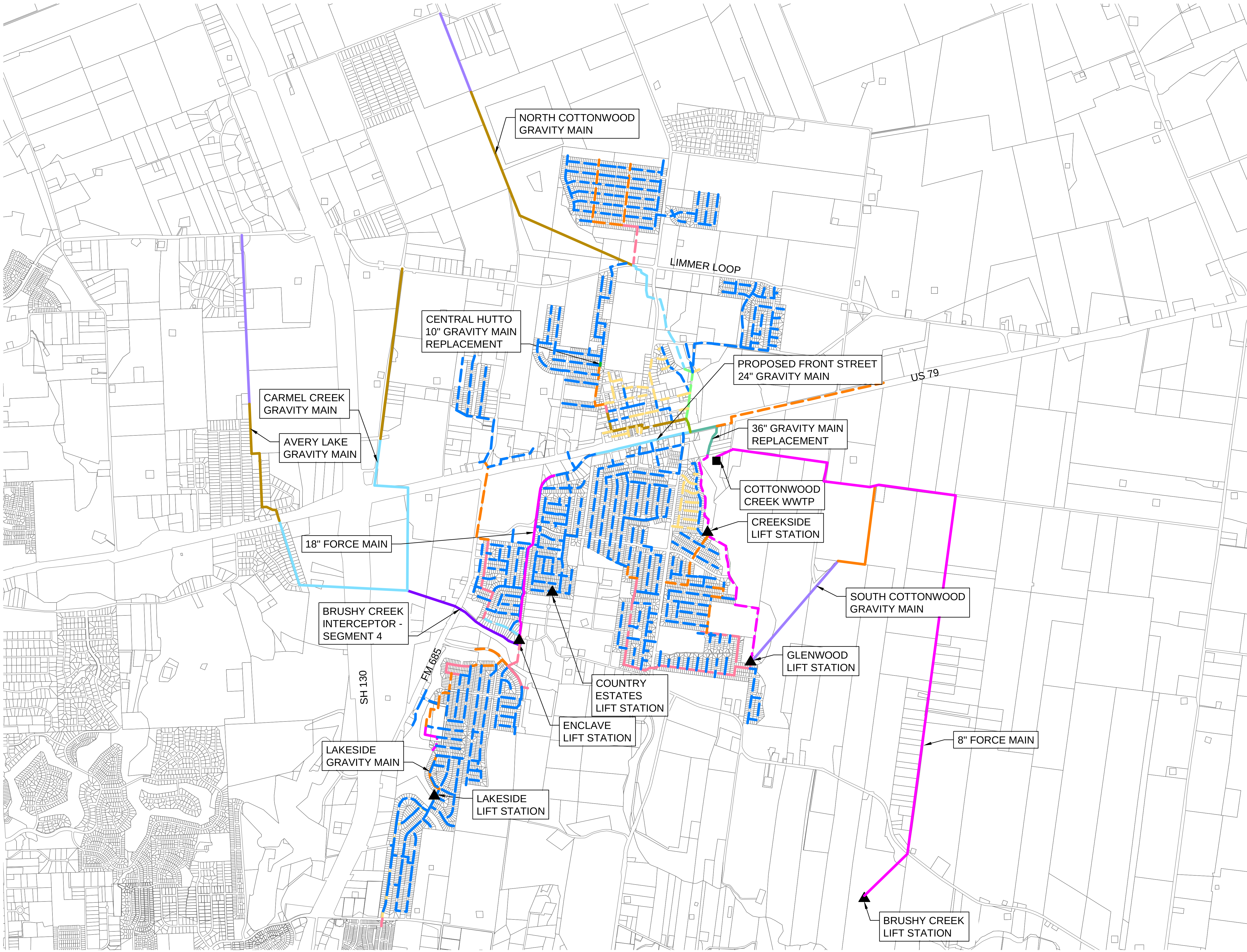

CITY OF HUTTO

CONVEYANCE IMPROVEMENTS IF COTTONWOOD CREEK WWTP IS EXPANDED 2012-2040

FIGURE 9-3

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9.3 Alternative No. 3 – Construct Lower Brushy Creek Wastewater Treatment Plant

A third alternative for treatment was discussed in ***Section 7.5*** with the first phase of construction of the Lower Brushy Creek WWTP beginning in 2013. The improvements necessary to convey flow to the appropriate treatment plants are shown in **Figure 9-4** and **Figure 9-5** and included in the list below.

- In 2012, the existing 18-inch interceptor from Highway 79 to the Cottonwood Creek WWTP must be upgraded to 24-inches.
- Construction will begin on Segments 1 and 2 of the Carmel Creek Interceptor and Segment 4 of the Brushy Creek Interceptor to serve the East Williamson County Higher Education Center expected to be developed on County Road 108 in 2012.
- In 2013, construction should begin on the Brushy Creek Force Main that will transmit flow from the Enclave Lift Station to the proposed Lower Brushy Creek WWTP. In addition, the improvements necessary at the Enclave Lift Station to pump to the Brushy Creek Force Main must be made at the same time.
- The Avery Lake gravity main was assumed to be built in 2015 to serve development projected in the Avery Lake sewershed.
- The 12-inch Lakeside gravity main to transmit the Lakeside Lift Station flow to the Enclave Lift Station will be built in 2018.
- In 2020, all three segments of the North Cottonwood Creek Interceptor are proposed to be built to serve the development expected in the North Cottonwood Creek sewershed. At the same time the third segment of the Carmel Creek Interceptor will also be built.
- In 2024, the Brushy Creek Interceptor will be built. This will allow the flow from the Enclave Lift Station to be transmitted via gravity flow to the Lower Brushy Creek WWTP. The Enclave Lift Station and Brushy Creek Force Main will be decommissioned at this time.
- In 2025, the Glenwood and Country Estates gravity mains will be built to connect those sewersheds to the Brushy Creek Interceptor, decommissioning those two lift stations.
- The South Cottonwood Creek Interceptor will be built to serve the development expected in the South Cottonwood Creek sewershed in 2030.
- A small portion (80 linear feet) of the Central Hutto gravity main must be increased from an 8-inch diameter pipe to a 10-inch diameter pipe in 2030 to convey the flow expected without surcharging the pipe.

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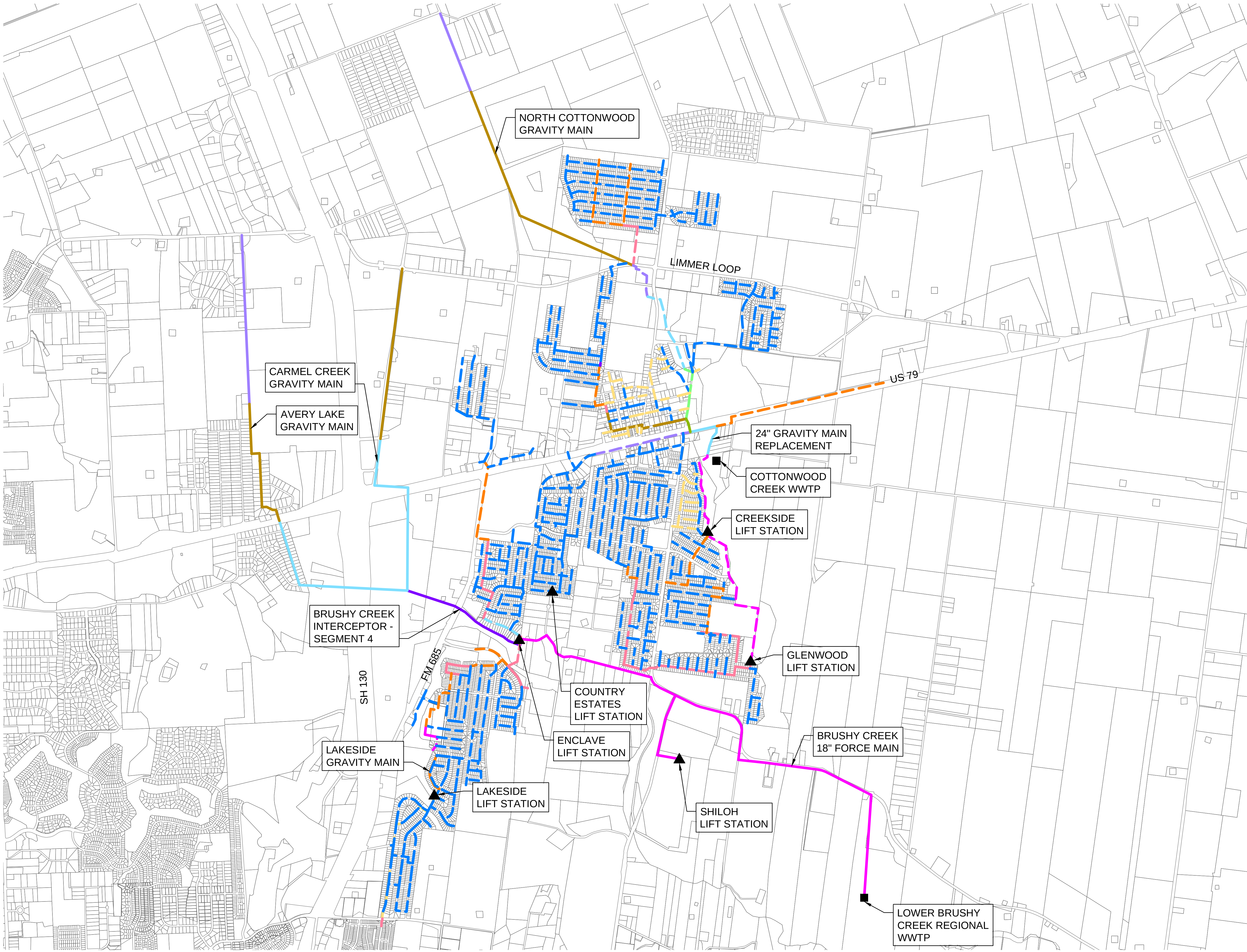

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CONVEYANCE IMPROVEMENTS IF LOWER BRUSHY CREEK WWTP IS BUILT 2012-2020

FIGURE 9-4

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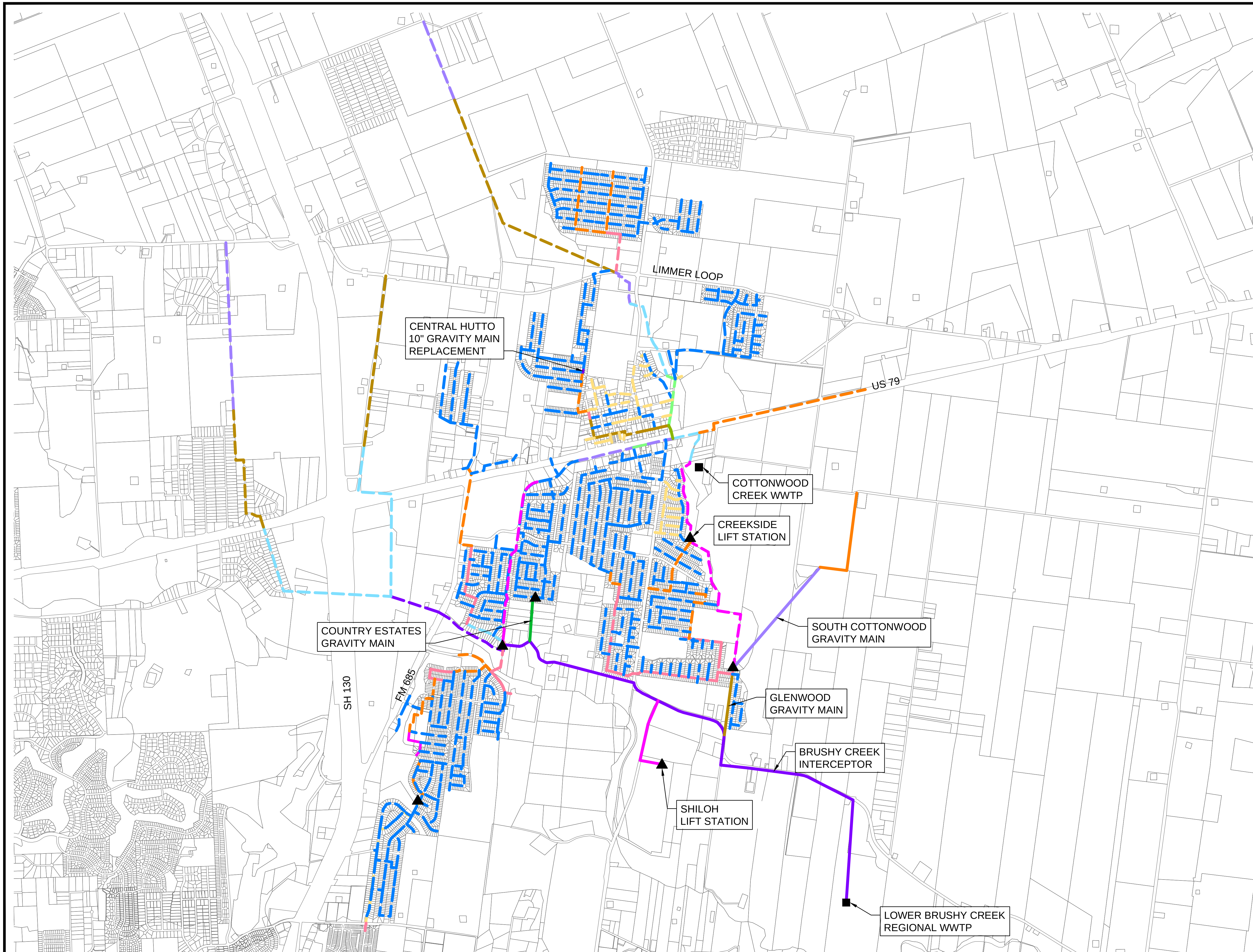

LEGEND

- 6" WWL
- 8" WWL
- 10" WWL
- 12" WWL
- 15" WWL
- 18" WWL
- 21" WWL
- 24" WWL
- 27" WWL
- 33" WWL
- 42" WWL
- FORCE MAIN
- EXISTING LINES
- FUTURE LINES
- WWTP
- LIFT STATION

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CONVEYANCE IMPROVEMENTS NECESSARY IF LOWER BRUSHY CREEK WWTP IS BUILT 2020-2040

FIGURE 9-5

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10 Identification of Capital Improvement Projects

For each of the three treatment options considered in ***Section 8*** and the corresponding conveyance improvements discussed in ***Section 9***, capital costs of the proposed improvements were estimated. Unit costs for pipeline projects were based on recent bid tabulations for nearby projects. Detailed estimates of treatment plant costs and lift station costs as well as the estimates for the pipeline projects are included in Appendix E.

The CIP lists below are divided by facility type: treatment plants, lift station projects, gravity mains, and force mains. For each project, the year that construction is projected to start has been identified. The total cost is shown in 2012 dollars and includes a 20% contingency.

Table 10-1 CIP List for Alternative No. 1 – Sending Flow to Pflugerville

Year	Project	Project Cost
2015	Improvements to Existing Plant to increase capacity	$1,363,000
2018	Construct Lower Brushy Creek WWTP	$10,560,000
2027	Expand Lower Brushy Creek WWTP	$10,995,264
	Totals - Treatment Plant Costs	**$22,918,264**
2012	Enclave LS Pump Upgrade to Front St. Gravity Main	$148,200
2012	Enclave LS 2 to pump flow to Pflugerville	$659,436
2018	Shiloh Lift Station	$659,436
2018	Enclave LS 2 Pump Upgrade to Brushy Creek Force Main	$472,200
	Totals - Lift Station Projects	**$1,939,272**
2012	Interceptor from Hwy 79 to Cottonwood Creek WWTP	$460,800
2012	Front St. Gravity Main (Seg 2)	$107,568
2015	Brushy Creek Interceptor Seg. 4	$955,584
2015	Carmel Creek Interceptor Seg. 1 & Seg. 2	$1,365,120
2018	Lakeside Gravity Main	$207,360
2020	Carmel Creek Interceptor Seg. 3	$1,663,200
2015	Avery Lake GM Seg. 1, Seg. 2 & Seg. 3	$3,257,280
2020	N. Cottonwood Creek GM Seg. 1, Seg. 2 & Seg. 3	$2,160,000
2027	Brushy Creek Interceptor Seg. 1, Seg. 2 & Seg. 3	$5,679,878
2030	Glenwood Gravity Main	$425,578
2030	Country Estates Gravity Main	$140,928
2030	S. Cottonwood Creek GM Seg. 1 & Seg. 2	$1,123,200
2030	Central Hutto GM Seg. 4	$15,360
	Totals - Gravity Main Projects	**$17,561,856**
2012	Force Main from Enclave LS 2 to Pflugerville	$1,734,000
2018	Shiloh Force Main	$210,000
2018	Brushy Creek Force Main to Lower Brushy Creek WWTP	$2,620,182

Totals - Force Main Projects	**$4,564,182**
Total CIP Projects	**$46,983,574**

Table 10-2 CIP List for Alternative No. 2 – Expanding Cottonwood Creek WWTP

Year	Project	Project Cost
2013	Expand Existing Plant	$11,112,000
2024	Expand Existing Plant	$8,952,000
	Totals - Treatment Plant Costs	**$20,064,000**
2013	New Enclave LS	$659,436
2016	Add third pump to New Enclave LS	$175,800
2024	Replace pump at New Enclave LS	$120,600
2030	Replace pump at New Enclave LS	$120,600
2025	Add third pump to Glenwood LS	$106,800
2015	Brushy Creek LS	$659,436
	Totals - Lift Station Projects	**$1,842,672**
2012	Interceptor from Highway 79 to Cottonwood Creek WWTP	$691,200
2013	Front Street Gravity Main	$539,400
2015	Brushy Creek Interceptor Seg. 4	$955,584
2015	Carmel Creek Interceptor Seg. 1 & Seg. 2	$1,365,120
2018	Lakeside Gravity Main	$207,360
2020	Carmel Creek Interceptor Seg. 3	$1,663,200
2020	Avery Lake GM Seg. 1, Seg. 2 & Seg. 3	$3,257,280
2020	N. Cottonwood Creek GM Seg. 1, Seg. 2 & Seg. 3	$2,160,000
2025	S. Cottonwood Creek GM Seg. 1 & Seg. 2	$1,123,200
2030	Central Hutto GM Seg. 4	$15,360
	Totals - Gravity Main Projects	**$11,977,704**
2015	Brushy Creek FM to Cottonwood Creek WWTP	$1,957,200
2016	New Enclave FM to Front Street GM	$1,605,180
	Totals - Force Main Projects	**$3,562,380**
	Total CIP Projects	**$37,446,756**

Table 10-3 CIP List for Alternative No. 3 – Construct Lower Brushy Creek WWTP

Year	Project	Project Cost
2013	Construct Lower Brushy Creek WWTP	$10,850,000
2024	Expand Lower Brushy Creek WWTP	$11,845,264
	Totals - Treatment Plant Costs	**$22,695,264**
2013	Enclave LS Pump Upgrade to Brushy Creek Force Main	$575,700
2015	Shiloh Lift Station	$659,436
	Totals - Lift Station Projects	**$1,235,136**
2012	Interceptor from Highway 79 to Cottonwood Creek WWTP	$460,800
2015	Brushy Creek Interceptor Seg. 4	$955,584
2015	Carmel Creek Interceptor Seg. 1 & Seg. 2	$1,365,120
2018	Lakeside Gravity Main	$207,360
2020	Carmel Creek Interceptor Seg. 3	$1,663,200
2015	Avery Lake GM Seg. 1, Seg. 2 & Seg. 3	$3,257,280
2020	N. Cottonwood Creek GM Seg. 1, Seg. 2 & Seg. 3	$2,160,000
2024	Brushy Creek Interceptor Seg. 1, Seg. 2 & Seg. 3	$5,679,878
2025	Glenwood Gravity Main	$425,578
2025	Country Estates Gravity Main	$140,928
2025	S. Cottonwood Creek GM Seg. 1, Seg. 2	$1,123,200
2030	Central Hutto GM Seg. 4	$15,360
	Totals - Gravity Main Projects	**$17,454,288**
2013	Brushy Creek Force Main to Lower Brushy Creek WWTP	$2,620,182
2015	Shiloh Force Main	$210,000
	Totals - Force Main Projects	**$2,830,182**
	Total CIP Projects	**$44,214,870**

10.1 Net Present Value Analysis

In addition to the capital costs shown in the tables above, a net present value analysis was performed for each alternative. The net present value analysis included the capital costs shown in the CIP Lists above as well as operational and maintenance costs for each alternative. The analysis for Alternative 1 included a $125,000 cost per year from 2014-2019 to account for the treatment of flow by Pflugerville. Operational and maintenance costs included costs for treatment and sludge handling, energy costs to power the lift stations, maintenance and cleaning costs for the lift stations, and gravity main cleaning costs. Appendix F includes the detailed net present value calculations.

Table 10-4 summarizes and compares the net present value analysis for each alternative.

Table 10-4 Net Present Value Comparison ($ Millions)

Alternative	Capital Costs			Operational & Maintenance Costs				Total Capital & O&M Costs	**Net Present Value**
	Treatment	Pumps	Pipes	Treatment	LS Energy	LS Maint.	Gravity Lines		
Flow to Pflugerville	$23.67	$1.94	$22.12	$62.67	$0.32	$1.79	$1.76	$114.27	**$66.66**
Expand CCWWTP	$20.06	$1.84	$15.54	$55.94	$0.88	$2.48	$1.51	$98.25	**$57.66**
Construct LBCWWTP	$22.70	$0.66	$20.28	$52.79	$0.25	$1.61	$1.86	$100.15	**$59.75**

10.2 Annual Costs

The annual costs from 2012 to 2040 for each alternative were also calculated for comparison purposes. The annual cost calculation considered the debt service on the capital projects. Non-capital costs considered were engineering costs, legal fees, permitting costs, engineering and legal contingency costs, easement costs, surveying and legal costs, and environmental costs. An interest rate of 5% was assumed with a debt term of 30 years for treatment plant projects and 20 years for lift station and pipeline projects.

Figure 10-1 compares the annual costs from 2013 to 2022 for the expansion of Cottonwood Creek WWTP versus construction of Lower Brushy Creek WWTP. The annual costs for Alternative 1 were not included in the figure because the net present value of that option was 16% greater than the lowest net present value of Alternative 2. It should be noted that the differences in annual costs for Alternative 2 and 3 are relatively minor throughout the time period from 2013 to 2022. From 2013 to 2019 the costs for constructing the Lower Brushy Creek WWTP are somewhat higher, however after 2019, the costs for the expansion of Cottonwood Creek WWTP are higher. The analysis does not indicate a clear advantage between Alternative 2 or 3. Appendix G includes the detailed annual cost calculations.

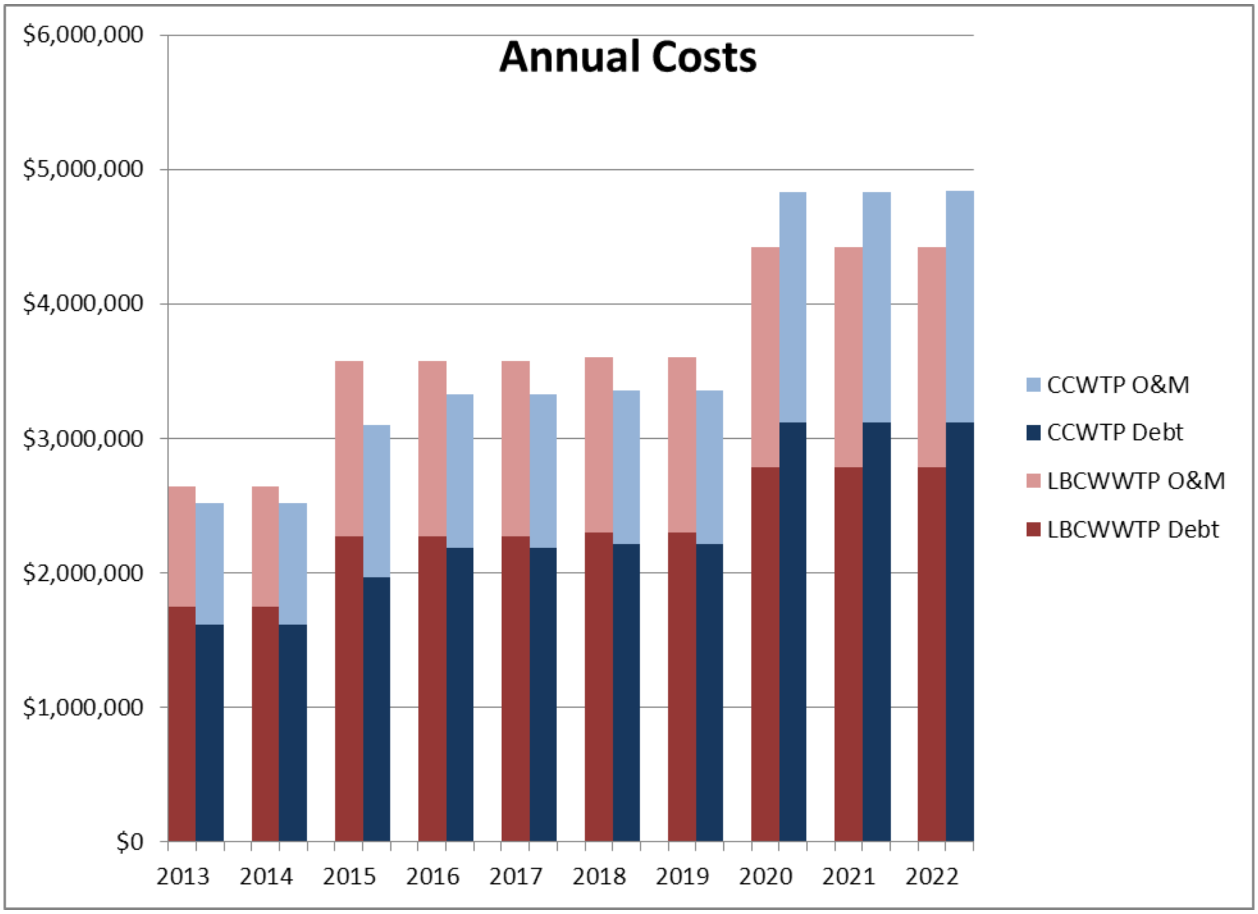

Figure 10-1 Annual Costs for Expansion of Cottonwood Creek WWTP and Construction of Lower Brushy Creek WWTP

11 Recommendations

This study explored three possibilities for collecting and treating the wastewater flow projected to be generated in the study area between 2012 and 2040. Each alternative has advantages and disadvantages.

Although sending an additional 0.5 mgd of wastewater flow from the Enclave Lift Station to Pflugerville for treatment does delay construction of the Lower Brushy Creek WWTP, expansions are required at the existing Cottonwood Creek WWTP. The lift station and force main that would be built to convey the flow to Pflugerville would only be in service for a relatively short time. In addition, Pflugerville officials have indicated that their system may not have the capacity for the additional flow from Hutto.

Expanding the existing Cottonwood Creek WWTP to 5.5 mgd would allow all of the flow in the study area to be treated at that site in 2040. This would delay any construction at the Lower Brushy Creek WWTP until beyond the 2040 study period. However, 70% of the flow projected for 2040 must be pumped to the Cottonwood Creek site incurring a greater possibility of overflows as well as lift station energy and maintenance costs. There is insufficient space at the Cottonwood Creek WWTP site to expand the plant beyond 5.5 mgd and there is insufficient room for sludge dewatering facilities for the full 5.5 mgd facilities.

Constructing the Lower Brushy Creek WWTP will allow the existing Cottonwood Creek WWTP to treat only the flow that naturally drains to the site with the addition of the flow from the Creekside lift station in 2040. No expansions would be required at the Cottonwood Creek plant and all of the wastewater to the Lower Brushy Creek WWTP would be conveyed to that site via gravity flow. The size of the proposed Lower Brushy Creek WWTP is large enough to allow for a 12 mgd plant in the future with sludge handling capabilities. Although, this option includes constructing a force main from the Enclave lift station to the Lower Brushy Creek site that would be used temporarily before the Brushy Creek Interceptor is built, this force main may be repurposed to carry reclaimed effluent in the future. This will be further discussed in ***Section 12***.

Constructing the Lower Brushy Creek WWTP is the recommended alternative. The net present value of this option is only 3.5% greater than the lowest net present value calculated (which is well within the margin of error for this type of comparison). Only 2% of the projected 2040 flow would be conveyed to the treatment facilities via lift stations and force mains, which provides for a significantly lower possibility of overflows in the wastewater system. The location of the Lower Brushy Creek WWTP allows for more options in terms of regionalization than the Cottonwood Creek plant site.

Table 11-1 below lists the projects through 2040 necessary for implementation of the Lower Brushy Creek WWTP option, the estimated construction cost in 2012 dollars, and the year construction is projected to commence. **Figures 11-1** and **11-2** show the improvements in two periods, 2012-2020 and 2020-2040, respectively.

Table 11-1 CIP List for Construction of Lower Brushy Creek WWTP

Year	Project	Project Cost
2013	Construct Lower Brushy Creek WWTP	$10,850,000
2024	Expand Lower Brushy Creek WWTP	$11,845,264
	Totals - Treatment Plant Costs	**$22,695,264**
2013	Enclave LS Pump Upgrade to Brushy Creek Force Main	$575,700
2015	Shiloh Lift Station	$659,436
	Totals - Lift Station Projects	**$1,235,136**
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2015	Avery Lake GM Seg. 1, Seg. 2 & Seg. 3	$3,257,280
2020	N. Cottonwood Creek GM Seg. 1, Seg. 2 & Seg. 3	$2,160,000
2024	Brushy Creek Interceptor Seg. 1, Seg. 2 & Seg. 3	$5,679,878
2025	Glenwood Gravity Main	$425,578
2025	Country Estates Gravity Main	$140,928
2025	S. Cottonwood Creek GM Seg. 1, Seg. 2	$1,123,200
2030	Central Hutto GM Seg. 4	$15,360
	Totals - Gravity Main Projects	**$17,454,288**
2013	Brushy Creek Force Main to Lower Brushy Creek WWTP	$2,620,182
2015	Shiloh Force Main	$210,000
	Totals - Force Main Projects	**$2,830,182**
	Total CIP Projects	**$44,214,870**

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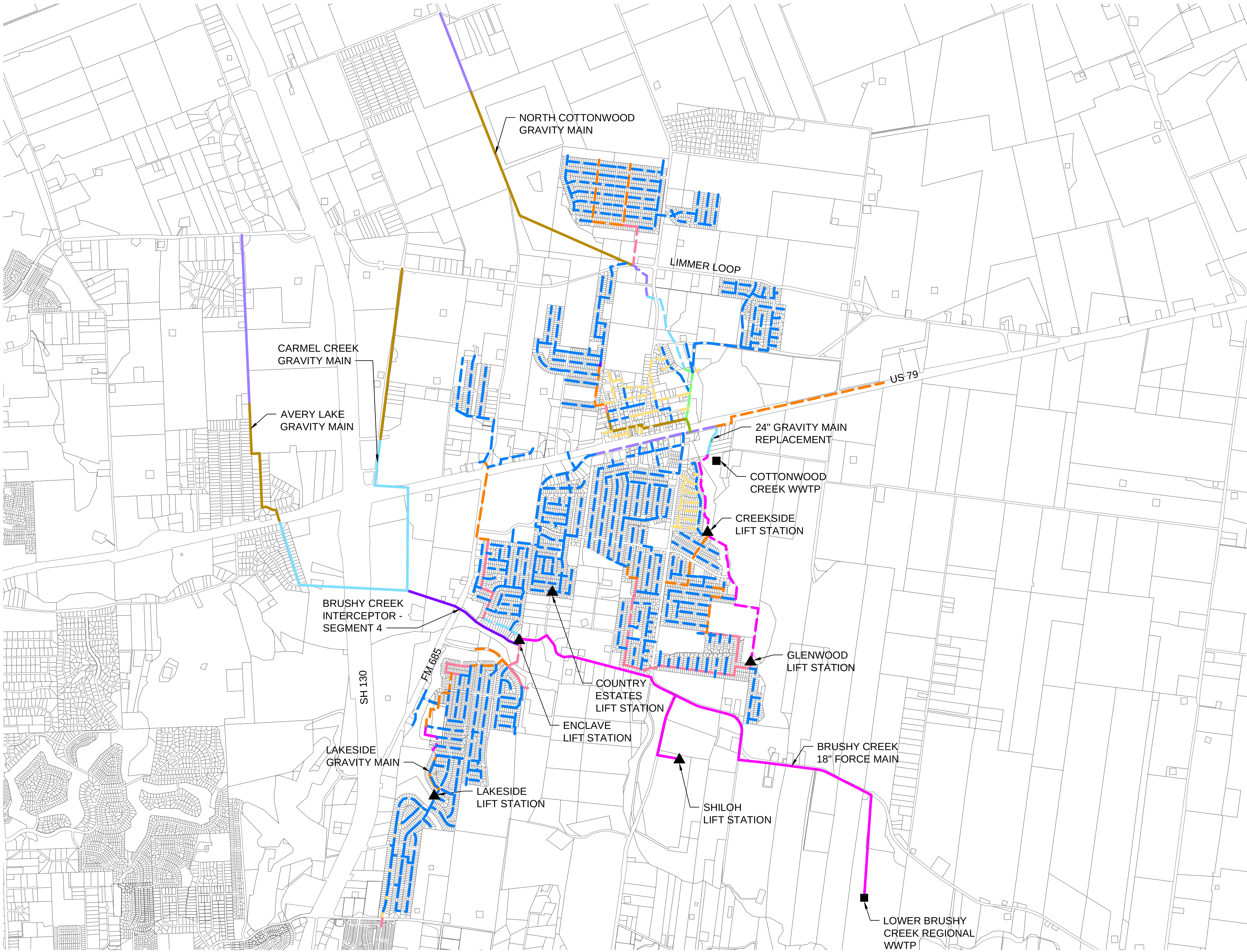
File: X:\Projects\0204 – Hutto Master Plan\DWG\Exhibits\0204_WW-Mains_2012-20_Figure 11-1.dwg Layout: Small Plotted: 8/15/2012 10:45:23 AM Plotted by: Robert Kaylor Saved by: RKaylor

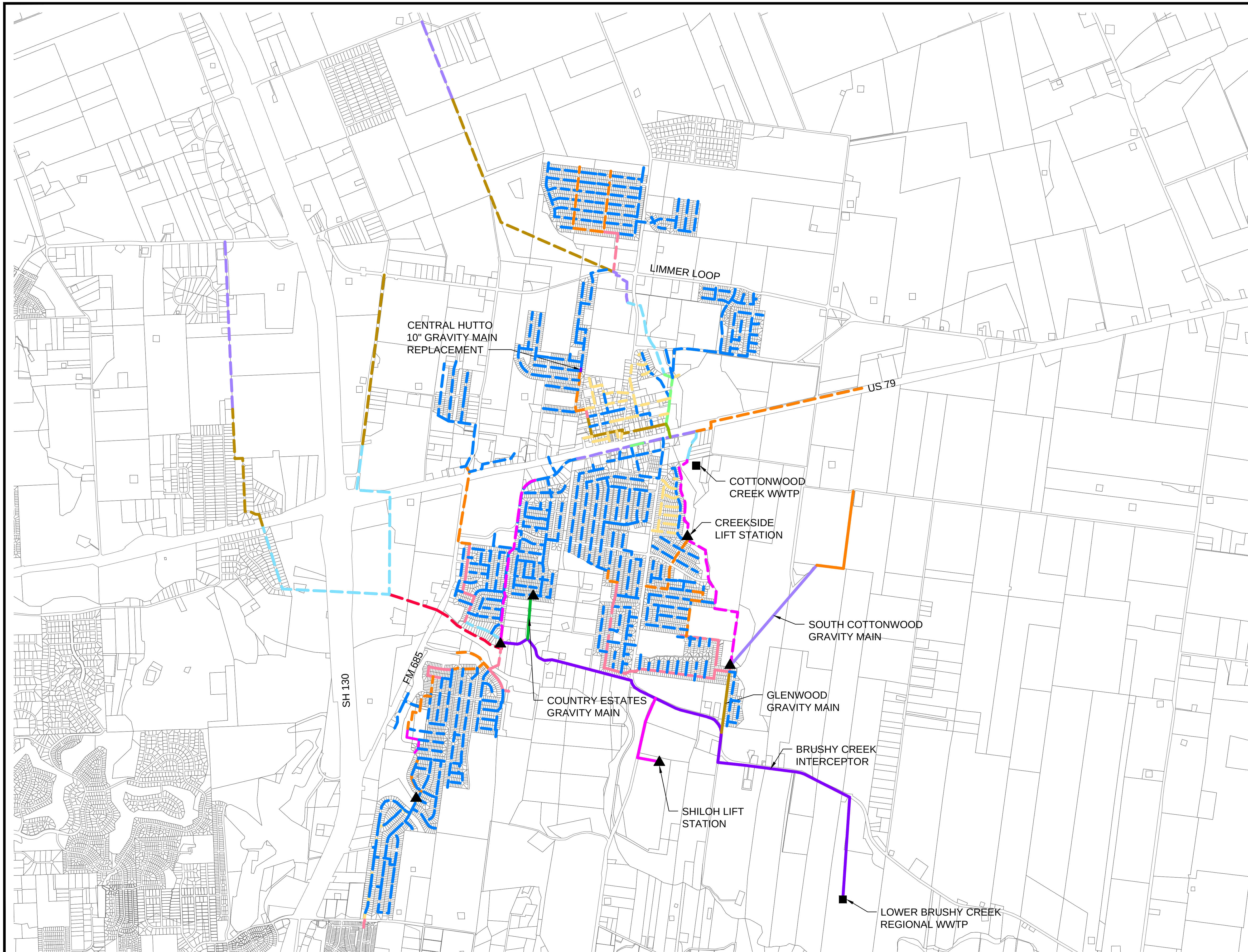


CITY OF HUTTO

CONVEYANCE IMPROVEMENTS IF LOWER BRUSHY CREEK WWTP IS BUILT 2012-2020

FIGURE 11-1

K FRIESE & ASSOCIATES, INC. (FIRM # 6535)
1120 S. CAPITAL OF TEXAS HIGHWAY
THE SETTING II, SUITE 100
AUSTIN, TEXAS 78746
PH: 512-338-1704 FAX: 512-338-1784



LEGEND

- 6" WWL
- 8" WWL
- 10" WWL
- 12" WWL
- 15" WWL
- 18" WWL
- 21" WWL
- 24" WWL
- 27" WWL
- 33" WWL
- 42" WWL
- FORCE MAIN
- EXISTING LINES
- FUTURE LINES
- WWTP
- LIFT STATION

CITY OF HUTTO

CONVEYANCE IMPROVEMENTS NECESSARY IF LOWER BRUSHY CREEK WWTP IS BUILT 2020-2040

FIGURE11-2

K✦FRIESE & ASSOCIATES, INC.
(FIRM # 6535)
1120 S. CAPITAL OF TEXAS HIGHWAY
THE SETTING II, SUITE 100
AUSTIN, TEXAS 78746
PH: 512-338-1704 FAX: 512-338-1784

12 Reclaimed Effluent Feasibility

The study includes identifying reuse opportunities in the study area. Although the participants did not provide an inventory of sites that may be eligible for accepting treated effluent for irrigation purposes at this time, in the future it may be feasible to use treated effluent to irrigate recreational fields and landscaping at schools or public parks in the study area.

Alternatives No. 1 and 3 discussed in ***Section 9*** include the Brushy Creek Force Main from the Enclave Lift Station site to the proposed Lower Brushy Creek WWTP site. This force main is temporary and will be abandoned after the Brushy Creek Interceptor is built. When the use of treated effluent for irrigation becomes feasible, this pipe could be used as part of the effluent distribution system to carry the treated effluent from the WWTP toward Hutto High School and the East Williamson County Higher Education Center. If tertiary treatment were added to the Cottonwood Creek WWTP, a similar strategy could be employed. Since flow will be conveyed to the Lower Brushy Creek WWTP via gravity piping, force mains from the three abandoned lift stations that formerly pumped flow to Cottonwood Creek WWTP could be used to distribute reclaimed effluent to demand locations.

Table 12-1 below lists locations that may be good candidates for reclaimed effluent use in the future. These are all existing schools or parks that are developed, but none of them are currently using effluent as irrigation water. In order to use treated effluent infrastructure to convey the effluent from the treatment plant location to each site would need to be built. The table also includes the amount of effluent that could possibly be utilized at each site.

Table 12-1 Reclaimed Effluent Sites

Possible Effluent Reuse Sites	Amount of Effluent (MGD)
Fritz Park	0.10
Hutto Elementary School	0.01
Cottonwood Creek ElementarySchool and Hutto Middle School	0.11
Hutto High School	0.14
Nadine Johnson Elementary School	0.01
Hutto Lake Park	0.08
Farley Middle School	0.09
Ray Elementary School	0.03
Creekside Park	0.07
Country Estates Park	0.004

13 Funding Options

Funding sources for the improvements recommended in this study are dependent on the selected alternative and the financial viability of each political entity within the study area. This section presents information on possible funding options.

13.1 TWDB Financial Assistance Programs

TWDB has several programs that offer loans at interest rates lower than the market offers to finance projects for public water and wastewater systems that facilitate compliance with state and federal regulations. The following section describes financial assistance programs that are supported through the TWDB. The availability of funds in each program may vary depending on the program cycle and appropriations. Contact the TWDB for fund availability. A water conservation and drought contingency plan is required when financial assistance greater than $500,000 is received.

13.1.1 *Texas Water Development Fund*

The Texas Water Development Fund is a streamlined state loan program that does not receive federal subsidies. It provides financing for wastewater collection and treatment projects, water supply, distribution and treatment projects, flood control projects, and the purchase of water rights. This fund enables the TWDB to fund multiple eligible components in one loan as authorized under Texas Water Code § 17, Subchapter L. Once a complete application is received, it is typically presented to TWDB's Board members for consideration within 60 to 90 days.

13.1.2 *Clean Water State Revolving Fund*

Loans from the Clean Water State Revolving Fund (CWSRF) can be used for planning, designing, and constructing wastewater treatment facilities, wastewater recycling and reuse facilities, collection systems, stormwater pollution control, nonpoint source pollution control, and estuary management. All projects financed by a Clean Water State Revolving Fund loan must have a National Environmental Policy Act-type environmental review performed as required by the Clean Water Act. TWDB staff members are available to assist applicants in determining the scope of investigation required, preparing reports, and coordinating with pertinent federal and state environmental regulatory agencies. All applicants are required to schedule a pre-application conference that will guide them through the application process. The CWSRF program functions on an annual cycle. Project information must be submitted so that the project can be ranked with all other projects seeking funding from this program.

13.1.3 *State Participation Program*

The State Participation Program enables the TWDB to assume a temporary ownership interest in a regional project when the local sponsors are unable to assume debt for the optimally sized facility. The program is authorized under Texas Water Code § 16, Subchapters E and F, and governed by TWDB rules in Texas Administrative Code Title 31 § 363, Subchapters A and J. The TWDB may acquire ownership interest in the water rights or a co-ownership interest of the property and treatment works. The loan repayments that would have been required had the assistance been from a conventional loan are deferred. Ultimately, the cost of the funding repaid to the TWDB is based upon purchase payments, which allow the TWDB to recover its principal and interest costs and issuance expenses.

The program is intended to allow for optimization of regional projects through limited State participation where the benefits can be documented, and where such development is unaffordable without State participation. The goal is to allow for the "right sizing" of projects in consideration of future growth. On new water supply and state water plan projects the TWDB can fund as much as 80 percent of costs, provided that the applicant finances at least 20 percent of the total project cost from sources other than the State Participation account and that at least 20 percent of the total capacity of the proposed project serves existing needs. On other State Participation projects, the TWDB can fund as much as 50 percent of costs, provided that the applicant finances at least 50 percent of the total project cost from sources other than the State Participation account and that at least 50 percent of the total capacity of the proposed project serves existing needs. State participation is limited to the excess capacity in the project up to the percentages identified above.

All applicants are encouraged to schedule a pre-application conference that will guide them through the State Participation Program application process. The applicant must submit an engineering feasibility report and environmental information, as well as general, fiscal, and legal information to the TWDB's Project Finance office. As the earlier projects repurchase the TWDB's interest, additional funds become available for future projects. (Texas Water Development Board, SPP, April 2011)

13.1.4 *Research and Planning Fund Grants*

Through its Research and Planning Fund, the TWDB provides financial assistance to individuals and political subdivisions to do research and feasibility studies in practical solutions to water-related problems. Collectively, the TWDB has awarded more than $60 million in research and planning grants. Three categories are eligible for funding through the Research and Planning Fund: Regional Water Supply and Wastewater Facilities Planning, Water Research, and Flood Protection Planning (not discussed here). This study was funded by a Regional Wastewater Planning Study grant.

Regional Water Supply and Wastewater Facilities Planning grants are awarded to political subdivisions, including cities, counties, special districts, and nonprofit water supply corporations, to prepare plans to develop regional water supply facilities and wastewater facilities. A regional facility is a system that incorporates two or more service areas or serves an area involving two or more political subdivisions.

Water Research Grants are awarded for research dedicated to significantly enhancing the proper planning, management, conservation, development, or protection of Texas' water resources.

Grants have been awarded to investigate a plumbing retrofit program, the reuse of surface water to increase the dependable water supply of a reservoir, watershed yield augmentation, groundwater protection and recharge, and nonpoint source pollution control.

Grants for regional and flood protection planning are limited to 50 percent of the total cost of the project; however, the TWDB may provide as much as 75 percent of the total cost to political subdivisions that have unemployment rates exceeding the state average by 50 percent or more and have per capita income that is 65 percent or less of the state average. For water research projects, the TWDB may award grants for as much as 100 percent of the cost. (Texas Water Development Board, October 2010)

13.1.5 *State Water Plan Funding*

State Water Plan Funding was established in response to the 2007 State Water Plan estimate that regional and local water supply entities will need to spend $30.7 billion between 2007 and 2060 to meet the state's additional water supply needs. The Texas Legislature's 2007 and 2009 appropriations enabled issuance of over $1.2 billion in bonds for State Water Plan projects. These projects must be recommended water management strategies in the most recent TWDB approved regional water plan and approved State Water Plan. Each of the various sources of water plan funding—the Water Infrastructure Fund, the Water Infrastructure Fund-Deferred, the Water Infrastructure Fund-Rural, the State Participation Program, and the Economically Distressed Areas Program—offer below-market financing options, depending on the type of project or applicant.

The Water Infrastructure Fund offers loans for up to 20 years at 2 percent below the TWDB's cost of funds for the planning, design, and construction of State Water Plan projects. The Water Infrastructure Fund-Deferred allows an applicant to defer payments for up to 10 years for projects with significant planning, design, and permitting requirements. The Water Infrastructure Fund-Rural offers up to 50 percent grant funding and 0 percent interest loans to finance State Water Plan projects in rural areas. The Economically Distressed Areas Program also offers grants for water plan projects.

Applicants are required to schedule a pre-application conference to discuss the project's eligibility. An application consists of general, fiscal, legal, engineering, and environmental information. Abridged applications are due on February 1 and August 1 of each year. The TWDB will prioritize projects if there is more than one project competing for the funds. Applications are prioritized in March and September of each year. The prioritization criteria are in TWDB Rules at the Texas Administrative Code Title 31 §§ 363.1208, 363.1007. The TWDB meets to consider applications for financial assistance. If the application is approved, the TWDB will extend a one-year commitment. (Texas Water development Board, SWPF, April 2011)

13.2 Other Funding Options

In addition to Federal and State water and wastewater programs, funding sources may also originate from revenue bonds and developer participation towards the regional infrastructure of the system. An overview of these financing mechanisms is presented below.

13.2.1 *Revenue Bonds*

A municipal utility may pledge future earnings to fund improvements to their wastewater system through the issuance of revenue bonds. A revenue bond is a special type of municipal bond, and the income generated by the improvement or expansion of the wastewater project would be used for repayment. Unlike general obligation bonds, only the revenues specified in the legal contract between the bond holder and bond issuer are required to be used for repayment of the principal and interest of the revenue bonds. Since the pledge of security is not as great as that of general obligation bond, revenue bonds may carry a slightly higher interest rate than general obligation bonds.

13.2.2 *Developer Participation*

Developer participation typically occurs through two means: upfront capital contributions or payment of impact fees for a water or wastewater infrastructure project. Under a regional system where several political subdivisions are participating, a single independent organization or entity is recommended to manage and/or operate the regional system, such as a river authority or regional utility authority. River authorities, a regional utility authority, or other similar entities may require a developer to completely finance the entire cost of an infrastructure project and then turn it over to the utility to own and operate on their behalf. A utility may also require a developer to pledge capital toward an infrastructure project through an upfront cash payment or letter of credit for the utility to draw on if needed to reduce the level of risk on the project.

The utility may also require that developers contribute toward the cost of new water/wastewater infrastructure through the payment of impact fees. The intent of this funding source is that the cost of new infrastructure serving new utility customers will not be subsidized by the existing utility rate payers. In essence, growth pays for growth.

13.3 Other Resources

For more information on financial programs, contact the TWDB at (512) 463-7847. Additional information on financial programs is available on the TWDB Web site at www.twdb.state.tx.us/financial/programs.

Financial assistance programs from other agencies is also available on the TWDB Web site at www.twdb.state.tx.us/assistance/financial/in_infrastructure/fin_links/infrastructure_links.asp.

Information on other federal funding opportunities can be found at www.grants.gov.

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Appendix A Methodology for Determination of Population Projections

Population Inside Hutto City Limits (Region 1)

A combination of the data sources was used to develop the population projections for Region 1. To determine the estimated population of the City, the process outlined below was utilized.

Step 1) *Sewershed composition:* In order to utilize the CAMPO database, each sewershed located within the CIP Study Area was reviewed to determine the portion of each TAZ located within the sewershed boundary.

Step 2) *Calculate average household size:* The typical household size for the CAMPO TAZ located within the sewersheds boundaries were averaged for a sewershed household size.

Step 3) *Determine the maximum sewershed population:* The City analyzed each sewershed and provided the maximum connections expected. Multiplying the sewershed average household size by the maximum expected connections yields the maximum population anticipated within the sewershed.

Step 4) *Determine the number of existing households:* From aerial imagery, the number of houses located within each sewershed were counted.

Step 5) *Compute 2010 total population:* The number of houses per sewershed was multiplied by the sewershed average household size *(Step 2)* to calculate the 2010 population per sewershed. The total population within the City Limits is the sum of the sewershed populations.

Step 6) *Adjust computed 2010 population:* Using the 2010 Census population as the target, the computed 2010 total population was adjusted. This adjustment was made by distributing the difference between the computed population and the census population to the sewersheds based on the amount of the sewershed area located within the City Limits.

Step 7) *Project future population:* The adjusted 2010 populations for the sewersheds were increased at the TWDB growth rates for the study years.

Step 8) *Correct for maximum development:* If the projected sewershed population exceeded the maximum determined by the City *(Step 3)*, then the maximum population was used for that year and all subsequent years.

CIP Study Area Population (Region 2)

To analyze Region 2, the sewersheds delineated in the 2008 CIP Plan were utilized in the following process.

Step 9) *Determine the number of households per TAZ:* Using the CAMPO database, the number of households for the CAMPO study years were tabulated for each TAZ identified in *Step 1*. The number of households for 2020 and 2030 per TAZ were interpolated from the given CAMPO data while the expected number of households for 2040 was extrapolated.

Step 10) *Determine the TAZ growth rates:* The growth rate for each study year, starting with 2015, was then calculated by dividing the increase in the number of households by the total number from the previous year.

Step 11) *Determine sewershed growth rates:* The growth rates for the TAZs located within a sewershed were averaged to calculate the sewershed growth rate.

Step 12) *Develop sewershed divisions:* For each sewershed, the area of each TAZ located in Region 2 was measured. The percentage of the TAZ located in this region was then calculated.

Step 13) *Compute 2010 population for sewersheds located in Region 2:* The percentage of the TAZ in the sewershed was multiplied by the 2010 population of the unmodified TAZ to determine the portion of the TAZ population located within the study area. The TAZ populations were added to determine sewershed populations.

Step 14) *Compute 2010 population for Region 2:* The sewershed populations located in Region 2 were added to determine the population for the study area excluding the City Limits.

Step 15) *Project future populations:* The 2010 populations for the sewersheds were increased at the computed sewershed growth rates *(Step 11)* for the study years.

Step 16) *Correct for maximum development:* If the projected sewershed population exceeded the maximum expected determined by the City *(Step 3)*, then the maximum population was used for that year and all subsequent years.

Remaining Master Plan Study Area Population (Region 3)

To analyze Region 3, the delineated sewersheds were utilized in the following process.

Step 17) *Sewershed composition:* In order to utilize the CAMPO database, each sewershed was reviewed to determine the portion of each TAZ located within the sewershed boundary.

Step 18) *Determine the number of households per TAZ:* Using the CAMPO database, the number of households for the CAMPO study years were tabulated for each TAZ identified in *Step 17*. The number of households for 2020 and 2030 per TAZ were interpolated from the given CAMPO data while the expected number of households for 2040 was extrapolated.

Step 19) *Determine the TAZ growth rates:* The growth rate for each study year, starting with 2015, was then calculated by dividing the increase in the number of households by the total number from the previous year.

Step 20) *Determine sewershed growth rates:* The growth rates for the TAZs located within a sewershed were averaged to calculate the sewershed growth rate.

Step 21) *Develop sewershed divisions:* For each sewershed, the area of each TAZ located in Region 3 was measured. The percentage of the TAZ located in this region was then calculated.

Step 22) *Compute 2010 population for sewersheds located in Region 3:* The percentage of the TAZ in the sewershed was multiplied by the 2010 population of the unmodified TAZ to determine the portion of the TAZ population located within the study area. The TAZ populations were added to determine sewershed populations.

Step 23) *Compute 2010 population for Region 3:* The sewershed populations located in

Region 3 were added to determine the population for the study area excluding the CIP Study Area and City Limits.

Step 24) *Project future population:* The 2010 population for the sewersheds were increased at the computed sewershed growth rates *(Step 20)* for the study years.

Appendix B Pump Testing Results

PUMP TESTING RESULTS (GPM)							
Pump Test	Influent before pump start	Drawdown after pump start at ON	Capacity at pump-ON	Drawdown before pump stop	Influent after pump stop	Capacity at pump-OFF	**Average Pumping Rate**
LS001-P#1-A	114	-628	741	-602	110	713	**727**
LS001-P#1-B	218	-517	735	-477	238	715	**725**
LS001-P#1-C	72	-672	744	-647	72	719	**731**
LS001-P#2-A	129	-696	825	-645	131	776	**800**
LS001-P#2-B	206	-613	819	-597	191	787	**803**
LS001-P#2-C	60	-750	810	-728	60	788	**799**
LS002-P#1-A	165	-964	1129	-962	180	1141	**1135**
LS002-P#1-B	177	-948	1124	-938	197	1135	**1130**
LS002-P#2-A	182	-996	1178	-998	204	1201	**1190**
LS002-P#2-B	150	-1047	1197	-1037	171	1208	**1202**
LS003-P#1-A	77	-459	535	-461	75	535	**535**
LS003-P#1-B	23	-515	538	-512	23	535	**537**
LS003-P#1-C	73	-467	540	-458	71	529	**534**
LS003-P#2-A	58	-403	461	-392	64	456	**459**
LS003-P#2-B	69	-386	455	-382	66	448	**451**
LS003-P#2-C	27	-428	455	-425	25	450	**453**
LS003-P#2-D	104	-368	471	-359	102	460	**466**
LS004-P#1-A	73	-496	568	-501	77	578	**573**
LS004-P#1-B	112	-458	570	-472	112	584	**577**
LS004-P#1-C	37	-537	574	-547	29	576	**575**
LS004-P#2-A	69	-510	579	-510	72	582	**580**
LS004-P#2-B	112	-460	572	-477	110	586	**579**
LS004-P#2-C	35	-543	578	-549	31	580	**579**
LS005-P#1-A	47	-418	465	-419	44	463	**464**
LS005-P#1-B	64	-404	468	-398	70	469	**468**
LS005-P#1-C	16	-452	468	-449	16	465	**466**
LS005-P#2-A	49	-430	480	-429	52	480	**480**
LS005-P#2-B	68	-412	480	-410	56	466	**473**
LS005-P#2-C	19	-458	477	-457	16	472	**475**

Appendix C Wet Well Level Charts

Lift Station 1
Enclave

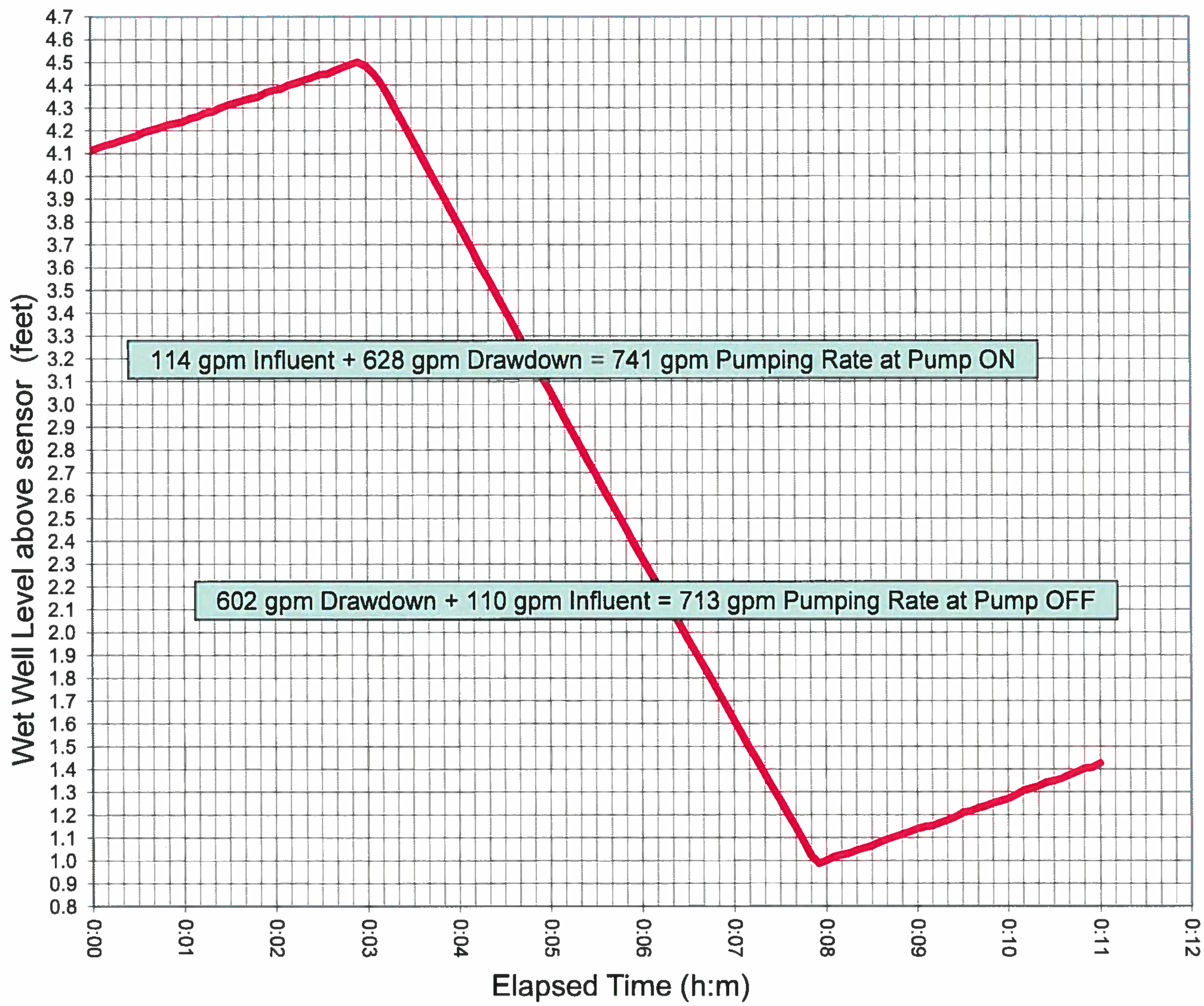
LS001
Pump- P#1

File: LS001-P#1-A

Wet Well Size = 12 ft dia
Operating Range = 3.51 ft
Operating Volume = 2970 gal

Avg. Pumping Rate = 727 gpm
(Rated Capacity = 337 gpm)

Time Between Starts at pump test average influent rate = 32 min.
Minimum Time Between Starts = 16.3 min. (at 364 gpm influent)



Test (#7) date & time: 6/21/11 9:24 AM

Notes:

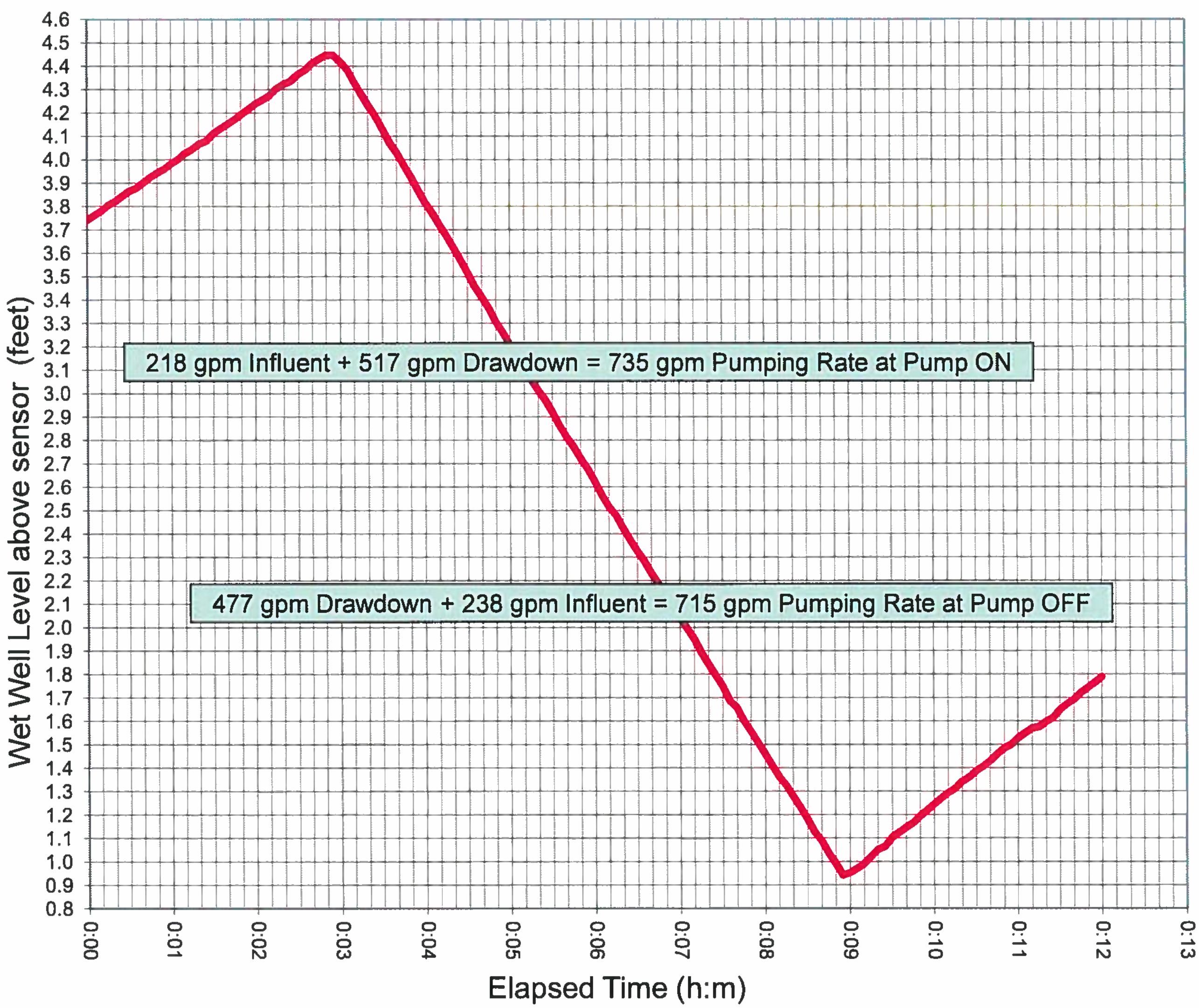
Lift Station 1
Enclave

LS001
Pump- P#1

File: LS001-P#1-B

Wet Well Size = 12 ft dia
Operating Range = 3.51 ft
Operating Volume = 2970 gal
Time Between Starts at pump test average influent rate = 19 min.
Minimum Time Between Starts = 16.4 min. (at 363 gpm influent)

Avg. Pumping Rate = 725 gpm
(Rated Capacity = 337 gpm)



Test (#9) date & time: 6/21/11 9:21 PM

Notes: High influent rate

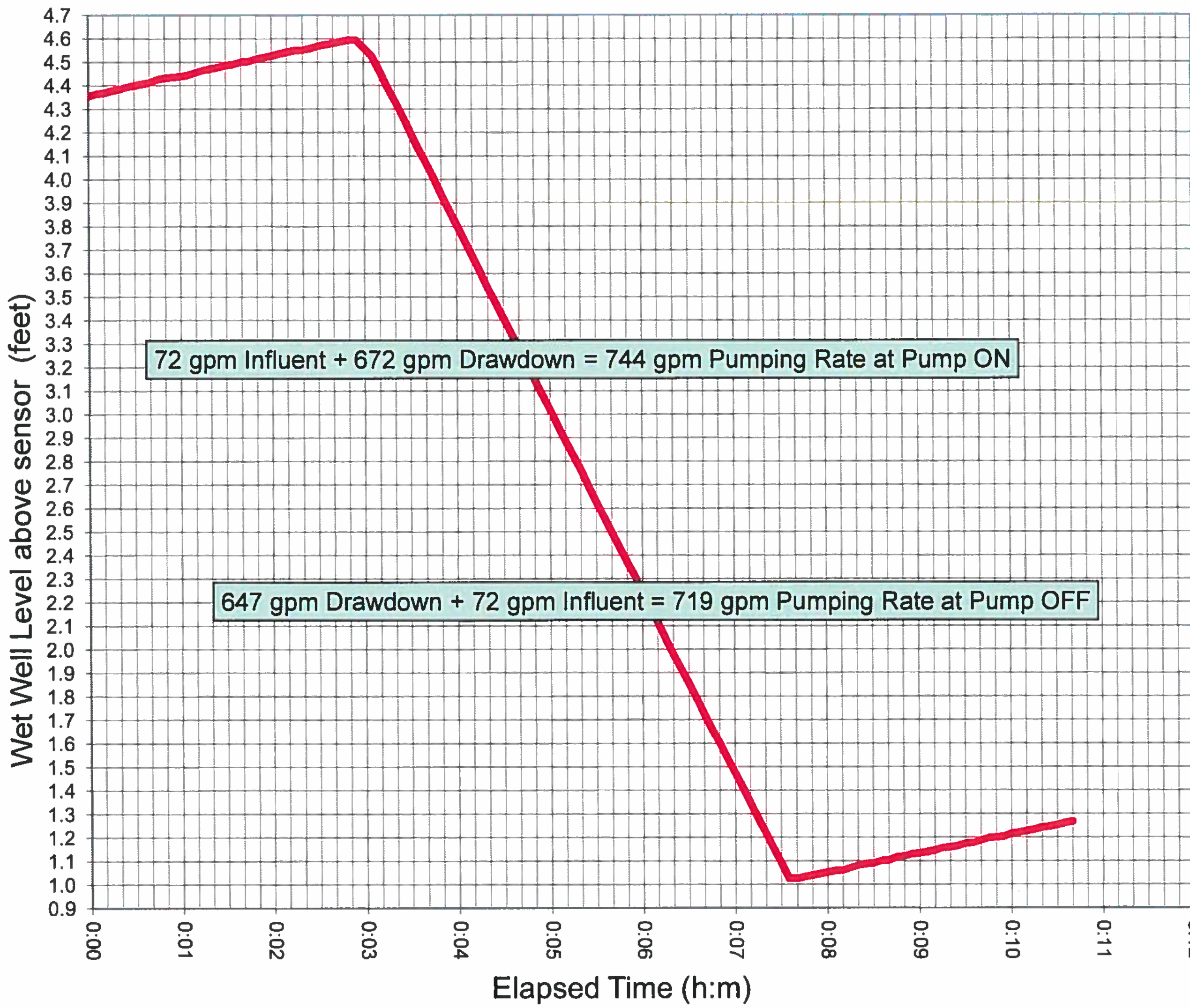
Lift Station 1
Enclave

LS001
Pump- P#1

File: LS001-P#1-C

Wet Well Size = 12 ft dia
Operating Range = 3.57 ft
Operating Volume = 3021 gal
Time Between Starts at pump test average influent rate = 47 min.
Minimum Time Between Starts = 16.5 min. (at 366 gpm influent)

Avg. Pumping Rate = 731 gpm
(Rated Capacity = 337 gpm)



