



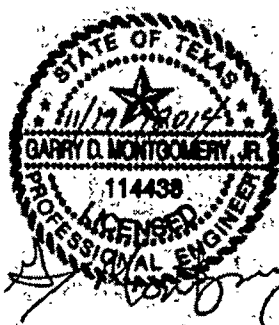
2014 WATER MASTER PLAN

Green Valley Special Utility District

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1.0 INTRODUCTION AND BACKGROUND

Since the inception of the Green Valley Water Service Company and its conversion to Green Valley Special Utility District (GVSUD), GVSUD has earned a respected reputation for excellent water quality and friendly customer service. GVSUD started as a rural water supply corporation back in 1963. Over the past 50-years, GVSUD service area has experienced a steady increase of residential growth. Through the years, GVSUD has gained significant experience managing and servicing this extensive growth. In an effort to continue serving its customers with superior water service, GVSUD has authorized River City Engineering (RCE) to update this Water Master Plan and to prioritize proposed future Capital Improvement Projects (CIPs). This strategic plan will ensure adequate water supplies and infrastructure to meet the continued rapid growth of the area.

This master plans purpose is to analyze GVSUD's existing conditions, estimate future water demands, determine the necessary capital improvement projects to meet those demands, estimate proposed project costs and schedules, and recognize long-term water opportunities and provide the utility the operation options to move different water sources around the CCN service area and efficiently utilize all water sources where necessary. This document shall serve as a long-term adaptable guide to be used as needed to manage future service area development and projected water needs.

2.0 WATER CONNECTIONS

A water connection is defined as the average demand used by a single-family residence. GVSUD historically has not provided for many commercial meters and has not experienced a great deal of commercial growth since the 2008 study was completed. Therefore, for the convenience of this report, all of GVSUD's existing and proposed water connections are considered equal to a single-family residential meter. This assumption will need to be re-evaluated if GVSUD sees an increase in commercial development in the future. We are starting to see signs of industrial and commercial growth along the IH 10 Corridor, however the developments that have made application for service most recently align well with residential type demands.

3.0 HISTORICAL WATER CONNECTIONS AND WATER USE

Many different factors affect growth and development within an area. These include but are not limited to, the local and regional economy, development restrictions, environmental constraints, the current housing inventory, and existing and proposed roadways. GVSUD does not control any of these factors, and therefore, projecting the impact of these factors into the future is difficult.

Table 3.0 shows the total quantity of connections for each of the years from 2003 to 2013.

TABLE 3.0

Green Valley Special Utility District Historical Connection Growth				
1	2	3	4	5
Year	Historical Water Connections	Historical Annual Water Pumped (acre-feet)	Historical Annual Growth (%)	Historical Annual Water Pumped (acre- feet/Connection)
2003	6,500	2310		0.36
2004	6,800	2334	4.62%	0.34
2005	7,500	2776	10.29%	0.37
2006	8,000	3091	6.67%	0.39
2007	8,302	2577	3.78%	0.31
2008	8,453	3235	1.82%	0.38
2009	8,650	3042	2.33%	0.35
2010	8,829	2742	2.07%	0.31
2011	8,995	3289	1.88%	0.37
2012	9,274	2737	3.10%	0.30
2013	9,621	2739	3.74%	0.28

Historical Average Annual Water Connections Percent Growth (%) =
Historical Average Annual Water Usage (acre-feet/EDU) =

4.45%**0.34**

Note:

1. All historical data was provided by GVSUD.

The district has experienced an annual growth rate average of 4.45% and average water usage of 0.34 acre-feet/connection. Pockets of higher growth may exist within certain areas of the District's CCN, requiring a detailed study of each pressure plane. As shown in the table above, the variance in annual growth in 2005 and 2008 could be contributed to the completion of several residential developments in 2005. From the historical data provided, it is safe to assume an average connection growth rate of 5% to predict connection quantity in the future. GVSUD historically uses 0.34 acre-feet/connection/year which will suffice to predict future water usage due to the conservative connection growth value.

As shown in Table 3.1 on the following page, Guadalupe County and the City of New Braunfels are experiencing similar growth to GVSUD.

TABLE 3.1

Surrounding Area Historical Growth				
1	2	3	4	5
Year	Guadalupe County Population	Guadalupe County Growth (%)	New Braunfels Population	New Braunfels Growth (%)
2003	96,445		42,489	
2004	99,038	2.69%	44,596	4.96%
2005	102,313	3.31%	46,577	4.44%
2006	107,670	5.24%	49,514	6.31%
2007	112,581	4.56%	52,056	5.13%
2008	117,341	4.23%	53,975	3.69%
2009	121,432	3.49%	55,867	3.51%
2010	132,409	9.04%	58,226	4.22%
2011	135,757	2.53%	59,590	2.34%
2012	139,841	3.01%	60,761	1.97%
Average		4.23%		4.06%

- Connection Growth Rate = 4.45%
- Water Demand per Connection = 0.34 Acre-feet/Connection/Year

CHART 3.2

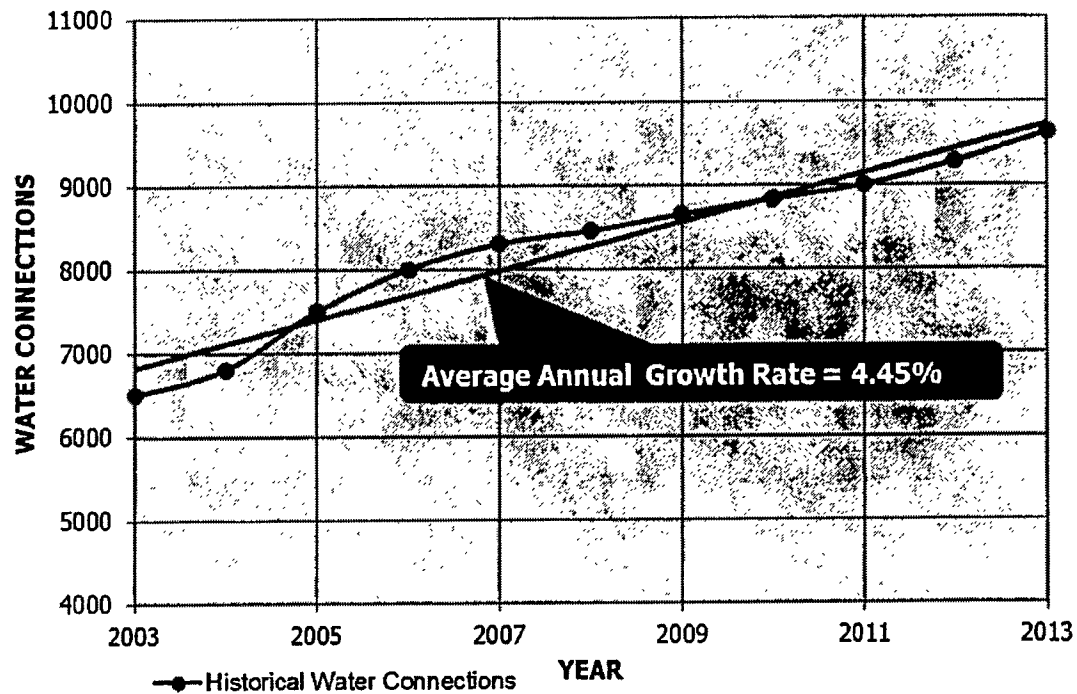
GVSUD Historical Water Connections

Chart 3.2 above displays the historical water connections for the years 2003 to 2013. An average historical growth rate of 4.45% was experienced in the past ten years. It is assumed that the growth rate will remain steady into the future and a growth rate of 5% will be used for projected connection quantity into the future.

CHART 3.3

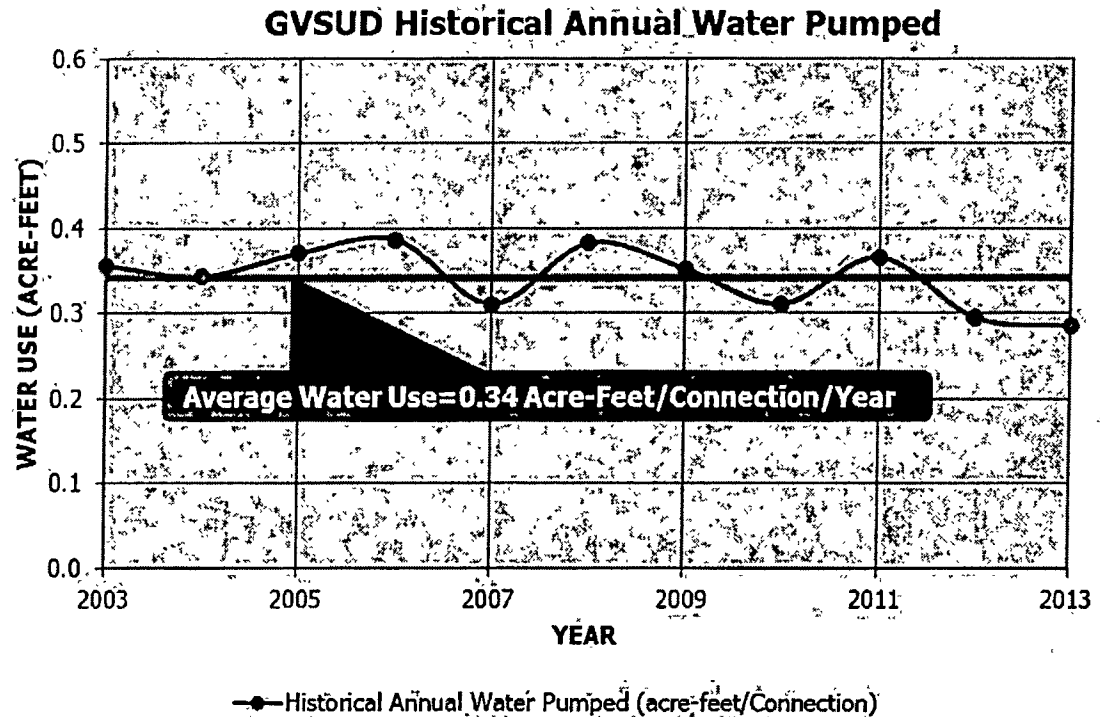


Chart 3.3 above displays the historical water usage for the years 2003 to 2013. The average water use rate for GVSUD was 0.34 acre-feet/connection/year.

4.0. PROJECTED WATER CONNECTIONS AND WATER USE

The 5% average annual growth rate was used to determine quantity of future connections. An 8% and 10% average annual growth rate is also shown in the table to represent a hurried growth of the GVSUD service area. The future connection count along with 0.34 acre-feet/year average water use was used to determine the future estimated water demand.

Table 4.1, shows the projected connection growth based on a 5%, 8% and 10% growth trend and a 0.34 acre-feet/connection/year water use.

TABLE 4.1

Green Valley Special Utility District Projected Growth						
Year	Projected Water Connections			Projected Water Demand (acre-feet/year)		
	5%	8%	10%	5%	8%	10%
2013	9,621	9,621	9,621	3,271	3,271	3,271
2014	10,102	10,391	10,583	3,435	3,533	3,598
2015	10,607	11,222	11,641	3,606	3,815	3,958
2016	11,138	12,120	12,806	3,787	4,121	4,354
2017	11,694	13,089	14,086	3,976	4,450	4,789
2018	12,279	14,136	15,495	4,175	4,806	5,268
2019	12,893	15,267	17,044	4,384	5,191	5,795
2020	13,538	16,489	18,749	4,603	5,606	6,375
2021	14,215	17,808	20,623	4,833	6,055	7,012
2022	14,925	19,232	22,686	5,075	6,539	7,713
2023	15,672	20,771	24,954	5,328	7,062	8,484
2024	16,455	22,433	27,450	5,595	7,627	9,333
2025	17,278	24,227	30,195	5,874	8,237	10,266
2026	18,142	26,165	33,214	6,168	8,896	11,293
2027	19,049	28,259	36,536	6,477	9,608	12,422
2028	20,001	30,519	40,189	6,800	10,377	13,664
2029	21,001	32,961	44,208	7,140	11,207	15,031
2030	22,052	35,598	48,629	7,498	12,103	16,534
2031	23,154	38,446	53,492	7,872	13,072	18,187
2032	24,312	41,521	58,841	8,266	14,117	20,006
2033	25,527	44,843	64,725	8,679	15,247	22,007
2034	26,804	48,431	71,198	9,113	16,466	24,207

Note: Water Usage assumption of 0.34 acre-feet per Connection/Year.

This data indicates a projected water demand for the year 2034 of 9,113 acre-feet, 16,466 acre-feet and 24,207 acre-feet for the associated growth rates of 5%, 8% and 10%, respectively.

5.0 SUMMARY OF EXISTING WATER SYSTEM

GVSUD was divided into individual pressure planes based on Hydraulic Grade Lines in order to quantify the existing and projected number of connections in the study area. These areas are shown on Attachment 'A', Existing Pressure Planes Map. Shown below, in Table 5.0, is a summary of the existing connections per individual pressure planes.

TABLE 5.0

Existing Connections Per Pressure Plane			
1	2	3	4
Service Level No.	Pressure Plane	Existing Connections	Percentage of Connections Per Pressure Plane
1	Plant 1	1,877	19.51%
2	Plant 2		0.00%
3	Plant 3	318	3.31%
4	Plant 4	2,688	27.94%
5	Plant 5	476	4.95%
6	Wells	2,030	21.10%
7	Plant 10		0.00%
8	Leissner	927	9.64%
9	Haeckerville	528	5.49%
10	Wagner	489	5.08%
11	East Central	234	2.43%
12	1518 EST	54	0.56%
TOTAL		9,621	100%

As shown in the above table, there are 9,621 existing connections in the system, as of January 2013.

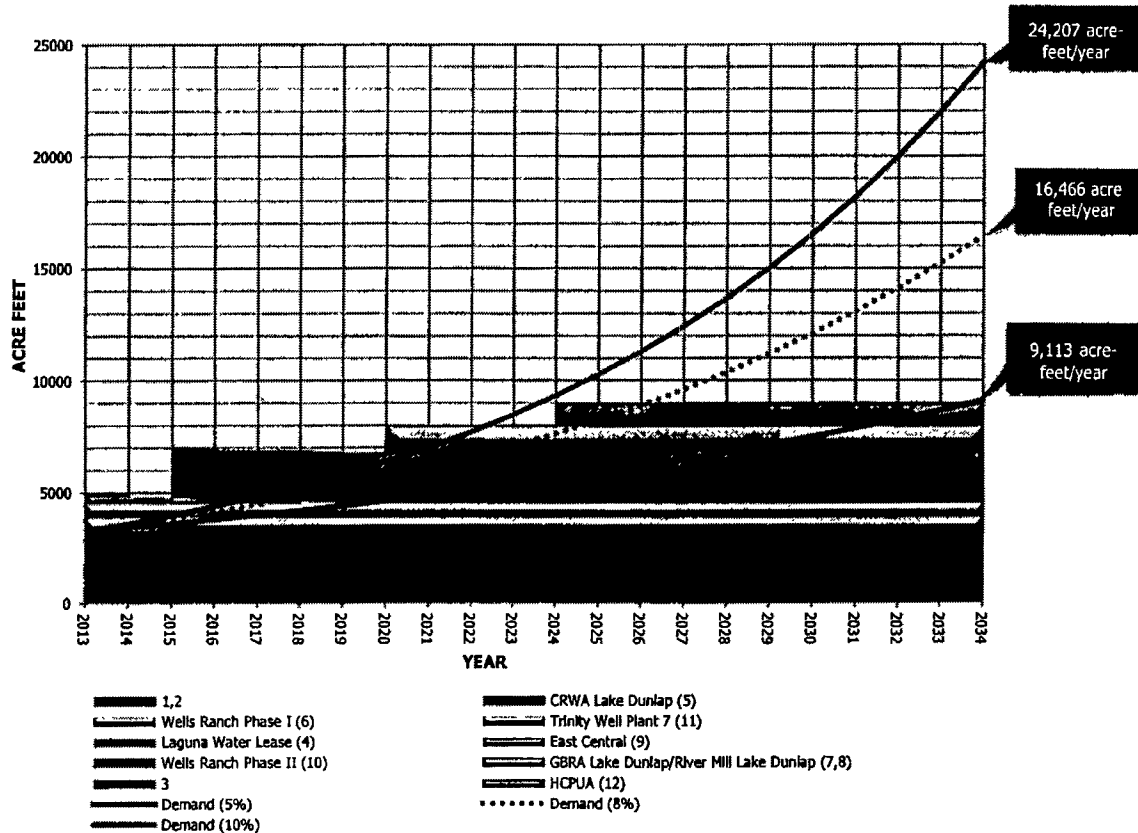
5.1 EXISTING WATER SUPPLY CAPACITY AND WATER RIGHTS

GVSUD currently has contracted water rights with several sources. These water rights include Edwards Wells, a Trinity Well, Canyon Regional Water Authority, East Central Special Utility District and Hays Caldwell Public Utility Agency. GVSUD currently has 5,004 acre-feet/year in water rights with some of these water rights in the form of short-term leases due to expire soon. These leases are not guaranteed to renew. This puts GVSUD at risk of losing these water rights.

Chart 5.1 below gives a summary of the current water rights in relation to the projected demand. The water rights' numbers correspond to Table 5.1 on the following page.

CHART 5.1

GVSUD Existing Water Inventory vs Future Demand



GVSUD currently has approximately 1,704 acre-feet of Edwards Aquifer well water and 600 acre-feet of Trinity Aquifer well water. By 2015, the amount of Edwards well water will decrease by nearly 172 acre-feet and by 2018 another 132 acre-feet due to leases expiring. The remaining 1,400.8 acre-feet of Edwards Aquifer water rights are owned. In 2012, GVSUD signed a lease with East Central to buy 200 acre-feet of water. This lease is a 3-year lease and is due to expire in 2015. There is no guarantee that this lease will be renewed at that time. These short-term leases pose a serious risk for GVSUD as it impairs GVSUD from being able to use these water sources for future planning. As of 2014, there is approximately 5,004 acre-feet of water available to GVSUD.