Test (#12) date & time: 6/22/11 5:16 AM

Notes: Low influent rate

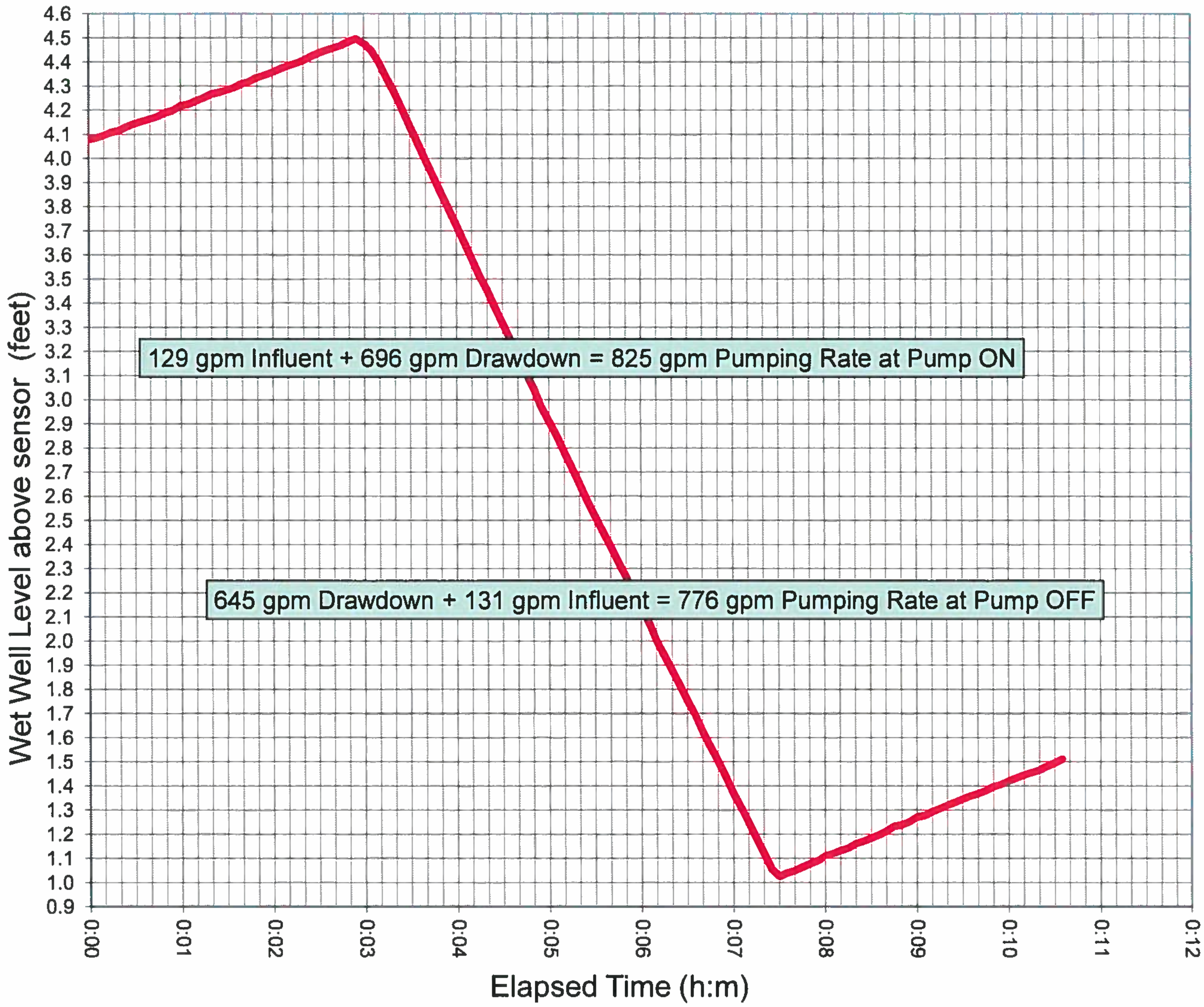
Lift Station 1 Enclave

LS001
Pump- P#2

File: LS001-P#2-A

Wet Well Size = 12 ft dia
Operating Range = 3.47 ft
Operating Volume = 2936 gal
Time Between Starts at pump test average influent rate = 27 min.
Minimum Time Between Starts = 14.7 min. (at 400 gpm influent)

Avg. Pumping Rate = 800 gpm
(Rated Capacity = 337 gpm)



Test (#8) date & time: 6/21/11 9:52 AM

Notes:

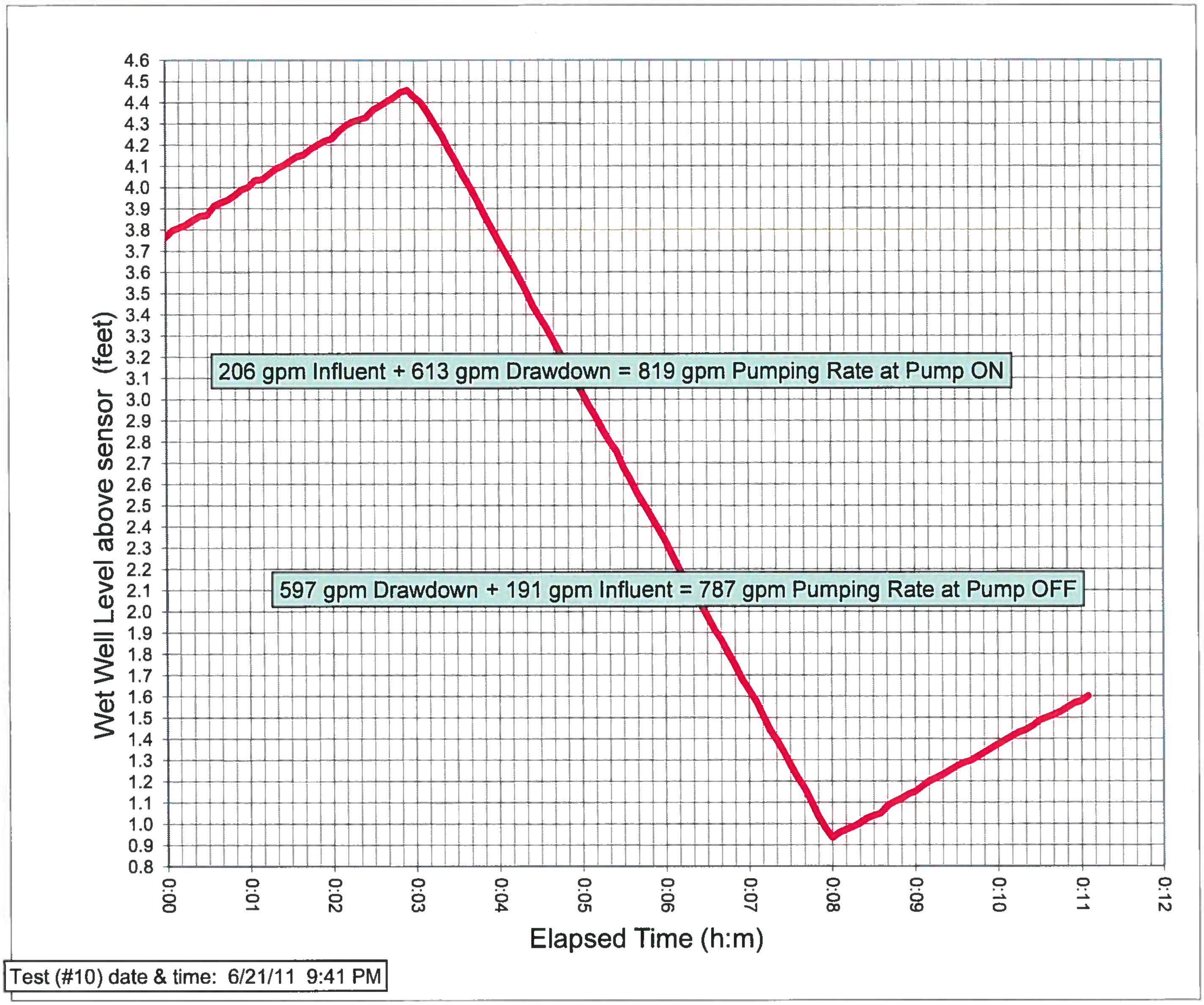
Lift Station 1
Enclave

LS001
Pump- P#2

File: LS001-P#2-B

Wet Well Size = 12 ft dia
Operating Range = 3.52 ft
Operating Volume = 2978 gal
Time Between Starts at pump test average influent rate = 20 min.
Minimum Time Between Starts = 14.8 min. (at 402 gpm influent)

Avg. Pumping Rate = 803 gpm
(Rated Capacity = 337 gpm)



Notes: High influent rate

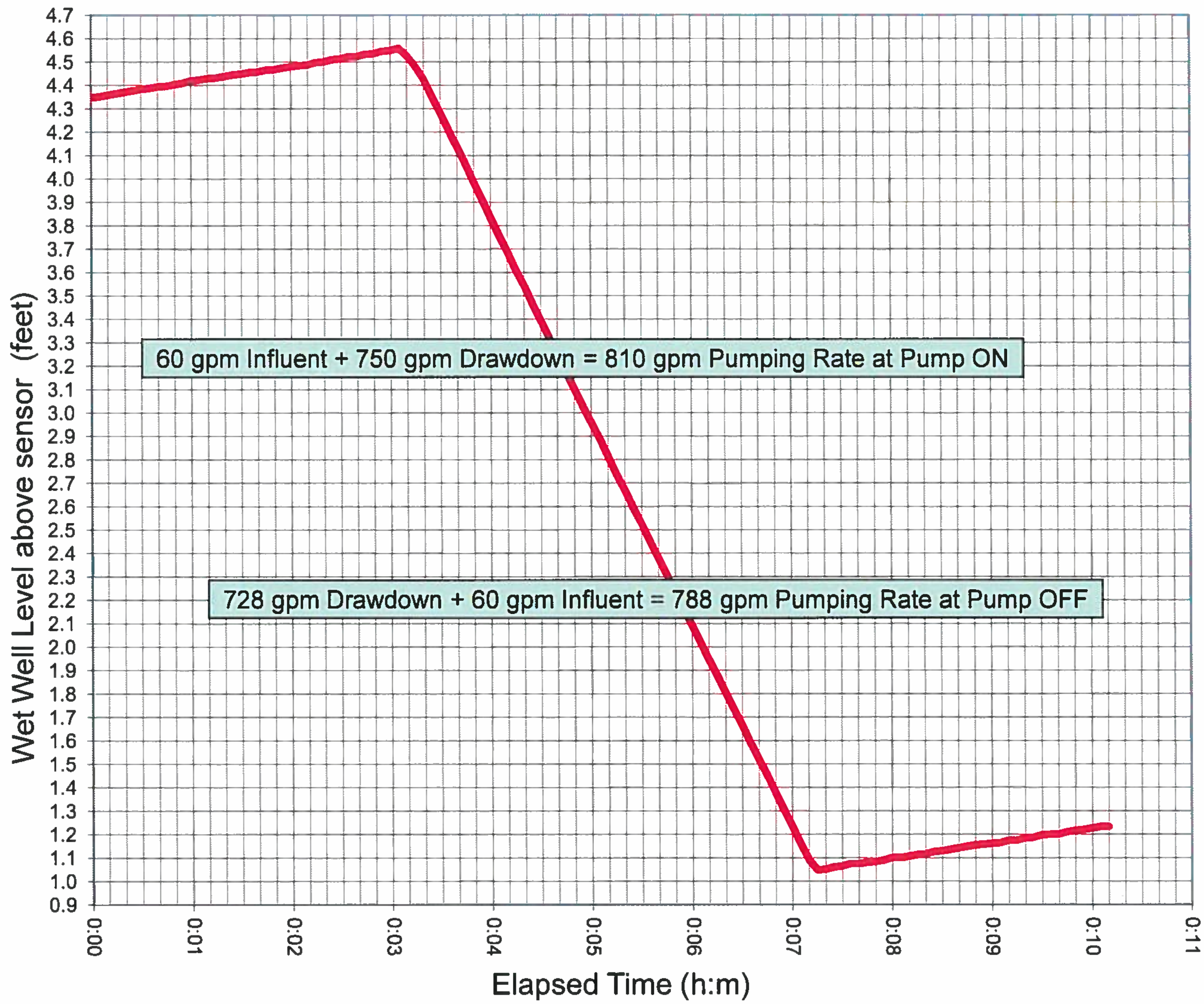
Lift Station 1
Enclave

LS001
Pump- P#2

File: LS001-P#2-C

Wet Well Size = 12 ft dia
Operating Range = 3.51 ft
Operating Volume = 2970 gal
Time Between Starts at pump test average influent rate = 54 min.
Minimum Time Between Starts = 14.9 min. (at 400 gpm influent)

Avg. Pumping Rate = 799 gpm
(Rated Capacity = 337 gpm)



Test (#11) date & time: 6/22/11 4:24 AM

Notes: Low influent rate

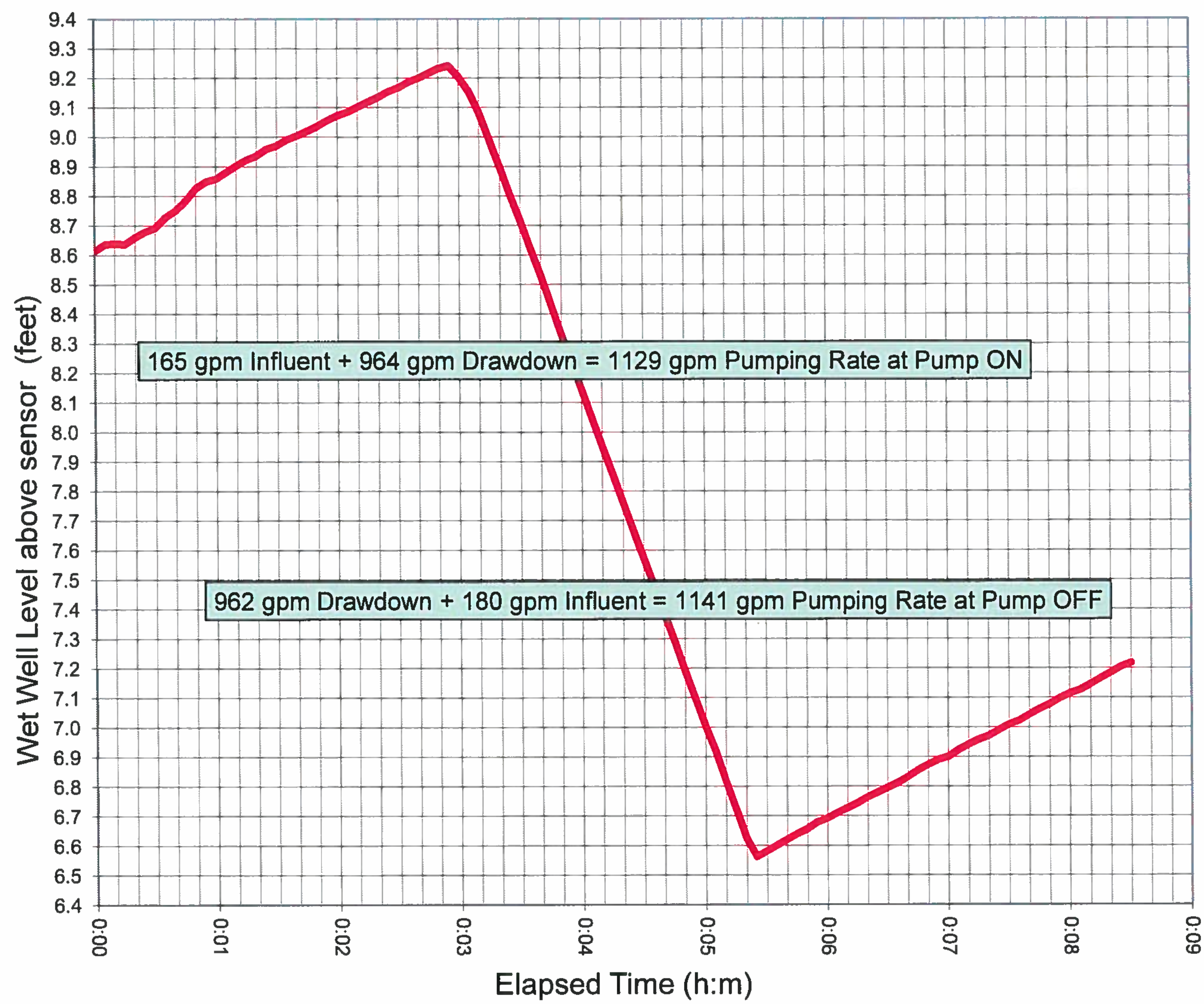
Lift Station 2
Glenwood

LS002
Pump- P#1

File: LS002-P#1-A

Wet Well Size = 12 ft dia
Operating Range = 2.68 ft
Operating Volume = 2267 gal
Time Between Starts at pump test average influent rate = 16 min.
Minimum Time Between Starts = 8 min. (at 568 gpm influent)

Avg. Pumping Rate = 1135 gpm
(Rated Capacity = 300 gpm)



Test (#26) date & time: 6/24/11 8:43 AM

Notes: Calc'd pumping rate at pump-On is low due to backwater in influent line

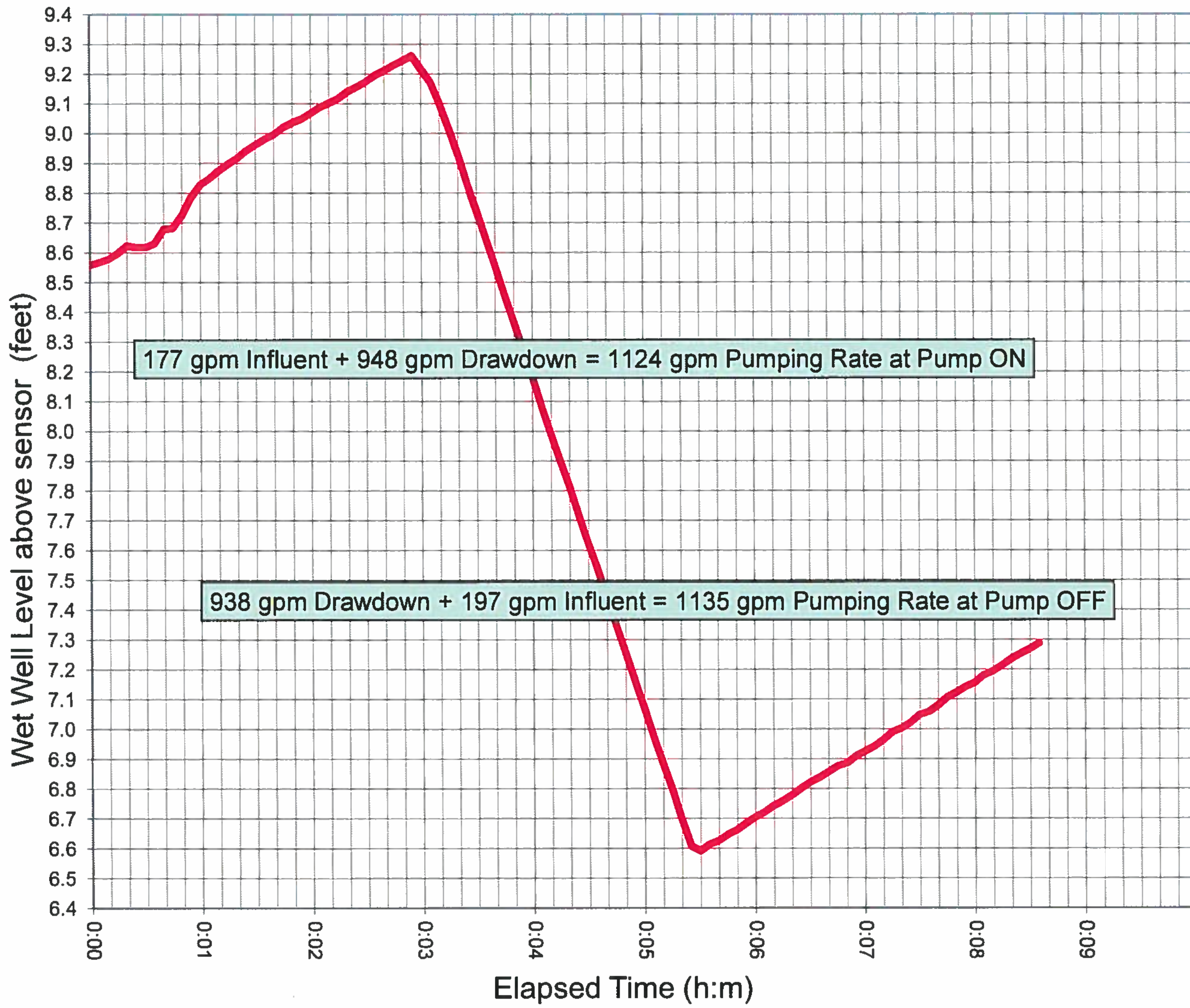
Lift Station 2 Glenwood

LS002
Pump- P#1

File: LS002-P#1-B

Wet Well Size = 12 ft dia
Operating Range = 2.67 ft
Operating Volume = 2259 gal
Time Between Starts at pump test average influent rate = 15 min.
Minimum Time Between Starts = 8 min. (at 565 gpm influent)

Avg. Pumping Rate = 1130 gpm
(Rated Capacity = 300 gpm)



Test (#28) date & time: 6/24/11 9:14 AM

Notes: Calc'd pumping rate at pump-On is low due to backwater in influent line

Lift Station 2 Glenwood

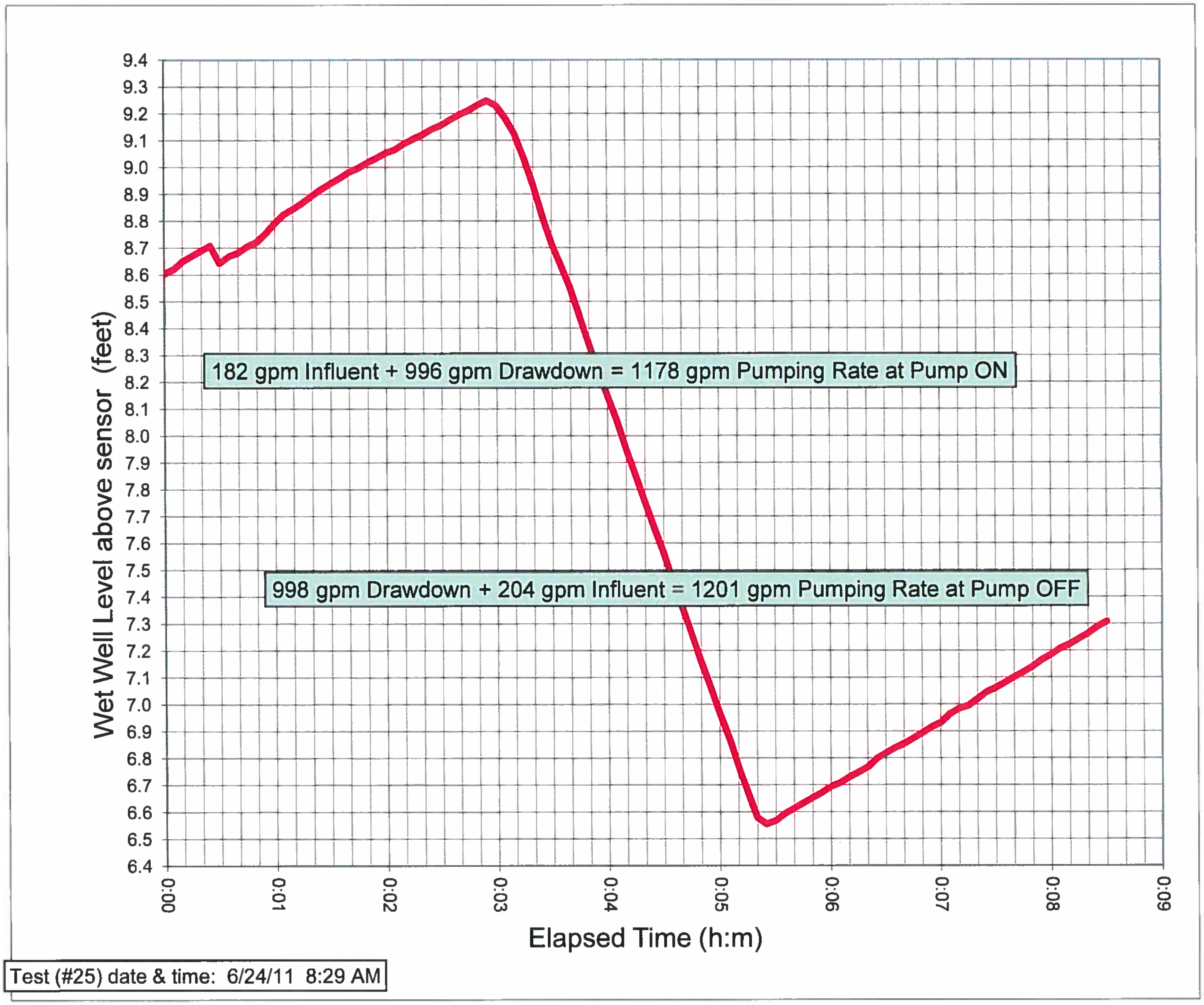
LS002 Pump- P#2

File: LS002-P#2-A

Wet Well Size = 12 ft dia
Operating Range = 2.69 ft
Operating Volume = 2276 gal

Avg. Pumping Rate = 1190 gpm
(Rated Capacity = 300 gpm)

Time Between Starts at pump test average influent rate = 14 min.
Minimum Time Between Starts = 7.7 min. (at 595 gpm influent)



Notes: Calc'd pumping rate at pump-On is low due to backwater in influent line

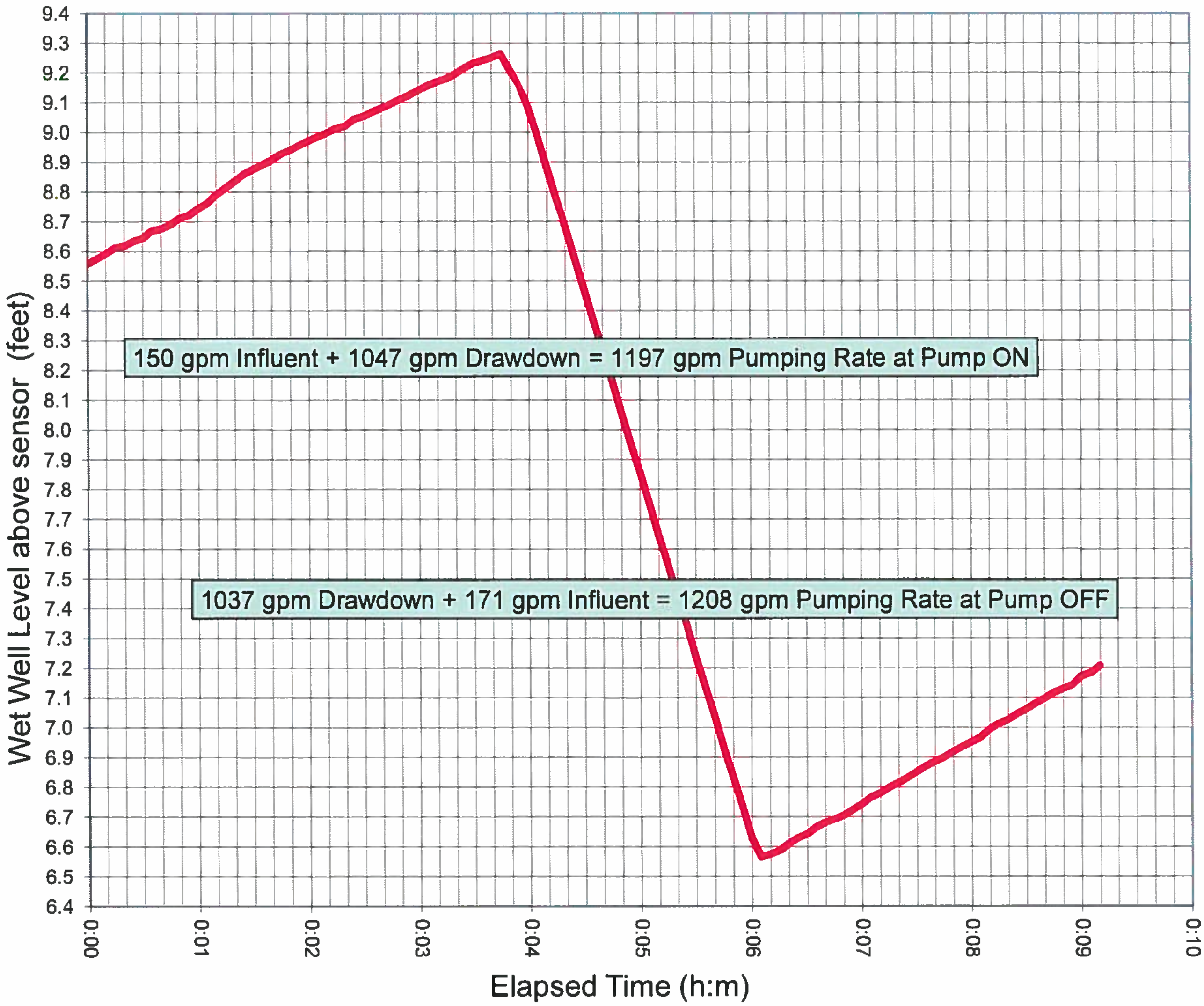
Lift Station 2
Glenwood

LS002
Pump- P#2

File: LS002-P#2-B

Wet Well Size = 12 ft dia
Operating Range = 2.7 ft
Operating Volume = 2284 gal
Time Between Starts at pump test average influent rate = 17 min.
Minimum Time Between Starts = 7.6 min. (at 601 gpm influent)

Avg. Pumping Rate = 1202 gpm
(Rated Capacity = 300 gpm)



Test (#27) date & time: 6/24/11 8:59 AM

Notes: Calc'd pumping rate at pump-On is low due to backwater in influent line

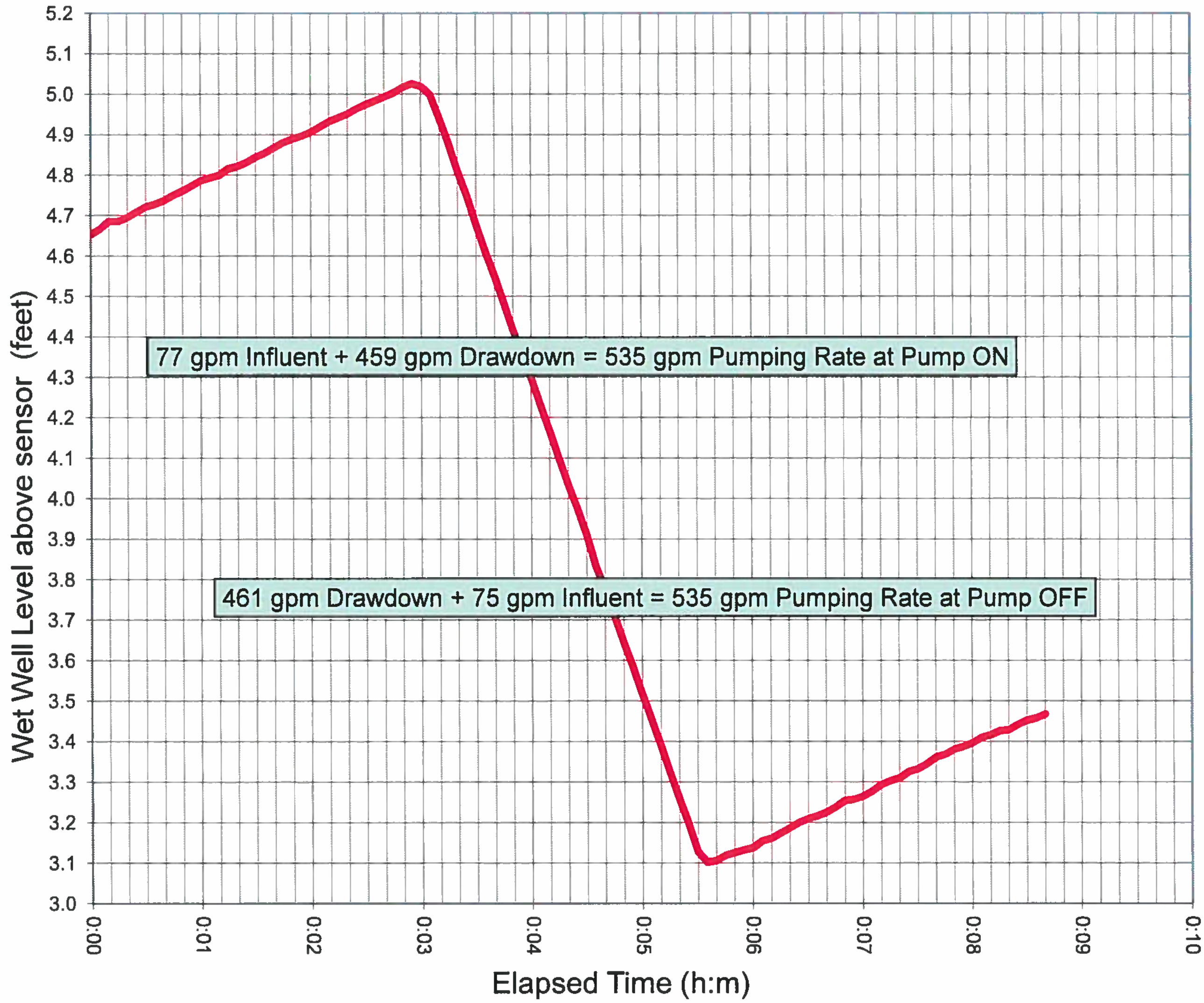
Lift Station 3
Lakeside

LS003
Pump- P#1

File: LS003-P#1-A

Wet Well Size = 10 ft dia
Operating Range = 1.92 ft
Operating Volume = 1128 gal
Time Between Starts at pump test average influent rate = 18 min.
Minimum Time Between Starts = 8.4 min. (at 268 gpm influent)

Avg. Pumping Rate = 535 gpm
(Rated Capacity = n/a gpm)



Test (#29) date & time: 6/20/11 9:23 AM

Notes:

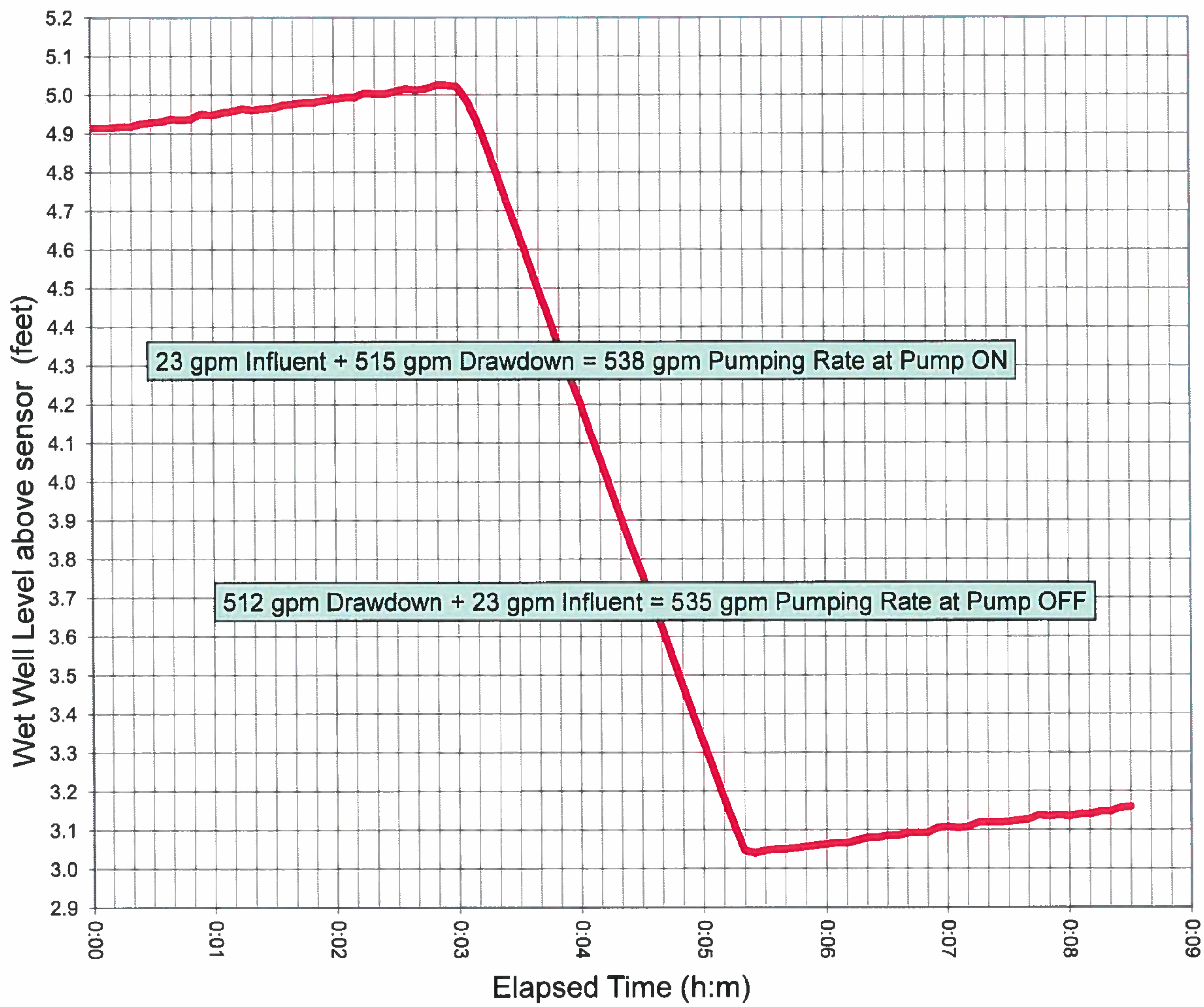
Lift Station 3
Lakeside

LS003
Pump- P#1

File: LS003-P#1-B

Wet Well Size = 10 ft dia
Operating Range = 1.98 ft
Operating Volume = 1163 gal
Time Between Starts at pump test average influent rate = 53 min.
Minimum Time Between Starts = 8.7 min. (at 269 gpm influent)

Avg. Pumping Rate = 537 gpm
(Rated Capacity = n/a gpm)



Test (#4) date & time: 6/21/11 2:44 AM

Notes: Low influent rate

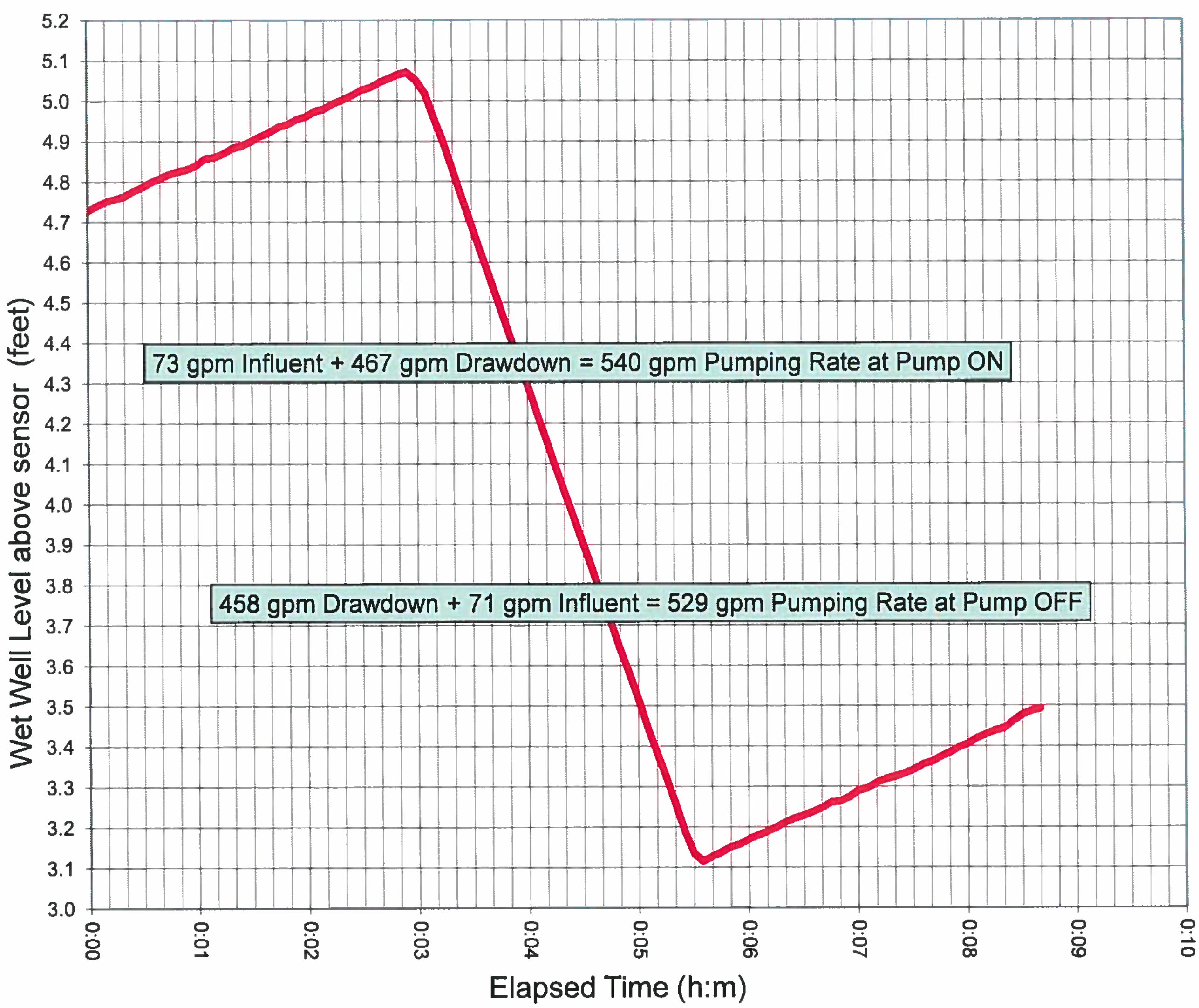
Lift Station 3
Lakeside

LS003
Pump- P#1

File: LS003-P#1-C

Wet Well Size = 10 ft dia
Operating Range = 1.96 ft
Operating Volume = 1152 gal
Time Between Starts at pump test average influent rate = 19 min.
Minimum Time Between Starts = 8.6 min. (at 267 gpm influent)

<u>Avg. Pumping Rate = 534 gpm</u>
(Rated Capacity = n/a gpm)



Test (#5) date & time: 6/21/11 6:25 AM

Notes:

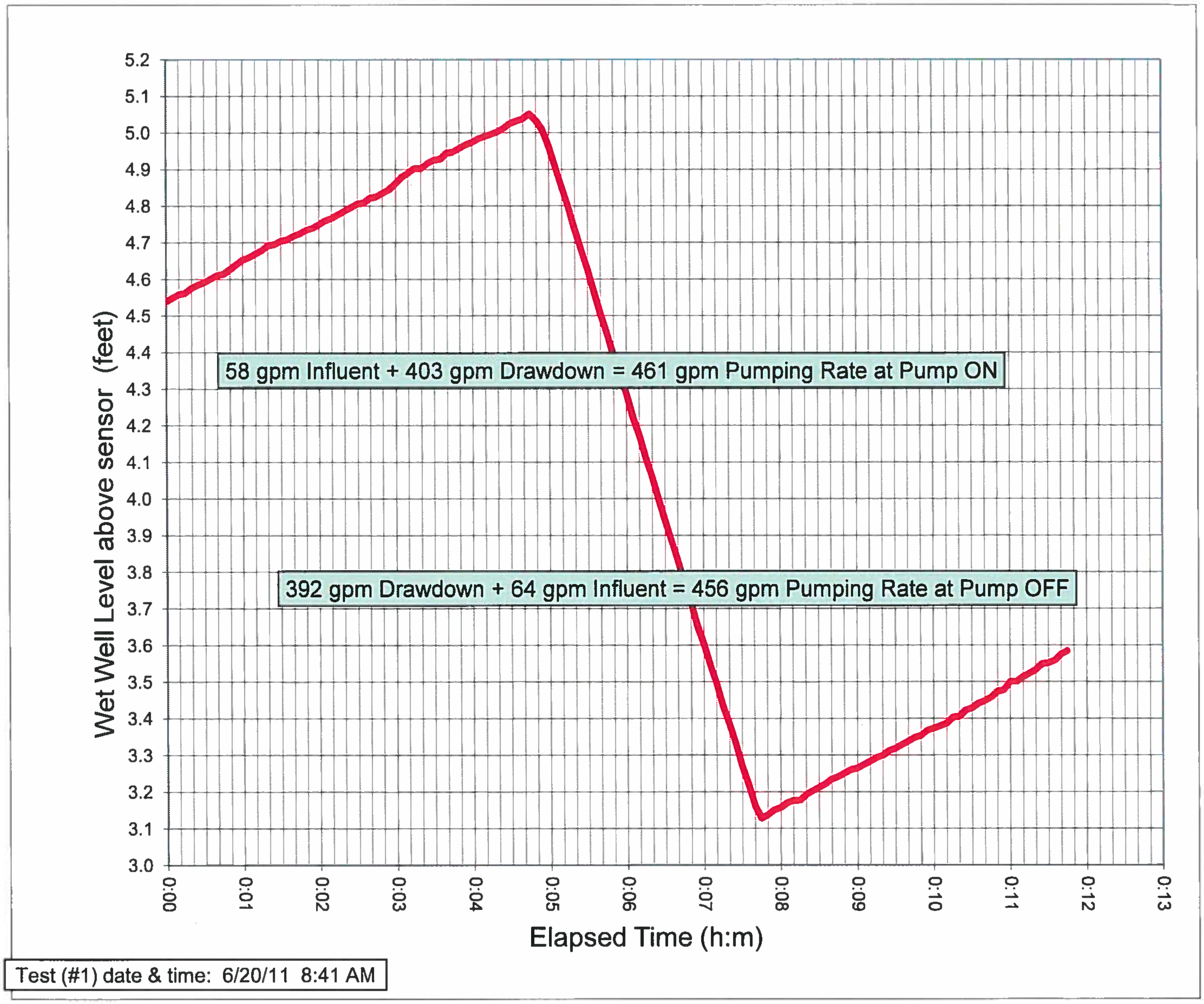
Lift Station 3 Lakeside

LS003 Pump- P#2

File: LS003-P#2-A

Wet Well Size = 10 ft dia
Operating Range = 1.92 ft
Operating Volume = 1128 gal
Time Between Starts at pump test average influent rate = 21 min.
Minimum Time Between Starts = 9.8 min. (at 230 gpm influent)

Avg. Pumping Rate = 459 gpm
(Rated Capacity = n/a gpm)



Notes:

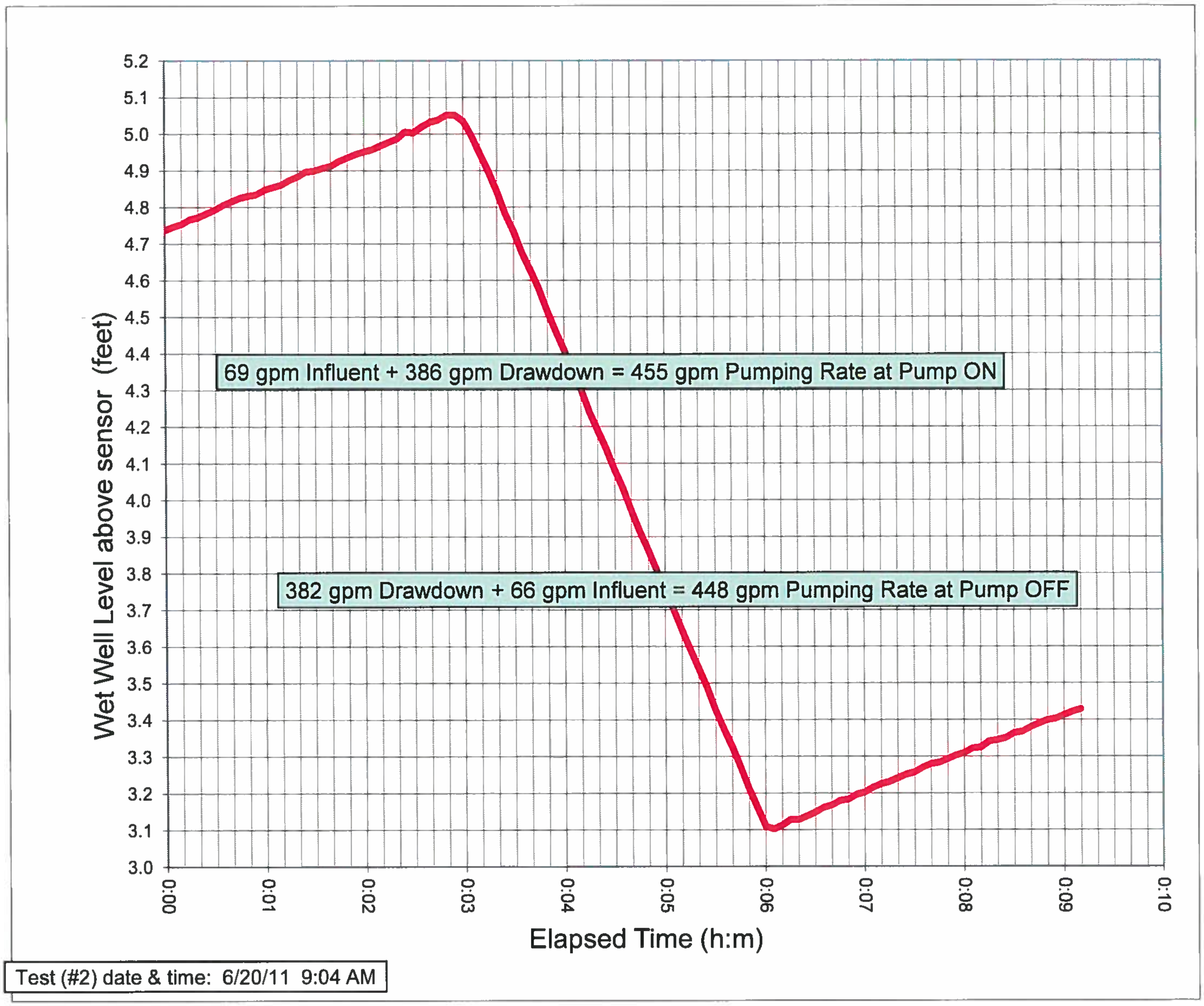
Lift Station 3
Lakeside

LS003
Pump- P#2

File: LS003-P#2-B

Wet Well Size = 10 ft dia
Operating Range = 1.95 ft
Operating Volume = 1146 gal
Time Between Starts at pump test average influent rate = 20 min.
Minimum Time Between Starts = 10.2 min. (at 226 gpm influent)

<u>Avg. Pumping Rate = 451 gpm</u>
(Rated Capacity = n/a gpm)



Notes:

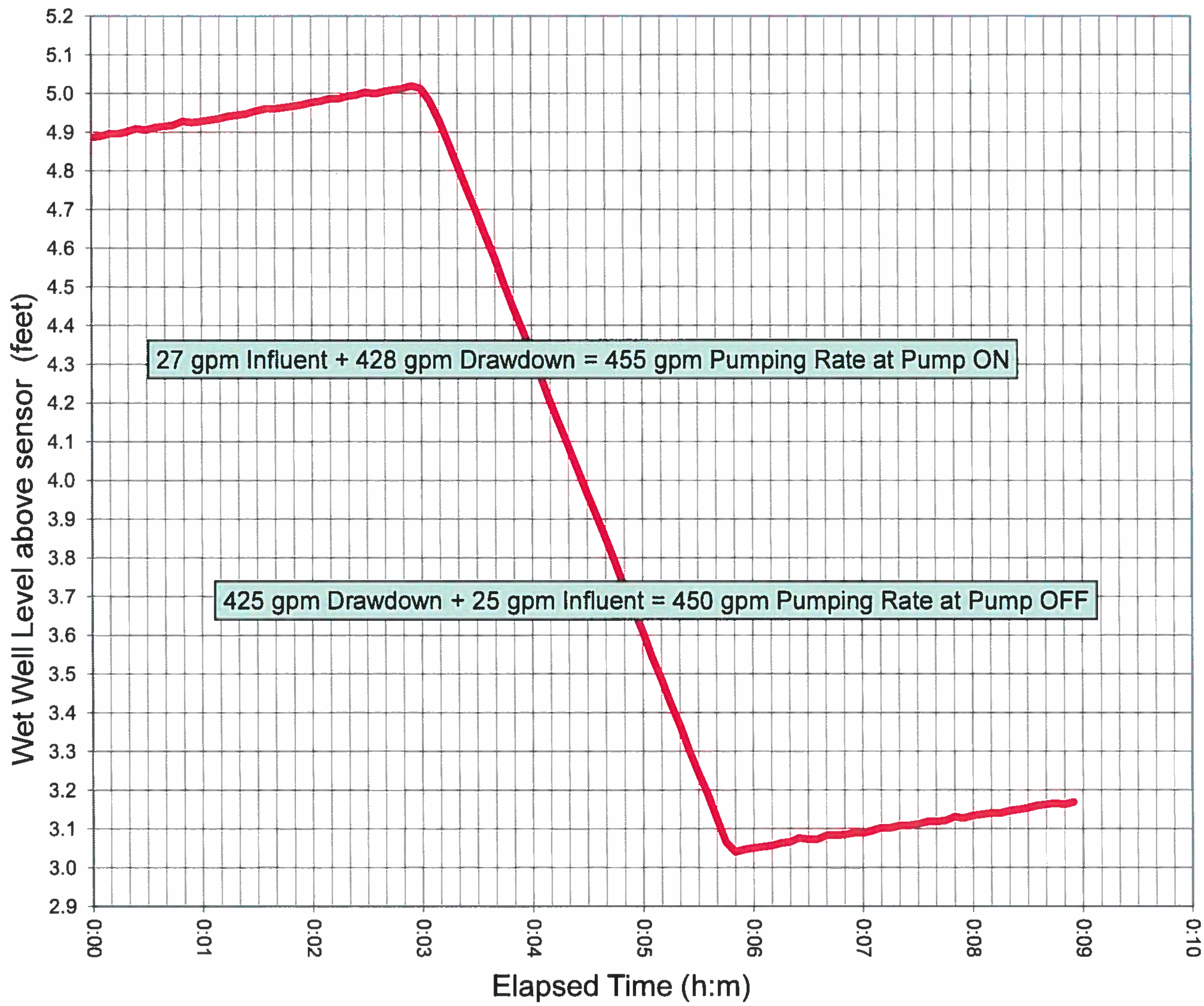
Lift Station 3
Lakeside

LS003
Pump- P#2

File: LS003-P#2-C

Wet Well Size = 10 ft dia
Operating Range = 1.98 ft
Operating Volume = 1163 gal
Time Between Starts at pump test average influent rate = 48 min.
Minimum Time Between Starts = 10.3 min. (at 227 gpm influent)

Avg. Pumping Rate = 453 gpm
(Rated Capacity = n/a gpm)



Test (#3) date & time: 6/21/11 1:50 AM

Notes: Low influent rate

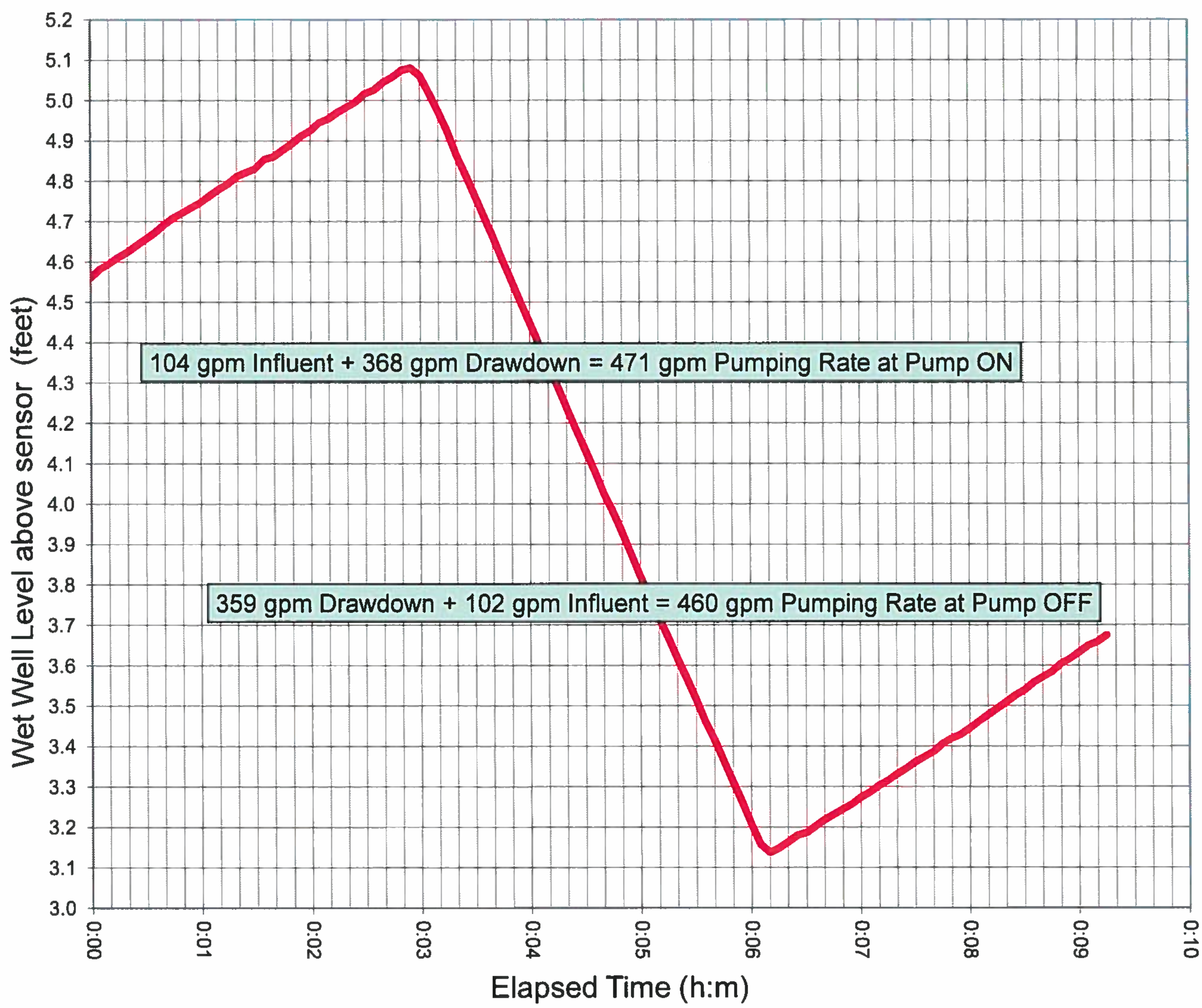
Lift Station 3 Lakeside

LS003 Pump- P#2

File: LS003-P#2-D

Wet Well Size = 10 ft dia
Operating Range = 1.94 ft
Operating Volume = 1140 gal
Time Between Starts at pump test average influent rate = 14 min.
Minimum Time Between Starts = 9.8 min. (at 233 gpm influent)

Avg. Pumping Rate = 466 gpm
(Rated Capacity = n/a gpm)



Test (#6) date & time: 6/21/11 6:40 AM

Notes: High influent rate

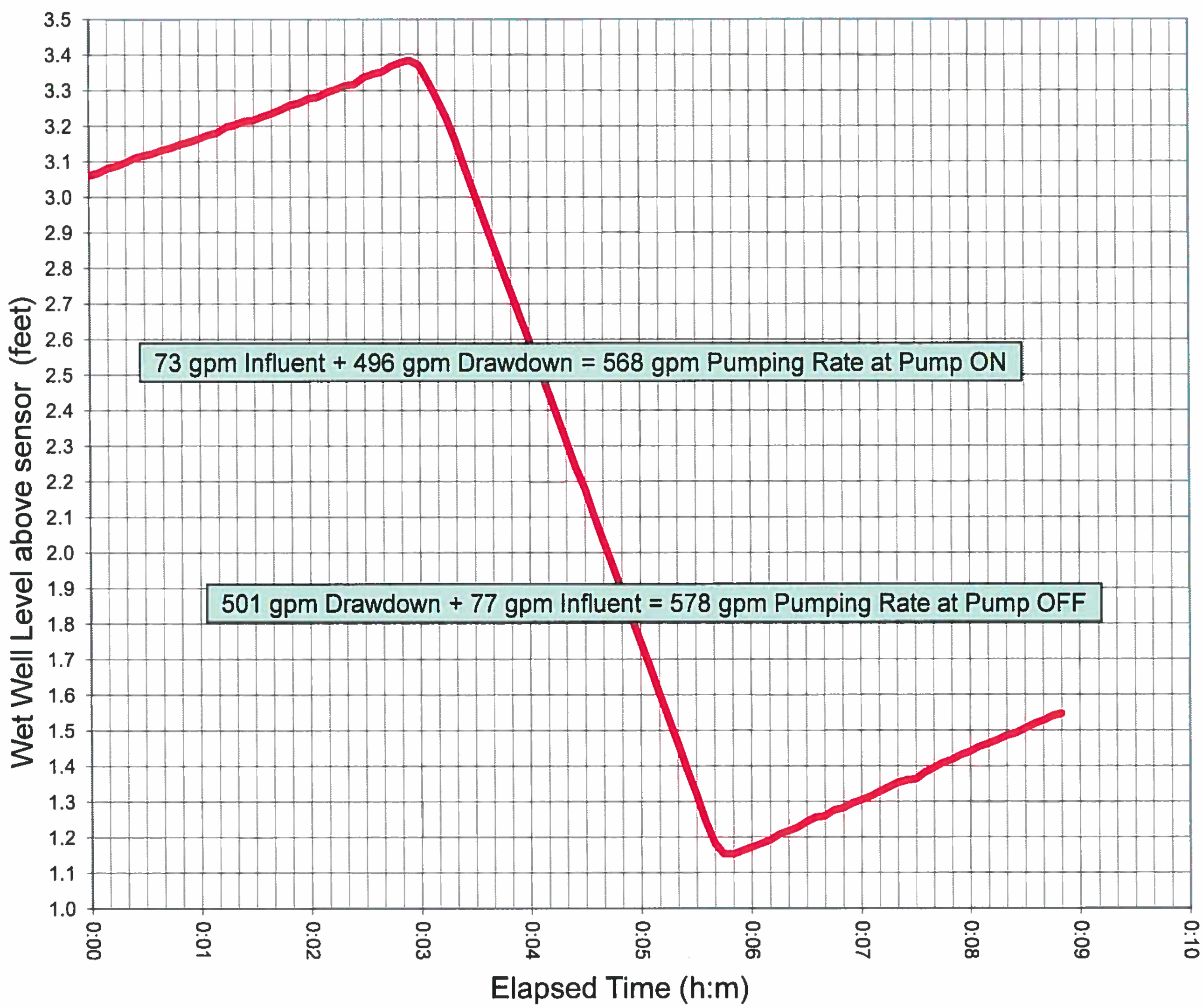
Lift Station 4
Country Estates

LS004
Pump- P#1

File: LS004-P#1-A

Wet Well Size = 10 ft dia
Operating Range = 2.23 ft
Operating Volume = 1310 gal
Time Between Starts at pump test average influent rate = 20 min.
Minimum Time Between Starts = 9.1 min. (at 287 gpm influent)

Avg. Pumping Rate = 573 gpm
(Rated Capacity = 413 gpm)



Test (#13) date & time: 6/22/11 10:03 AM

Notes:

Lift Station 4
Country Estates

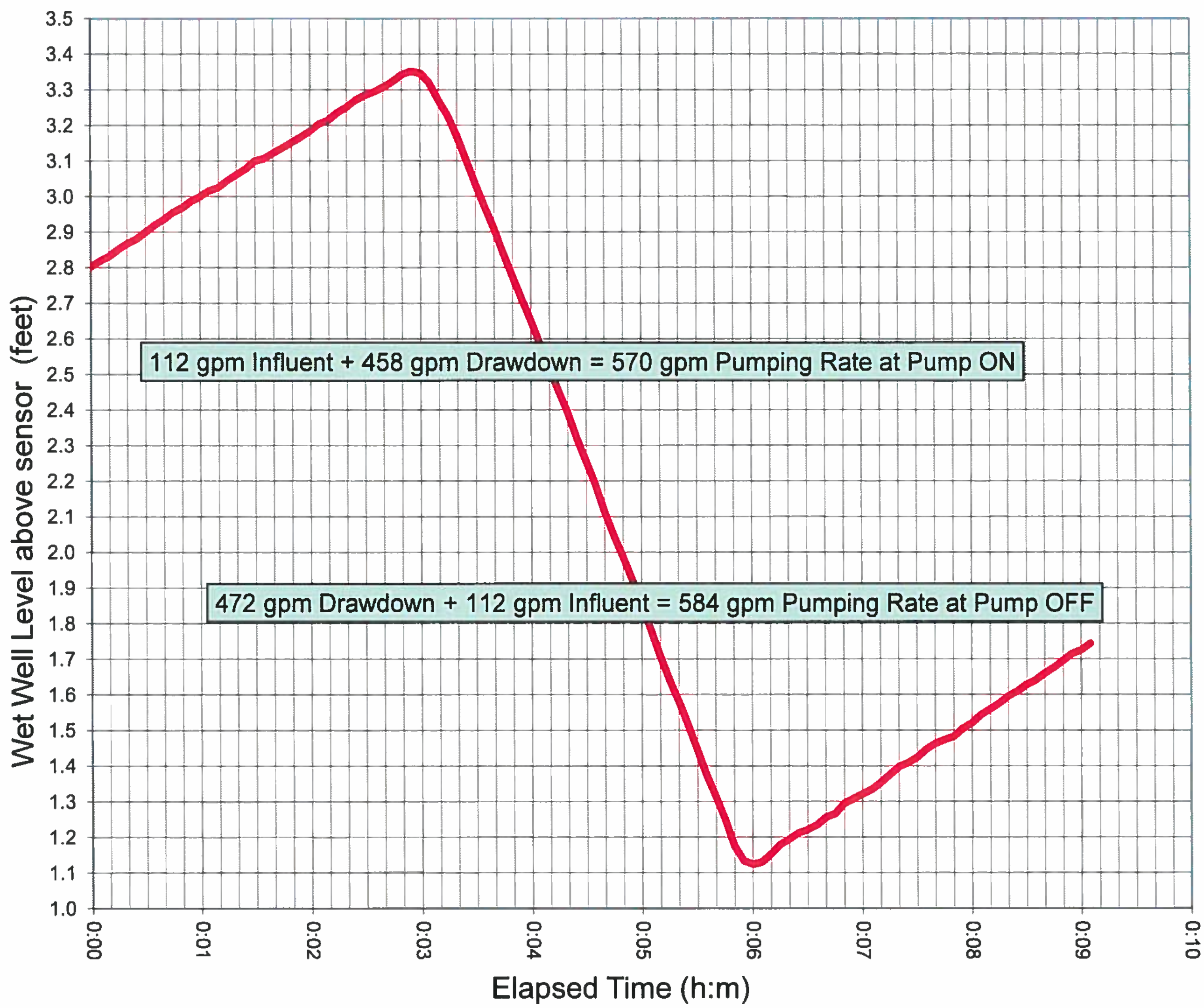
LS004
Pump- P#1

File: LS004-P#1-B

Wet Well Size = 10 ft dia
Operating Range = 2.23 ft
Operating Volume = 1310 gal

Avg. Pumping Rate = 577 gpm
(Rated Capacity = 413 gpm)

Time Between Starts at pump test average influent rate = 15 min.
Minimum Time Between Starts = 9.1 min. (at 289 gpm influent)