TABLE 5.1

GVSUD AVAILABLE WATER INVENTORY						
No.	PERMIT #	OLD #	COUNTY	ACRE FT.	SOURCE	EXPIRES
1	P100-199	BE00081AD	COMAL	309	Edwards	Owned
2	P100-776	CO00146	COMAL	1091.812	Edwards	Owned
3	P103-289		COMAL	171.56	Edwards	Leased
			TOTAL ACRE FT.	1572.372		
4	LAGUNA WATER LEASE		COMAL	132	Edwards	2018
			TOTAL ACRE FT.	1704.372		
5	CRWA LAKE DUNLAP			1800	CRWA	Owned
6	WELLS RANCH PH 1			700	CRWA	Owned
7	GBRA LAKE DUNLAP			1000	CRWA	40 Year term/not available
8	RIVER MILL LAKE DUNLAP			190	CRWA	Owned but not available
			TOTAL ACRE FT.	3690		
9	EAST CENTRAL			200	East Central	12/31/2015
10	WELLS RANCH PH 2			2300	CRWA	Negotiation Pending
11	TRINITY WELL PLANT 7			600	Trinity	Owned
12	HCPUA			1000	HCPUA	Owned (Assumed 2024)
			GRAND TOTAL ACRE FT.	9494.372		

5.2 EXISTING PRESSURE PLANES

The boundary of each existing pressure plane was determined from USGS topography. The topography was used to establish the different water pressure planes based on desired minimum and maximum water pressures. These pressure plane boundaries were delineated with help from GVSUD staff. The boundaries of these twelve (12) Pressure Planes are shown on Attachment A, GVSUD Existing Pressure Planes. A summary and outline of the equipment for each Pressure Plane is located below in Table 5.3:

5.3 DESCRIPTION OF EXISTING PLANT 1 PRESSURE PLANE

Plant 1 Pressure Plane serves the area in the northwestern part of GVSUD, this pressure plane is shown on Attachment A. This service area also includes the CRWA Damrau elevated storage tank. This Pressure Plane has a hydraulic grade line of 1008 feet mean sea level (MSL). A pneumatic pressure tank and pump combination is used in order to provide this pressure plane with pressure. The water supply for this pressure plane is currently provided by Edwards Aquifer and Trinity Aquifer water. In 2015 the

Weil Road Booster Pump Station will be completed and will deliver CRWA water to this service area. This will bring an additional source of water, more storage, and less restricted water. As shown on Table 5.0, Plant 1 Pressure Plane currently serves 1,877 connections. A summary of existing Plant 1 infrastructure is listed below and shown in Table 5.3:

- 200,000-gallon Ground Storage
- 1,000,000-gallon Elevated Storage
- 5,000-gallon Pneumatic Pressure Tank
- 3 Booster Pumps @ 450 gpm = 1,350 gpm
- Weil Road Booster Pump Station (Construction Completion in 2015)
 - 500,000-gallon Ground Storage
 - 2 Booster Pumps @ 1,440 gpm = 2,800 gpm

5.4 DESCRIPTION OF EXISTING PLANT 2 PRESSURE PLANE

Plant 2 Pressure Plane serves the area in the northeastern part of GVSUD and northeastern of Plant 3 Pressure Plane, this pressure plane is shown on Attachment 'A'. This Pressure Plane has a hydraulic grade line of 897 feet MSL. Plant 1 is currently serving the water supply for this pressure plane. As shown on Table 5.0, Plant 2 Pressure Plane is currently within the Plant 1 Pressure Plane. A summary of Plant 2 is listed below and shown in Table 5.3:

- 127,000-gallon Ground Storage
- 80,000-gallon Ground Storage
- 100,000-gallon Elevated Storage
- 4 Booster Pumps @ 450 gpm = 1,800 gpm

5.5 DESCRIPTION OF EXISTING PLANT 3 PRESSURE PLANE

Plant 3 Pressure Plane serves the area west of Wagner and north of East Central Special Utility District service area, this pressure plane is shown on Attachment 'A'. The Water supply for this pressure plane is provided by Edwards Aquifer water and water from Canyon Regional Water Authority. This Pressure Plane has a hydraulic grade line of 830 feet MSL. As shown on Table 5.0, Plant 3 Pressure Plane currently serves 318 connections. A summary of Plant 3 is listed below and shown in Table 5.3:

- 127,000-gallon Ground Storage
- 80,000-gallon Ground Storage
- 100,000-gallon Elevated Storage
- 4 Booster Pumps @ 450 gpm = 1,800 gpm

5.6 DESCRIPTION OF EXISTING PLANT 4 PRESSURE PLANE

Plant 4 Pressure Plane serves the northeast corner of the GVSUD area and is east of Plant 1 Pressure Plane, this pressure plane is shown on Attachment 'A'. This Pressure Plane has a hydraulic grade line of 830 feet MSL. The water supply for this pressure plane is provided by Canyon Regional Water Authority's Lake Dunlap plant. This pressure plane is using existing CRWA-Lake Dunlap storage tanks and high service pumps to feed the meters in this pressure plane and to fill the Plant 4 elevated tower near Zipp Road. Table 5.0 shows a summary of the existing pressure plane. The total number of existing connections served by Plant 4 Pressure Plane is 2,688 connections. A summary of Plant 4 is listed below and shown in Table 5.3:

- 100,000-gallon Elevated Storage – currently not in service
- 500,000-gallon Elevated Storage
- CRWA-Lake Dunlap existing equipment (tanks & high service pumps)

5.7 DESCRIPTION OF EXISTING PLANT 5 PRESSURE PLANE

Plant 5 Pressure Plane serves the area southwest of GVSUD service area and east of East Central SUD service area, this pressure plane is shown on Attachment 'A'. The water for this pressure plane is provided by the Edwards Aquifer. This Edwards water is piped from the Plant 7, 8 & 9 Pressure Plane (Wells Pressure Plane), across IH-35 and sent through the system to Plant 5. As shown on Table 5.0, Plant 5 Pressure Plane currently serves 476 connections. A summary of Plant 5 is listed below and shown in Table 5.3:

- 60,000-gallon Ground Storage
- 3,000-gallon Pneumatic Pressure Tank
- 2 Booster Pumps @ 225 gpm = 450 gpm

5.8 DESCRIPTION OF EXISTING WELLS PRESSURE PLANE (PLANT 7, 8 & 9)

The Wells Pressure Plane serves the area in the northwestern portion of GVSUD service area, this pressure plane is shown on Attachment 'A'. The water supply for this pressure plane is provided by two Edwards Aquifer wells and one Trinity well that are owned by GVSUD. This Pressure Plane has a hydraulic grade line of 1008 feet mean sea level (MSL). As shown on Table 5.0, the Wells Pressure Plane currently serves 2,030 connections. A summary of Plants 7, 8 & 9 are listed below and shown in Table 5.3:

- Plant 7
 - 200,000-gallon Ground Storage
 - 5,000-gallon Pneumatic Pressure Tank
 - 2 Booster Pumps @ 800 gpm = 1,600 gpm
 - 2 Booster Pumps @ 450 gpm = 900 gpm

- Well #2
 - 1 Well pump @ 800 gpm
- Well #3
 - 1 Well pump @ 1,600 gpm
- Well #4
 - 1 Well pump @ 600 gpm
- Plant 8
 - 200,000-gallon Ground Storage
 - 5,000-gallon Pneumatic Pressure Tank
 - Well #1
 - 1 Well pump @ 1,200 gpm
 - 1 Booster Pump @ 800 gpm
 - 1 Booster Pump @ 450 gpm
- Plant 9
 - 200,000-gallon Ground Storage
 - 80,000-gallon Ground Storage
 - 300,000-gallon Elevated Storage
 - 2 Booster Pumps @ 500 gpm = 1,000 gpm
 - 2 Booster Pumps @ 1,000 gpm = 2,000 gpm

5.10 DESCRIPTION OF EXISTING PLANT 10 PRESSURE PLANE

Plant 10 Pressure Plane serves the area in the southeastern most portion of GVSUD, this pressure plane is shown on Attachment 'A'. Canyon Regional Water Authority provides the water supply for this pressure plane through a take point at Leissner Booster Pump Station. As shown on Table 5.0, Plant 10 is being bypassed and is not currently serving any connections, but is being maintained for future use if needed. A summary of Plant 10 is listed below and shown in Table 5.3:

- 2 ea. @ 250,000-gallon Ground Storage
- 13,000-gallon Pneumatic Pressure Tank
- 3 Booster Pumps @ 500 gpm = 1,500 gpm

5.11 DESCRIPTION OF EXISTING 1518 PRESSURE PLANE

1518 Pressure Plane serves the area in the southwestern most portion of GVSUD, this pressure plane is shown on Attachment 'A'. This Pressure Plane has a hydraulic grade line of 880 feet mean sea level (MSL). The water supply for this pressure plane is provided by Canyon Regional Water Authority FM 1518 elevated storage tank. As shown on Table 5.3, 1518 Pressure Plane currently serves 54 connections.

5.12 DESCRIPTION OF EXISTING LEISSNER PRESSURE PLANE

Leissner Pressure Plane serves the area southeast of GVSUD service area and west of East Central SUD and Plant 3 service areas, this pressure plane is shown on Attachment 'A'. The water for this pressure plane is provided by CRWA Leissner Booster Pump Station, which transports Wells Ranch water. As shown on Table 5.3, Leissner Pressure Plane currently serves 927 connections.

5.13 DESCRIPTION OF EXISTING HAECKERVILLE PRESSURE PLANE

Hackerville Pressure Plane serves the area southwest of the Wagner service area as shown on Attachment 'A'. The water supply for this pressure plane is currently served by CRWA. As shown on Table 5.3, the Hackerville Pressure Plane currently serves 528 connections.

5.14 DESCRIPTION OF EXISTING WAGNER PRESSURE PLANE

Wagner Pressure Plane serves the area southwest of the City of Marion located in the center of GVSUD, this pressure plane is shown on Attachment 'A'. This pressure plane has a hydraulic grade line of 880 feet mean sea level. This area is currently using the CRWA Wagner Booster Pump Station to serve this pressure plane. As shown on Table 5.3, Wagner Pressure Plane currently serves 489 connections.

5.15 DESCRIPTION OF EXISTING EAST CENTRAL PRESSURE PLANE

East Central Pressure Plane serves the area of the south central most portion of GVSUD, this pressure plane is shown on Attachment 'A'. The water supply for this pressure plane is East Central Special Utility District. This area currently experiences a pressure of approximately 90 psi from ECSUD pressure tank and is provided by a nearby ECSUD booster pump station. This contract may not be renewed with East Central SUD when it expires in 2015. As shown on Table 5.3, East Central Pressure Plane currently serves 234 connections.

Table 5.3 on the following page gives an overall summary of the current plants in the GVSUD system.

TABLE 5.3 SUMMARY OF EXISTING PRESSURE PLANES

GREEN VALLEY SPECIAL UTILITY DISTRICT EXISTING EQUIPMENT						
Plane Name	Connections	GST Capacity (gallons)	EST Capacity (gallons)	Pneumatic Tank (gallons)	Booster Pumps	Well Pumps
Plant 1 Pressure Plane	1877	200,000	1,000,000	5,000	3 @ 450 gpm	
Plant 2 Pressure Plane	-	127,000 80,000	100,000		4 @ 450 gpm	
Plant 3 Pressure Plane	318	127,000 80,000	100,000		4 @ 450 gpm	
Plant 4 Pressure Plane	2,688		500,000			
Plant 5 Pressure Plane	476	60,000		3,000	2 @ 225 gpm	
Wells Pressure Plane	Plant 7	200,000		5,000	2 @ 800 gpm 2 @ 50 gpm 1 @ 800 gpm 1 @ 600 gpm	
	Plant 7, Well #2					1 @ 800 gpm
	Plant 7, Well #3					1 @ 1,600 gpm
	Plant 7, Well #4					1 @ 600 gpm
	Plant 8	200,000		5,000	1 @ 800 gpm 2 @ 450 gpm	
	Plant 8, Well #1					1 @ 1,200 gpm
	Plant 9	200,000 80,000	300,000		2 @ 500 gpm 2 @ 1,000 gpm	
Plant 10 Pressure Plane	-	250,000 250,000		13,000	3 @ 500 gpm	
1518 Pressure Plane	54					
Leissner Pressure Plane	927					
Haeckerville Pressure Plane	528					
Wagner Pressure Plane	489					
East Central Pressure Plane	234					
TOTAL	9,621	1,854,000	2,000,000	31,000	14,700 gpm	4,200
Capacity per Connection		394.38	289.31		3.13	2.07

GVSUD is currently able to supply water to all connections using their current infrastructure. However, as they grow they will need to implement additional infrastructure in order to be able to supply water to the existing and additional connections.

The GVSUD water system as a whole has enough capacity to meet current demands. A summary of their capacity per connection is listed below:

- Ground Storage - 394 gallons/connection
- Elevated Storage – 289 gallons/connection
- Booster Pumps – 3.13 gpm/connection
- Well Pumps – 2.07 gpm/connection

6.0 TCEQ DESIGN STANDARDS

The Texas Commission on Environmental Quality (30 TAC §290.45) has set minimum design standards that ensure a water system is capable of meeting the demands of its customers; these standards are in Attachment 5. TCEQ does not include consideration for additional fire flows that maybe necessary for future development in their minimum requirements. These standards must be met in order to be compliant with the state.

Water Treatment Plant:

- Treatment Capacity: 0.6 gpm/connection (must be greater than the anticipated maximum daily demand)

Storage:

- Total Storage: 200 gallons/connection
- Elevated Storage: 100 gallons/connection
- Pressure Tank: 20 gallons/connection (in lieu of elevated storage up to 2,500 connections)

Pumping:

- If less than 200 gallons per connection of elevated storage is provided, two or more pumps with a total capacity of 2.0 gpm/connection, or that have a total capacity of at least 1,000 gpm and the ability to meet peak hourly demands with the largest pump out of service, whichever is less.
- If at least 200 gallons/connection of elevated storage is provided: two or more pumps with a minimum capacity of 0.6 gpm/connection.

7.0 GVSUD DESIGN REQUIREMENTS

RCE used historical water usage records to establish design requirements in order to ensure that minimum service equals or exceeds the minimum requirements expected by the TCEQ and meets or exceeds GVSUD future water demands.

As a whole, GVSUD design requirements exceed the minimum criteria established by TCEQ. GVSUD current water system is in full compliance with TCEQ and is able to meet current demands in the system. In Table 7.1, are GVSUD's historical water usage records.

TABLE 7.1

Green Valley Special Utility District Historic Water Use					
1	2	3	4	5	6
Year	Historical Water Connections	Daily Avg. Pumped (gpd)	Daily Avg. Pumped per Conn. (gpd/Conn.)	Average Daily Water Usage per Conn. (gpm/Conn.)	Peak Hour Water Usage per Conn. (gpm/Conn.)*
2003	6,500	2,062,238	317.3	0.22	0.9
2004	6,800	2,083,664	306.4	0.21	0.9
2005	7,500	2,478,256	330.4	0.23	0.9
2006	8,000	2,759,471	344.9	0.24	1.0
2007	8,302	2,300,600	277.1	0.19	0.8
2008	8,453	2,888,026	341.7	0.24	0.9
2009	8,650	2,715,726	314.0	0.22	0.9
2010	8,829	2,447,903	277.3	0.19	0.8
2011	8,995	2,936,234	326.4	0.23	0.9
2012	9,274	2,443,439	263.5	0.18	0.7
2013	9,621	2,445,225	254.2	0.18	0.7
Average			304.8	0.21	0.8

*Based on a Peak Factor of 4

The preceding table shows the average daily and peak hour water usage. The average number of connections used for each year was provided by GVSUD staff. We used the last 11 years of data to represent modern operating conditions. The average water usage for the past 11 years is 0.21 gpm/connection. This average use value is less than the 0.31 gpm/connection as suggested by the Texas Water Development Board and Edwards Aquifer Authority. The table above shows that the Average Daily Demand is 304.8 gpd/connection, and the Peak Hour Demand, is 0.8 gpm/connection. These values were used in determining GVSUD's design requirements. The color of the text corresponds to the location of the value in Table 7.1 above.

However, when the system is broken down into pressure planes, some individual pressure planes fail to meet the TCEQ minimums using only GVSUD infrastructure, however the Districts wholesale connections provide additional storage, pump capacity and pressure. Water production capacity is designed to meet historical peak daily demand. System storage is designed and based on average daily demand. Annual evaluations of the average daily demand and peak daily demand of water flows should be conducted based on daily records of pumping for the calendar year. This will enable the design requirements to be revised and adjusted accordingly. GVSUD design requirements for average and peak flows are as follows:

- Average Daily Demand: 351 gpd/connection
- Peak Daily Demand: 702 gpd/connection
- Peak Hour Demand: 0.8 gpm/connection + Fire Flow

TCEQ minimum requirements do not consider fire flow. Additional size for water main projects may be required to not only meet the minimum requirements of the TCEQ, but to confidently provide fire flow protection. This additional fire flow consideration will be on a project-by-project basis.

The average daily demand of 351 gpd/connection is based on the 10-year historic average of 304.8 gpd/connection with an added 15-percent safety factor. Below is an explanation of how this value was calculated:

$$304.8 \times .15 = 45.72 + 305 = 351 \text{ gpd/connection}$$

The peak daily demand is based on the average maximum with a peak factor of 2 (two). We used a peak factor of 2 because we were not able to obtain peak usage data from GVSUD, therefore used an industry standard of 2. A peak factor of 2 represents an average water system. The maximum peak daily demand is 702 gpd/connection. The calculation is shown below.

$$351 \times 2 = 702 \text{ gpd/connection}$$

GVSUD historical water use is at 0.21 gpm/connection. This value is the average daily demand and is used to calculate storage volumes. This calculation is based on the 0.34 acre-feet/year historical average annual water usage per connection. Below is the calculation that shows how this number was achieved.

$$\frac{.34 \text{ acre} - \text{ft}}{\text{year}} \times \frac{1 \text{ year}}{365 \text{ days}} \times \frac{1 \text{ day}}{24 \text{ hrs}} \times \frac{1 \text{ hr}}{60 \text{ min}} \times \frac{43,560 \text{ ft}^2}{1 \text{ acre}} \times \frac{7.48 \text{ gal}}{1 \text{ ft}^3} = 0.21 \text{ gpm/connection}$$

GVSUD is currently in compliance with TCEQ minimums, however TCEQ does not account for future growth in these requirements. Due to rapid growth in this area, GVSUD will need to perform several water system improvements in order to meet this ever-growing demand and to remain compliant with TCEQ. The following is a summary of GVSUD's design requirements for water treatment, storage, and pumping based on these average and peak flow design requirements:

Historical Water Supply Capacity:

0.25 gpm/connection (Peak Day Demand)

(.21x15%) = 0.242 = 0.25 gpm/Connection ~ 0.40 acre-feet/connection

Water Plant:

$$\frac{1,704 \text{ ac} - \text{ft (Edwards Rights)} + 600 \text{ ac} - \text{ft (Trinity Rights)}}{0.4 \text{ acre} - \text{feet/connection}} = 5,760 \text{ connections}$$

$$5,760 \text{ connections} \times 0.6 \text{ gpm/connection (TCEQ min)} = 3,456 \text{ gpm}$$

Well 1 – 800 gpm

Well 2 – 1,600 gpm

Well 3 – 1,200 gpm

Well 4 – 600 gpm

TOTAL – 4,200 gpm*

**Does not include CRWA Wells Ranch or Lake Dunlap*

$$\text{Existing capacity} = 4,200 \text{ gpm} > \text{TCEQ minimum Capacity} = 3,456 \text{ gpm}$$

Storage:

- Total Storage: 176 gallons/connection (Average Daily Demand)
- Ground Storage: 88 gallons/connection
- Elevated Storage: 88 gallons/connection

Pumping:

- High Service Pumps: 0.8 gpm/connection (Peak Hour Demand) (Firm)

The water supply capacity was determined by taking the highest peak daily demand and adding 15% giving us a value of 0.25 gpm/connection after rounding up to the nearest hundredth.

The values above were calculated by taking the daily average pumped for each year and averaging these values equals 351 gpd/connection. This value was then halved in order to allow for 12 hours of storage capacity. The 351 gpd/connection represents a full 24 hours of storage capacity. The ground and elevated storage requirements were calculated by taking the total amount of storage and dividing by 2 (two) to distribute evenly between elevated and ground storage. The same ratio that TCEQ established in their design criteria was applied to GVSUD's design criteria. The elevated requirement from TCEQ was half as much as the total storage amount, therefore, we are establishing a total storage criteria of 176 gallons/connection and 88 gallons/connection for elevated storage. This calculation is shown below.

- 24 hours = 176 gallons/connection

$$\frac{176 \text{ gallon}}{\text{day}} \times \frac{1}{2} \text{ day} = 88 \text{ gallons/connection}$$

- 12 hours = 88 gallons/connection

The high service pump usage was determined to be 0.8 gpm/connection and per TCEQ requirements, 2.0 gpm/connection was used.

Below is a summary of TCEQ requirements vs. GVSUD demand. The more stringent value will be used for future capacity design criteria:

TCEQ vs. GVSUD			
Description	TCEQ (minimum)	Green Valley SUD (existing)	Green Valley SUD (demand)
Water Rights (acre-feet/connection/year)	0.50	0.52	0.34
Water Plant Supply (gpm/connection)	0.60	2.07	0.25
Total Storage (gallons/connection)	200	400.6	176
Ground Storage (gallons/connection)	-	192.7	88
Elevated Storage (gallons/connection)	100	207.88	88
Pumping (gpm/connection)	2.0	3.13	0.8

Note: Bold value indicates GVSUD design criteria used for future development.

Clarification: The 0.44 gpm/connection Water Plant Supply calculation includes the infrastructure owned by GVSUD and does not include any CRWA infrastructure that provides pressure, storage, treatment and pumping capacity to the system. If the calculation is completed using the number of connections for the service area being serviced (Wells, Plant 1 and Plant 5 Pressure Planes) the results are as follows:

Water Plant Supply =

4200 gpm Well Capacity / 4383 connections = 0.96 gpm/connection > TCEQ minimum

Similarly, we could add the CRWA infrastructure (Treatment, pumping and storage) to provide a more accurate picture of the robust system in place to serve the District. At this time all calculations will include infrastructure and capacity owned and operated by GVSUD directly.

8.0 PROPOSED WATER SYSTEM

The GVSUD water system is currently very complex and requires extensive maintenance in order to maintain the 12 existing pressure planes. It is proposed that GVSUD move to a simpler, more efficient, self-maintained, water system that will meet the rapidly growing demands of its customers. The system is currently complicated due to 12 pressure planes and containing many mechanical devices such as pneumatic tanks and PRVs that require extensive maintenance, limit redundancy, and are prone to failure. This proposed water system will allow for the movement of water to all parts of the system and give the system redundant water sources.

RCE has identified capital improvement projects (CIPs) in order to meet future storage, pump and water demands through the year 2034 and replace aging infrastructure. The strategy of these CIP's will be to combine the existing 12 pressure planes into four pressure planes in an effort to allow the GVSUD water system the opportunity to run effectively and efficiently in the future as demands for water increases. The proposed CIPs will provide redundancy in each pressure plane. These areas are shown on Attachment 'B', Proposed Pressure Planes Map.

8.1 PROPOSED WATER SUPPLY

The water supply for GVSUD is obtained from many different sources and is composed of several leases. A list of the current and expired water leases was compiled in order to analyze the amount of water that will be needed in the future. This list is shown in Table 5.2.

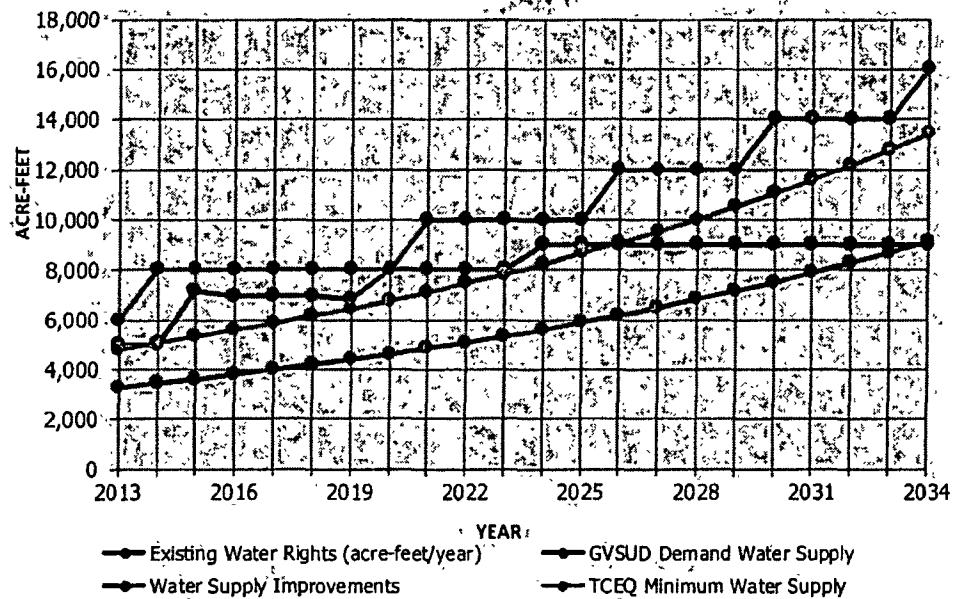
It is recommended that GVSUD continue to pursue supplemental sources of water supply. GVSUD's current water rights with East Central are due to expire in 2015 and the Laguna Water Lease is set to expire in 2018. According to Chart 5.1, by 2020 GVSUD will have exhausted its 4,500 acre-feet of owned water inventory assuming a 5% projected water demand growth. Therefore, the water opportunities CRWA Wells Ranch Phase 2 and GBRA Lake Dunlap/River Mill Lake Dunlap projects shown in Chart 5.1 will need to be negotiated and ready for distribution. GVSUD projected water demand is 9,113 acre-feet/year by 2034. A couple of providers to further explore for water opportunities in Edwards Wells, East Central Special Utility District, Schertz Sequin, Trinity wells, Carrizo-Wilcox wells, GBRA, HCPUA, CRWA water swap with SAWS and Springs Hill Water Supply Company. Another option is to explore more opportunities with brackish water. In addition to finding addition sources of water, GVSUD should implement a water conservation plan that would reduce the amount of water required throughout the system each year.

Water Supply

Year	Projected Connections	Existing Water Rights (acre-feet/year)	GVSUD Demand Water Supply (acre-feet/year)	TCEQ Minimum Water Supply (acre-feet/year)	Water Supply Improvements (acre-feet/year)
2013	9,621	5,004	3,271	4,811	6,000
2014	10,102	5,004	3,435	5,051	8,000
2015	10,607	7,133	3,606	5,304	8,000
2016	11,138	6,933	3,787	5,569	8,000
2017	11,694	6,933	3,976	5,847	8,000
2018	12,279	6,933	4,175	6,140	8,000
2019	12,893	6,801	4,384	6,447	8,000
2020	13,538	7,991	4,603	6,769	8,000
2021	14,215	7,991	4,833	7,107	10,000
2022	14,925	7,991	5,075	7,463	10,000
2023	15,672	7,991	5,328	7,836	10,000
2024	16,455	8,991	5,595	8,228	10,000
2025	17,278	8,991	5,874	8,639	10,000
2026	18,142	8,991	6,168	9,071	12,000
2027	19,049	8,991	6,477	9,524	12,000
2028	20,001	8,991	6,800	10,001	12,000
2029	21,001	8,991	7,140	10,501	12,000
2030	22,052	8,991	7,498	11,026	14,000
2031	23,154	8,991	7,872	11,577	14,000
2032	24,312	8,991	8,266	12,156	14,000
2033	25,527	8,991	8,679	12,764	14,000
2034	26,804	8,991	9,113	13,402	16,000

* Note: See Table 5.1 for summary of GVSUD Existing Water Rights.

Minimum Water Rights Supply Criteria = 0.31 gpm/Connection **0.50** Acre-Feet/Connection
 GVSUD Historical Annual Water Usage = 0.21 gpm/Connection **0.34** Acre-Feet/Connection



GVSUD water supply will not require additional water rights until 2034 according to the future demand projection shown on the previous page. The dark blue line in the figure above shows that GVSUD's current water rights. In order to meet the TCEQ minimum water supply the District will need to find additional water rights by 2025.

8.2 PROPOSED 750-FT PRESSURE PLANE

The proposed 750' pressure plane includes the current 1518, Plant 5, Leissner, and East Central service levels. The boundary of this pressure plane serves 1,460 connections. It is projected that by 2024 this plane will have approximately 2,497 connections. In analyzing this proposed pressure plane it is determined that this plane will need additional infrastructure in order to meet TCEQ minimum requirements. A summary of the current infrastructure is listed below:

- 1,950 gpm pumping capacity (1,450 gpm capacity with largest out of commission)
- 560,000 gallons Ground Storage
- 16,000 gallons Pneumatic Pressure Tanks.

This does not account for the existing infrastructure at Plant 15 or East Central pressure plane. CRWA has the Lake Dunlap Water Treatment Plant that also feeds water into this pressure plane. This water treatment plant has storage tanks as well as high service pumps that contribute to this service area.

The table and chart below shows the future required pumping capacity as well as the current pumping capacity. It shows that the current capacity is below the required pumping capacity. This plane will need approximately 7,000 gallons per minute of pumping capacity in order to meet its demand in the future. This chart also gives us an outlook on the additional capacity that will be required in order to meet the demands of this pressure plane.

This proposed pressure plane does not currently have any elevated storage. Fortunately, this pressure plane can temporarily comply with TCEQ minimum design standards and feed off the 830 pressure plane elevated tanks until an elevated storage is added. When this plane is ready for this infrastructure, it will need an additional 500,000 gallon of elevated storage.

This plane has sufficient storage but TCEQ requires that each pressure plane have at least 100 gallons/connection of elevated storage. Therefore, the construction of the 500,000 gallon of elevated storage will meet this requirement and ensure that enough pressure is provided to all the water connections in this plane. This plane will continue to use pumping capacity from adjacent pressure planes until their plant improvements are completed. This pressure plane has excess water and can temporary share water with other pressure planes that are deficient in water capacity while the transition to

the four proposed pressure planes is completed. GVSUD currently obtains water from several CRWA metering stations. These metering stations gives GVSUD the capability to utilize CRWA surface and future groundwater.

The following pages give an overview of the current situation and future infrastructure that will be needed by the year 2034 for the 750' pressure plane. Below is a summary of the deficiencies for this pressure plane.

750 Pressure Plane			
	Elevated Storage (gallons)	Total Storage (gallons)	Pumping (gpm)
Existing	0	560,000	1,950
Required	500,000	1,060,000	8,950
Deficit	500,000	500,000	7,000

RCE has proposed two elevated storage tanks with booster pumps onsite that will ensure that this proposed pressure plane is able to meet future water demands. The projects will include two pipeline improvements and an elevated tank in the McQueeney area in order to eliminate PRVs. The other elevated tank will be constructed to the south of IH-10 off Gin Road. Together, these two elevated tanks floating together will be able to service the 750-pressure plane. A summary of the projects needed for this pressure plane is shown in the table below.

750 Pressure Plane Proposed Improvements	
Project	Year
Pipeline from FM 725 to CRWA Lake Dunlap WTP	2016
16" Pipeline along FM 725 – Union Wine to Altwein	2017
750 Elevated Storage Tank	2018
750' Elevated Storage Tank at Gin Road	2020

750 Pressure Plane**PUMPING CAPACITY**

Year	Projected Connections	Existing Pumping Capacity	TCEQ Minimum Pumping Capacity	GVSUD Demand Pumping Capacity	Pumping Capacity Improvements
2013	1,460	1,950	2,920	1,168	1,950
2014	1,533	1,950	3,066	1,226	4,950
2015	1,610	1,950	3,219	1,288	4,950
2016	1,690	1,950	3,380	1,352	4,950
2017	1,775	1,950	3,549	1,420	4,950
2018	1,863	1,950	3,727	1,491	4,950
2019	1,957	1,950	3,913	1,565	4,950
2020	2,054	1,950	4,109	1,643	4,950
2021	2,157	1,950	4,314	1,726	6,950
2022	2,265	1,950	4,530	1,812	6,950
2023	2,378	1,950	4,756	1,903	6,950
2024	2,497	1,950	4,994	1,998	6,950
2025	2,622	1,950	5,244	2,098	6,950
2026	2,753	1,950	5,506	2,202	6,950
2027	2,891	1,950	5,781	2,313	6,950
2028	3,035	1,950	6,070	2,428	6,950
2029	3,187	1,951	6,374	2,550	8,950
2030	3,346	1,952	6,693	2,677	8,950
2031	3,514	1,953	7,027	2,811	8,950
2032	3,689	1,954	7,379	2,951	8,950
2033	3,874	1,955	7,748	3,099	8,950
2034	4,068	1,956	8,135	3,254	8,950

TCEQ minimum Pumping Capacity Criteria =

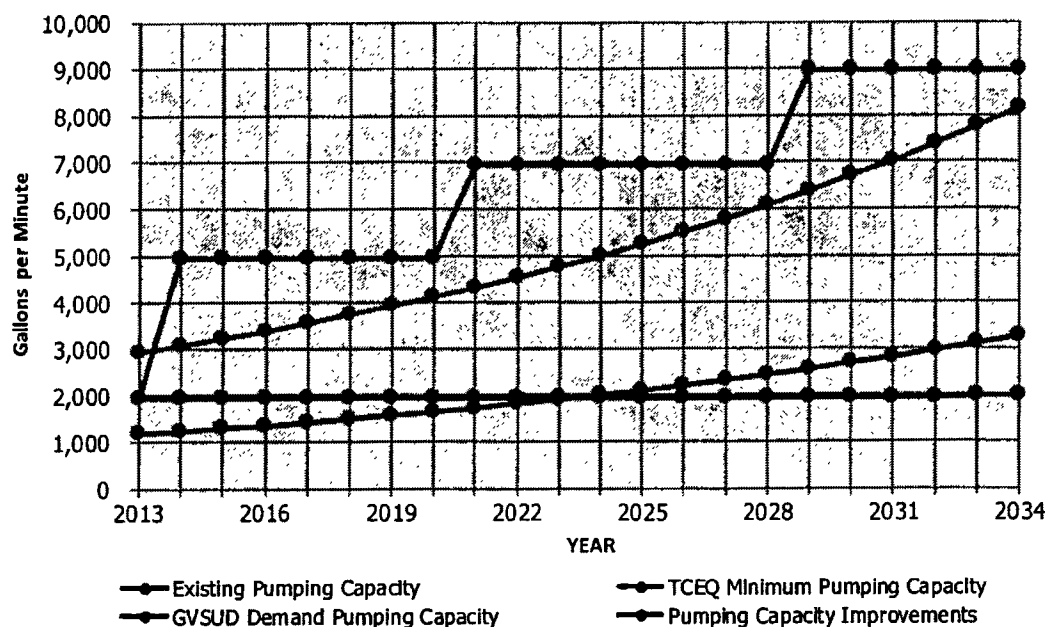
2.0

gpm/Connection

GVSUD Pumping Capacity Design Criteria =

0.8

gpm/Connection

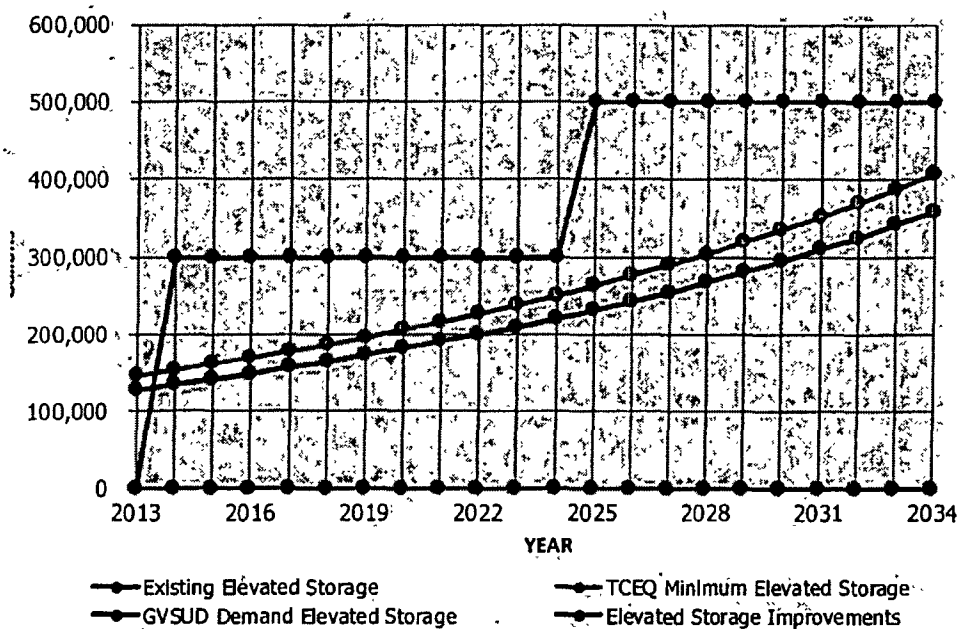


750 Pressure Plane**ELEVATED STORAGE**

Year	Projected Connections	Existing Elevated Storage	TCEQ Minimum Elevated Storage	GVSUD Demand Elevated Storage	Elevated Storage Improvements
2013	1,460	0	146,000	128,480	0
2014	1,533	0	153,300	134,904	300,000
2015	1,610	0	160,965	141,649	300,000
2016	1,690	0	169,013	148,732	300,000
2017	1,775	0	177,464	156,168	300,000
2018	1,863	0	186,337	163,977	300,000
2019	1,957	0	195,654	172,175	300,000
2020	2,054	0	205,437	180,784	300,000
2021	2,157	0	215,708	189,823	300,000
2022	2,265	0	226,494	199,315	300,000
2023	2,378	0	237,819	209,280	300,000
2024	2,497	0	249,710	219,744	300,000
2025	2,622	0	262,195	230,732	500,000
2026	2,753	0	275,305	242,268	500,000
2027	2,891	0	289,070	254,382	500,000
2028	3,035	0	303,524	267,101	500,000
2029	3,187	0	318,700	280,456	500,000
2030	3,346	0	334,635	294,479	500,000
2031	3,514	0	351,366	309,202	500,000
2032	3,689	0	368,935	324,663	500,000
2033	3,874	0	387,381	340,896	500,000
2034	4,068	0	406,751	357,940	500,000

TCEQ minimum Elevated Storage Criteria =
GVSUD Elevated Storage Design Criteria =

100 Gallons/Connection
88 Gallons/Connection



750 Pressure Plane**TOTAL STORAGE**

Year	Projected Connections	Existing Total Storage	TCEQ Minimum Total Storage	GVSUD Demand Total Storage	Total Storage Improvements
2013	1,460	560,000	292,000	256,960	
2014	1,533	560,000	306,600	269,808	
2015	1,610	560,000	321,930	283,298	
2016	1,690	560,000	338,027	297,463	
2017	1,775	560,000	354,928	312,336	
2018	1,863	560,000	372,674	327,953	
2019	1,957	560,000	391,308	344,351	
2020	2,054	560,000	410,873	361,569	
2021	2,157	560,000	431,417	379,647	
2022	2,265	560,000	452,988	398,629	560,000
2023	2,378	560,000	475,637	418,561	860,000
2024	2,497	560,000	499,419	439,489	860,000
2025	2,622	560,000	524,390	461,463	860,000
2026	2,753	560,000	550,610	484,536	860,000
2027	2,891	560,000	578,140	508,763	860,000
2028	3,035	560,000	607,047	534,201	860,000
2029	3,187	560,000	637,399	560,911	860,000
2030	3,346	560,000	669,269	588,957	860,000
2031	3,514	560,000	702,733	618,405	860,000
2032	3,689	560,000	737,869	649,325	860,000
2033	3,874	560,000	774,763	681,791	860,000
2034	4,068	560,000	813,501	715,881	860,000

TCEQ minimum Total Storage Criteria =

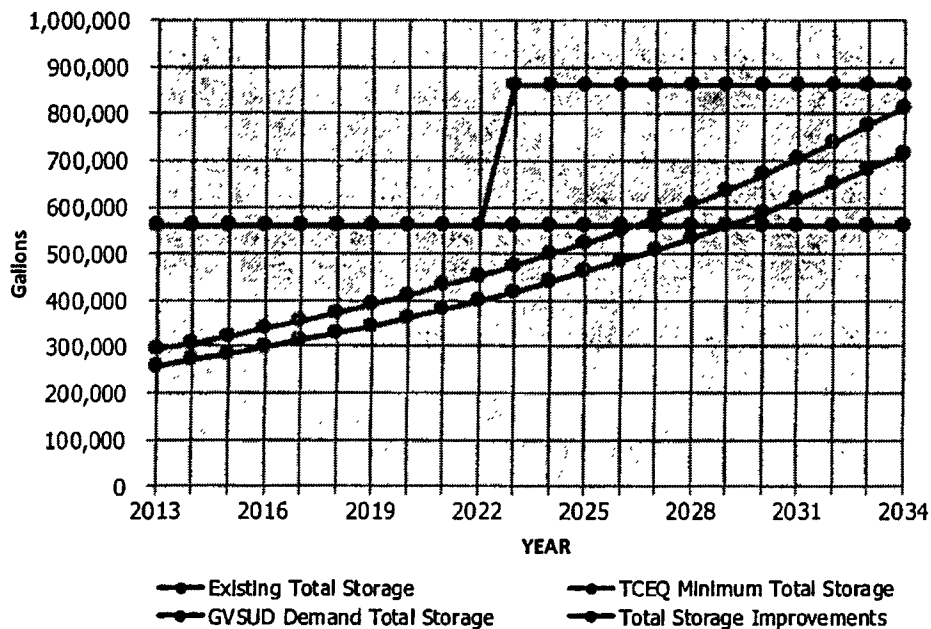
200

Gallons/Connection

GVSUD Total Storage Design Criteria =

176

Gallons/Connection



8.3 PROPOSED 1008-FT PRESSURE PLANE

The proposed 1008 pressure plane includes the existing Plant 1 and Plant 9 pressure planes. The boundary for this pressure plane will serve 3,030 connections and is projected to have 5,182 connections by the year 2024. This plane currently has 4,350 gallons per minute of pumping capacity (3,350 gpm with the largest 1,000-gpm pump out of commission), 480,000 gallons of ground capacity, 1,300,000 gallons of elevated storage capacity, and 5,000 gallons of pneumatic pressure tanks.

This plane currently has extensive storage capacity both elevated and ground. The Weil Road Booster Pump Station and ground storage tank currently in progress will add 3,600 gpm to the pumping capacity and 0.5 MG to the storage capacity. GVSUD plans to eliminate pressure tanks due to maintenance issues and high electricity costs associated with their use.

The following pages give an overview of the current situation and future infrastructure that will be needed by the year 2034 for the 1008' pressure plane. Below is a summary of this pressure planes deficiency.

1008 Pressure Plane			
	Elevated Storage (gallons)	Total Storage (gallons)	Pumping (gpm)
Existing	1,300,000	1,780,000	4,350
Required	0	0	7,150
Deficit	0	0	2,800*

*Deficit will be obtained once Weil Road Booster Station is constructed.

The proposed 1008 pressure plane will consist of three separate projects that will ensure that future water demands are met. Currently in progress, is a booster pump station on Weil Road that that will move CRWA water into this pressure plane. Another project currently in progress is a large segment of a 24" pipeline to eventually connect Plant 1 and Plant 9 allowing the two elevated storage tanks to float and operate on the same redundant pressures. The first project will be to upgrade Plant 9 with elevated storage and pumping capacity. The second project is to construct a direct fill pipeline from the existing wells north of IH 35 to Plant 1. The final project will be to upgrade the Plant 1 ground storage and pumping facilities. All these projects will ensure that GVSUD will be able to provide fire flow to future developments in this pressure plane. A summary of the projects needed for this pressure plane is shown in the table on the following page.