Test (#15) date & time: 6/22/11 10:25 PM

Notes: High influent rate

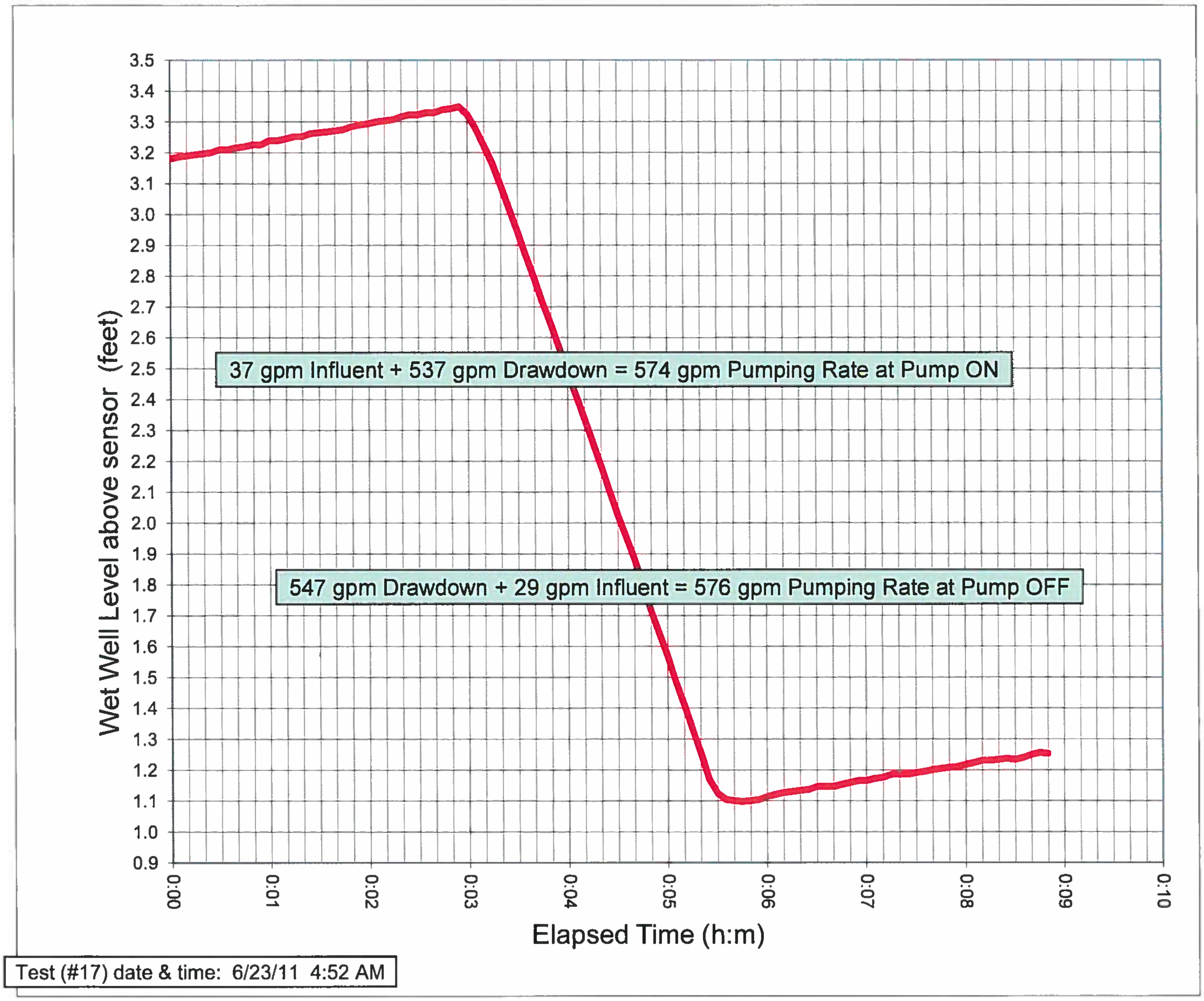
Lift Station 4
Country Estates

LS004
Pump- P#1

File: LS004-P#1-C

Wet Well Size = 10 ft dia
Operating Range = 2.25 ft
Operating Volume = 1322 gal
Time Between Starts at pump test average influent rate = 43 min.
Minimum Time Between Starts = 9.2 min. (at 288 gpm influent)

Avg. Pumping Rate = 575 gpm
(Rated Capacity = 413 gpm)



Notes: Low influent rate

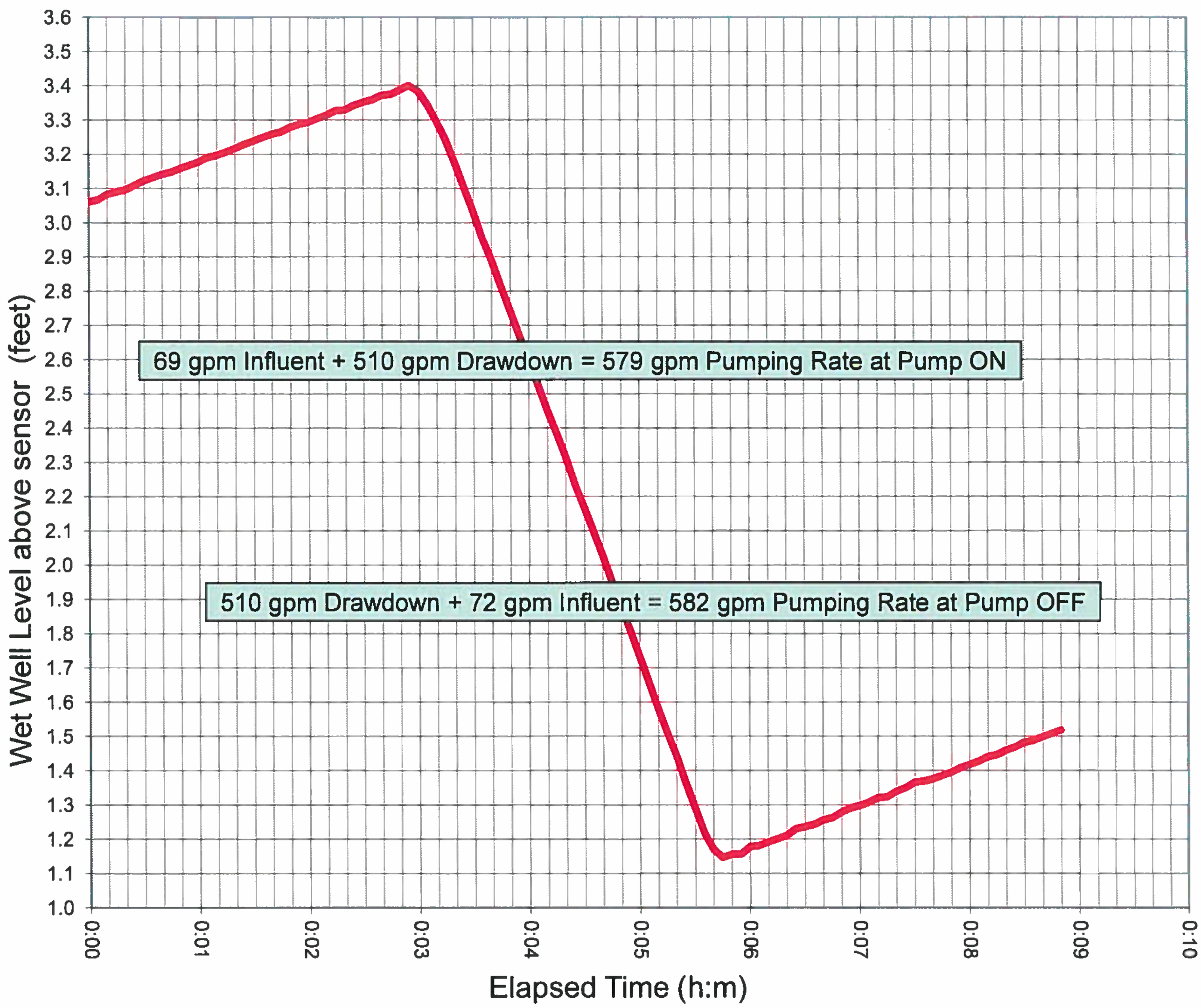
Lift Station 4
Country Estates

LS004
Pump- P#2

File: LS004-P#2-A

Wet Well Size = 10 ft dia
Operating Range = 2.25 ft
Operating Volume = 1322 gal
Time Between Starts at pump test average influent rate = 22 min.
Minimum Time Between Starts = 9.1 min. (at 290 gpm influent)

<u>Avg. Pumping Rate = 580 gpm</u>
(Rated Capacity = 413 gpm)



Test (#14) date & time: 6/22/11 10:25 AM

Notes:

Lift Station 4
Country Estates

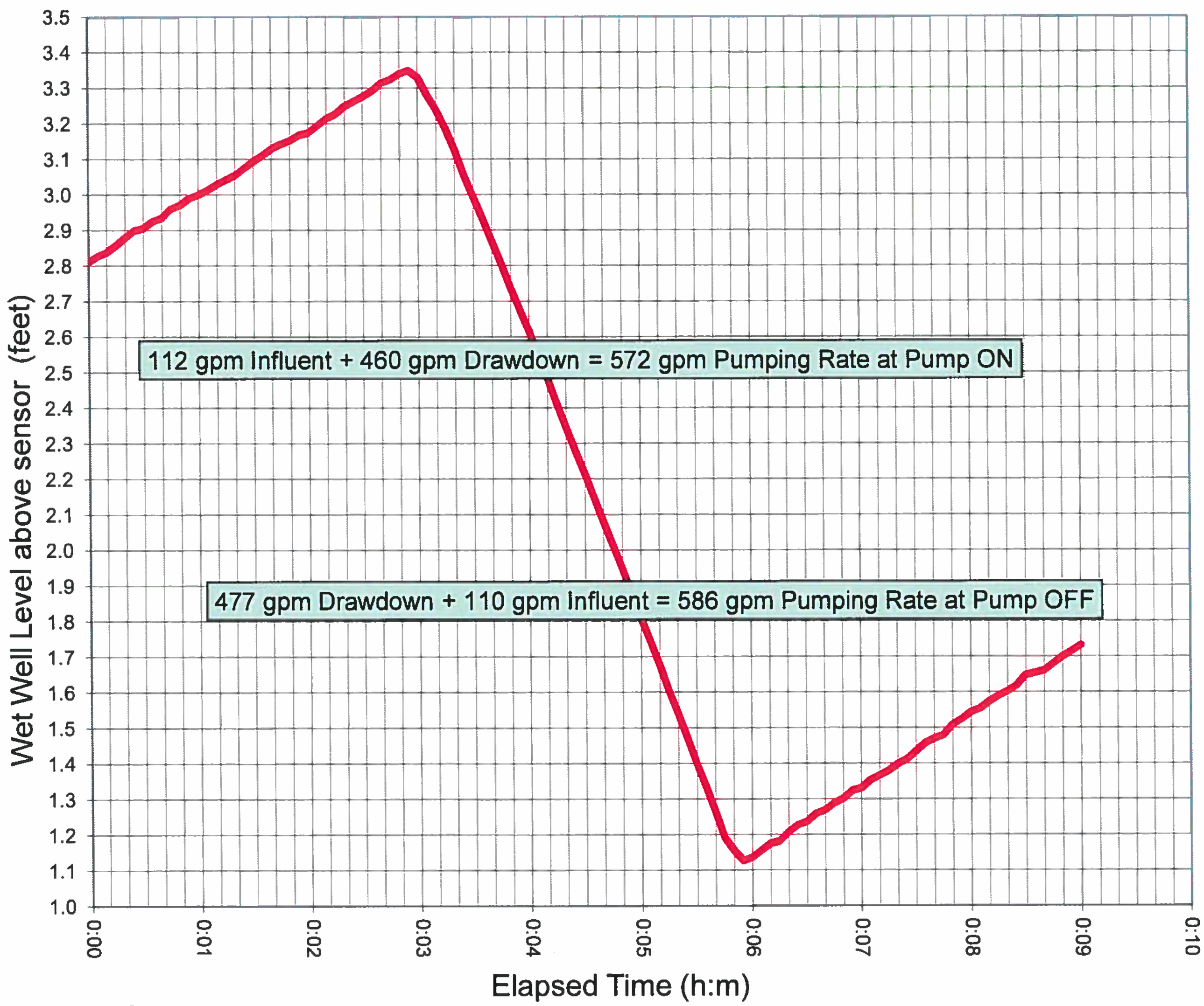
LS004
Pump- P#2

File: LS004-P#2-B

Wet Well Size = 10 ft dia
Operating Range = 2.22 ft
Operating Volume = 1304 gal

Avg. Pumping Rate = 579 gpm
(Rated Capacity = 413 gpm)

Time Between Starts at pump test average influent rate = 15 min.
Minimum Time Between Starts = 9 min. (at 290 gpm influent)



Test (#18) date & time: 6/22/11 10:10 PM

Notes: High influent rate

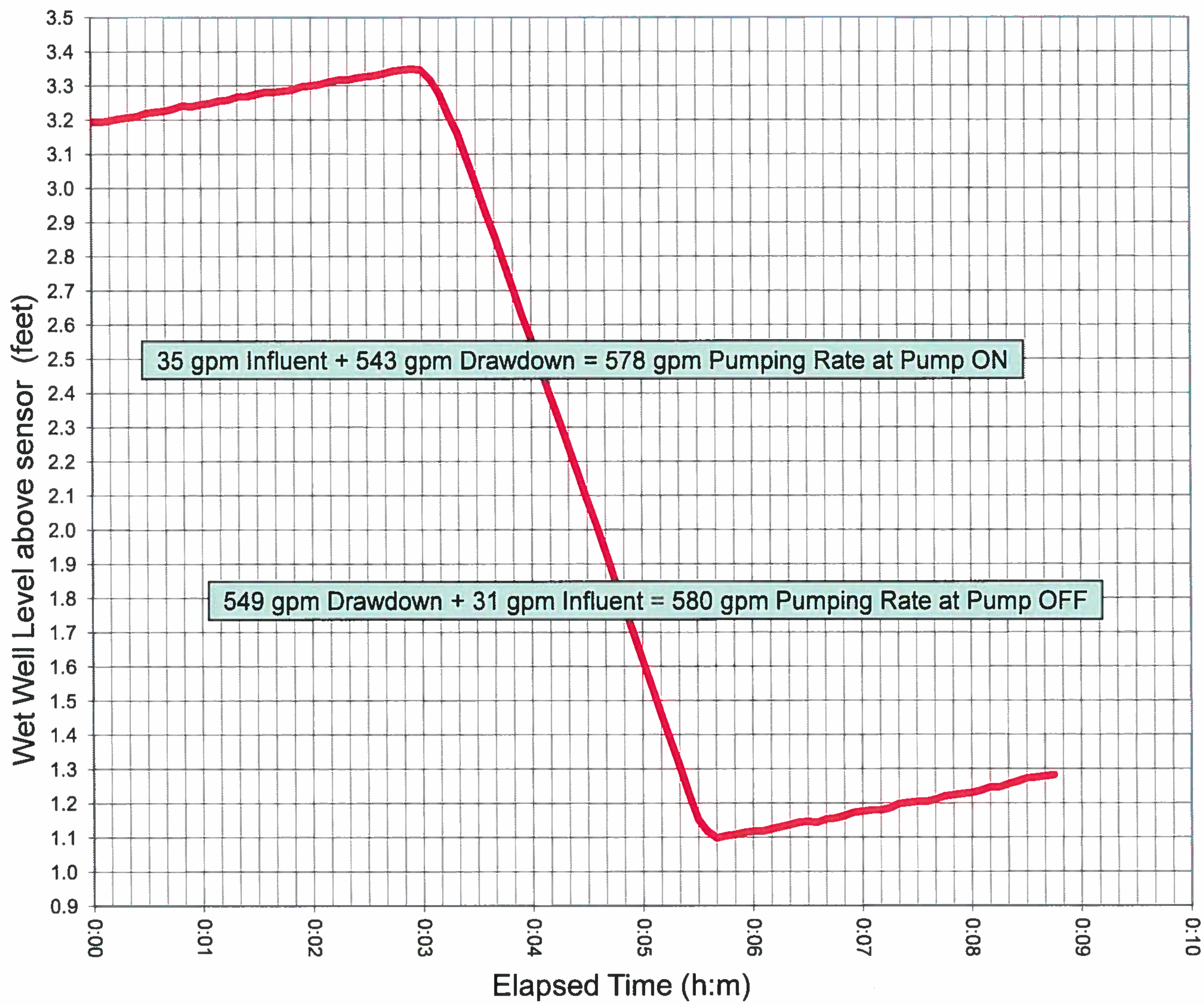
Lift Station 4
Country Estates

LS004
Pump- P#2

File: LS004-P#2-C

Wet Well Size = 10 ft dia
Operating Range = 2.25 ft
Operating Volume = 1322 gal
Time Between Starts at pump test average influent rate = 43 min.
Minimum Time Between Starts = 9.1 min. (at 290 gpm influent)

Avg. Pumping Rate = 579 gpm
(Rated Capacity = 413 gpm)



Test (#16) date & time: 6/23/11 4:09 AM

Notes: Low influent rate

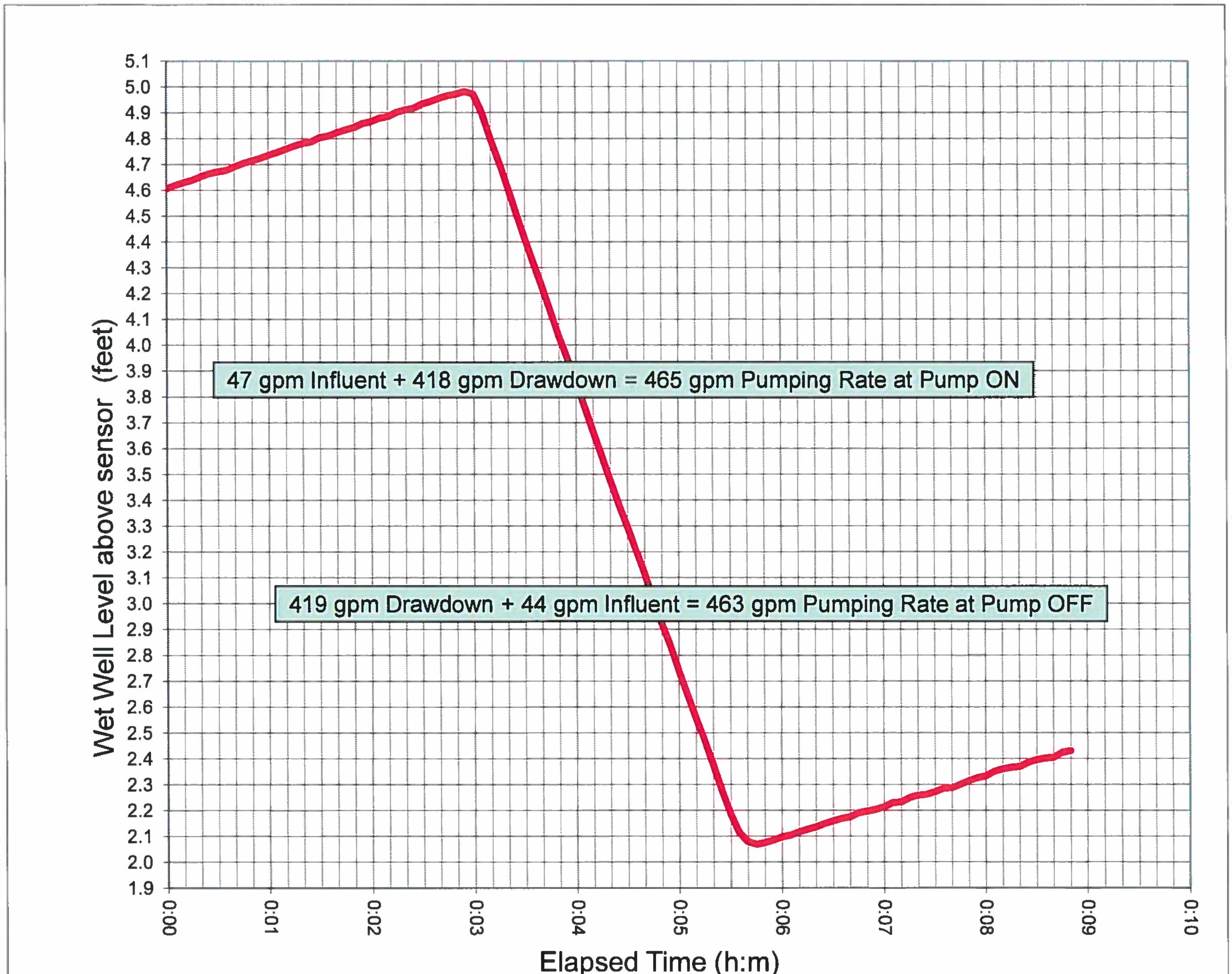
Lift Station 5
Creekside

LS005
Pump- P#1

File: LS005-P#1-A

Wet Well Size = 8 ft dia
Operating Range = 2.91 ft
Operating Volume = 1094 gal
Time Between Starts at pump test average influent rate = 27 min.
Minimum Time Between Starts = 9.4 min. (at 232 gpm influent)

Avg. Pumping Rate = 464 gpm
(Rated Capacity = 250 gpm)



Test (#20) date & time: 6/23/11 10:29 AM

Notes:

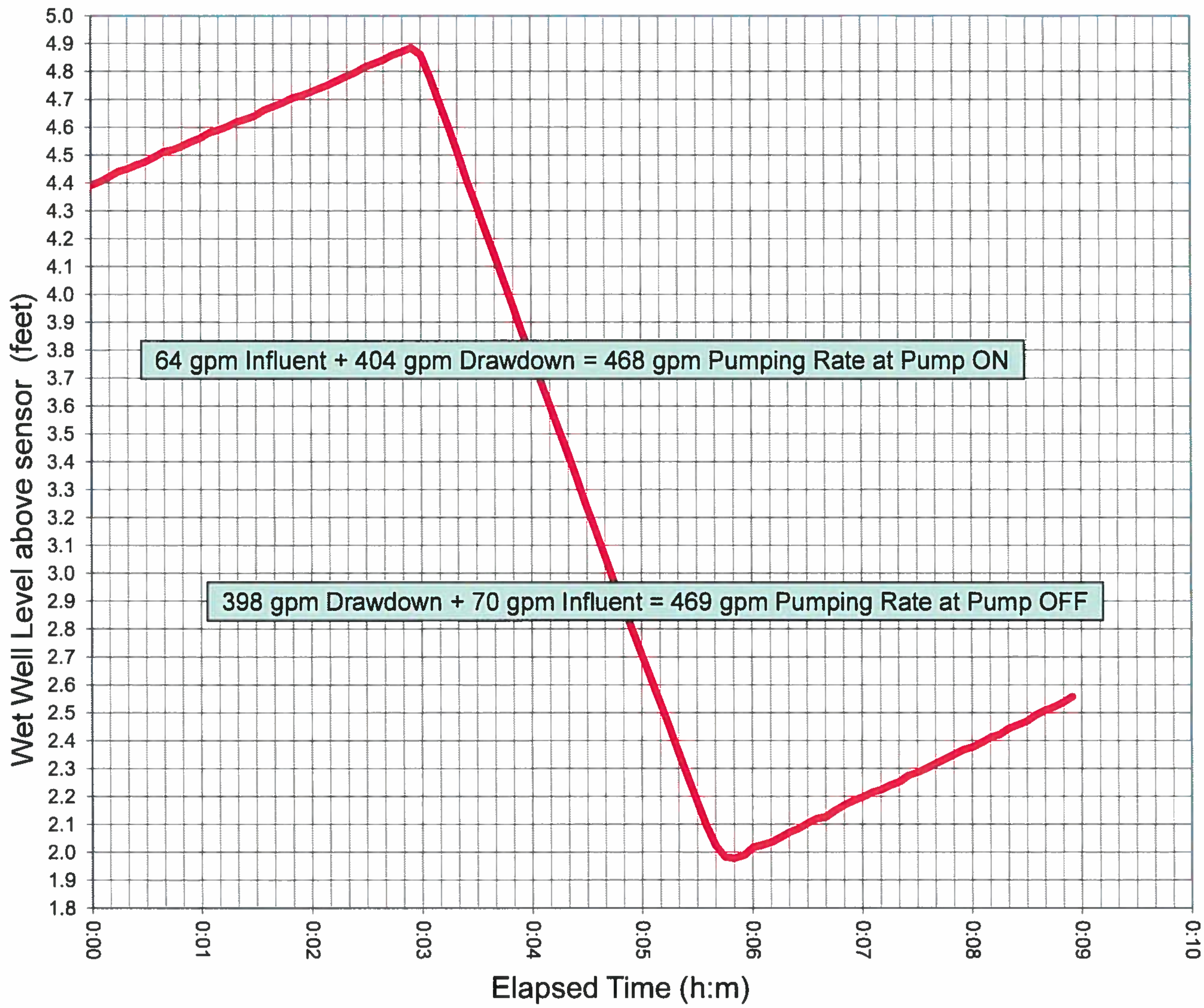
Lift Station 5
Creekside

LS005
Pump- P#1

File: LS005-P#1-B

Wet Well Size = 8 ft dia
Operating Range = 2.91 ft
Operating Volume = 1094 gal
Time Between Starts at pump test average influent rate = 19 min.
Minimum Time Between Starts = 9.4 min. (at 234 gpm influent)

Avg. Pumping Rate = 468 gpm
(Rated Capacity = 250 gpm)



Test (#21) date & time: 6/23/11 8:56 PM

Notes: High influent rate

Lift Station 5
Creekside

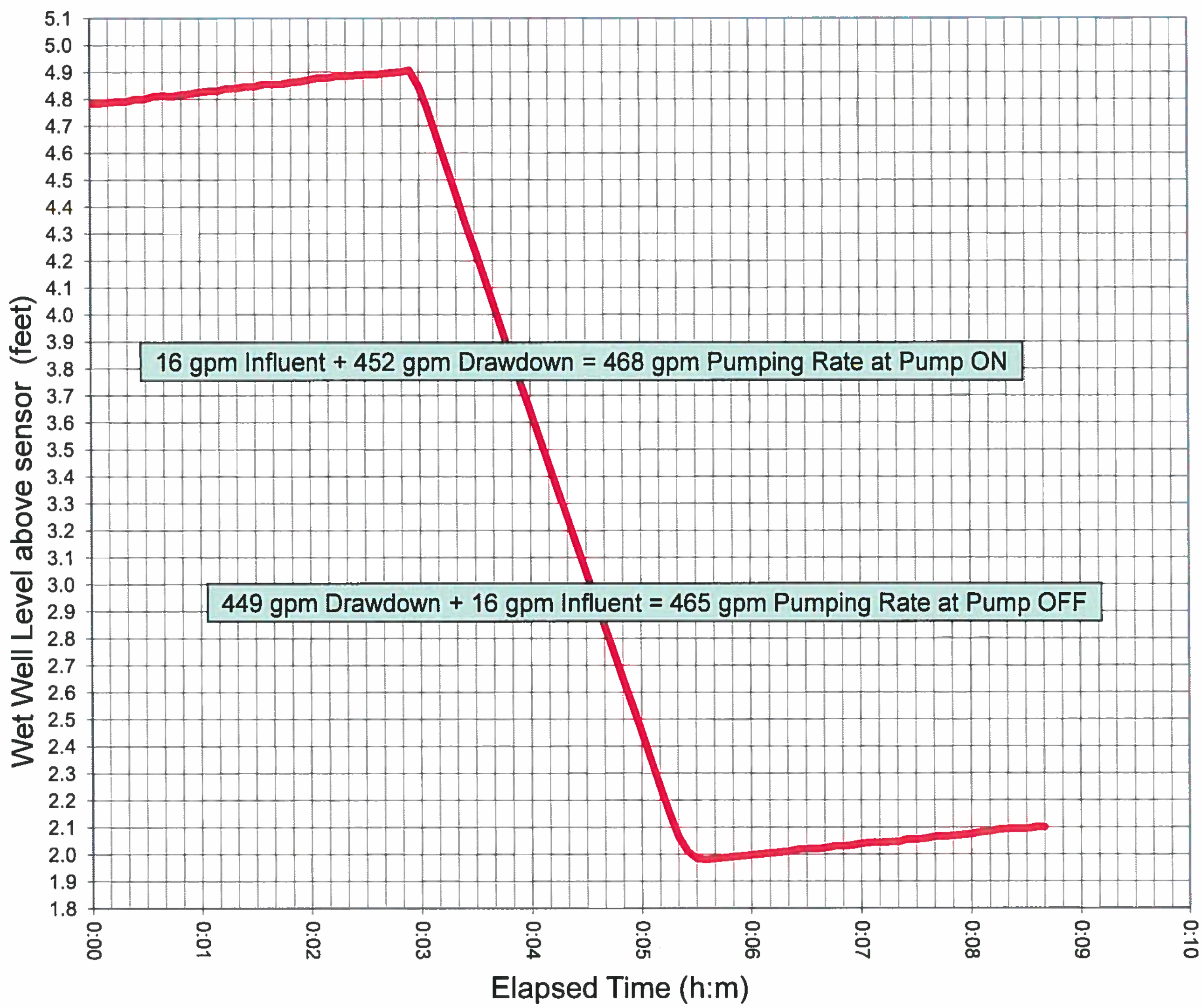
LS005
Pump- P#1

File: LS005-P#1-C

Wet Well Size = 8 ft dia
Operating Range = 2.93 ft
Operating Volume = 1102 gal

Avg. Pumping Rate = 466 gpm
(Rated Capacity = 250 gpm)

Time Between Starts at pump test average influent rate = 72 min.
Minimum Time Between Starts = 9.5 min. (at 233 gpm influent)



Test (#23) date & time: 6/24/11 2:26 AM

Notes: Low influent rate

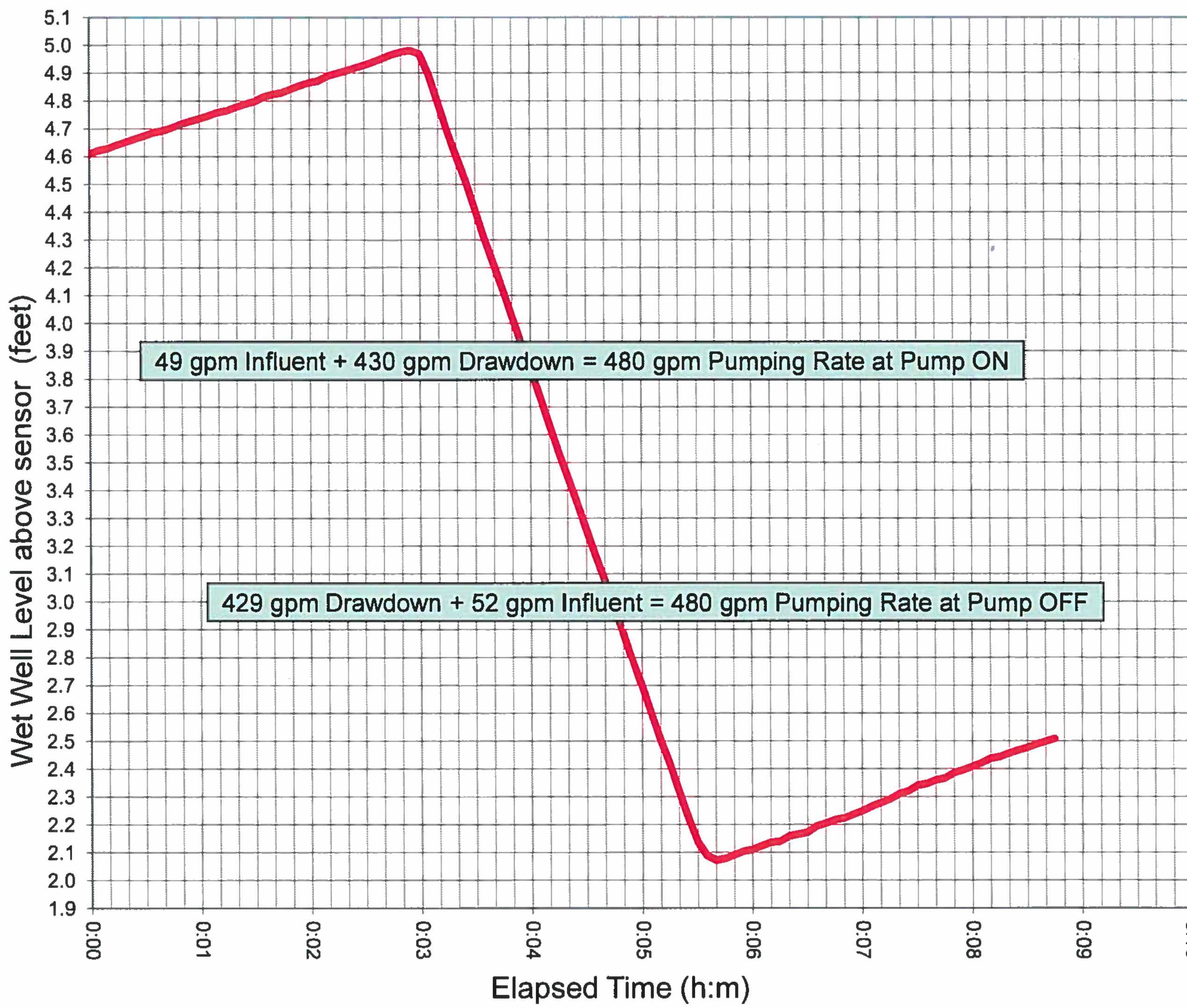
Lift Station 5 Creekside

LS005 Pump- P#2

File: LS005-P#2-A

Wet Well Size = 8 ft dia
Operating Range = 2.91 ft
Operating Volume = 1094 gal
Time Between Starts at pump test average influent rate = 24 min.
Minimum Time Between Starts = 9.1 min. (at 240 gpm influent)

Avg. Pumping Rate = 480 gpm
(Rated Capacity = 250 gpm)



Test (#19) date & time: 6/23/11 10:02 AM

Notes:

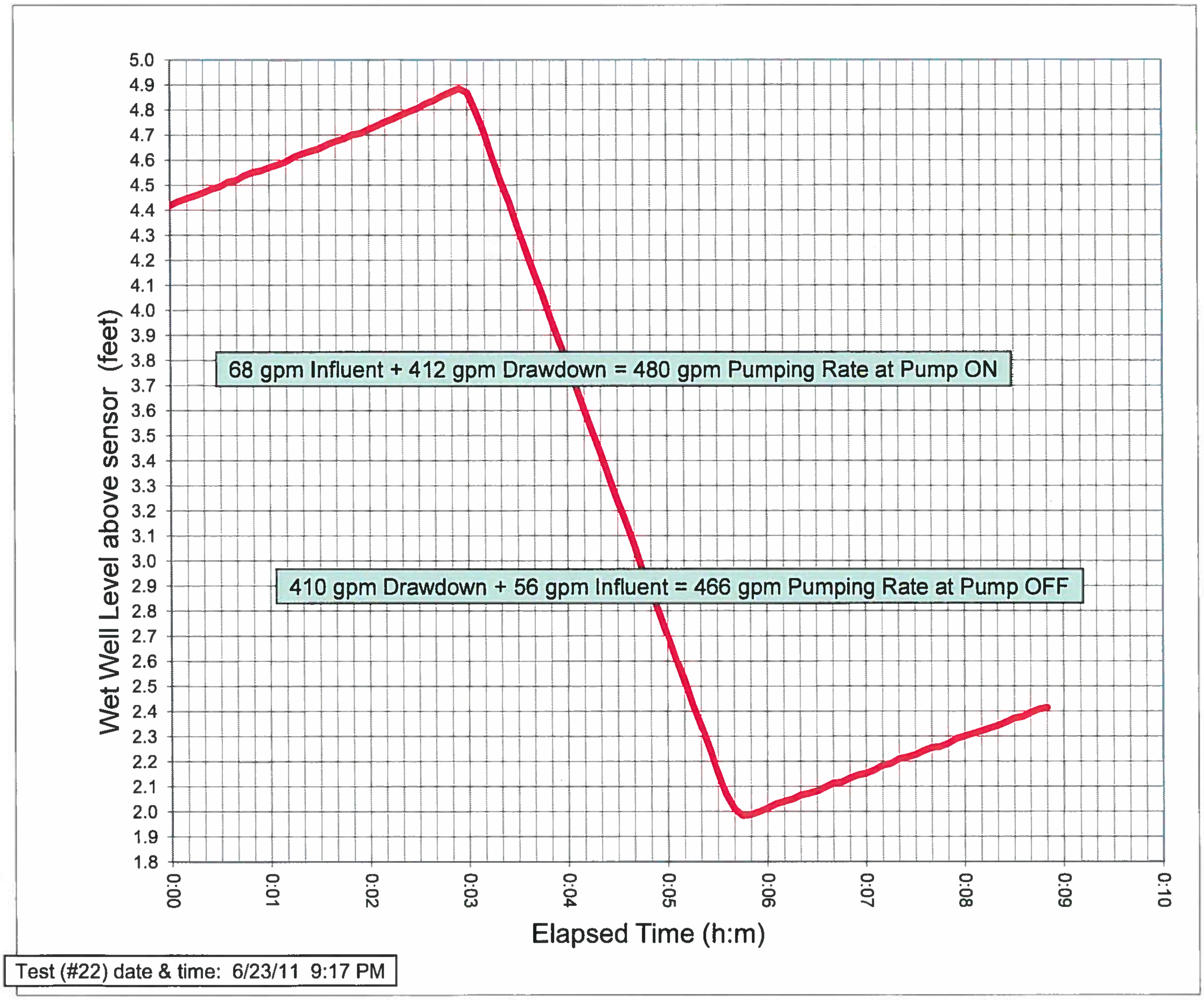
Lift Station 5 Creekside

LS005 Pump- P#2

File: LS005-P#2-B

Wet Well Size = 8 ft dia
Operating Range = 2.9 ft
Operating Volume = 1091 gal
Time Between Starts at pump test average influent rate = 20 min.
Minimum Time Between Starts = 9.2 min. (at 237 gpm influent)

Avg. Pumping Rate = 473 gpm
(Rated Capacity = 250 gpm)



Notes: High influent rate

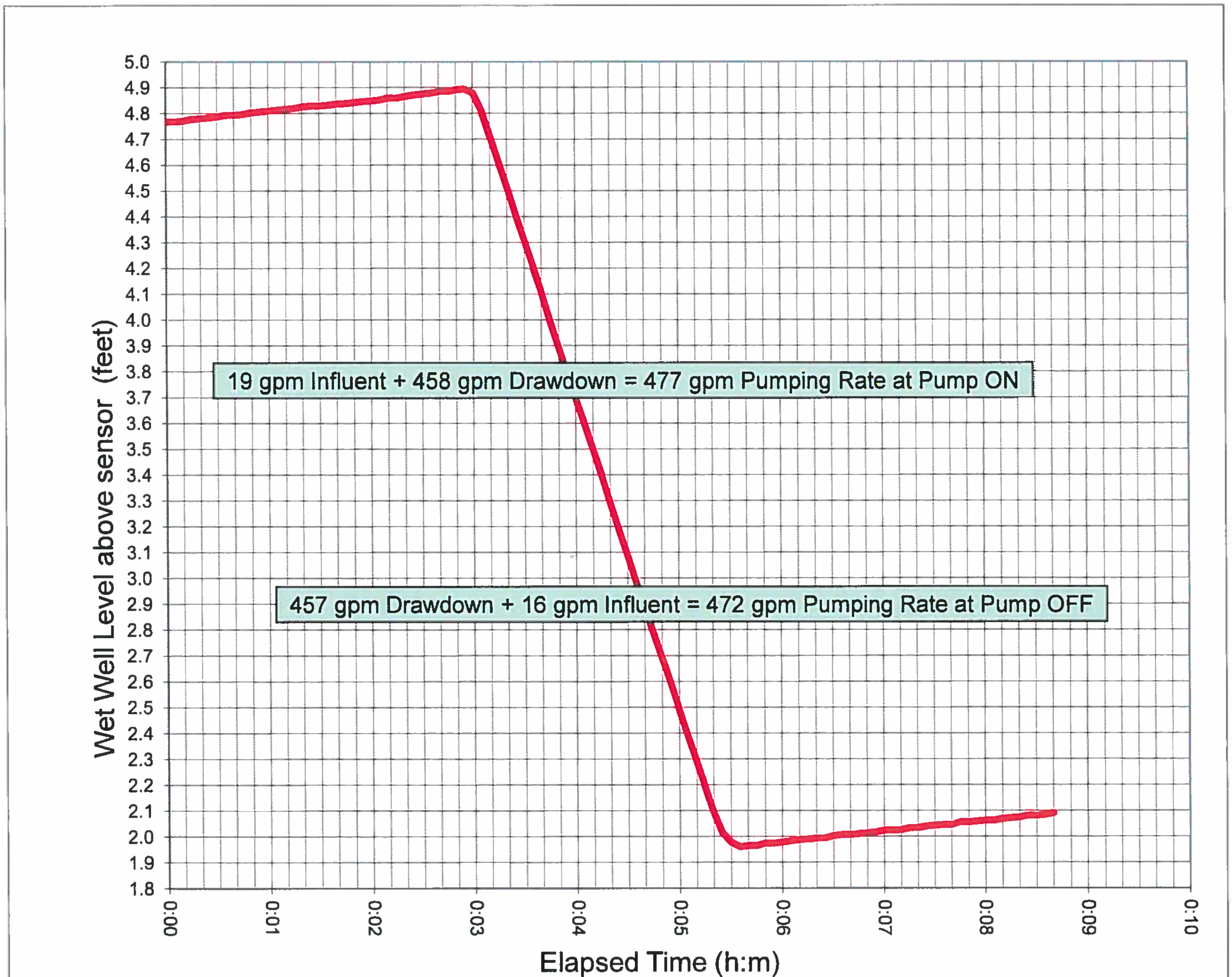
Lift Station 5
Creekside

LS005
Pump- P#2

File: LS005-P#2-C

Wet Well Size = 8 ft dia
Operating Range = 2.93 ft
Operating Volume = 1102 gal
Time Between Starts at pump test average influent rate = 66 min.
Minimum Time Between Starts = 9.3 min. (at 238 gpm influent)

Avg. Pumping Rate = 475 gpm
(Rated Capacity = 250 gpm)

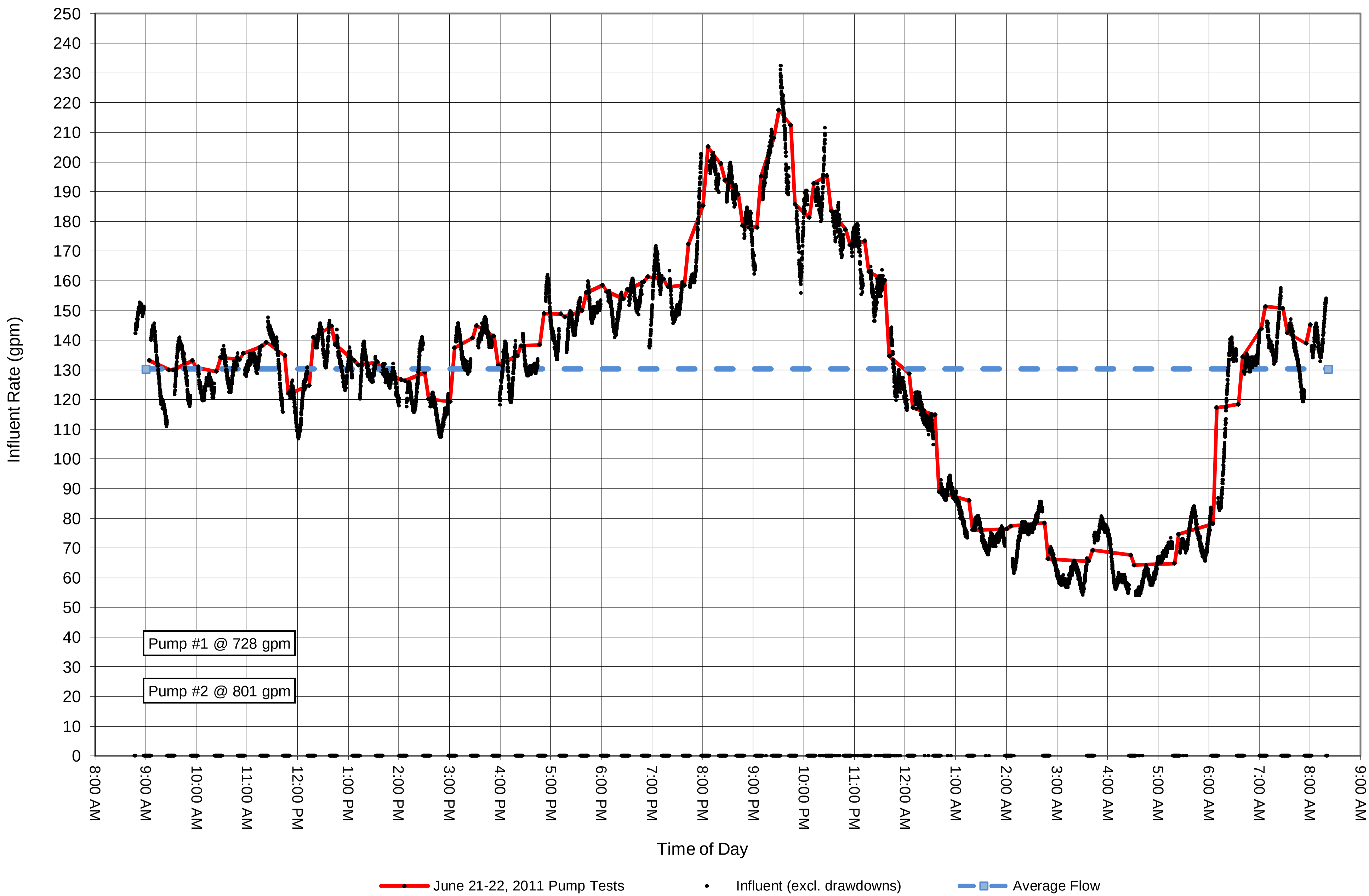


Test (#24) date & time: 6/24/11 3:51 AM

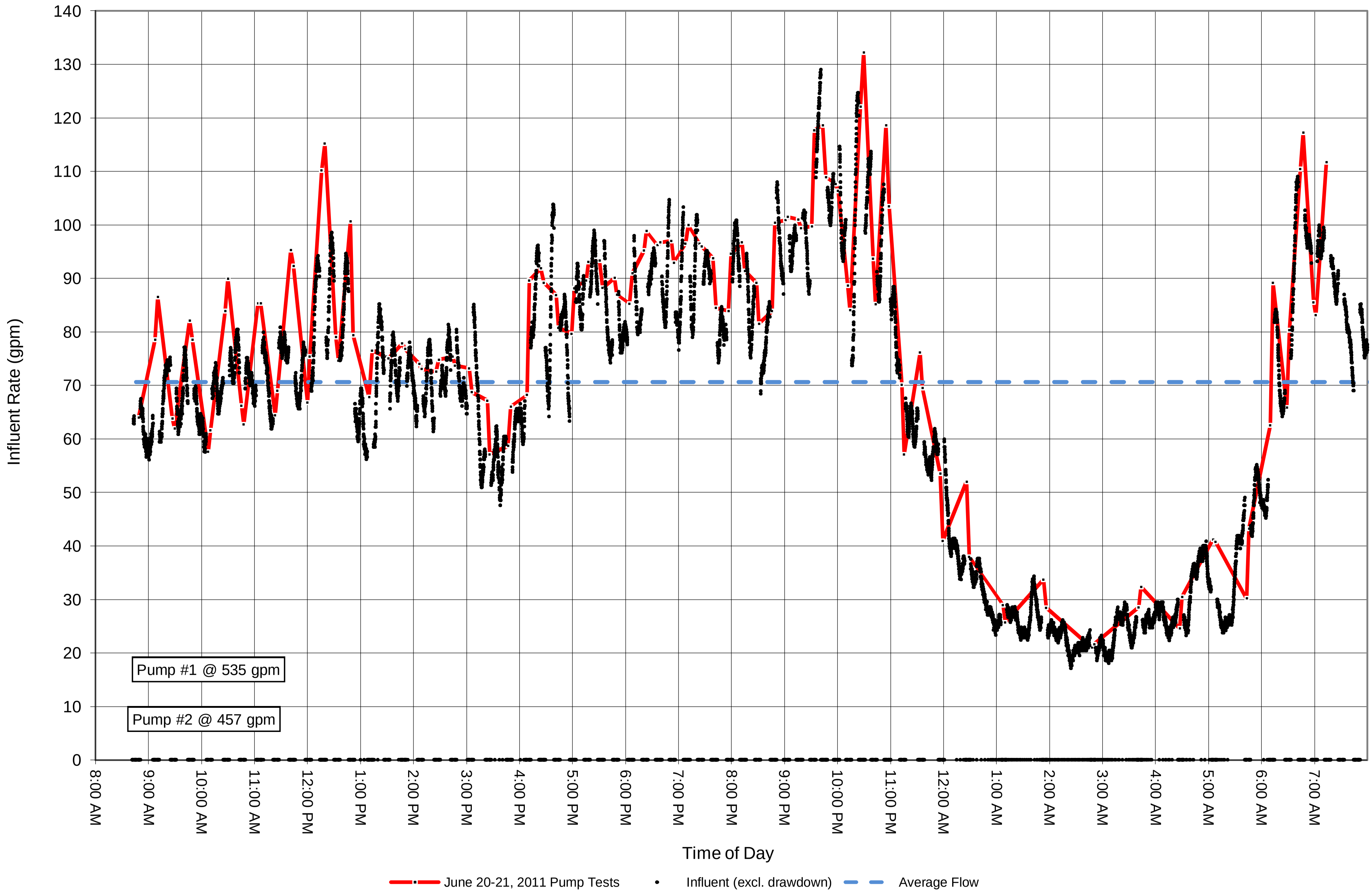
Notes: Low influent rate

Appendix D Lift Station Diurnal Curves

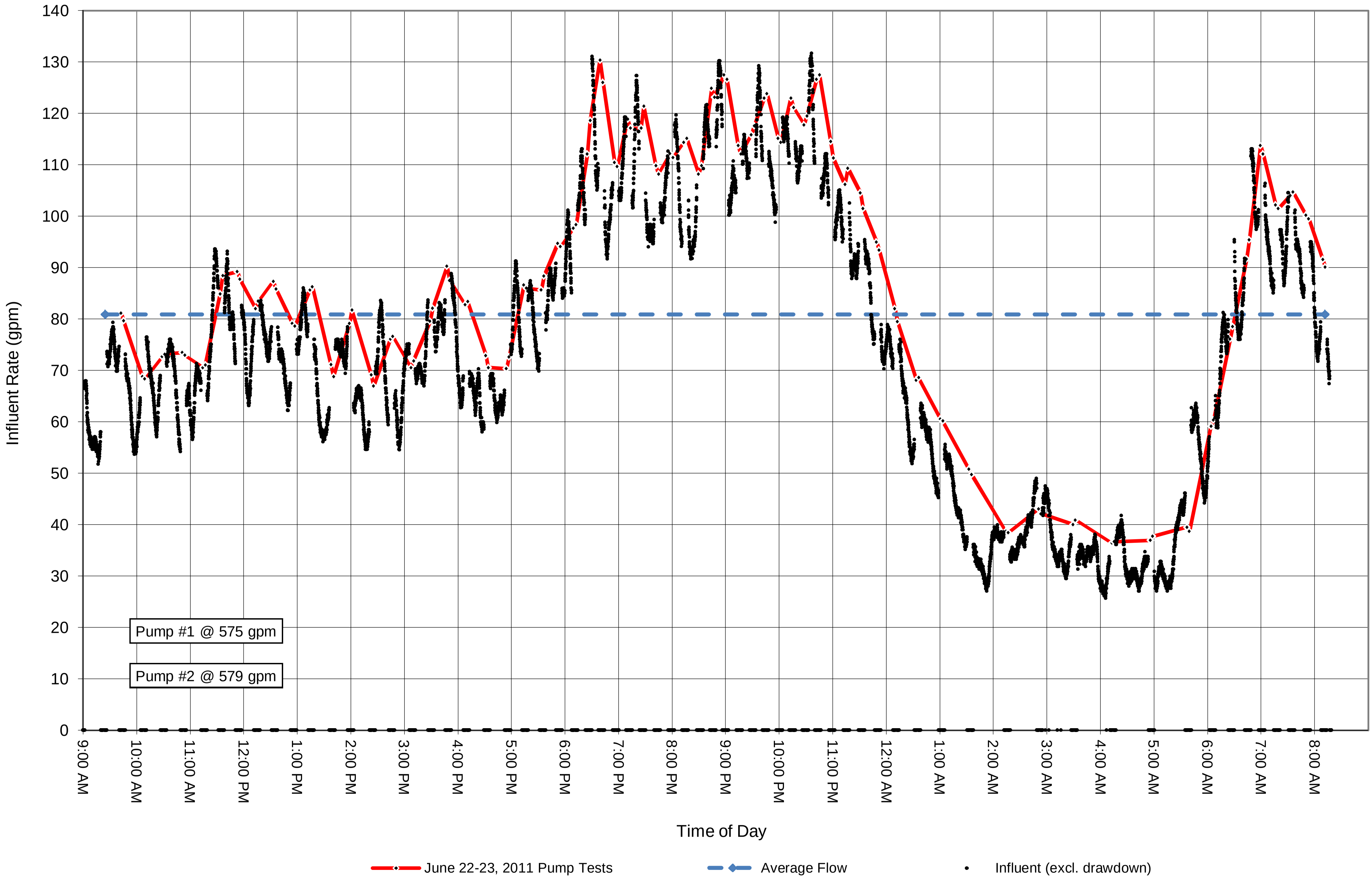
Enclave Lift Station Diurnal Curve



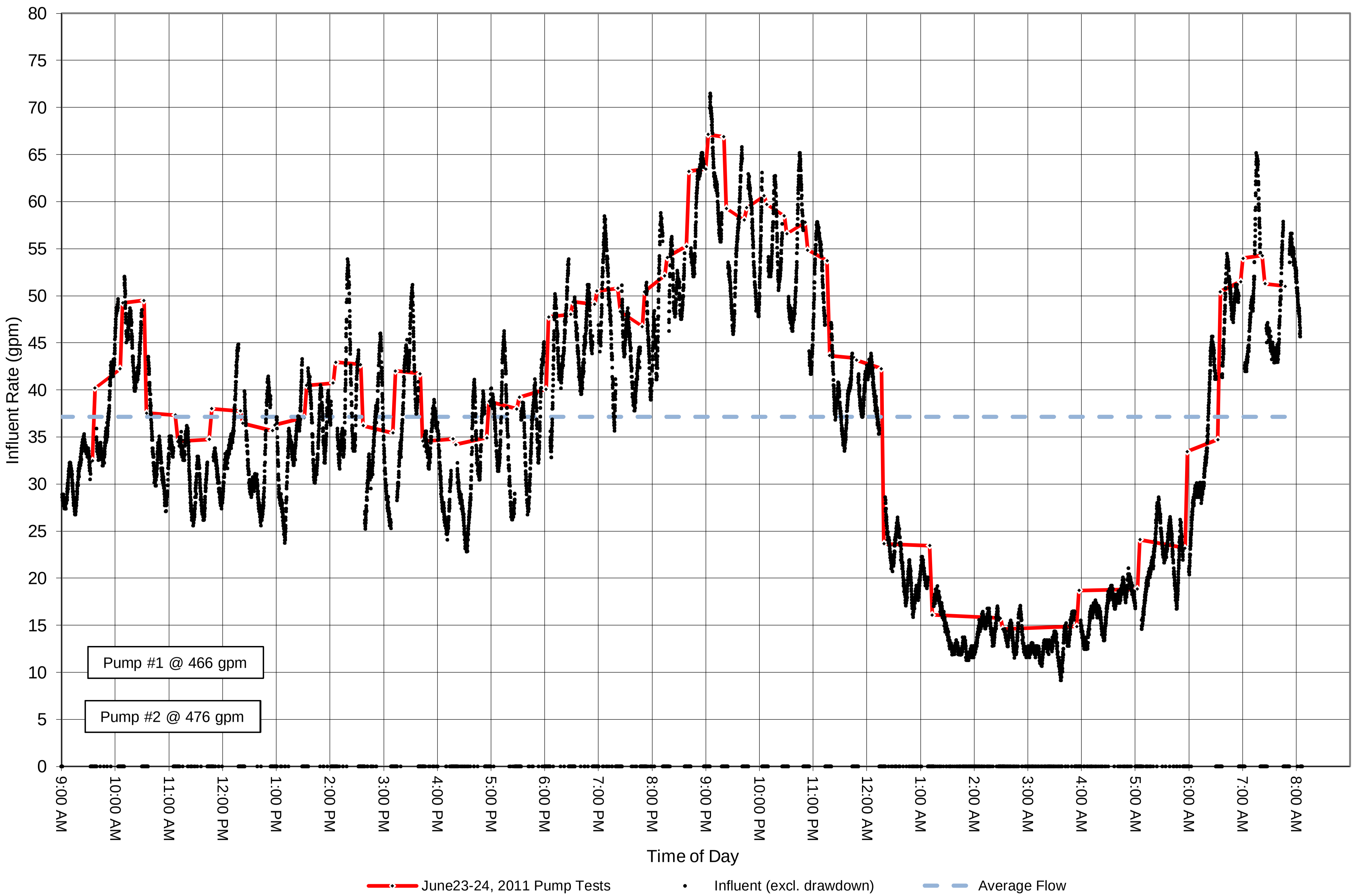
Lakeside Lift Station Diurnal Curve



Country Estates Lift Station Diurnal Curve



Creekside Diurnal Curve



Appendix E Capital Cost Estimates

Hutto Regional Wastewater Study Capital Cost Estimates

Assumptions

Costs are in 2012 dollars.
Treatment plant costs include Alum for Phosphorus removal and ultraviolet disinfection.
Wet sludge is trucked to Brushy Creek East Regional Wastewater Facility for dewatering and disposal by Brazos River Authority.
Costs for land acquisition and easements have not been included.
Costs for engineering and surveying have not been included.

Treatment Plant Costs

In Alternative 1, the existing Cottonwood Creek WWTP must be expanded to 1.95 mgd. The costs for that expansion are shown below.

Expansion of Cottonwood Creek WWTP to 1.95 mgd	
Demolition	$17,750.00
Lift station & influent piping	$205,120.00
Aeration basins	$171,840.00
New clarifier	$331,350.00
Alum feed system Plants 1 & 2	$90,690.00
Sludge holding tank improvements	$4,980.00
New chlorine contact tank	$52,800.00
Blowers	$219,055.00
Gas chlorination systems imprv.	$25,225.00
Electrical / Instrumentation	$49,750.00
Miscellaneous	$16,500.00
Total estimated costs	$1,185,060.00
Contingencies	$177,759.00
Total Estimated Construction Cost	**$1,362,819.00**

Costs above are based on the enhanced secondary activated sludge process, with fine bubble diffusers in the aeration tanks and alum feed. Included are a new clarifier and chlorine contact tank. Existing tankage will be used for aeration and sludge holding.

Depending on the alternative, the Cottonwood Creek WWTP will be expanded and the Lower Brushy Creek WWTP will be constructed in two separate phases of 2 mgd each. The tables below include the costs for the two phases at the two different plant sites.

HUTTO WASTWATER TREATMENT PLANT EXPANSION						
COTTONWOOD CREEK (EXISTING) SITE VS. LOWER BRUSHY CREEK (PROPOSED) SITE						
ENGINEER'S OPINION OF PROBABLE COST						
Assumptions: Alum precipitation for P removal; wet sludge trucked to Brushy Creek Regional plant for dewatering and disposal by BRA (i.e. no on-ste dewatering); UV disinfection						
PHASE 1 - 2 MGD						
			Alternative 2 Expansion at Existing Cottonwood Creek Site		**Alternative 3 Construction at Lower Brushy Creek Site**	
	Number Req'd	Units	Unit Cost	Total Construction Cost	Unit Cost	Total Construction Cost
Site Preparation & Infrastructure						
Existing Site						
Demolition	1	LS	$ 15,000	$ 15,000		
Move/construct buildings on City's Public Works site	1	LS	$ 50,000	$ 50,000		
Environment site surveys / assessments (due to former use as lagoon)	1	LS	$ 40,000	$ 40,000		
20' wiide roads at existing site	1600	LF	$ 120	$ 192,000		
Potable water line extensions (4")	600	LF	$ 40	$ 24,000		
36 " effluent outfall line (for 4 mgd / 16 mgd peak)	200	LF	$ 320	$ 64,000		
Fencing (solid wood for noise & asthetics)	900	LF	$ 20	$ 18,000		
Fencing (chain link security)	1300	LF	$ 10	$ 13,000		
Proposed Site						
Site clearing and grubbing	13	acres			$ 1,000	$ 13,000
20' wide road at new site	4000	LF			$ 120	$ 480,000
Bridge at new site	1	LS			$ 150,000	$ 150,000
4" potable water line	4000	LF			$ 40	$ 160,000
36" effluent outfall line (for 4 mgd / 16 mgd peak)	1300	LF			$ 280	$ 364,000
Fencing (chain link security)	2000	LF			$ 10	$ 20,000
Subtotal				$ 416,000		$ 1,187,000
On-Site Influent Lift Station						
Existing Site						
42" influent gravity sewer (on site)	375	LF	$ 336	$ 126,000		
16 mgd firm capacity LS (for Phases 1 and 2)	1	LS	$ 900,000	$ 900,000		
30" FM to splitter box at headworks	375	LF	$ 240	$ 90,000		
Proposed Site						
On-site influent lift station not required for Phase 1 (2 mgd); flow pumped directly to Headworks from off-site lift station (Enclave)						
18" FM (FM 1660 to splitter box at headworks) sized per KFA calcs for Phase 1	3600	LF			$ 155	$ 558,000
Subtotal				$ 1,116,000		$ 558,000
Preliminary Treatment (Headworks)						
Both Sites						
Splitter box	1	LS	$ 40,000	$ 40,000	$ 40,000	$ 40,000
Mechanical screening, washer, conveyor or auger	1	LS	$ 300,000	$ 300,000	$ 300,000	$ 300,000
Redundant manual bar screen	1	LS	$ 20,000	$ 20,000	$ 20,000	$ 20,000

HUTTO WASTWATER TREATMENT PLANT EXPANSION							
COTTONWOOD CREEK (EXISTING) SITE VS. LOWER BRUSHY CREEK (PROPOSED) SITE							
ENGINEER'S OPINION OF PROBABLE COST							
Assumptions: Alum precipitation for P removal; wet sludge trucked to Brushy Creek Regional plant for dewatering and disposal by BRA (i.e. no on-ste dewatering); UV disinfection							
PHASE 1 - 2 MGD							
			Alternative 2 Expansion at Existing Cottonwood Creek Site		**Alternative 3 Construction at Lower Brushy Creek Site**		
	Number Req'd	Units	Unit Cost	Total Construction Cost	Unit Cost	Total Construction Cost	
Grit chamber(s) with grit washer/auger	1	LS	$ 350,000	$ 350,000	$ 350,000	$ 350,000	
Splitter box or weir	1	LS	$ 30,000	$ 30,000	$ 30,000	$ 30,000	
Piping allowance	1	LS	$ 50,000	$ 50,000	$ 50,000	$ 50,000	
Subtotal				$ 790,000		$ 790,000	
Activated Sludge Treatment							
Both Sites							
Aeration tanks (90' x 35' x 20')	2	EA	$ 800,000	$ 1,600,000	$ 800,000	$ 1,600,000	
Blowers (3 with slab, shed roof & elec)	1	LS	$ 500,000	$ 500,000	$ 500,000	$ 500,000	
Clarifiers (66' diameter each)	2	EA	$ 375,000	$ 750,000	$ 375,000	$ 750,000	
RAS pumping station	1	LS	$ 200,000	$ 200,000	$ 200,000	$ 200,000	
Alum feed system	1	LS	$ 150,000	$ 150,000	$ 150,000	$ 150,000	
Existing Site							
Piping allowance	1	LS	$ 350,000	$ 350,000			
Proposed Site							
Piping allowance	1	LS			$ 300,000	$ 300,000	
Subtotal				$ 3,550,000		$ 3,500,000	
Solids Storage and Dewatering							
Both Sites							
Sludge holding tanks (30' x 35' x 20') with diffusers	2	EA	$ 200,000	$ 400,000	$ 200,000	$ 400,000	
Decanting mechanisms	2	EA	$ 25,000	$ 50,000	$ 25,000	$ 50,000	
Existing Site							
Piping allowance	1	LS	$ 70,000	$ 70,000			
Proposed Site							
Piping allowance	1	LS			$ 50,000	$ 50,000	
Subtotal				$ 520,000		$ 500,000	
Disinfection / Flow Measurment / Aeration (DO)							
Both Sites							
UV disinfection basin and system	1	LS	$ 600,000	$ 600,000	$ 600,000	$ 600,000	
Non-potable water supply system	1	LS	$ 40,000	$ 40,000	$ 40,000	$ 40,000	
Flume type flow measurment system	1	LS	$ 25,000	$ 25,000	$ 25,000	$ 25,000	
Cascade aeration structure	1	LS	$ 75,000	$ 75,000	$ 75,000	$ 75,000	
Piping allowance	1	LS	$ 60,000	$ 60,000	$ 60,000	$ 60,000	
Subtotal				$ 800,000		$ 800,000	
Odor Control Measures							
Both Sites							
RAS recyle to Lift Station during off-peak flows	1	LS	$ 50,000	$ 50,000	$ 40,000	$ 40,000	

HUTTO WASTWATER TREATMENT PLANT EXPANSION

COTTONWOOD CREEK (EXISTING) SITE VS. LOWER BRUSHY CREEK (PROPOSED) SITE

ENGINEER'S OPINION OF PROBABLE COST

Assumptions: Alum precipitation for P removal; wet sludge trucked to Brushy Creek Regional plant for dewatering and disposal by BRA (i.e. no on-ste dewatering); UV disinfection

PHASE 1 - 2 MGD

			Alternative 2 Expansion at Existing Cottonwood Creek Site		Alternative 3 Construction at Lower Brushy Creek Site	
	Number Req'd	Units	Unit Cost	Total Construction Cost	Unit Cost	Total Construction Cost
Existing Site						
Carbon adsorption system for odors from lift station, headworks and sludge holding tank	1	LS	$ 84,000	$ 84,000		
Ductwork allowance	1	LS	$ 38,000	$ 38,000		
Enclosure over sludge holding tanks	1	LS	$ 136,000	$ 136,000		
Proposed Site						
No additional measures (other than RAS recycle) are likely to be required due to increased setbacks (500')						
Subtotal				$ 308,000		$ 40,000
Electrical and Instrumentation						
Both Sites						
SCADA system / Instrumentation	1	LS	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Elec for Headworks	1	LS	$ 200,000	$ 200,000	$ 200,000	$ 200,000
Elec for blowers,clarifiers, RAS pumping, alum feed	1	LS	$ 600,000	$ 600,000	$ 600,000	$ 600,000
Elec for UV system & flow measurement	1	LS	$ 150,000	$ 150,000	$ 150,000	$ 150,000
Misc. site lighting, etc.	1	LS	$ 100,000	$ 100,000	$ 100,000	$ 100,000
Existing Site						
Expansion and extension of power	1	LS	$ 100,000	$ 100,000		
On site lift station	1	LS	$ 300,000	$ 300,000		
Odor control systems	1	LS	$ 60,000	$ 60,000		
Proposed Site						
Extension of power to new site	1	LS			$ 125,000	$ 125,000
Subtotal				$ 1,610,000		$ 1,275,000
Office/Lab/Restrooms						
Both Sites						
Metal building for office/lab/restrooms	1	LS	$ 150,000	$ 150,000	$ 150,000	$ 150,000
Subtotal				$ 150,000		$ 150,000
Total construction costs				$ 9,260,000		$ 8,800,000
Contingencies	20%			$ 1,852,000		$ 1,760,000
Total Construction Cost				**$ 11,112,000**		**$ 10,560,000**

HUTTO WASTWATER TREATMENT PLANT EXPANSION

COTTONWOOD CREEK (EXISTING) SITE VS. LOWER BRUSHY CREEK (PROPOSED) SITE

ENGINEER'S OPINION OF PROBABLE COST

Assumptions: Alum precipitation for P removal; wet sludge trucked to Brushy Creek Regional plant for dewatering and disposal by BRA (i.e. no on-ste dewatering); UV disinfection

PHASE 2 - 2 MGD Expansion

			Alternative 2 Expansion at Existing Cottonwood Creek Site		Alternative 3 Construction at Lower Brushy Creek Site	
	Number Req'd	Units	Unit Cost	Total Construction Cost	Unit Cost	Total Construction Cost
Site Preparation & Infrastructure						
Existing Site						
20' wide roads at existing site	500	LF	$ 120	$ 60,000		
Potable water line extensions (4")	200	LF	$ 40	$ 8,000		
Fencing (solid wood for noise & asthetics)	300	LF	$ 20	$ 6,000		
Fencing (chain link security)	200	LF	$ 10	$ 2,000		
Proposed Site						
20' wide road at new site	500	LF			$ 120	$ 60,000
4" potable water line	200	LF			$ 40	$ 8,000
Fencing (chain link security)	500	LF			$ 10	$ 5,000
Subtotal				$ 76,000		$ 73,000
On-Site Influent Lift Station						
Existing Site						
Extension of FM to Phase 2 headworks	1	LS	$ 50,000	$ 50,000		
Proposed Site						
Plug and abandon in place 18" force main (on site)	1	LS			$ 120	$ 120
42" influent gravity sewer (on site); sized for 4 mgd average/16 mgd peak	3600	LF			$ 336	$ 1,209,600
16 mgd firm capacity LS (for Phases 1 and 2)	1	LS			$ 900,000	$ 900,000
Subtotal				$ 50,000		$ 2,109,720
Preliminary Treatment (Headworks)						
Both Sites						
Mechanical screening, washer, conveyor or auger	1	LS	$ 300,000	$ 300,000	$ 300,000	$ 300,000
Redundant manual bar screen	1	LS	$ 20,000	$ 20,000	$ 20,000	$ 20,000
Grit chamber(s) with grit washer/auger	1	LS	$ 350,000	$ 350,000	$ 350,000	$ 350,000
Splitter box or weir	1	LS	$ 30,000	$ 30,000	$ 30,000	$ 30,000
Piping allowance	1	LS	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Subtotal				$ 750,000		$ 750,000
Activated Sludge Treatment						
Both Sites						
Aeration tanks (90' x 35' x 20')	2	EA	$ 800,000	$ 1,600,000	$ 800,000	$ 1,600,000
Blowers (3 with slab, shed roof & elec)	1	LS	$ 500,000	$ 500,000	$ 500,000	$ 500,000
Clarifiers (66' diameter each)	2	EA	$ 375,000	$ 750,000	$ 375,000	$ 750,000
RAS pumping station	1	LS	$ 200,000	$ 200,000	$ 200,000	$ 200,000

HUTTO WASTWATER TREATMENT PLANT EXPANSION

COTTONWOOD CREEK (EXISTING) SITE VS. LOWER BRUSHY CREEK (PROPOSED) SITE

ENGINEER'S OPINION OF PROBABLE COST

Assumptions: Alum precipitation for P removal; wet sludge trucked to Brushy Creek Regional plant for dewatering and disposal by BRA (i.e. no on-ste dewatering); UV disinfection

PHASE 2 - 2 MGD Expansion

	Number Req'd	Units	**Alternative 2 Expansion at Existing Cottonwood Creek Site** Unit Cost	Total Construction Cost	**Alternative 3 Construction at Lower Brushy Creek Site** Unit Cost	Total Construction Cost
Alum feed system	1	LS	$ 150,000	$ 150,000	$ 150,000	$ 150,000
Existing Site						
Piping allowance	1	LS	$ 350,000	$ 350,000		
Proposed Site						
Piping allowance	1	LS			$ 300,000	$ 300,000
Subtotal				$ 3,550,000		$ 3,500,000
Solids Storage and Dewatering						
Both Sites						
Sludge holding tanks (30' x 35' x 20') with diffusers	2	EA	$ 200,000	$ 400,000	$ 200,000	$ 400,000
Decanting mechanisms	2	EA	$ 25,000	$ 50,000	$ 25,000	$ 50,000
Existing Site						
Piping allowance	1	LS	$ 70,000	$ 70,000		
Proposed Site						
Piping allowance	1	LS			$ 50,000	$ 50,000
Subtotal				$ 520,000		$ 500,000
Disinfection / Flow Measurment / Aeration (DO)						
Both Sites						
UV disinfection basin and system	1	LS	$ 600,000	$ 600,000	$ 600,000	$ 600,000
Non-potable water supply system	1	LS	$ 40,000	$ 40,000	$ 40,000	$ 40,000
Flume type flow measurment system	1	LS	$ 25,000	$ 25,000	$ 25,000	$ 25,000
Cascade aeration structure	1	LS	$ 75,000	$ 75,000	$ 75,000	$ 75,000
Piping allowance	1	LS	$ 60,000	$ 60,000	$ 60,000	$ 60,000
Subtotal				$ 800,000		$ 800,000
Odor Control Measures						
Existing Site						
Carbon adsorption system for odors from headworks and sludge holding tank	1	LS	$ 50,000	$ 50,000		
Ductwork allowance	1	LS	$ 38,000	$ 38,000		
Enclosure over sludge holding tanks	1	LS	$ 136,000	$ 136,000		
Proposed Site						
No additional measures are likely to be required due to increased setbacks (500')						
Subtotal				$ 224,000		$ -
Electrical and Instrumentation						
Both Sites						

HUTTO WASTWATER TREATMENT PLANT EXPANSION

COTTONWOOD CREEK (EXISTING) SITE VS. LOWER BRUSHY CREEK (PROPOSED) SITE

ENGINEER'S OPINION OF PROBABLE COST

Assumptions: Alum precipitation for P removal; wet sludge trucked to Brushy Creek Regional plant for dewatering and disposal by BRA (i.e. no on-ste dewatering); UV disinfection

PHASE 2 - 2 MGD Expansion

			Alternative 2 Expansion at Existing Cottonwood Creek Site		Alternative 3 Construction at Lower Brushy Creek Site	
	Number Req'd	Units	Unit Cost	Total Construction Cost	Unit Cost	Total Construction Cost
SCADA system / Instrumentation	1	LS	$ 60,000	$ 60,000	$ 60,000	$ 60,000
Elec for Headworks	1	LS	$ 200,000	$ 200,000	$ 200,000	$ 200,000
Elec for blowers,clarifiers, RAS pumping, alum feed	1	LS	$ 600,000	$ 600,000	$ 600,000	$ 600,000
Elec for UV system & flow measurement	1	LS	$ 150,000	$ 150,000	$ 150,000	$ 150,000
Misc. site lighting, etc.	1	LS	$ 70,000	$ 70,000	$ 70,000	$ 70,000
<u>Existing Site</u>						
On site lift station - add pumps	1	LS	$ 300,000	$ 300,000		
Odor control systems	1	LS	$ 60,000	$ 60,000		
<u>Proposed Site</u>						
New on-site LS	1	LS			$ 300,000	$ 300,000
Subtotal				$ 1,440,000		$ 1,380,000
Office/Lab/Restrooms						
<u>Both Sites</u>						
Allowance for improvements and/or expansion	1	LS	$ 50,000	$ 50,000	$ 50,000	$ 50,000
Subtotal				$ 50,000		$ 50,000
Total construction costs				$ 7,460,000		$ 9,162,720
Contingencies	20%			$ 1,492,000		$ 1,832,544
Total Construction Cost				**$ 8,952,000**		**$ 10,995,264**

Lift Station Costs

A 20% contingency was added to the following lift station costs when they were included in the CIP lists in ***Section 9***. The costs below include a 15% contractor's mark-up.