1008 Pressure Plane Proposed Improvements	
Project	Year
Plant 9 Improvements	2017
20" Pipe Line from Wells to Plant 1 Improvements	2019
Plant 1 - Storage & Pump Improvements	2020

Green Valley Special Utility District

2014 Water Master Plan

1008 Pressure Plane**PUMPING CAPACITY**

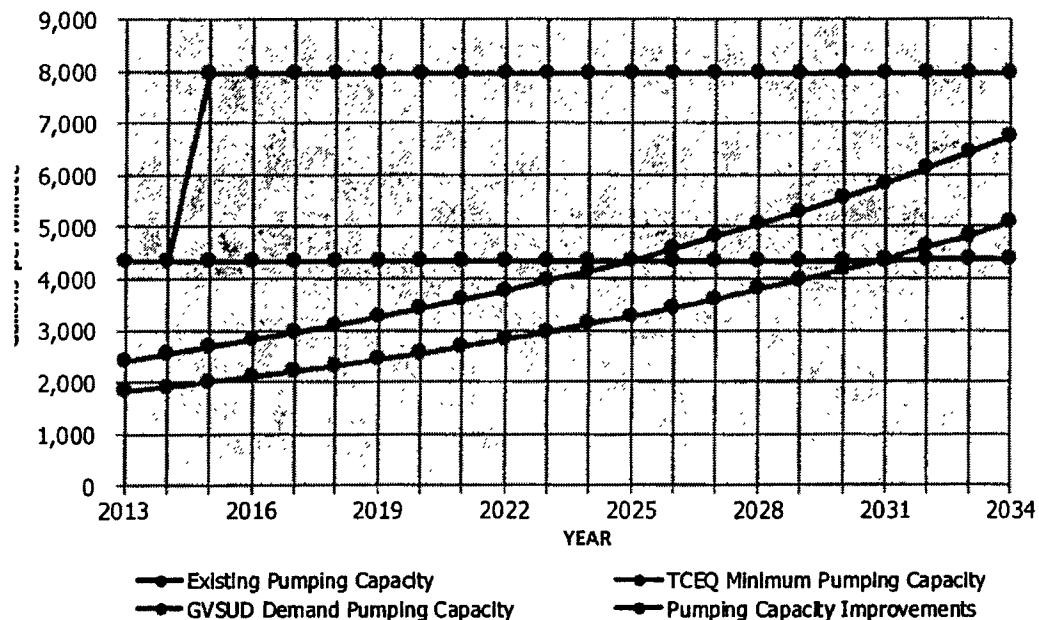
Year	Projected Connections	Existing Pumping Capacity	TCEQ Minimum Pumping Capacity	GVSUD Demand Pumping Capacity	Pumping Capacity Improvements
2013	3,030	4,350	1,818	2,424	4,350
2014	3,182	4,350	1,909	2,545	4,350
2015	3,341	4,350	2,004	2,672	7,950
2016	3,508	4,350	2,105	2,806	7,950
2017	3,683	4,350	2,210	2,946	7,950
2018	3,867	4,350	2,320	3,094	7,950
2019	4,060	4,350	2,436	3,248	7,950
2020	4,264	4,350	2,558	3,411	7,950
2021	4,477	4,350	2,686	3,581	7,950
2022	4,701	4,350	2,820	3,760	7,950
2023	4,936	4,350	2,961	3,948	7,950
2024	5,182	4,350	3,109	4,146	7,950
2025	5,441	4,350	3,265	4,353	7,950
2026	5,714	4,350	3,428	4,571	7,950
2027	5,999	4,350	3,600	4,799	7,950
2028	6,299	4,350	3,779	5,039	7,950
2029	6,614	4,351	3,968	5,291	7,950
2030	6,945	4,352	4,167	5,556	7,950
2031	7,292	4,353	4,375	5,834	7,950
2032	7,657	4,354	4,594	6,125	7,950
2033	8,039	4,355	4,824	6,432	7,950
2034	8,441	4,356	5,065	6,753	7,950

TCEQ minimum Pumping Capacity Criteria =

0.6 gpm/Connection

GVSUD Pumping Capacity Design Criteria =

0.8 gpm/Connection

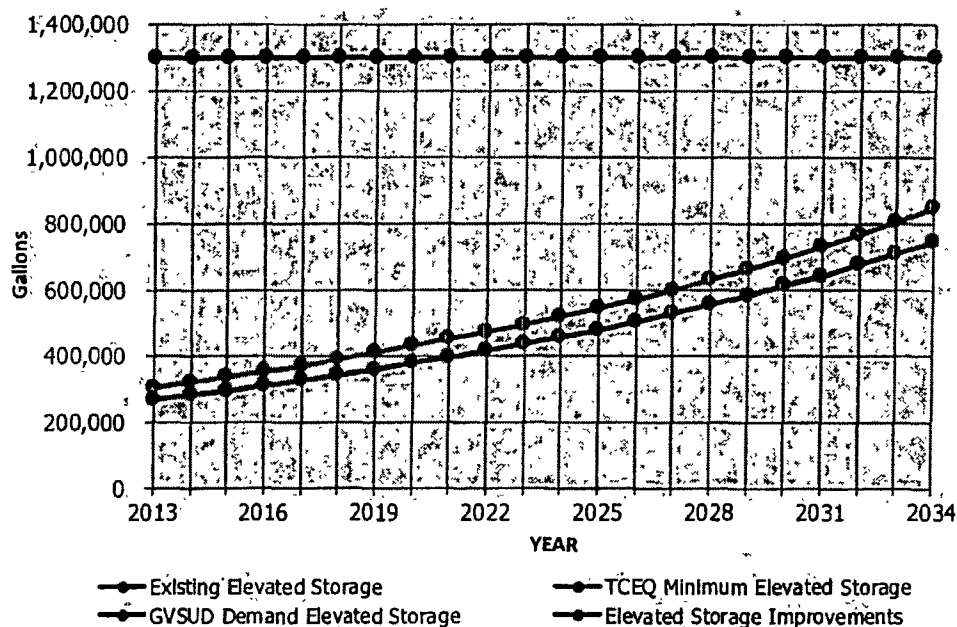


1008 Pressure Plane**ELEVATED STORAGE**

Year	Projected Connections	Existing Elevated Storage	TCEQ Minimum Elevated Storage	GVSUD Demand Elevated Storage	Elevated Storage Improvements
2013	3,030	1,300,000	303,000	266,640	
2014	3,182	1,300,000	318,150	279,972	
2015	3,341	1,300,000	334,058	293,971	
2016	3,508	1,300,000	350,760	308,669	
2017	3,683	1,300,000	368,298	324,103	
2018	3,867	1,300,000	386,713	340,308	
2019	4,060	1,300,000	406,049	357,323	
2020	4,264	1,300,000	426,351	375,189	
2021	4,477	1,300,000	447,669	393,949	
2022	4,701	1,300,000	470,052	413,646	
2023	4,936	1,300,000	493,555	434,328	
2024	5,182	1,300,000	518,233	456,045	
2025	5,441	1,300,000	544,144	478,847	
2026	5,714	1,300,000	571,352	502,789	
2027	5,999	1,300,000	599,919	527,929	
2028	6,299	1,300,000	629,915	554,325	
2029	6,614	1,300,000	661,411	582,042	
2030	6,945	1,300,000	694,482	611,144	
2031	7,292	1,300,000	729,206	641,701	
2032	7,657	1,300,000	765,666	673,786	
2033	8,039	1,300,000	803,949	707,475	
2034	8,441	1,300,000	844,147	742,849	

TCEQ minimum Elevated Storage Criteria =
 GVSUD Elevated Storage Design Criteria =

100 Gallons/Connection
 88 Gallons/Connection



Green Valley Special Utility District

2014 Water Master Plan

1008 Pressure Plane**TOTAL STORAGE**

Year	Projected Connections	Existing Total Storage	TCEQ Minimum Total Storage	GVSUD Demand Total Storage	Total Storage Improvements
2013	3,030	1,780,000	606,000	533,280	
2014	3,182	1,780,000	636,300	559,944	
2015	3,341	1,780,000	668,115	587,941	
2016	3,508	1,780,000	701,521	617,338	
2017	3,683	1,780,000	736,597	648,205	
2018	3,867	1,780,000	773,427	680,615	
2019	4,060	1,780,000	812,098	714,646	
2020	4,264	1,780,000	852,703	750,379	
2021	4,477	1,780,000	895,338	787,897	
2022	4,701	1,780,000	940,105	827,292	
2023	4,936	1,780,000	987,110	868,657	
2024	5,182	1,780,000	1,036,466	912,090	
2025	5,441	1,780,000	1,088,289	957,694	
2026	5,714	1,780,000	1,142,703	1,005,579	
2027	5,999	1,780,000	1,199,839	1,055,858	
2028	6,299	1,780,000	1,259,830	1,108,651	
2029	6,614	1,780,000	1,322,822	1,164,083	
2030	6,945	1,780,000	1,388,963	1,222,288	
2031	7,292	1,780,000	1,458,411	1,283,402	
2032	7,657	1,780,000	1,531,332	1,347,572	
2033	8,039	1,780,000	1,607,898	1,414,951	
2034	8,441	1,780,000	1,688,293	1,485,698	

TCEQ minimum Total Storage Criteria =

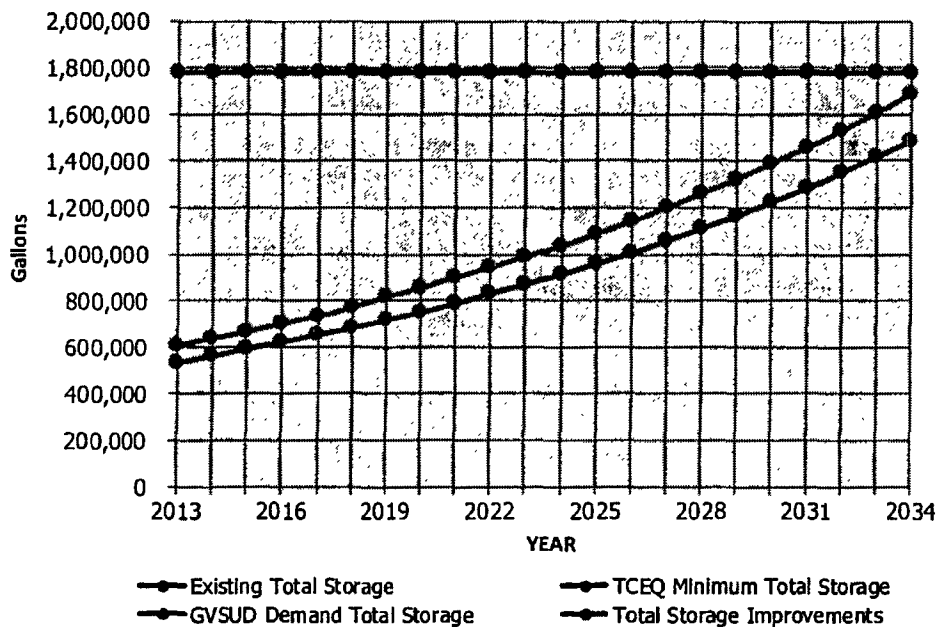
200

Gallons/Connection

GVSUD Total Storage Design Criteria =

176

Gallons/Connection



8.4 PROPOSED 897-FT PRESSURE PLANE

The proposed 897' pressure plane includes the current Plant 2, Plant 7, Plant 8 and the Damerau pressure planes. The boundary for this pressure plane currently serves 881 connections and is projected to grow to 1,507 connections by 2024. This plane currently has 6,600 gallons per minute of pumping capacity (a 5,800 gpm pumping capacity with the largest 800 gpm pump out of commission), 607,000 gallons of storage capacity and 100,000 gallons of elevated storage and 10,000 gallons of pneumatic pressure tanks. This pressure plane will need 150,000 gallons of additional elevated storage in order to meet GVSUD demand by 2034.

The following pages give an overview of the current situation and future infrastructure that will be needed by the year 2034 for the 897' pressure plane. Below is a summary of the deficiencies for this pressure plane.

897 Pressure Plane			
	Elevated Storage (gallons)	Total Storage (gallons)	Pumping (gpm)
Existing	100,000	707,000	6,600
Required	250,000	0	0
Deficit	150,000	0	0

The proposed 897-pressure plane primary consists of preparing the three Edwards Aquifer wells and one Trinity Aquifer well so that they can boost water into the 1008 pressure plane. The proposed projects include adding a ground storage tank that will allow well water from all 4 wells to be pumped to a common storage tank. This common storage tank will then pump water into the GVSUD system. The Weil Road Booster Pump Station and ground storage tank will also be able to pump to this pressure plane until the common ground storage tank described above is constructed. The fill pipeline from Youngsford to the Weil Road BPS will provide water from an additional source to the service area. The construction of a second Trinity Aquifer well will provide additional water to fill the proposed ground storage tank to supplement the GVSUD system. The modification to the existing pipelines is to connect the wells to Plant 1 & Plant 9 and secure confident easements. This will also ensure that Plant 1 & Plant 9 float together. These projects will ensure that future developments in this area are able to have sufficient domestic drinking water as well as fire flows. A summary of the projects needed for this pressure plane is shown below.

897 Pressure Plane Proposed Improvements	
Project	Year
897' Ground Storage Tank and Booster Pump Station	2017
16" Weil Road BPS Fill Pipeline – Youngsford to Weil Rd BPS	2018
Trinity Well Development	2019
24" Pipe Line that connects existing wells to 897' GST	2021
20" Pipe Line from Wells to Plant 9 Improvements	2022
20" Pipe Line from Wells to Plant 1 Improvements	2023

897 Pressure Plane**PUMPING CAPACITY**

Year	Projected Connections	Existing Pumping Capacity	TCEQ Minimum Pumping Capacity	GVSUD Demand Pumping Capacity	Pumping Capacity Improvements
2013	881	5,550	529	705	
2014	925	5,550	555	740	
2015	971	5,550	583	777	
2016	1,020	5,550	612	816	
2017	1,071	5,550	643	857	
2018	1,124	5,550	675	900	
2019	1,181	5,550	708	944	
2020	1,240	5,550	744	992	
2021	1,302	5,550	781	1,041	
2022	1,367	5,550	820	1,093	
2023	1,435	5,550	861	1,148	
2024	1,507	5,550	904	1,205	
2025	1,582	5,550	949	1,266	
2026	1,661	5,550	997	1,329	
2027	1,744	5,550	1,047	1,395	
2028	1,832	5,550	1,099	1,465	
2029	1,923	5,550	1,154	1,538	
2030	2,019	5,550	1,212	1,615	
2031	2,120	5,550	1,272	1,696	
2032	2,226	5,550	1,336	1,781	
2033	2,338	5,550	1,403	1,870	
2034	2,454	5,550	1,473	1,964	

TCEQ minimum Pumping Capacity Criteria =

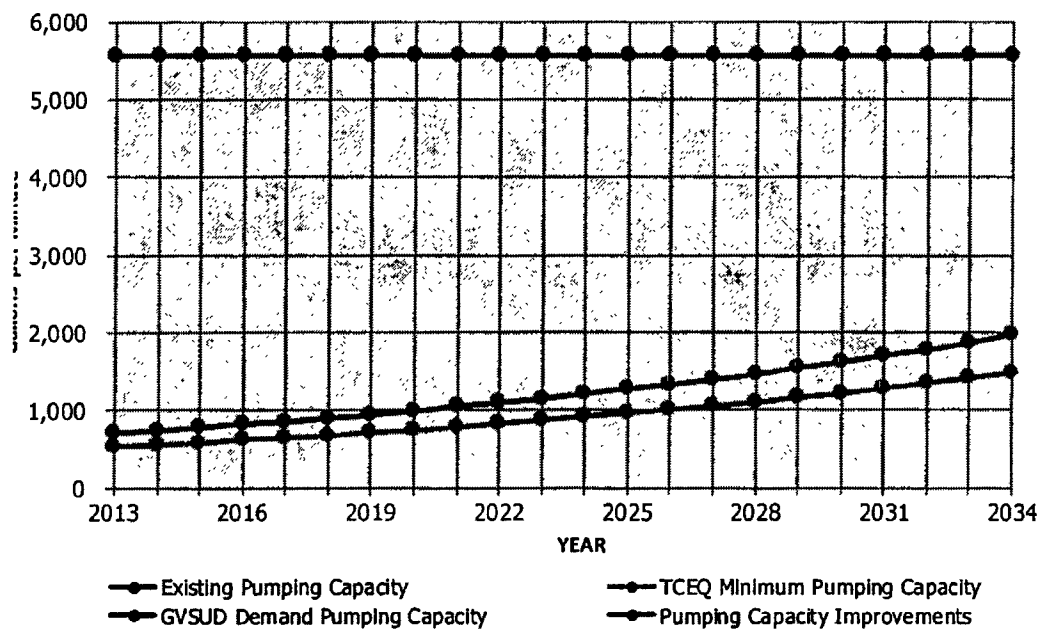
0.6

gpm/Connection

GVSUD Pumping Capacity Design Criteria =

0.8

gpm/Connection



Green Valley Special Utility District

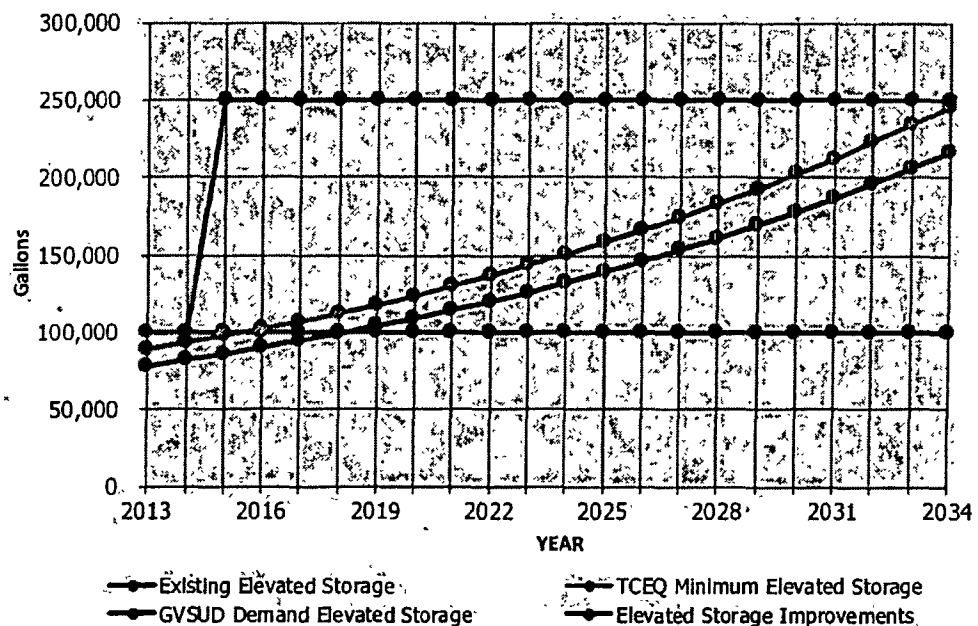
2014 Water Master Plan

897 Pressure Plane**ELEVATED STORAGE**

Year	Projected Connections	Existing Elevated Storage	TCEQ Minimum Elevated Storage	GVSUD Demand Elevated Storage	Elevated Storage Improvements
2013	881	100,000	88,100	77,528	100,000
2014	925	100,000	92,505	81,404	100,000
2015	971	100,000	97,130	85,475	250,000
2016	1,020	100,000	101,987	89,748	250,000
2017	1,071	100,000	107,086	94,236	250,000
2018	1,124	100,000	112,440	98,948	250,000
2019	1,181	100,000	118,062	103,895	250,000
2020	1,240	100,000	123,966	109,090	250,000
2021	1,302	100,000	130,164	114,544	250,000
2022	1,367	100,000	136,672	120,271	250,000
2023	1,435	100,000	143,506	126,285	250,000
2024	1,507	100,000	150,681	132,599	250,000
2025	1,582	100,000	158,215	139,229	250,000
2026	1,661	100,000	166,126	146,191	250,000
2027	1,744	100,000	174,432	153,500	250,000
2028	1,832	100,000	183,154	161,175	250,000
2029	1,923	100,000	192,311	169,234	250,000
2030	2,019	100,000	201,927	177,696	250,000
2031	2,120	100,000	212,023	186,580	250,000
2032	2,226	100,000	222,624	195,909	250,000
2033	2,338	100,000	233,756	205,705	250,000
2034	2,454	100,000	245,443	215,990	250,000

TCEQ minimum Elevated Storage Criteria =
 GVSUD Elevated Storage Design Criteria =

100 Gallons/Connection
88 Gallons/Connection



Green Valley Special Utility District

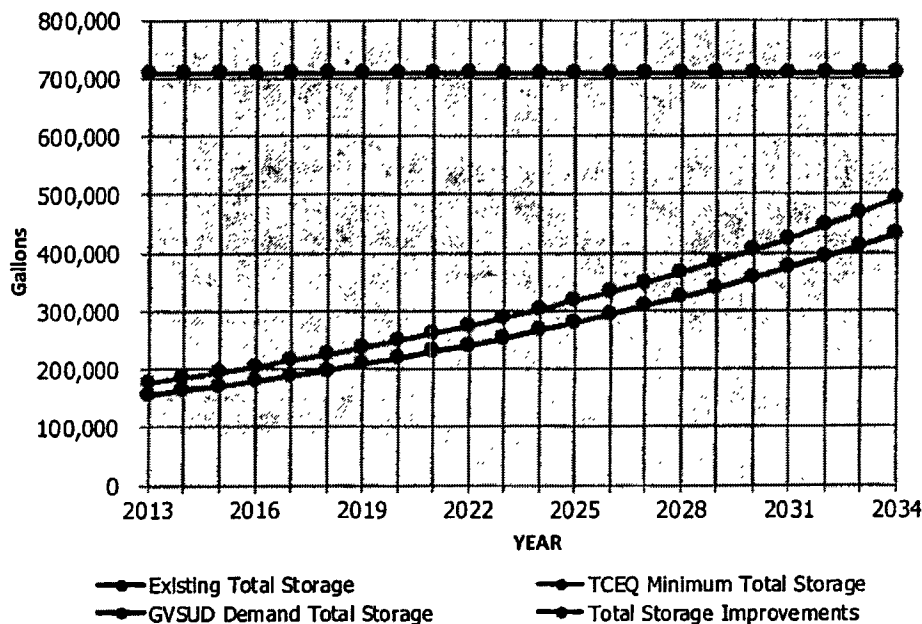
2014 Water Master Plan

897 Pressure Plane**TOTAL STORAGE**

Year	Projected Connections	Existing Total Storage	TCEQ Minimum Total Storage	GVSUD Demand Total Storage	Total Storage Improvements
2013	881	707,000	176,200	155,056	
2014	925	707,000	185,010	162,809	
2015	971	707,000	194,261	170,949	
2016	1,020	707,000	203,974	179,497	
2017	1,071	707,000	214,172	188,472	
2018	1,124	707,000	224,881	197,895	
2019	1,181	707,000	236,125	207,790	
2020	1,240	707,000	247,931	218,179	
2021	1,302	707,000	260,328	229,088	
2022	1,367	707,000	273,344	240,543	
2023	1,435	707,000	287,011	252,570	
2024	1,507	707,000	301,362	265,198	
2025	1,582	707,000	316,430	278,458	
2026	1,661	707,000	332,251	292,381	
2027	1,744	707,000	348,864	307,000	
2028	1,832	707,000	366,307	322,350	
2029	1,923	707,001	384,623	338,468	
2030	2,019	707,002	403,854	355,391	
2031	2,120	707,003	424,046	373,161	
2032	2,226	707,004	445,249	391,819	
2033	2,338	707,005	467,511	411,410	
2034	2,454	707,006	490,887	431,980	

TCEQ minimum Total Storage Criteria =
GVSUD Total Storage Design Criteria =

200 Gallons/Connection
176 Gallons/Connection



8.5 PROPOSED 830-FT PRESSURE PLANE

The proposed 830' pressure plane includes Plant 3, Plant 4, Haeckerville, and the Wagner pressure planes. This pressure plane currently has 1,800 gallons per minute of pumping capacity (1,350 gpm with one of the four 450 gpm pumps out of commission), 207,000 gallons of ground storage capacity and 700,000 gallons of elevated storage.

This plane will need to add approximately 23,000 gallons per minute of additional pumping capacity by 2034. This plane will use water from the 897-pressure plane since that plane has excess capacities. This pressure plane will be able to meet demands with some assistance from the 897 plane and CRWA existing infrastructure until it can get additional infrastructure built.

This pressure plane will need to add approximately 700,000 gallons of elevated storage by the year 2034. This pressure plane can continue to use water from the 897-pressure plane until infrastructure is in place.

In addition to the 700,000 gallons of elevated storage requirements, this plane will need an additional 750,000 gallons of storage in order to meet the total storage requirement.

The following pages give an overview of the current situation and future infrastructure that will be needed by the year 2034 for the 830' pressure plane. Below is a summary of the deficiencies for this pressure plane.

830 Pressure Plane			
	Elevated Storage (Gallons)	Total Storage (Gallons)	Pumping (GPM)
Existing	700,000	907,000	1,800
Required	1,400,000	2,457,000	24,800
Deficit	700,000	1,550,000	23,000

The proposed 830-pressure plane will consist of constructing an elevated storage tank and several pipeline upgrades. This elevated storage tank will also float with the existing Zipp Rd tank and Plant 3 tank. This elevated storage tank site will also need to contain at least 23,000 gallons per minute of additional pumping capacity in order to meet demands in the year 2034. A summary of the projects needed for this pressure plane is shown in the table below.

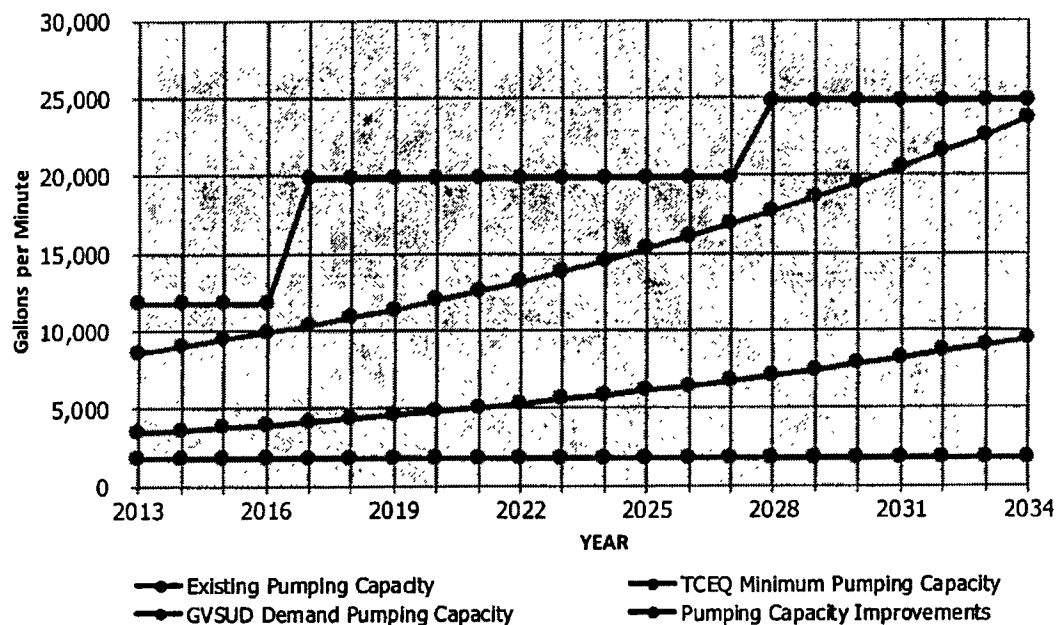
830 Pressure Plane Proposed Improvements	
Project	Year
Pipeline Along Klein Road – FM 1044 to FM 725	2016
8" Pipeline along Bolton Road (connect)	2017
GVSUD Take Point Meter Station at Santa Clara and IH 10	2018
16" Pipe Line Along Hardy Road	2019
830' EST @ Hardy Road and Union Wine	2020

830 Pressure Plane**PUMPING CAPACITY**

Year	Projected Connections	Existing Pumping Capacity	TCEQ Minimum Pumping Capacity	GVSUD Demand Pumping Capacity	Pumping Capacity Improvements
2013	4,250	1,800	8,500	3,400	11,800
2014	4,463	1,800	8,925	3,570	11,800
2015	4,686	1,800	9,371	3,749	11,800
2016	4,920	1,800	9,840	3,936	11,800
2017	5,166	1,800	10,332	4,133	19,800
2018	5,424	1,800	10,848	4,339	19,800
2019	5,695	1,800	11,391	4,556	19,800
2020	5,980	1,800	11,960	4,784	19,800
2021	6,279	1,800	12,558	5,023	19,800
2022	6,593	1,800	13,186	5,275	19,800
2023	6,923	1,800	13,846	5,538	19,800
2024	7,269	1,800	14,538	5,815	19,800
2025	7,632	1,800	15,265	6,106	19,800
2026	8,014	1,800	16,028	6,411	19,800
2027	8,415	1,800	16,829	6,732	19,800
2028	8,835	1,800	17,671	7,068	24,800
2029	9,277	1,800	18,554	7,422	24,800
2030	9,741	1,800	19,482	7,793	24,800
2031	10,228	1,800	20,456	8,183	24,800
2032	10,740	1,800	21,479	8,592	24,800
2033	11,277	1,800	22,553	9,021	24,800
2034	11,840	1,800	23,681	9,472	24,800

TCEQ minimum Pumping Capacity Criteria =
 GVSUD Pumping Capacity Design Criteria =

2.0 gpm/Connection
0.8 gpm/Connection

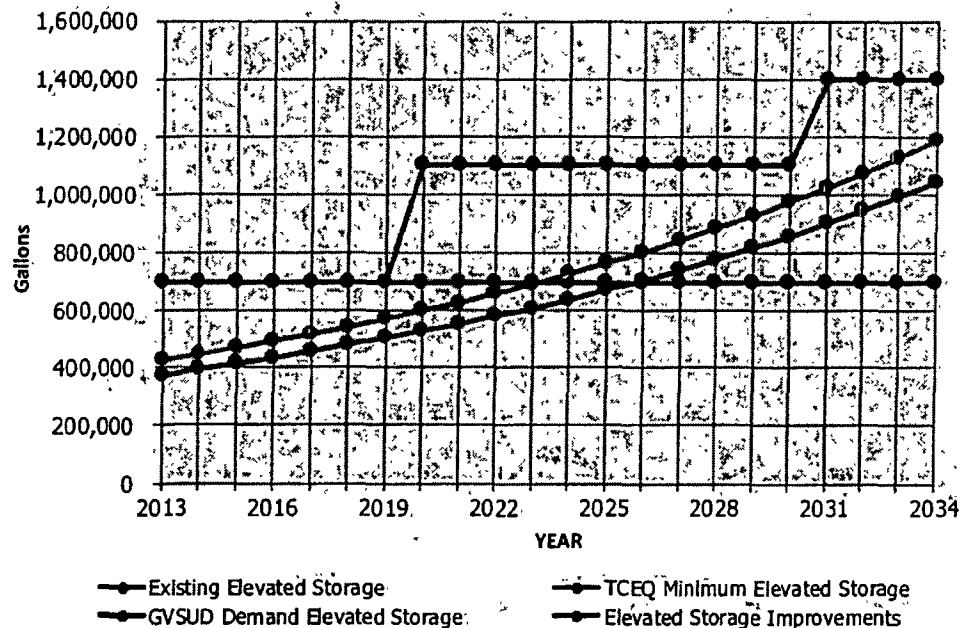


830 Pressure Plane**ELEVATED STORAGE**

Year	Projected Connections	Existing Elevated Storage	TCEQ Minimum Elevated Storage	GVSUD Demand Elevated Storage	Elevated Storage Improvements
2013	4,250	700,000	425,000	374,000	
2014	4,463	700,000	446,250	392,700	700,000
2015	4,686	700,000	468,563	412,335	700,000
2016	4,920	700,000	491,991	432,952	700,000
2017	5,166	700,000	516,590	454,599	700,000
2018	5,424	700,000	542,420	477,329	700,000
2019	5,695	700,000	569,541	501,196	700,000
2020	5,980	700,000	598,018	526,256	1,100,000
2021	6,279	700,000	627,919	552,568	1,100,000
2022	6,593	700,000	659,314	580,197	1,100,000
2023	6,923	700,000	692,280	609,207	1,100,000
2024	7,269	700,000	726,894	639,667	1,100,000
2025	7,632	700,000	763,239	671,650	1,100,000
2026	8,014	700,000	801,401	705,233	1,100,000
2027	8,415	700,000	841,471	740,494	1,100,000
2028	8,835	700,000	883,544	777,519	1,100,000
2029	9,277	700,000	927,722	816,395	1,100,000
2030	9,741	700,000	974,108	857,215	1,100,000
2031	10,228	700,000	1,022,813	900,076	1,400,000
2032	10,740	700,000	1,073,954	945,079	1,400,000
2033	11,277	700,000	1,127,652	992,333	1,400,000
2034	11,840	700,000	1,184,034	1,041,950	1,400,000

TCEQ minimum Elevated Storage Criteria =
 GVSUD Elevated Storage Design Criteria =

100 Gallons/Connection
88 Gallons/Connection



830 Pressure Plane**TOTAL STORAGE**

Year	Projected Connections	Existing Total Storage	TCEQ Minimum Total Storage	GVSUD Demand Total Storage	Total Storage Improvements
2013	4,250	907,000	850,000	748,000	1,407,000
2014	4,463	907,000	892,500	785,400	1,407,000
2015	4,686	907,000	937,125	824,670	1,407,000
2016	4,920	907,000	983,981	865,904	1,407,000
2017	5,166	907,000	1,033,180	909,199	1,407,000
2018	5,424	907,000	1,084,839	954,659	1,407,000
2019	5,695	907,000	1,139,081	1,002,392	1,407,000
2020	5,980	907,000	1,196,035	1,052,511	2,157,000
2021	6,279	907,000	1,255,837	1,105,137	2,157,000
2022	6,593	907,000	1,318,629	1,160,394	2,157,000
2023	6,923	907,000	1,384,560	1,218,413	2,157,000
2024	7,269	907,000	1,453,788	1,279,334	2,157,000
2025	7,632	907,000	1,526,478	1,343,301	2,157,000
2026	8,014	907,000	1,602,802	1,410,466	2,157,000
2027	8,415	907,000	1,682,942	1,480,989	2,157,000
2028	8,835	907,000	1,767,089	1,555,038	2,157,000
2029	9,277	907,000	1,855,443	1,632,790	2,157,000
2030	9,741	907,000	1,948,216	1,714,430	2,157,000
2031	10,228	907,000	2,045,626	1,800,151	2,457,000
2032	10,740	907,000	2,147,908	1,890,159	2,457,000
2033	11,277	907,000	2,255,303	1,984,667	2,457,000
2034	11,840	907,000	2,368,068	2,083,900	2,457,000

TCEQ minimum Total Storage Criteria =

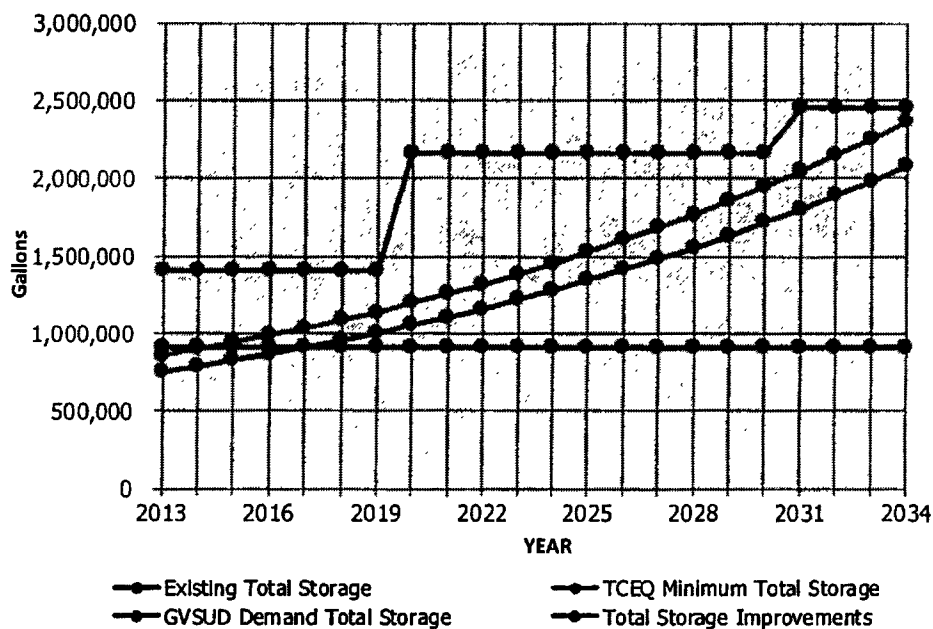
200

Gallons/Connection

GVSUD Total Storage Design Criteria =

176

Gallons/Connection



9.0 PROJECT LIST

For GVSUD to eventually operate with four (4) pressure planes the following projects are recommended. GVSUD should first focus on capital improvement projects that will improve the water system so that all water demands will be met. Attachment 'C', Proposed Capital Improvements gives an approximate location of the proposed projects as well as a proposed descriptive list of the projects. There are also several projects that GVSUD can pursue in order to make their water system work more efficiently and effectively, which will eliminate the need for constant system monitoring and hands on attention. These projects allow for a self-sustaining water system.

River City Engineering has a summary of project costs and is shown on the following page in Table 9.1. Also in Attachment 1, is a detailed cost estimate for the capital improvement projects.

Green Valley Special Utility District

2014 Water Master Plan

TABLE 9.1

Green Valley Special Utility District Statement of Probable Cost Proposed Capital Improvement Projects		
Project	Description	Total Cost
1	16" Pipe Line along Terminal Loop	\$ 436,391
2	24" Pipe Line that Connects Plant 1 to Plant 9	\$ 943,930
3	12" Pipe along Youngsford Road from Country Lane to Santa Clara	\$ 681,482
4	GVSUD Take-Point Meter Station at Zuehl Road & IH10	\$ 170,678
5	16" Pipe Line Along Green Valley Road, Plant 1 to Plant 2	\$ 7,447,496
6	12" Pipe from Wells to Plant 1	\$ 886,032
7	12" Pipe along FM 1518 from Abbott to Kusmierz	\$ 416,671
8	GVSUD Take-Point Meter Station at Linne Road & IH10	\$ 224,428
9	24" Pipe Line from Wells to Plant 9 Improvements	\$ 4,579,792
10	12" Pipe Line Along FM 482	\$ 2,573,630
11	24" Pipe Line IH-35 Crossing	\$ 939,676
12	Well Side Booster Pump Station	\$ 2,179,970
13	Plant 9 Improvements	\$ 2,621,296
14	830' Elevated Storage Tank at Most Western FM 78	\$ 2,347,485
15	12" Pipe Line along Marlon Road from CRWA Pipe to GV Road	\$ 1,054,146
16	12" Pipe Line along Toile Road & Country Lane	\$ 1,170,762
17	750' Elevated Water Storage Tank at McQueeney	\$ 3,965,167
18	12" Pipe along Schwab & Wosnig	\$ 1,490,904
19	Common Ground Storage Tank and Booster Pump Station	\$ 2,524,067
20	24" Pipe Line connects Existing Wells	\$ 1,576,310
21	750' Elevated Storage Tank at South of Plant 10	\$ 3,960,167
22	12" Pipeline along Well Road - BPS extension to Marlon Road	\$ 1,390,928
23	Pipeline along Klein Road - FM 1044 to FM 725	\$ 2,589,869
24	830' EST @ Hardy Rd and Union Wine	\$ 2,323,485
25	Pipeline from FM 725 to CRWA Lake Dunlap WTP	\$ 568,875
26	16" Pipeline along FM 725 - Union Wine to Altwein	\$ 687,853
27	16" Well Road BPS Fill Pipeline - Youngsford to Well Rd BPS	\$ 1,666,082
28	830' EST @ Youngsford and Short Cut Rd	\$ 2,365,485
29	12" Pipeline along N Santa Clara Rd - Well Rd to Gerdes Rd	\$ 2,368,355
30	16" Pipeline along Schumann Rd - Pioneer Rd to Plant 10	\$ 1,948,936
31	16" Pipeline along Pioneer Rd (connect)	\$ 255,999
32	8" Pipeline along Lower Valley Ln - Weir Rd to Haeckerville Rd	\$ 580,557
33	8" Pipeline along Lower Sequin Rd (connect)	\$ 431,657
34	8" Pipeline along Bolton Rd (connect)	\$ 223,437
35	8" Pipeline along Schmoekel Rd - Stolte Rd to Santa Clara Rd	\$ 922,623
36	GVSUD Take-Point Meter Station at Santa Clara Rd & IH10	\$ 154,996
37	750' EST @ Gin Road	\$ 2,365,485
38	8" Pipeline along FM 775 - Leissner School Rd to Beutnagel Ln	\$ 1,177,803
39	12" Pipeline along Abbott Road - FM 1518 to FM 2538	\$ 1,335,437
40	8" Pipeline along New Berlin Rd - Gable Ln to Miller Rd	\$ 1,121,154
41	8" Pipeline along Engel Rd - Green Valley Rd to Service Boundary	\$ 316,789
42	Plant 1 - 1MG Ground Storage Tank	\$ 1,402,522
43	16" Pipeline along FM 1044 from Green Valley Rd to Youngsford	\$ 3,524,957
44	16" Pipeline along Union Wine from FM 1044 to Sunshine Lane	\$ 1,669,664
45	16" Pipeline along Youngsford from FM 1044 to FM 725	\$ 3,708,914
46	16" Pipeline along FM 1044 from Youngsford to Wosnig Road	\$ 2,488,966
47	830' EST @ Plant 3	\$ 2,281,891
48	Trinity Well Development	\$ 1,100,000
Total		\$ 83,163,200

10.0 CONCLUSIONS AND RECOMMENDATIONS

RCE has analyzed GVSUD's existing water conditions in preparing this report. This analysis involved using historical data and projections in order to predict future growth. Using Attachment 'A', existing pressure planes map, RCE was able to analyze the existing water system and make professional engineering decisions for the future of GVSUD. It was determined that GVSUD will experience a 5% increase in water connections each year and water use of 0.34 acre-feet/connection each year. These growth rates were projected out until the year 2034. TCEQ minimum requirements were then compared to GVSUD historical data and the more stringent requirement was used for future planning. It was determined that GVSUD will need to combine several pressure planes as shown in Attachment 'B', Proposed Pressure Planes map, in order to allow for a simpler, more efficient water system.

In order to meet future demands and move water sources around the CCN service area, GVSUD will need to build additional infrastructure and find additional water rights. The capital improvement projects are identified in Attachment 'C', Proposed Capital Improvements Map. Once infrastructure is built, GVSUD will have a stable, self-sufficient, redundant water system.