Alternative 1 Lift Station Costs

Upgrade Enclave Lift Station to 1500 gpm (Discharging to Front Street Gravity Main)

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and install one 775 gpm pump	1	EA	$ 40,000	$ 40,000	$ 6,000	$ 20,000	$ 20,000	$ 66,000			$ 66,000
Electrical Upgrades	1	LS	$ 50,000	$ 50,000	$ 7,500		$ -	$ 57,500			$ 57,500
Subtotal				**$ 90,000**	**$ 13,500**		**$ 20,000**	**$ 123,500**			**$ 123,500**

Replace pumps in Enclave LS (4200 gpm) to discharge to Brushy Creek Force Main

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install three 2100 gpm pumps	3	EA	$ 60,000	$ 180,000	$ 27,000	$ 20,000	$ 60,000	$ 267,000			$ 267,000
Remove existing	1	LS	$ 10,000	$ 10,000	$ 1,500		$ -	$ 11,500			$ 11,500
Electrical equipment	1	LS	$175,000	$ 175,000	$ 26,250		$ -	$ 201,250			$ 201,250
Subtotal				**$ 365,000**	**$ 54,750**		**$ 60,000**	**$ 479,750**			**$ 479,750**

Construct Enclave Lift Station #2 (1400 gpm) to discharge to Pflugerville

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install two 1400 gpm pumps	2	EA	$ 70,000	$ 140,000	$ 21,000	$ 20,000	$ 40,000	$ 201,000			$ 201,000
(includes MCC with soft starts, control panel, small prefab building, and generator)	1	LS	$275,000	$ 275,000	$ 41,250		$ -	$ 316,250			$ 316,250
Excavation for lift station wet well	215	CY							$ 12	$ 2,580	$ 2,580
Concrete base slab for LS wet well	11	CY							$ 500	$ 5,500	$ 5,500
12 ft dia. reinforced concrete pipe for wet well	21	VF							$ 400	$ 8,400	$ 8,400
Cover slab	6	CY							$ 700	$ 4,200	$ 4,200
Influent piping into wet well	1	LS							$ 8,000	$ 8,000	$ 8,000
Excavation for valve vault	50	CY							$ 12	$ 600	$ 600
Precast valve vault	1	LS							$ 3,000	$ 3,000	$ 3,000
Subtotal				**$ 415,000**	**$ 62,250**		**$ 40,000**	**$ 517,250**		**$ 32,280**	**$ 549,530**

Construct Shiloh Lift Station (830 gpm) to discharge to 18" Brushy Creek Force Main

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install two 830 gpm pumps	2	EA	$ 70,000	$ 140,000	$ 21,000	$ 20,000	$ 40,000	$ 201,000			$ 201,000
Electrical equipment (includes MCC with soft starts, control panel, small prefab building, and generator)	1	LS	$ 275,000	$ 275,000	$ 41,250		$ -	$ 316,250			$ 316,250
Excavation for lift station wet well	215	CY							$ 12	$ 2,580	$ 2,580
Concrete base slab for LS wet well	11	CY							$ 500	$ 5,500	$ 5,500
12 ft dia. reinforced concrete pipe for wet well	21	VF							$ 400	$ 8,400	$ 8,400
Cover slab	6	CY							$ 700	$ 4,200	$ 4,200
Influent piping into wet well	1	LS							$ 8,000	$ 8,000	$ 8,000
Excavation for valve vault	50	CY							$ 12	$ 600	$ 600
Precast valve vault	1	LS							$ 3,000	$ 3,000	$ 3,000
Subtotal				**$ 415,000**	**$ 62,250**		**$ 40,000**	**$ 517,250**		**$ 32,280**	**$ 549,530**

Alternative 2 Lift Station Costs

Construct New Enclave Lift Station (1800 gpm) to discharge to Front Street Gravity Main

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install two 1800 gpm pumps	2	EA	$ 70,000	$ 140,000	$ 21,000	$ 20,000	$ 40,000	$ 201,000			$ 201,000
Electrical equipment (includes MCC with soft starts, control panel, small prefab building, and generator)	1	LS	$275,000	$ 275,000	$ 41,250		$ -	$ 316,250			$ 316,250
Excavation for lift station wet well	215	CY							$ 12	$ 2,580	$ 2,580
Concrete base slab for LS wet well	11	CY							$ 500	$ 5,500	$ 5,500
12 ft dia. reinforced concrete pipe for wet well	21	VF							$ 400	$ 8,400	$ 8,400
Cover slab	6	CY							$ 700	$ 4,200	$ 4,200
Influent piping into wet well	1	LS							$ 8,000	$ 8,000	$ 8,000
Excavation for valve vault	50	CY							$ 12	$ 600	$ 600
Precast valve vault	1	LS							$ 3,000	$ 3,000	$ 3,000
Subtotal				**$ 415,000**	**$ 62,250**		**$ 40,000**	**$ 517,250**		**$ 32,280**	**$ 549,530**

Add third pump to Enclave LS (3600 gpm) to discharge to Front Street Gravity Main

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install one 2350 gpm pump	1	EA	$ 60,000	$ 60,000	$ 9,000	$ 20,000	$ 20,000	$ 89,000			$ 89,000
Electrical equipment	1	LS	$ 50,000	$ 50,000	$ 7,500		$ -	$ 57,500			$ 57,500
Subtotal				**$ 110,000**	**$ 16,500**		**$ 20,000**	**$ 146,500**			**$ 146,500**

Replace pump in Enclave LS (4150 gpm) to discharge to Front Street Gravity Main

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install one 2350 gpm pumps	1	EA	$ 60,000	$ 60,000	$ 9,000	$ 20,000	$ 20,000	$ 89,000			$ 89,000
Remove existing pump	1	LS	$ 10,000	$ 10,000	$ 1,500		$ -	$ 11,500			$ 11,500
Subtotal				**$ 70,000**	**$ 10,500**		**$ 20,000**	**$ 100,500**			**$ 100,500**

Replace pump in Enclave LS (4700 gpm) to discharge to Front Street Gravity Main

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install one 2350 gpm pumps	1	EA	$ 60,000	$ 60,000	$ 9,000	$ 20,000	$ 20,000	$ 89,000			$ 89,000
Remove existing pump	1	LS	$ 10,000	$ 10,000	$ 1,500		$ -	$ 11,500			$ 11,500
Subtotal				**$ 70,000**	**$ 10,500**		**$ 20,000**	**$ 100,500**			**$ 100,500**

Add third pump to Glenwood LS (2200 gpm) to discharge to Existing WWTP

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install one 1100 gpm pump	1	EA	$ 60,000	$ 60,000	$ 9,000	$ 20,000	$ 20,000	$ 89,000			$ 89,000
Subtotal				**$ 60,000**	**$ 9,000**		**$ 20,000**	**$ 89,000**			**$ 89,000**

Construct New Brushy Creek Lift Station (830 gpm) to discharge to Existing Plant

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install two 830 gpm pumps	2	EA	$ 70,000	$ 140,000	$ 21,000	$ 20,000	$ 40,000	$ 201,000			$ 201,000
Electrical equipment (includes MCC with soft starts, control panel, small prefab building, and generator)	1	LS	$275,000	$ 275,000	$ 41,250		$ -	$ 316,250			$ 316,250
Excavation for lift station wet well	215	CY							$ 12	$ 2,580	$ 2,580
Concrete base slab for LS wet well	11	CY							$ 500	$ 5,500	$ 5,500
12 ft dia. reinforced concrete pipe for wet well	21	VF							$ 400	$ 8,400	$ 8,400
Cover slab	6	CY							$ 700	$ 4,200	$ 4,200
Influent piping into wet well	1	LS							$ 8,000	$ 8,000	$ 8,000
Excavation for valve vault	50	CY							$ 12	$ 600	$ 600
Precast valve vault	1	LS							$ 3,000	$ 3,000	$ 3,000
Subtotal				**$ 415,000**	**$ 62,250**		**$ 40,000**	**$ 517,250**		**$ 32,280**	**$ 549,530**

Alternative 3 Lift Station Costs

Replace pumps in Enclave LS (4200 gpm) to discharge to Brushy Creek Force Main

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install three 2100 gpm pumps	3	EA	$ 60,000	$ 180,000	$ 27,000	$ 20,000	$ 60,000	$ 267,000			$ 267,000
Remove existing	1	LS	$ 10,000	$ 10,000	$ 1,500		$ -	$ 11,500			$ 11,500
Electrical equipment	1	LS	$175,000	$ 175,000	$ 26,250		$ -	$ 201,250			$ 201,250
Subtotal				**$ 365,000**	**$ 54,750**		**$ 60,000**	**$ 479,750**			**$ 479,750**

Construct Shiloh Lift Station (830 gpm) to discharge to 18" Brushy Creek Force Main

	Number Req'd	Units	Unit Equip. Cost	Total Equipment Cost	Contractor's Markup	Unit Installation Cost	Total Installation Cost	Total Equip + Mark-up + Installation	Unit Civil / Structural / Electrical Construction Cost	Total Civil / Structural / Electrical Construction Cost	Total Equip. Costs plus Site Construction Costs
Furnish and Install two 830 gpm pumps	2	EA	$ 70,000	$ 140,000	$ 21,000	$ 20,000	$ 40,000	$ 201,000			$ 201,000
Electrical equipment (includes MCC with soft starts, control panel, small prefab building, and generator)	1	LS	$ 275,000	$ 275,000	$ 41,250		$ -	$ 316,250			$ 316,250
Excavation for lift station wet well	215	CY							$ 12	$ 2,580	$ 2,580
Concrete base slab for LS wet well	11	CY							$ 500	$ 5,500	$ 5,500
12 ft dia. reinforced concrete pipe for wet well	21	VF							$ 400	$ 8,400	$ 8,400
Cover slab	6	CY							$ 700	$ 4,200	$ 4,200
Influent piping into wet well	1	LS							$ 8,000	$ 8,000	$ 8,000
Excavation for valve vault	50	CY							$ 12	$ 600	$ 600
Precast valve vault	1	LS							$ 3,000	$ 3,000	$ 3,000
Subtotal				**$ 415,000**	**$ 62,250**		**$ 40,000**	**$ 517,250**		**$ 32,280**	**$ 549,530**

Pipeline Costs

Unit costs for pipelines were based on recent construction bids in the area. The following tables identify the unit costs used for each pipe diameter. A 20% contingency is included in the costs in the tables below. The unit cost for the Central Hutto GM Seg. 4 in all three alternatives was doubled because of the relatively short length of the project.

WW Gravity Main

Size (inch)	Cost/LF
10	$80
12	$96
15	$120
18	$144
21	$168
24	$192
27	$216
42	$336
48	$384
54	$432

WW Force Main

Size (inch)	Cost/LF
10	$85
15	$130
16	$140
18	$155

Alternative 1 Pipeline Costs

Gravity Main Pipe Projects					
Year	Project	Size/Capacity	Length (LF)	Unit Cost	Total Cost
2012	Interceptor from Hwy 79 to Cottonwood Creek WWTP	24	2,000	$192	$460,800
2012	Front St. Gravity Main (Seg 2)	27	415	$216	$107,568
2012	Brushy Creek Interceptor Seg. 4	42	2,370	$336	$955,584
2012	Carmel Creek Interceptor Seg. 1	42	1,500	$336	$604,800
2012	Carmel Creek Interceptor Seg. 2	24	3,300	$192	$760,320
2018	Lakeside Gravity Main	12	1,800	$96	$207,360
2020	Carmel Creek Interceptor Seg. 3	21	8,250	$168	$1,663,200
2015	Avery Lake GM Seg. 1	24	6,300	$192	$1,451,520
2015	Avery Lake GM Seg. 2	21	4,200	$168	$846,720
2015	Avery Lake GM Seg. 3	18	5,550	$144	$959,040
2020	N. Cottonwood Creek GM Seg. 1	21	4,050	$168	$816,480
2020	N. Cottonwood Creek GM Seg. 2	21	4,350	$168	$876,960
2020	N. Cottonwood Creek GM Seg. 3	18	2,700	$144	$466,560
2027	Brushy Creek Interceptor Seg. 1	42	5,478	$336	$2,208,730
2027	Brushy Creek Interceptor Seg. 2	42	7,426	$336	$2,994,163
2027	Brushy Creek Interceptor Seg. 3	42	1,183	$336	$476,986
2030	Glenwood Gravity Main	21	2,111	$168	$425,578
2030	Country Estates Gravity Main	10	1,468	$80	$140,928
2030	S. Cottonwood Creek GM Seg. 1	18	4,200	$144	$725,760
2030	S. Cottonwood Creek GM Seg. 2	12	3,450	$96	$397,440
2030	Central Hutto GM Seg. 4	10	80	$160	$15,360
	Totals - Gravity Main Projects				$17,561,856

Force Main Pipe Projects					
Year	Project	Size/Capacity	Length (LF)	Unit Cost	Total Cost
2012	Force Main from Enclave LS 2 to Pflugerville	10	17,000	$85	$1,734,000
2018	Shiloh Force Main	8	2,500	$70	$210,000
2018	Brushy Creek Force Main	18	14,087	$155	$2,620,182
	Totals - Force Main Projects				$4,564,182

Alternative 2 Pipeline Costs

Gravity Main Pipe Projects					
Year	Project	Size/Capacity	Length (LF)	Unit Cost	Total Cost
2012	Interceptor from Highway 79 to Cottonwood Creek WWTP	24	2,000	$192	$460,800
2012	Brushy Creek Interceptor Seg. 4	42	2,370	$336	$955,584
2012	Carmel Creek Interceptor Seg. 1	42	1,500	$336	$604,800
2012	Carmel Creek Interceptor Seg. 2	24	3,300	$192	$760,320
2018	Lakeside Gravity Main	12	1,800	$96	$207,360
2020	Carmel Creek Interceptor Seg. 3	21	8,250	$168	$1,663,200
2015	Avery Lake GM Seg. 1	24	6,300	$192	$1,451,520
2015	Avery Lake GM Seg. 2	21	4,200	$168	$846,720
2015	Avery Lake GM Seg. 3	18	5,550	$144	$959,040
2020	N. Cottonwood Creek GM Seg. 1	21	4,050	$168	$816,480
2020	N. Cottonwood Creek GM Seg. 2	21	4,350	$168	$876,960
2020	N. Cottonwood Creek GM Seg. 3	18	2,700	$144	$466,560
2024	Brushy Creek Interceptor Seg. 1	42	5,478	$336	$2,208,730
2024	Brushy Creek Interceptor Seg. 2	42	7,426	$336	$2,994,163
2024	Brushy Creek Interceptor Seg. 3	42	1,183	$336	$476,986
2025	Glenwood Gravity Main	21	2,111	$168	$425,578
2025	Country Estates Gravity Main	10	1,468	$80	$140,928
2025	S. Cottonwood Creek GM Seg. 1	18	4,200	$144	$725,760
2025	S. Cottonwood Creek GM Seg. 2	12	3,450	$96	$397,440
2030	Central Hutto GM Seg. 4	10	80	$160	$15,360
	Totals				**$17,454,288**

Force Main Pipe Projects					
Year	Project	Size/Capacity	Length (LF)	Unit Cost	Total Cost
2013	Brushy Creek Force Main	18	14,087	$155	$2,620,182
2015	Shiloh Force Main	8	2,500	$70	$210,000
	Totals				**$2,830,182**

Alternative 3 Pipeline Costs

Gravity Main Pipe Projects					
Year	Project	Size/Capacity	Length (LF)	Unit Cost	Total Cost
2012	Interceptor from Highway 79 to Cottonwood Creek WWTP	36	2,000	$288	$691,200
2013	Front Street Gravity Main	24	2,900	$155	$539,400
2012	Brushy Creek Interceptor Seg. 4	42	2,370	$336	$955,584
2012	Carmel Creek Interceptor Seg. 1	42	1,500	$336	$604,800
2012	Carmel Creek Interceptor Seg. 2	24	3,300	$192	$760,320
2018	Lakeside Gravity Main	12	1,800	$96	$207,360
2020	Carmel Creek Interceptor Seg. 3	21	8,250	$168	$1,663,200
2020	Avery Lake GM Seg. 1	24	6,300	$192	$1,451,520
2020	Avery Lake GM Seg. 2	21	4,200	$168	$846,720
2020	Avery Lake GM Seg. 3	18	5,550	$144	$959,040
2020	N. Cottonwood Creek GM Seg. 1	21	4,050	$168	$816,480
2020	N. Cottonwood Creek GM Seg. 2	21	4,350	$168	$876,960
2020	N. Cottonwood Creek GM Seg. 3	18	2,700	$144	$466,560
2025	S. Cottonwood Creek GM Seg. 1	18	4,200	$144	$725,760
2025	S. Cottonwood Creek GM Seg. 2	12	3,450	$96	$397,440
2030	Central Hutto GM Seg. 4	10	80	$160	$15,360
		Totals			$11,977,704

Force Main Pipe Projects					
Year	Project	Size/Capacity	Length (LF)	Unit Cost	Total Cost
2015	Brushy Creek FM	8	23,300	$70	$1,957,200
2016	New Enclave FM to Front Street GM	18	8,630	$155	$1,605,180
		Totals			$3,562,380

Appendix F Net Present Value Analysis

Net Present Value Analysis

The net present value analysis included the capital costs and operational and maintenance costs. The capital costs came from the cost estimates included in Appendix C. Operational and maintenance costs included the costs for the treatment plants, energy costs to power the lift stations, maintenance and cleaning costs for the lift stations, and line cleaning costs.

Hutto provided information on the routine maintenance of the lift stations, including the amount of time that crew leaders and utility operator must spend to maintain each lift station. The hourly rate of the crew leader is $26.84 while the hourly rate of a utility operator is $20.76. The following table shows the time and cost for each lift station. It was assumed that the proposed Brushy Creek lift station would have the same maintenance costs as the majority of the other lift stations.

Routine Monthly Maintenance				
Lift Station	Leader	Oper	Cost/Mo.	Cost/Year
Enclave	4	4	$190.38	$2,284.61
Country Estates	4	4	$190.38	$2,284.61
Creekside	4	4	$190.38	$2,284.61
Glenwood	8	8	$380.77	$4,569.22
Lakeside	8	8	$380.77	$4,569.22
Brushy Creek	4	4	$190.38	$2,284.61

Hutto cleans 4 lift stations per month for an average cost of $1,600. It was assumed that if more than 4 lift stations were in service for a given month, then only 4 lift stations would be cleaned that specific month. If 4 lift stations or less were in service for a given month, then it was assumed that each lift station was cleaned once a month at a cost of $400 per lift station.

The routine monthly maintenance costs also included approximately $10,000 per year per lift station for repairs and overhaul work.

It was assumed that the total length of new gravity main gets cleaned and TV'ed once every five years at a cost of $6 per linear foot.

Hutto pays $0.147 per kilowatt hour for electricity.

Energy costs for the three alternatives are included on the following three pages.

ADWF= 75 Gal/Person/Day
Efficiency 70%
Elec Cost $0.15 per kilowatt hour

Alternative 1 - 0.5 MGD from Enclave LS Treated by Pflugerville

Year	Enclave Lift Station #1				Enclave Lift Station #2				Country Estates Lift Station				Creekside Lift Station				Glenwood Lift Station				Shiloh Lift Station				Lakeside Lift Station				Total System		
	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Energy Used (kwh/day)	Daily Cost	Yearly Cost
2010	3,093	161	3.34	2.49		0	0.00	0.00	1,508	79	1.05	0.78	1,097	57	0.43	0.32	4,284	223	3.82	2.85	0	0	0.00	0.00	956	50	1.26	0.94	176.98	$26.02	$9,495.95
2015	8,602	101	2.09	1.56		347	17.41	12.99	1,788	93	1.24	0.93	1,097	57	0.43	0.32	5,488	286	4.89	3.65	0	0	0.00	0.00	968	50	1.27	0.95	489.29	$71.93	$26,252.74
2020	15,574	811	4.68	3.49		0	0.00	0.00	1,984	103	1.38	1.03	1,097	57	0.43	0.32	5,885	306	5.24	3.91	1,385	72	1.27	0.95	0	0	0.00	0.00	232.82	$34.22	$12,491.95
2025	20,923	1,090	6.29	4.69		0	0.00	0.00	1,984	103	1.38	1.03	1,097	57	0.43	0.32	7,055	367	6.28	4.69	1,980	103	1.82	1.36	0	0	0.00	0.00	290.09	$42.64	$15,564.54
2030	0	0	0.00	0.00		0	0.00	0.00	0	0	0.00	0.00	1,097	57	0.43	0.32	0	0	0.00	0.00	2,778	145	2.56	1.91	0	0	0.00	0.00	53.49	$7.86	$2,869.83
2035	0	0	0.00	0.00		0	0.00	0.00	0	0	0.00	0.00	1,097	57	0.43	0.32	0	0	0.00	0.00	3,401	177	3.13	2.34	0	0	0.00	0.00	63.76	$9.37	$3,421.06
2040	0	0	0.00	0.00		0	0.00	0.00	0	0	0.00	0.00	1,097	57	0.43	0.32	0	0	0.00	0.00	3,877	202	3.57	2.66	0	0	0.00	0.00	71.60	$10.52	$3,841.46

Enclave Lift Station #1			Enclave Lift Station #2			Country Estates Lift Station			Creekside Lift Station			Glenwood Lift Station			Shiloh Lift Station			Lakeside Lift Station		
Pump Off elev	583.000		Pump Off elev	583.000		Pump Off elev	603.500		Pump Off elev	614.500		Pump Off elev	585.600		Pump Off elev	585.000		Pump Off elev	652.000	
FM Disch elev	640.420		FM Disch elev	722.000		FM Disch elev	640.420		FM Disch elev	635.350		FM Disch elev	633.000		FM Disch elev	634.000		FM Disch elev	722.000	
Head =	57	feet	**Head =**	139	feet	**Head =**	37	feet	**Head =**	21	feet	**Head =**	47	feet	**Head =**	49	feet	**Head =**	70	feet
Pump Off elev	583.000																			
FM Disch elev	599.000																			
Head =	16	feet																		

Pop	**Enclave North**	**Enclave South**	**Carmel Creek**	**Avery Lake**	**Lakeside**	**Country Estates**	**Creekside**	**Glenwood**	**South Cottonwood**	**Brushy Creek**
2010	**1,302**	**1,791**	**0**	**0**	**956**	**1,508**	**1,097**	**4,284**	**0**	**0**
2015	**1,543**	**2,093**	**997**	**3,970**	**968**	**1,788**	**1,097**	**4,284**	**1,564**	**650**
2020	**1,784**	**2,547**	**2,082**	**7,425**	**1,737**	**1,984**	**1,097**	**4,284**	**2,079**	**907**
2025	**2,069**	**3,053**	**2,931**	**10,430**	**2,440**	**1,984**	**1,097**	**4,284**	**3,599**	**1,152**
2030	**2,355**	**3,482**	**3,379**	**11,714**	**2,824**	**1,984**	**1,097**	**4,284**	**5,577**	**1,495**
2035	**2,672**	**3,946**	**3,713**	**12,267**	**3,182**	**1,984**	**1,097**	**4,284**	**7,005**	**1,790**
2040	**2,990**	**4,406**	**3,987**	**12,791**	**3,521**	**1,984**	**1,097**	**4,284**	**7,897**	**2,060**

Lakeside flow to Enclave in 2020

77% of S. Cottonwood goes to Glenwood, 23% goes to Brushy Creek

Assumptions

1. Flow from Brushy Creek Sewershed begins in 2020 and flows directly to LBCWWTP.
2. Pumps run 24 hours per day.
3. A portion of flow (0.5 mgd) from Enclave LS will be pumped to Pflugerville for treatment beginning in 2014. The remainder of flow will go to the Front Street Gravity Main until the Brushy Creek Interceptor is built.
4. The Brushy Creek Interceptor will be in service in 2030
5. The force main from Enclave LS to Pflugerville discharges at the same location as the Lakeside force main.

ADWF= 75 Gal/Person/Day
Efficiency 70%
Elec Cost $0.15 per kilowatt hour

Alternative 2 - Expand Existing Cottonwood Creek Wastewater Treatment Plant

	Enclave Lift Station				Country Estates Lift Station				Creekside Lift Station				Glenwood Lift Station				Lakeside Lift Station				Brushy Creek Lift Station				Total System		
Year	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Energy Used (kwh/day)	Daily Cost	Yearly Cost
2010	3,093	161	3.34	2.49	1,508	79	1.05	0.78	1,097	57	0.43	0.32	4,284	223	3.82	2.85	956	50	1.26	0.94	0	0	0.00	0.00	176.98	$26.02	$9,495.95
2015	8,602	448	9.28	6.92	1,788	93	1.24	0.93	1,097	57	0.43	0.32	5,488	286	4.89	3.65	968	50	1.27	0.95	1,009	53	0.93	0.69	322.98	$47.48	$17,329.60
2020	15,574	811	16.80	12.53	1,984	103	1.38	1.03	1,097	57	0.43	0.32	5,885	306	5.24	3.91	0	0	0.00	0.00	1,385	72	1.27	0.95	449.83	$66.12	$24,135.36
2025	20,923	1,090	22.57	16.84	1,984	103	1.38	1.03	1,097	57	0.43	0.32	7,055	367	6.28	4.69	0	0	0.00	0.00	1,980	103	1.82	1.36	581.62	$85.50	$31,206.70
2030	23,753	1,237	25.63	19.12	1,984	103	1.38	1.03	1,097	57	0.43	0.32	8,578	447	7.64	5.70	0	0	0.00	0.00	2,778	145	2.56	1.91	673.74	$99.04	$36,149.46
2035	25,780	1,343	27.81	20.75	1,984	103	1.38	1.03	1,097	57	0.43	0.32	9,678	504	8.62	6.43	0	0	0.00	0.00	3,401	177	3.13	2.34	740.69	$108.88	$39,741.90
2040	27,695	1,442	29.88	22.29	1,984	103	1.38	1.03	1,097	57	0.43	0.32	10,365	540	9.23	6.89	0	0	0.00	0.00	3,877	202	3.57	2.66	796.48	$117.08	$42,734.89
	Pump Off elev	583.000			Pump Off elev	603.500			Pump Off elev	614.500			Pump Off elev	585.600			Pump Off elev	652.000			Pump Off elev	585.000					
	FM Disch elev	640.420			FM Disch elev	640.420			FM Disch elev	635.350			FM Disch elev	633.000			FM Disch elev	722.000			FM Disch elev	634.000					
	Head =	57	feet		**Head =**	37	feet		**Head =**	21	feet		**Head =**	47	feet		**Head =**	70	feet		**Head =**	49	feet				

Pop	Enclave North	Enclave South	Carmel Creek	Avery Lake	Lakeside	Country Estates	Creekside	Glenwood	South Cottonwood	Brushy Creek
2010	1,302	1,791	0	0	956	1,508	1,097	4,284	0	0
2015	1,543	2,093	997	3,970	968	1,788	1,097	4,284	1,564	650
2020	1,784	2,547	2,082	7,425	1,737	1,984	1,097	4,284	2,079	907
2025	2,069	3,053	2,931	10,430	2,440	1,984	1,097	4,284	3,599	1,152
2030	2,355	3,482	3,379	11,714	2,824	1,984	1,097	4,284	5,577	1,495
2035	2,672	3,946	3,713	12,267	3,182	1,984	1,097	4,284	7,005	1,790
2040	2,990	4,406	3,987	12,791	3,521	1,984	1,097	4,284	7,897	2,060

Lakeside flow to Enclave in 2020

77% of S. Cottonwood goes to Glenwood, 23% goes to Brushy Creek

Assumptions

1. Flow from Brushy Creek Sewershed begins in 2015.
2. Pumps run 24 hours per day.

ADWF= 75 Gal/Person/Day
Efficiency 70%
Elec Cost $0.15 per kilowatt hour

Alternative 3 - Construct Proposed Lower Brushy Creek Wastewater Treatment Plant

Year	Enclave Lift Station				Country Estates Lift Station				Creekside Lift Station				Glenwood Lift Station				Lakeside Lift Station				Shiloh Lift Station				Total System		
	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Pop	ADWF (gpm)	hp	KW	Energy Used (kwh/day)	Daily Cost	Yearly Cost
2010	3,093	161	3.34	2.49	1,508	79	1.05	0.78	1,097	57	0.43	0.32	4,284	223	3.82	2.85	956	50	1.26	0.94	0	0	0.00	0.00	176.98	$26.02	$9,495.95
2015	8,602	448	2.59	1.93	1,788	93	1.24	0.93	1,097	57	0.43	0.32	5,488	286	4.89	3.65	968	50	1.27	0.95	1,009	53	0.93	0.69	203.13	$29.86	$10,898.88
2020	15,574	811	4.68	3.49	1,984	103	1.38	1.03	1,097	57	0.43	0.32	5,885	306	5.24	3.91	0	0	0.00	0.00	1,385	72	1.27	0.95	232.82	$34.22	$12,491.95
2025	20,923	1,090	6.29	4.69	1,984	103	1.38	1.03	1,097	57	0.43	0.32	7,055	367	6.28	4.69	0	0	0.00	0.00	1,980	103	1.82	1.36	290.09	$42.64	$15,564.54
2030	0	0	0.00	0.00	0	0	0.00	0.00	1,097	57	0.43	0.32	0	0	0.00	0.00	0	0	0.00	0.00	2,778	145	2.56	1.91	53.49	$7.86	$2,869.83
2035	0	0	0.00	0.00	0	0	0.00	0.00	1,097	57	0.43	0.32	0	0	0.00	0.00	0	0	0.00	0.00	3,401	177	3.13	2.34	63.76	$9.37	$3,421.06
2040	0	0	0.00	0.00	0	0	0.00	0.00	1,097	57	0.43	0.32	0	0	0.00	0.00	0	0	0.00	0.00	3,877	202	3.57	2.66	71.60	$10.52	$3,841.46

Station	Pump Off elev	FM Disch elev	Head =
Enclave	583.000	640.420	57 feet
Enclave	583.000	599.000	16 feet
Country Estates	603.500	640.420	37 feet
Creekside	614.500	635.350	21 feet
Glenwood	585.600	633.000	47 feet
Lakeside	652.000	722.000	70 feet
Shiloh	585.000	634.000	49 feet

Pop	**Enclave North**	**Enclave South**	**Carmel Creek**	**Avery Lake**	**Lakeside**	**Country Estates**	**Creekside**	**Glenwood**	**South Cottonwood**	**Brushy Creek**
2010	**1,302**	**1,791**	**0**	**0**	**956**	**1,508**	**1,097**	**4,284**	**0**	**0**
2015	**1,543**	**2,093**	**997**	**3,970**	**968**	**1,788**	**1,097**	**4,284**	**1,564**	**650**
2020	**1,784**	**2,547**	**2,082**	**7,425**	**1,737**	**1,984**	**1,097**	**4,284**	**2,079**	**907**
2025	**2,069**	**3,053**	**2,931**	**10,430**	**2,440**	**1,984**	**1,097**	**4,284**	**3,599**	**1,152**
2030	**2,355**	**3,482**	**3,379**	**11,714**	**2,824**	**1,984**	**1,097**	**4,284**	**5,577**	**1,495**
2035	**2,672**	**3,946**	**3,713**	**12,267**	**3,182**	**1,984**	**1,097**	**4,284**	**7,005**	**1,790**
2040	**2,990**	**4,406**	**3,987**	**12,791**	**3,521**	**1,984**	**1,097**	**4,284**	**7,897**	**2,060**

Lakeside flow to Enclave in 2020

77% of S. Cottonwood goes to Glenwood, 23% goes to directly to LBCWWTF

Assumptions

1. Flow from Brushy Creek Sewershed begins in 2015 and goes directly to LBCWWTP.
2. Pumps run 24 hours per day.
3. Enclave LS pumps to Front Street Gravity Main until 2015. At that point, it will pump into the Brushy Creek Force Main.
4. The Brushy Creek Interceptor will be in service in 2025.

Alternative 1 - Sending Flow to Pflugerville

	Routine Maintenance (Yearly Cost per LS)							Cleaning	Other		
	Enclave LS 1	Enclave LS 2	Country Est	Creekside	Glenwood	Shiloh	Lakeside	No. LSs			Total
2012	$2,284.61		$2,284.61	$2,284.61	$4,569.22		$4,569.22	5	$19,200	$50,000	$85,192.26
2013	$2,284.61		$2,284.61	$2,284.61	$4,569.22		$4,569.22	5	$19,200	$50,000	$85,192.26
2014	$2,284.61	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$4,569.22	6	$19,200	$60,000	$97,476.86
2015	$2,284.61	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$4,569.22	6	$19,200	$60,000	$97,476.86
2016	$2,284.61	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$4,569.22	6	$19,200	$60,000	$97,476.86
2017	$2,284.61	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$4,569.22	6	$19,200	$60,000	$97,476.86
2018	$2,284.61	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$2,284.61	$4,569.22	7	$19,200	$70,000	$109,761.47
2019	$2,284.61	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$2,284.61	$4,569.22	7	$19,200	$70,000	$109,761.47
2020	$2,284.61		$2,284.61	$2,284.61	$4,569.22	$2,284.61		5	$19,200	$50,000	$82,907.65
2021	$2,284.61		$2,284.61	$2,284.61	$4,569.22	$2,284.61		5	$19,200	$50,000	$82,907.65
2022	$2,284.61		$2,284.61	$2,284.61	$4,569.22	$2,284.61		5	$19,200	$50,000	$82,907.65
2023	$2,284.61		$2,284.61	$2,284.61	$4,569.22	$2,284.61		5	$19,200	$50,000	$82,907.65
2024	$2,284.61		$2,284.61	$2,284.61	$4,569.22	$2,284.61		5	$19,200	$50,000	$82,907.65
2025	$2,284.61		$2,284.61	$2,284.61	$4,569.22	$2,284.61		5	$19,200	$50,000	$82,907.65
2026				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2027				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2028				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2029				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2030				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2031				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2032				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2033				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2034				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2035				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2036				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2037				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2038				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2039				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22
2040				$2,284.61		$2,284.61		2	$9,600	$20,000	$34,169.22

Alternative 2 - Expanding Cottonwood Creek WWTP										
	Routine Maintenance (Yearly Cost per LS)							Cleaning	Other	
	Enclave LS 1	Country Est	Creekside	Glenwood	Lakeside	Brushy Crk	No. LSs	Yearly Cost	Maintenance	Total
2012	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22		5	$19,200	$50,000	$85,192.26
2013	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22		5	$19,200	$50,000	$85,192.26
2014	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22		5	$19,200	$50,000	$85,192.26
2015	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	6	$19,200	$60,000	$97,476.86
2016	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	6	$19,200	$60,000	$97,476.86
2017	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	6	$19,200	$60,000	$97,476.86
2018	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	6	$19,200	$60,000	$97,476.86
2019	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	6	$19,200	$60,000	$97,476.86
2020	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2021	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2022	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2023	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2024	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2025	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2026	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2027	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2028	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2029	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2030	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2031	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2032	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2033	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2034	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2035	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2036	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2037	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2038	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2039	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65
2040	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	5	$19,200	$50,000	$82,907.65

Alternative 3 - Constructing Lower Brushy Creek WWTP										
	Routine Maintenance (Yearly Cost per LS)							Cleaning	Other	
	Enclave LS 1	Country Est	Creekside	Glenwood	Lakeside	Shiloh	No. LSs	Yearly Cost	Maintenance	Total
2012	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22		5	$19,200	$50,000	$85,192.26
2013	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22		5	$19,200	$50,000	$85,192.26
2014	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22		5	$19,200	$50,000	$85,192.26
2015	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	5	$19,200	$50,000	$85,192.26
2016	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	5	$19,200	$50,000	$85,192.26
2017	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	5	$19,200	$50,000	$85,192.26
2018	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	5	$19,200	$50,000	$85,192.26
2019	$2,284.61	$2,284.61	$2,284.61	$4,569.22	$4,569.22	$2,284.61	5	$19,200	$50,000	$85,192.26
2020	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	4	$19,200	$40,000	$70,623.04
2021	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	4	$19,200	$40,000	$70,623.04
2022	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	4	$19,200	$40,000	$70,623.04
2023	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	4	$19,200	$40,000	$70,623.04
2024	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	4	$19,200	$40,000	$70,623.04
2025	$2,284.61	$2,284.61	$2,284.61	$4,569.22		$2,284.61	4	$19,200	$40,000	$70,623.04
2026			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2027			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2028			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2029			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2030			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2031			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2032			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2033			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2034			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2035			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2036			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2037			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2038			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2039			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22
2040			$2,284.61			$2,284.61	2	$9,600	$20,000	$34,169.22

Yearly Gravity Main Line Cleaning Costs

Alternative 1 - Send Flow to Pflugerville			
	Length of New Gravity Main (LF)	Length Cleaned Each Year	Yearly Cost to Clean GM
2012	9,585	1,917	$11,502.00
2013	9,585	1,917	$11,502.00
2014	9,585	1,917	$11,502.00
2015	25,635	5,127	$30,762.00
2016	25,635	5,127	$30,762.00
2017	25,635	5,127	$30,762.00
2018	27,435	5,487	$32,922.00
2019	27,435	5,487	$32,922.00
2020	46,785	9,357	$56,142.00
2021	46,785	9,357	$56,142.00
2022	46,785	9,357	$56,142.00
2023	46,785	9,357	$56,142.00
2024	46,785	9,357	$56,142.00
2025	46,785	9,357	$56,142.00
2026	46,785	9,357	$56,142.00
2027	60,872	12,174	$73,046.40
2028	60,872	12,174	$73,046.40
2029	60,872	12,174	$73,046.40
2030	72,181	14,436	$86,617.20
2031	72,181	14,436	$86,617.20
2032	72,181	14,436	$86,617.20
2033	72,181	14,436	$86,617.20
2034	72,181	14,436	$86,617.20
2035	72,181	14,436	$86,617.20
2036	72,181	14,436	$86,617.20
2037	72,181	14,436	$86,617.20
2038	72,181	14,436	$86,617.20
2039	72,181	14,436	$86,617.20
2040	72,181	14,436	$86,617.20

Alternative 2 - Expand Cottonwood Creek WWTP			
	Length of New Gravity Main (LF)	Length Cleaned Each Year	Yearly Cost to Clean GM
2012	9,170	1,834	$11,004.00
2013	12,070	2,414	$14,484.00
2014	12,070	2,414	$14,484.00
2015	12,070	2,414	$14,484.00
2016	12,070	2,414	$14,484.00
2017	12,070	2,414	$14,484.00
2018	13,870	2,774	$16,644.00
2019	13,870	2,774	$16,644.00
2020	49,270	9,854	$59,124.00
2021	49,270	9,854	$59,124.00
2022	49,270	9,854	$59,124.00
2023	49,270	9,854	$59,124.00
2024	49,270	9,854	$59,124.00
2025	56,920	11,384	$68,304.00
2026	56,920	11,384	$68,304.00
2027	56,920	11,384	$68,304.00
2028	56,920	11,384	$68,304.00
2029	56,920	11,384	$68,304.00
2030	57,000	11,400	$68,400.00
2031	57,000	11,400	$68,400.00
2032	57,000	11,400	$68,400.00
2033	57,000	11,400	$68,400.00
2034	57,000	11,400	$68,400.00
2035	57,000	11,400	$68,400.00
2036	57,000	11,400	$68,400.00
2037	57,000	11,400	$68,400.00
2038	57,000	11,400	$68,400.00
2039	57,000	11,400	$68,400.00
2040	57,000	11,400	$68,400.00

Alternative 3 - Construct Lower Brushy Creek WWTP			
	Length of New Gravity Main (LF)	Length Cleaned Each Year	Yearly Cost to Clean GM
2012	9,170	1,834	$11,004.00
2013	9,170	1,834	$11,004.00
2014	9,170	1,834	$11,004.00
2015	25,220	5,044	$30,264.00
2016	25,220	5,044	$30,264.00
2017	25,220	5,044	$30,264.00
2018	27,020	5,404	$32,424.00
2019	27,020	5,404	$32,424.00
2020	46,370	9,274	$55,644.00
2021	46,370	9,274	$55,644.00
2022	46,370	9,274	$55,644.00
2023	46,370	9,274	$55,644.00
2024	60,457	12,091	$72,548.40
2025	71,686	14,337	$86,023.20
2026	71,686	14,337	$86,023.20
2027	71,686	14,337	$86,023.20
2028	71,686	14,337	$86,023.20
2029	71,686	14,337	$86,023.20
2030	71,766	14,353	$86,119.20
2031	71,766	14,353	$86,119.20
2032	71,766	14,353	$86,119.20
2033	71,766	14,353	$86,119.20
2034	71,766	14,353	$86,119.20
2035	71,766	14,353	$86,119.20
2036	71,766	14,353	$86,119.20
2037	71,766	14,353	$86,119.20
2038	71,766	14,353	$86,119.20
2039	71,766	14,353	$86,119.20
2040	71,766	14,353	$86,119.20

Alternative 1 - Send Flow to Pflugerville

	Capital Costs			Operational & Maintenance Costs				Total Capital &	Net Present
	Treatment	Pumps	Pipes	Treatment	LS Energy	LS Maint.	Gravity Lines	O&M Costs	Value
2012	$0	$807,636	$4,623,072	$1,179,884	$16,199	$85,192	$11,502	$6,723,485	$6,723,485
2013	$0	$0	$0	$1,375,700	$19,550	$85,192	$11,502	$1,491,944	$1,420,899
2014	$125,000	$0	$0	$1,571,515	$22,901	$97,477	$11,502	$1,828,395	$1,658,408
2015	$1,488,000	$0	$3,257,280	$1,767,330	$26,253	$97,477	$30,762	$6,667,102	$5,759,293
2016	$125,000	$0	$0	$1,869,209	$23,501	$97,477	$30,762	$2,145,948	$1,765,477
2017	$125,000	$0	$0	$1,971,088	$20,748	$97,477	$30,762	$2,245,075	$1,759,075
2018	$10,685,000	$1,131,636	$3,037,542	$2,072,966	$17,996	$109,761	$32,922	$17,087,824	$12,751,197
2019	$125,000	$0	$0	$2,174,845	$15,244	$109,761	$32,922	$2,457,773	$1,746,693
2020	$0	$0	$3,823,200	$2,276,724	$12,492	$82,908	$56,142	$6,251,466	$4,231,238
2021	$0	$0	$0	$2,196,789	$13,106	$82,908	$56,142	$2,348,945	$1,514,151
2022	$0	$0	$0	$2,116,854	$13,721	$82,908	$56,142	$2,269,625	$1,393,353
2023	$0	$0	$0	$2,036,919	$14,336	$82,908	$56,142	$2,190,304	$1,280,625
2024	$0	$0	$0	$1,956,984	$14,950	$82,908	$56,142	$2,110,984	$1,175,475
2025	$0	$0	$0	$1,877,049	$15,565	$82,908	$56,142	$2,031,663	$1,077,434
2026	$0	$0	$0	$1,959,145	$13,026	$34,169	$56,142	$2,062,482	$1,041,693
2027	$10,995,264	$0	$5,679,878	$2,041,241	$10,487	$34,169	$73,046	$18,834,085	$9,059,517
2028	$0	$0	$0	$2,123,336	$7,948	$34,169	$73,046	$2,238,500	$1,025,483
2029	$0	$0	$0	$2,205,432	$5,409	$34,169	$73,046	$2,318,057	$1,011,360
2030	$0	$0	$1,705,066	$2,287,528	$2,870	$34,169	$86,617	$4,116,250	$1,710,387
2031	$0	$0	$0	$2,338,205	$2,980	$34,169	$86,617	$2,461,971	$974,286
2032	$0	$0	$0	$2,388,881	$3,090	$34,169	$86,617	$2,512,758	$947,032
2033	$0	$0	$0	$2,439,558	$3,201	$34,169	$86,617	$2,563,545	$920,165
2034	$0	$0	$0	$2,490,234	$3,311	$34,169	$86,617	$2,614,332	$893,709
2035	$0	$0	$0	$2,540,911	$3,421	$34,169	$86,617	$2,665,118	$867,686
2036	$0	$0	$0	$2,588,106	$3,505	$34,169	$86,617	$2,712,397	$841,027
2037	$0	$0	$0	$2,635,300	$3,589	$34,169	$86,617	$2,759,676	$814,940
2038	$0	$0	$0	$2,682,495	$3,673	$34,169	$86,617	$2,806,954	$789,430
2039	$0	$0	$0	$2,729,689	$3,757	$34,169	$86,617	$2,854,233	$764,501
2040	$0	$0	$0	$2,776,884	$3,841	$34,169	$86,617	$2,901,511	$740,157
								Total NPV	**$66,658,177**

Alternative 3 - Construct Proposed Lower Brushy Creek WWTP

	Capital Costs			Operational & Maintenance Costs				Total Capital &	Net Present
	Treatment	Pumps	Pipes	Treatment	LS Energy	LS Maint.	Gravity Lines	O&M Costs	Value
2012	$0	$0	$2,781,504	$788,254	$10,057	$85,192	$11,004	$3,676,011	$3,676,011
2013	$10,850,000	$0	$2,620,182	$788,254	$10,338	$85,192	$11,004	$14,364,970	$13,680,924
2014	$0	$0	$0	$788,254	$10,618	$85,192	$11,004	$895,069	$811,854
2015	$0	$659,436	$3,467,280	$1,172,970	$10,899	$85,192	$30,264	$5,426,041	$4,687,218
2016	$0	$0	$0	$1,172,970	$11,217	$85,192	$30,264	$1,299,644	$1,069,220
2017	$0	$0	$0	$1,172,970	$11,536	$85,192	$30,264	$1,299,962	$1,018,554
2018	$0	$0	$207,360	$1,172,970	$11,855	$85,192	$32,424	$1,509,801	$1,126,637
2019	$0	$0	$0	$1,172,970	$12,173	$85,192	$32,424	$1,302,760	$925,847
2020	$0	$0	$3,823,200	$1,495,459	$12,492	$70,623	$55,644	$5,457,418	$3,693,795
2021	$0	$0	$0	$1,495,459	$13,106	$70,623	$55,644	$1,634,832	$1,053,828
2022	$0	$0	$0	$1,495,459	$13,721	$70,623	$55,644	$1,635,447	$1,004,023
2023	$0	$0	$0	$1,495,459	$14,336	$70,623	$55,644	$1,636,061	$956,571
2024	$11,845,264	$0	$5,679,878	$1,495,459	$14,950	$70,623	$72,548	$19,178,723	$10,679,430
2025	$0	$0	$1,689,706	$2,027,577	$15,565	$70,623	$86,023	$3,889,493	$2,062,681
2026	$0	$0	$0	$2,027,577	$13,026	$34,169	$86,023	$2,160,795	$1,091,348
2027	$0	$0	$0	$2,027,577	$10,487	$34,169	$86,023	$2,158,256	$1,038,158
2028	$0	$0	$0	$2,027,577	$7,948	$34,169	$86,023	$2,155,717	$987,559
2029	$0	$0	$0	$2,027,577	$5,409	$34,169	$86,023	$2,153,178	$939,424
2030	$0	$0	$15,360	$2,287,219	$2,870	$34,169	$86,119	$2,425,737	$1,007,944
2031	$0	$0	$0	$2,287,219	$2,980	$34,169	$86,119	$2,410,487	$953,912
2032	$0	$0	$0	$2,287,219	$3,090	$34,169	$86,119	$2,410,597	$908,529
2033	$0	$0	$0	$2,287,219	$3,201	$34,169	$86,119	$2,410,708	$865,305
2034	$0	$0	$0	$2,287,219	$3,311	$34,169	$86,119	$2,410,818	$824,138
2035	$0	$0	$0	$2,545,440	$3,421	$34,169	$86,119	$2,669,149	$868,998
2036	$0	$0	$0	$2,545,440	$3,505	$34,169	$86,119	$2,669,234	$827,644
2037	$0	$0	$0	$2,545,440	$3,589	$34,169	$86,119	$2,669,318	$788,257
2038	$0	$0	$0	$2,545,440	$3,673	$34,169	$86,119	$2,669,402	$750,745
2039	$0	$0	$0	$2,545,440	$3,757	$34,169	$86,119	$2,669,486	$715,017
2040	$0	$0	$0	$2,777,052	$3,841	$34,169	$86,119	$2,901,182	$740,073
								Total NPV	**$59,753,643**

Alternative 2- Expand Existing Cottonwood Creek Wastewater Treatment Plant

	Capital Costs			Operational & Maintenance Costs				Total Capital &	Net Present
	Treatment	Pumps	Pipes	Treatment	LS Energy	LS Maint.	Gravity Lines	O&M Costs	Value
2012	$0	$0	$3,011,904	$788,254	$12,629	$85,192	$11,004	$3,908,984	$3,908,984
2013	$11,112,000	$659,436	$539,400	$788,254	$14,196	$85,192	$14,484	$13,212,962	$12,583,774
2014	$0	$0	$0	$788,254	$15,763	$85,192	$14,484	$903,693	$819,676
2015	$0	$659,436	$1,957,200	$1,006,305	$17,330	$97,477	$14,484	$3,752,231	$3,241,319
2016	$0	$175,800	$1,605,180	$1,006,305	$18,691	$97,477	$14,484	$2,917,937	$2,400,594
2017	$0	$0	$0	$1,006,305	$20,052	$97,477	$14,484	$1,138,318	$891,902
2018	$0	$0	$207,360	$1,006,305	$21,413	$97,477	$16,644	$1,349,199	$1,006,793
2019	$0	$0	$0	$1,006,305	$22,774	$97,477	$16,644	$1,143,200	$812,451
2020	$0	$0	$7,080,480	$1,551,104	$24,135	$82,908	$59,124	$8,797,751	$5,954,664
2021	$0	$0	$0	$1,551,104	$25,550	$82,908	$59,124	$1,718,685	$1,107,880
2022	$0	$0	$0	$1,551,104	$26,964	$82,908	$59,124	$1,720,100	$1,055,992
2023	$0	$0	$0	$1,551,104	$28,378	$82,908	$59,124	$1,721,514	$1,006,533
2024	$8,952,000	$120,600	$0	$1,551,104	$29,792	$82,908	$59,124	$10,795,528	$6,011,354
2025	$0	$106,800	$1,123,200	$2,177,736	$31,207	$82,908	$68,304	$3,590,154	$1,903,936
2026	$0	$0	$0	$2,177,736	$32,195	$82,908	$68,304	$2,361,143	$1,192,538
2027	$0	$0	$0	$2,177,736	$33,184	$82,908	$68,304	$2,362,131	$1,136,226
2028	$0	$0	$0	$2,177,736	$34,172	$82,908	$68,304	$2,363,120	$1,082,572
2029	$0	$0	$0	$2,177,736	$35,161	$82,908	$68,304	$2,364,109	$1,031,453
2030	$0	$120,600	$15,360	$2,537,480	$36,149	$82,908	$68,400	$2,860,897	$1,188,762
2031	$0	$0	$0	$2,537,480	$36,868	$82,908	$68,400	$2,725,656	$1,078,634
2032	$0	$0	$0	$2,537,480	$37,586	$82,908	$68,400	$2,726,374	$1,027,542
2033	$0	$0	$0	$2,537,480	$38,305	$82,908	$68,400	$2,727,093	$978,869
2034	$0	$0	$0	$2,537,480	$39,023	$82,908	$68,400	$2,727,811	$932,502
2035	$0	$0	$0	$2,826,560	$39,742	$82,908	$68,400	$3,017,610	$982,447
2036	$0	$0	$0	$2,826,560	$40,340	$82,908	$68,400	$3,018,208	$935,849
2037	$0	$0	$0	$2,826,560	$40,939	$82,908	$68,400	$3,018,807	$891,462
2038	$0	$0	$0	$2,826,560	$41,538	$82,908	$68,400	$3,019,405	$849,180
2039	$0	$0	$0	$2,826,560	$42,136	$82,908	$68,400	$3,020,004	$808,903
2040	$0	$0	$0	$3,077,096	$42,735	$82,908	$68,400	$3,271,139	$834,447
								Total NPV	**$57,657,236**

Appendix G Annual Costs for Each Alternative

Hutto Regional Wastewater Study Annual Costs

In order to determine the annual costs, the debt service on the capital projects was calculated. Non-capital costs included engineering costs (15% of project capital cost), legal fees (5% of project capital cost), permitting costs (1% of project capital cost), engineering and legal contingency costs (30% of project capital cost), easement costs ($10,000 per acre on pipeline projects), surveying and legal costs (10% of pipeline project capital costs), and environmental costs ($5 per linear foot for pipeline projects). An interest rate of 5% was assumed with a debt term of 30 years for treatment plant projects and a term of 20 years for lift station and pipeline projects.

The following tables include the debt service for each alternative and a summary of the annual costs for each alternative.

Alternative 1 - Send Flow to Pflugerville

	Wastewater Treatment Plants							Lift Station and Pipeline Projects										
	Capital Costs	Non-Capital Costs					Debt Service	Capital Costs	Pipeline Lengths	Non-Capital Costs								Debt Service
		Engineering	Legal	Permitting	E&L Cont.	Total				Engineering	Legal	Permitting	E&L Cont.	Easement	Survey & Legal	Environmental	Total	
2012	$0	$0	$0	$0	$0	$0	$0	$5,430,708	26,585	$814,606	$271,535	$54,307	$1,629,212	$244,123	$24,412	$132,925	$3,171,121	$690,000
2013	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2014	$125,000	$18,750	$6,250	$1,250	$37,500	$63,750	$12,000	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2015	$1,488,000	$223,200	$74,400	$14,880	$446,400	$758,880	$146,000	$3,257,280	16,050	$488,592	$162,864	$32,573	$977,184	$147,383	$14,738	$80,250	$1,903,584	$414,000
2016	$125,000	$18,750	$6,250	$1,250	$37,500	$63,750	$12,000	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2017	$125,000	$18,750	$6,250	$1,250	$37,500	$63,750	$12,000	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2018	$10,685,000	$1,602,750	$534,250	$106,850	$3,205,500	$5,449,350	$1,050,000	$4,169,178	18,387	$625,377	$208,459	$41,692	$1,250,753	$168,843	$16,884	$91,935	$2,403,943	$527,000
2019	$125,000	$18,750	$6,250	$1,250	$37,500	$63,750	$12,000	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2020	$0	$0	$0	$0	$0	$0	$0	$3,823,200	19,350	$573,480	$191,160	$38,232	$1,146,960	$177,686	$17,769	$96,750	$2,242,037	$487,000
2021	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2022	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2023	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2024	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2025	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2026	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2027	$10,995,264	$1,649,290	$549,763	$109,953	$3,298,579	$5,607,585	$1,080,000	$5,679,878	14,087	$851,982	$283,994	$56,799	$1,703,964	$129,357	$12,936	$70,435	$3,109,466	$705,000
2028	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2029	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2030	$0	$0	$0	$0	$0	$0	$0	$1,705,066	11,309	$255,760	$85,253	$17,051	$511,520	$103,848	$10,385	$56,545	$1,040,361	$220,000
2031	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2032	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2033	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2034	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2035	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2036	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2037	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2038	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2039	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2040	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Alternative 2 - Expand Cottonwood Creek WWTP

	Wastewater Treatment Plants						
	Capital Costs	Non-Capital Costs					Debt Service
		Engineering	Legal	Permitting	E&L Cont.	Total	
2012	$0	$0	$0	$0	$0	$0	$0
2013	$11,112,000	$1,666,800	$555,600	$111,120	$3,333,600	$5,667,120	$1,092,000
2014	$0	$0	$0	$0	$0	$0	$0
2015	$0	$0	$0	$0	$0	$0	$0
2016	$0	$0	$0	$0	$0	$0	$0
2017	$0	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0	$0
2019	$0	$0	$0	$0	$0	$0	$0
2020	$0	$0	$0	$0	$0	$0	$0
2021	$0	$0	$0	$0	$0	$0	$0
2022	$0	$0	$0	$0	$0	$0	$0
2023	$0	$0	$0	$0	$0	$0	$0
2024	$8,952,000	$1,342,800	$447,600	$89,520	$2,685,600	$4,565,520	$879,000
2025	$0	$0	$0	$0	$0	$0	$0
2026	$0	$0	$0	$0	$0	$0	$0
2027	$0	$0	$0	$0	$0	$0	$0
2028	$0	$0	$0	$0	$0	$0	$0
2029	$0	$0	$0	$0	$0	$0	$0
2030	$0	$0	$0	$0	$0	$0	$0
2031	$0	$0	$0	$0	$0	$0	$0
2032	$0	$0	$0	$0	$0	$0	$0
2033	$0	$0	$0	$0	$0	$0	$0
2034	$0	$0	$0	$0	$0	$0	$0
2035	$0	$0	$0	$0	$0	$0	$0
2036	$0	$0	$0	$0	$0	$0	$0
2037	$0	$0	$0	$0	$0	$0	$0
2038	$0	$0	$0	$0	$0	$0	$0
2039	$0	$0	$0	$0	$0	$0	$0
2040	$0	$0	$0	$0	$0	$0	$0

	Lift Station and Pipeline Projects											
	Capital Costs	Pipeline Lengths	Non-Capital Costs								Debt Service
			Engineering	Legal	Permitting	E&L Cont.	Easement	Survey & Legal	Environmental	Total	
2012	$3,011,904	9,170	$451,786	$150,595	$30,119	$903,571	$84,206	$8,421	$45,850	$1,674,547	$376,000
2013	$1,198,836	2,900	$179,825	$59,942	$11,988	$359,651	$26,630	$2,663	$14,500	$655,199	$149,000
2014	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2015	$2,616,636	23,300	$392,495	$130,832	$26,166	$784,991	$213,958	$21,396	$116,500	$1,686,338	$345,000
2016	$1,780,980	8,630	$267,147	$89,049	$17,810	$534,294	$79,247	$7,925	$43,150	$1,038,622	$226,000
2017	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2018	$207,360	1,800	$31,104	$10,368	$2,074	$62,208	$16,529	$1,653	$9,000	$132,935	$27,000
2019	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2020	$7,080,480	35,400	$1,062,072	$354,024	$70,805	$2,124,144	$325,069	$32,507	$177,000	$4,145,621	$901,000
2021	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2022	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2023	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2024	$120,600	0	$18,090	$6,030	$1,206	$36,180	$0	$0	$0	$61,506	$15,000
2025	$1,230,000	7,650	$184,500	$61,500	$12,300	$369,000	$70,248	$7,025	$38,250	$742,823	$158,000
2026	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2027	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2028	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2029	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2030	$135,960	80	$20,394	$6,798	$1,360	$40,788	$735	$73	$400	$70,548	$17,000
2031	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2032	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2033	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2034	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2035	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2036	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2037	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2038	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2039	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2040	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Alternative 3 - Construct Lower Brushy Creek WWTP

	Wastewater Treatment Plants							Lift Station and Pipeline Projects										
	Capital Costs	Non-Capital Costs					Debt Service	Capital Costs	Pipeline Lengths	Non-Capital Costs								Debt Service
		Engineering	Legal	Permitting	E&L Cont.	Total				Engineering	Legal	Permitting	E&L Cont.	Easement	Survey & Legal	Environmental	Total	
2012	$0	$0	$0	$0	$0	$0	$0	$2,781,504	9,170	$417,226	$139,075	$27,815	$834,451	$84,206	$8,421	$45,850	$1,557,043	$348,000
2013	$10,850,000	$1,627,500	$542,500	$108,500	$3,255,000	$5,533,500	$1,066,000	$2,620,182	14,087	$393,027	$131,009	$26,202	$786,055	$129,357	$12,936	$70,435	$1,549,021	$335,000
2014	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2015	$0	$0	$0	$0	$0	$0	$0	$4,126,716	18,550	$619,007	$206,336	$41,267	$1,238,015	$170,340	$17,034	$92,750	$2,384,749	$522,000
2016	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2017	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2018	$0	$0	$0	$0	$0	$0	$0	$207,360	1,800	$31,104	$10,368	$2,074	$62,208	$16,529	$1,653	$9,000	$132,935	$27,000
2019	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2020	$0	$0	$0	$0	$0	$0	$0	$3,823,200	19,350	$573,480	$191,160	$38,232	$1,146,960	$177,686	$17,769	$96,750	$2,242,037	$487,000
2021	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2022	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2023	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2024	$11,845,264	$1,776,790	$592,263	$118,453	$3,553,579	$6,041,085	$1,164,000	$5,679,878	14,087	$851,982	$283,994	$56,799	$1,703,964	$129,357	$12,936	$70,435	$3,109,466	$705,000
2025	$0	$0	$0	$0	$0	$0	$0	$1,689,706	11,229	$253,456	$84,485	$16,897	$506,912	$103,113	$10,311	$56,145	$1,031,319	$218,000
2026	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2027	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2028	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2029	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2030	$0	$0	$0	$0	$0	$0	$0	$15,360	80	$2,304	$768	$154	$4,608	$735	$73	$400	$9,042	$2,000
2031	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2032	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2033	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2034	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2035	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2036	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2037	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2038	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2039	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0
2040	$0	$0	$0	$0	$0	$0	$0	$0	0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Annual Cost Summary

	Alternative 1 - Send Flow to Pflugerville				Alternative 2 - Expand CCWTP				Alternative 3 - Construct LBCWWTP			
	Debt Service		O&M	Annual Costs	Debt Service		O&M	Annual Costs	Debt Service		O&M	Annual Costs
	Treatment	LS & Pipes			Treatment	LS & Pipes			Treatment	LS & Pipes		
2012	$0	$690,000	$1,292,777	$1,982,777	$0	$376,000	$897,080	$1,273,080	$0	$348,000	$894,507	$1,242,507
2013	$0	$690,000	$1,491,944	$2,181,944	$1,092,000	$525,000	$902,126	$2,519,126	$1,066,000	$683,000	$894,788	$2,643,788
2014	$12,000	$690,000	$1,703,395	$2,405,395	$1,092,000	$525,000	$903,693	$2,520,693	$1,066,000	$683,000	$895,069	$2,644,069
2015	$158,000	$1,104,000	$1,921,822	$3,183,822	$1,092,000	$870,000	$1,135,595	$3,097,595	$1,066,000	$1,205,000	$1,299,325	$3,570,325
2016	$170,000	$1,104,000	$2,020,948	$3,294,948	$1,092,000	$1,096,000	$1,136,957	$3,324,957	$1,066,000	$1,205,000	$1,299,644	$3,570,644
2017	$182,000	$1,104,000	$2,120,075	$3,406,075	$1,092,000	$1,096,000	$1,138,318	$3,326,318	$1,066,000	$1,205,000	$1,299,962	$3,570,962
2018	$1,232,000	$1,631,000	$2,233,646	$5,096,646	$1,092,000	$1,123,000	$1,141,839	$3,356,839	$1,066,000	$1,232,000	$1,302,441	$3,600,441
2019	$1,244,000	$1,631,000	$2,332,773	$5,207,773	$1,092,000	$1,123,000	$1,143,200	$3,358,200	$1,066,000	$1,232,000	$1,302,760	$3,600,760
2020	$1,244,000	$2,118,000	$2,428,266	$5,790,266	$1,092,000	$2,024,000	$1,717,271	$4,833,271	$1,066,000	$1,719,000	$1,634,218	$4,419,218
2021	$1,244,000	$2,118,000	$2,348,945	$5,710,945	$1,092,000	$2,024,000	$1,718,685	$4,834,685	$1,066,000	$1,719,000	$1,634,832	$4,419,832
2022	$1,244,000	$2,118,000	$2,269,625	$5,631,625	$1,092,000	$2,024,000	$1,720,100	$4,836,100	$1,066,000	$1,719,000	$1,635,447	$4,420,447
2023	$1,244,000	$2,118,000	$2,190,304	$5,552,304	$1,092,000	$2,024,000	$1,721,514	$4,837,514	$1,066,000	$1,719,000	$1,636,061	$4,421,061
2024	$1,244,000	$2,118,000	$2,110,984	$5,472,984	$1,971,000	$2,039,000	$1,722,928	$5,732,928	$2,230,000	$2,424,000	$1,653,580	$6,307,580
2025	$1,244,000	$2,118,000	$2,031,663	$5,393,663	$1,971,000	$2,197,000	$2,360,154	$6,528,154	$2,230,000	$2,642,000	$2,199,787	$7,071,787
2026	$1,244,000	$2,118,000	$2,062,482	$5,424,482	$1,971,000	$2,197,000	$2,361,143	$6,529,143	$2,230,000	$2,642,000	$2,160,795	$7,032,795
2027	$2,324,000	$2,823,000	$2,158,943	$7,305,943	$1,971,000	$2,197,000	$2,362,131	$6,530,131	$2,230,000	$2,642,000	$2,158,256	$7,030,256
2028	$2,324,000	$2,823,000	$2,238,500	$7,385,500	$1,971,000	$2,197,000	$2,363,120	$6,531,120	$2,230,000	$2,642,000	$2,155,717	$7,027,717
2029	$2,324,000	$2,823,000	$2,318,057	$7,465,057	$1,971,000	$2,197,000	$2,364,109	$6,532,109	$2,230,000	$2,642,000	$2,153,178	$7,025,178
2030	$2,324,000	$3,043,000	$2,411,184	$7,778,184	$1,971,000	$2,214,000	$2,724,937	$6,909,937	$2,230,000	$2,644,000	$2,410,377	$7,284,377
2031	$2,324,000	$3,043,000	$2,461,971	$7,828,971	$1,971,000	$2,214,000	$2,725,656	$6,910,656	$2,230,000	$2,644,000	$2,410,487	$7,284,487
2032	$2,324,000	$2,353,000	$2,512,758	$7,189,758	$1,971,000	$1,838,000	$2,726,374	$6,535,374	$2,230,000	$2,296,000	$2,410,597	$6,936,597
2033	$2,324,000	$2,353,000	$2,563,545	$7,240,545	$1,971,000	$1,689,000	$2,727,093	$6,387,093	$2,230,000	$1,961,000	$2,410,708	$6,601,708
2034	$2,324,000	$2,353,000	$2,614,332	$7,291,332	$1,971,000	$1,689,000	$2,727,811	$6,387,811	$2,230,000	$1,961,000	$2,410,818	$6,601,818
2035	$2,324,000	$1,939,000	$2,665,118	$6,928,118	$1,971,000	$1,344,000	$3,017,610	$6,332,610	$2,230,000	$1,439,000	$2,669,149	$6,338,149
2036	$2,324,000	$1,939,000	$2,712,397	$6,975,397	$1,971,000	$1,118,000	$3,018,208	$6,107,208	$2,230,000	$1,439,000	$2,669,234	$6,338,234
2037	$2,324,000	$1,939,000	$2,759,676	$7,022,676	$1,971,000	$1,118,000	$3,018,807	$6,107,807	$2,230,000	$1,439,000	$2,669,318	$6,338,318
2038	$2,324,000	$1,412,000	$2,806,954	$6,542,954	$1,971,000	$1,091,000	$3,019,405	$6,081,405	$2,230,000	$1,412,000	$2,669,402	$6,311,402
2039	$2,324,000	$1,412,000	$2,854,233	$6,590,233	$1,971,000	$1,091,000	$3,020,004	$6,082,004	$2,230,000	$1,412,000	$2,669,486	$6,311,486
2040	$2,324,000	$925,000	$2,901,511	$6,150,511	$1,971,000	$190,000	$3,271,139	$5,432,139	$2,230,000	$925,000	$2,901,182	$6,056,182

Debt Term for Treatment Projects was assumed to be 30 years, while Debt Term on Lift Station and Pipe Projects was assumed to be 20 years.

Appendix H Water Conservation Plans

RESOLUTION NO. 2010-029-00
WATER CONSERVATION PLAN

A RESOLUTION ADOPTING A WATER CONSERVATION PLAN FOR THE CITY OF HUTTO

WHEREAS, the City is required to adopt a Water Conservation Plan in order to be considered for capital projects funding from the Texas Water Development Board; and

WHEREAS, the City is a Texas home-rule municipality that owns and operates a water system for the use of the municipality and its residents;

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF HUTTO, TEXAS, that the Hutto City Council hereby approves the resolution to adopt a Water Conservation Plan, a copy of same being attached hereto as "Exhibit A" and incorporated herein for all purposes.

CONSIDERED and RESOLVED on this the **16th** day of the month of **September, 2010.**

THE CITY OF HUTTO, TEXAS

David F. Begier

David F. Begier, Mayor

ATTEST:

Christine Martinez

Christine Martinez, City Secretary

CITY OF HUTTO

WATER CONSERVATION PLAN

1. Utility profile

a. The City of Hutto obtains its water supply from three sources. Hutto has a water supply agreement with Heart of Texas Water Supplier (HOT), The City of Taylor (Taylor), and Manville Special Utility District (Manville). HOT withdraws water from a ground source, Taylor uses surface water, and Manville has a combination of surface and groundwater supplies. Potable water supply is delivered to the city, and the city distributes the potable water to its retail and wholesale customers.

b. The service area of Hutto's water utility is bordered by SH 130 to the west and FM 3349 to the East. The water utility service area extends to Limmer Loop on the north and south to Brushy Creek. Hutto's water utility serves an area of about 20 square miles.

c. The city's current resident population is 17,120 in 2009. The city's five and ten year population projections are 25,100 and 33,625, respectively. The city's water utility currently provides about 3,594 service connections and expects to serve 6,398 and 8,399 by the year 2015 and 2020, respectively.

d. Water system data compiled from the city's 2007 monthly operating reports indicated an average daily water use of 0.97 MGD and a peak daily demand of 1.93 MGD. As of 2007 Hutto's water purchase contract is as follows:

- 500,000 gpd from Manville
- 175,000 gpd from Taylor (with the ability to have a total purchase of 300,000 gpd).
- Water supply from HOT increases each year. The first year of this agreement occurred in 2007, in which Hutto received 0.6 MGD from HOT.
  - Year 2: 0.85 MGD
  - Year 3: 1.05 MGD
  - Year 4: 1.35 MGD
  - Year 5: 1.6 MGD
  - Year 6: 2.0 MGD
  - Year 7: 2.3 MGD

- Year 8: 2.5 MGD
- Years 9-15: 3.0 MGD
- Years 16-20: 4.5 MGD
- Years 20-50 5.0 MGD

2. Conservation goals

a. The City will continue to promote its current water conservation practices and plans to elevate its emphasis on water conservation measures. The current average per capita water use is 95 gallons per person per day. The City will seek to reduce the per capita usage to 94 gallons per person per day in the next five years and to 93 gallons per person per day in the next 10 years.

b. In addition to reducing per capita water use, the City will also strive to minimize its water loss. The current water loss is 3% of the total volume used. The City will seek to maintain water loss at 3% of total volume used over the next ten years.

c. The programs described below serve to ensure that the water supply and distribution system is capable of meeting the growing water demands that are expected within the service area, based on Hutto's projected growth.

3. Source supply metering devices

Master meters were installed at point of delivery from water suppliers. In addition, the city has implemented an automatic meter reading system.

4. Universal metering and meter maintenance

a. The city will develop a program to test all meters which appear to have an abnormally high or low usage. Meters that show zero consumption will be tested promptly. Meters will also be tested at the customers request.

b. All water customers, including city offices and public facilities are metered.

5. Control measures for unaccounted water

A Schedule for testing of meters is proposed:

(1) Production meters will be tested annually.

(2) Meters larger than 2-inch, to be tested every five (5) years.

(3) Meters 2-inch and smaller will be tested and/or replaced once every ten (10) years.

Based on the recorded water meter readings, the city will conduct an annual water balance and audit to evaluate the system wide metering condition and identify unaccounted for water usage.

6. Illegal taps and other theft of water

All water system employees and concerned citizens are encouraged to be vigilant in observing for the theft of water. Examples of potential theft of water are:

a. Occupied residence or business without authorized water meter.

b. Bypassing of meters.

c. Reversed meters.

d. Newly constructed or relocated building without applying for taps.

e. New building construction site.

7. Implementation and enforcement

a. New service connections will be provided with water conservation practice information.

b. The city will encourage local builders and developers to employ the Uniform Plumbing Code in plumbing practice and install water conserving plumbing fixtures in new construction and replacement of existing fixtures.

c. The city does not have a plumbing retrofit program. However, customers in existing buildings which do not have water saving devices will be encouraged to replace their old plumbing fixtures. The education program will emphasize the advantage of installing water saving devices.

d. An active program for collection of delinquent accounts will be pursued by the city.

e. Criminal charges will be enforced against water theft.

8. Public education

The City of Hutto will promote water conservation by informing customers of the city's plan to conserve water. The following methods will be used to inform water users.

a. Distribution of educational materials to all customers will be made once during the first year of the program and once per year thereafter. The distribution will be timed to correspond with the peak summer demand period.

b. Regular articles will be published in the local paper corresponding to the distribution mentioned above and more often if conditions warrant.

c. Radio and TV news release will be incorporated with State, regional, and local water conservation promotion.

d. New customers will receive general conservation information when applying for service.

e. Annual class presentation and drawing contest about water conservation to students at local schools.

f. Encourage local plumbing supply retailers to educate and promote the use of water saving devices.

g. The city, through its subdivision regulations, will encourage water customers to incorporate Xeriscape and promote native and drought resist plants in their landscape plan. Customers are also encouraged to apply separate meter for irrigation use.

9. Water rate structure

a. The user rate structure in place is a minimum monthly base rate for the first two thousand (2,000) gallons used based upon the size of water meter. After the consumption of the first 2,000 gallons per month, a volumetric charge per each additional thousand (1,000) gallons consumed is then applied to customers that is the same for all water usage volumes and meter sizes. This rate structure is conservation-oriented as it charges a nominally higher water rate following a customer's consumption of the first 2,000 gallons.

b. Service regulations that address the conservation of water include the following:

(1) Requirements that there be no free service.

(2) All usage through city fire hydrants shall be authorized by the city and that usage shall be charged for at a metered rate.

10. Leak detection and repair

City employees are requested to report all leaks. Meter readers are required to report all possible leaks in the system. The city investigates all reported leaks, performs periodic visual inspections, and schedules leak detection surveys of the water distribution lines. When leaks are discovered work orders are generated and maintenance is dispatched to repair leeks promptly.

11. Record management system

a. The city administers a comprehensive record management system that accounts for its water use characteristics. The record management system is maintained by the city water and is configured to provide the following water use information:

(1) Water purchases;

(2) Water deliveries;

(3) Water sales; and

(4) Water losses.

b. The city's record management system further allows for the separation of aggregate water sales and water usage characteristics into four customer-specific categories that include:

(1) Residential;

(2) Commercial;

(3) Public/institutional; and

(4) Industrial.

12. Annual report

The city will submit an annual report to the regulatory agencies on the Water Conservation Plan pursuant to the reporting requirement. The report will include the following:

a. Public information which has been issued.

b. Public response to plan.

c. Effectiveness of water conservation plan in reducing water consumption by providing production and sales records.

d. Implementation progress and status plan.

13. Water reuse program

a. Analyze the potential use of reclaimed water to irrigate municipal parks, athletic fields, roadway medians and right-of-ways (ROW's), and other landscaped areas that could benefit from these nonpotable reclaimed water uses; and evaluate the potential use of reclaimed water to meet commercial/industrial demands for such nonpotable reuse applications as site irrigation, cooling water make-up, wash down, and process water use.

b. The city's reclaimed water program evaluation will assess the potential feasibility and cost-effectiveness of the development of an urban nonpotable reuse system. The focus of the city's water reclamation program will be to provide water conservation through the future use of reclaimed water in place of potable water supplies where drinking water quality is not required.

14. Adoption

The Water Conservation Plan will be adopted by resolution of the City Council. The plan will be updated periodically to enhance its intended effort.

15. Schedule for Implementing Plan to Achieve Targets and Goals

The City of Hutto will adhere to the following schedule, to achieve the targets and goals for water conservation:

a. Calibrations of meters for all treated water deliveries will be conducted according to the schedule set forth in Section 5.

b. Meters will continue to be regularly monitored for accuracy and replaced as necessary.

c. Water audits will be conducted annually.
   (1) Real water losses will be identified and corrected.
   (2) Real water losses will be minimized by replacement of deteriorating water mains and appurtenances, as is conducted by City of Hutto staff on an on-going basis.

d. The City of Hutto will mail out material developed by the staff, materials obtained from the Texas Water Development Board, Texas Commission on Environmental Quality or other sources annually (in the spring) to all customers.

e. The leak detection program described in the plan is currently in use by the City of Hutto, which reduces real water losses.
   (1) City employees are required to report all leaks.
   (2) City meter readers are required to investigate and report all leaks.
   (3) Pressure is controlled to just above the standard-of-service level by use of a SCADA system.

(4) Pressure zones are operated based on the topography.

(5) Surges in pressure are limited by control valves.

f. The City of Hutto adopted the 2006 International Plumbing Code, and all new construction or renovations in the City use water conserving fixtures.

16. Tracking Targets and Goals

The staff shall track targets and goals by utilizing the following procedures:

a. Logs shall be maintained for meter calibration, meter testing, and meter replacement programs.

b. Annual water audits shall be documented and kept in the Utility Department files.

c. Staff shall keep a record of the number of mail-outs distributed annually.

d. Rates are tracked by means of ordinances adopted.

e. Logs shall be maintained for the City's Leak Detection Program, including but not limited to the following:

(1) Annual inspections and soundings of all water main fittings and connections.

(2) Annual intermittent night-flow measurements; and,

(3) SCADA system.

City of Pflugerville
Water Conservation Plan
April 12, 2011

1.0 Introduction

The City of Pflugerville (the "City") has developed this Water Conservation Plan (the "Plan") for its wholesale and retail treated water utility systems to effectively manage public water resources and to plan appropriate responses to emergency and drought conditions. The Plan recognizes that conservation is a valuable tool in managing water and wastewater utility systems. Benefits of water conservation include: extending available water supplies; reducing the risk of shortage during periods of extreme drought; reducing water and wastewater utility operating costs; improving the reliability and quality of water utility service; reducing customer costs for water service; reducing wastewater flows; improving the performance of wastewater treatment systems; and enhancing water quality and the environment.

This Plan applies to all of the City of Pflugerville's retail and wholesale treated water customers. This plan was adopted on September 10, 2002, amended on September 12, 2006 and updated on this date of April 12, 2011 and will be updated at least every five years to account for changes in water usage due to growth in the customer base.

2.0 Authorization, Implementation and Enforcement

The City Manager, or his/her designee, of the City of Pflugerville is hereby authorized and directed to implement the applicable provisions of this Plan. The City Manager, or his/her designee, will act as Administrator of the Water Conservation Program. He/she will oversee the execution and implementation of the program and will be responsible for keeping adequate records for program verification.

This Amended Plan was presented to the Pflugerville City Council for approval on April 12,, 2011. This Amended Plan will be enforced by the following methods:

a. City Council adopting this plan by ordinance. The ordinance adopting this plan is included as Exhibit F.

b. The water rate structure will be enforced; water service will be discontinued for any customers not paying the monthly bill; and

c. The building inspector will not certify new construction unless it meets adopted plumbing codes.

3.0 Utility Profile—Baseline Evaluation of Water and Wastewater Utility System and Customer Use

3.1 *Population and Service Area.* The City of Pflugerville's current water service area population is 36,771 based on 12,257 connections. The estimated January 2011 population for the City of Pflugerville is 51,359. The City experienced a population boom in the 1990's, growing from a population of 4,444 in 1990 to a population of 16,335 in 2000. Since 2000 growth has continued and projections show that the City's population will continue to grow, with the population estimated to be at 55,200 by the year 2020. The water service area has grown as well. The City's current water service area is presented in Exhibit A.

3.2 *Water Utility System and Water Usage.* The City of Pflugerville serves 23,502 customers. Residential customers comprise nearly 96% of total connections and nearly 86% of total yearly consumption. The peak-to-average ratio of water use was nearly 2.6. More detailed water and wastewater utility data is found in Exhibit C.

4.0 Water Conservation Plan Elements

4.1 *Water Conservation Goals.* **The City's goal is to reduce water use by 5% by 2015 and 13.6% by 2020**. These percentages translate to daily use of 4.26 million gallons in 2015 and 3.97 million gallons by 2020, excluding population growth. On a per person basis the City estimates that the current user needs an average of 204 gallons of water per day. The City aims to reduce per user needs to 176.21 gallons per day by 2020. The City will measure its progress on reduction in water use by comparing the current daily per resident use to per resident use multiplied by the population each year. **Pflugerville's unaccounted for water is less than 10%. Their goal therefore is to maintain unaccounted for water at 10% or less.**

4.2 <u>**Water Conservation Measures**</u>

(1) *Universal Metering and Meter Replacement and Repair.* All utility customers will be metered. A regularly scheduled maintenance program of meter repair and replacement will be performed in accordance with the following schedule:

Production (master) meters:	Test once a year
Meters larger than 1":	Test once a year
Meters 1" or smaller:	Test or replace once every 10 years

Zero consumption accounts will be checked to see if water is actually being used or not recorded. In addition, the meters will be checked for proper sizing.

(2) *Distribution System Leak Detection and Repair.* The City's unaccounted-for-water is due to sections of the water distribution system being polybutylene pipe, which has a known history of leakage. The City has a year round leak detection and pipe replacement program in place.

(3) *Plumbing Retrofit Program.* State and federal laws require that homes built after 1992 have low-flow (less than 3 gallons per minute) showerheads, faucet aerators and ultra low flush (less than 1.6 gallons per flush) toilets installed. Most homes in Pflugerville were built after that time and would have the water efficient fixture. However, the City will consider offering low-flow showerheads, faucet aerators, toilet leak detection dye tablets, and other conservation materials to customers in older homes.

(4) *Water Pricing Incentives.* The City charges a volumetric increasing block rate to all customers. A copy of the city's current rate structure is found in Exhibit B.

(5) *Continuing education program on water conservation.*

a. As part of a continuing public education and information campaign based on this Plan, the city will:

i. Develop and provide water conservation packets for new retail water customers;

ii. Provide all retail water customers with at least one brochure/flier on water conservation each year;

iii. Implement an extensive landscape water management public information program;

iv. Assist wholesale water customers in their public education efforts.

b. In the spring of 2001, the City implemented a pilot "Drop by Drop" landscape rebate program. The City offered rebates of between $50 and $500 to residential customers that installed approved plants in the landscape. This program has now been adopted as an ongoing water conservation program.

c. The City offers rain barrels and home composters to its citizens at reduced cost to encourage water conservation.

(6) *Coordination with Regional Planning Group.* The City of Pflugerville has sent a copy of this plan to the Lower Colorado Regional Water Planning Group for their review.

A copy of the letter transmitting this plan to the Regional Water Planning Group is included as Exhibit E.

(7) *Wholesale Customers.* For every wholesale water supply contract entered into or renewed after official adoption of this water conservation plan, including any contract extensions, the wholesale water customer must develop and implement a water conservation plan or water conservation measures according the TCEQ guidelines. If the customer intends to resell the water, then the contract between the initial supplier and customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with LCRA and TCEQ guidelines.

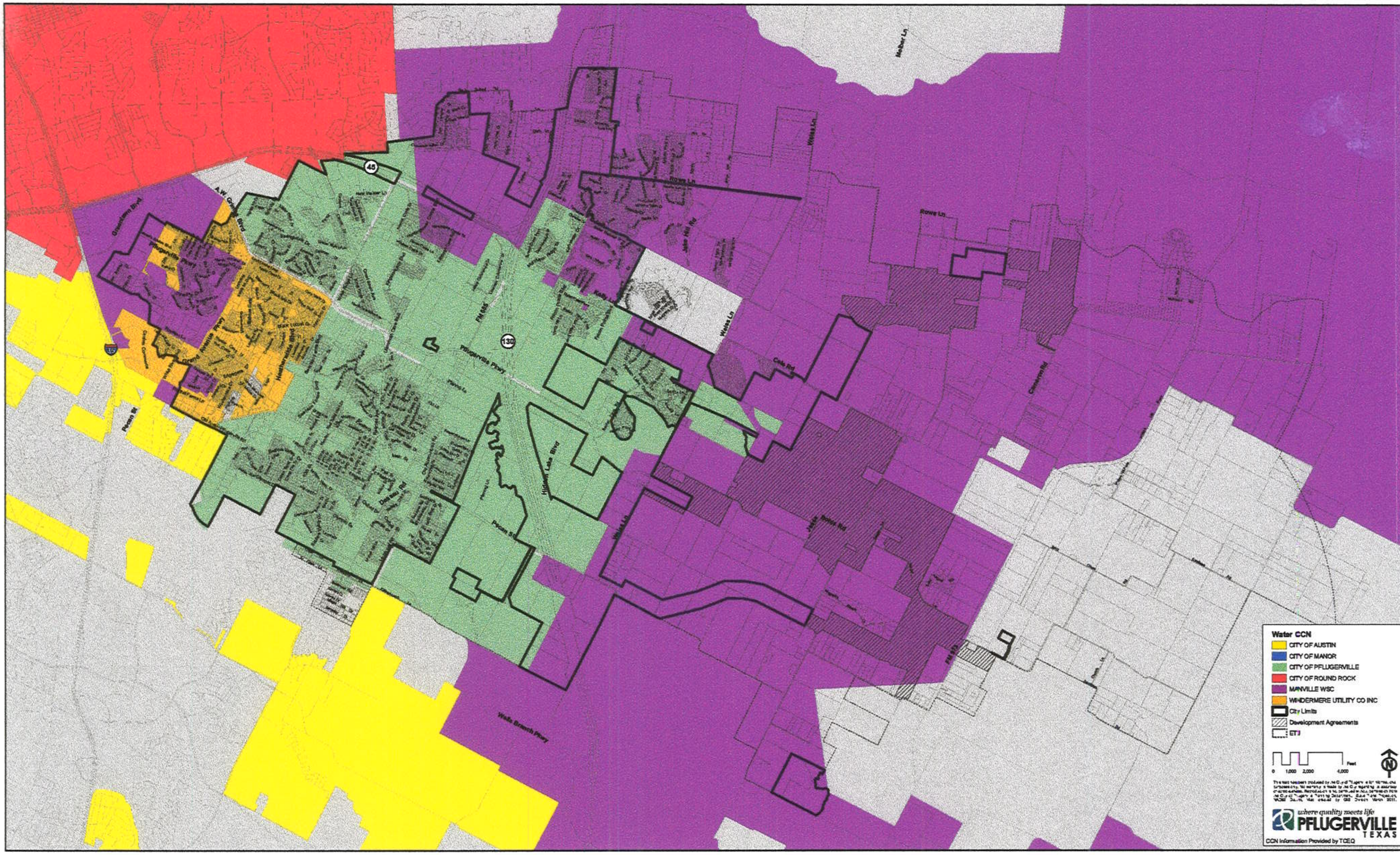
(8) *Measures to determine and control unaccounted-for uses of water and for universal metering of customer and public uses of water.* The City is using INCODE Utility Billing software meter reading reports. Monthly readings are done using Neptune drive-by unit or hand-held devices and software. City staff conducts visual inspections to determine if the system is distributing to illegal connections or connections where service has been abandoned.

(9) *Other Conservation Strategies.* The city will also pursue adopting codes or ordinances that promote the use of water conserving technologies, promote water efficiency, or avoid water waste. In addition, the city provides recycled wastewater to Travis County in order to irrigate numerous soccer and baseball fields in the Travis County Northeast Metropolitan Park. A more detailed discussion of the City's water conservation strategies is attached as Exhibit D.

EXHIBIT A

WATER SERVICE AREA MAP

Water CCN



Water CCN
CITY OF AUSTIN
CITY OF MANOR
CITY OF PFLUGERVILLE
CITY OF ROUND ROCK
MANVILLE WSC
WINDERMERE UTILITY CO INC
City Limits
Development Agreements
ETJ
Feet
0 1,000 2,000 4,000
where quality meets life
PFLUGERVILLE
TEXAS
CCN Information Provided by TCEQ
45
130
Pflugerville Pkwy
Weiss Ln
Wells Branch Pkwy

EXHIBIT B

CURRENT WATER RATE ORDINANCE

(As of October 12, 2010)

ORDINANCE NO. 1051-10-10-12

AN ORDINANCE OF THE CITY OF PFLUGERVILLE, TEXAS, AMENDING RATES, CHARGES AND FEES FOR WATER, WASTEWATER AND SOLID WASTE UTILITY SERVICE AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the City Council desires to waive deposits for new customers who enroll in the automatic draft program for a minimum of one full year, a $25.00 connection charge will apply.

WHEREAS, the City Council has determined that a $1200.00 deposit is required for construction or fire hydrant meters, which will be returned, less any outstanding balance, upon receipt of meter.

WHEREAS, the City Council has determined that service is no longer provided to the Northtown Municipal Utility District and therefore, specified rates are not required and are removed from this Ordinance.

WHEREAS, these rates will be effective on first reading..

BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF PFLUGERVILLE, TEXAS:

Section 1. Retail Water Rates.

The City will charge every retail utility customer of the city water rates that include the Monthly Base Charge and the Volume Charge, set forth in (A) and (B) in this Section.

(A) The Monthly Base Charge is as follows:

Meter Size	Customer Costs
5/8"	$13.68
3/4"	$13.68
1"	$22.84
1 1/2"	$45.11
2"	$72.85
3"	$136.68
4"	$227.83
6"	$455.52
8"	$728.84

Rates for larger size meter subject to separate agreement with the city.

(B) The Volume Charge for all meter sizes is:

Gallons	Charge per 1000 gallons
0- 12000	$4.35
12001-26000	$4.61
26001+	$4.73

Section 2. Catastrophic Water Leaks.

In the event of a catastrophic water leak by a residential water customer the City may allow a credit to the customer's bill under the following circumstances. A minimum usage of 40,000 gallons more than the previous month's usage will make the customer eligible for consideration of a credit to the customer's account. The average of the past twelve months of usage will be used as a base for crediting 100% of the excess usage billed (amount of credit will be based on the highest rate per 1,000 gallons). The City would require the customer to submit a written request for a credit with a copy of the bill from a licensed plumber certifying that the leak has been repaired and a copy of a valid City of Pflugerville Building Permit for the repair. The request must detail location and dates of the leak. Customers who have been notified of a leak, but have not repaired it within 15 days of notification, will not qualify for the credit. Customers are eligible for only one credit per account location.

Section 3. Retail Wastewater Rates.

The City will charge every retail utility customer served by the City wastewater rates that include the Monthly Base Charge and the Volume Charge set for the in (A) and (B) in this section.

(A) The Monthly Base Charge is as follows;

(1) In-City Customers.

Water Meter Size	Monthly Base Charge
5/8"	$18.50
3/4"	$18.50
1"	$19.51
1 ½"	$21.99
2"	$24.96
3"	$31.95
4"	$41.90
6"	$66.78
8"	$106.43

(2) Out-of-City Customers.

Water Meter Size	Monthly Base Charge
5/8"	$23.50
3/4"	$23.50
1"	$24.51
1 ½"	$26.99
2"	$29.96
3"	$36.95
4"	$46.90
6"	$71.78
8"	$111.43

(B) The Volume Charge for all meter sizes is $3.51 per 1000 gallons for every 1000 gallons over 3000.

(C) The quantity of wastewater used to calculate the Volume Charge for wastewater will be determined as follows:

(1) Residential Customers. Each March, the City will determine each customer's water usage during the preceding November, December, January and February and calculate the average of the 3 lowest water usage months during that period. The average will be used to calculate the customer's Volume Charges until the next March, when the average will be recalculated. For customers that do not receive water service from the City, the quantity of wastewater used to calculate the monthly bill will be determined by calculating the city average usage for residential customers during the preceding November, December, January and February.

(2) Non-Residential Customers. The City will determine each customer's water usage during the month and that amount will be used to calculate the customer's Volume Charges. For customers that do not receive water service from the City, the quantity of wastewater used to calculate the monthly bill will be determined by calculating the city average usage for residential customers during the preceding November, December, January and February.

Section 4. Wholesale Wastewater Rates

(A) Wilke Lane Treatment Plant.

The City will charge a rate of $26.50 per LUE per month to all wholesale customers served by the Wilke Lane wastewater treatment plant.

Section 5. Solid Waste Disposal Rates.

The City will charge each customer $15.60 for in-city residents and $17.60 for out-of-city residents plus applicable taxes for removing residential refuse and for resource recovery services, as described in Chapter 52 of the City of Pflugerville, Texas Code of Ordinances.

Section 6. Special Charges.

The City will charge each of the following charges for service calls and delinquent bills:

(A) Connect initial utility service (not including tap or impact fees) - No Charge;

(B) Connect initial water service with enrollment in draft program - $25.00.

(C) Move existing customer's service from one location to another - $25.00;

(D) Disconnect service for Nonpayment of Bill - $25.00;

(E) Reinstate service that was disconnected for Nonpayment of Bill - $25.00; and

(F) Any customer account that is delinquent will incur a 10% per month penalty charge on all accrued and unpaid charges.

Section 7. Deposits.

Each customer must pay the deposit set forth in this Section, or replenish the deposit if the City draws upon it, when the customer initially applies for the service or when the customers applies to reinstate service that has been disconnected for nonpayment of a bill. The amount of the deposit is as follows:

Service	Deposit Amount
Solid Waste Only	$25.00
Wastewater Only	$50.00
Water Only	$125.00
Any Combination	$125.00
Construction/Fire Hydrant	$1,200.00

The customer's deposit will be returned in full if the customer's account has not been delinquent for 12 consecutive months. The customer's deposit will be returned, less any outstanding balance, within 30 days from the day the customer's account is closed. Construction/Fire Hydrant meter deposits will be returned, less any outstanding balance, upon receipt of meter.

A customer may enroll in the automatic draft program for a period of not less than one year, in lieu of placing a utility deposit.

Section 8. Effective Date.

This will be effective on October 1, 2010.

Section 9. Severability.

If any provision of this Ordinance is illegal, invalid, or unenforceable under present or future laws, the remainder of this Ordinance will not be affected and, in lieu of each illegal, invalid, or unenforceable provision, a provision as similar in terms to the illegal, invalid, or unenforceable provision as is possible and is legal, valid, and enforceable will be added to this Ordinance.

PASSED AND APPROVED this 12th day of October, 2010.

CITY OF PFLUGERVILLE, TEXAS

By: ____________________________

Jeff Coleman, Mayor

ATTEST:

Karen Thompson

Karen Thompson, City Secretary

APPROVED AS TO FORM:

Floyd Akers, City Attorney

EXHIBIT C

WATER AND WASTEWATER SYSTEM DATA

TEXAS WATER DEVELOPMENT BOARD

UTILITY PROFILE

The purpose of the Utility Profile is to assist with water conservation plan development and to ensure that important information and data be considered when preparing your water conservation plan and its target and goals. Please complete all questions as completely and objectively as possible. See *Water Conservation Plan Guidance Checklist* (WRD-022) for information on other water conservation provisions. You may contact the Municipal Water Conservation Unit of the TWDB at 512-936-2391 for assistance.

APPLICANT DATA

Name of Utility: City of Pflugerville

Address & Zip: PO Box 589, Pflugerville, TX 78691-0589

Telephone Number: 512-990-6100 Fax: 512-251-5786

Form Completed By: Darrell Winslett Title: Water Superintendent

Signature: ____________ Date: ____________

Name and Phone Number of Person/Department responsible for implementing a water conservation program:

Name: Darrell Winslett Phone: 512-251-5786

UTILITY DATA

I. CUSTOMER DATA

A. Population and Service Area Data

1. Please attach a copy of your Certificate of Convenience and Necessity (CCN) from the TCEQ CCN # 11303. A map of the service area is attached as Exhibit A
2. Service area size (square miles): 9.5

3. Current population of service area: 36,771

4. Current population served by utility: a: water 36,771
b: wastewater___________

5. Population served by water utility for the previous five years:

Year	Population
2004	18,306
2005	19,545
2006	21,048
2007	21,874
2008	22,410

6. Projected population for service area in the following decades:

Year	Population
2010	22,932
2020	37,692
2030	51,333
2040	55,862
2050	61,523

7. List source(s)/method(s) for the calculation of current and projected population:
Planning department projects our city growth and population. They only look out to 2030. The growth beyond 2030 will only be a guess.

B. Active Connections

1. Current number of active connections by user type. If not a separate classification, check whether multi-family service is counted as Residential _____ or Commercial X

Treated water users:	Metered	Not-metered	Total
Residential-Single-Family	11,283	0	
Residential-Multi-Family	0	0	0
Commercial	399	0	
Industrial	0	0	
Public	44	0	
Other	0	0	0

2. List the net number of new connections per year for most recent three years:

2. List the net number of new connections per year for most recent three years:

Year	2006	2007	2008
Residential –Single-Family	1,049	886	476
Residential-Multi-Family	1	5	8
Commercial	33	36	23
Industrial	0	0	0
Public	2	2	2
Other	3	1	0

C. **High Volume Customers**

List annual water use for the five highest volume retail and wholesale customers (Please indicate if treated or raw water delivery.)

	Customer	Use (1,000gal./yr.)	Indicate Treated OR Raw
(1)	Manville WSC	393,511,600	treated
(2)	Windermere Utility	127,287,000	treated
(3)	Travis County TNR	61,017,000	treated
(4)	PISD	59,658,700	treated
(5)	City of Manor	27,046,900	treated

II. WATER USE DATA FOR SERVICE AREA

A. **Water Accounting Data**

1. Amount of water use for previous five years (in 1,000 gal.):
Please indicate: Diverted Water ______
Treated Water X

Year	2008	2007	2006	2005	2004
January	101,965	79,415	80,608	58,723	66,882
February	97,650	79,447	65,403	51,065	60,657
March	110,354	101,305	75,442	57,800	66,785
April	118,740	102,518	91,258	76,897	71,054
May	138,738	110,893	166,952	91,771	77,605
June	222,455	106,808	150,198	122,626	80,642
July	223,374	108,759	119,363	119,220	94,099
August	235,328	149,146	192,500	97,407	104,670
September	207,662	138,844	111,862	120,052	103,667
October	176,811	151,382	101,657	105,092	72,363
November	156,144	128,981	98,824	86,577	62,144
December	128,641	106,165	85,664	78,888	59,412
Total	1,917,862	1,363,663	1,339,731	1,066,118	919,880

Please indicate how the above figures were determined (e.g., from a master meter located at the point of a diversion from a stream or located at a point where raw water enters the treatment plant, or from water sales).

Master meter on our wells and at our surface water treatment plant.

2. Amount of water (in 1,000 gallons) delivered (sold) as recorded by the following account types (See #1, Appendix A) for the past five years.

Year	Residential	Commercial	Industrial	Wholesale	Other	Total Sold
2004	723,711	159,512	0	29,726	32,162	945,111
2005	879,360	183,723	0	33,120	51,120	1,147,323
2006	1,026,027	219,574	0	80,737	53,825	1,380,163
2007	930,397	212,345	0	323,180	44,173	1,510,095
2008	1,284,138	337,492	0	493,030	50,158	2,164,818

3. List previous five years records for water loss (See #2, Appendix A)

Year	Amount (gal.)
2004	111298650
2005	183000000
2006	103500000
2007	103500000
2008	103500000

4. List previous five years records for annual peak-to-average daily use ratio (See #3, Appendix A)

Year	Average MGD	Peak MGD	Ratio
2004	2.520	4.848	1.92
2005	2.920	7.641	2.61
2006	3.670	8.904	2.42
2007	3.736	6.586	1.76
2008	5.254	9.896	1.88

5. Total per capita water use for previous five years (See #4, Appendix A):

Year	Population	Total Diverted (or Treated Less Wholesale Sales (1,000 gal.)	Per Capita (gpcd)
2004	18306	9,153.91	136
2005	19515	1,114.203	148
2006	19545	1,299.426	182
2007	21873	1,186.915	156
2008	22410	1,674.788	204

6. Seasonal water use for the previous five years (in gallons per person per day) (See #5, Appendix A):

Year	Population	Base Per Capita Use	Summer Per Capita Use
2004	18306	116	169.53
2005	19515	96.33	193
2006	19545	127.8	262.7
2007	21873	124.21	185
2008	22410	151	337.7

B. Projected Water Demands

Project water supply requirements for at least the next ten years using population trends, historical water use, and economic growth, etc. Indicate sources of data and how projected water demands were determined.
Attach additional sheets if necessary.

Year	gpcpd	Service Population	Annual Water Use In 1000 gal.
2010	204.00	22,932	1,707,517
2011	201.96	24,408	1,799,245
2012	199.94	25,884	1,888,969
2013	197.94	27,360	1,976,718
2014	195.96	28,836	2,062,523
2015	194.00	30,312	2,146,415

Year	gpcpd	Service Population	Annual Water Use In 1000 gal.
2015	194.00	30,312	2,146,416
2016	190.63	31,788	2,211,765
2017	187.31	33,264	2,274,191
2018	184.05	34,740	2,333,776
2019	180.85	36,216	2,390,598
2020	177.14	37,692	2,437,018

Took the average number of connection from last 5 years, did the same for water average per capita for the next ten years.
**On the number of connections took 2/3 of total for our CCN, others 1/3 is outside our water service area.

III. WATER SUPPLY SYSTEM

A. Water Supply Sources

List all current water supply sources and the amounts available with each:

	Source	Amount Available
Surface Water:	Lake Pflugerville / LCRA Colorado River	15.5 MGD
Groundwater:	3 wells in Edwards Aquifer	7.7 MGD
Contracts:	NA	- MGD
Other:	NA	- MGD

B. Treatment and Distribution System

1. Design daily capacity of system: 23.2 MGD

2. Storage Capacity: Elevated 1.750 MGD, Ground 3.487 MGD

3. If surface water, do you recycle filter backwash to the head of the plant?
Yes ______ No X**. If yes, approximately ________ MGD.

**Not at this time, work on project to recycle water should start January 2010.

4. Please describe the water system. Include the number of treatment plants, wells, and storage tanks. If possible, include a sketch of the system layout.

Pfenning Ln Booster
Pump Station

Kelly Ln Elevated Tank

Well # 4 Ground Storage

Pfennig Ln Standpipe

Clearwell SWTP

*Interconnect with
SWW for Windermere

Surface water is supplied to about 3/4 of the City, the other 1/4 on the south and southwest side of town get blended water from surface and wells.

Well # 6 Ground Storage

South Standpipe

Well # 7 Ground Storage

Appendix A

Definitions of Utility Profile Terms

1. **Residential – Single Family** should include water sold to single family and duplexes.
Residential – Multi-Family should include water sold to this class of customers only.
Commercial/Institutional sales should include water sold to retail businesses, offices, hospitals, etc.
Industrial sales should include water sold to manufacturing and other heavy industry.
Wholesale sales should include water sold to another utility for resale to the public.
Other water sales should be noted as necessary.

2. **Total use in gallons per capita per day** is defined as total average daily amount of water treated or raw water provided for potable use by a public water supply system. The calculation is made by dividing the water diverted or pumped for treatment by population served. Indirect reuse volumes shall be credited against total diversion volumes for the purpose of calculation gallons per capita per day for targets and goals developed for the water conservation plan. Total water use is calculated by subtracting the wholesale sales from the total treated or raw water.

3. **Residential use in gallons per captita per day** is calculated by dividing the total single family plus multi-family residential water sales by the population served and then dividing by 365.

4. **Seasonal water use** is the difference between winter daily per capita use and summer daily per capita use. To calculate **the winter daily per capita use**, add the monthly diversions for December, January, and February, and divide by 90. Then divide this figure by the population. To calculate the **summer daily per capita use**, use the months of June, July, and August.

5. **Water Loss** is the difference between water a utility purchases or produces and the amount of water that it can account for in sales and other use, metered and unmetered, such as firefighting, line flushing, and water for public buildings and water treatment plants. Water loss can result from:
    1. Inaccurate or incomplete record keeping;
    2. Meter error;
    3. Leaks; and
    4. Water theft and unauthorized use.

6. The **peak-day to average-day ratio** is calculated by dividing the maximum daily pumpage by the average daily pumpage. Average daily pumpage is the total pumpage for the year divided by 365.

EXHIBIT D

DISCUSSION OF WATER CONSERVATION GOALS

Water Conservation Goals

The technical potential for reducing per capita water use is the range in potential water savings that can be achieved by implementing specific water conservation measures. The bottom of the range represents the potential savings under a "most likely", or real-world conservation scenario. The top of the range represents the potential savings under an "advanced" conservation scenario. The conservation measures include:

- Reducing unaccounted-for water uses;
- Reducing indoor water use due to water conserving plumbing fixtures;
- Reducing seasonal water use; and
- Reducing water use through public education program

Guidelines for calculating the technical potential water savings for each of the conservation measures are given below.

1. Reducing unaccounted-for water uses.

The Texas Commission on Environmental Quality (TCEQ) considers unaccounted-for water uses of 15% or less acceptable for communities serving more than 5,000 people. Smaller, older systems that have a larger service area may legitimately experience larger losses. Losses above 15% may be an area of concern, and provide a conservation potential.

2. Reducing indoor water use due to water-conserving plumbing fixtures

The TCEQ uses 20.5 gpcd as the most reliable figure upon which to base potential water savings, which represents the "most likely" conservation scenario. This figure is based upon the estimate that by 2050, 90% of the pre-1992 homes, and all new homes will have been equipped with water conserving plumbing fixtures.

The figure used for the "advanced" conservation scenario, 21.7 gpcd, is an estimate of the average savings that would result from a home equipped exclusively with water-conserving plumbing fixtures. This figure is considered "advanced" because in a typical city, 100% of the homes are not exclusively equipped with water-conserving fixtures.

3. Reducing seasonal water use

The Texas Water Development Board (TWDB) has calculated seasonal use as a percentage of average annual per capita use for East Texas (20%), West Texas (25%), and a statewide average of 22.5%. Seasonal water use is calculated by multiplying the average annual per capita use in the gpcd by the appropriate percentage, The technical potential for reduction in seasonal use is then calculated by multiplying the seasonal use by 7% for the "most likely" conservation scenario, and by 20% for the "advanced" scenario.(based on LCRA calculations)

4. Reducing Water Use through Public Education Programs

The technical potential for water conservation from public education program is estimated to be from 2% of the average annual per capita use for the "most likely" conservation scenario to 5% for the "advanced" scenario, according to the "Water Conservation Guidebook", published in 1993 by the America Water Works Association.

To calculate the total technical potential for reducing municipal per capita water use, add the individual technical potential amounts.

Summary of Technical Potential Calculations		
Conservation Measure	**Calculation Procedure**	**Result**
Reducing unaccounted-for uses	(Dry-year demand) x (Unaccounted for percentage if more than 15%, minus 15%)	0 to 12.81 gpcd
Reducing indoor water use due to water-efficient plumbing fixtures	20.5 gpcd ("rule of thumb") to 21.7 gpcd (advanced)	20.5 to 21.7 gpcd
Reducing seasonal water use	Seasonal use (Avg use x 22.5%) x 7% and 20%	3.21 to 9.18 gpcd
Reducing water use through public education program	Average use x 2% and 5%	4.08 to 10.2 gpcd
	Total Technical Potential Savings	**27.79 to 41.08**

To calculate the long-run planning goal, subtract these totals from the dry-year water demand.

Estimation of the technical potential for reducing per capita water use	
Conservation Measure	**Conservation Scenario Most Likely**
Reduction in unaccounted-for uses	0
Reduction in indoor water use due to water-conserving plumbing fixtures	20.5 gpcd
Reduction in seasonal use	3.21 gpcd
Reduction in water use due to public education programs	4.08 gpcd

TOTAL TECHNICAL POTENTIAL FOR REDUCING PER CAPITA WATER USE: 27.79

*Subtract these totals from the dry-year per capita use to calculate the long-run planning goal.

Planning Goal

The planning goal equals the dry year per capita water use minus the total technical potentials calculated above.

Planning goal (in gpcd): 176.21
Goal to be achieved by year: 2020

Needed reduction in per capita use to meet planning goal

Current per capita use: 204
Planning Goal: 176.21
Difference between current use and goal: 27.79
(Represents needed reduction in per capita use to meet goal)

TOTAL TECHNICAL POTENTIAL FOR REDUCING PER CAPITA WATER USE: 27.79

*Subtract these totals from the dry-year per capita use to calculate the long-run planning goal.

Planning Goal

The planning goal equals the dry year per capita water use minus the total technical potentials calculated above.

Planning goal (in gpcd): 176.21
Goal to be achieved by year: 2020

Needed reduction in per capita use to meet planning goal

Current per capita use: 204
Planning Goal: 176.21
Difference between current use and goal: 27.79
(Represents needed reduction in per capita use to meet goal)

EXHIBIT F

RESOLUTION

RESOLUTION NO. 1280-11-04-12-0030

RESOLUTION OF THE CITY OF PFLUGERVILLE, TEXAS ADOPTING A WATER CONSERVATION PLAN

WHEREAS, the City of Pflugerville established a written plan to provide for the conservation of the City's water resources adopted by Resolution No. 191-02-02-12-3D on February 12, 2002; Resolution No. 270-02-09-10-4J adopted on September 10, 2002; and by Resolution No. 912-06-09-12-8K adopted on September 12, 2006; and

WHEREAS, conservation of water will extend available water supplies, reduce the risk of water shortages, reduce water and wastewater utility operating costs, reduce customer costs for water service, reduce wastewater flows, and enhance water quality and the environment; and

WHEREAS, the City Council of City of Pflugerville now wishes to amend the City's water conservation plan to reflect new five and ten-year goals for water conservation; NOW THEREFORE,

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF PFLUGERVILLE, TEXAS:

That the City Council hereby approves and adopts the attached amended City of Pflugerville Water Conservation Plan.

APPROVED this 12th day of April 2011.

CITY OF PFLUGERVILLE, TEXAS

Jeff Coleman, Mayor

ATTEST:

Karen Thompson

Karen Thompson, City Secretary

<u>EXHIBIT "A"</u>

WATER CONSERVATION PLAN

I. Approval of the Plan

The Board of Directors (the "*<u>Board</u>*") of Jonah Special Utility District (the "*<u>District</u>*") hereby establishes the Water Conservation Plan (the "*<u>Plan</u>*"), set forth below. The Board commits to implement this Plan according to the procedures set forth below.

II. Water Conservation Plan

2.01 Water and Wastewater Utility System Profile.

A. Service Area Population. As of the date of adoption of this Plan, the District had 4,788 residential connections. The estimated population of the District's service area is 13,958.

B. Water Utility Data.

1. *Type* / *Existing*

Type	*Existing*
Residential	4,788 Connections
Commercial	149 Connections

2. Percent of Connections Metered: 100%

3. Average daily use is estimated to be approximately 120 gallons per capita per day.

4. The District receives its water supply (up to 0.5 MGD) from Brazos River Authority ("*<u>Water Supplier</u>*") and (up to 4.4 MGD) from the District's groundwater wells in the Edwards Aquifer.

C. Financial Data. The District's water rates and connection/impact fees are set forth in the District's Rate Order. The rates and fees are comparable to surrounding adjacent systems and are cost-based and use an increasing block rate structure to promote conservation.

2.02 Conservation Strategies.

A. Minimum Measures.

1. <u>Water Conservation Goals</u>. The District's five-year target for water savings is to reduce daily water consumption in gallons per capita by 3%, and the District's 10-year target for water savings is to reduce daily water consumption in gallons per capita by an additional 3% over the five-year target. The District will attempt to achieve these targets and goals by:

a. Encouraging and supporting efficient water use and reduced waste.

b. Taking measures to maintain per capita water usage below the median of the previous five years' gallons per capita per day consumption for similarly situated water providers.

c. Striving to limit unaccounted-for water from the District's system to no more than 10% of the volume of water delivered based on a moving five year average.

d. Implementing and maintaining a program of universal metering and meter replacement and repair.

e. Encouraging decreasing waste in landscape irrigation.

f. Raising public awareness of water conservation and encouraging responsible public behavior through a coordinated public education and information program.

g. Developing a system specific strategy to conserve water during peak demands, thereby reducing peak use.

h. Encouraging the use of water-efficient plumbing fixtures.

i. Encouraging and supporting efficient water use and reduced waste.

j. Implementing all applicable water conservation measures required by any water supplier of the District.

2. Meters. The District will regularly monitor all water deliveries and sales to its customers. All water sources and all service connection accounts will be individually metered and read on a regular basis. The District will maintain a billing system that recognizes the following user categories: residential, commercial (including public and governmental water uses) and industrial. The information to be collected and maintained as described herein will be used to complete the annual water conservation report. The District will strive to implement the following with respect to metering and meter repair/replacement:

a. The supply of water from Water Supplier and the District's wells will be metered with water meters capable of accuracy within +/-5%.

b. Each connection will be metered with a water meter capable of accuracy within +/- 5%.

c. Each connection on the system will be metered, including landscape irrigation and public facilities.

d. A regularly scheduled maintenance program of meter repair and replacement will be established in accordance with the following time intervals:

i. Master Meters: Test once/year

ii. 1" + Meters: Test once/5 years

iii. Meters <1": Test once/ 10 years

3. Education and Public Information Programs. The District will attempt to undertake a coordinated water conservation public education and information program with its customers that may include:

a. Providing a conservation message that may be included with water bills at least twice per year.

b. Encouraging local media coverage of water conservation issues and the importance of water conservation.

c. Making water conservation information and materials available.

d. Notify local organizations, schools, and civic groups that the District's staff, and staff of the Brazos River Authority, are available to make presentations on the importance of water conservation and the best ways to save water.

e. Make information on water conservation on the District's website and include links to the Texas Smartscape website and to other sites with good information about water conservation, including the Texas Water Development Board's and the Texas Commission on Environmental Quality's websites.

B. Other Measures. Other measures may include system operation requirements and rules that promote water conservation such as use of new water conserving technology in construction, landscape watering management, and appropriate use of updated plumbing fixtures that conserve water. In addition, the District will regularly review this Plan in accordance with applicable rules to ensure that it is effective and efficient.

2.03 Coordination with Regional Water Planning Group. The service area of the District is located within the Brazos Regional Water Planning Area (Region G) of the State of Texas and the District has provided or will provide a copy of this water conservation plan to the regional water planning group.

2.04 Leak Detection and Repair Most water leaks, illegal connections, or abandoned water services are discovered through the visual observation of field crews and other personnel, or are reported by the public. The District has trained its personnel to look for and report evidence of water leaks in the water distribution system to the appropriate department. All leaks will be repaired as soon as possible in order to maintain a sound water system. Areas of the water distribution system in which numerous leaks and line breaks occur should be programmed for replacement, as funds are available.

Specialized, state-of-the-art leak detection equipment is available free of charge from the Conservation Division of the Texas Water Development Board to reduce water loss by detecting water leaks within the water distribution system. The District will develop a leak detection and repair program to minimize unaccounted-for water losses in its water distribution system within the next three (3) years.

2.05 Ordinances, Plumbing Codes, or Rules on Water-Conserving Fixtures

The District has adopted applicable sections of the National Standard Plumbing Code (2006), as amended, promulgated by the Plumbing Heating Cooling Contractors National Association, in Section B, subsection 9, of its Rate Order, adopted August 24, 2006, as guidance in the design, installation and maintenance of line extensions and service facilities.

2.06 Water Conservation Coordinator The District's General Manager, or a person designated by the District's General Manager, is designated as the District's Water Conservation Coordinator.

III. Drought Contingency Plan

The District's Drought Contingency Plan is part of its Rate Order, initially adopted August 24, 2006.

IV. Enforcement. The District's Water Conservation Coordinator should:

1. Oversee the execution and administration of all Plan elements;

2. Supervise the keeping of records for the program verification and to assess the program effectiveness; and

3. Make recommendations for changes in the Plan as needed.

V. Review and Update of Water Conservation Plan. As required by the Texas Commission on Environmental Quality (the "TCEQ"), the District will review the Plan every five years. The Plan will be updated as appropriate based on new or updated information. Should the Plan be revised during any five-year period, an amended plan must be submitted to the TCEQ within ninety (90) days of being adopted.

Appendix I Drought Contingency Plans

CITY OF HUTTO
DROUGHT CONTINGENCY PLAN

CHAPTER 13 UTILITIES

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.001 Declaration of policy, purpose, and intent

(a) In order to conserve the available water supply and protect the integrity of water supply facilities, with particular regard for domestic water use, sanitation, and fire protection, and to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other water supply emergency conditions, the city hereby adopts the following regulations and restrictions on the delivery and consumption of water.

(b) Water uses regulated or prohibited under this drought contingency plan (the plan) are considered to be nonessential, and continuation of such uses during times of water shortage or other emergency water supply condition are deemed to constitute a waste of water which subjects the offender(s) to penalties as defined in section 13.05.011 of this plan.

(2004 Code, sec. 13.401)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.002 Public involvement

Opportunity for the public to provide input into the preparation of the plan was provided by the city by means of scheduling and providing public notice of a public meeting to accept input on the plan. (2004 Code, sec. 13.402)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.003 Public education

The city will periodically provide the public with information about the plan, including information about the conditions under which each stage of the plan is to be initiated or terminated and the drought response measures to be implemented in each stage. This information will be provided by means of press releases or utility bill inserts. (2004 Code, sec. 13.403)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.004 Coordination with regional water planning groups

The service area of the city is located within the Brazos Region, and [the city] has provided a copy of this plan to the Brazos Region. (2004 Code, sec. 13.404)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.005 Authorization

The mayor or his/her designee is hereby authorized and directed to implement the applicable provisions of this plan upon determination that such implementation is necessary to protect public health, safety, and welfare. The mayor or his/her designee shall have the authority to initiate or terminate drought or other water supply emergency response measures as described in this plan. (2004 Code, sec. 13.405)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.006 Applicability

The provisions of this plan shall apply to all persons, customers, and property utilizing water provided by the city. The terms "person" and "customer" as used in the plan include individuals, corporations, partnerships, associations, and all other legal entities. (2004 Code, sec. 13.406)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.007 Definitions

For the purposes of this plan, the following definitions shall apply:

Aesthetic water use. Water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Commercial and institutional water use. Water use which is integral to the operations of commercial and nonprofit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

Conservation. Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Customer. Any person, company, or organization using water supplied by the city.

Domestic water use. Water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Even-numbered address. Street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Industrial water use. The use of water in processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use. Water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, and rights-of-way and medians.

Nonessential water use. Water uses that are not essential nor required for the protection of public health, safety, and welfare, including:

(1) Irrigation of landscape areas, including parks, athletic fields, and golf courses, except as otherwise provided under this plan;

(2) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;

(3) Use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;

(4) Use of water to wash down buildings or structures for purposes other than immediate fire protection;

(5) Flushing gutters or permitting water to run or accumulate in any gutter or street;

(6) Use of water to fill, refill, or add to any indoor or outdoor swimming pools or Jacuzzi-type pools;

(7) Use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;

(8) Failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and

(9) Use of water from hydrants for construction purposes or any other purposes other than firefighting.

Odd-numbered address. Street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

(2004 Code, sec. 13.407)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.008 Criteria for initiation and termination of drought response stages

(a) The mayor or his/her designee shall monitor water supply and/or demand conditions on a daily basis and shall determine when conditions warrant initiation or termination of each stage of the plan, that is, when the specified "triggers" are reached.

(b) The triggering criteria described below are based on known system capacity limits.

(1) Stage 1 triggers–Mild water shortage conditions.

(A) Requirements for initiation. Customers shall be requested to voluntarily conserve water and adhere to the prescribed restrictions on certain water uses, defined in section 13.05.007, when:

Example 1: Annually, beginning on May 1 through September 30.

Example 2: When the water supply available to the city is equal to or less than 75% of storage.

Example 3: When, pursuant to requirements specified in the city wholesale water purchase contract with Manville Water Supply Corporation, notification is received requesting initiation of stage 1 of the drought contingency plan.

(B) Requirements for termination. Stage 1 of the plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 7 consecutive days.

(2) Stage 2 triggers–Moderate water shortage conditions.

(A) Requirements for initiation. Customers shall be required to comply with the requirements and restrictions on certain nonessential water uses provided in section 13.05.009 of this plan when:

Example 1: Annually, beginning on May 1 through September 30.

Example 2: When the water supply available to the city is equal to or less than 75% of storage.

Example 3: When, pursuant to requirements specified in the city wholesale water purchase contract with Manville Water Supply Corporation, notification is received requesting initiation of stage 2 of the drought contingency plan.

(B) Requirements for termination. Stage 2 of the plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 7 consecutive days. Upon termination of stage 2, stage 1 becomes operative.

(3) Stage 3 triggers–Severe water shortage conditions.

(A) Requirements for initiation. Customers shall be required to comply with the requirements and restrictions on certain nonessential water uses for stage 3 of this plan when:

Example 1: Annually, beginning on May 1 through September 30.

Example 2: When the water supply available to the city is equal to or less than 75% of storage.

Example 3: When, pursuant to requirements specified in the city wholesale water purchase contract with Manville Water Supply Corporation, notification is received requesting initiation of stage 3 of the drought contingency plan.

(B) Requirements for termination. Stage 3 of the plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 7 consecutive days. Upon termination of stage 3, stage 2 becomes operative.

(4) Stage 4 triggers–Critical water shortage conditions.

(A) Requirements for initiation. Customers shall be required to comply with the requirements and restrictions on certain nonessential water uses for stage 4 of this plan when _____ (describe triggering criteria; see examples in stage 1).

Example 1: Annually, beginning on May 1 through September 30.

Example 2: When the water supply available to the city is equal to or less than 50% of storage.

Example 3: When, pursuant to requirements specified in the city wholesale water purchase contract with Manville Water Supply Corporation, notification is received requesting initiation of stage 4 of the drought contingency plan.

(B) Requirements for termination. Stage 4 of the plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 7 consecutive days. Upon termination of stage 4, stage 3 becomes operative.

(5) Stage 5 triggers–Emergency water shortage conditions.

(A) Requirements for initiation. Customers shall be required to comply with the requirements and restrictions for stage 5 of this plan when the mayor or his/her designee determines that a water supply emergency exists based on:

(i) Major water line breaks, or pump or system failures occur, which cause unprecedented loss of capability to provide water service; or

(ii) Natural or manmade contamination of the water supply source(s).

(B) Requirements for termination. Stage 5 of the plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 2 consecutive days.

(6) Stage 6 triggers–Water allocation.

(A) Requirements for initiation. Customers shall be required to comply with the water allocation plan prescribed in section 13.05.009 of this plan and comply with the requirements and restrictions for stage 5 of this plan when:

Example 1: Annually, beginning on May 1 through September 30.

Example 2: When the water supply available to the city is equal to or less than 25% of storage.

Example 3: When, pursuant to requirements specified in the city wholesale water purchase contract with Manville Water Supply Corporation, notification is received requesting initiation of stage 6 of the drought contingency plan ___________________ (describing triggering criteria, see examples in stage 1).

(B) Requirements for termination. Water allocation may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 3 consecutive days.

(2004 Code, sec. 13.408)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.009 Drought response stages

(a) Monitoring and notification. The mayor or his/her designee shall monitor water supply and/or demand conditions on a daily basis and in accordance with the triggering criteria set forth in section 13.05.008 of this plan; shall determine that a mild, moderate, severe, critical, emergency or water shortage condition exists; and shall implement the following notification procedures:

(1) Notification of public. The mayor or his/her designee shall notify the public by means of the following examples:

(A) Public service announcements;

(B) Signs posted in public places;

(C) Take-home fliers at schools.

(2) Additional notification. The mayor or his/ her designee shall notify directly, or cause to be notified directly, the following individuals and entities: [sic]

(b) Response stages.

(1) Stage 1 response–Mild water shortage conditions.

(A) Goal. Achieve a voluntary 20-percent reduction in daily water demand.

(B) Supply management measures. Discontinued flushing of water mains, activation and use of an alternative supply source; use of reclaimed water for nonpotable purposes.

(C) Voluntary water use restrictions.

(i) Water customers are requested to voluntarily limit the irrigation of landscaped areas to Sundays and Thursdays for customers with a street address ending in an even number (0, 2, 4, 6 or 8), and Saturdays and Wednesdays for water customers with a street address ending in an odd number (1, 3, 5, 7 or 9), and to irrigate landscapes only between the hours of midnight and 10:00 a.m. and 7:00 p.m. to midnight on designated watering days.

(ii) All operations of the city shall adhere to water use restrictions prescribed for stage 2 of the plan.

(iii) Water customers are requested to practice water conservation and to minimize or discontinue water use for nonessential purposes.

(2) Stage 2 response–Moderate water shortage conditions.

(A) Goal. Achieve a 30-percent reduction in daily water demand.

(B) Supply management measures. Describe measures, if any, to be implemented directly by the city to manage limited water supplies and/or reduce water demand. Reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for nonpotable purposes.

(C) Water use restrictions. Under threat of penalty for violation, the following water use restrictions shall apply to all persons:

(i) Irrigation of landscaped areas with hose-end sprinklers or automatic irrigation systems shall be limited to Sundays and Thursdays for customers with a street address ending in an even number (0, 2, 4, 6 or 8), and Saturdays and Wednesdays for water customers with a street address ending in an odd number (1, 3, 5, 7 or 9), and irrigation of landscaped areas is further limited to the hours of 12:00 midnight until 10:00 a.m. and between 8:00 p.m. and 12:00 midnight on designated watering days. However, irrigation of landscaped areas is permitted at any time if it is by means of a handheld hose, a faucet-filled bucket or watering can of five (5) gallons or less, or drip irrigation system.

(ii) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight. Such washing, when allowed, shall be done with a handheld bucket or a handheld hose equipped with a positive shutoff nozzle for quick rinses. Vehicle washing may be done at any time on the immediate premises of a commercial carwash or commercial service station. Further, such washing may be exempted from these regulations if the health, safety, and welfare of the public is contingent upon frequent vehicle cleansing, such as garbage trucks and vehicles used to transport food and perishables.

(iii) Use of water to fill, refill, or add to any indoor or outdoor swimming pools, wading pools, or Jacuzzi-type pools is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight.

(iv) Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a recirculation system.

(v) Use of water from hydrants shall be limited to firefighting, related activities, or other activities necessary to maintain public health, safety, and welfare, except that use of water from designated fire hydrants for construction purposes may be allowed under special permit from the city.

(vi) Use of water for the irrigation of golf course greens, tees, and fairways is prohibited except on designated watering days between the hours 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight. However, if the golf course utilizes a water source other than that provided by the city, the facility shall not be subject to these regulations.

(vii) All restaurants are prohibited from serving water to patrons except upon request of the patron.

(viii) The following uses of water are defined as nonessential and are prohibited:

a. Wash down of any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;

b. Use of water to wash down buildings or structures for purposes other than immediate fire protection;

c. Use of water for dust control;

d. Flushing gutters or permitting water to run or accumulate in any gutter or street; and

e. Failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s).

(3) Stage 3 response–Severe water shortage conditions.

(A) Goal. Achieve a 50-percent reduction in daily water demand.

(B) Supply management measures. Reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for nonpotable purposes.

(C) Water use restrictions. All requirements of stage 2 shall remain in effect during stage 3 except:

(i) Irrigation of landscaped areas shall be limited to designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight and shall be by means of handheld hoses, handheld buckets, drip irrigation, or permanently installed automatic sprinkler systems only. The use of hose-end sprinklers is prohibited at all times.

(ii) The watering of golf course tees is prohibited unless the golf course utilizes a water source other than that provided by the city.

(iii) The use of water for construction purposes from designated fire hydrants under special permit is to be discontinued.

(4) Stage 4 response–Critical water shortage conditions.

(A) Goal. Achieve a 60-percent reduction in daily water demand.

(B) Supply management measures. Describe measures, if any, to be implemented directly by city. Discontinue flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source; use of reclaimed water for nonpotable purposes.

(C) Water use restrictions. All requirements of stages 2 and 3 shall remain in effect during stage 4 except:

(i) Irrigation of landscaped areas shall be limited to designated watering days between the hours of 6:00 a.m. and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight and shall be by means of handheld hoses, handheld buckets, or drip irrigation only. The use of hose-end sprinklers or permanently installed automatic sprinkler systems are prohibited at all times.

(ii) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle not occurring on the premises of a commercial carwash and commercial service stations and not in the immediate interest of public health, safety, and welfare is prohibited. Further, such vehicle washing at commercial carwashes and commercial service stations shall occur only between the hours of 6:00 a.m. and 10:00 a.m. and between 6:00 p.m. and 10 p.m.

(iii) The filling, refilling, or adding of water to swimming pools, wading pools, and Jacuzzi-type pools is prohibited.

(iv) Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a recirculation system.

(v) No application for new, additional, expanded, or increased-in-size water service connections, meters, service lines, pipeline extensions, mains, or water service facilities of any kind shall be approved, and time limits for approval of such applications are hereby suspended for such time as this drought response stage or a higher-numbered stage shall be in effect.

(5) Stage 5 response–Emergency water shortage conditions.

(A) Goal. Achieve a 75-percent reduction in daily water demand.

(B) Supply management measures. Discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for nonpotable purposes.

(C) Water use restrictions. All requirements of stages 2, 3, and 4 shall remain in effect during stage 5 except:

(i) Irrigation of landscaped areas is absolutely prohibited.

(ii) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle is absolutely prohibited.

(6) Stage 6 response–Water allocation. In the event that water shortage conditions threaten public health, safety, and welfare, the mayor is hereby authorized to allocate water according to the following water allocation plan:

(A) Single-family residential customers. The allocation to residential water customers residing in a single-family dwelling shall be as follows:

Persons per Household	Gallons per Month
1 or 2	6,000
3 or 4	7,000
5 or 6	8,000
7 or 8	9,000
9 or 10	10,000
11 or more	12,000

"Household" means the residential premises served by the customer's meter. "Persons per household" includes only those persons currently physically residing at the premises and expected to reside there for the entire billing period. It shall be assumed that a particular customer's household is comprised of two (2) persons unless the customer notifies the city of a greater number of persons per household on a form prescribed by the mayor. The mayor shall give his/her best effort to see that such forms are mailed, otherwise provided, or made available to every residential customer. If, however, a customer does not receive such a form, it shall be the customer's responsibility to go to the city offices to complete and sign the form claiming more than two (2) persons per household. New customers may claim more persons per household at the time of applying for water service on the form prescribed by the mayor. When the number of persons per household increases so as to place the customer in a different allocation category, the customer may notify the city on such form, and the change will be implemented in the next practicable billing period. If the number of persons in a household is reduced, the customer shall notify the city in writing within two (2) days. In prescribing the method for claiming more than two (2) persons per household, the mayor shall adopt methods to insure the accuracy of the claim. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of persons in a household or fails to timely notify the city of a reduction in the number of person in a household shall be fined not less than $1.00.

(2004 Code, sec. 13.410)

Residential water customers shall pay the surcharges as provided in appendix A to this code. Surcharges shall be cumulative.

(B) Master-metered multifamily residential customers. The allocation to a customer billed from a master meter which jointly measures water to multiple permanent residential dwelling units (e.g., apartments, mobile homes) shall be allocated 6,000 gallons per month for each dwelling unit. It shall be assumed that such a customer's meter serves two dwelling units unless the customer notifies the city of a greater number on a form prescribed by the mayor. The mayor shall give his/her best effort to see that such forms are mailed, otherwise provided, or made available to every such customer. If, however, a customer does not receive such a form, it shall be the customer's responsibility to go to the city offices to complete and sign the form claiming more than two (2) dwellings. A dwelling unit may be claimed under this provision whether it is occupied or not. New customers may claim more dwelling units at the time of applying for water service on the form prescribed by the mayor. If the number of dwelling units served by a master meter is reduced, the customer shall notify the city in writing within two (2) days. In prescribing the method for claiming more than two (2) dwelling units, the mayor shall adopt methods to insure the accuracy of the claim. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of dwelling units served by a master meter or fails to timely notify the city of a reduction in the number of person in a household shall be fined not less than $100.00. Customers billed from a master meter under this provision shall pay monthly surcharges as provided in appendix A to this code. Surcharges shall be cumulative.

(C) Commercial customers. A monthly water allocation shall be established by the mayor or his/her designee for each nonresidential commercial customer other than an industrial customer who uses water for processing purposes. The nonresidential customer's allocation shall be approximately 75 percent of the customer's usage for corresponding month's billing period for the previous 12 months. If the customer's billing history is shorter than 12 months, the monthly average for the period for which there is a record shall be used for any monthly period for which no history exists. Provided, however, a customer, 75 percent of whose monthly usage is less than 3,000 gallons, shall be allocated 3,000 gallons. The mayor shall give his/her best effort to see that notice of each nonresidential customer's allocation is mailed to such customer. If, however, a customer does not receive such notice, it shall be the customer's responsibility to contact the city to determine the allocation. Upon request of the customer or at the initiative of the mayor, the allocation may be reduced or increased if: (1) the designated period does not accurately reflect the customer's normal water usage; (2) one nonresidential customer agrees to transfer part of its allocation to another nonresidential customer; or (3) other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may appeal an allocation established hereunder to the city council. Nonresidential commercial customers shall pay surcharges as provided in appendix A to this code. The surcharges shall be cumulative.

(D) Industrial customers. A monthly water allocation shall be established by the mayor, or his/her designee, for each industrial customer which uses water for processing purposes. The industrial customer's allocation shall be approximately 90 percent of the customer's water usage baseline. Ninety (90) days after the initial imposition of the allocation for industrial customers, the industrial customer's allocation shall be further reduced to 85 percent of the customer's water usage baseline. The industrial customer's water use baseline will be computed on the average water use for the 12-month period ending prior to the date of implementation of stage 2 of the plan. If the industrial water customer's billing history is shorter than 12 months, the monthly average for the period for which there is a record shall be used for any monthly period for which no billing history exists. The mayor shall give his/her best effort to see that notice of each industrial customer's allocation is mailed to such customer. If, however, a customer does not receive such notice, it shall be the customer's responsibility to contact the city to determine the allocation, and the allocation shall be fully effective notwithstanding the lack of receipt of written notice. Upon request of the customer or at the initiative of the mayor, the allocation may be reduced or increased: (1) if the designated period does not accurately reflect the customer's normal water use because the customer had shut down a major processing unit for repair or overhaul during the period; (2) the customer has added or is in the process of adding significant additional processing capacity; (3) the customer has shut down or significantly reduced the production of a major processing unit; (4) the customer has previously implemented significant permanent water conservation measures such that the ability to further reduce water use is limited; (5) the customer agrees to transfer part of its allocation to another industrial customer; or (6) if other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may appeal an allocation established hereunder to the city council. Industrial customers shall pay surcharges as provided in appendix A to this code. The surcharges shall be cumulative.