It is recommended that the district adopt the proposed pressure planes and proposed capital improvement projects as the future outlook for the GVSUD water system. GVSUD must monitor and prioritize the Capital Improvements Projects listed in this report on a routine basis. GVSUD may shuffle the priority of the proposed CIPs to meet their current needs as their priorities change and growth occurs.

The projections in this report are only intended to serve as a guide. Due to the Study Area's layout, possibility of service expansions through further annexation, and changing political and economic climates, projections beyond a five or ten year horizon involve a great deal of speculation. It is therefore essential that projected water demands and system limitations be evaluated and updated on a routine basis.

ATTACHMENT 1

DETAILED STATEMENT OF PROBABLE COST

Green Valley Special Utility District 16" Pipe Line along Terminal Loop

1

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare ROW	LF	2,100	\$1.00	\$2,100.00
2	Install 16" diameter PVC C905 pipe	LF	2,100	\$100.00	\$210,000.00
3	Install 16" diameter gate valves w/box	EA	2	\$5,500.00	\$11,000.00
4	Install 16" diameter tie-ins	EA	2	\$4,000.00	\$8,000.00
5	Ductile Iron Fittings	TON	2	\$4,800.00	\$9,600.00
6	Install Fire Hydrant Assembly	EA	3	\$4,500.00	\$13,500.00
7	Fencing Repair	LF	2,100	\$1.00	\$2,100.00
8	Final Grade & Seed	LF	2,100	\$1.00	\$2,100.00
9	16" PRV	EA	1	\$25,000.00	\$25,000.00
	TOTAL CONSTRUCTION				\$283,400.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$28,340.00
	Contingencies	10%			\$28,340.00
	TOTAL				\$340,080.00
	Easements	LF	2,100	\$12.00	\$25,200.00
	Easement Surveys and Acquisition Costs	LF	2,100	\$5.00	\$10,500.00
	Easement Acquisition Consultant	LF	2,100	\$5.00	\$10,500.00
	TOTAL EASEMENT COSTS				\$46,200.00
	Basic Engineering	12%			\$40,809.60
	Surveying	LF	2,100	\$2.00	\$4,200.00
	Construction Phase Services	1.5%			\$5,101.20
	TOTAL ENGINEERING COSTS				\$50,110.80
	TOTAL PROJECT				\$436,390.80

Green Valley Special Utility District 24" Pipe Line that Connects Plant 1 to Plant 9

2

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare ROW	LF	4,100	\$1.00	\$4,100.00
2	Install 24" diameter Dip Water pipe	LF	4,100	\$120.00	\$492,000.00
3	Install 24" diameter valves w/box	EA	5	\$12,500.00	\$62,500.00
4	Install 24" diameter tie-ins	EA	2	\$4,500.00	\$9,000.00
5	Ductile Iron Fittings	TON	5	\$4,500.00	\$22,500.00
6	Install Fire Hydrant Assembly	EA	5	\$4,500.00	\$22,500.00
7	Fencing Repair	LF	4,100	\$1.00	\$4,100.00
8	Final Grade & Seed	LF	4,100	\$1.00	\$4,100.00
	TOTAL CONSTRUCTION				\$620,800.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$62,080.00
	Contingencies	10%			\$62,080.00
	TOTAL				\$744,960.00
	Easements	LF	4,100	\$12.00	\$49,200.00
	Easement Surveys and Acquisition Costs	LF	4,100	\$5.00	\$20,500.00
	Easement Acquisition Consultant	LF	4,100	\$5.00	\$20,500.00
	TOTAL EASEMENT COSTS				\$90,200.00
	Basic Engineering	12%			\$89,395.20
	Surveying	LF	4,100	\$2.00	\$8,200.00
	Construction Phase Services	1.5%			\$11,174.40
	TOTAL ENGINEERING COSTS				\$108,769.60
	TOTAL PROJECT				\$943,929.60

Green Valley Special Utility District **3**
12" Pipe along Youngsford Road from Country Lane to Santa Clara

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare ROW	LF	5,400	\$1.00	\$5,400.00
2	Install 12" diameter PVC C909 pipe	LF	5,400	\$65.00	\$351,000.00
3	Install 12" diameter gate valves w/box	EA	2	\$2,500.00	\$5,000.00
4	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
5	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
6	Install Fire Hydrant Assembly	EA	4	\$4,500.00	\$18,000.00
7	Fencing Repair	LF	5,400	\$1.00	\$5,400.00
8	Final Grade & Seed	LF	5,400	\$1.00	\$5,400.00
TOTAL CONSTRUCTION					\$405,200.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$40,520.00
	Contingencies	10%			\$40,520.00
	TOTAL				\$486,240.00
	Easements	LF	5,400	\$12.00	\$64,800.00
	Easement Surveys and Acquisition Costs	LF	5,400	\$5.00	\$27,000.00
	Easement Acquisition Consultant	LF	5,400	\$5.00	\$27,000.00
	TOTAL EASEMENT COSTS				\$118,800.00
	Basic Engineering	12%			\$58,348.80
	Surveying	LF	5,400	\$2.00	\$10,800.00
	Construction Phase Services	1.5%			\$7,293.60
	TOTAL ENGINEERING COSTS				\$76,442.40
	TOTAL PROJECT				\$681,482.40

Green Valley Special Utility District
GVSUD Take-Point Meter Station at Zuehl Road & IH10

4

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	0.25	\$2,500.00	\$625.00
2	8" Cla Val	EA	1	\$25,000.00	\$25,000.00
3	Install 16" diameter DIP Class 350 pipe	LF	100	\$100.00	\$10,000.00
4	Install 8" diameter DIP Class 350 pipe	LF	25	\$60.00	\$1,500.00
5	Install 16" diameter valves w/box	EA	1	\$5,500.00	\$5,500.00
6	Install 16" diameter tie-ins	EA	1	\$4,000.00	\$4,000.00
7	Ductile Iron Fittings	TON	1	\$4,500.00	\$2,250.00
8	Install Fire Hydrant Assembly	EA	0	\$4,500.00	\$0.00
9	Metering Station Concrete & Buidling	SF	288	\$35.00	\$10,080.00
10	Site Power	LS	1	\$2,500.00	\$2,500.00
11	Site Electrical	LS	1	\$12,000.00	\$12,000.00
12	Chemical Building and Chemical Yard Pipe	LS	1	\$15,000.00	\$15,000.00
13	Site Controls and Communication	LS	1	\$15,000.00	\$15,000.00
14	Driveway	SY	200	\$45.00	\$9,000.00
15	Fencing	LF	120	\$12.00	\$1,440.00
16	Landscaping	LS	1	\$500.00	\$500.00
	TOTAL CONSTRUCTION				\$114,395.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$11,439.50
	Contingencies	10%			\$12,583.45
	TOTAL				\$138,417.95
	Property	AC	0.25	\$5,000.00	\$1,250.00
	Easement Surveys and Acquisition Costs	LS	1.00	\$5,000.00	\$5,000.00
	Attorney	LS	1.00	\$5,000.00	\$5,000.00
	TOTAL EASEMENT COSTS				\$11,250.00
	Basic Engineering	12%			\$16,610.15
	Surveying	LS	1	\$2,000.00	\$2,000.00
	Geotechnical	LS	2	\$1,200.00	\$2,400.00
	TOTAL ENGINEERING COSTS				\$21,010.15
	TOTAL PROJECT				\$170,678.10

Green Valley Special Utility District
16" Pipe Line Along Green Valley Road, Plant 1 to Plant 2

5

Engineers Opinion of Probable Costs:

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	43,600	\$1.00	\$43,600.00
2	Install 16" diameter PVC C905 Pipe	LF	43,600	\$100.00	\$4,360,000.00
3	Install 16" diameter gate valves w/box	EA	22	\$5,500.00	\$121,000.00
4	Install 16" diameter tie-ins	EA	2	\$4,000.00	\$8,000.00
5	Ductile Iron Fittings	TON	10	\$4,500.00	\$45,000.00
6	Install Fire Hydrant Assembly	EA	22	\$4,500.00	\$99,000.00
7	Fencing Repair	LF	43,600	\$1.00	\$43,600.00
8	Final Grade & Seed	LF	43,600	\$1.00	\$43,600.00
	SUBTOTAL				\$4,763,800.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$476,380.00
	Contingencies	10%			\$476,380.00
	TOTAL				\$5,716,560.00
	Easements	LF	43,600	\$12.00	\$523,200.00
	Easement Surveys and Acquisition Costs	LF	43,600	\$3.00	\$130,800.00
	Easement Acquisition Consultant	LF	43,600	\$5.00	\$218,000.00
	TOTAL EASEMENT COSTS				\$872,000.00
	Basic Engineering	12%			\$685,987.20
	Surveying	LF	43,600	\$2.00	\$87,200.00
	Construction Phase Services	1.5%			\$85,748.40
	TOTAL ENGINEERING COSTS				\$858,935.60
	TOTAL PROJECT				\$7,447,495.60

Green Valley Special Utility District 12" Pipe from Wells to Plant 1

6

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare ROW	LF	6,500	\$1.00	\$6,500.00
2	Install 12" diameter PVC C909 Pipe	LF	6,500	\$65.00	\$422,500.00
3	Install 12" diameter valves w/box	EA	10	\$2,500.00	\$25,000.00
4	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
5	Ductile Iron Fittings	TON	4	\$4,500.00	\$18,000.00
6	Install Fire Hydrant Assembly	EA	10	\$4,500.00	\$45,000.00
7	Fencing Repair	LF	6,500	\$1.00	\$6,500.00
8	Final Grade & Seed	LF	6,500	\$1.00	\$6,500.00
	TOTAL CONSTRUCTION				\$536,000.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$53,600.00
	Contingencies	10%			\$53,600.00
	TOTAL				\$643,200.00
	Easements	LF	6,500	\$12.00	\$78,000.00
	Easement Surveys and Acquisition Costs	LF	6,500	\$5.00	\$32,500.00
	Easement Acquisition Consultant	LF	6,500	\$5.00	\$32,500.00
	TOTAL EASEMENT COSTS				\$143,000.00
	Basic Engineering	12%			\$77,184.00
	Surveying	LF	6,500	\$2.00	\$13,000.00
	Construction Phase Services	1.5%			\$9,648.00
	TOTAL ENGINEERING COSTS				\$99,832.00
	TOTAL PROJECT				\$886,032.00

Green Valley Special Utility District
12" Pipe along FM 1518 from Abbott to Kusmierz

7

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare ROW	LF	3,100	\$1.00	\$3,100.00
2	Install 12" diameter PVC C909 pipe	LF	3,100	\$65.00	\$201,500.00
3	Install 12" diameter gate valves w/box	EA	3	\$2,500.00	\$7,500.00
4	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
5	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
6	Install Fire Hydrant Assembly	EA	4	\$4,500.00	\$18,000.00
7	Fencing Repair	LF	3,100	\$1.00	\$3,100.00
8	Final Grade & Seed	LF	3,100	\$1.00	\$3,100.00
	TOTAL CONSTRUCTION				\$251,300.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$25,130.00
	Contingencies	10%			\$25,130.00
	TOTAL				\$301,560.00
	Easements	LF	3,100	\$12.00	\$37,200.00
	Easement Surveys and Acquisition Costs	LF	3,100	\$5.00	\$15,500.00
	Easement Acquisition Consultant	LF	3,100	\$5.00	\$15,500.00
	TOTAL EASEMENT COSTS				\$68,200.00
	Basic Engineering	12%			\$36,187.20
	Surveying	LF	3,100	\$2.00	\$6,200.00
	Construction Phase Services	1.5%			\$4,523.40
	TOTAL ENGINEERING COSTS				\$46,910.60
	TOTAL PROJECT				\$416,670.60

Green Valley Special Utility District
GVSUD Take-Point Meter Station at Linne Road & IH10

8

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	0.25	\$2,500.00	\$625.00
2	8" Cla Val	EA	1	\$25,000.00	\$25,000.00
3	Install 16" diameter DIP Class 350 pipe	LF	100	\$100.00	\$10,000.00
4	Install 8" diameter DIP Class 350 pipe	LF	25	\$60.00	\$1,500.00
5	Install 16" diameter valves w/box	EA	1	\$5,500.00	\$5,500.00
6	Install 16" diameter tie-ins	EA	1	\$4,000.00	\$4,000.00
7	Ductile Iron Fittings	TON	1	\$4,500.00	\$2,250.00
8	Install Fire Hydrant Assembly	EA	0	\$4,500.00	\$0.00
9	Metering Station Concrete & Buidling	SF	288	\$35.00	\$10,080.00
10	Site Power	LS	1	\$2,500.00	\$2,500.00
11	Site Electrical	LS	1	\$12,000.00	\$12,000.00
12	Chemical Building and Chemical Yard Pipe	LS	1	\$15,000.00	\$15,000.00
13	Site Controls and Communication	LS	1	\$15,000.00	\$15,000.00
14	Driveway	SY	200	\$45.00	\$9,000.00
15	Fencing	LF	120	\$12.00	\$1,440.00
16	Landscaping	LS	1	\$500.00	\$500.00
	TOTAL CONSTRUCTION				\$114,395.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$11,439.50
	Contingencies	10%			\$12,583.45
	TOTAL				\$138,417.95
	Property	LS	1.00	\$40,000.00	\$40,000.00
	Easement Surveys and Acquisition Costs	LS	1.00	\$20,000.00	\$20,000.00
	Attorney	LS	1.00	\$5,000.00	\$5,000.00
	TOTAL EASEMENT COSTS				\$65,000.00
	Basic Engineering	12%			\$16,610.15
	Surveying	LS	1	\$2,000.00	\$2,000.00
	Geotechnical	LS	2	\$1,200.00	\$2,400.00
	TOTAL ENGINEERING COSTS				\$21,010.15
	TOTAL PROJECT				\$224,428.10

Green Valley Special Utility District
24" Pipe Line from Wells to Plant 9 Improvements

9

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	16,500	\$1.00	\$16,500.00
2	Install 24" diameter DIP	LF	16,500	\$175.00	\$2,887,500.00
3	Install 24" diameter valves w/box	EA	8	\$7,750.00	\$62,000.00
4	Install 24" diameter tie-ins	EA	4	\$4,700.00	\$18,800.00
5	Ductile Iron Fittings	TON	4	\$4,500.00	\$18,000.00
6	Install Fire Hydrant Assembly	EA	8	\$4,500.00	\$36,000.00
7	Fencing Repair	LF	16,500	\$1.00	\$16,500.00
8	Final Grade & Seed	LF	16,500	\$1.00	\$16,500.00
	TOTAL CONSTRUCTION				\$3,071,800.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$307,180.00
	Contingencies	10%			\$307,180.00
	TOTAL				\$3,686,160.00
	Easements	LF	16,500	\$12.00	\$198,000.00
	Easement Surveys and Acquisition Costs	LF	16,500	\$5.00	\$82,500.00
	Easement Acquisition Consultant	LF	16,500	\$5.00	\$82,500.00
	TOTAL EASEMENT COSTS				\$363,000.00
	Basic Engineering	12%			\$442,339.20
	Surveying	LF	16,500	\$2.00	\$33,000.00
	Construction Phase Services	1.5%			\$55,292.40
	TOTAL ENGINEERING COSTS				\$530,631.60
	TOTAL PROJECT				\$4,579,791.60

**Green Valley Special Utility District
12" Pipe Line Along FM 482**

10

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	22,000	\$1.00	\$22,000.00
2	Install 12" diameter PVC C900 Pipe	LF	22,000	\$65.00	\$1,430,000.00
3	Install 12" diameter gate valves w/box	EA	11	\$2,500.00	\$27,500.00
4	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
5	Ductile Iron Fittings	TON	8	\$4,500.00	\$36,000.00
6	Install Fire Hydrant Assembly	EA	11	\$4,500.00	\$49,500.00
7	Fencing Repair	LF	22,000	\$1.00	\$22,000.00
8	Final Grade & Seed	LF	22,000	\$1.00	\$22,000.00
	TOTAL CONSTRUCTION				\$1,615,000.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$161,500.00
	Contingencies	10%			\$161,500.00
	TOTAL				\$1,938,000.00
	Easements	LF	22,000	\$12.00	\$264,000.00
	Easement Surveys and Acquisition Costs	LF	22,000	\$2.00	\$44,000.00
	Easement Acquisition Consultant	LF	22,000	\$1.00	\$22,000.00
	TOTAL EASEMENT COSTS				\$330,000.00
	Basic Engineering	12%			\$232,560.00
	Surveying	LF	22,000	\$2.00	\$44,000.00
	Construction Phase Services	1.5%			\$29,070.00
	TOTAL ENGINEERING COSTS				\$305,630.00
	TOTAL PROJECT				\$2,573,630.00

Green Valley Special Utility District **24" Pipe Line IH-35 Crossing**

11

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	2,500	\$1.00	\$2,500.00
2	Install 24" diameter DIP	LF	2,500	\$175.00	\$437,500.00
3	Install 24" diameter gate valves w/box	EA	2	\$9,350.00	\$18,700.00
4	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
5	Ductile Iron Fittings	TON	4	\$4,500.00	\$18,000.00
6	Install Fire Hydrant Assembly	EA	5	\$4,500.00	\$22,500.00
7	Fencing Repair	LF	2,500	\$1.00	\$2,500.00
8	Final Grade & Seed	LF	2,500	\$1.00	\$2,500.00
9	Bore	LF	250	\$500.00	\$125,000.00
	TOTAL CONSTRUCTION				\$642,200.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$64,220.00
	Contingencies	10%			\$64,220.00
	TOTAL				\$770,640.00
	Easements	LF	2,500	\$12.00	\$30,000.00
	Easement Surveys and Acquisition Costs	LF	2,500	\$5.00	\$12,500.00
	Easement Acquisition Consultant	LF	2,500	\$5.00	\$12,500.00
	TOTAL EASEMENT COSTS				\$55,000.00
	Basic Engineering	12%			\$92,476.80
	Surveying	LF	5,000	\$2.00	\$10,000.00
	Construction Phase Services	1.5%			\$11,559.60
	TOTAL ENGINEERING COSTS				\$114,036.40
	TOTAL PROJECT				\$939,676.40

Note: 1. Unit prices were used from SAWS average unit price list revised October 2005.