(2004 Code, secs. 13.409, 13.410; Ordinance adopting Code)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.010 Enforcement

(a) No person shall knowingly or intentionally allow the use of water from the city for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this plan or in an amount in excess of that permitted by the drought response stage in effect at the time pursuant to action taken by mayor, or his/her designee, in accordance with provisions of this plan. (2004 Code, sec. 13.411)

(b) Any person who violates this plan is guilty of a misdemeanor and upon conviction shall be punished by a fine in accordance with the general penalty in section 1.01.009 of this code. Each day that one or more of the provisions in this plan is violated shall constitute a separate offense. If a person is convicted of three or more distinct violations of this plan, the mayor shall, upon due notice to the customer, be authorized to discontinue water service to the premises where such violations occur. Services discontinued under such circumstances shall be restored only upon payment of a reconnection charge as provided in appendix A to this code and any other costs incurred by the city in discontinuing service. In addition, suitable assurance must be given to the mayor that the same action shall not be repeated while the plan is in effect. Compliance with this plan may also be sought through injunctive relief in the district court. (2004 Code, sec. 13.411; Ordinance adopting Code)

(c) Any person, including a person classified as a water customer of the city, in apparent control of the property where a violation occurs or originates shall be presumed to be the violator, and proof that the violation occurred on the person's property shall constitute a rebuttable presumption that the person in apparent control of the property committed the violation, but any such person shall have the right to show that he/she did not commit the violation. Parents shall be presumed to be responsible for violations of their minor children, and proof that a violation committed by a child occurred on property within the parents' control shall constitute a rebuttable presumption that the parent committed the violation, but any such parent may be excused if he/she proves that he/she had previously directed the child not to use the water as it was used in violation of this plan and that the parent could not have reasonably known of the violation.

(d) Any employee of the city, police officer, or other city employee designated by the mayor may issue a citation to a person he/she reasonably believes to be in violation of this plan. The citation shall be prepared in duplicate and shall contain the name and address of the alleged violator, if known, the offense charged, and shall direct him/her to appear in the municipal court on the date shown on the citation for which the date shall not be less than 3 days nor more than 5 days from the date the citation was issued. The alleged violator shall be served a copy of the citation. Service of the citation shall be complete upon delivery of the citation to the alleged violator, to an agent or employee of a violator, or to a person over 14 years of age who is a member of the violator's immediate family or is a resident of the violator's residence. The alleged violator shall appear in municipal court to enter a plea of guilty or not guilty for the violation of this plan. If the alleged violator fails to appear in municipal court, a warrant for his/her arrest may be issued. A summons to appear may be issued in lieu of an arrest warrant. These cases shall be expedited and given preferential setting in municipal court before all other cases.

(2004 Code, sec. 13.411)

ARTICLE 13.05 DROUGHT CONTINGENCY PLAN*

Sec. 13.05.011 Variances

(a) The mayor or his designee may, in writing, grant temporary variance for existing water uses otherwise prohibited under this plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the person requesting such variance and if one or more of the following conditions are met:

> (1) Compliance with this plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the plan is in effect.
>
> (2) Alternative methods can be implemented which will achieve the same level of reduction in water use.

(b) Persons requesting an exemption from the provisions of this plan shall file a petition for variance with the city in 5 days after the plan or a particular drought response stage has been invoked. All petitions for variances shall be reviewed by the mayor, or his/her designee, and shall include the following:

(1) Name and address of the petitioner(s).

(2) Purpose of water use.

(3) Specific provision(s) of the plan from which the petitioner is requesting relief.

(4) Detailed statement as to how the specific provision of the plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if the petitioner complies with this plan.

(5) Description of the relief requested.

(6) Period of time for which the variance is sought.

(7) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this plan and the compliance date.

(8) Other pertinent information.

(c) Variances granted by the city will be subject to the following conditions, unless waived or modified by the mayor or his/her designee:

(1) Variances granted shall include a timetable for compliance.

(2) Variances granted shall expire when the plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

(d) No variance shall be retroactive or otherwise justify any violation of this plan occurring prior to the issuance of the variance.

(2004 Code, sec. 13.412)

CITY OF PFLUGERVILLE
DROUGHT CONTINGENCY PLAN

DROUGHT CONTINGENCY PLAN

§ 53.200 SCOPE.

The requirements in §§53.200 through 53.213 ("Subchapter") are established as the city's Drought Contingency Plan (the "Plan"). Copies of this Plan will be available for inspection or reproduction in the office of the City Secretary.

(Ord. 579-00-03-14, passed 3-14-00)

§ 53.201 DECLARATION OF POLICY, PURPOSE, AND INTENT.

(A) In order to conserve the available water supply and protect the integrity of water supply facilities, with particular regard for domestic water use, sanitation, and fire protection, and to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other water supply emergency conditions, the City of Pflugerville hereby adopts the regulations and restrictions on the delivery and consumption of potable water set forth in this Subchapter.

(B) Water uses regulated or prohibited under the Plan are considered to be non-essential and continuation of such uses during times of water shortage or other emergency water supply condition are deemed to constitute a waste of water which subjects the offender(s) to penalties as defined in § 53.086 of this Plan.

(C) The City of Pflugerville operates a reuse irrigation system that utilizes wastewater effluent to provide water for irrigation. The use of effluent irrigation water will not be affected by this plan.

§ 53.202 PUBLIC INVOLVEMENT.

The public was able to provide input into the preparation of the Plan during a public hearing the city scheduled and for which it provided notice scheduling and providing public notice of a public meeting to accept input on the Plan.

§ 53.203 PUBLIC EDUCATION.

The city will educate the public about conservation and drought conditions by information distributed from the Water Conservation Information Center. During periods of drought conditions, Step I conditions will establish an information center and an information person, and require the utilization of the most effective methods developed for information distribution on a daily basis. Before the voluntary water conservation plan is scheduled to begin, the Plan will be communicated to the public through articles in the official city newspaper and the city's internet website. As trigger conditions approach, the public will be notified through articles on the current conditions and water conservation methods in the official city newspaper and the city's internet website.

§ 53.204 COORDINATION WITH REGIONAL WATER PLANNING GROUPS AND COMPLIANCE WITH THE LCRA WATER MANAGEMENT PLAN.

The service area of the City of Pflugerville is located within the Lower Colorado Regional Water Planning Area and the City of Pflugerville has provided a copy of this Plan to the regional water planning group. The City of Pflugerville will comply with firm water drought response requirements as required in the Lower Colorado River Authority Water Management Plan.

(Ord. 664-02-03-12, passed 3-12-02)

§ 53.205 AUTHORIZATION.

The City Manager is hereby authorized and directed to implement the applicable provisions of this Plan upon determination that such implementation is necessary to protect public health, safety, and welfare. The City Manager may initiate or terminate drought or other water supply emergency response measures as described in this Plan.

§ 53.206 APPLICATION.

The provisions of this Plan apply to all persons, customers, and property utilizing water provided by the city. The terms "person" and "customer" as used in the Plan includes individuals, corporations, partnerships, associations, and all other legal entities.

§ 53.207 DEFINITIONS.

For the purposes of this Plan, the following definitions apply:

(A) AESTHETIC WATER USE. Water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

(B) COMMERCIAL AND INSTITUTIONAL WATER USE. Water use that is integral to the operations of commercial and nonprofit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

(C) CONSERVATION. Those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

(D) CUSTOMER. Any person, company, or organization using water supplied by the city.

(E) DOMESTIC WATER USE. Water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

(F) DRIP IRRIGATION SYSTEM. Small diameter pressurized lines directly buried in the soil to a nominal depth of six inches and containing pressure reducing emitters to restrict water flow to a very low rate.

(G) INDUSTRIAL WATER USE. The use of water in processes designed to convert materials of lower value into forms having greater usability and value.

(H) LANDSCAPE IRRIGATION USE. Water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, athletic fields, parks, and rights-of-way and medians.

(I) NONESSENTIAL WATER USE. Water uses that are not essential nor required for the protection of public health, safety, and welfare, including:

(1) Landscape irrigation use, except as otherwise provided under this Plan;

(2) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;

(3) Use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;

(4) Use of water to wash down buildings or structures for purposes other than immediate fire protection;

(5) Flushing gutters or permitting water to run or accumulate in any gutter or street;

(6) Use of water to fill, refill, or add to any indoor or outdoor swimming pools or Jacuzzi-type pools;

(7) Use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;

(8) Failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and

(9) Use of water from hydrants for construction purposes or any other purposes other than firefighting.

(J) HOUSEHOLD. Means the residential premises served by the customer's meter.

(K) PERSONS PER HOUSEHOLD. Includes only those persons currently physically residing at the premises and expected to reside there for the entire billing period.

(L) OUTDOOR WATER USE DAY. The day that a Customer may use water outdoors for purposes permitted by this subchapter. Addresses, box numbers or rural postal route numbers ending in the following number are assigned the following days for outdoor water use:

Wednesday and Saturday	Residential homes with a street address ending in an odd number.
Thursday and Sunday	Residential homes with a street address ending in an even number.
Tuesday and Friday	Watering days for commercial facilities including apartments, condominiums, civic, commercial, industrial and institutional properties.
Monday	No watering.

(Ord. 588-00-06-27, passed 6-27-00; Am. Ord. 603-00-10-10, passed 10-10-00; Ord. 909-07-09-25, passed 9-25-07)

§ 53.208 TRIGGERING CRITERIA FOR INITIATION AND TERMINATION OF DROUGHT RESPONSE STAGES.

The City Manager will monitor water supply and/or demand conditions on a daily basis and will advise the Mayor and the City Council when conditions warrant initiation or termination of each stage of the Plan. The City Manager may order that the appropriate stage of water conservation be implemented or terminated in accordance with the applicable provisions of this Subchapter by public notification. Public notification of the initiation or termination of drought response stages will be by means of notice mailed had delivered [sic] to the service address of each water customer. The triggering criteria described below are based on the statistical analysis of the vulnerability of the city's water source under drought of record conditions.

The triggering criteria described below are based on the statistical analysis of the vulnerability of the city's water source under drought of record conditions.

(A) Stage 1 - Mild Water Shortage Conditions

<u>Requirements for initiation</u> - Customers will be requested to voluntarily conserve water and adhere to the prescribed restrictions on non-essential water uses, defined in § <u>53.209</u>(A) of this Plan, from May 1 to September 30 of each year.

(B) Stage 2 - Moderate Water Shortage Conditions

Requirements for initiation - Customers must comply with the requirements and restrictions on certain non-essential water uses, defined in § 53.209(A) of this Plan, when the average daily water consumption reaches 80% of production/distribution capacity for a period of three consecutive days, the aquifer level drops to 350 feet below ground level as measured at the well #6 monitoring well, or the City Manager determines that Stage 2 implementation is necessary under the city's wholesale water purchase contract with the Lower Colorado River Authority.

Requirements for termination - Stage 2 of the Plan may be rescinded by the City Manager when all of the conditions listed as triggering events have ceased to exist for a period of 3 consecutive days or by the City Council if any of the conditions listed as triggering events, other than requirements imposed by the city's wholesale water contract with the Lower Colorado River Authority, have ceased to exist and the City Council finds that termination of the Drought Response Stage 2 will not adversely affect the public health, safety or welfare. Upon termination of Stage 2, Stage 1 becomes operative for at least 30 days.

(C) Stage 3 - Severe Water Shortage Conditions

Requirements for initiation - Customers must comply with the requirements and restrictions on certain non-essential water uses for Stage 3 of this Plan when the average daily water consumption reaches 90% of production/distribution capacity for a period of 3 consecutive days, the aquifer drops to 380 feet below ground level as measured at the well #6 monitoring well, or the City Manager determines that Stage 3 implementation is necessary under the city's wholesale water purchase contract with the Lower Colorado River Authority.

Requirements for termination - Stage 3 of the Plan may be rescinded by the City Manager when all of the conditions listed as triggering events have ceased to exist for a period of 3 consecutive days or by the City Council if any of the conditions listed as triggering events, other than requirements imposed by the city's wholesale water contract with the Lower Colorado River Authority, have ceased to exist and the City Council finds that termination of the Drought Response Stage 3 will not adversely affect the public health, safety or welfare. Upon termination of Stage 3, Stage 2 becomes operative.

(D) Stage 4 - Emergency Water Shortage Conditions

Requirements for initiation - Customers must comply with the requirements and restrictions for Stage 4 of this Plan when the City Manager determines that a water supply emergency exists based on:

(1) Major water line breaks, or pump or system failures occur, and cause unexpected loss of capability to provide water service;

(2) System demand exceeds available high service pump capacity;

(3) There is detection of accidental or intentional contamination of the water system;

(4) There is detection of water systems failure from acts of God (e.g., tornados, hurricanes, etc.) or man;

(5) A mechanical failure of pumping equipment occurs during a moderate drought and will require more than 12 hours to repair; or

(6) Implementation is necessary under the city's wholesale water contract with the Lower Colorado River Authority.

Requirements for termination – Stage 4 of the Plan may be rescinded by the City Manager when all of the conditions listed as triggering events have ceased to exist for a period of 3 consecutive days or the emergency condition no longer exists or by the City Council if any of the conditions listed as triggering events, other than requirements imposed by the city's wholesale water contract with the Lower Colorado River Authority, have ceased to exist and the City Council finds that termination of the Drought Response Stage 2 will not adversely affect the public health, safety or welfare.

(E) Water Rationing

Requirements for initiation - Customers must comply with the water allocation plan prescribed in § 53.210 of this Plan and comply with the requirements and restrictions for Stage 4 of this Plan when the City Manager determines that water rationing is necessary.

Requirements for termination - Water rationing may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of 3 consecutive days.

(Ord. 579-00-03-14, passed 3-14-00; Am. Ord. 588-00-06-27, passed 6-27-00; Ord. 603-00-10-10, passed 10-10-00)

§ 53.209 DROUGHT RESPONSE STAGES.

The Utility Department will monitor water supply and/or demand conditions on a daily basis and, in accordance with the triggering criteria set forth in § 53.208 of the Plan, will recommend to the City Manager the extent of the conservation required through the implementation or termination of particular conservation stages in order for the city to prudently plan for and supply water to its customers. The City Manager may order the appropriate stage of water conservation implemented or terminated in accordance with the applicable provisions of this Subchapter by public notification. The conservation stage will take effect immediately upon public notification:

(A) Stage 1 - Mild Water Shortage Conditions

(1) Goal. Achieve a voluntary 5% reduction in average daily water use (e.g., total water use, daily water demand, etc.).

(2) Supply Management Measures. The city must comply with the voluntary water use restrictions below from May 1 to September 30 of each year.

(3) Required Water Use Restrictions. Outdoor irrigation by a permanently installed automatic irrigation system is prohibited between the hours of 10:00 a.m. and 7:00 p.m. This prohibition does not apply to irrigation:

(a) at a single family, duplex, triplex, or fourplex residence;

(b) using treated wastewater effluent or raw water;

(c) of a new landscape:

(i) during landscape installation; and

(ii) within the first seven days after installation is complete;

(iii) during repair or testing of a new or existing irrigation system; or

(iv) at a commercial plant nursery.

(4) Voluntary Water Use Restrictions.

(a) Customers whose use is not restricted by § 53.209(A)(3) are requested to voluntarily comply with the restrictions in § 53.209(B).

(b) All city operations will comply with the water use restrictions prescribed for Stage 1 of the Plan.

(c) Water Customers are requested to practice water conservation and to minimize or discontinue water use for non-essential purposes.

(5) Prohibited Waste of Water. The following uses constitute a waste of water and are prohibited:

(a) failing to repair a controllable leak, including a broken sprinkler head, a leaking valve, or a leaking faucet;

(b) operating a permanently installed irrigation system with a broken head, with a head that is out of adjustment and spraying more than 10 percent of the spray on a street or parking lot, or that is misting;

(c) during irrigation:

(i) allowing a substantial amount of water to run off a property; or

(ii) allowing water to pond in the street or parking lot to a depth greater than1/4 of an inch

(B) Stage 2 - Moderate Water Shortage Conditions

(1) Goal. Achieve a 10 percent reduction in average daily water use (e.g., total water use, daily water demand, etc.).

(2) Supply Management Measures. The city will reduce or discontinue flushing of water mains; reduce or discontinue irrigation of public landscaped areas; use an alternative water supply source, where possible; and use reclaimed water for non-potable purposes, where possible. The city will comply with the water use restrictions for Stage 2 when Stage 2 is implemented.

(3) Water Use Restrictions. The water use and waste restrictions in § 53.209(A) and the following water use restrictions will apply to all Customers during Stage 2:

(a) Outdoor irrigation is permitted at anytime if it is by means of a hand- held hose, a faucet-filled bucket or watering can of five gallons or less.

(b) Outdoor irrigation is permitted by a hose end sprinkler, a soaker hose, or drip irrigation, from 12:00 midnight to 10:00 a.m. and 7:00 p.m. to 12:00 midnight on an outdoor water use day as designated by the City Manager.

(c) Outdoor irrigation is permitted by a permanently installed automatic irrigation system from12:00 midnight to 10:00 a.m. on an outdoor water use day as designated by the City Manager.

(d) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle is prohibited except on designated watering days from 12:00 midnight to 10:00 a.m. and 7:00 p.m. to 12:00 midnight. Such washing, when allowed, must be done with a hand-held bucket or a hand-held hose equipped with a positive shutoff nozzle. This restriction does not apply to a commercial carwash or a commercial service station or if washing is necessary to protect the health, safety, and welfare of the public. Charity car washes are prohibited.

(e) Watering the ground around a foundation to prevent foundation cracking is prohibited except on a designated outdoor water use day from 12:00 midnight to 10:00 a.m.

(f) Use of water to fill, refill, or add to any indoor or outdoor swimming pools, wading pools, or jacuzzi-type pools is prohibited. This prohibition does not apply to a public swimming or wading pool if the water is taken from the city's water distribution system and it does not leak.

(g) Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited, except where necessary to support aquatic life or where such fountains or ponds are equipped with a recirculation system.

(h) Use of water from hydrants will be limited to fire-fighting and related activities, or other activities necessary to maintain public health, safety, and welfare, except that use of water from designated fire hydrants for construction purposes may be allowed under a permit for construction water from the city.

(i) Use of water for the irrigation of golf course greens, tees, and fairways is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight. However, if the golf course utilizes an irrigation water source other than potable water obtained from wells in the Edwards Aquifer, the facility will not be subject to these regulations.

(j) All restaurants are prohibited from serving water to their customers except upon the customer's request.

(k) The following uses of water are non-essential and prohibited except to alleviate an immediate health or safety hazard:

(l) Wash down of any sidewalks, walkways, driveways, parking lots, tennis courts, patios or other hard-surfaced areas;

(i) use of water to wash down buildings or structures for purposes other than immediate fire protection.

(ii) use of water for dust control;

(iii) flushing gutters or permitting water to run or accumulate in any gutter or street; and

(iv) failure to repair a controllable leak within a reasonable period after being given notice to repair such leak.

(4) Notwithstanding the prohibitions in this section, irrigation of new landscape installation is permitted if the City Manager determines that the installation cannot be postponed. In that event, irrigation may only occur during the hours permitted under § 53.209(B)(3)(ii) and (iii) and in accordance with the following 30 day irrigation schedule:

(a) for the first ten days after installation, once a day;

(b) for day 11 through 20 after installation, once every other day; and

(c) for day 21 through 30 after installation, once every third day.

(5) The Stage 2 restrictions do not apply to the following:

(a) the necessary use of water other than for landscape irrigation, by a governmental entity in pursuit of a governmental function for the benefit of the public, including for a capital improvement construction project;

(b) the necessary use of water, other than for landscape irrigation, for land development including roadway base preparation, flushing utility lines, dust control, concrete or asphalt work and building construction;

(c) the necessary use of water for repair of a water distribution facility, residential and commercial plumbing, or a permanently installed landscape irrigation system; and

(d) the use of water under a variance granted by the Review Board in accordance with § 53.212.

(C) Stage 3 - Severe Water Shortage Conditions

(1) Goal. Achieve a 25 percent reduction in average daily water usage (e.g., total water use, daily water demand, etc.).

(2) Supply Management Measures. The city will reduce or discontinue flushing of water mains; reduce or discontinue irrigation of public landscaped areas; use an alternative water supply source, where possible; and use reclaimed water for non-potable purposes, where possible. The city must comply with the water use restrictions for Stage 3 when Stage 3 is implemented.

(3) Water Use Restrictions. All requirements of Stage 2 will remain in effect during Stage 3 except:

(a) Irrigation of landscaped areas is limited to the designated watering days and hours specified in § 53.209(B)(3)(ii) and must be by means of hand-held hoses or hand-held buckets of five gallons or less only. The use of hose-end sprinklers, drip-irrigation systems, or permanently installed automatic sprinkler systems is prohibited at all times.

(b) The watering of golf course fairways is prohibited unless golf course utilizes an irrigation water source other than potable water obtained from wells in the Edwards Aquifer.

(c) The washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment not occurring on the immediate premises of a commercial carwash or a commercial service station and not necessary to protect the public health, safety, and welfare are prohibited.

(d) The washing of automobiles, trucks, trailers, boats, airplanes, or other types of mobile equipment on the immediate premises of a commercial carwash or a commercial service station not necessary to protect the public health, safety, and welfare, may occur between 12:00 noon and 5:00 p.m.

(e) Commercial plant nurseries may use only hand-held hoses, hand-held watering cans, or drip irrigation.

(f) The filling, refilling, or adding of potable water to public swimming or wading pools is prohibited.

(g) No new landscapes of any type may be established.

(h) Irrigation of new landscape installation under § 53.209(B)(4) is prohibited.

(i) The city may not approve any applications for the following until 14 days after the application is filed and provided that the city has not entered Stage 4 of its drought response conditions:

(i) building permits for new buildings, pools or irrigation facilities, or

(ii) new, additional, expanded, or increased-in-size water service connections, meters, service lines, pipeline extensions, mains, or water service facilities of any kind.

(D) Stage 4 - Emergency Water Shortage Conditions

(1) Goal. Achieve a 75 percent reduction in average daily water use (e.g., total water use, daily water demand, etc.).

(2) Supply Management Measures. The city must reduce or discontinue flushing of water mains; reduce or discontinue irrigation of public landscaped areas; use an alternative water supply source, where possible; and use reclaimed water for non-potable purposes, where possible. The city must comply with the water use restrictions for Stage 4 when the restrictions are implemented.

(3) Water Use Restrictions. All requirements of Stage 2 and 3 will remain in effect during Stage 4 except:

(a) Irrigation of landscaped areas is absolutely prohibited.

(b) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle is absolutely prohibited.

(c) No applications for the following will be allowed or approved:

(i) building permits for new buildings, pools or irrigation facilities, or

(ii) new, additional, expanded, or increased-in-size water service connections, meters, service lines, pipeline extensions, mains, or water service facilities of any kind.

(Ord. 579-00-03-14, passed 3-14-00; Am. Ord. 588-00-06-27, passed 6-27-00; Am. Ord. 603-00-10-10; passed 10-10-00)

§ 53.210 WATER RATIONING.

If water shortage conditions threaten public health, safety, and welfare, the City Manager may ration water according to the following water allocation plan:

(A) Single-Family Residential Customers

The allocation to residential water customers residing in a single-family dwelling will be as follows:

Persons per Household	Gallons per Month
1 or 2	6,000
3 or 4	7,000
5 or 6	8,000
7 or 8	9,000
9 or 10	10,000
11 or more	12,000

It will be assumed that a particular customer's household is comprised of two persons unless the customer notifies the City of Pflugerville of a greater number of persons per household on a form prescribed by the City Manager. The City Manager will use best efforts to see that the forms are mailed, otherwise provided, or made available to every residential customer. If, however, a customer does not receive such a form, it will be the customer's responsibility to go to the City of Pflugerville offices to complete and sign the form claiming more than two persons per household. New customers may claim more persons per household at the time of applying for water service on the form prescribed by the City Manager. When the number of persons per household increases so as to place the customer in a different allocation category, the customer may notify the City Manager on such form and the change will be implemented in the next practicable billing period. If the number of persons in a household is reduced, the customer must notify the City Manager in writing within two days. In prescribing the method for claiming more than two persons per household, the City Manager will adopt methods to insure the accuracy of the claim. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of persons in a household or fails to timely notify the City Manager of a reduction in the number of person in a household may be fined not less than $50.00. Residential water customers will pay the following surcharges:

$25.00 for the first 1,000 gallons over allocation.

$50.00 for the second 1,000 gallons over allocation.

$75.00 for the third 1,000 gallons over allocation.

$100.00 for each additional 1,000 gallons over allocation.

Surcharges will be cumulative.

(B) Master-Metered Multi-Family Residential Customers

A customer billed from a master meter that jointly measures water to multiple permanent residential dwelling units (e.g., apartments, mobile homes) will be allocated 6,000 gallons per month for each dwelling unit. It will be assumed that such a customer's meter serves two dwelling units unless the customer notifies the city of a greater number on a form prescribed by the City Manager. The City Manager will use best efforts to see that the forms are mailed, otherwise provided, or made available to every customer. If, however, a customer does not receive a form, it will be the customer's responsibility to go to the city offices to complete and sign the form claiming more than two dwelling units. A dwelling unit may be claimed under this provision whether it is occupied or not. New customers may claim more dwelling units at the time of applying for water service on the form prescribed by the City Manager. If the number of dwelling units served by a master meter is reduced, the customer must notify the City Manager in writing within two days. In prescribing the method for claiming more than two dwelling units, the City Manager will adopt methods to insure the accuracy of the claim. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of dwelling units served by a master meter or fails to timely notify the City Manager of a reduction in the number of persons in a household may be fined not less than $500.00. Customers billed from a master meter under this provision must pay the following monthly surcharges:

$25.00 for 1,000 gallons over allocation up through 1,000 gallons for each dwelling unit.

$50.00, thereafter, for each additional 1,000 gallons over allocation up through a second 1,000 gallons for each dwelling unit.

$75.00, thereafter, for each additional 1,000 gallons over allocation up through a third 1,000 gallons for each dwelling unit.

$100.00, thereafter for each additional 1,000 gallons over allocation.

Surcharges will be cumulative.

(C) Commercial Customers

A monthly water usage allocation will be established by the City Manager, or a designee, for each nonresidential commercial customer other than an industrial customer who uses water for processing purposes. The non-residential customer's allocation will be approximately 75% of the customer's usage for corresponding month's billing period for the previous 12 months. If the customer's billing history is shorter than 12 months, the monthly average for the period for which there is a record will be used for any monthly period for which no history exists. Provided, however, a customer, 75% of whose monthly usage is less than 6,000 gallons, will be allocated 6,000 gallons. The City Manager will use best efforts to see that notice of each non-residential customer's allocation is mailed to each customer. If, however, a customer does not receive the notice, it will be the customer's responsibility to contact the City of Pflugerville to determine the allocation. Upon request of the customer or at the initiative of the City Manager, the allocation may be reduced or increased if: (1) the designated period does not accurately reflect the customer's normal water usage; (2) one nonresidential customer agrees to transfer part of its allocation to another nonresidential customer in a binding agreement satisfactory to the city; or (3) other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may appeal an allocation established hereunder to the City Council. Nonresidential commercial customers must pay the following surcharges:

Customers whose allocation is 0 gallons through 10,000 gallons per month:

$25.00 per thousand gallons for the first 1,000 gallons over allocation.

$50.00 per thousand gallons for the second 1,000 gallons over allocation.

$75.00 per thousand gallons for the third 1,000 gallons over allocation.

$100.00 per thousand gallons for each additional 1,000 gallons over allocation.

Customers whose allocation is 10,001 gallons per month or more:

$50.00 per 1,000 gallons in excess of the allocation up through 5 percent above allocation.

$100.00 per 1,000 gallons from 5 percent through 10 percent above allocation.

$150.00 per 1,000 gallons from 10 percent through 15 percent above allocation.

$200.00 per 1,000 gallons more than 15 percent above allocation.

The surcharges will be cumulative.

(D) Industrial Customers

A monthly water usage allocation will be established by the City Manager, or a designee, for each industrial customer, that uses water for processing purposes. The industrial customer's allocation will be approximately 90% of the customer's water usage baseline as defined below. Ninety days after the initial imposition of the allocation for industrial customers, the industrial customer's allocation will be further reduced to 80% of the customer's water usage baseline. The industrial customer's water usage baseline will be computed on the average water usage for the 12 month period ending before the date of implementation of Stage 2 of the Plan. If the industrial water customer's billing history is shorter than 12 months, the monthly average for the period for which there is a record will be used for any monthly period for which no billing history exists. The City Manager will use best efforts to see that notice of each industrial customers allocation is mailed to each customer. If, however, a customer does not receive the notice, it will be the customer's responsibility to contact the city to determine the allocation, and the allocation will be fully effective notwithstanding the lack of receipt of written notice. Upon request of the customer or at the initiative of the City Manager, the allocation may be reduced or increased if: (1) the designated period does not accurately reflect the customer's normal water usage because the customer had shutdown a major processing unit for repair or overhaul during the period; (2) the customer has added or is in the process of adding significant additional processing capacity; (3) the customer has shutdown or significantly reduced the production of a major processing unit; (4) the customer has previously implemented significant permanent water conservation measures such that the ability to further reduce usage is limited; (5) the customer agrees to transfer part of its allocation to another industrial customer in a binding document satisfactory to the city; or (6) if other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may appeal an allocation established hereunder to the City Council. Industrial customers must pay the following surcharges:

Customers whose allocation is 0 gallons through 20,000 gallons per month:

$25.00 per thousand gallons for the first 1,000 gallons over allocation.

$50.00 per thousand gallons for the second 1,000 gallons over allocation.

$75.00 per thousand gallons for the third 1,000 gallons over allocation.

$100.00 per thousand gallons for each additional 1,000 gallons over allocation.

Customers whose allocation is 20,001 gallons per month or more:

$50.00 per 1,000 gallons in excess of the allocation up through 5 percent above allocation.

$100.00 per ,1000 gallons from 5 percent through 10 percent above allocation.

$150.00 per 1,000 gallons from 10 percent through 15 percent above allocation.

$200.00 per 1,000 gallons more than 15 percent above allocation.

The surcharges will be cumulative.

§ 53.211 ENFORCEMENT.

(A) No person may knowingly or intentionally allow the use of water from the city for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this Plan, or in an amount in excess of that permitted by the drought response stage in effect at the time pursuant to action taken by the City Manager, or a designee, in accordance with provisions of this Plan.

(B) Proof of a culpable mental state is not required for a conviction of an offense under this Subchapter. Any person, including a person classified as a water customer of the city, in apparent control of the property where a violation occurs or originates, is presumed to be the violator, and proof that the violation occurred on the person's property constitutes a rebuttable presumption that the person in apparent control of the property committed the violation, but any person may show that he/she did not commit the violation. Parents are presumed to be responsible for violations of their minor children and proof that a violation, committed by a child, occurred on property within the parents' control is a rebuttable presumption that the parent committed the violation, but any such parent may be excused if the parent proves that he/she had previously directed the child not to use the water as it was used in violation of this Plan and that the parent could not have reasonably known of the violation.

(C) Any person who violates this Plan is guilty of a class C misdemeanor punishable by a fine not to exceed $2,000.00 per day. Prosecution of an offense under Subsection (A) of this section does not preclude other remedies. The enforcement of other remedies does not prevent prosecution for a violation of this Subchapter under Subsection (A) of this section.

(D) Each day that one or more of the provisions in this Plan is violated is a separate offense. If a person is convicted of three or more distinct violations of this Plan, the city may, upon due notice to the customer, discontinue or restrict water service to the premises where such violations occur.

(E) A city police officer or any employee of the city designated by the City Manager may issue a citation to a person reasonably believed to be in violation of this ordinance. The citation will be prepared in duplicate and will contain the name and address of the alleged violator, if known, the offense charged, and will direct the person to appear in the municipal court on the date shown on the citation. The date will not be less than 3 days from the date the citation was issued. The alleged violator will be served a copy of the citation. Service of the citation will be complete upon delivery of the citation to the alleged violator, to an agent or employee of a violator, or to a person over 14 years of age who is a member of the violator's immediate family or is a resident of the violator's residence. The alleged violator must appear in municipal court to enter a plea of guilty or not guilty for the violation of this Plan. If the alleged violator fails to appear in municipal court, a warrant for the person's arrest may be issued. A summons to appear may be issued in lieu of an arrest warrant. These cases must be expedited and given preferential setting in municipal court before all other cases.

§ 53.212 VARIANCES.

(A) A Review Board consisting of the City Manager, the Public Works Director, the Water Superintendent, the City Engineer, and the Mayor will be established on February 1 of each year in which the City Manager anticipates that Stage 2 restrictions may be enacted. The Review Board will review hardship and special cases that cannot strictly comply with this Subchapter to determine whether the cases warrant a variance, permit, or compliance agreement (collectively, "Variance").

(B) The Review Board will make its determination no later than the 15th working day after receipt of a properly completed "Application for Variance/Permit/Compliance Agreement" form. A variance may be granted only for reasons of economic hardship or health conditions substantiated by a licensed physician. In this section, "economic hardship" means a threat to a person's or entity's primary source of income. Inconvenience or the potential for damage to landscaping does not constitute an economic hardship under this section. All applications for a variance must be reviewed by the Review Board and must include the following:

(1) Name and address of the petitioner(s);

(2) Purpose of water use;

(3) Specific provision(s) of the Plan from which the petitioner is requesting relief;

(4) Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this ordinance;

(5) Description of the relief requested;

(6) Period of time for which the variance is sought;

(7) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this Plan and the compliance date; and

(8) Other pertinent information.

(C) Until the Review Board has acted on an application, the applicant must comply with all provisions of this Subchapter. The Review Board may not approve a variance if the terms and conditions do not meet or exceed the purpose and intent of this Subchapter.

(D) If the Review Board determines there is an economic hardship, it may authorize the implementation of alternative water use restrictions that further the purposes of the Plan. The alternative water use restrictions must be set forth on the face of the variance and the customer must keep a copy of the variance in a location that is accessible by and visible to the public.

(E) The Review Board may, in writing, grant temporary variance for existing water uses otherwise prohibited under this Plan if it determines that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the person requesting such variance and if either of the following conditions are met:

(1) Compliance with this Plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the Plan is in effect; or

(2) Alternative methods can be implemented that will achieve the same level of reduction in water use.

(F) A fee of $200.00 will be collected for each application for a variance under this section to defray administrative costs.

(G) Variances granted by the City of Pflugerville are subject to the following conditions, unless waived or modified by the Review Board:

(1) Variances must include a timetable for compliance; and

(2) Variances expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

(H) A variance may not be retroactive or otherwise justify any violation of this Plan occurring before the variance is issued.

§ 53.213 WHOLESALE CUSTOMERS IMPLEMENTATION OF PLAN.

Each wholesale customer of the city must develop and implement a water conservation plan or water conservation measures using the applicable elements in this Plan. If the wholesale customer intends to resell the water, then the contract between the city and the wholesale customer must provide that the contract for the resale of the water must have water conservation requirements so that each successive customer in the resale of the water will be required to implement water conservation measures in accordance with applicable provision of this Plan.

(Ord. 677-02-09-10, passed 9-10-02)

§ 53.214 PRO RATA WATER ALLOCATION (WHOLESALE CUSTOMERS).

(A) In the event that the triggering criteria specified in § 53.208 of this chapter have been met, the City Manager is hereby authorized initiate allocation of water supplies on a pro rata basis in accordance with Texas Water Code § 11.039 and according to the following water allocation policies and procedures:

(1) A wholesale customer's monthly allocation shall be a percentage of the customer's water usage baseline. The percentage will be set by resolution of the City Council based on the City Manager assessment of the severity of the water shortage condition and the need to curtail water diversions and/or deliveries and may be adjusted periodically by resolution of the City Council as conditions warrant. Once pro rata allocation is in effect, water diversions by or deliveries to each wholesale customer shall be limited to the allocation established for each month.

(2) A monthly water usage allocation shall be established by the City Manager, or his/her designee, for each wholesale customer. The wholesale customer's water usage baseline will be computed on the average water usage by month for the 36 month period immediately prior to the implementation of the computation. If the wholesale water customer's billing history is less than 36 months, the monthly average for the period for which there is a record shall be used for any monthly period for which no billing history exists.

(3) The City Manager shall provide notice, by certified mail, to each wholesale customer informing them of their monthly water usage allocations and shall

notify the news media and the executive director of the Texas Commission on Environmental Quality upon initiation of pro rata water allocation.

(4) Upon request of the customer or at the initiative of the City Manager, the allocation may be reduced or increased if, (1) the designated period does not accurately reflect the wholesale customer's normal water usage; (2) the customer agrees to transfer part of its allocation to another wholesale customer; or (3) other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may appeal an allocation established hereunder to the City Council of the city.

(B) The requirements of this section must be included in any contract that is entered into, renewed or amended after the effective date of this section.

(Ord. 681-02-10-22, passed 10-22-02)

§ 53.215 SEVERABILITY.

If any provision of this Plan is illegal, invalid, or unenforceable under present or future laws, the remainder of this Plan will not be affected and, in lieu of each illegal, invalid, or unenforceable provision, a provision as similar in terms to the illegal, invalid, or unenforceable provision as is possible and is legal, valid, and enforceable will be added to this Plan.

(Ord. 558-99-09-14, passed 09-14-99; Am. Ord. 677-02-09-10, passed 9-10-02; Am. Ord. 681-02-10-22, passed 10-22-02)

§ 53.999 PENALTY.

(A) Any person, firm, or corporation who violates any provision of §§ 53.001 or 53.104 shall be guilty of a misdemeanor and upon conviction shall be subject to a fine not to exceed $2,000. Each day of such violation shall constitute a separate offense. Such penalty shall be cumulative and not exclusive of any other rights or remedies the city may have.

(Ord. 54-7-15-74, passed 7-15-74; Am. Ord. 206-85-7-30, passed 7-30-85; Am. Ord. 219-85-12-3, passed 12-3-85; Am. Ord. 260-87-08-11, passed 8-11-87; Am. Ord. 325-90-09-11, passed 9-11-90)

(B) Any person who violates any of the provisions of §§ 53.015 through 53.026 is guilty of a misdemeanor, and upon conviction shall be punished by a fine of not exceeding $2,000 for each offense. Each day of violation constitutes a separate offense. It shall be a valid affirmative defense to any prosecution hereunder if either of the following matters are shown to exist:

(1) That the facts constituting a violation are not known to the defendant and could not have been known by him by the exercise of reasonable diligence, or

(2) That despite good faith, reasonable and diligent effort on the part of the defendant to avoid and not commit or suffer the acts, conduct or conditions charged as constituting the violation, it was not reasonably possible for one in the defendant's position to in any way avoid committing or suffering the violation, and such impossibility did not arise from any wrongful or negligent conduct or inaction on the defendant's part. Provided further, that the mere inconvenience, effort or expense to defendant to avoid a violation will not constitute a defense.

(Ord. 68-75-5-19, passed 5-19-75; Am. Ord. 172-83-11-7, passed 11-7-83; Am. Ord. 260-87-08-11, passed 8-11-87)

(C) A person who continues prohibited discharges in violation of §§ 53.040 through 53.061 is guilty of a misdemeanor and upon conviction is punishable by a fine of not more than $500 for each act of violation and for each day of violation. In addition to proceeding under authority of this division (B), the city is entitled to pursue all other criminal and civil remedies to which it is entitled under authority of statutes or other ordinances against a person continuing prohibited discharges.

(Ord. 113-2-1-21-80, passed 1-21-80; Am. Ord. 260-87-08-11, passed 8-11-87; Am. Ord. 772-05-01-25, passed 1-25-05)

ORDINANCE NO. 1074-11-04-26

AN ORDINANCE OF THE CITY OF PFLUGERVILLE, TEXAS, AMENDING CHAPTER 53 OF THE CITY CODE; REGARDING THE DROUGHT CONTINGENCY PLAN; ESTABLISHING RATES FOR SURCHARGES; PROVIDING A PENALTY NOT TO EXCEED $2,000 PER OFFENSE; AND PROVIDING SEVERABILITY AND AN EFFECTIVE DATE.

WHEREAS, in compliance with applicable legal requirements and the City's wholesale water contract with the Lower Colorado River Authority, the City Council desires to amend its drought contingency plan;

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

Section 1. General

That §§ 53.200-53.999 of the Code of Ordinances of the City of Pflugerville, Texas are hereby deleted in their entirety and amended to read as shown on Exhibit "A", which is made part of this Ordinance for all purposes and is hereby adopted and will be the official policy of the City.

Section 2. Conflicts.

All ordinances that are in conflict with the provisions of this ordinance are hereby repealed and all other ordinances of the City not in conflict with the provisions of this ordinance remain in full force and effect.

Section 3. Effective Date.

This Ordinance will take effect upon its passage and adoption by the City Council in accordance with the provisions of Section 3.15(d) of the City Charter.

Section 4. Severability.

If any provision of this Ordinance is illegal, invalid, or unenforceable under present or future laws, the remainder of this Ordinance will not be affected and, in lieu of each illegal, invalid, or unenforceable provision, a provision as similar in terms to the illegal, invalid, or unenforceable provision as is possible and is legal, valid, and enforceable will be added to this Ordinance.

PASSED AND APPROVED this 26 day of April, 2011.

CITY OF PFLUGERVILLE, TEXAS

By: ______________________________
Jeff Coleman, Mayor

ATTEST:

____
Karen Thompson, City Secretary

JONAH SPECIAL UTILITY DISTRICT
DROUGHT CONTINGENCY PLAN

SECTION H.

DROUGHT CONTINGENCY PLAN

1. **Declaration of Policy Purpose and Intent.** In order to conserve the available water supply and protect the integrity of water supply facilities, with particular regard for domestic water use, sanitation, and to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other water supply emergency conditions, Jonah Water Special Utility District hereby adopts the following regulations and restrictions on the delivery and consumption of water.

Water uses regulated or prohibited under this Drought Contingency Plan (the Plan) are considered to be non-essential and continuation of such uses during times of water shortage or other emergency water supply conditions are hereby limited according to the provisions outlined herein

2. **Public Involvement.** Opportunity for the public to provide input into the preparation of the Plan was provided by Jonah Water Special Utility District by means of open public meeting of the Jonah Water Special Utility District Board of Directors.

3. **Public Education.** Jonah Water Special Utility District will periodically provide the public with information about the Plan, including information about the conditions under which each stage of the Plan is to be initiated or terminated with the drought response measures to he implemented in each stage. This information may be provided by means of newsletter, or other similar means, to the water customers of Jonah Water Special Utility District.

4. **Coordination with Regional Water Planning Groups.** The service area of Jonah Water Special Utility District is located within the Brazos Region G and Jonah Water Special Utility District has provided a copy of this Plan to the Brazos Region G RWPG, care of the Brazos River Authority, P0. Box 7555, Waco, Texas 76714.

5. **Authorization.** The Board of Directors of the Jonah Water Special Utility District, or their designee is hereby authorized and directed to implement the applicable provisions of this Plan upon determination that such implementation is necessary to protect public health, safety, and welfare. The Board of Directors of the Jonah Water S.U.D., or their designee, shall have the authority to initiate or terminate drought or other water supply emergency response measures as described in this Plan.

6. **Application.** The provisions of this Plan shall apply to all persons, customers, and property utilizing water provided by Jonah Water Special Utility District. The terms "person" and "customer" as used in the Plan include individuals, corporations, partnerships, associations, and all other legal entities. Jonah Water Special Utility District shall be exempt from application of this plan when necessary to protect health, safety, and welfare, as determined by the Board of Directors of the Jonah Water Special Utility District, or their designee.

7. **Definitions.** For the purposes of this Plan, the following definitions shall apply:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Commercial and institutional water use: water use which is integral to the operations of commercial and non-profit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Customer: any person, company, or organization using water supplied by Jonah water Special Utility District.

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Even number address: Street addresses ending in 0, 2, 4, 6, or 8 and locations without addresses.

Industrial water use: the use of water in processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, and rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

(a) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;

(b) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;

(c) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;

(d) use of water to wash down buildings or structures for purposes other than immediate fire protection;

(e) flushing gutters or permitting water to run or accumulate in any gutter or street;

(f) use of water to fill, refill, or add to any indoor or outdoor swimming pools or Jacuzzi-type pools;

(g) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;

(h) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and

(i) use of water from hydrants or flush valves for construction purposes or any other purposes other than fire fighting.

Odd numbered addresses: street addresses ending in 1, 3, 5, 7, or 9.

8. **Triggering Criteria for Initiation and Termination of Drought Response Stages**. The Board of Directors of the Jonah Water Special Utility District, or their designee, shall monitor water supply and/or demand conditions on a daily basis and shall determine when conditions warrant initiation or termination of each stage of the Plan. Public notification of the initiation or termination of drought response stages may be by means of notice published in local newspaper and/or public service announcements via television or radio.

The triggering criteria described below are based on analysis of the system emphasizing the importance of water supply to each plant.

(a) **Stage I – Mild Water Shortage Conditions**

(1) Requirements for initiation - Customers shall be requested to voluntarily conserve water and adhere to the prescribed restrictions on certain water uses, defined in Section 7.7 of this Plan when any one plant on the system reaches a demand equal to or greater than *75%* of the total production (or refill) capacity for three (3) consecutive days.

(2) Requirements for termination - Stage I of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist or demand is equal to or less than 70% of the total production (or refill) capacity for a period of seven (7) consecutive days. Public notification of termination shall not be necessary. Goal: 5% reduction. This percentage of reduction would bring Jonah Water SUD to normal operating conditions, with no restrictions.

(b) **Stage 2 - Moderate Water Shortage Conditions**

(1) Requirements for initiation - Customers shall be required to comply with the requirements and restriction on certain non-essential water uses provided in Section 7.7 of this Plan when any one plant on the system reaches a demand equal to or greater than 100% of the total production (or refill) capacity of such plants, for three (3) consecutive days.

(2) Requirements for termination - Stage 2 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist or demand is equal to or less than 70% of the total production (or refill) capacity for a period of seven (7) consecutive days. Upon termination of Stage 2, Stage I becomes operative. Public notification of termination of this stage shall be issued by the Board of Directors of the Jonah Water Special Utility District, or their designee.

Goal: 30% reduction. This percentage of reduction would bring Jonah Water SUD to normal operating conditions, with no restrictions.

(c) **Stage 3 - - Severe Water Shortage Conditions**

(1) Requirements for initiation - Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses provided in Section 7.7 of this Plan when any one plant on the system reaches a demand equal to or greater than 115% of the total production (or refill) capacity of such plants for three (3) consecutive days.

(2) Requirements for termination - Stage 3 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist or demand is equal to or less than 70% of the total production (or refill) capacity for a period of seven (7) consecutive days. Upon termination of Stage 3, Stage 2 becomes operative. Public notification of termination of this stage shall be issued by the Board of Directors of the Jonah Water Special Utility District, or their designee. Goal: 45% reduction. This percentage of reduction would bring Jonah Water SUD to normal operating conditions, with no restrictions.

(d) **Stage 4- Critical Water Shortage Conditions**

(1) Requirements for initiation - Customers shall he required to comply with the requirements and restrictions on certain non-essential water uses provided in Section 7.7 of this Plan when any one plant on the system reaches a demand equal to or greater then 118% of the total production (or refill) capacity of such plants for three (3) consecutive days.

(2) Requirements for termination- Stage 4 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist or demand is equal to or less than 70% of the total production (or refill) capacity for a period of seven (7) consecutive days. Upon termination of Stage 4, Stage 3 becomes operative. Public notification of termination of this stage shall be issued by the Board of Directors of the Jonah Water Special Utility District, or their designee. Goal: 48% reduction. This percentage of reduction would bring Jonah Water SUD to normal operating conditions, with no restrictions.

(e) **Stage 5 - Emergency Water Shortage Conditions**

(1) Requirements for initiation - Customers shall be required to comply with the requirements and restrictions of Section 7 of this Plan when the Board of Directors of the Jonah Water Special Utility District, or their designee, determines that a water supply emergency exists based on:

(A) Major water line breaks, or pump or system failures occur, which cause unprecedented loss of capability to provide water service; or

(B) Natural or man-made contamination of the water supply source (s).

(2) Requirements for termination - Stage 5 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist. Public notification of termination of this stage shall be issued by the Board of Directors of the Jonah Water Special Utility District, or their designee.

9. **Drought Response Stages**. The Board of Directors of the Jonah Water Special Utility District, or their designee, shall monitor water supply and/or demand conditions on a daily basis and, in accordance with the triggering criteria set forth in Section 7 of the Plan, shall determine that a mild, moderate, severe, critical, or emergency condition exists and shall implement the provisions outlined in Section 7.8.

Stage 1 - Mild Water Shortage Conditions

Water customers are requested to practice water conservation and to minimize or discontinue water use for non-essential purposes.

Stage 2 - Moderate Water Shortage Conditions

Water Use Restrictions - The following water use restrictions shall apply to all persons:

(a) Irrigation of landscaped areas with hose-end sprinklers or automatic Irrigation systems shall be limited to:

If your street address number ends in:
0, 2, 4, 6, or 8 – you may water on Sundays, Tuesdays, and Thursdays.
1, 3, 5, 7, or 9 – you may water on Mondays, Wednesdays, and Saturdays.

Irrigation of landscaped areas is further limited to the hours of 12:00 midnight until 10:00 a.m. and between 8:00 p.m. and 12:00 midnight on designated watering days. However, irrigation of landscaped areas is permitted at anytime if it is by means of a hand-held hose, a faucet filled bucket or watering can of five (5) gallons or less, or drip irrigation system.

(b) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight. Such washing, when allowed, shall be done with a hand-held bucket or a hand-held hose equipped with a positive shutoff nozzle for quick rinses.

Vehicle washing may be done at any time on the immediate premises of a commercial car wash or commercial service station. Further, such washing may be exempted from these regulations if the health, safety, and welfare of the public is contingent upon frequent vehicle cleansing, such as garbage trucks and vehicles used to transport food and perishables.

(c) Use of water to fill, refill, or add to any indoor or outdoor swimming pools, wading pools, or Jacuzzi-type pools is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between8:00pm and 12:00 midnight.

(d) Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a re-circulation system.

(e) Use of water for the irrigation of golf course greens, tees, and fairways is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight. However, if the golf course utilizes a water source other than that provided by the Jonah Water Special Utility District, the facility shall not be subject to these regulations in the use of such other water source.

(f) Non-essential water uses as previously defined are prohibited.

Stage 3 - Severe Water Shortage Conditions

Water Use Restrictions - All requirements of Stage 2 shall remain in effect during Stage 3 except:

(a) Irrigation of landscaped areas shall be limited to Stage 2 designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight and shall be by means of hand-held hoses, hand-held buckets, drip irrigation, hose-end sprinklers, or permanently installed automatic sprinkler system only.

(b) The watering of golf course greens, tees and fairways is prohibited unless the golf course utilizes a water source other than that provided by Jonah Water Special Utility District.

(c) The use of water for construction purposes from designated fire hydrants or flush valves is to be discontinued.

If your street address number ends in:

0 or 3	you may water on Mondays only
2 or 4	you may water on Tuesdays only
5 or 6	you may water on Wednesdays only
7 or 8	you may water on Thursdays only
3 or 0	you may water on Fridays only

<u>There will be no outdoor watering or car washing on Saturdays and/or Sundays.</u>

Stage 4 - Critical Water Shortage Conditions

Emergency water shortage conditions. <u>All outdoor water usage to cease</u>.

10. **Enforcement.**

(a) No person shall allow the use of water from Jonah Water Special Utility District for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this Plan, or in an amount in excess of that permitted by the drought response stage in effect at the time pursuant to action taken by the Board of Directors of the Jonah Water Special Utility District, or their designee, in accordance with provisions of this Plan.

(b) The Board of Directors of the Jonah Water Special Utility District may institute temporary rate schedules to enforce the drought response stages. The customers of the Jonah Water Special Utility District shall be notified of the new rate schedule.

(c) First Violation-the District will issue a warning to the Customer via mail or hand delivered and Customer's continued water usage will be closely monitored.

(d) Subsequent Violation-the District will install a flow restrictor in the line to limit the amount of water which will pass through the meter in a twenty-four (24) hour period. The cost to be charged to the Customer's account shall be the actual installed cost to the District, not to exceed $50.00.

(e) Continued Violation-the District will terminate service at the meter. The District will require payment of all fees for restoration of service. Fees for reinstatement of service will include Service Call $50.00; Re-connect Fee $50.00 plus Customer's current water charges.

11. **Variances**. The Board of Directors of the Jonah Water Special Utility District, or their designee, may, in writing, grant temporary variance for existing water uses otherwise prohibited under this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, safety or fire protection of the public or the person requesting such variance and if one or more of the following conditions are met:

(a) Compliance with this Plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the Plan is in effect.

(b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

Persons requesting an exemption from the provisions of this Plan shall file a petition for variance with the Secretary of Jonah Water Special Utility District within 5 days after the Plan or particular drought response stage has been invoked. All petitions for variances shall be reviewed by the Board of Directors of the Jonah Water Special Utility District, or their designee, and shall include the following:

(1) Name and address of the petitioner(s).

(2) Purpose of water use.

(3) Specific provision(s) of the Plan from which the petitioner is requesting relief.

(4) Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Ordinance.

(5) Description of the relief requested.

(6) Period of time for which the variance is sought.

(7) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this Plan and the compliance date.

(8) Other pertinent information.

Variances granted by Jonah Water Special Utility District shall be subject to the following conditions, unless waived or modified by the Board of Directors.

(9) Variances granted shall include a timetable for compliance.

(10) Variances granted shall expire when the Plan is no longer in effect, unless the petitioner has failed to meet specified requirements.

(11) Variances granted may be revoked by the Board of Directors of the Jonah Water Special Utility District, or their designee, at any time and without cause.

No variance shall be retroactive or otherwise justify any violation of this Plan occurring prior to the issuance of the variance.

12. **Severability**. It is hereby declared to be the intention of Jonah Water Special Utility District that the sections, paragraphs, sentences, clauses, and phrases of this plan are severable and, if any phrase, clause, sentence, paragraph, or section of this Plan shall be declared unconstitutional by the valid judgment or decree of any court of competent jurisdiction, such unconstitutionality shall not affect any of the remaining phrases, clauses, sentences, paragraphs, and sections of this Plan, since the same would not have been adopted by Jonah Water Special Utility District without the incorporation into this Plan of any such unconstitutional phrase, clause, sentence, paragraph, or section.

Appendix J Documentation of Public Meetings and Comments Received

SUSAN ROTH
water and wastewater consulting

Meeting Agenda

Hutto Regional Wastewater Facility Study

DATE: *Wednesday, June 1, 2011*
TIME: *2:00 – 3:30 p.m.*
LOCATION: *City of Hutto, Council Chambers*

Items for Discussion:

2:00 – 2:10	1. Welcome and Introduction • Attendees: TWDB & Participants • Consulting Engineer: K Friese & Associates, Inc.
2:10 – 2:25	2. TWDB Program Overview • Background • History • Purpose of Regional Facility Program
2:25 – 2:45	3. Regional Wastewater Study • Study Area • Project Participants • Scope of Work • Project Schedule
2:45 – 3:00	4. In-Kind Contributions
3:00 – 3:10	5. Project Data Request
3:10 – 3:30	6. Q&A Discussion

Hutto Regional Wastewater Facility Study
Project Kick-off Meeting
June 1, 2011

Name	Title	City/Entity	Phone Number	Email Address
Scott Martinez	Executive Director	Hutto Economic Dev. Corp	512-759-2806	smartinez@huttoedc.com
Matt Bushak	City Engr.	Hutto	512-759-4022	mbushak@huttotx.gov
Jim Devereaux	Utilities Super	Hutto	512-759-4020	james.devereaux@huttotx.gov.
Michael Lafferty	Associate Engr.	Hutto	" " 4024	michael.lafferty@huttotx.gov
Scot Stromsness	Director of P.W.	Hutto	" " 4016	scot.stromsness@huttotx.gov
Tom Owens		KFA	338-1704	TOWENS@KFRIESE.COM
Rainey Lann	Director of Facilities	Hutto ISD	512-759-3771 x1037	rainey.lann@hutto.txed.net
David Meesey	Program Spec	TWDB	512) 936-0852	david.meesey@TWDB.STATE.TX.US
Susan Roth	President	Susan Roth Consulting	512-796-6692	susan@sroth consulting.com

Meeting Agenda

Hutto Regional Wastewater Facility Study

DATE: *Wednesday, November 30, 2011*
TIME: *10:00 – 11:30 a.m.*
LOCATION: *Jonah Water Special Utility District*

Items for Discussion:

10:00 – 10:15	1. Welcome and Introduction • Attendees: TWDB & Participants • Project Overview & Schedule
10:15 – 11:00	2. Regional Wastewater Facility Study • Review of Data Collection Activities • Population Projections • Wastewater Flow Projections • Regional Infrastructure Alternatives
11:00 – 11:20	3. Q&A Discussion – Project Participants
11:20 – 11:30	4. Wrap-up

Hutto Regional Wastewater Facility Study
Project Meeting
November 30, 2011

Name	Title	City/Entity	Phone Number	Email Address
Scot Stromsness	P.W. Director	City of Hutto	759-4018	Scot.stromsness@HuttoTX.gov
Jim Devereaux	Utility Supert	City of Hutto	759-4020	JAMES.DEVEREAUX@HuttoTX.gov
RAINEY LANN	DIRECTOR OF FACILITIES	HUTTO ISD	759-3771	rainey.lann@hotto.txed.net
TREY BUZBEE	Mgr.	BRA	254-761-3168	tbuzbee@brazos.org
Derrell Winslett	Water Conservation Mur	City of Pflugerville	(512) 251-9935	derrellw@cityofpflugervilletx.gov
MATT WOODARD	Utility Foreman	City of Pflugerville	(512) 251-9935	Mattw@cityofpflugervilletx.gov
Michael Lafferty	Associate Eng.	City of Hutto	(512) 759-4024	michael.lafferty@huttotx.gov
Matt Bushak	City Engineer	COH	512-759-4022	matthew.bushak@Huttotx.gov
DAVID MEESEY	PROGRAM SPECIALIST	TWDB	512)936-0852	david.meesey@TWDB.STATE.TX.US
Bill Brown	General Manager	Jonah Water	512-759-1286	bbrown@jonahwater.com
Susan Roth	President	Susan Roth Consulting	512-796-6692	susan@srothconsulting.com

Sub-Areas

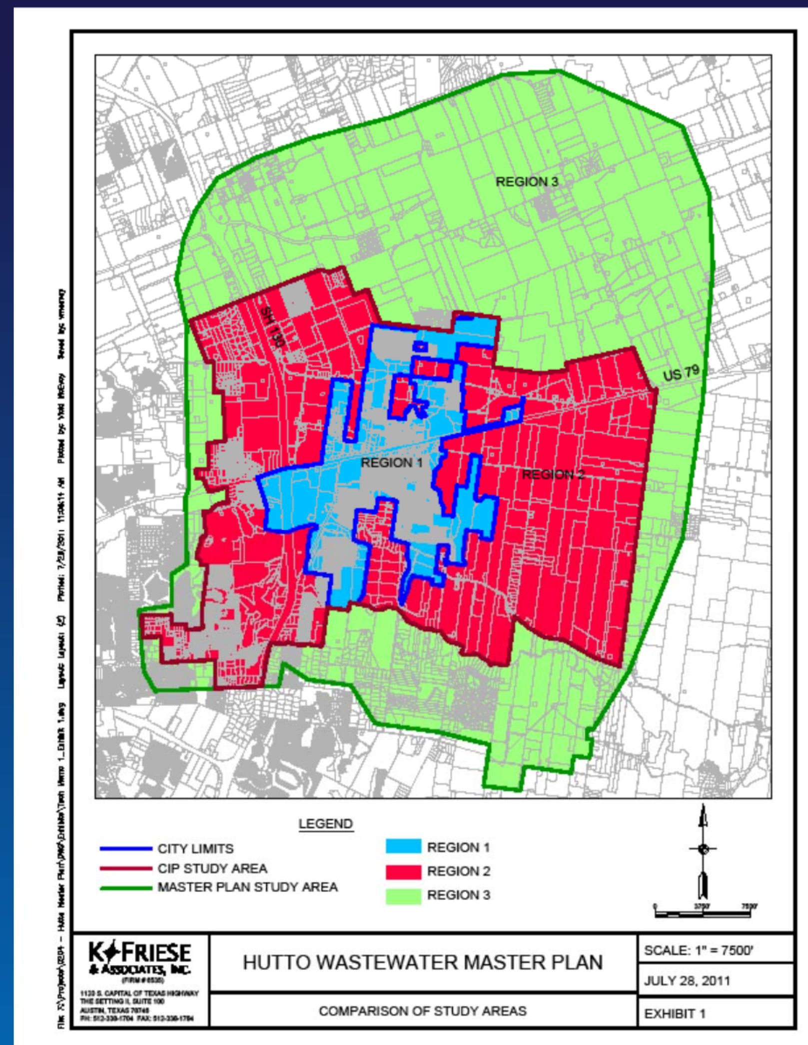
- **Sewersheds**
  - The Study Area is divided into 22 Sewersheds
  - Each Sewershed represents a drainage basin or lift station service area
  - Sewersheds provide for common analysis areas and terminology throughout the study
- **Traffic Analysis Zones (TAZ)**
  - From CAMPO
  - Small Geographic areas developed to analyze nodes of growth and activity

Population Projections

- **Goal: Estimate Total Population for the City and Study Area, by Sewershed, in 5 year increments, from 2010 through 2040 (study period)**
- **Data Sources:**
  - TWDB: provided on a County and City basis
  - CAMPO 2035 Plan: provided by TAZ
  - City of Hutto 2008 CIP Plan: provided by Sewershed
  - City of Hutto Planning Department LUE Projections: provided by Subdivision
  - Hutto Economic Development Corporation Population Projections: provided for entire study area
  - 2010 Census

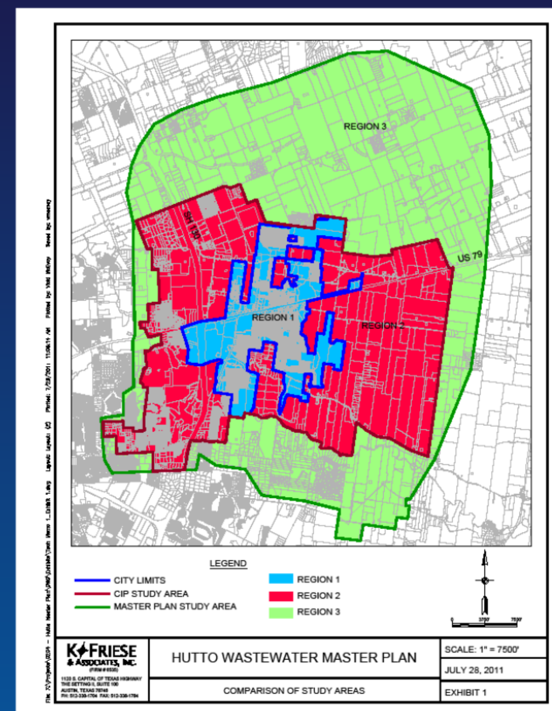
Population Projections

- **Divided the Study Area into three Regions**
  - Region 1 – City Limits
  - Region 2 – "CIP Plan"
    - Consistent with Study Area for 2008 City of Hutto CIP Study
  - Region 3 – Remaining Study Area



Population Projections

- **Divided the Study Area into three Regions and used best available data**
  - Region 1 – City Limits
    - TWDB Growth Rates
  - Region 2 – “CIP Plan”
    - CAMPO 2035 Plan
  - Region 3 – Remaining Study Area
    - CAMPO 2035 Plan
  - Adjusted for:
    - 2010 Census
    - Number of existing homes per aerial photos & plats
    - Maximum densities from City of Hutto Planning Department

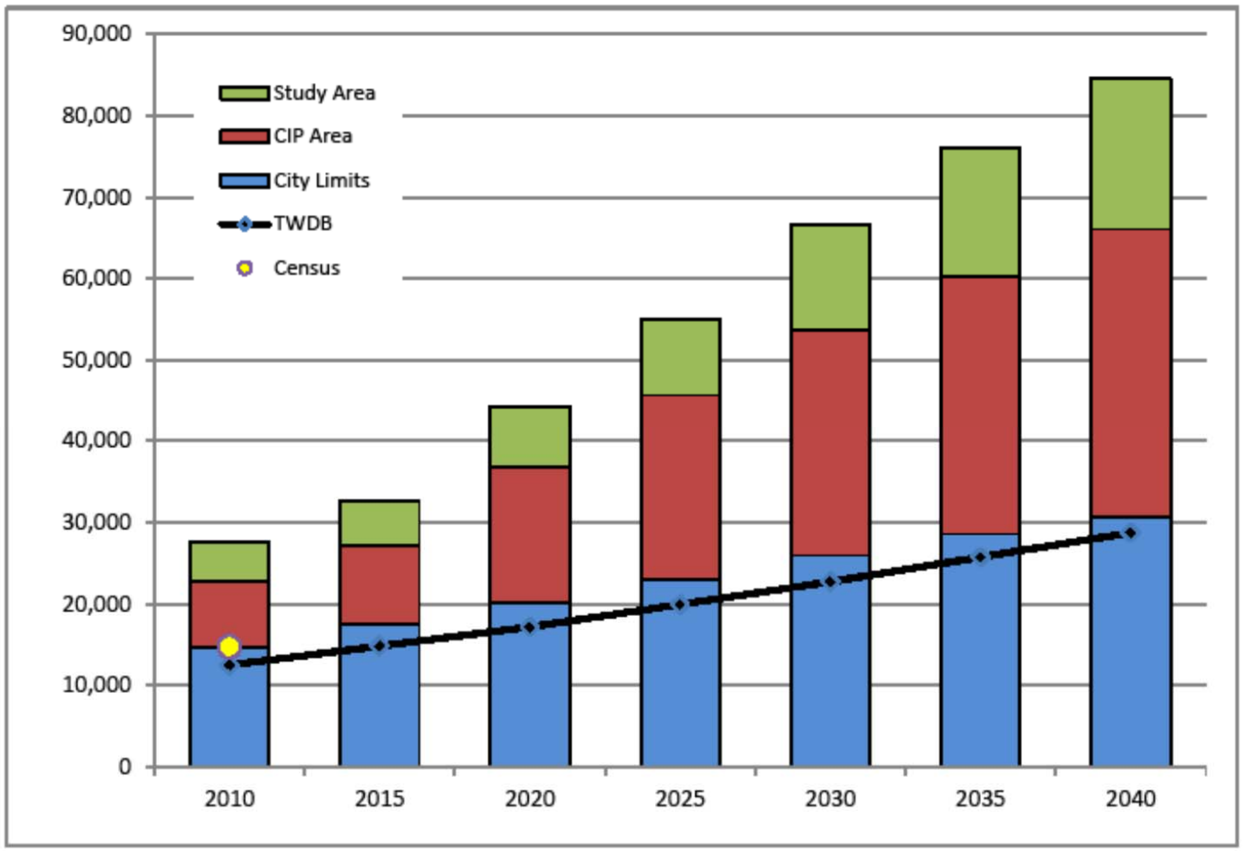


Population Projections

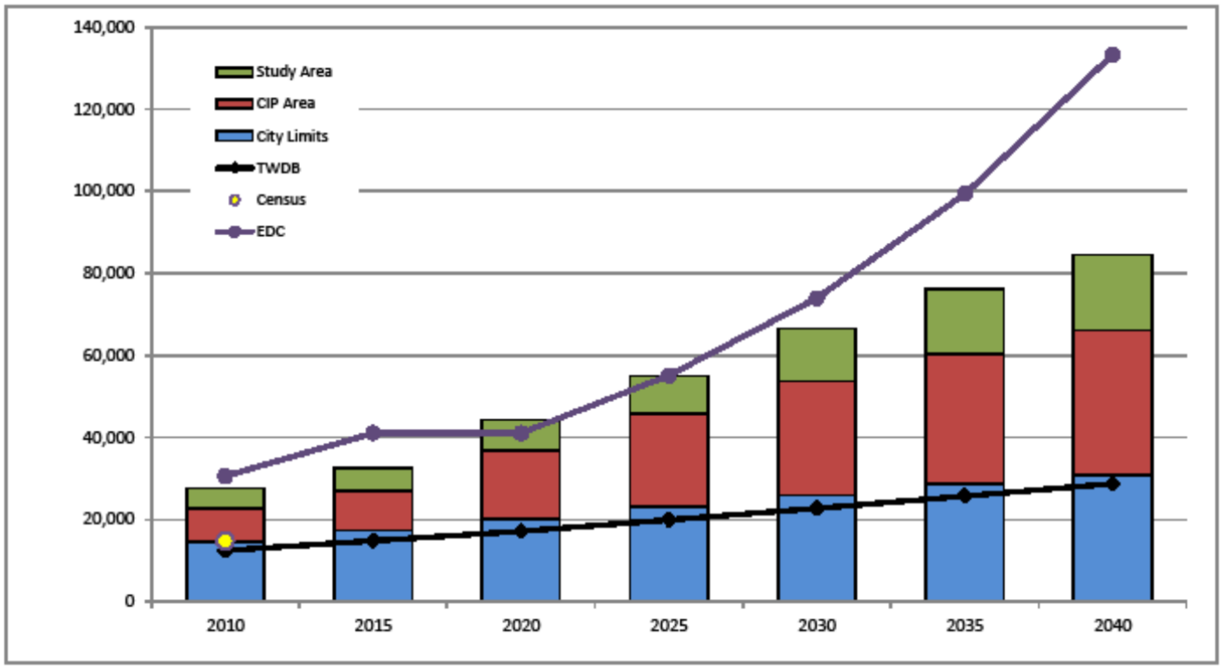
- Divided the Study Area into three Regions and used best available data

		2010	2015	2020	2025	2030	2035	2040
City Limits	Population	14,968	17,417	20,111	23,039	25,943	28,591	30,762
	Growth Rate		19%	15%	15%	13%	10%	10%
CIP Area	Population	8,012	9,728	16,622	22,654	27,764	31,686	35,326
	Growth Rate		21%	71%	36%	23%	14%	11%
Remaining Area	Population	4,905	5,420	7,592	9,368	12,858	15,760	18,454
	Growth Rate		10%	40%	23%	37%	23%	17%
Total	Population	27,615	32,565	44,325	55,061	66,565	76,038	84,542
	Growth Rate		18%	36%	24%	21%	14%	11%

Population Projections



Population Projections



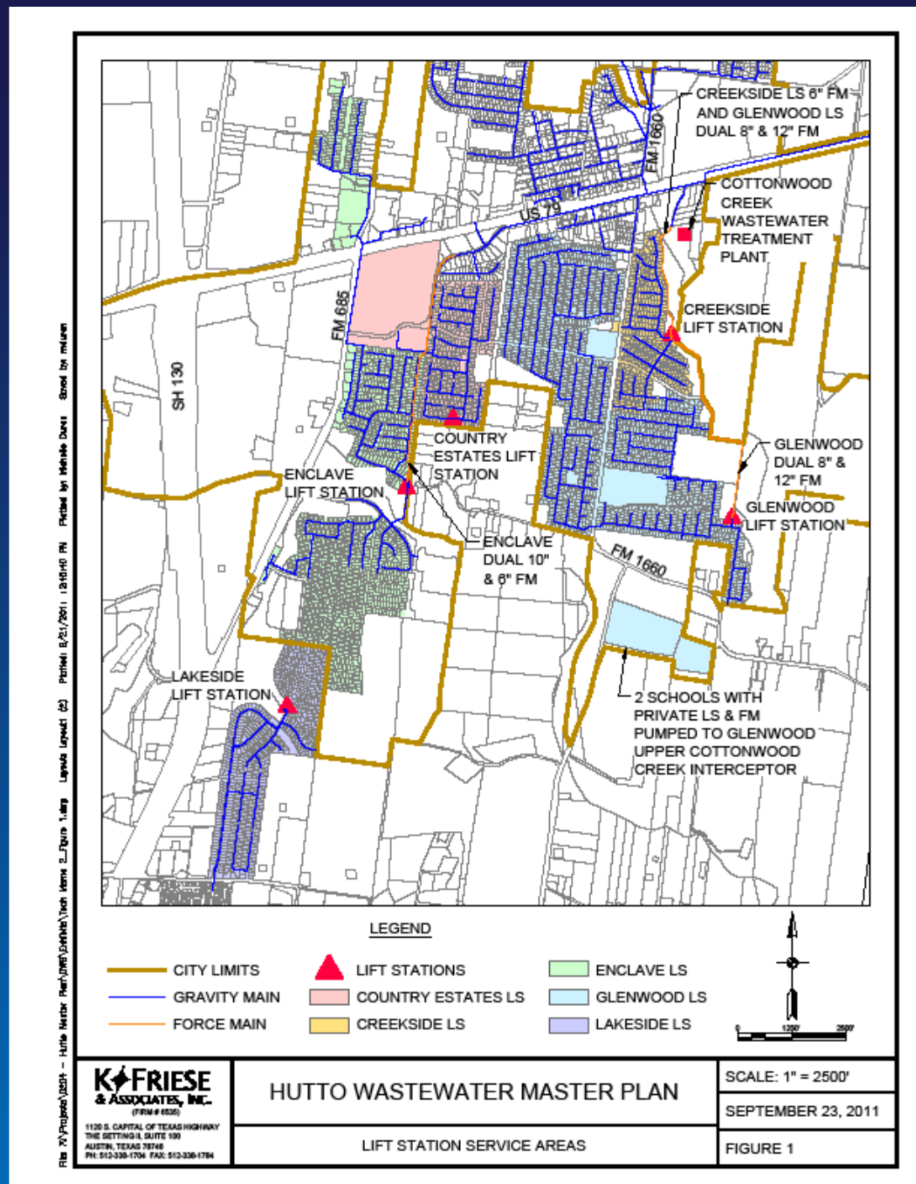
Population Projections

- Questions on Population Projections?

Evaluation Criteria

- **Goal – Determine actual per capita wastewater flows to establish some certainty for system analysis and design**
- **Scope**
  - Lift Station Pump Testing and Data Collection
    - Used level logger to record wet well level every 5 seconds before, during, and after a pump run
    - Determined fill and drawdown rates based on wet well diameter
    - Calculated pumping rate for each pump
    - Tested 5 lift stations

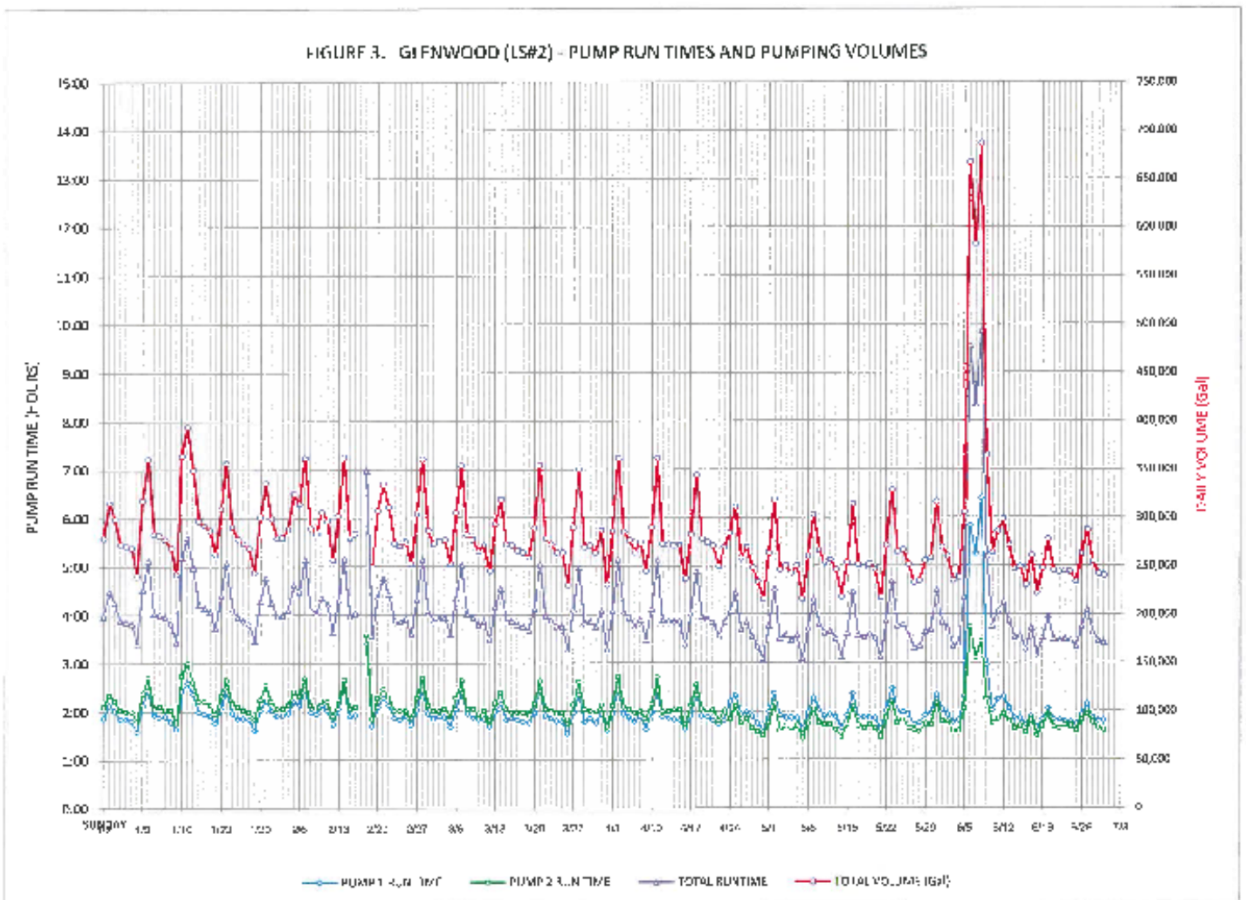
Evaluation Criteria



Evaluation Criteria

- **Goal – Determine actual per capita wastewater flows to establish some certainty for system analysis and design**
- **Scope**
  - Lift Station Data Analysis
    - Used OmniSite daily pump run times to calculate each lift station’s daily pumpage volume
    - Used lift station level logger data to calculate diurnal flow patterns

Evaluation Criteria

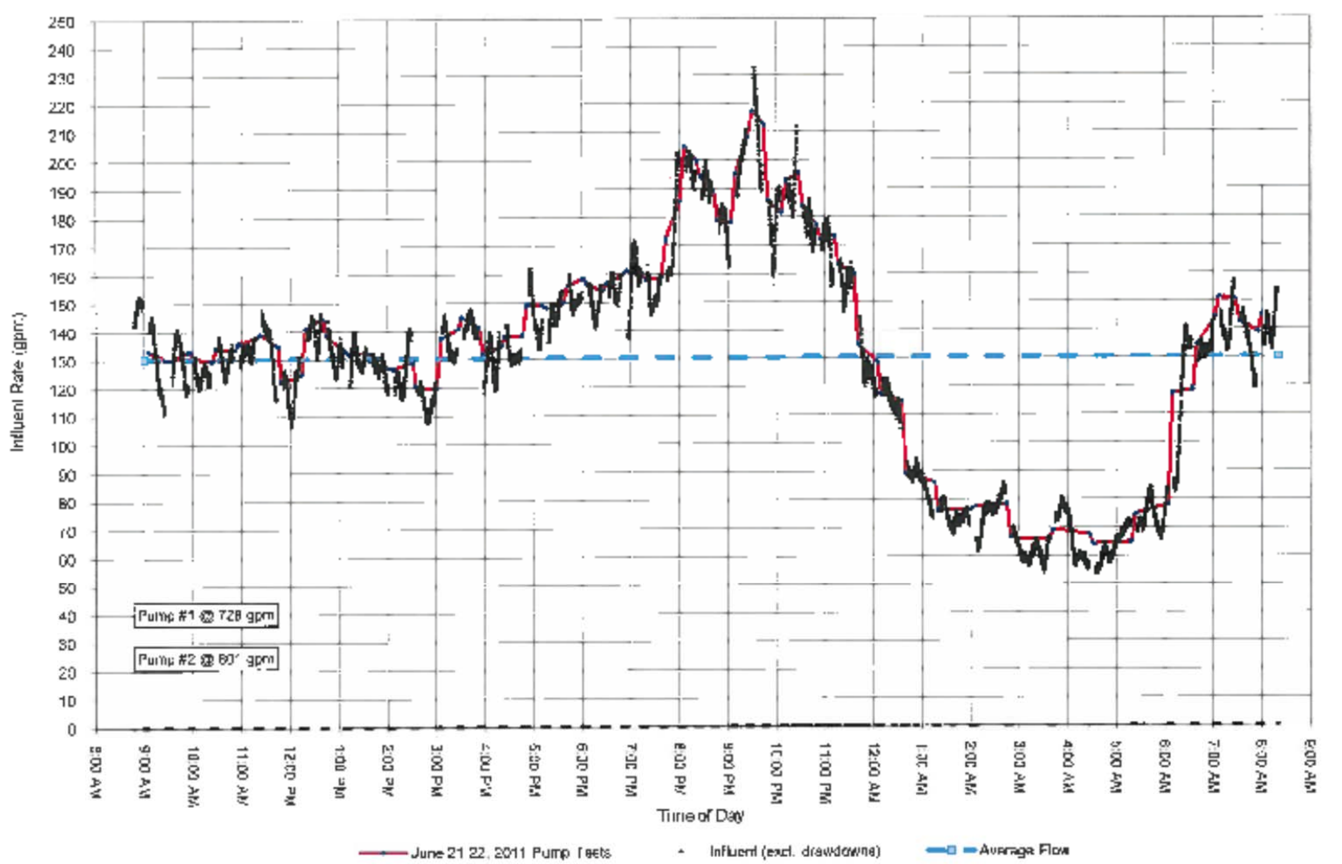


9/15/2011

K FRIESE & ASSOCIATES, INC.

Evaluation Criteria

FIGURE 7. ENCLAVE LIFT STATION DIURNAL CURVE



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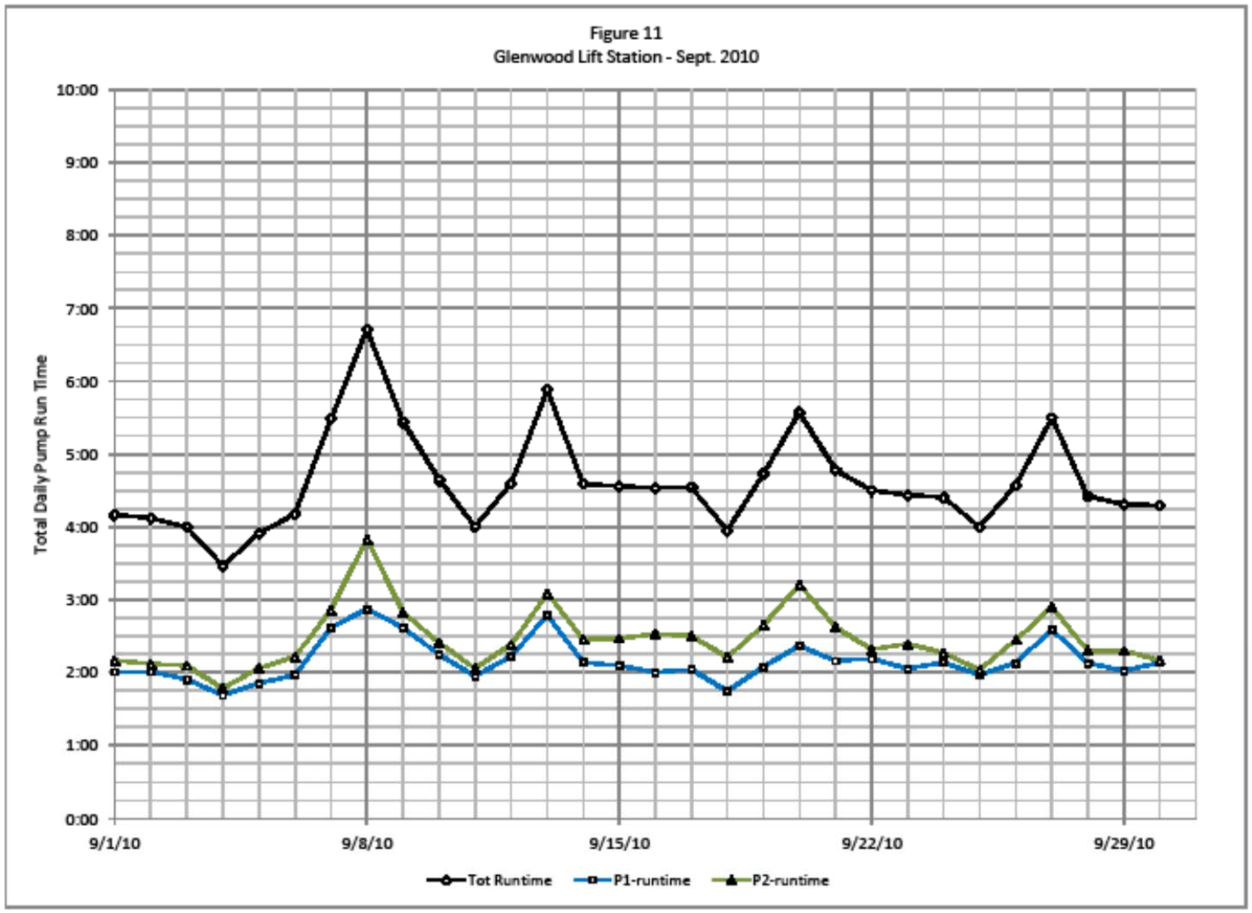
K FRIESL & ASSOCIATES, INC.

Evaluation Criteria

- **Goal – Determine actual per capita wastewater flows to establish some certainty for system analysis and design**
- **Scope**
  - Wet Weather Flow
    - Used OmniSite data to look at lift station response for 5.6 inch rain event of September 8, 2010
      - Glenwood is the only lift station that showed a significant response to the rain event

Evaluation Criteria



Evaluation Criteria

- Goal – Determine actual per capita wastewater flows to establish some certainty for system analysis and design
- Results

Criteria	Average Value from Analysis	Utility Criteria Manual Value	Recommended Value
People per Household	2.92	3.5	3.1
Unit Flow (gpd per capita)	72	80	75
Flow from Residential Single Family Unit (gpd)	210	280	232.5
Inflow & Infiltration (gallons per acre per day)	N/A	500	500

Evaluation Criteria

- Questions on Evaluation Criteria?

Flow Projections

- **Sewersheds with Existing Wastewater Infrastructure**

- **Areas of Near Term Growth**
  - Carmel Creek Sewershed
  - Avery Lake Sewershed
  - North Cottonwood Creek Sewershed
  - South Cottonwood Creek Sewershed

Flow Projections

- **Sewersheds on Outskirts of Study Area**
  - Jonah Area
  - Eastern Portion of Study Area
  - Southern Portion of Study Area
- **Sewersheds with No Wastewater Flow**
  - Pecan Branch
  - Coyote Trail

Flow Projections

Total Flow in Study Area (MGD)	2010	2015	2020	2025	2030	2035	2040
Average Dry Weather Flows	1.85	2.22	2.98	3.68	4.43	5.04	5.58
Peak Wet Weather Flows	6.10	7.15	9.23	11.09	13.01	14.55	15.90

Flow Projections

- Questions on Flow Projections?

Service Options

- Expansion of Existing Hutto Wastewater Treatment Plant, then Build Proposed Brushy Creek Wastewater Treatment Plant
- Construct Force Main from Enclave Lift Station to Proposed Brushy Creek Wastewater Treatment Plant (Existing Plant will continue to be operated)
- Construct Proposed Brushy Creek Interceptor and Proposed Brushy Creek Wastewater Treatment Plant (Existing Plant will continue to be operated)

Service Options

- **Possibility of Diverting Flow to Pflugerville's Collection System for Treatment**

  – How much flow and for what length of time could the City of Pflugerville accept wastewater from Hutto's collection system?

  – How much will it cost to convey the flow from Hutto's system to Pflugerville's system?

  – How much will Pflugerville charge Hutto to treat the wastewater?

Service Options

Total Average Daily Flow in Study Area (MGD)

	2010	2015	2020	2025	2030	2035	2040
Sewersheds Drain to Ex. WWTP	0.55	0.65	0.85	0.99	1.16	1.33	1.50
Sewersheds Drain to Enclave LS	0.46	0.65	1.04	1.39	1.57	1.69	1.81
Sewersheds Drain to Other Existing LS*	0.51	0.53	0.60	0.65	0.68	0.71	0.73
Sewersheds Drain to Proposed WWTP	0.16	0.21	0.29	0.44	0.63	0.78	0.88
Sewersheds Drain to East of Study Area	0.17	0.18	0.20	0.21	0.38	0.52	0.65

*includes Country Estates LS and Glenwood LS, which currently pump to the existing WWTP but will eventually gravity flow to the proposed WWTP, and Lakeside LS which currently pumps to Pflugerville

Service Options

- **Projected Flow to Enclave Lift Station**

Sewershed	2010	2015	2020	2025	2030	2035	2040
Avery Lake	0.16	0.30	0.56	0.78	0.88	0.92	0.96
Carmel Creek	0.07	0.07	0.16	0.22	0.25	0.28	0.30
Enclave North	0.10	0.12	0.13	0.16	0.18	0.20	0.22
Enclave South	0.13	0.16	0.19	0.23	0.26	0.30	0.33
Total ADWF (MGD)	0.46	0.65	1.04	1.39	1.57	1.69	1.81
Total PWWF (MGD)	1.81	2.43	3.69	4.75	5.30	5.66	6.00

Service Options

- Discussion on Service Options

Meeting Agenda

Hutto Regional Wastewater Facility Study

DATE: *Wednesday, May 9, 2012*
TIME: *10:00 – 11:30 a.m.*
LOCATION: *City of Hutto, Council Chambers*

Items for Discussion:

10:00 – 10:10	1. Welcome and Introductions • Attendees: TWDB & Participants • Project Recap
10:10 – 10:55	2. Regional Wastewater Facility Study • Review of Population Projections • Review of Wastewater Flow Projections • Analysis of Regional Wastewater Alternatives
10:55 – 11:05	3. Preliminary Conclusions and Summary
11:05 – 11:25	4. Q&A Discussion
11:25 – 11:30	5. Wrap Up and Next Steps

Hutto Regional Wastewater Facility Study
Project Meeting
May 9, 2012

Name	Title	City/Entity	Phone Number	Email Address
Darrell Winslett	Water Conservation Man-	City of Pflugerville	512 251-9935	darrellw@pflugervilletx.gov
Jim Clarno		Clarno Consulting	512 338 3871	Jim.Clarno@ATT.net
Rainey Lann		Hutto ISD	512-759-3771	burton.lann@hutto.txed.net
David Mersey	Flunky	TWDB	512-936-0852	
Tom Britton	Pres.	Hutto Chamber	759-4400	
Jennifer Sullivan	Engineer	K Friese	338-1704	jsullivan@kfriese.com
Bill Brown	GM	Jonah WaterSUD	759-1986	bbrown@jonahwater.com
Matt Bushak	City Engineer	City of Hutto	759-4022	
Michael Lafferty	Sr. Associate Engineer	City of Hutto	759-4024	michael.lafferty@huttotx.gov
Tom Owens	Project Manager	K Friese	338-1704	towens@kfriese.com
Trey Buzbee	BRA		254-761-3168	tbuzbee@brazos.org
Susan Roth Consulting	President	Susan Roth Consulting	512-796-6692	susan@srothconsulting.com

Hutto Regional Wastewater Master Plan

Wednesday, May 9, 2012

Hutto City Council Chambers

Presented by

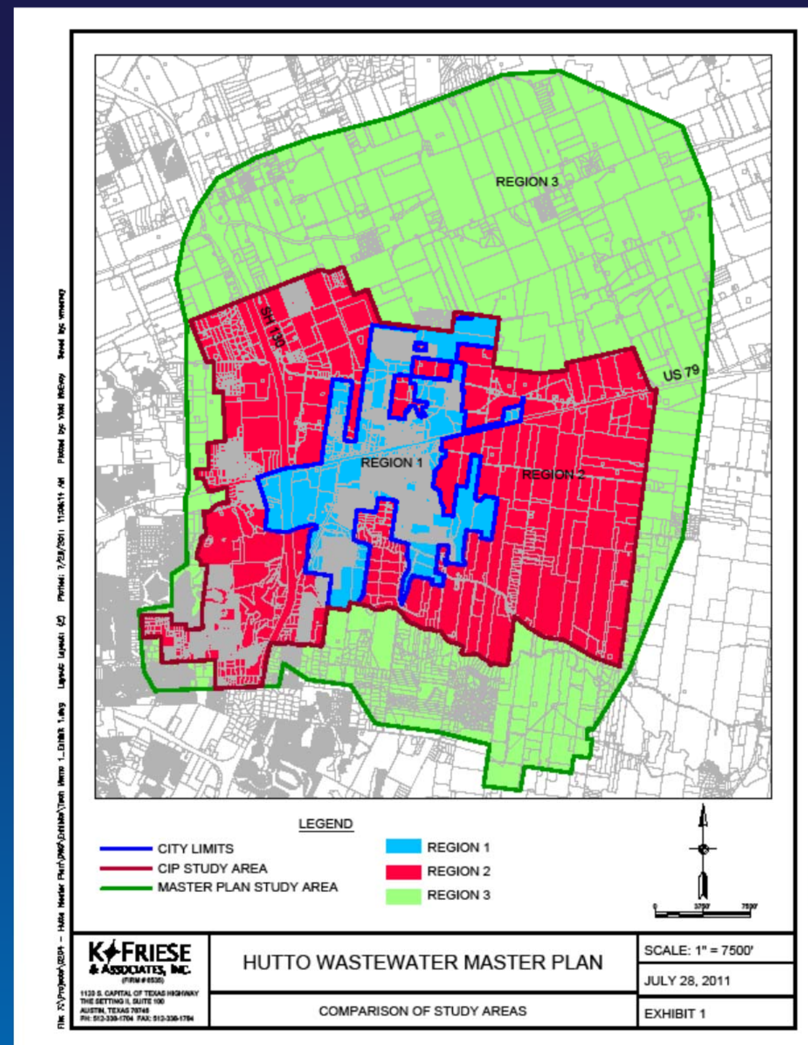
K FRIESE & ASSOCIATES, INC.

Purpose and Scope

- **Purpose**
  - Develop a Capital Improvements Plan (CIP) to plan for future growth
  - Examine methods to prolong service life of existing infrastructure to defer expenditures for a new wastewater treatment plant and large wastewater interceptor
- **Scope**
  - Basin Delineation and Population Projections
  - Determination of Wastewater Flows
  - Analysis of Treatment Options
  - Analysis of Wastewater Conveyance
  - Identify and Recommend CIP Projects

Study Area

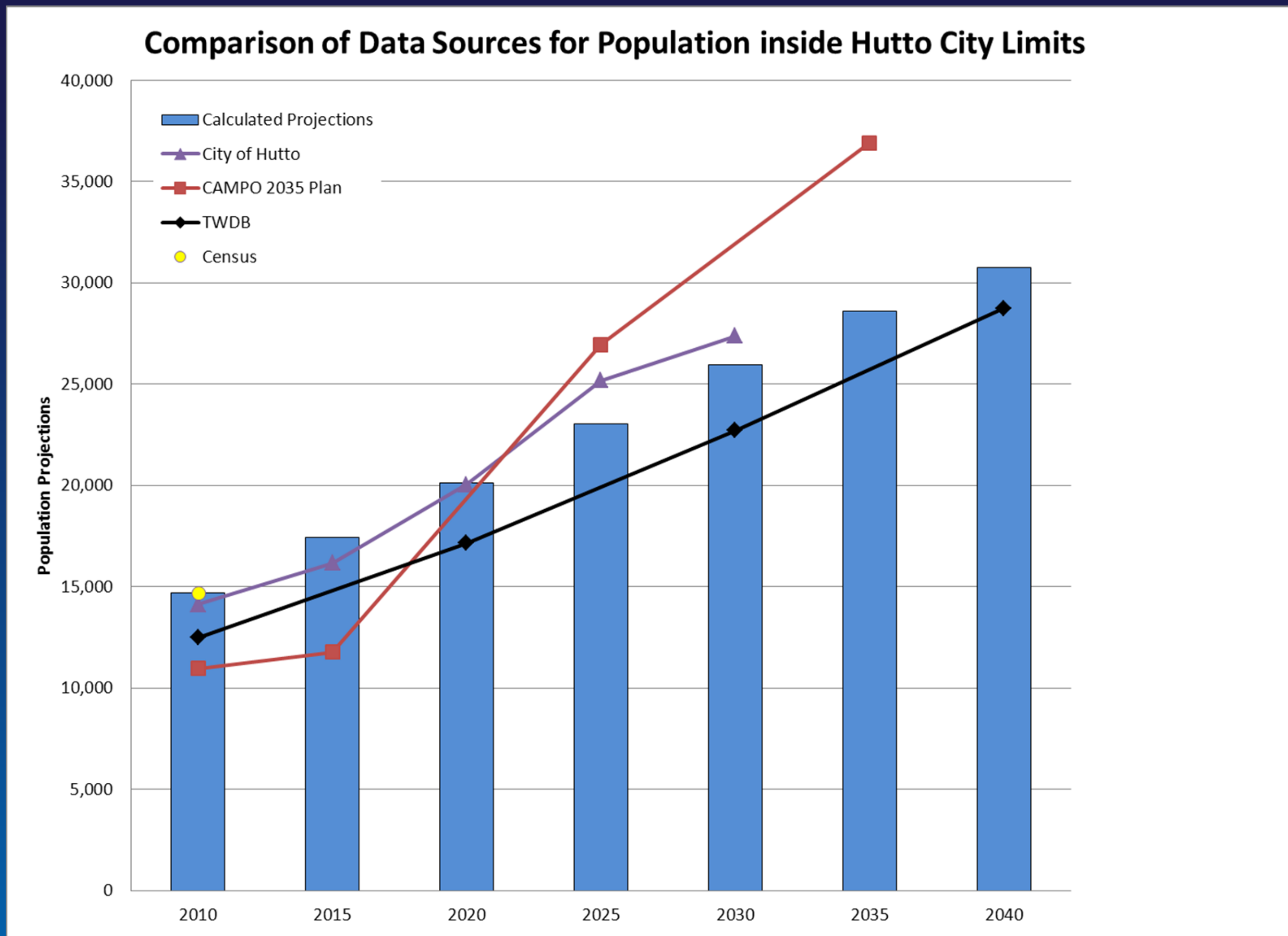
- **Divided the Study Area into three Regions**
  - Region 1 – City Limits
  - Region 2 – “CIP Plan”
    - Consistent with Study Area for 2008 City of Hutto CIP Study
  - Region 3 – Remaining Study Area



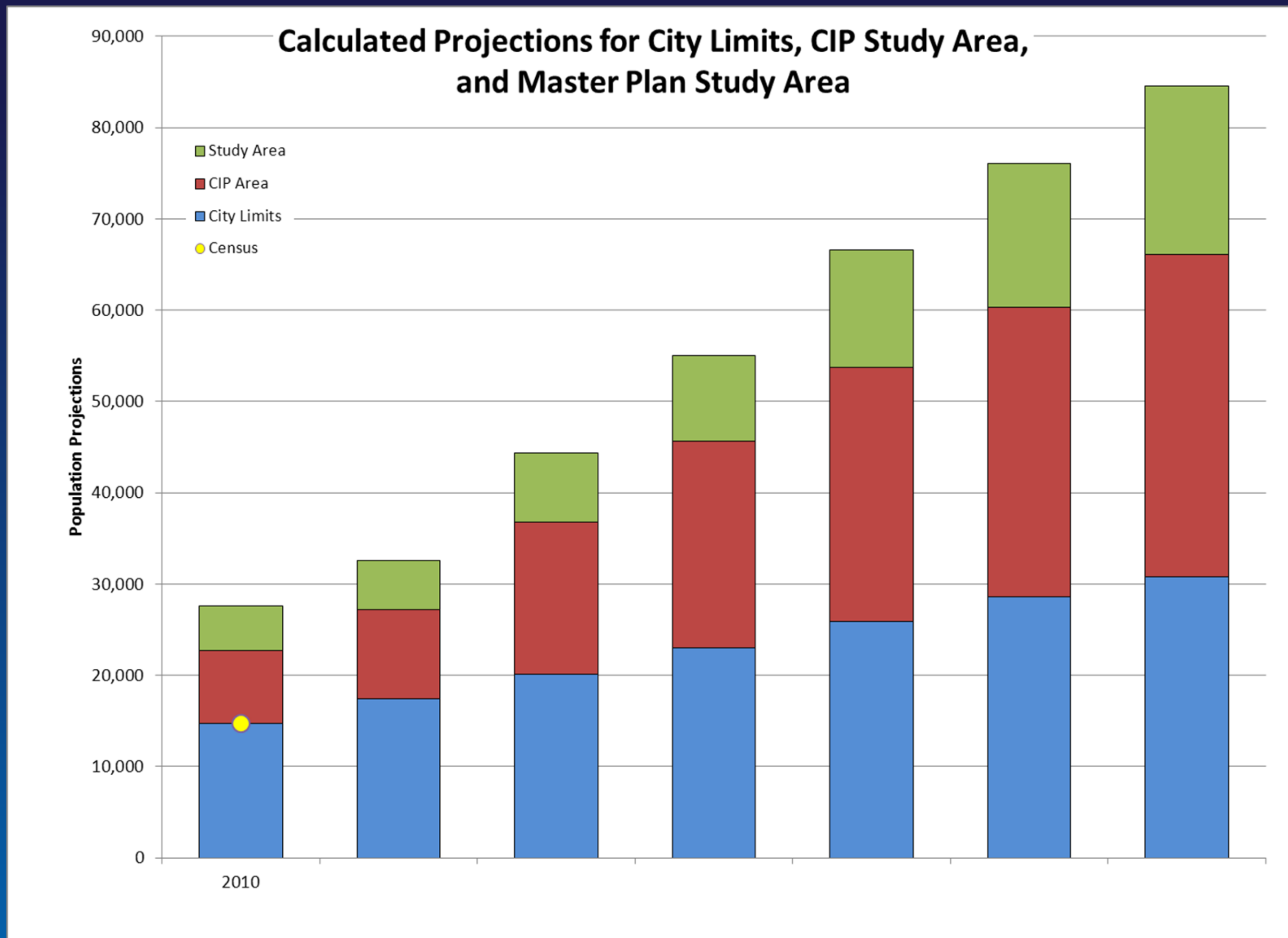
Population Projections

- **Data Sources included:**
  - TWDB: provided on a County and City basis
  - CAMPO 2035 Plan: provided by TAZ
  - City of Hutto Planning Department LUE Projections: provided by Subdivision
  - 2010 Census
- **Population Projections in 5-Year Increments through 2040**

Population Projections



Population Projections



Design Criteria

- Goal – Determine actual per capita wastewater flows to establish some certainty for system analysis and design
- Used Lift Station Pump Testing and City SCADA Data
- Results

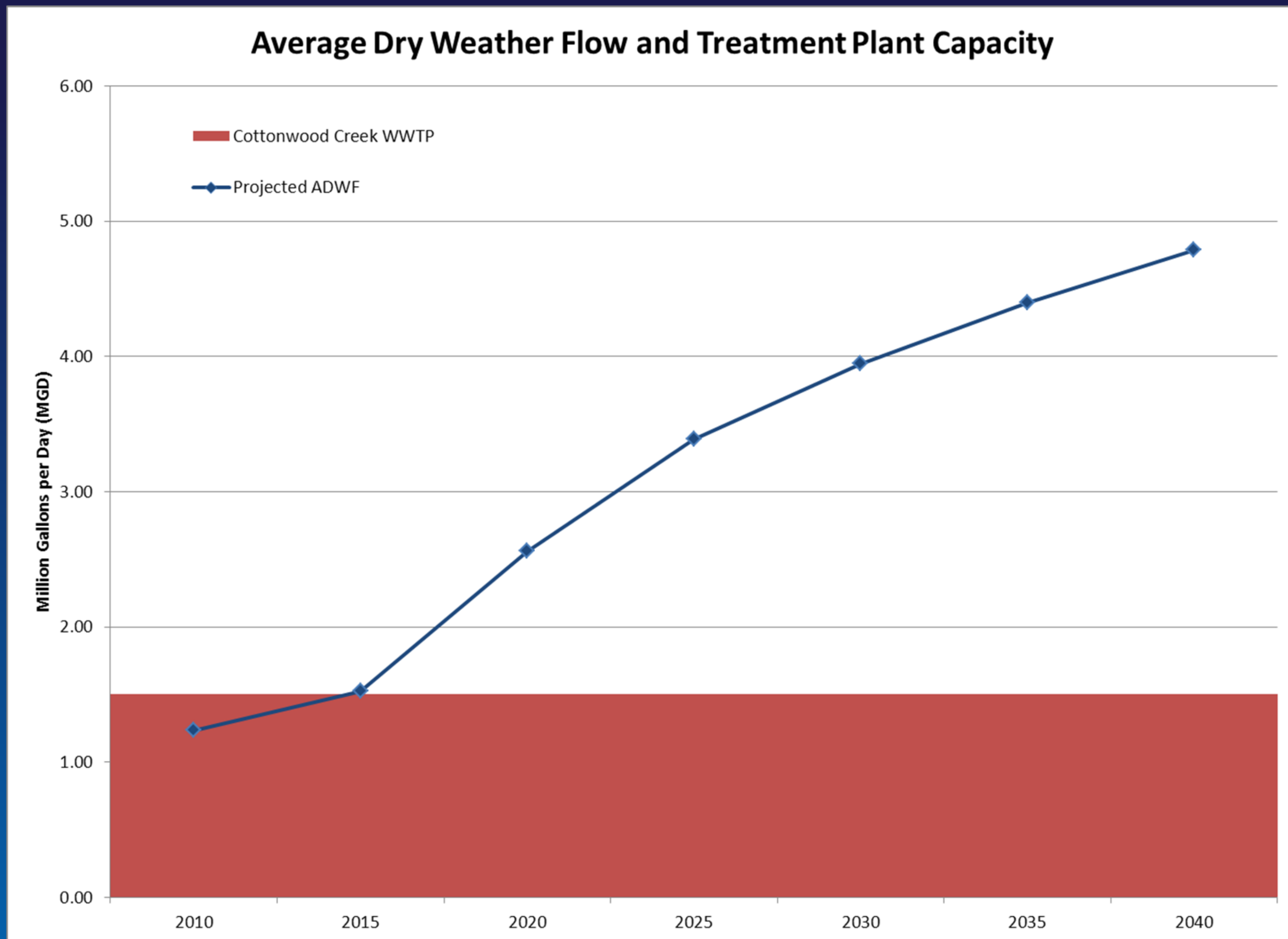
Criteria	Value
People per Household	3.1
Unit Flow (gpd per capita)	75
Flow from Residential Single Family Unit (gpd)	232.5
Inflow & Infiltration (gallons per acre per day)	500

Flow Projections

- Combined Population Projections and Design Criteria
- For “CIP Study Area”
- Flow Projections

Total Flow in Study Area (MGD)	2010	2015	2020	2025	2030	2035	2040
Average Dry Weather Flows	1.24	1.53	2.56	3.39	3.95	4.40	4.79

Treatment Options



Treatment Options

- Pump a Portion of Flow to City of Pflugerville
- Expand Existing Cottonwood Creek Wastewater Treatment Plant
- Build Lower Brushy Creek Wastewater Treatment Plant

Treatment Options

- **Pump 0.5 MGD of Flow from Enclave Lift Station to Pflugerville for Treatment**
  - Construct a temporary 1,400 gpm lift station and 10-inch force main to pump flow from Enclave to Pflugerville
  - Expand existing Cottonwood Creek WWTP to 1.9 MGD
  - Pflugerville will treat flow until 2020
  - Additional Hutto Treatment capacity is required in 2020

Treatment Options

- **Expand Existing Cottonwood Creek Wastewater Treatment Plant to Serve Projected 4.79 MGD in 2040**
  - Cottonwood Creek WWTP can treat 1.5 MGD
  - Phase 1 Expansion of 2 MGD start construction in 2013
  - Phase 2 Expansion of 2 MGD start construction in 2024
  - All sludge will be hauled to Brushy Creek facility
  - Lift stations and force mains remain in service
  - Proposed lift station and force main from Brushy Creek sewershed

Treatment Options

- **Build Lower Brushy Creek Wastewater Treatment Plant to Treat Excess Flow**
  - Projected flow in 2040 is 4.79 MGD
  - Existing Cottonwood Creek WWTP 1.5 MGD
  - Phase 1 of Lower Brushy Creek WWTP (2 MGD) start construction in 2013
  - Phase 2 of Lower Brushy Creek WWTP (2 MGD) start construction in 2024
  - Only Creekside lift station will be in service in 2040

Flow Conveyance

- Conveyance Improvements were determined for each treatment option

Cost Estimates (2012 – 2040)

- **Pump 0.5 MGD to Pflugerville Total Capital Cost $46,114,138**

Year	Project	Size/Capacity	Project Cost
2015	Improvements to Existing Plant to increase capacity	0.5 MGD	$1,363,000
2018	Construct Lower Brushy Creek WWTP	2.0 MGD	$10,560,000
2027	Expand Lower Brushy Creek WWTP	2.0 MGD	$10,995,264
	Totals - Treatment Plant Costs		$22,918,264
2012	Enclave LS Pump Upgrade to Front St. Gravity Main	1500 gpm	$148,200
2012	Enclave LS 2 to pump flow to Pflugerville	1400 gpm	$659,436
2018	Enclave LS 2 Pump Upgrade to Brushy Creek Force Main	4200 gpm firm	$472,200
	Totals - Lift Station Projects		$1,279,836
2012	Interceptor from Hwy 79 to Cottonwood Creek WWTP	24	$460,800
2012	Front St. Gravity Main (Seg 2)	27	$107,568
2015	Brushy Creek Interceptor Seg. 4	42	$955,584
2015	Carmel Creek Interceptor Seg. 1 & Seg. 2	42/24	$1,365,120
2018	Lakeside Gravity Main	12	$207,360
2020	Carmel Creek Interceptor Seg. 3	21	$1,663,200
2015	Avery Lake GM Seg. 1, Seg. 2 & Seg. 3	24/21/18	$3,257,280
2020	N. Cottonwood Creek GM Seg. 1, Seg. 2 & Seg. 3	21/21/18	$2,160,000
2027	Brushy Creek Interceptor Seg. 1, Seg. 2 & Seg. 3	42/42/42	$5,679,878
2030	Glenwood Gravity Main	21	$425,578
2030	Country Estates Gravity Main	10	$140,928
2030	S. Cottonwood Creek GM Seg. 1 & Seg. 2	18/12	$1,123,200
2030	Central Hutto GM Seg. 4	10	$15,360
	Totals - Gravity Main Projects		$17,561,856
2012	Force Main from Enclave LS 2 to Pflugerville	10	$1,734,000
2018	Brushy Creek Force Main	18	$2,620,182
	Totals - Force Main Projects		$4,354,182

Cost Estimates (2012 – 2040)

- **Expand Existing Cottonwood Creek WWTP $37,446,756**

Year	Project	Size/Capacity	Total Cost
2013	Expand Existing Plant	2.0 MGD	$11,112,000
2024	Expand Existing Plant	2.0 MGD	$8,952,000
	Totals - Treatment Plant Costs		$20,064,000
2013	New Enclave LS	1800 gpm firm	$659,436
2016	Add third pump to New Enclave LS	3600 gpm firm	$175,800
2024	Replace pump at New Enclave LS	4150 gpm firm	$120,600
2030	Replace pump at New Enclave LS	4700 gpm firm	$120,600
2025	Add third pump to Glenwood LS	2200 gpm firm	$106,800
2015	Brushy Creek LS	830 gpm firm	$659,436
	Totals - Lift Station Projects		$1,842,672
2012	Interceptor from Highway 79 to Cottonwood Creek WWTP	36	$691,200
2013	Front Street Gravity Main	24	$539,400
2015	Brushy Creek Interceptor Seg. 4	42	$955,584
2015	Carmel Creek Interceptor Seg. 1 & Seg. 2	42/24	$1,365,120
2018	Lakeside Gravity Main	12	$207,360
2020	Carmel Creek Interceptor Seg. 3	21	$1,663,200
2020	Avery Lake GM Seg. 1, Seg. 2 & Seg. 3	24/21/18	$3,257,280
2020	N. Cottonwood Creek GM Seg. 1, Seg. 2 & Seg. 3	21/21/18	$2,160,000
2025	S. Cottonwood Creek GM Seg. 1 & Seg. 2	18/12	$1,123,200
2030	Central Hutto GM Seg. 4	10	$15,360
	Totals - Gravity Main Projects		$11,977,704
2015	Brushy Creek FM	8	$1,957,200
2016	New Enclave FM to Front Street GM	18	$1,605,180
	Totals - Force Main Projects		$3,562,380

Cost Estimates (2012 – 2040)

- **Build Lower Brushy Creek WWTP $43,345,434**

Year	Project	Size/Capacity	Total Cost
2013	Construct Lower Brushy Creek WWTP	2.0 MGD	$10,850,000
2024	Expand Lower Brushy Creek WWTP	2.0 MGD	$11,845,264
	Totals - Treatment Plant Costs		**$22,695,264**
2013	Enclave LS Pump Upgrade to Brushy Creek Force Main	3700 gpm firm	$575,700
	Totals - Lift Station Projects		**$575,700**
2012	Interceptor from Highway 79 to Cottonwood Creek WWTP	24	$460,800
2015	Brushy Creek Interceptor Seg. 4	42	$955,584
2015	Carmel Creek Interceptor Seg. 1 & Seg. 2	42/24	$1,365,120
2018	Lakeside Gravity Main	12	$207,360
2020	Carmel Creek Interceptor Seg. 3	21	$1,663,200
2015	Avery Lake GM Seg. 1, Seg. 2 & Seg. 3	24/21/18	$3,257,280
2020	N. Cottonwood Creek GM Seg. 1, Seg. 2 & Seg. 3	21/21/18	$2,160,000
2024	Brushy Creek Interceptor Seg. 1, Seg. 2 & Seg. 3	42/42/42	$5,679,878
2025	Glenwood Gravity Main	21	$425,578
2025	Country Estates Gravity Main	10	$140,928
2025	S. Cottonwood Creek GM Seg. 1, Seg. 2	18/12	$1,123,200
2030	Central Hutto GM Seg. 4	10	$15,360
	Totals - Gravity Main Projects		**$17,454,288**
2013	Brushy Creek Force Main	18	$2,620,182
	Totals - Force Main Projects		**$2,620,182**

Net Present Value

- Capital Costs
- Operation & Maintenance Costs
  - Treatment & Sludge Handling
  - Lift Station Energy Usage
  - Lift Station Routine Monthly Maintenance, Cleaning, and Repairs
  - Cleaning of Gravity Mains

Net Present Value

- Pump 0.5 MGD to Pflugerville - $66,143,443

	Capital Costs			Operational & Maintenance Costs				Total Capital & O&M Costs	Net Present Value
	Treatment	Pumps	Pipes	Treatment	LS Energy	LS Maint.	Gravity Lines		
2012	$0	$807,636	$2,302,368	$1,162,364	$16,199	$85,192	$2,898	$4,376,657	$4,376,657
2013	$0	$0	$0	$1,349,420	$19,550	$85,192	$2,898	$1,457,060	$1,387,676
2014	$125,000	$0	$0	$1,536,475	$22,901	$97,477	$2,898	$1,784,751	$1,618,822
2015	$1,488,000	$0	$5,577,984	$1,723,530	$26,253	$97,477	$30,762	$8,944,006	$7,726,168
2016	$125,000	$0	$0	$1,820,591	$23,256	$97,477	$30,762	$2,097,085	$1,725,277
2017	$125,000	$0	$0	$1,917,652	$20,259	$97,477	$30,762	$2,191,149	$1,716,823
2018	$10,685,000	$472,200	$2,827,542	$2,014,712	$17,262	$97,477	$32,922	$16,147,115	$12,049,226
2019	$125,000	$0	$0	$2,111,773	$14,264	$97,477	$32,922	$2,381,437	$1,692,442
2020	$0	$0	$3,823,200	$2,208,834	$11,267	$70,623	$56,142	$6,170,066	$4,176,144
2021	$0	$0	$0	$2,154,843	$11,777	$70,623	$56,142	$2,293,385	$1,478,336
2022	$0	$0	$0	$2,100,852	$12,286	$70,623	$56,142	$2,239,903	$1,375,106
2023	$0	$0	$0	$2,046,862	$12,795	$70,623	$56,142	$2,186,422	$1,278,356
2024	$0	$0	$0	$1,992,871	$13,304	$70,623	$56,142	$2,132,940	$1,187,701
2025	$0	$0	$0	$1,938,880	$13,814	$70,623	$56,142	$2,079,459	$1,102,781
2026	$0	$0	$0	$2,044,788	$11,133	$17,085	$56,142	$2,129,148	$1,075,365
2027	$10,995,264	$0	$5,679,878	$2,150,697	$8,453	$17,085	$73,046	$18,924,423	$9,102,971
2028	$0	$0	$0	$2,256,605	$5,773	$17,085	$73,046	$2,352,509	$1,077,712
2029	$0	$0	$0	$2,362,514	$3,093	$17,085	$73,046	$2,455,738	$1,071,430
2030	$0	$0	$1,705,066	$2,468,422	$413	$17,085	$86,617	$4,277,602	$1,777,432
2031	$0	$0	$0	$2,524,588	$413	$17,085	$86,617	$2,628,703	$1,040,267
2032	$0	$0	$0	$2,580,754	$413	$17,085	$86,617	$2,684,869	$1,011,899
2033	$0	$0	$0	$2,636,921	$413	$17,085	$86,617	$2,741,035	$983,874
2034	$0	$0	$0	$2,693,087	$413	$17,085	$86,617	$2,797,201	$956,223
2035	$0	$0	$0	$2,749,253	$413	$17,085	$86,617	$2,853,368	$928,975
2036	$0	$0	$0	$2,799,068	$413	$17,085	$86,617	$2,903,183	$900,184
2037	$0	$0	$0	$2,848,883	$413	$17,085	$86,617	$2,952,998	$872,029
2038	$0	$0	$0	$2,898,699	$413	$17,085	$86,617	$3,002,813	$844,513
2039	$0	$0	$0	$2,948,514	$413	$17,085	$86,617	$3,052,628	$817,641
2040	$0	$0	$0	$2,998,329	$413	$17,085	$86,617	$3,102,444	$791,414
								Total NPV	$66,143,443

Net Present Value

- Expansion of Ex. Cottonwood Creek WWTP - $55,968,371

	Capital Costs			Operational & Maintenance Costs				Total Capital & O&M Costs	Net Present Value
	Treatment	Pumps	Pipes	Treatment	LS Energy	LS Maint.	Gravity Lines		
2012	$0	$0	$691,200	$788,254	$12,629	$85,192	$2,400	$1,579,676	$1,579,676
2013	$11,112,000	$659,436	$539,400	$788,254	$14,196	$85,192	$5,880	$13,204,358	$12,575,579
2014	$0	$0	$0	$788,254	$15,763	$85,192	$5,880	$895,089	$811,872
2015	$0	$659,436	$4,277,904	$953,380	$17,330	$97,477	$14,484	$6,020,010	$5,200,311
2016	$0	$175,800	$1,605,180	$953,380	$18,691	$97,477	$14,484	$2,865,012	$2,357,052
2017	$0	$0	$0	$953,380	$20,052	$97,477	$14,484	$1,085,393	$850,434
2018	$0	$0	$207,360	$953,380	$21,413	$97,477	$16,644	$1,296,274	$967,300
2019	$0	$0	$0	$953,380	$22,774	$97,477	$16,644	$1,090,275	$774,838
2020	$0	$0	$7,080,480	$1,457,664	$24,135	$82,908	$59,124	$8,704,311	$5,891,420
2021	$0	$0	$0	$1,457,664	$25,550	$82,908	$59,124	$1,625,245	$1,047,648
2022	$0	$0	$0	$1,457,664	$26,964	$82,908	$59,124	$1,626,660	$998,628
2023	$0	$0	$0	$1,457,664	$28,378	$82,908	$59,124	$1,628,074	$951,901
2024	$8,952,000	$120,600	$0	$1,457,664	$29,792	$82,908	$59,124	$10,702,088	$5,959,323
2025	$0	$106,800	$1,123,200	$2,054,001	$31,207	$82,908	$68,304	$3,466,419	$1,838,316
2026	$0	$0	$0	$2,054,001	$32,195	$82,908	$68,304	$2,237,408	$1,130,043
2027	$0	$0	$0	$2,054,001	$33,184	$82,908	$68,304	$2,238,396	$1,076,707
2028	$0	$0	$0	$2,054,001	$34,172	$82,908	$68,304	$2,239,385	$1,025,888
2029	$0	$0	$0	$2,054,001	$35,161	$82,908	$68,304	$2,240,374	$977,468
2030	$0	$120,600	$15,360	$2,393,305	$36,149	$82,908	$68,400	$2,716,722	$1,128,854
2031	$0	$0	$0	$2,393,305	$36,868	$82,908	$68,400	$2,581,481	$1,021,580
2032	$0	$0	$0	$2,393,305	$37,586	$82,908	$68,400	$2,582,199	$973,204
2033	$0	$0	$0	$2,393,305	$38,305	$82,908	$68,400	$2,582,918	$927,119
2034	$0	$0	$0	$2,393,305	$39,023	$82,908	$68,400	$2,583,636	$883,216
2035	$0	$0	$0	$2,665,960	$39,742	$82,908	$68,400	$2,857,010	$930,160
2036	$0	$0	$0	$2,665,960	$40,340	$82,908	$68,400	$2,857,608	$886,053
2037	$0	$0	$0	$2,665,960	$40,939	$82,908	$68,400	$2,858,207	$844,036
2038	$0	$0	$0	$2,665,960	$41,538	$82,908	$68,400	$2,858,805	$804,013
2039	$0	$0	$0	$2,665,960	$42,136	$82,908	$68,400	$2,859,404	$765,887
2040	$0	$0	$0	$2,902,261	$42,735	$82,908	$68,400	$3,096,304	$789,847
								Total NPV	$55,968,371

Net Present Value

- **Construction of Proposed LBCWWTP - $58,496,428**

Capital Costs			Operational & Maintenance Costs				Total Capital & O&M Costs	Net Present Value
Treatment	Pumps	Pipes	Treatment	LS Energy	LS Maint.	Gravity Lines		
$0	$0	$460,800	$788,254	$9,700	$85,192	$2,400	$1,346,346	$1,346,346
$10,850,000	$575,700	$2,620,182	$788,254	$9,802	$85,192	$2,400	$14,931,530	$14,220,505
$0	$0	$0	$788,254	$9,904	$85,192	$2,400	$885,750	$803,402
$0	$0	$5,577,984	$1,134,280	$10,006	$85,192	$30,264	$6,837,726	$5,906,685
$0	$0	$0	$1,134,280	$10,258	$85,192	$30,264	$1,259,995	$1,036,601
$0	$0	$0	$1,134,280	$10,511	$85,192	$30,264	$1,260,247	$987,436
$0	$0	$207,360	$1,134,280	$10,763	$85,192	$32,424	$1,470,019	$1,096,951
$0	$0	$0	$1,134,280	$11,015	$85,192	$32,424	$1,262,911	$897,528
$0	$0	$3,823,200	$1,447,279	$11,267	$70,623	$55,644	$5,408,013	$3,660,356
$0	$0	$0	$1,447,279	$11,777	$70,623	$55,644	$1,585,323	$1,021,913
$0	$0	$0	$1,447,279	$12,286	$70,623	$55,644	$1,585,832	$973,563
$0	$0	$0	$1,447,279	$12,795	$70,623	$55,644	$1,586,341	$927,501
$11,845,264	$0	$5,679,878	$1,447,279	$13,304	$70,623	$72,548	$19,128,897	$10,651,686
$0	$0	$1,689,706	$1,974,287	$13,814	$70,623	$86,023	$3,834,452	$2,033,492
$0	$0	$0	$1,974,287	$11,133	$17,085	$86,023	$2,088,528	$1,054,849
$0	$0	$0	$1,974,287	$8,453	$17,085	$86,023	$2,085,848	$1,003,329
$0	$0	$0	$1,974,287	$5,773	$17,085	$86,023	$2,083,168	$954,323
$0	$0	$0	$1,974,287	$3,093	$17,085	$86,023	$2,080,488	$907,710
$0	$0	$15,360	$2,244,879	$413	$17,085	$86,119	$2,363,856	$982,231
$0	$0	$0	$2,244,879	$413	$17,085	$86,119	$2,348,496	$929,379
$0	$0	$0	$2,244,879	$413	$17,085	$86,119	$2,348,496	$885,123
$0	$0	$0	$2,244,879	$413	$17,085	$86,119	$2,348,496	$842,975
$0	$0	$0	$2,244,879	$413	$17,085	$86,119	$2,348,496	$802,833
$0	$0	$0	$2,496,895	$413	$17,085	$86,119	$2,600,512	$846,652
$0	$0	$0	$2,496,895	$413	$17,085	$86,119	$2,600,512	$806,335
$0	$0	$0	$2,496,895	$413	$17,085	$86,119	$2,600,512	$767,938
$0	$0	$0	$2,496,895	$413	$17,085	$86,119	$2,600,512	$731,370
$0	$0	$0	$2,496,895	$413	$17,085	$86,119	$2,600,512	$696,543
$0	$0	$0	$2,722,302	$413	$17,085	$86,119	$2,825,919	$720,874
							Total NPV	$58,496,428

Net Present Value

- Summary of NPV Analysis

Total Costs for Each Scenario from 2012-2040 (in $M)									
Scenario	Capital Costs			Operational & Maintenance Costs				Total Capital & O&M Costs	Net Present Value
	Treatment	Pumps	Pipes	Treatment	LS Energy	LS Maint.	Gravity Lines		
Pflugerville	$23.67	$1.28	$21.92	$65.04	$0.27	$1.44	$1.73	$115.34	$66.14
Expand CCWWTP	$20.06	$1.84	$15.54	$52.89	$0.88	$2.48	$1.48	$95.18	$55.97
Construct LBCWWTP	$22.70	$0.58	$20.07	$51.58	$0.19	$1.36	$1.84	$98.31	$58.50

Pump to Pflugerville

- **Advantages**
  - Delays capital costs associated with Hutto treatment capacity expansions
- **Disadvantages**
  - Includes temporary lift station and force main that will be used for short time
  - Additional Hutto treatment facilities are needed in 2020
  - City of Pflugerville capacity issues

Expand Cottonwood Creek WWTP

- **Advantages**
  - Delays construction of Lower Brushy Creek WWTP to beyond 2040
- **Disadvantages**
  - Only 30% of flow expected in 2040 naturally drains to plant site, remaining 70% must be pumped
  - Site cannot be expanded beyond 5.5 MGD without purchasing more land
  - Insufficient site for sludge dewatering facilities. Sludge must be wet hauled.

Construct Lower Brushy Creek WWTP

- **Advantages**
  - Only 2% of 2040 flow will be transmitted to treatment facility via pumping
  - Creekside lift station is only lift station to remain in service after construction of Brushy Creek Interceptor in 2024
  - Sufficient site for expansion of the plant to 12 MGD or more in the future
  - Sludge may be dewatered on site
- **Disadvantages**
  - Includes temporary 18-inch Brushy Creek force main and upgrades to Enclave Lift Station

Recommendation

- **Construct Lower Brushy Creek WWTP**
  - Estimated NPV within 4.5% of lowest NPV option (expand existing Cottonwood Creek WWTP). This is well within the margin of error for this level of estimate.
  - Only one lift station in operation in year 2040 with 97% of flow conveyance by gravity. This provides a significantly lower chance of overflows.
  - Site provides sludge handling options. Existing Cottonwood Creek WWTP site is insufficient for sludge dewatering facilities.
  - Site adequate for future plant expansions. Existing Cottonwood Creek site cannot be expanded beyond 5.5 MGD.

Meeting Agenda

Hutto Regional Wastewater Facility Study

DATE: *Thursday, July 26, 2012*
TIME: *10:00 – 11:30 a.m.*
LOCATION: *Williamson County Engineer Office Division*

Items for Discussion:

10:00 – 10:10	1. Welcome and Introductions • Attendees: TWDB & Participants • Project Recap & Schedule
10:10 – 10:50	2. Regional Wastewater Facility Study • Highlights of the initial draft report • Review comments from project participants • Timeline to finalize report
10:50 – 11:10	3. Funding opportunities and programs offered by TWDB
11:10 – 11:20	4. Q&A Discussion
11:20 – 11:30	5. Wrap Up

Hutto Regional Wastewater Facility Study
Project Meeting
July 26, 2012

Name	Title	City/Entity	Phone Number	Email Address
DAVID MEESEY	MANAGER/ PROGRAM SPECIALIST	TWDB	512) 936-0852	david.meesey@TWDB.TEXAS.GOV
Darrell Nichols	Project Lead	TWDB	512-463-8491	darrell.nichols@twdb.texas.gov
Trey Buzbee	Gov. ~~[illegible]~~ Relations Mgr	BRA	254-761-3168	trey.buzbee@yahoo.com
MATT WOODARD	Utility Foreman	City of Pflugerville	(512)251-9935 ext. 701	mattw@cityofpflugervilletx.gov
TOM OWENS	ENGINEER	K FRIESE & ASSOC. INC.	(512)338-1704	TOWENS@KFRIESE.COM
Michael Lafferty	EIT	City of Hutto	512-759-4024	michael.lafferty@huttotx.gov
Matt Bushak	City Engineer	City of Hutto	512-759-4022	matthew.bushak@huttotx.gov
Anthony Felderhoff	Intern for COH	City of Hutto		anthony.felderhoff@huttotx.gov
Susan Roth	President	Susan Roth Consulting	512-796-6692	susan@srothconsulting.com

Hutto Regional Wastewater Master Plan

Thursday, July 26, 2012

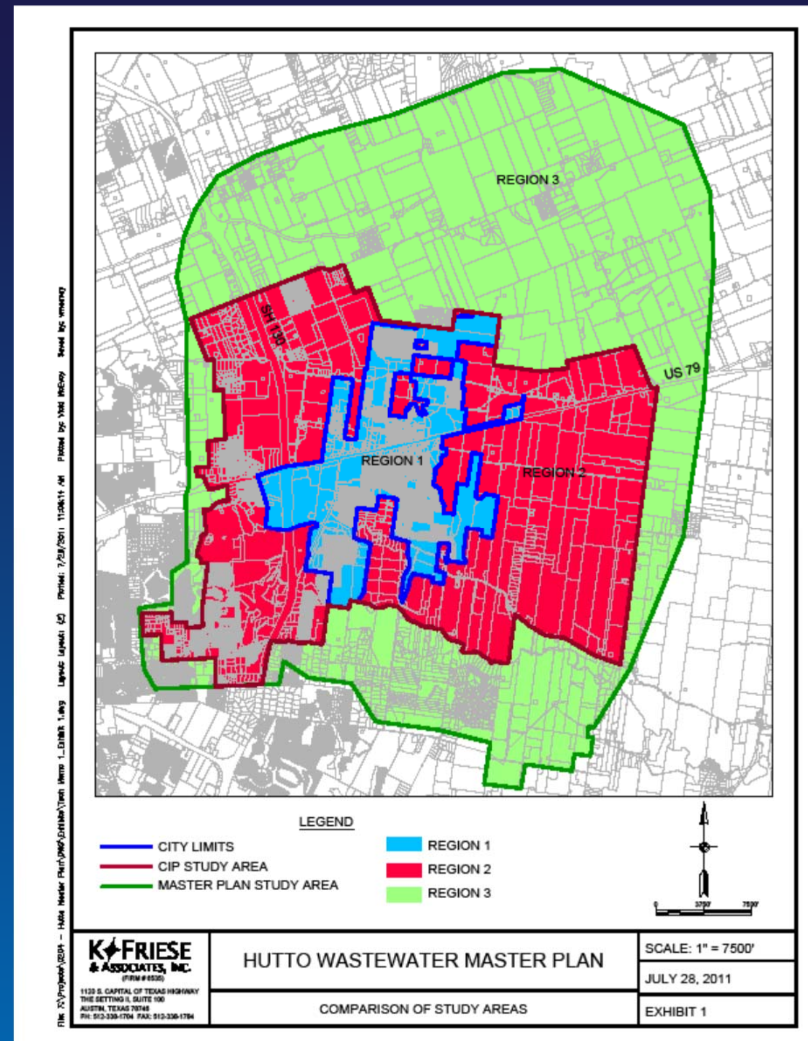
Purpose and Scope

- **Purpose**
  - Develop CIP to Plan for Future Growth
  - Evaluate Methods to Defer Expenditures

- **Scope**
  - Basin Delineation, Population & Flow Projections
  - Evaluate Treatment & Conveyance Options
  - Identify and Recommend CIP Projects

Study Area

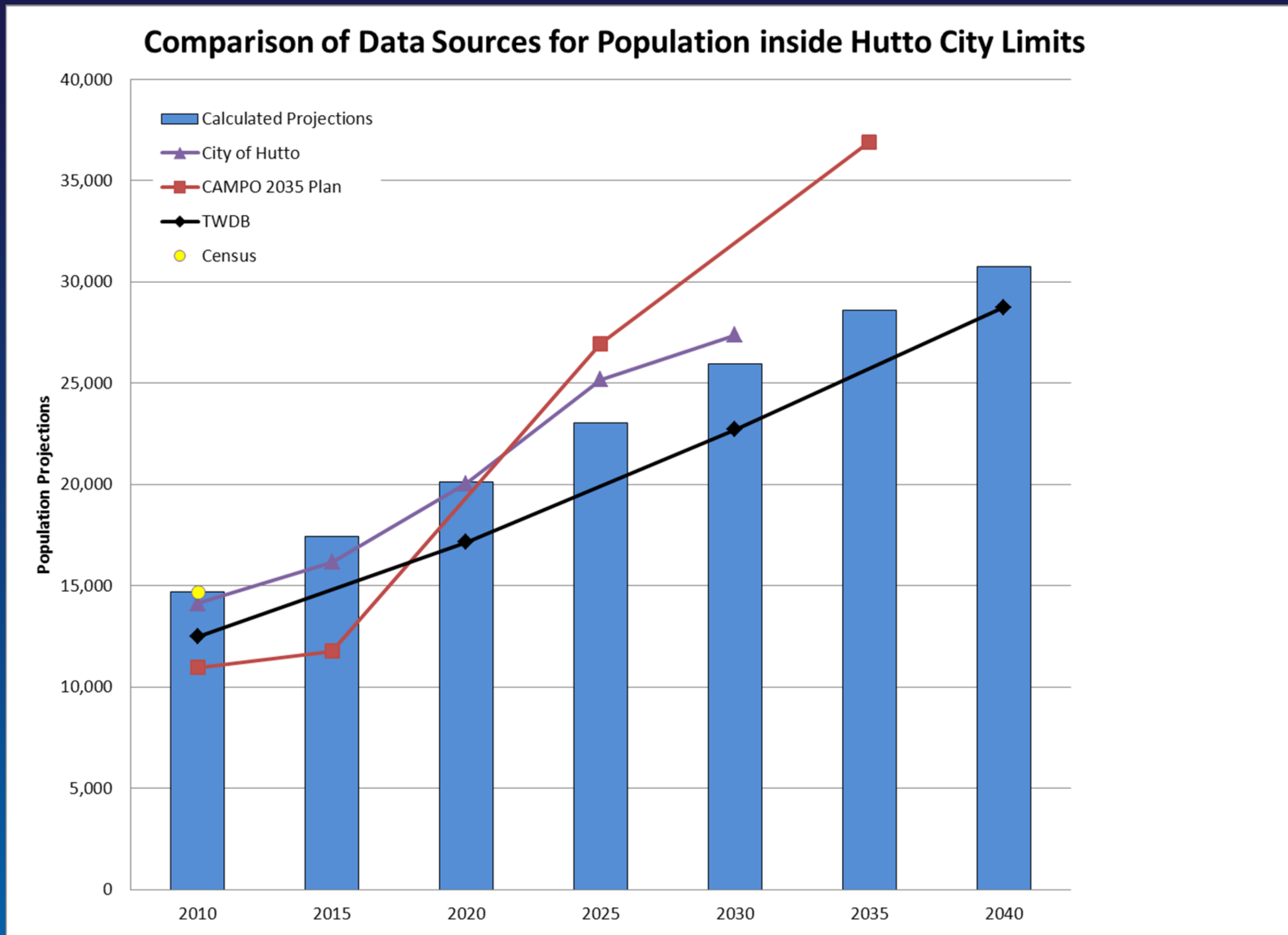
- **Divided Study Area into Three Regions**
  - Region 1 – City Limits
  - Region 2 – "2008 CIP Plan"
  - Region 3 – TWDB Study Area