Green Valley Special Utility District Well Side Booster Pump Station

12

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.5	\$2,500.00	\$3,750.00
2	0.5 MG Composite Ground Storage Tank	EA	1	\$500,000.00	\$500,000.00
3	Install 24" diameter DIP Water pipe	LF	250	\$175.00	\$43,750.00
4	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
5	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
6	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
8	Pumps, Pump Pad, Appurtenances Facility	LS	1	\$250,000.00	\$250,000.00
9	MCC, MCC Building, and MCC Building Items	LS	1	\$300,000.00	\$300,000.00
10	Site Power	LS	1	\$75,000.00	\$75,000.00
11	Chemical Building and Chemical Yard Pipe	LS	1	\$50,000.00	\$50,000.00
12	Site Controls and Communication	LS	1	\$75,000.00	\$75,000.00
13	Driveway	SY	500	\$45.00	\$22,500.00
14	Fencing	LF	1,000	\$12.00	\$12,000.00
15	Landscaping	LS	1	\$2,500.00	\$2,500.00
16	Emergency Generator	LS	1	\$200,000.00	\$200,000.00
	TOTAL CONSTRUCTION				\$1,598,400.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$159,840.00
	Contingencies	10%			\$175,824.00
	TOTAL				\$1,934,064.00
	Property	AC	1.0	\$28,000.00	\$28,000.00
	Easement Surveys and Acquisition Costs	AC	1.0	\$3,000.00	\$3,000.00
	Attorney	LS	1.0	\$7,500.00	\$7,500.00
	TOTAL EASEMENT COSTS				\$38,500.00
	Basic Engineering	10%			\$193,406.40
	Surveying	LS	1	\$4,500.00	\$4,500.00
	Geotechnical	LS	1	\$9,500.00	\$9,500.00
	TOTAL ENGINEERING COSTS				\$207,406.40
	TOTAL PROJECT				\$2,179,970.40

Green Valley Special Utility District Plant 9 Improvements

13

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.0	\$2,500.00	\$2,500.00
2	1 MG Composite Elevated Storage Tank	EA	1	\$1,500,000.00	\$1,500,000.00
3	Install 24" diameter DIP Water pipe	LF	500	\$175.00	\$87,500.00
4	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
5	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
6	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
8	Emergency Generator	EA	1	\$200,000.00	\$200,000.00
9	Demo Existing Plant 9	LS	1	\$75,000.00	\$75,000.00
10	Driveway, Fencing, Landscape Site Dress Up	LS	1	\$30,000.00	\$30,000.00
	TOTAL CONSTRUCTION				\$1,958,900.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$195,890.00
	Contingencies	10%			\$215,479.00
	TOTAL				\$2,370,269.00
	Easements		0	\$12.00	\$0.00
	Easement Surveys and Acquisition Costs		0	\$2.00	\$0.00
	Environmental Investigation		0	\$1.00	\$0.00
	TOTAL EASEMENT COSTS				\$0.00
	Basic Engineering	10%			\$237,026.90
	Surveying	LS	1	\$4,500.00	\$4,500.00
	Geotechnical Services	LS	1	\$9,500.00	\$9,500.00
	TOTAL ENGINEERING COSTS				\$251,026.90
	TOTAL PROJECT				\$2,621,295.90

Green Valley Special Utility District
830' Elevated Storage Tank at Most Western FM 78

14

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.0	\$45,000.00	\$45,000.00
2	1 MG Composite Elevated Storage Tank	EA	1	\$1,500,000.00	\$1,500,000.00
3	Install 24" diameter DIP Water pipe	LF	550	\$175.00	\$96,250.00
4	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
5	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
6	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
8	Driveway, Fencing, Landscape Site Dress Up	LS	1	\$30,000.00	\$30,000.00
	TOTAL CONSTRUCTION				\$1,735,150.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$173,515.00
	Contingencies	10%			\$190,866.50
	TOTAL				\$2,099,531.50
	Property	AC	1.0	\$12,000.00	\$12,000.00
	Easement Surveys and Acquisition Costs	LS	1.0	\$4,500.00	\$4,500.00
	Attorney	LS	1.0	\$7,500.00	\$7,500.00
	TOTAL EASEMENT COSTS				\$24,000.00
	Basic Engineering	10%			\$209,953.15
	Surveying	LS	1	\$4,500.00	\$4,500.00
	Geotechnical	LS	1	\$9,500.00	\$9,500.00
	TOTAL ENGINEERING COSTS				\$223,953.15
	TOTAL PROJECT				\$2,347,484.65

15

Green Valley Special Utility District
12" Pipe Line along Marion Road from CRWA Pipe to GV Road

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	8,000	\$1.00	\$8,000.00
2	Install 12" diameter PVC C909 Pipe	LF	8,000	\$65.00	\$520,000.00
3	Install 12" diameter gate valves w/box	EA	8	\$2,500.00	\$20,000.00
4	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
5	Ductile Iron Fittings	TON	6	\$4,500.00	\$27,000.00
6	Install Fire Hydrant Assembly	EA	8	\$4,500.00	\$36,000.00
7	Fencing Repair	LF	8,000	\$1.00	\$8,000.00
8	Final Grade & Seed	LF	8,000	\$1.00	\$8,000.00
	TOTAL CONSTRUCTION				\$633,000.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$63,300.00
	Contingencies	10%			\$63,300.00
	TOTAL				\$759,600.00
	Easements	LF	8,000	\$12.00	\$96,000.00
	Easement Surveys and Acquisition Costs	LF	8,000	\$5.00	\$40,000.00
	Easement Acquisition Consultant	LF	8,000	\$5.00	\$40,000.00
	TOTAL EASEMENT COSTS				\$176,000.00
	Basic Engineering	12%			\$91,152.00
	Surveying	LF	8,000	\$2.00	\$16,000.00
	Construction Phase Services	1.5%			\$11,394.00
	TOTAL ENGINEERING COSTS				\$118,546.00
	TOTAL PROJECT				\$1,054,146.00

Green Valley Special Utility District
12" Pipe Line along Tolle Road & Country Lane

16

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	9,000	\$1.00	\$9,000.00
2	Install 12" diameter PVC C909 Pipe	LF	9,000	\$65.00	\$585,000.00
3	Install 12" diameter gate valves w/box	EA	8	\$2,500.00	\$20,000.00
4	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
5	Ductile Iron Fittings	TON	6	\$4,500.00	\$27,000.00
6	Install Fire Hydrant Assembly	EA	8	\$4,500.00	\$36,000.00
7	Fencing Repair	LF	9,000	\$1.00	\$9,000.00
8	Final Grade & Seed	LF	9,000	\$1.00	\$9,000.00
	TOTAL CONSTRUCTION				\$701,000.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$70,100.00
	Contingencies	10%			\$70,100.00
	TOTAL				\$841,200.00
	Easements	LF	9,000	\$12.00	\$108,000.00
	Easement Surveys and Acquisition Costs	LF	9,000	\$5.00	\$45,000.00
	Easement Acquisition Consultant	LF	9,000	\$5.00	\$45,000.00
	TOTAL EASEMENT COSTS				\$198,000.00
	Basic Engineering	12%			\$100,944.00
	Surveying	LF	9,000	\$2.00	\$18,000.00
	Construction Phase Services	1.5%			\$12,618.00
	TOTAL ENGINEERING COSTS				\$131,562.00
	TOTAL PROJECT				\$1,170,762.00

Green Valley Special Utility District
750' Elevated Water Storage Tank at McQueeney

17

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.0	\$2,500.00	\$2,500.00
2	1 MG Composite Elevated Storage Tank	EA	1	\$1,500,000.00	\$1,500,000.00
3	0.5 MG Concrete Ground Storage Tank	EA	1	\$500,000.00	\$500,000.00
4	Pumps, Pump Pad; Appurtenances, Chem.	LS	1	\$250,000.00	\$250,000.00
5	MCC, Building; Site Power, SCADA	LS	1	\$300,000.00	\$300,000.00
6	Install 24" diameter DIP Water pipe	LF	550	\$175.00	\$96,250.00
7	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
8	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
9	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
10	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
11	Emergency Generator	EA	1	\$200,000.00	\$200,000.00
12	Driveway, Fencing, Landscape Site Dress Up	LS	1	\$30,000.00	\$30,000.00
TOTAL CONSTRUCTION -					\$2,942,650.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$294,265.00
	Contingencies	10%			\$323,691.50
	TOTAL				\$3,560,606.50
	Property	LS	1	\$12,000.00	\$12,000.00
	Easement Surveys and Acquisition Costs	LS	1	\$4,500.00	\$4,500.00
	Attorney	LS	1	\$7,500.00	\$7,500.00
	TOTAL EASEMENT COSTS				\$24,000.00
	Basic Engineering	10%			\$356,060.65
	Surveying	LS	1	\$9,500.00	\$9,500.00
	Geotechnical Services	LS	1	\$15,000.00	\$15,000.00
	TOTAL ENGINEERING COSTS				\$380,560.65
	TOTAL PROJECT				\$3,965,167.15

**Green Valley Special Utility District
12" Pipe along Schwab & Wosnig**

18

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare ROW	LF	11,500	\$1.00	\$11,500.00
2	Install 12" diameter PVC C909 pipe	LF	11,500	\$65.00	\$747,500.00
3	Install 12" diameter gate valves w/box	EA	11	\$2,500.00	\$27,500.00
4	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
5	Ductile Iron Fittings	TON	6	\$4,500.00	\$27,000.00
6	Install Fire Hydrant Assembly	EA	11	\$4,500.00	\$49,500.00
7	Fencing Repair	LF	11,500	\$1.00	\$11,500.00
8	Final Grade & Seed	LF	11,500	\$1.00	\$11,500.00
	TOTAL CONSTRUCTION				\$892,000.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$89,200.00
	Contingencies	10%			\$89,200.00
	TOTAL				\$1,070,400.00
	Easements	LF	11,500	\$12.00	\$138,000.00
	Easement Surveys and Acquisition Costs	LF	11,500	\$5.00	\$57,500.00
	Easement Acquisition Consultant	LF	11,500	\$5.00	\$57,500.00
	TOTAL EASEMENT COSTS				\$253,000.00
	Basic Engineering	12%			\$128,448.00
	Surveying	LF	11,500	\$2.00	\$23,000.00
	Construction Phase Services	1.5%			\$16,056.00
	TOTAL ENGINEERING COSTS				\$167,504.00
	TOTAL PROJECT				\$1,490,904.00

Green Valley Special Utility District
Common Ground Storage Tank and Booster Pump Station
Common to all Three wells
Engineering Opinion of Probable Costs

19

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1.	Prepare Site	AC	1.0	\$2,500.00	\$2,500.00
2	1 MG Concrete Ground Storage Tank	EA	1	\$900,000.00	\$900,000.00
3	Pumps, Pump Pad, Appurtenances, Chem	LS	1	\$250,000.00	\$250,000.00
4	MCC, Building, Site Power, SCADA	LS	1	\$300,000.00	\$300,000.00
5	Install 24" diameter DIP Water pipe	LF	550	\$175.00	\$96,250.00
6	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
7	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
8	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
9	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
10	Emergency Generator	EA	1	\$200,000.00	\$200,000.00
11	Driveway, Fencing, Landscape Site Dress Up	LS	1	\$30,000.00	\$30,000.00
	TOTAL CONSTRUCTION				\$1,842,650.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$184,265.00
	Contingencies	10%			\$202,691.50
	TOTAL				\$2,229,606.50
	Property	LS	1	\$45,000.00	\$45,000.00
	Easement Surveys and Acquisition Costs	LS	1	\$5,000.00	\$5,000.00
	Attorney	LS	1	\$7,500.00	\$7,500.00
	TOTAL EASEMENT COSTS				\$57,500.00
	Basic Engineering	10%			\$222,960.65
	Surveying	LS	1	\$4,500.00	\$4,500.00
	Geotechnical Services	LS	1	\$9,500.00	\$9,500.00
	TOTAL ENGINEERING COSTS				\$236,960.65
	TOTAL PROJECT				\$2,524,067.15

Green Valley Special Utility District **24" Pipe Line connects Existing Wells**

20

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1	\$2,500.00	\$1,250.00
2	Install 24" diameter DIP	LF	5,700	\$175.00	\$997,500.00
3	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
4	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
5	Ductile Iron Fittings	EA	3	\$4,500.00	\$13,500.00
6	Install Fire Hydrant Assembly	EA	5	\$4,500.00	\$22,500.00
7	Fencing Repair	LF	5700	\$1.00	\$5,700.00
8	Final Grading & Seed	LF	5,700	\$1.00	\$5,700.00
	TOTAL CONSTRUCTION				\$1,096,550.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$109,655.00
	Contingencies	10%			\$120,620.50
	TOTAL				\$1,326,825.50
	Easements	LF	5,700	\$12.00	\$68,400.00
	Easement Surveys and Acquisition Costs	LF	5,700	\$2.00	\$11,400.00
	Easement Acquisition Consultant	LF	5,700	\$1.00	\$5,700.00
	TOTAL EASEMENT COSTS				\$85,500.00
	Basic Engineering	10%			\$132,682.55
	Surveying	LF	5,700	\$2.00	\$11,400.00
	Construction Phase Services	1.5%			\$19,902.38
	TOTAL ENGINEERING COSTS				\$163,984.93
	TOTAL PROJECT				\$1,576,310.43

Green Valley Special Utility District
750' Elevated Storage Tank at South of Plant 10

21

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.0	\$2,500.00	\$2,500.00
2	1 MG Composite Elevated Storage Tank	EA	1	\$1,500,000.00	\$1,500,000.00
3	0.5 MG Concrete Ground Storage Tank	EA	1	\$500,000.00	\$500,000.00
4	Pumps; Pump Pad, Appurtenances, Chem	LS	1	\$250,000.00	\$250,000.00
5	MCC, Building, Site Power, SCADA	LS	1	\$300,000.00	\$300,000.00
6	Install 24" diameter DIP	LF	550	\$175.00	\$96,250.00
7	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
8	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
9	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
10	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
11	Emergency Generator	EA	1	\$200,000.00	\$200,000.00
12	Driveway, Fencing, Landscape Site Dress Up	LS	1	\$30,000.00	\$30,000.00
	TOTAL CONSTRUCTION				\$2,942,650.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$294,265.00
	Contingencies	10%			\$323,691.50
	TOTAL				\$3,560,606.50
	Property	LS	1	\$12,000.00	\$12,000.00
	Easement Surveys and Acquisition Costs	LS	1	\$4,500.00	\$4,500.00
	Attorney	LS	1	\$7,500.00	\$7,500.00
	TOTAL EASEMENT COSTS				\$24,000.00
	Basic Engineering	10%			\$356,060.65
	Surveying	LS	1	\$4,500.00	\$4,500.00
	Geotechnical Services	LS	1	\$15,000.00	\$15,000.00
	TOTAL ENGINEERING COSTS				\$375,560.65
	TOTAL PROJECT				\$3,960,167.15

Green Valley Special Utility District
12" Pipeline along Weil Road - BPS extension to Marion Road

22

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	11,600	\$1.00	\$11,600.00
2	Install 12" diameter C909 PVC Pipe	LF	11,600	\$65.00	\$754,000.00
3	Install 12" diameter valves w/box	EA	11	\$2,500.00	\$27,500.00
4	Install 12" diameter tie-ins	EA	1	\$3,000.00	\$3,000.00
5	Install 8" diameter tie-ins	EA	1	\$2,500.00	\$2,500.00
6	Ductile Iron Fittings	EA	4	\$4,500.00	\$18,000.00
7	Install Fire Hydrant Assembly	EA	10	\$4,500.00	\$45,000.00
8	Fencing Repair	LF	11,600	\$1.00	\$11,600.00
9	Final Grading & Seed	LF	11,600	\$1.00	\$11,600.00
	TOTAL CONSTRUCTION				\$884,800.00
	Bonds, Mobilization & Insurance	10%			\$88,480.00
	Contingencies	10%			\$97,328.00
	TOTAL				\$1,070,608.00
	Easements	LF	11,600	\$12.00	\$139,200.00
	Easement Surveys and Acquisition Costs	LF	11,600	\$2.00	\$23,200.00
	Easement Acquisition Consultant	LF	11,600	\$1.00	\$11,600.00
	TOTAL EASEMENT COSTS				\$174,000.00
	Basic Engineering	10%			\$107,060.80
	Surveying	LF	11,600	\$2.00	\$23,200.00
	Construction Phase Services	1.5%			\$16,059.12
	TOTAL ENGINEERING COSTS				\$146,319.92
	TOTAL PROJECT				\$1,390,927.92

Green Valley Special Utility District
Pipeline along Klein Road - FM 1044 to FM 725

23

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	15,155	\$1.00	\$15,155.00
2	Install 16" diameter C905 PVC Pipe	LF	15,155	\$100.00	\$1,515,500.00
3	Install 16" diameter valves w/box	EA	15	\$5,500.00	\$82,500.00
4	Install 4" diameter tie-ins	EA	2	\$885.00	\$1,770.00
5	Install 8" diameter tie-ins	EA	5	\$1,980.00	\$9,900.00
6	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
7	Ductile Iron Fittings	EA	5	\$4,500.00	\$22,500.00
8	Install Fire Hydrant Assembly	EA	15	\$4,500.00	\$67,500.00
9	Fencing Repair	LF	15,155	\$1.00	\$15,155.00
10	Final Grading & Seed	LF	15,155	\$1.00	\$15,155.00
	TOTAL CONSTRUCTION				\$1,751,135.00
	Bonds, Mobilization & Insurance	10%			\$175,113.50
	Contingencies	10%			\$192,624.85
	TOTAL				\$2,118,873.35
	Easements	LF	15,155	\$12.00	\$181,860.00
	Easement Surveys and Acquisition Costs	LF	15,155	\$2.00	\$30,310.00
	Easement Acquisition Consultant	LF	15,155	\$1.00	\$15,155.00
	TOTAL EASEMENT COSTS				\$227,325.00
	Basic Engineering	10%			\$211,887.34
	Surveying	LF		\$2.00	\$0.00
	Construction Phase Services	1.5%			\$31,783.10
	TOTAL ENGINEERING COSTS				\$243,670.44
	TOTAL PROJECT				\$2,589,868.79

**Green Valley Special Utility District
830' EST @ Hardy Rd and Union Wine**

24

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.0	\$45,000.00	\$45,000.00
2	1 MG Composite Elevated Storage Tank	EA	1	\$1,500,000.00	\$1,500,000.00
3	Install 24" diameter DIP Water pipe	LF	550	\$175.00	\$96,250.00
4	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
5	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
6	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
8	Driveway, Fencing, Landscape Site Dress Up	LS	1	\$30,000.00	\$30,000.00
	TOTAL CONSTRUCTION				\$1,735,150.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$173,515.00
	Contingencies	10%			\$190,866.50
	TOTAL				\$2,099,531.50
	Property	AC			\$0.00
	Easement Surveys and Acquisition Costs	LS			\$0.00
	Attorney	LS			\$0.00
	TOTAL EASEMENT COSTS				\$0.00
	Basic Engineering	10%			\$209,953.15
	Surveying	LS	1	\$4,500.00	\$4,500.00
	Geotechnical	LS	1	\$9,500.00	\$9,500.00
	TOTAL ENGINEERING COSTS				\$223,953.15
	TOTAL PROJECT				\$2,323,484.65

Green Valley Special Utility District
Pipeline from FM 725 to CRWA Lake Dunlap WTP

25

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	3,340	\$1.00	\$3,340.00
2	Install 16" diameter C905 PVC Pipe	LF	3,340	\$100.00	\$334,000.00
3	Install 16" diameter valves w/box	EA	3	\$5,500.00	\$16,500.00
4	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
5	Ductile Iron Fittings	EA	2	\$4,500.00	\$9,000.00
6	Install Fire Hydrant Assembly	EA	2	\$4,500.00	\$9,000.00
7	Fencing Repair	LF	3,340	\$1.00	\$3,340.00
8	Final Grading & Seed	LF	3,340	\$1.00	\$3,340.00
	TOTAL CONSTRUCTION				\$384,520.00
	Bonds, Mobilization & Insurance	10%			\$38,452.00
	Contingencies	10%			\$42,297.20
	TOTAL				\$465,269.20
	Easements	LF	3,340	\$12.00	\$40,080.00
	Easement Surveys and Acquisition Costs	LF	3,340	\$2.00	\$6,680.00
	Easement Acquisition Consultant	LF	3,340	\$1.00	\$3,340.00
	TOTAL EASEMENT COSTS				\$50,100.00
	Basic Engineering	10%			\$46,526.92
	Surveying	LF		\$2.00	\$0.00
	Construction Phase Services	1.5%			\$6,979.04
	TOTAL ENGINEERING COSTS				\$53,505.96
	TOTAL PROJECT				\$568,875.16

Green Valley Special Utility District
16" Pipeline along FM 725 - Union Wine to Altwein

26

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	3,900	\$1.00	\$3,900.00
2	Install 16" diameter C905 PVC Pipe	LF	3,900	\$100.00	\$390,000.00
3	Install 16" diameter valves w/box	EA	4	\$5,500.00	\$22,000.00
4	Install 16" diameter tie-ins	EA	1	\$4,000.00	\$4,000.00
5	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
6	Ductile Iron Fittings	EA	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	4	\$4,500.00	\$18,000.00
8	Fencing Repair	LF	3,900	\$1.00	\$3,900.00
9	Final Grading & Seed	LF	3,900	\$1.00	\$3,900.00
	TOTAL CONSTRUCTION				\$460,700.00
	Bonds, Mobilization & Insurance	10%			\$46,070.00
	Contingencies	10%			\$50,677.00
	TOTAL				\$557,447.00
	Easements	LF	3,900	\$12.00	\$46,800.00
	Easement Surveys and Acquisition Costs	LF	3,900	\$2.00	\$7,800.00
	Easement Acquisition Consultant	LF	3,900	\$1.00	\$3,900.00
	TOTAL EASEMENT COSTS				\$58,500.00
	Basic Engineering	10%			\$55,744.70
	Surveying	LF	3,900	\$2.00	\$7,800.00
	Construction Phase Services	1.5%			\$8,361.71
	TOTAL ENGINEERING COSTS				\$71,906.41
	TOTAL PROJECT				\$687,853.41

Green Valley Special Utility District
16" Weil Road BPS Fill Pipeline - Youngsford to Weil Rd BPS

27

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	9,500	\$1.00	\$9,500.00
2	Install 16" diameter C905 PVC Pipe	LF	9,500	\$100.00	\$950,000.00
3	Install 16" diameter valves w/box	EA	8	\$5,500.00	\$44,000.00
4	Install 16" diameter tie-ins	EA	2	\$4,000.00	\$8,000.00
5	Ductile Iron Fittings	EA	3	\$4,500.00	\$13,500.00
6	Install Fire Hydrant Assembly	EA	8	\$4,500.00	\$36,000.00
7	Fencing Repair	LF	9,500	\$1.00	\$9,500.00
8	Final Grading & Seed	LF	9,500	\$1.00	\$9,500.00
	TOTAL CONSTRUCTION				\$1,080,000.00
	Bonds, Mobilization & Insurance	10%			\$108,000.00
	Contingencies	10%			\$118,800.00
	TOTAL				\$1,306,800.00
	Easements	LF	9,500	\$12.00	\$114,000.00
	Easement Surveys and Acquisition Costs	LF	9,500	\$4.00	\$38,000.00
	Easement Acquisition Consultant	LF	9,500	\$4.00	\$38,000.00
	TOTAL EASEMENT COSTS				\$190,000.00
	Basic Engineering	10%			\$130,680.00
	Surveying	LF	9,500	\$2.00	\$19,000.00
	Construction Phase Services	1.5%			\$19,602.00
	TOTAL ENGINEERING COSTS				\$169,282.00
	TOTAL PROJECT				\$1,666,082.00