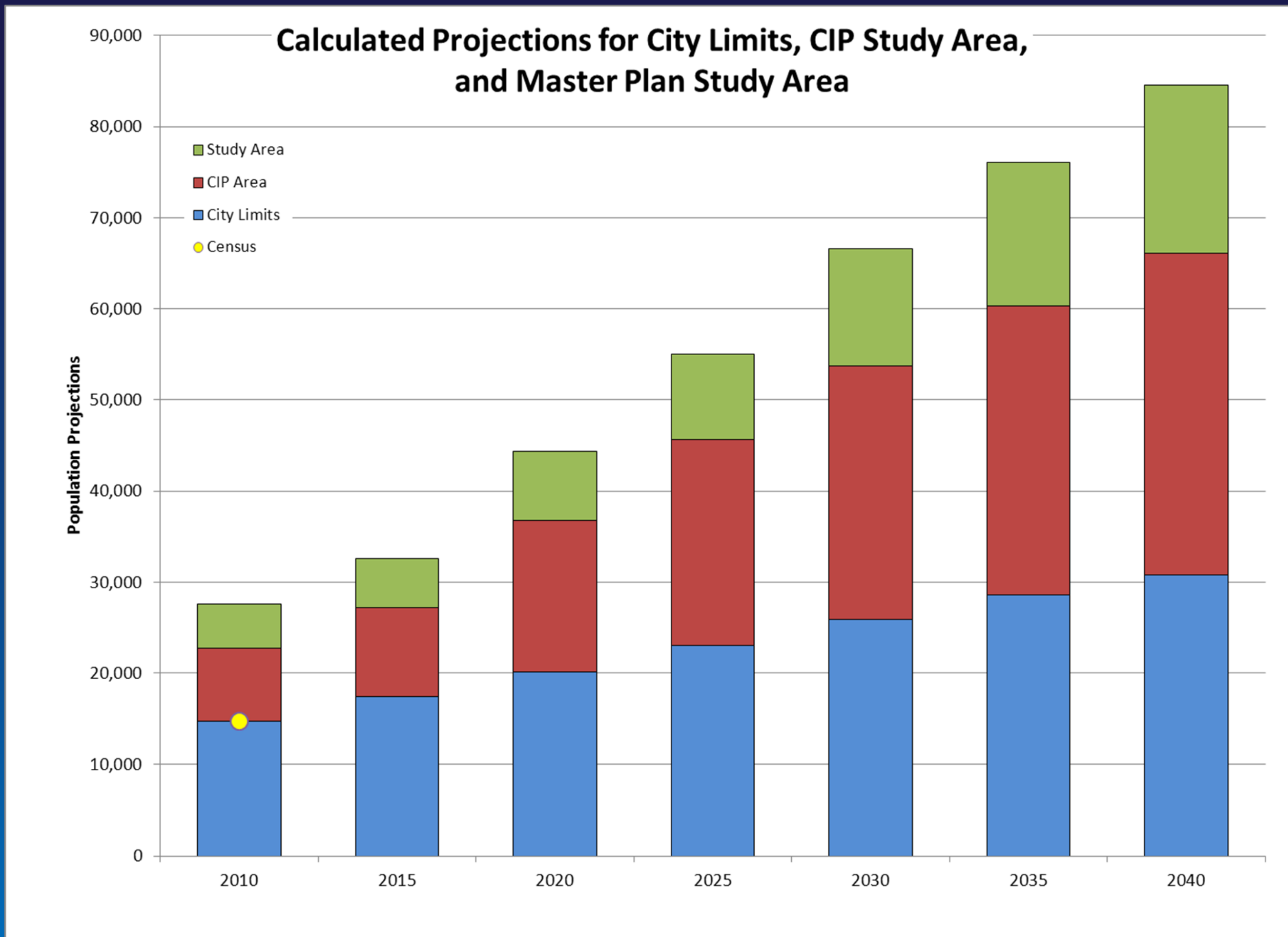
Population Projections

- **Data Sources included:**
  - TWDB
  - CAMPO 2035 Plan
  - City of Hutto Planning Department LUE Projections
  - Economic Development Corporation
- **Population Projections in 5-Year Increments through 2040**

Population Projections



Population Projections



Design Criteria

- Goal – Determine per capita wastewater flows to establish some certainty for system analysis and design
- Based on Lift Station Pump Testing and City SCADA Data

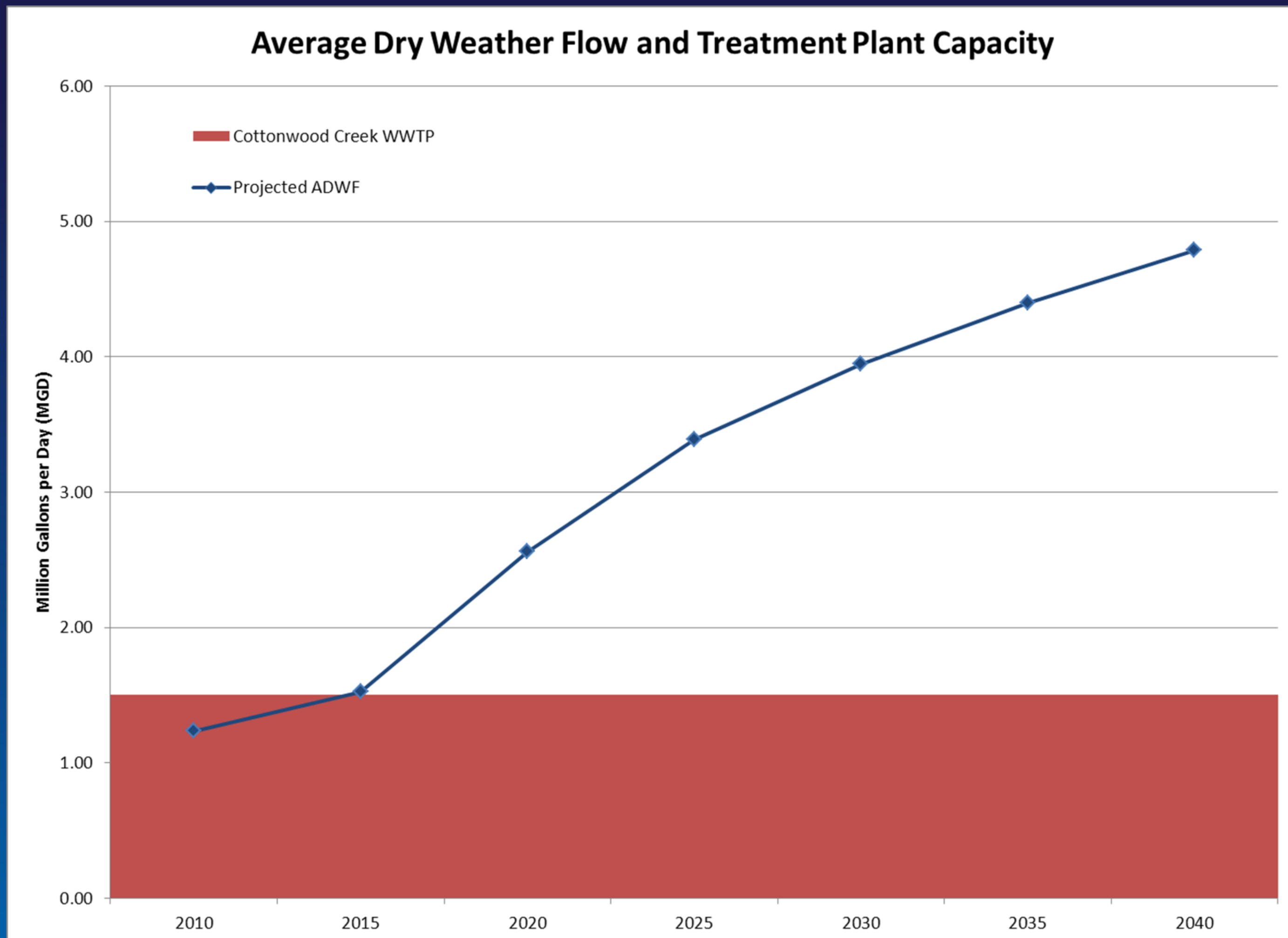
Criteria	Value
People per Household	3.1
Unit Flow (gpd per capita)	75
Flow from Residential Single Family Unit (gpd)	232.5
Inflow & Infiltration (gallons per acre per day)	500

Flow Projections

- Combined Population Projections and Design Criteria

Total Flow in Study Area (MGD)	2010	2015	2020	2025	2030	2035	2040
Average Dry Weather Flows	1.24	1.53	2.56	3.39	3.95	4.40	4.79

Treatment Options



Treatment Options

1. Pump 0.5 MGD to City of Pflugerville

2. Expand Existing Cottonwood Creek Wastewater Treatment Plant (CCWWTP)

3. Construct Lower Brushy Creek Wastewater Treatment Plant (LBCWWTP)

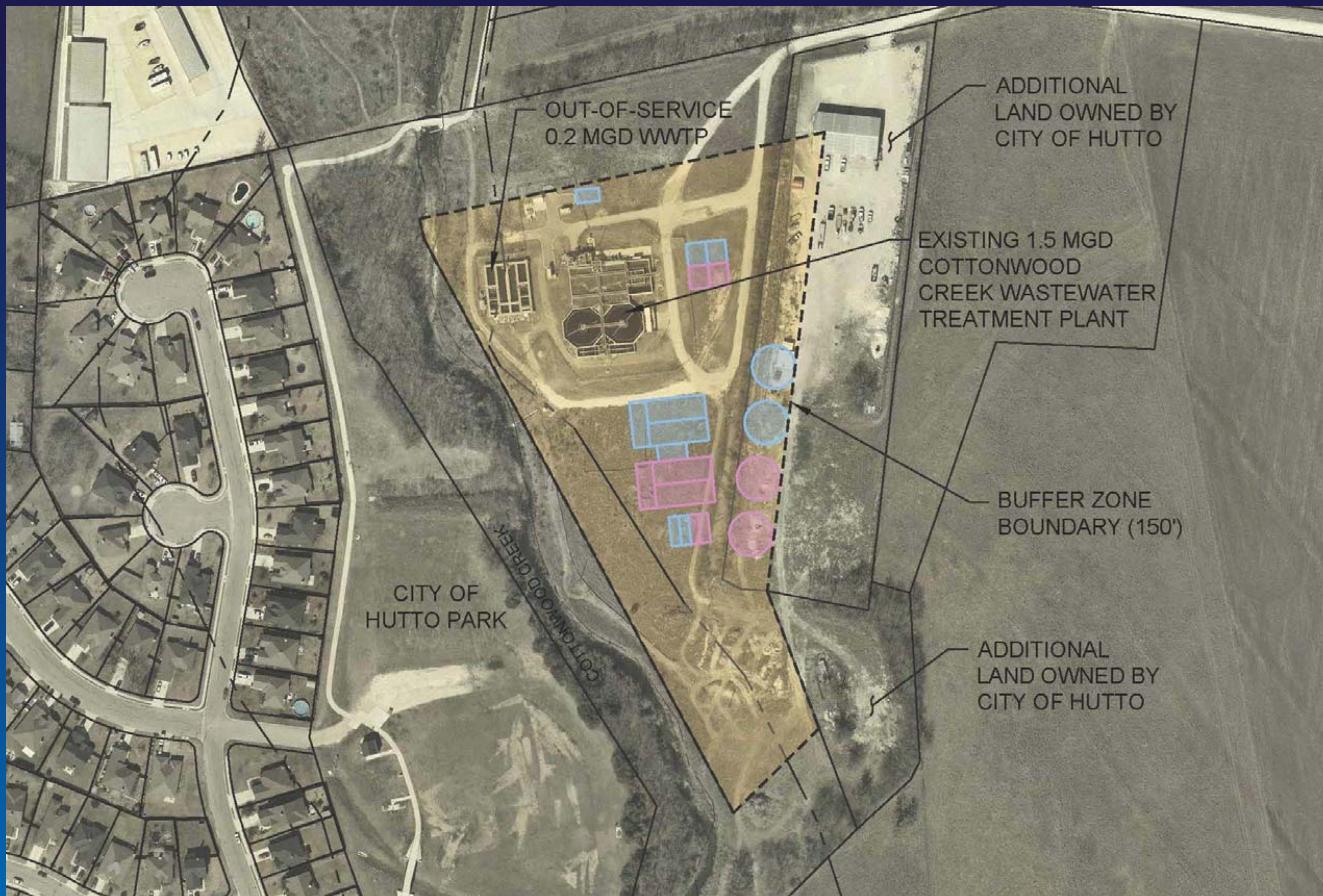
Treatment Options

1. **Pump 0.5 MGD of Flow from Enclave Lift Station to Pflugerville for Treatment**
   - Temporary 1,400 gpm lift station and 10-inch force main to Pflugerville
   - Expand Cottonwood Creek WWTP to 1.9 MGD
   - Pflugerville will treat flow until 2020
   - Additional Hutto Treatment capacity required in 2020

Treatment Options

2. **Expand Cottonwood Creek Wastewater Treatment Plant**
   - Phase 1 Expansion of 2 MGD start construction in 2013
   - Phase 2 Expansion of 2 MGD start construction in 2024
   - All sludge will be hauled to Brushy Creek Regional facility

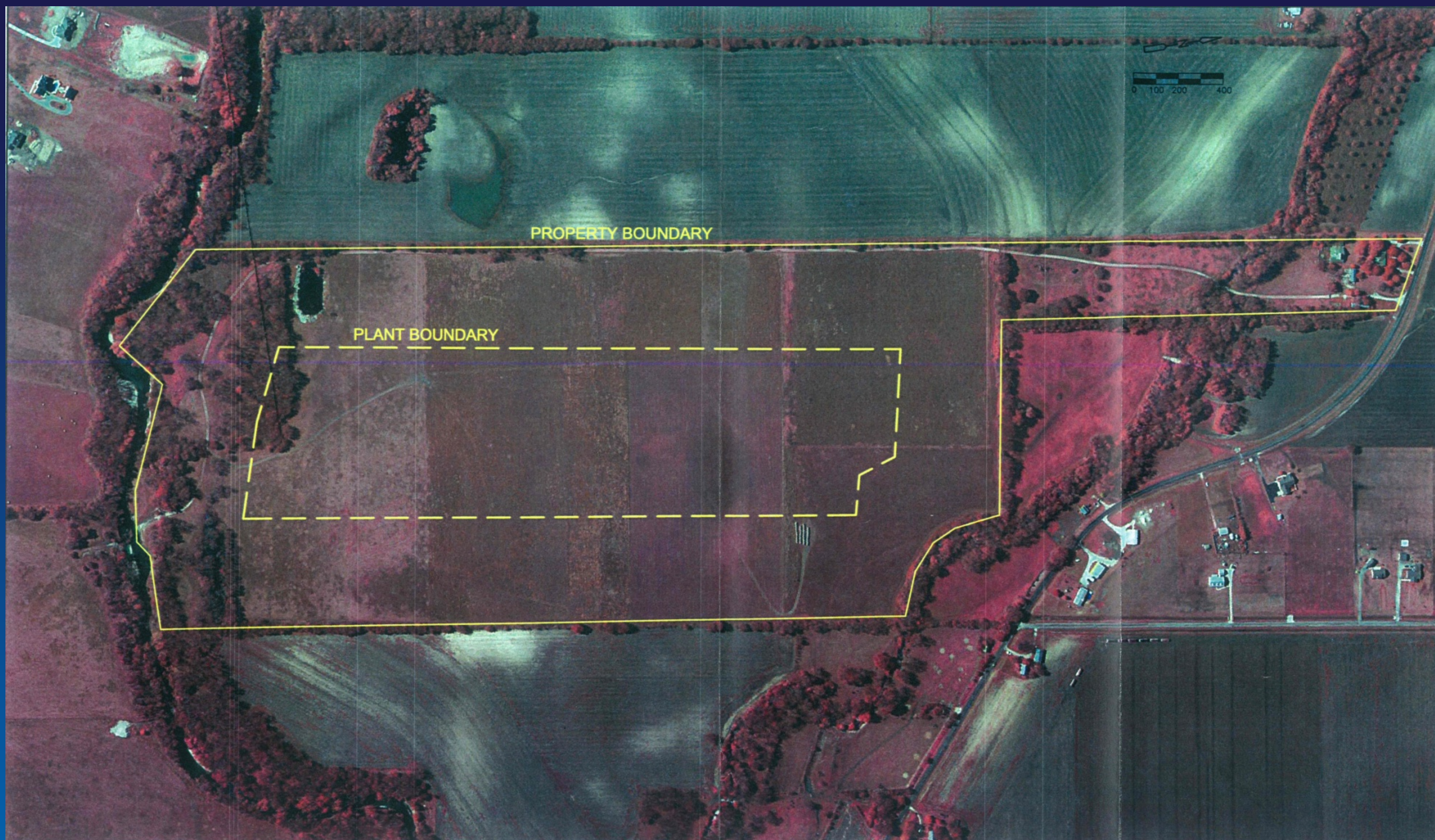
Potential Site Plan for CCWWTP



Treatment Options

3. **Construct Lower Brushy Creek Wastewater Treatment Plant**
   - 2 MGD Phase 1 start construction in 2013
   - Phase 2 Expansion of 2 MGD start construction in 2024
   - Cottonwood Creek WWTP remains 1.5 MGD

Site for LBCWWTP



From: Lower Brushy Creek Regional Wastewater Treatment Plant Preliminary Engineering Report, May 2008, by CDM

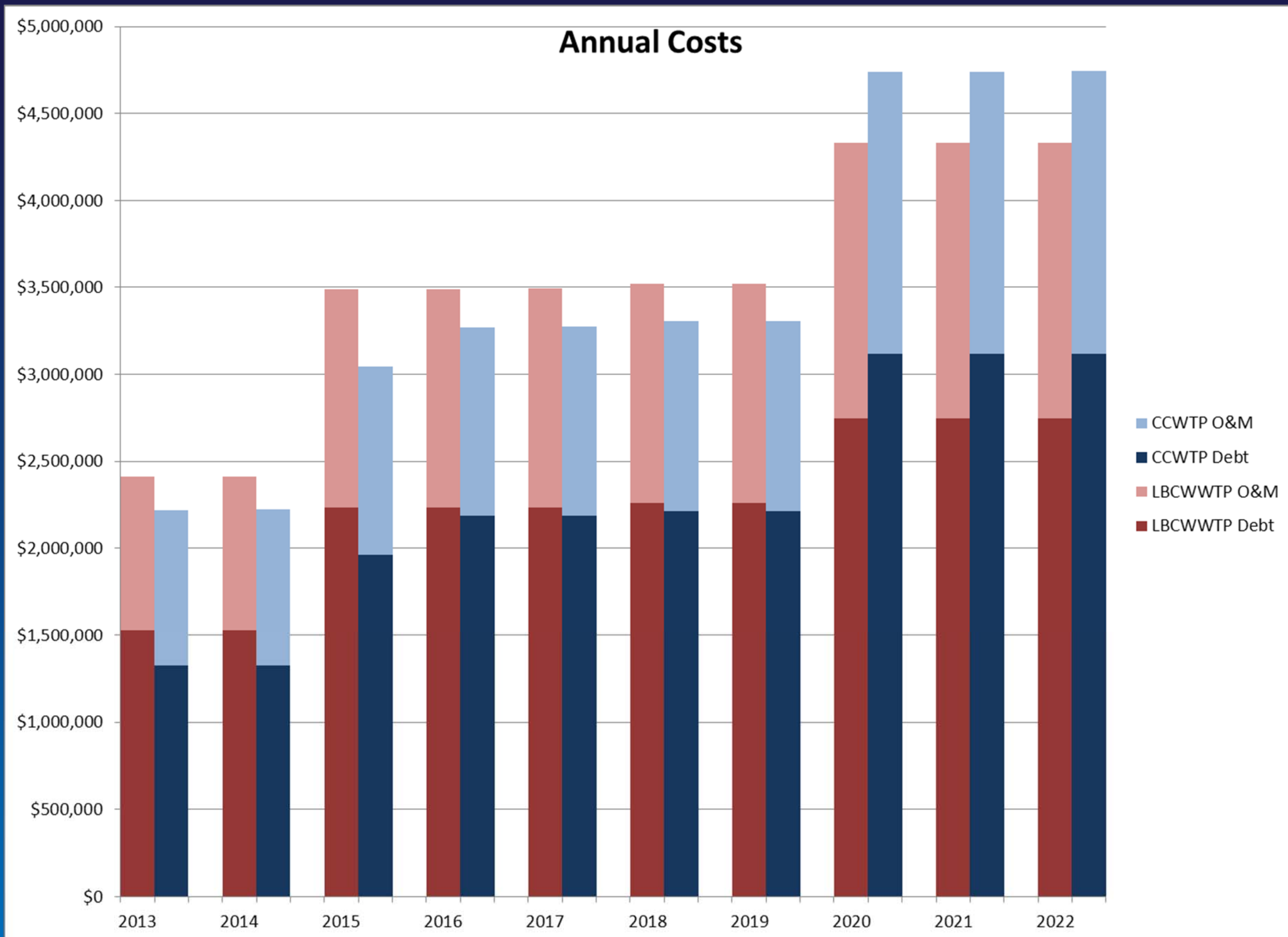
Net Present Value

- **Treatment & Conveyance Capital Costs**
- **Operation & Maintenance Costs**
  - Treatment & Sludge Handling
  - Lift Station Energy Usage
  - Lift Station Routine Monthly Maintenance, Cleaning, and Repairs
  - Cleaning of Gravity Mains

Net Present Value

Total Costs for Each Scenario from 2012-2040 (in $M)									
Scenario	Capital Costs			Operational & Maintenance Costs				Total Capital & O&M Costs	Net Present Value
	Treatment	Pumps	Pipes	Treatment	LS Energy	LS Maint.	Gravity Lines		
Pflugerville	$23.67	$1.28	$21.92	$65.04	$0.27	$1.44	$1.73	$115.37	$66.48
Expand CCWWTP	$20.06	$1.84	$15.54	$52.89	$0.88	$2.48	$1.51	$95.20	$56.31
Construct LBCWWTP	$22.70	$0.58	$20.07	$51.58	$0.19	$1.36	$1.86	$98.33	$58.84

Annual Costs – Cottonwood Creek and Lower Brushy Creek WWTPs



Pump to Pflugerville

- **Advantages**
  - Delays capital costs
- **Disadvantages**
  - Temporary lift station and force main
  - Additional treatment facilities needed in 2020
  - City of Pflugerville capacity issues

Expand Cottonwood Creek WWTP

- **Advantages**
  - Delays construction of Lower Brushy Creek WWTP to beyond 2040
- **Disadvantages**
  - 70% of 2040 flow must be pumped
  - Site cannot be expanded beyond 5.5 MGD without additional land
  - Insufficient site for sludge dewatering facilities for 5.5 MGD
  - Minimum required 150-foot buffer zone provided

Construct Lower Brushy Creek WWTP

- **Advantages**
  - Only 2% of 2040 flow pumped
  - Sufficient site for future expansion
  - Sludge may be dewatered on site
  - 500-foot buffer zone
- **Disadvantages**
  - Temporary 18-inch Brushy Creek force main and upgrades to Enclave Lift Station
    - could be used as reclaimed effluent distribution line in future

Recommendation

- **Construct Lower Brushy Creek WWTP**
  - NPV and Annual Costs similar to Cottonwood Creek WWTP expansion option
  - 98% of 2040 flow conveyed by gravity
    - Significantly lower chance of overflows
  - Sludge handling options
  - Site adequate for future plant expansions

CIP Program (2012 – 2040)

- Build Lower Brushy Creek WWTP $43,345,434

Year	Project	Size/Capacity	Total Cost
2013	Construct Lower Brushy Creek WWTP	2.0 MGD	$10,850,000
2024	Expand Lower Brushy Creek WWTP	2.0 MGD	$11,845,264
	Totals - Treatment Plant Costs		$22,695,264
2013	Enclave LS Pump Upgrade to Brushy Creek Force Main	3700 gpm firm	$575,700
	Totals - Lift Station Projects		$575,700
2012	Interceptor from Highway 79 to Cottonwood Creek WWTP	24	$460,800
2012	Brushy Creek Interceptor Seg. 4	42	$955,584
2012	Carmel Creek Interceptor Seg. 1 & Seg. 2	42/24	$1,365,120
2018	Lakeside Gravity Main	12	$207,360
2020	Carmel Creek Interceptor Seg. 3	21	$1,663,200
2015	Avery Lake GM Seg. 1, Seg. 2 & Seg. 3	24/21/18	$3,257,280
2020	N. Cottonwood Creek GM Seg. 1, Seg. 2 & Seg. 3	21/21/18	$2,160,000
2024	Brushy Creek Interceptor Seg. 1, Seg. 2 & Seg. 3	42/42/42	$5,679,878
2025	Glenwood Gravity Main	21	$425,578
2025	Country Estates Gravity Main	10	$140,928
2025	S. Cottonwood Creek GM Seg. 1, Seg. 2	18/12	$1,123,200
2030	Central Hutto GM Seg. 4	10	$15,360
	Totals - Gravity Main Projects		$17,454,288
2013	Brushy Creek Force Main	18	$2,620,182
	Totals - Force Main Projects		$2,620,182

Discussion / Questions

HUTTO REGIONAL WW STUDY – INITIAL DRAFT REPORT REVIEW COMMENTS FROM SUSAN ROTH CONSULTING, LLC

Thursday, August 2, 2012

As a follow up to the project meeting last week, I have not received any other review comments at this time from the project participants. I only have a few comments/suggestions below:

1. TWDB Contract Number is 1148311255 (reference on report cover)
2. Include templates of Water Conservation and Drought Contingency Plans for Appendix H & I (attached below)
3. Need to include the complete list of official project participants in the Executive Summary and Introduction; I've attached sample language to incorporate into both sections
4. Verify the write up in the Introduction on Pg. 13 is current (verbatim from the Scope of Work I wrote for the grant application in Dec 2010)
5. Suggest including a summary about the Water Infrastructure Fund under Section 13.0, Funding Options (based on Darrell's & David's comments)
6. Verify the information presented in Section 13.2 is current (verbatim from my report last year for the *TWDB Burnet-Llano County Regional Water Facility Study.*)

Please let me know if you have any questions.

Thanks,
Susan

Susan K. Roth, P.E., PMP
Susan Roth Consulting, LLC
512.796.6692 (cell)
512.231.9851 (fax)
susan@srothconsulting.com

In March 2011,

Hutto Independent School District,
Hutto Area Chamber of Commerce,

Executive Summary

Water

The City of Hutto, in conjunction with the City of Pflugerville, ~~the~~ Jonah Water Special Utility District (Jonah SUD), ~~the~~ Hutto Economic Development Corporation, and Williamson County, ~~has~~ received planning grant assistance from the Texas Water Development Board (TWDB) to complete a regional wastewater study for the Hutto area. The study area for the master plan includes approximately 44,000 acres of land, around and including, Hutto, as shown in **Figure ES-1**. The purpose of the study is to assist Hutto and other participants with planning for growth throughout the study period from the present to 2040.

The City of Hutto's wastewater facilities include the Cottonwood Creek Wastewater Treatment Plant (WWTP), five lift stations and associated force mains and gravity mains from 4-inches to 33-inches in diameter. **Figure ES-2** depicts Hutto's wastewater facilities. The City of Pflugerville has wastewater collection system facilities just south of a portion of Hutto's existing system. This collection system delivers flow to Pflugerville's Central WWTP. Jonah SUD's existing customers within the study area are served by a combination of wholesale service from Hutto and onsite septic systems. Several areas within Hutto's certificate of convenience and necessity (CCN) but that are not presently served by Hutto's existing collection system also have onsite septic systems. It was assumed that these areas would be connected to the system in the future, as the system expands, due to the proximity of the septic system areas to existing collection system lines.

Population projections for the study area were determined in five year increments through 2040 based on information from TWDB, Capital Area Metropolitan Planning Organization 2035 Plan, City of Hutto Planning Department, City of Hutto 2008 Wastewater System Capital Improvement Program, the Economic Development Corporation, and the 2010 Census population for the city limits of Hutto. In 2010, the population of the study area was projected to be 27,615, while in 2040 it is projected to have grown to 84,542.

Pump testing was performed at each lift station to determine the actual pumping rates. Existing per capita wastewater flows were derived from this information in conjunction with SCADA data and land use data. The flows calculated from the pump testing results and SCADA data analysis were compared to criteria published by the City of Hutto to aid in the design and construction of wastewater facilities. Based on this comparison, a flow of 75 gallon per day per capita and an inflow and infiltration value of 500 gallons per acre per day were selected as the design criteria to determine the wastewater flow generated by the projected population.

Flow projections for the study area were generated based on the population projections and the design criteria. Areas closer to existing wastewater facilities were assumed to connect to the system sooner than areas on the outskirts of the study area. A large portion of the study area (particularly the northern, eastern, and southern sections) is projected to be developed relatively sparsely in 2040. Therefore it was assumed that those areas will not be connected to centralized wastewater collection in 2040. In 2010, the flow connected to the wastewater system was projected to be 1.24 million gallons per day (mgd), in 2040 the average daily flow that will be treated is projected to be 4.79 mgd.

In March 2011,

Hutto Independent School District,
Hutto Area Chamber of Commerce,

1 Introduction water

The City of Hutto, in conjunction with the City of Pflugerville, ~~the~~ Jonah Water Special Utility District (Jonah SUD), ~~the~~ Hutto Economic Development Corporation, and Williamson County, ~~has~~ received planning grant assistance from the Texas Water Development Board (TWDB) to complete a regional wastewater study for the Hutto area. Hutto selected K Friese & Associates, Inc. ~~to develop~~ the study. The study area for the master plan includes approximately 44,000 acres of land, around and including, Hutto and is shown on the following page as **Figure 1-1 Study Area**.

as the engineering consultant for

See next page for text to insert here

The study area is located in one of the fastest growing regions of Williamson County. The population in the study area, primarily the City of Hutto, has dramatically increased and is approximately 15 times greater than it was 10 years ago. Since 2005, the population has more than doubled and is projected to continue increasing within the study area at historically high levels in the next 10 years due to future developments projected within and near the City of Hutto service area. In addition, State Highway 130 (SH 130), an alternate route to Interstate Highway 35, has accelerated growth in the area.

Jonah SUD, located north of Hutto, currently has a vast water service area of approximately 385 square miles and 90% of its customers are served by septic systems. Due to a recent certificate of convenience and necessity (CCN) exchange agreement between the City of Hutto and Jonah SUD, a few developments in this sector will have retail wastewater service provided by Jonah and wholesale service from the City of Hutto. This area is primed for growth and will need a plan in place for providing centralized wastewater service.

The existing Hutto wastewater system is comprised of gravity collection mains, lift stations and associated force mains, as well as a wastewater treatment plant (WWTP) located on Cottonwood Creek just south of Highway 79 permitted for 1.7 million gallons per day (mgd) annual average flow. In addition, Hutto has contracted with Pflugerville to accept and treat flow from a part of its service area, the Lakeside lift station, until 2020. The City of Pflugerville has been growing for some time and will continue to grow due to its close proximity to the Austin area. As a result of the anticipated growth, a regional wastewater plan is needed to identify the best possible means to provide wastewater service.

Planning for regional wastewater collection and treatment facilities is important at this time in order to provide the necessary treatment for the growing area, address infrastructure capacity issues and failing septic systems, and to develop a plan for efficient sharing of resources with the City of Pflugerville and Jonah SUD. The proposed planning study would provide a regional solution to serve the wastewater treatment needs in the area, while considering regional objectives such as beneficial reuse of effluent and protection of water quality.

1.1 Purpose

This study will develop a Capital Improvements Program (CIP) list that will assist Hutto and the other grant participants with planning for future growth. Additionally, the study will examine

(*) Susan Roth Consulting, LLC, served as the Grant Administrator for the study; she developed the scope of work for the project, secured the project partnerships, prepared the grant application, and coordinated the project meetings.

WATER CONSERVATION PLAN GUIDANCE CHECKLIST

This guidance checklist applies to all Texas Water Development Board (TWDB) Financial Assistance Programs specified in its rules under Texas Administrative Code 31, Chapters 355, 363, 371, 375, 382, and 384. **The TWDB will accept Water Conservation Plans determined by the Texas Commission on Environmental Quality (TCEQ) to satisfy the requirements of 30 TAC Chapter 288.**

Basically, *the water conservation plan* is a strategy or combination of strategies for reducing the consumption of water, reducing the loss or waste of water, improving or maintaining the efficiency in the use of water, or increasing recycling and reuse of water. It contains best management practices measures to try to meet the targets and goals identified in the plan. *The Drought Contingency (Emergency Demand Management) Plan* is a strategy or combination of strategies for responding to temporary and potentially recurring water supply shortages and other supply emergencies.

THE WATER CONSERVATION PLAN REQUIREMENTS:

A. _____ An evaluation of the Applicant's water and wastewater system and customer use characteristics to identify water conservation opportunities and potential targets and goals. Completion of the ***Water Conservation Utility Profile,*** **WRD-264,** as part of the evaluation is required. Attach it to the Plan.

B.______ Inclusion of 5-year and 10 –year targets & goals. Target and goals should be specific and quantified for <u>municipal use</u> **expressed in gallons per capita per day (<u>gpcd</u>) as well as <u>goals for water loss programs</u>).** Consider state and regional targets and goals, local climate, demographics, and the utility profile. Consider the anticipated savings that can be achieved by utilizing the appropriate Best Management Practices and other conservation techniques.

C. _____ A schedule for implementing the plan to achieve the applicant's targets and goals.

D. _____ A method for tracking the implementation and effectiveness of the plan. The method should track annual water use and provide information sufficient to evaluate the implementation conservation measures. The plan should measure progress annually, and, at a minimum, evaluate the progress towards meeting the targets and goals every five years.

E. _____ A master meter to measure and account for the amount of water diverted from the source of supply.

F. _____ A program of universal metering of both customer and public uses of water, for meter testing, repair and for periodic replacement.

G. _____ Measures to determine and control unaccounted-for uses of water. (for example, periodic visual inspections along distribution lines; annual or monthly audit of the water system to determine illegal connections, abandoned services, etc.)

H. _____ A continuous program of leak detection, repair, and water loss accounting for the water transmission, delivery, and distribution system in order to control water loss.

I. ______ A program of continuing education and information regarding water conservation. This should include providing water conservation information directly to each residential, industrial and commercial customer annually, and providing water conservation literature to new customers when they apply for service.

J. _____ A water rate structure which is not "promotional," i.e., a rate structure which is cost-based and which does not encourage the excessive use of water. <u>Include copy of the rate structure</u>.

K. ____ A means of implementation and enforcement which shall be evidenced by adoption of the plan:

1. a copy of the ordinance, resolution, or tariff indicating official adoption of the water conservation plan by the applicant and
2. a description of the authority by which the applicant will implement and enforce the conservation plan.

L. ______ If the Applicant will utilize the project financed by the TWDB to furnish water or wastewater services to another supplying entity that in turn will furnish the water or wastewater services to the ultimate consumer, the requirements for the water conservation plan also pertain to these supplier entities.
To comply with this requirement the applicant shall:

1. submit its own water conservation plan;
2. submit the other entity's (or entities) water conservation plan;
3. require, by contract, that the other entity (or entities), adopt a water conservation plan that conforms to the board's requirement and submit it to the board. If the requirement is to be included in an existing water or wastewater service contract, it may be included, at the earliest of the renewal or substantial amendment of that contract, or by other appropriate measures.

M. _____ Documentation that the regional water planning group for the service area of the applicant has been notified of the applicant's water conservation plan.

Note: The water conservation plan may also include other conservation method or technique that the applicant deems appropriate.

N. The Drought Contingency Plan shall include:

1. _____ **Trigger conditions**. Describe information to be monitored. For example, reservoir levels, daily water demand, water production or distribution system limitations. Supply source contamination and system outage or equipment failure should be considered too. Determine specific quantified targets of water use reduction.

2. _____ **Demand management measures**. Refers to actions that will be implemented by the utility during <u>each stage</u> of the plan when predetermined triggering criteria are met. **Drought plans must include quantified and specific targets for water use reductions to be achieved during periods of water shortage and drought.** Supply management measures typically can be taken by the utility to better manage available water supply, as well as the use of backup or alternative water sources. The demand management measures <u>should curtail nonessential water uses</u>, for example, outdoor water use.

3. _____ **Initiation and termination procedures**. The drought plan must include specific procedures to be followed for the initiation or termination of each drought response stage, including procedures for notification of the public.

4. ______ **Variances and enforcement.** The plans should specify procedures for considering (approving and denying) variances to the plan. Equally as important is the inclusion of provisions for enforcement of any mandatory water use restrictions, including specification of penalties for violations of such restrictions.

5. ______ **Measures to inform and educate the public**. Involving the public in the preparation of the drought contingency plan provides an important means for educating the public about the need for the plan and its content.

0. ______ **Adopt the plan.** No plan is complete without formal adoption by the governing body of the entity. For a municipal water system, adoption would be by the city council as an ordinance, or a resolution by an entity's board of directors.

P. ____ Reporting Requirement: Identify who will be responsible for preparing the annual report on the utility profile form WRD-264. Loan/Grant Recipients must maintain an approved water conservation program in effect until all financial obligations to the state have been discharged and shall **report annually** to the executive administrator of the TWDB on the progress in implementing each of the minimum requirements in its water conservation plan and the status of any of its customers' water conservation plan required by contract, within one year after closing on the financial assistance and annually thereafter. The content and format for the annual reporting is included in the form: ***Water Conservation Program Annual Report*, WRD-265**.

Assistance: For information and assistance contact:

Adolph L. Stickelbault (adolph.stickelbault@twdb.state.tx.us)
Texas Water Development Board
PO Box 13231
Austin, Texas 78711-3231
512-936-2391

Municipal Plan Assistance and Forms:
http://www.twdb.state.tx.us/assistance/conservation/Municipal/Plans/CPlans.asp

Best Management Practices Information:
http://www.twdb.state.tx.us/assistance/conservation/TaskForceDocs/WCITFBMPGuide.pdf

Quantification Techniques:
http://www.twdb.state.tx.us/assistance/conservation/gdsstudy.asp

Drought Contingency Plan
for a Retail Public Water Supplier

Texas Commission on Environmental Quality

Instructions: The following form is a model of a drought contingency plan for a retail public water supplier. Not all items may apply to your system's situation. This form is supplied for your convenience, but you are not required to use this form to submit your plan to the TCEQ. Submit completed plans to: Water Supply Division MC 160, TCEQ, P.O. Box 13087, Austin TX 78711-3087.

____

(Name of Utility)

____

(Address, City, Zip Code)

____

(CCN#)

____

(PWS #s)

____

(Date)

Section I: Declaration of Policy, Purpose, and Intent

In order to conserve the available water supply and protect the integrity of water supply facilities, with particular regard for domestic water use, sanitation, and fire protection, and to protect and preserve public health, welfare, and safety and minimize the adverse impacts of water supply shortage or other water supply emergency conditions, the ___________________ (name of your water supplier) hereby adopts the following regulations and restrictions on the delivery and consumption of water through an ordinance/or resolution (see Appendix C for an example).

Water uses regulated or prohibited under this Drought Contingency Plan (the Plan) are considered to be non-essential and continuation of such uses during times of water shortage or other emergency water supply condition are deemed to constitute a waste of water which subjects the offender(s) to penalties as defined in Section XI of this Plan.

Section II: Public Involvement

Opportunity for the public to provide input into the preparation of the Plan was provided by the _____________ (name of your water supplier) by means of _______________ (describe methods used to inform the public about the preparation of the plan and provide opportunities for input; for example, scheduling and providing public notice of a public meeting to accept input on the Plan).

Section III: Public Education

The _____________ (name of your water supplier) will periodically provide the public with information about the Plan, including information about the conditions under which each stage of the Plan is to be initiated or terminated and the drought response measures to be implemented in each stage. This information will be provided by means of _________________ (describe methods to be used to provide information to the public about the Plan; for example, public events, press releases or utility bill inserts).

Section IV: Coordination with Regional Water Planning Groups

The service area of the ____________ (name of your water supplier) is located within the ___________ (name of regional water planning area or areas) and __________ (name of your water supplier) has provided a copy of this Plan to the ___________ (name of your regional water planning group or groups).

Section V: Authorization

The __________________ (designated official; for example, the mayor, city manager, utility director, general manager, etc.), or his/her designee is hereby authorized and directed to implement the applicable provisions of this Plan upon determination that such implementation is necessary to protect public health, safety, and welfare. The ______________, (designated official) or his/her designee, shall have the authority to initiate or terminate drought or other water supply emergency response measures as described in this Plan.

Section VI: Application

The provisions of this Plan shall apply to all persons, customers, and property utilizing water provided by the _________________ (name of your water supplier). The terms "person" and "customer" as used in the Plan include individuals, corporations, partnerships, associations, and all other legal entities.

Section VII: Definitions

For the purposes of this Plan**,** the following definitions shall apply:

Aesthetic water use: water use for ornamental or decorative purposes such as fountains, reflecting pools, and water gardens.

Commercial and institutional water use: water use which is integral to the operations of commercial and non-profit establishments and governmental entities such as retail establishments, hotels and motels, restaurants, and office buildings.

Conservation: those practices, techniques, and technologies that reduce the consumption of water, reduce the loss or waste of water, improve the efficiency in the use of water or increase the recycling and reuse of water so that a supply is conserved and made available for future or alternative uses.

Customer: any person, company, or organization using water supplied by _________________ (name of your water supplier).

Domestic water use: water use for personal needs or for household or sanitary purposes such as drinking, bathing, heating, cooking, sanitation, or for cleaning a residence, business, industry, or institution.

Even number address: street addresses, box numbers, or rural postal route numbers ending in 0, 2, 4, 6, or 8 and locations without addresses.

Industrial water use: the use of water in processes designed to convert materials of lower value into forms having greater usability and value.

Landscape irrigation use: water used for the irrigation and maintenance of landscaped areas, whether publicly or privately owned, including residential and commercial lawns, gardens, golf courses, parks, and rights-of-way and medians.

Non-essential water use: water uses that are not essential nor required for the protection of public, health, safety, and welfare, including:

(a) irrigation of landscape areas, including parks, athletic fields, and golf courses, except otherwise provided under this Plan;
(b) use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle;
(c) use of water to wash down any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
(d) use of water to wash down buildings or structures for purposes other than immediate fire protection;
(e) flushing gutters or permitting water to run or accumulate in any gutter or street;
(f) use of water to fill, refill, or add to any indoor or outdoor swimming pools or jacuzzi-type pools;

(g) use of water in a fountain or pond for aesthetic or scenic purposes except where necessary to support aquatic life;
(h) failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s); and
(i) use of water from hydrants for construction purposes or any other purposes other than fire fighting.

Odd numbered address: street addresses, box numbers, or rural postal route numbers ending in 1, 3, 5, 7, or 9.

Section VIII: Criteria for Initiation and Termination of Drought Response Stages

The ________________ (designated official) or his/her designee shall monitor water supply and/or demand conditions on a __________ (example: daily, weekly, monthly) basis and shall determine when conditions warrant initiation or termination of each stage of the Plan, that is, when the specified "triggers" are reached.

The triggering criteria described below are based on ______________________________________
____
(*provide a brief description of the rationale for the triggering criteria; for example, triggering criteria / trigger levels based on a statistical analysis of the vulnerability of the water source under drought of record conditions, or based on known system capacity limits*).

Stage 1 Triggers – MILD Water Shortage Conditions

Requirements for initiation
Customers shall be requested to voluntarily conserve water and adhere to the prescribed restrictions on certain water uses, defined in Section VII–Definitions, when

____
(*describe triggering criteria / trigger levels; see examples below*).

> *Following are examples of the types of triggering criteria that might be used in one or more successive stages of a drought contingency plan. One or a combination of such criteria must be defined for each drought response stage, but usually not all will apply. Select those appropriate to your system:*
>
> *Example 1:* *Annually, beginning on May 1 through September 30.*
>
> *Example 2:* *When the water supply available to the _______ (name of your water supplier) is equal to or less than _______ (acre-feet, percentage of storage, etc.).*
>
> *Example 3:* *When, pursuant to requirements specified in the _____________(name of **your** water supplier) wholesale water purchase contract with ____________ (name*

of your wholesale water supplier), notification is received requesting initiation of Stage 1 of the Drought Contingency Plan.

Example 4: *When flows in the _______ (name of stream or river) are equal to or less than ____cubic feet per second.*

Example 5: *When the static water level in the ____________ (name of your water supplier) well(s) is equal to or less than _____feet above/below mean sea level.*

Example 6: *When the specific capacity of the __________________ (name of your water supplier) well(s) is equal to or less than _____ percent of the well's original specific capacity.*

Example 7: *When total daily water demand equals or exceeds ______ million gallons for ___consecutive days of ____ million gallons on a single day (example: based on the "safe" operating capacity of water supply facilities).*

Example 8: *Continually falling treated water reservoir levels which do not refill above __ percent overnight (example: based on an evaluation of minimum treated water storage required to avoid system outage).*

The public water supplier may devise other triggering criteria which are tailored to its system.

Requirements for termination
Stage 1 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of ___ (e.g. 3) consecutive days.

Stage 2 Triggers -- MODERATE Water Shortage Conditions

Requirements for initiation
Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses provided in Section IX of this Plan when ____________ (*describe triggering criteria; see examples in Stage 1*).

Requirements for termination
Stage 2 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of ___ (example: 3) consecutive days. Upon termination of Stage 2, Stage 1 becomes operative.

Stage 3 Triggers – SEVERE Water Shortage Conditions

Requirements for initiation
Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 3 of this Plan when ____________ (*describe triggering criteria; see examples in*

Stage 1).

Requirements for termination
Stage 3 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of ___ (example: 3) consecutive days. Upon termination of Stage 3, Stage 2 becomes operative.

Stage 4 Triggers -- CRITICAL Water Shortage Conditions

Requirements for initiation
Customers shall be required to comply with the requirements and restrictions on certain non-essential water uses for Stage 4 of this Plan when ____________ (*describe triggering criteria; see examples in Stage 1*).

Requirements for termination
Stage 4 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of ___ (example: 3) consecutive days. Upon termination of Stage 4, Stage 3 becomes operative.

Stage 5 Triggers -- EMERGENCY Water Shortage Conditions

Requirements for initiation
Customers shall be required to comply with the requirements and restrictions for Stage 5 of this Plan when ____________ (designated official), or his/her designee, determines that a water supply emergency exists based on:

1. Major water line breaks, or pump or system failures occur, which cause unprecedented loss of capability to provide water service; **or**

2. Natural or man-made contamination of the water supply source(s).

Requirements for termination
Stage 5 of the Plan may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of ___ (example: 3) consecutive days.

Stage 6 Triggers -- WATER ALLOCATION

Requirements for initiation
Customers shall be required to comply with the water allocation plan prescribed in Section IX of this Plan and comply with the requirements and restrictions for Stage 5 of this Plan when ____________ (describe triggering criteria, see examples in Stage 1).

Requirements for termination - Water allocation may be rescinded when all of the conditions listed as triggering events have ceased to exist for a period of ___ (example: 3) consecutive days.

> *Note: The inclusion of WATER ALLOCATION as part of a drought contingency plan may not be required in all cases. For example, for a given water supplier, an analysis of water supply availability under drought of record conditions may indicate that there is essentially no risk of water supply shortage. Hence, a drought contingency plan for such a water supplier might only address facility capacity limitations and emergency conditions (example: supply source contamination and system capacity limitations).*

Section IX: Drought Response Stages

The _______________ (designated official), or his/her designee, shall monitor water supply and/or demand conditions on a daily basis and, in accordance with the triggering criteria set forth in Section VIII of this Plan, shall determine that a mild, moderate, severe, critical, emergency or water shortage condition exists and shall implement the following notification procedures:

Notification

Notification of the Public:
The _________ (designated official) or his/ her designee shall notify the public by means of:

Examples:
publication in a newspaper of general circulation,
direct mail to each customer,
public service announcements,
signs posted in public places
take-home fliers at schools.

Additional Notification:
The _________ (designated official) or his/ her designee shall notify directly, or cause to be notified directly, the following individuals and entities:

Examples:
Mayor / Chairman and members of the City Council / Utility Board
Fire Chief(s)
City and/or County Emergency Management Coordinator(s)
County Judge & Commissioner(s)
State Disaster District / Department of Public Safety
TCEQ *(required when* mandatory *restrictions are imposed)*
Major water users

Critical water users, i.e. hospitals
Parks / street superintendents & public facilities managers

Note: The plan should specify direct notice only as appropriate to respective drought stages.

Stage 1 Response -- MILD Water Shortage Conditions

<u>Target</u>: Achieve a voluntary ___ percent reduction in _________(example: total water use, daily water demand, etc.).

<u>Best Management Practices for Supply Management</u>:

D*escribe additional measures, if any, to be implemented directly by (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, activation and use of an alternative supply source(s); use of reclaimed water for non-potable purposes.*

<u>Voluntary Water Use Restrictions for Reducing Demand</u> :

(a) Water customers are requested to voluntarily limit the irrigation of landscaped areas to Sundays and Thursdays for customers with a street address ending in an even number (0, 2, 4, 6 or 8), and Saturdays and Wednesdays for water customers with a street address ending in an odd number (1, 3, 5, 7 or 9), and to irrigate landscapes only between the hours of midnight and 10:00 a.m. and 8:00 p.m to midnight on designated watering days.

(b) All operations of the _____________ (name of your water supplier) shall adhere to water use restrictions prescribed for Stage 2 of the Plan.

(c) Water customers are requested to practice water conservation and to minimize or discontinue water use for non-essential purposes.

Stage 2 Response -- MODERATE Water Shortage Conditions

<u>Target</u>: Achieve a ___ percent reduction in _________ (example: total water use, daily water demand, etc.).

<u>Best Management Practices for Supply Management</u>:

Describe additional measures, if any, to be implemented directly by ____________ (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for non-potable purposes.

Water Use Restrictions for Demand Reduction:
Under threat of penalty for violation, the following water use restrictions shall apply to all persons:

(a) Irrigation of landscaped areas with hose-end sprinklers or automatic irrigation systems shall be limited to Sundays and Thursdays for customers with a street address ending in an even number (0, 2, 4, 6 or 8), and Saturdays and Wednesdays for water customers with a street address ending in an odd number (1, 3, 5, 7 or 9), and irrigation of landscaped areas is further limited to the hours of 12:00 midnight until 10:00 a.m. and between 8:00 p.m. and 12:00 midnight on designated watering days. However, irrigation of landscaped areas is permitted at anytime if it is by means of a hand-held hose, a faucet filled bucket or watering can of five (5) gallons or less, or drip irrigation system.

(b) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight. Such washing, when allowed, shall be done with a hand-held bucket or a hand-held hose equipped with a positive shutoff nozzle for quick rises. Vehicle washing may be done at any time on the immediate premises of a commercial car wash or commercial service station. Further, such washing may be exempted from these regulations if the health, safety, and welfare of the public is contingent upon frequent vehicle cleansing, such as garbage trucks and vehicles used to transport food and perishables.

(c) Use of water to fill, refill, or add to any indoor or outdoor swimming pools, wading pools, or jacuzzi-type pools is prohibited except on designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8 p.m. and 12:00 midnight.

(d) Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a recirculation system.

(e) Use of water from hydrants shall be limited to fire fighting, related activities, or other activities necessary to maintain public health, safety, and welfare, except that use of water from designated fire hydrants for construction purposes may be allowed under special permit from the ___________________ (name of your water supplier).

(f) Use of water for the irrigation of golf course greens, tees, and fairways is prohibited except on designated watering days between the hours 12:00 midnight and 10:00 a.m. and between 8 p.m. and 12:00 midnight. However, if the golf course utilizes a water source other than that provided by the _______________ (name of your water supplier), the facility shall not be subject to these regulations.

(g) All restaurants are prohibited from serving water to patrons except upon request of the patron.

(h) The following uses of water are defined as non-essential and are prohibited:

1. wash down of any sidewalks, walkways, driveways, parking lots, tennis courts, or other hard-surfaced areas;
2. use of water to wash down buildings or structures for purposes other than immediate fire protection;
3. use of water for dust control;
4. flushing gutters or permitting water to run or accumulate in any gutter or street; and
5. failure to repair a controllable leak(s) within a reasonable period after having been given notice directing the repair of such leak(s).

Stage 3 Response -- SEVERE Water Shortage Conditions

Target: Achieve a ___ percent reduction in _________ (example: total water use, daily water demand, etc.).

Best Management Practices for Supply Management:

Describe additional measures, if any, to be implemented directly by ____________ (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for non-potable purposes.

Water Use Restrictions for Demand Reduction:
All requirements of Stage 2 shall remain in effect during Stage 3 except:

(a) Irrigation of landscaped areas shall be limited to designated watering days between the hours of 12:00 midnight and 10:00 a.m. and between 8 p.m. and 12:00 midnight and shall be by means of hand-held hoses, hand-held buckets, drip irrigation, or permanently installed automatic sprinkler system only. The use of hose-end sprinklers is prohibited at all times.

(b) The watering of golf course tees is prohibited unless the golf course utilizes a water source other than that provided by the ____________________ (name of your water supplier).

(c) The use of water for construction purposes from designated fire hydrants under special permit is to be discontinued.

Stage 4 Response -- CRITICAL Water Shortage Conditions

Target: Achieve a ___ percent reduction in _________ (example: total water use, daily water demand, etc.).

Best Management Practices for Supply Management:

Describe additional measures, if any, to be implemented directly by ____________ (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for non-potable purposes.

Water Use Restrictions for Reducing Demand:. All requirements of Stage 2 and 3 shall remain in effect during Stage 4 except:

(a) Irrigation of landscaped areas shall be limited to designated watering days between the hours of 6:00 a.m. and 10:00 a.m. and between 8:00 p.m. and 12:00 midnight and shall be by means of hand-held hoses, hand-held buckets, or drip irrigation only. The use of hose-end sprinklers or permanently installed automatic sprinkler systems are prohibited at all times.

(b) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle not occurring on the premises of a commercial car wash and commercial service stations and not in the immediate interest of public health, safety, and welfare is prohibited. Further, such vehicle washing at commercial car washes and commercial service stations shall occur only between the hours of 6:00 a.m. and 10:00 a.m. and between 6:00 p.m. and 10 p.m.

(c) The filling, refilling, or adding of water to swimming pools, wading pools, and jacuzzi-type pools is prohibited.

(d) Operation of any ornamental fountain or pond for aesthetic or scenic purposes is prohibited except where necessary to support aquatic life or where such fountains or ponds are equipped with a recirculation system.

(e) No application for new, additional, expanded, or increased-in-size water service connections, meters, service lines, pipeline extensions, mains, or water service facilities of any kind shall be approved, and time limits for approval of such applications are hereby suspended for such time as this drought response stage or a higher-numbered stage shall be in effect.

Stage 5 Response -- EMERGENCY Water Shortage Conditions

Target: Achieve a ___ percent reduction in _________ (example: total water use, daily water demand, etc.).

Best Management Practices for Supply Management:

Describe additional measures, if any, to be implemented directly by ___________ (name of your water supplier) to manage limited water supplies and/or reduce water demand. Examples include: reduced or discontinued flushing of water mains, reduced or discontinued irrigation of public landscaped areas; use of an alternative supply source(s); use of reclaimed water for non-potable purposes.

Water Use Restrictions for Reducing Demand. All requirements of Stage 2, 3, and 4 shall remain in effect during Stage 5 except:

(a) Irrigation of landscaped areas is absolutely prohibited.

(b) Use of water to wash any motor vehicle, motorbike, boat, trailer, airplane or other vehicle is absolutely prohibited.

Stage 6 Response -- WATER ALLOCATION

In the event that water shortage conditions threaten public health, safety, and welfare, the ___________ (designated official) is hereby authorized to allocate water according to the following water allocation plan:

Single-Family Residential Customers

The allocation to residential water customers residing in a single-family dwelling shall be as follows:

Persons per Household	**Gallons per Month**
1 or 2	6,000
3 or 4	7,000
5 or 6	8,000
7 or 8	9,000
9 or 10	10,000
11 or more	12,000

"Household" means the residential premises served by the customer's meter. "Persons per household" includes only those persons currently physically residing at the premises and expected to reside there for the entire billing period. It shall be assumed that a particular customer's household is comprised of two (2) persons unless the customer notifies the ____________ (name of your water supplier) of a greater number of persons per household on a form prescribed by the ____________ designated official). The _________ (designated official) shall give his/her best effort to see that such forms are mailed, otherwise provided, or made available to every residential customer. If, however, a customer does not receive such a

form, it shall be the customer's responsibility to go to the ____________ (name of your water supplier) offices to complete and sign the form claiming more than two (2) persons per household. New customers may claim more persons per household at the time of applying for water service on the form prescribed by the __________ (designated official). When the number of persons per household increases so as to place the customer in a different allocation category, the customer may notify the _________ (name of water supplier) on such form and the change will be implemented in the next practicable billing period. If the number of persons in a household is reduced, the customer shall notify the _________(name of your water supplier) in writing within two (2) days. In prescribing the method for claiming more than two (2) persons per household, the _________ (designated official) shall adopt methods to insure the accuracy of the claim. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of persons in a household or fails to timely notify the ____________ (name of your water supplier) of a reduction in the number of person in a household shall be fined not less than $________.

Residential water customers shall pay the following surcharges:

$____ for the first 1,000 gallons over allocation.
$____ for the second 1,000 gallons over allocation.
$____ for the third 1,000 gallons over allocation.
$____ for each additional 1,000 gallons over allocation.

Surcharges shall be cumulative.

Master-Metered Multi-Family Residential Customers

The allocation to a customer billed from a master meter which jointly measures water to multiple permanent residential dwelling units (example: apartments, mobile homes) shall be allocated 6,000 gallons per month for each dwelling unit. It shall be assumed that such a customer's meter serves two dwelling units unless the customer notifies the ____________ (name of your water supplier) of a greater number on a form prescribed by the __________ (designated official). The _________ (designated official) shall give his/her best effort to see that such forms are mailed, otherwise provided, or made available to every such customer. If, however, a customer does not receive such a form, it shall be the customer's responsibility to go to the ____________ (name of your water supplier) offices to complete and sign the form claiming more than two (2) dwellings. A dwelling unit may be claimed under this provision whether it is occupied or not. New customers may claim more dwelling units at the time of applying for water service on the form prescribed by the __________ (designated official). If the number of dwelling units served by a master meter is reduced, the customer shall notify the _________(name of your water supplier) in writing within two (2) days. In prescribing the method for claiming more than two (2) dwelling units, the _________ (designated official) shall adopt methods to insure the accuracy of the claim. Any person who knowingly, recklessly, or with criminal negligence falsely reports the number of dwelling units served by a master meter or fails to timely notify the ____________ (name of your water supplier) of a reduction in the number of person in a household shall be fined not less than $________. Customers billed from a master meter under this provision shall pay the following monthly surcharges:

$____ for 1,000 gallons over allocation up through 1,000 gallons for each dwelling unit.
$____, thereafter, for each additional 1,000 gallons over allocation up through a second 1,000 gallons for each dwelling unit.
$____, thereafter, for each additional 1,000 gallons over allocation up through a third 1,000 gallons for each dwelling unit.
$ ____, thereafter for each additional 1,000 gallons over allocation.

Surcharges shall be cumulative.

Commercial Customers

A monthly water allocation shall be established by the __________ (designated official), or his/her designee, for each nonresidential commercial customer other than an industrial customer who uses water for processing purposes. The non-residential customer's allocation shall be approximately __ (e.g. 75%) percent of the customer's usage for corresponding month's billing period for the previous 12 months. If the customer's billing history is shorter than 12 months, the monthly average for the period for which there is a record shall be used for any monthly period for which no history exists. Provided, however, a customer, __ percent of whose monthly usage is less than ____ gallons, shall be allocated ____ gallons. The _________ (designated official) shall give his/her best effort to see that notice of each non-residential customer's allocation is mailed to such customer. If, however, a customer does not receive such notice, it shall be the customer's responsibility to contact the ____________ (name of your water supplier) to determine the allocation. Upon request of the customer or at the initiative of the ___________ (designated official), the allocation may be reduced or increased if, (1) the designated period does not accurately reflect the customer's normal water usage, (2) one nonresidential customer agrees to transfer part of its allocation to another nonresidential customer, or (3) other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may appeal an allocation established hereunder to the __________ (designated official or alternatively, a special water allocation review committee). Nonresidential commercial customers shall pay the following surcharges:

Customers whose allocation is _____ gallons through ______ gallons per month:

$____ per thousand gallons for the first 1,000 gallons over allocation.
$____ per thousand gallons for the second 1,000 gallons over allocation.
$____ per thousand gallons for the third 1,000 gallons over allocation.
$____ per thousand gallons for each additional 1,000 gallons over allocation.

Customers whose allocation is ______ gallons per month or more:

___ times the block rate for each 1,000 gallons in excess of the allocation up through 5 percent above allocation.
___ times the block rate for each 1,000 gallons from 5 percent through 10 percent above allocation.
___ times the block rate for each 1,000 gallons from 10 percent through 15 percent above allocation.
___ times the block rate for each 1,000 gallons more than 15 percent above allocation.

The surcharges shall be cumulative. As used herein, "block rate" means the charge to the customer per 1,000 gallons at the regular water rate schedule at the level of the customer's allocation.

Industrial Customers

A monthly water allocation shall be established by the __________ (designated official), or his/her designee, for each industrial customer, which uses water for processing purposes. The industrial customer's allocation shall be approximately __ (example: 90%) percent of the customer's water usage baseline. Ninety (90) days after the initial imposition of the allocation for industrial customers, the industrial customer's allocation shall be further reduced to __ (example: 85%) percent of the customer's water usage baseline. The industrial customer's water use baseline will be computed on the average water use for the ______ month period ending prior to the date of implementation of Stage 2 of the Plan. If the industrial water customer's billing history is shorter than ___ months, the monthly average for the period for which there is a record shall be used for any monthly period for which no billing history exists. The _________ (designated official) shall give his/her best effort to see that notice of each industrial customer's allocation is mailed to such customer. If, however, a customer does not receive such notice, it shall be the customer's responsibility to contact the ____________ (name of your water supplier) to determine the allocation, and the allocation shall be fully effective notwithstanding the lack of receipt of written notice. Upon request of the customer or at the initiative of the __________ (designated official), the allocation may be reduced or increased, (1) if the designated period does not accurately reflect the customer's normal water use because the customer had shutdown a major processing unit for repair or overhaul during the period, (2) the customer has added or is in the process of adding significant additional processing capacity, (3) the customer has shutdown or significantly reduced the production of a major processing unit, (4) the customer has previously implemented significant permanent water conservation measures such that the ability to further reduce water use is limited, (5) the customer agrees to transfer part of its allocation to another industrial customer, or (6) if other objective evidence demonstrates that the designated allocation is inaccurate under present conditions. A customer may appeal an allocation established hereunder to the __________ (designated official or alternatively, a special water allocation review committee). Industrial customers shall pay the following surcharges:

Customers whose allocation is _____ gallons through _______ gallons per month:

$____ per thousand gallons for the first 1,000 gallons over allocation.
$____ per thousand gallons for the second 1,000 gallons over allocation.
$____ per thousand gallons for the third 1,000 gallons over allocation.
$____ per thousand gallons for each additional 1,000 gallons over allocation.

Customers whose allocation is ______ gallons per month or more:

___ times the block rate for each 1,000 gallons in excess of the allocation up through 5 percent above allocation.
___ times the block rate for each 1,000 gallons from 5 percent through 10 percent above allocation.
___ times the block rate for each 1,000 gallons from 10 percent through 15 percent above allocation.
___ times the block rate for each 1,000 gallons more than 15 percent above allocation.

The surcharges shall be cumulative. As used herein, "block rate" means the charge to the customer per 1,000 gallons at the regular water rate schedule at the level of the customer's allocation.

Section X: Enforcement

(a) No person shall knowingly or intentionally allow the use of water from the _________________ (name of your water supplier) for residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this Plan, or in an amount in excess of that permitted by the drought response stage in effect at the time pursuant to action taken by ____________(designated official), or his/her designee, in accordance with provisions of this Plan.

(b) Any person who violates this Plan is guilty of a misdemeanor and, upon conviction shall be punished by a fine of not less than _______ dollars ($__) and not more than ______ dollars ($__). Each day that one or more of the provisions in this Plan is violated shall constitute a separate offense. If a person is convicted of three or more distinct violations of this Plan, the ____________ (designated official) shall, upon due notice to the customer, be authorized to discontinue water service to the premises where such violations occur. Services discontinued under such circumstances shall be restored only upon payment of a re-connection charge, hereby established at $______, and any other costs incurred by the __________________ (name of your water supplier) in discontinuing service. In addition, suitable assurance must be given to the _______________ (designated official) that the same action shall not be repeated while the Plan is in effect. Compliance with this plan may also be sought through injunctive relief in the district court.

(c) Any person, including a person classified as a water customer of the _____________ (name of your water supplier), in apparent control of the property where a violation occurs or originates shall be presumed to be the violator, and proof that the violation occurred on the person's property shall constitute a rebuttable presumption that the person in apparent control of the property committed the violation, but any such person shall have the right to show that he/she did not commit the violation. Parents shall be presumed to be responsible for violations of their minor children and proof that a violation, committed by a child, occurred on property within the parents' control shall constitute a rebuttable presumption that the parent committed the violation, but any such parent may be excused if he/she proves that he/she had previously directed the child not to use the water as it was used in violation of this Plan and that the parent could not have reasonably known of the violation.

(d) Any employee of the ______________ (name of your water supplier), police officer, or other _____ employee designated by the ___________ (designated official), may issue a citation to a person he/she reasonably believes to be in violation of this Ordinance. The citation shall be prepared in duplicate and shall contain the name and address of the alleged violator, if known, the offense charged, and shall direct him/her to appear in the ____________ (example: municipal court) on the date shown on the citation for which the date shall not be less than 3 days nor more than 5 days from the date the citation was issued. The alleged violator shall be served a copy of the citation. Service of the citation shall be complete upon delivery of the citation to the alleged violator, to an agent or employee of a violator, or to a person over 14 years of age who is a member of the violator's immediate family or is a resident of the violator's residence. The alleged violator shall appear in _________ (example: municipal court) to enter a plea of guilty or not guilty for the violation of this Plan. If the alleged violator fails to appear in __________ (example: municipal court), a warrant for his/her arrest may be issued. A summons to appear may be issued in lieu of an arrest warrant. These cases shall be expedited and given preferential setting in __________ (example: municipal court) before all other cases.

Section XI: Variances

The ________________ (designated official), or his/her designee, may, in writing, grant temporary variance for existing water uses otherwise prohibited under this Plan if it is determined that failure to grant such variance would cause an emergency condition adversely affecting the health, sanitation, or fire protection for the public or the person requesting such variance and if one or more of the following conditions are met:

(a) Compliance with this Plan cannot be technically accomplished during the duration of the water supply shortage or other condition for which the Plan is in effect.
(b) Alternative methods can be implemented which will achieve the same level of reduction in water use.

Persons requesting an exemption from the provisions of this Ordinance shall file a petition for variance with the _________________ (name of your water supplier) within 5 days after the Plan or a particular drought response stage has been invoked. All petitions for variances shall be reviewed by the __________ (designated official), or his/her designee, and shall include the following:

(a) Name and address of the petitioner(s).
(b) Purpose of water use.
(c) Specific provision(s) of the Plan from which the petitioner is requesting relief.
(d) Detailed statement as to how the specific provision of the Plan adversely affects the petitioner or what damage or harm will occur to the petitioner or others if petitioner complies with this Ordinance.
(e) Description of the relief requested.
(f) Period of time for which the variance is sought.
(g) Alternative water use restrictions or other measures the petitioner is taking or proposes to take to meet the intent of this Plan and the compliance date.
(h) Other pertinent information.

Texas Water
Development Board

P.O. Box 13231, 1700 N. Congress Ave.
Austin, TX 78711-3231, www.twdb.texas.gov
Phone (512) 463-7847, Fax (512) 475-2053

October 10, 2012

Matthew Bushak, P.E.
City Engineer
City of Hutto
401 West Front Street
Hutto, Texas 78634

RE: Regional Wastewater Facility Planning Grant Contract between the Texas Water Development Board (TWDB) and the City of Hutto (City); TWDB Contract No. 1148311255, Draft Report Comments for the Hutto Regional Wastewater Study

Dear Mr. Bushak:

Staff members of the TWDB have completed a review of the draft report prepared under the above-referenced contract. ATTACHMENT 1 provides the comments resulting from this review. As stated in the TWDB contract, the City will consider incorporating draft report comments from the Executive Administrator as well as other reviewers into the final report. In addition, the City will include a copy of the Executive Administrator's draft report comments in the Final Report.

The TWDB looks forward to receiving one (1) electronic copy of the entire Final Report in Portable Document Format (PDF) and six (6) bound double-sided copies. **Please further note, that in compliance with Texas Administrative Code Chapters 206 and 213 (related to Accessibility and Usability of State Web Sites), the digital copy of the final report must comply with the requirements and standards specified in statute. For more information, visit http://www.sos.state.tx.us/tac/index.shtml.** If you have any questions on accessibility, please contact David Carter with the Contract Administration Division at (512) 936-6079 or David.Carter@twdb.texas.gov

The City shall also submit one (1) electronic copy of any computer programs or models, and, if applicable, an operations manual developed under the terms of this Contract.

If you have any questions concerning the contract, please contact David Meesey, the TWDB's designated Contract Manager for this project at (512) 936-0852.

Sincerely,

Dan Hardin
for Carolyn L. Brittin
Deputy Executive Administrator
Water Resources Planning and Information

Enclosures

c: David Meesey, TWDB

Attachment 1
Hutto Regional Wastewater Planning Study
TWDB Contract No. 114311255
Draft Report Review Comments

1. Section 12, page 79: The scope of work states that "The consultant will determine the amount of effluent that each identified site and/or entity could potentially utilize over the planning period of the study. Section 12 includes a list of the entities, but not the amount of effluent. Please include this information as required by the scope of work.

2. Task IX in the scope of work states that conservation and drought management plans will be developed for Hutto, Pflugerville, and Jonah Water SUD. Although there are generic examples of each in the draft report, please include the actual plans for these entities in the final report.

3. Please include documentation of the required public meetings and any comments received in an appendix of the report.

4. Section 5, Figures 5-2 to 5-6: The axis values are difficult to read on each of the figures. Please consider providing larger formatted charts for those Figures.

5. Page 80, Section 13.1.1, 2nd Paragraph: there is no due date for submitting an application or timing for being considered by the Board. Once a complete application is received it is typically presented to the TWDB's Board members for consideration within 60 to 90 days.

6. Page 80, Section 13.1.2 Clean Water State Revolving Fund; please note that the CWSRF program does function on an annual cycle and the project information must be submitted so that the project can be ranked with all projects seeking funding from this program.

7. Page 80-81, Section 13.1.3 State Participation Program; please note that the State Participation is limited to the excess capacity in the project up to the percentages identified in the report.

8. Please correct all appendix letters and figure numbers that may have changed and are no longer accurate. For example, p. 26, section 5.3 Data Analysis, 2nd paragraph, change Appendix A to Appendix B.

9. Please define all acronyms the first time they are used in the report and correct all typographical errors.