**Green Valley Special Utility District
830' EST @ Youngsford and Short Cut Rd**

28

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.0	\$45,000.00	\$45,000.00
2	1 MG Composite Elevated Storage Tank	EA	1	\$1,500,000.00	\$1,500,000.00
3	Install 24" diameter DIP Water pipe	LF	550	\$175.00	\$96,250.00
4	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
5	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
6	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
8	Driveway, Fencing, Landscape Site Dress Up	LS	1	\$30,000.00	\$30,000.00
	TOTAL CONSTRUCTION				\$1,735,150.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$173,515.00
	Contingencies	10%			\$190,866.50
	TOTAL				\$2,099,531.50
	Property	AC	1.0	\$30,000.00	\$30,000.00
	Easement Surveys and Acquisition Costs	LS	1.0	\$4,500.00	\$4,500.00
	Attorney	LS	1.0	\$7,500.00	\$7,500.00
	TOTAL EASEMENT COSTS				\$42,000.00
	Basic Engineering	10%			\$209,953.15
	Surveying	LS	1	\$4,500.00	\$4,500.00
	Geotechnical	LS	1	\$9,500.00	\$9,500.00
	TOTAL ENGINEERING COSTS				\$223,953.15
	TOTAL PROJECT				\$2,365,484.65

Green Valley Special Utility District
12" Pipeline along N Santa Clara Rd - Weil Rd to Gerdes Rd

29

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	19,720	\$1.00	\$19,720.00
2	Install 12" diameter C909 PVC Pipe	LF	19,720	\$65.00	\$1,281,800.00
3	Install 12" diameter valves w/box	EA	19	\$2,500.00	\$47,500.00
4	Install 12" diameter tie-ins	EA	2	\$3,000.00	\$6,000.00
5	Ductile Iron Fittings	EA	6	\$4,500.00	\$27,000.00
6	Install Fire Hydrant Assembly	EA	19	\$4,500.00	\$85,500.00
7	Fencing Repair	LF	19,720	\$1.00	\$19,720.00
8	Final Grading & Seed	LF	19,720	\$1.00	\$19,720.00
	TOTAL CONSTRUCTION				\$1,506,960.00
	Bonds, Mobilization & Insurance	10%			\$150,696.00
	Contingencies	10%			\$165,765.60
	TOTAL				\$1,823,421.60
	Easements	LF	19,720	\$12.00	\$236,640.00
	Easement Surveys and Acquisition Costs	LF	19,720	\$2.00	\$39,440.00
	Easement Acquisition Consultant	LF	19,720	\$1.00	\$19,720.00
	TOTAL EASEMENT COSTS				\$295,800.00
	Basic Engineering	10%			\$182,342.16
	Surveying	LF	19,720	\$2.00	\$39,440.00
	Construction Phase Services	1.5%			\$27,351.32
	TOTAL ENGINEERING COSTS				\$249,133.48
	TOTAL PROJECT				\$2,368,355.08

Green Valley Special Utility District
16" Pipeline along Schumann Rd - Pioneer Rd to Plant 10

30

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	11,350	\$1.00	\$11,350.00
2	Install 16" diameter C909 PVC Pipe	LF	11,350	\$100.00	\$1,135,000.00
3	Install 16" diameter valves w/box	EA	10	\$5,500.00	\$55,000.00
4	Install 16" diameter tie-ins	EA	2	\$5,750.00	\$11,500.00
5	Install 12" diameter tie-ins	EA	1	\$3,000.00	\$3,000.00
6	Ductile Iron Fittings	EA	4	\$4,500.00	\$18,000.00
7	Install Fire Hydrant Assembly	EA	10	\$4,500.00	\$45,000.00
8	Fencing Repair	LF	11,350	\$1.00	\$11,350.00
9	Final Grading & Seed	LF	11,350	\$1.00	\$11,350.00
	TOTAL CONSTRUCTION				\$1,301,550.00
	Bonds, Mobilization & Insurance	10%			\$130,155.00
	Contingencies	10%			\$143,170.50
	TOTAL				\$1,574,875.50
	Easements	LF	11,350	\$12.00	\$136,200.00
	Easement Surveys and Acquisition Costs	LF	11,350	\$2.00	\$22,700.00
	Easement Acquisition Consultant	LF	11,350	\$1.00	\$11,350.00
	TOTAL EASEMENT COSTS				\$170,250.00
	Basic Engineering	10%			\$157,487.55
	Surveying	LF	11,350	\$2.00	\$22,700.00
	Construction Phase Services	1.5%			\$23,623.13
	TOTAL ENGINEERING COSTS				\$203,810.68
	TOTAL PROJECT				\$1,948,936.18

**Green Valley Special Utility District
16" Pipeline along Pioneer Rd (connect)**

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Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	1,330	\$1.00	\$1,330.00
2	Install 16" diameter C905 PVC Pipe	LF	1,330	\$100.00	\$133,000.00
3	Install 16" diameter valves w/box	EA	2	\$5,500.00	\$11,000.00
4	Install 16" diameter tie-ins	EA	2	\$5,750.00	\$11,500.00
5	Ductile Iron Fittings	EA	1	\$4,500.00	\$4,500.00
6	Install Fire Hydrant Assembly	EA	2	\$4,500.00	\$9,000.00
7	Fencing Repair	LF	1,330	\$1.00	\$1,330.00
8	Final Grading & Seed	LF	1,330	\$1.00	\$1,330.00
TOTAL CONSTRUCTION					\$172,990.00
	Bonds, Mobilization & Insurance	10%			\$17,299.00
	Contingencies	10%			\$19,028.90
	TOTAL				\$209,317.90
	Easements	LF	1,330	\$12.00	\$15,960.00
	Easement Surveys and Acquisition Costs	LF	1,330	\$2.00	\$2,660.00
	Easement Acquisition Consultant	LF	1,330	\$1.00	\$1,330.00
	TOTAL EASEMENT COSTS				\$19,950.00
	Basic Engineering	10%			\$20,931.79
	Surveying	LF	1,330	\$2.00	\$2,660.00
	Construction Phase Services	1.5%			\$3,139.77
	TOTAL ENGINEERING COSTS				\$26,731.56
	TOTAL PROJECT				\$255,999.46

Green Valley Special Utility District
8" Pipeline along Lower Valley Ln - Weir Rd to Haeckerville Rd

32

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	5,900	\$1.00	\$5,900.00
2	Install 8" diameter C909 PVC Pipe	LF	5,900	\$50.00	\$295,000.00
3	Install 8" diameter valves w/box	EA	5	\$2,000.00	\$10,000.00
4	Install 4" diameter tie-ins	EA	2	\$885.00	\$1,770.00
5	Ductile Iron Fittings	EA	2	\$4,500.00	\$9,000.00
6	Install Fire Hydrant Assembly	EA	5	\$4,500.00	\$22,500.00
7	Fencing Repair	LF	5,900	\$1.00	\$5,900.00
8	Final Grading & Seed	LF	5,900	\$1.00	\$5,900.00
	TOTAL CONSTRUCTION				\$355,970.00
	Bonds, Mobilization & Insurance	10%			\$35,597.00
	Contingencies	10%			\$39,156.70
	TOTAL				\$430,723.70
	Easements	LF	5,900	\$12.00	\$70,800.00
	Easement Surveys and Acquisition Costs	LF	5,900	\$2.00	\$11,800.00
	Easement Acquisition Consultant	LF	5,900	\$1.00	\$5,900.00
	TOTAL EASEMENT COSTS				\$88,500.00
	Basic Engineering	10%			\$43,072.37
	Surveying	LF	5,900	\$2.00	\$11,800.00
	Construction Phase Services	1.5%			\$6,460.86
	TOTAL ENGINEERING COSTS				\$61,333.23
	TOTAL PROJECT				\$580,556.93

Green Valley Special Utility District
8" Pipeline along Lower Seguin Rd (connect)

33

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	4,300	\$1.00	\$4,300.00
2	Install 8" diameter C909 PVC Pipe	LF	4,300	\$50.00	\$215,000.00
3	Install 8" diameter valves w/box	EA	4	\$2,000.00	\$8,000.00
4	Install 4" diameter tie-ins	EA	1	\$885.00	\$885.00
5	Install 8" diameter tie-ins	EA	1	\$1,980.00	\$1,980.00
6	Ductile Iron Fittings	EA	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	4	\$4,500.00	\$18,000.00
8	Fencing Repair	LF	4,300	\$1.00	\$4,300.00
9	Final Grading & Seed	LF	4,300	\$1.00	\$4,300.00
TOTAL CONSTRUCTION					\$265,765.00
	Bonds, Mobilization & Insurance	10%			\$26,576.50
	Contingencies	10%			\$29,234.15
TOTAL					\$321,575.65
	Easements	LF	4,300	\$12.00	\$51,600.00
	Easement Surveys and Acquisition Costs	LF	4,300	\$2.00	\$8,600.00
	Easement Acquisition Consultant	LF	4,300	\$1.00	\$4,300.00
TOTAL EASEMENT COSTS					\$64,500.00
	Basic Engineering	10%			\$32,157.57
	Surveying	LF	4,300	\$2.00	\$8,600.00
	Construction Phase Services	1.5%			\$4,823.63
TOTAL ENGINEERING COSTS					\$45,581.20
TOTAL PROJECT					\$431,656.85

**Green Valley Special Utility District
8" Pipeline along Bolton Rd (connect)**

34

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	1,250	\$1.00	\$1,250.00
2	Install 8" diameter C909 PVC Pipe	LF	1,250	\$50.00	\$62,500.00
3	Install 8" diameter valves w/box	EA	2	\$2,000.00	\$4,000.00
4	Install 2" diameter tie-ins	EA	1	\$500.00	\$500.00
5	Install 8" diameter tie-ins	EA	1	\$1,980.00	\$1,980.00
6	Ductile Iron Fittings	EA	1	\$4,500.00	\$4,500.00
7	Install Fire Hydrant Assembly	EA	2	\$4,500.00	\$9,000.00
8	Fencing Repair	LF	1,250	\$1.00	\$1,250.00
9	Final Grading & Seed	LF	1,250	\$1.00	\$1,250.00
	TOTAL CONSTRUCTION				\$86,230.00
	Bonds, Mobilization & Insurance	10%			\$8,623.00
	Contingencies	10%			\$9,485.30
	TOTAL				\$104,338.30
	Easements	LF	6,300	\$12.00	\$75,600.00
	Easement Surveys and Acquisition Costs	LF	6,300	\$2.00	\$12,600.00
	Easement Acquisition Consultant	LF	6,300	\$1.00	\$6,300.00
	TOTAL EASEMENT COSTS				\$94,500.00
	Basic Engineering	10%			\$10,433.83
	Surveying	LF	6,300	\$2.00	\$12,600.00
	Construction Phase Services	1.5%			\$1,565.07
	TOTAL ENGINEERING COSTS				\$24,598.90
	TOTAL PROJECT				\$223,437.20

Green Valley Special Utility District**35****8" Pipeline along Schmoekel Rd - Stolte Rd to Santa Clara Rd**

Engineering Opinion of Probable Costs:

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	9,300	\$1.00	\$9,300.00
2	Install 8" diameter C909 PVC Pipe	LF	9,300	\$50.00	\$465,000.00
3	Install 8" diameter valves w/box	EA	9	\$2,000.00	\$18,000.00
3	Install 4" diameter tie-ins	EA	2	\$885.00	\$1,770.00
5	Ductile Iron Fittings	EA	3	\$4,500.00	\$13,500.00
6	Install Fire Hydrant Assembly	EA	9	\$4,500.00	\$40,500.00
7	Fencing Repair	LF	9,300	\$1.00	\$9,300.00
8	Final Grading & Seed	LF	9,300	\$1.00	\$9,300.00
	TOTAL CONSTRUCTION				\$566,670.00
	Bonds, Mobilization & Insurance	10%			\$56,667.00
	Contingencies	10%			\$62,333.70
	TOTAL				\$685,670.70
	Easements	LF	9,300	\$12.00	\$111,600.00
	Easement Surveys and Acquisition Costs	LF	9,300	\$2.00	\$18,600.00
	Easement Acquisition Consultant	LF	9,300	\$1.00	\$9,300.00
	TOTAL EASEMENT COSTS				\$139,500.00
	Basic Engineering	10%			\$68,567.07
	Surveying	LF	9,300	\$2.00	\$18,600.00
	Construction Phase Services	1.5%			\$10,285.06
	TOTAL ENGINEERING COSTS				\$97,452.13
	TOTAL PROJECT				\$922,622.83

Green Valley Special Utility District
GVSUD Take-Point Meter Station at Santa Clara Rd & IH10

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Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	0.25	\$2,500.00	\$625.00
2	8" Cla Val	EA	1	\$25,000.00	\$25,000.00
3	Install 16" diameter DIP Class 350 pipe	LF	100	\$85.00	\$8,500.00
4	Install 8" diameter DIP Class 350 pipe	LF	25	\$70.00	\$1,750.00
5	Install 16" diameter valves w/box	EA	1	\$5,500.00	\$5,500.00
6	Install 16" diameter tie-ins	EA	1	\$4,000.00	\$4,000.00
7	Ductile Iron Fittings	TON	1	\$4,500.00	\$2,250.00
8	Install Fire Hydrant Assembly	EA	0	\$4,500.00	\$0.00
9	Metering Station Concrete & Buidling	SF	288	\$35.00	\$10,080.00
10	Site Power	LS	1	\$2,500.00	\$2,500.00
11	Site Electrical	LS	1	\$12,000.00	\$12,000.00
12	Chemical Building and Chemical Yard Pipe	LS	1	\$15,000.00	\$15,000.00
13	Site Controls and Communication	LS	1	\$15,000.00	\$15,000.00
14	Driveway	SY	200	\$45.00	\$9,000.00
15	Fencing	LF	120	\$12.00	\$1,440.00
16	Landscaping	LS	1	\$500.00	\$500.00
TOTAL CONSTRUCTION					\$113,145.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$11,314.50
	Contingencies	10%			\$12,445.95
	TOTAL				\$136,905.45
	Property	AC			\$0.00
	Easement Surveys and Acquisition Costs	AC			\$0.00
	Attorney	LS			\$0.00
	TOTAL EASEMENT COSTS				\$0.00
	Basic Engineering	10%			\$13,690.55
	Surveying	LS	1	\$2,000.00	\$2,000.00
	Geotechnical	LS	2	\$1,200.00	\$2,400.00
	TOTAL ENGINEERING COSTS				\$18,090.55
	TOTAL PROJECT				\$154,996.00

Green Valley Special Utility District
750' EST @ Gin Road

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Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.0	\$45,000.00	\$45,000.00
2	1 MG Composite Elevated Storage Tank	EA	1	\$1,500,000.00	\$1,500,000.00
3	Install 24" diameter DIP Water pipe	LF	550	\$175.00	\$96,250.00
4	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
5	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
6	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
8	Driveway, Fencing, Landscape Site Dress Up	LS	1	\$30,000.00	\$30,000.00
	TOTAL CONSTRUCTION				\$1,735,150.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$173,515.00
	Contingencies	10%			\$190,866.50
	TOTAL				\$2,099,531.50
	Property	AC	1.0	\$30,000.00	\$30,000.00
	Easement Surveys and Acquisition Costs	LS	1.0	\$4,500.00	\$4,500.00
	Attorney	LS	1.0	\$7,500.00	\$7,500.00
	TOTAL EASEMENT COSTS				\$42,000.00
	Basic Engineering	10%			\$209,953.15
	Surveying	LS	1	\$4,500.00	\$4,500.00
	Geotechnical	LS	1	\$9,500.00	\$9,500.00
	TOTAL ENGINEERING COSTS				\$223,953.15
	TOTAL PROJECT				\$2,365,484.65

Green Valley Special Utility District **38**
8" Pipeline along FM 775 - Leissner School Rd to Beutnagel Ln

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	11,900	\$1.00	\$11,900.00
2	Install 8" diameter C909 PVC Pipe	LF	11,900	\$50.00	\$595,000.00
3	Install 8" diameter valves w/box	EA	11	\$2,000.00	\$22,000.00
3	Install 16" diameter tie-ins	EA	1	\$1,600.00	\$1,600.00
4	Install 6" diameter tie-ins	EA	1	\$5,750.00	\$5,750.00
5	Ductile Iron Fittings	EA	3	\$4,500.00	\$13,500.00
6	Install Fire Hydrant Assembly	EA	11	\$4,500.00	\$49,500.00
7	Fencing Repair	LF	11,900	\$1.00	\$11,900.00
8	Final Grading & Seed	LF	11,900	\$1.00	\$11,900.00
	TOTAL CONSTRUCTION				\$723,050.00
	Bonds, Mobilization & Insurance	10%			\$72,305.00
	Contingencies	10%			\$79,535.50
	TOTAL				\$874,890.50
	Easements	LF	11,900	\$12.00	\$142,800.00
	Easement Surveys and Acquisition Costs	LF	11,900	\$2.00	\$23,800.00
	Easement Acquisition Consultant	LF	11,900	\$1.00	\$11,900.00
	TOTAL EASEMENT COSTS				\$178,500.00
	Basic Engineering	10%			\$87,489.05
	Surveying	LF	11,900	\$2.00	\$23,800.00
	Construction Phase Services	1.5%			\$13,123.36
	TOTAL ENGINEERING COSTS				\$124,412.41
	TOTAL PROJECT				\$1,177,802.91

Green Valley Special Utility District
12" Pipeline along Abbott Road - FM 1518 to FM 2538

39

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	11,125	\$1.00	\$11,125.00
2	Install 12" diameter C909 PVC Pipe	LF	11,125	\$65.00	\$723,125.00
3	Install 12" diameter valves w/box	EA	11	\$2,500.00	\$27,500.00
3	Install 4" diameter tie-ins	EA	3	\$885.00	\$2,655.00
5	Ductile Iron Fittings	EA	3	\$4,500.00	\$13,500.00
6	Install Fire Hydrant Assembly	EA	11	\$4,500.00	\$49,500.00
7	Fencing Repair	LF	11,125	\$1.00	\$11,125.00
8	Final Grading & Seed	LF	11,125	\$1.00	\$11,125.00
	TOTAL CONSTRUCTION				\$849,655.00
	Bonds, Mobilization & Insurance	10%			\$84,965.50
	Contingencies	10%			\$93,462.05
	TOTAL				\$1,028,082.55
	Easements	LF	11,125	\$12.00	\$133,500.00
	Easement Surveys and Acquisition Costs	LF	11,125	\$2.00	\$22,250.00
	Easement Acquisition Consultant	LF	11,125	\$1.00	\$11,125.00
	TOTAL EASEMENT COSTS				\$166,875.00
	Basic Engineering	10%			\$102,808.26
	Surveying	LF	11,125	\$2.00	\$22,250.00
	Construction Phase Services	1.5%			\$15,421.24
	TOTAL ENGINEERING COSTS				\$140,479.49
	TOTAL PROJECT				\$1,335,437.04

Green Valley Special Utility District
8" Pipeline along New Berlin Rd - Gable Ln to Miller Rd

40

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	11,345	\$1.00	\$11,345.00
2	Install 8" diameter C909 PVC Pipe	LF	11,345	\$50.00	\$567,250.00
3	Install 8" diameter valves w/box	EA	11	\$2,000.00	\$22,000.00
4	Install 4" diameter tie-ins	EA	2	\$885.00	\$1,770.00
5	Ductile Iron Fittings	EA	3	\$4,500.00	\$13,500.00
6	Install Fire Hydrant Assembly	EA	11	\$4,500.00	\$49,500.00
7	Fencing Repair	LF	11,345	\$1.00	\$11,345.00
8	Final Grading & Seed	LF	11,345	\$1.00	\$11,345.00
	TOTAL CONSTRUCTION				\$688,055.00
	Bonds, Mobilization & Insurance	10%			\$68,805.50
	Contingencies	10%			\$75,686.05
	TOTAL				\$832,546.55
	Easements	LF	11,345	\$12.00	\$136,140.00
	Easement Surveys and Acquisition Costs	LF	11,345	\$2.00	\$22,690.00
	Easement Acquisition Consultant	LF	11,345	\$1.00	\$11,345.00
	TOTAL EASEMENT COSTS				\$170,175.00
	Basic Engineering	10%			\$83,254.66
	Surveying	LF	11,345	\$2.00	\$22,690.00
	Construction Phase Services	1.5%			\$12,488.20
	TOTAL ENGINEERING COSTS				\$118,432.85
	TOTAL PROJECT				\$1,121,154.40

Green Valley Special Utility District **41**
8" Pipeline along Engel Rd - Green Valley Rd to Service Boundary

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	3,200	\$1.00	\$3,200.00
2	Install 8" diameter C909 PVC Pipe	LF	3,200	\$50.00	\$160,000.00
3	Install 8" diameter valves w/box	EA	3	\$2,000.00	\$6,000.00
4	Install 4" diameter tie-ins	EA	1	\$885.00	\$885.00
5	Ductile Iron Fittings	EA	1	\$4,500.00	\$4,500.00
6	Install Fire Hydrant Assembly	EA	3	\$4,500.00	\$13,500.00
7	Fencing Repair	LF	3,200	\$1.00	\$3,200.00
8	Final Grading & Seed	LF	3,200	\$1.00	\$3,200.00
	TOTAL CONSTRUCTION				\$194,485.00
	Bonds, Mobilization & Insurance	10%			\$19,448.50
	Contingencies	10%			\$21,393.35
	TOTAL				\$235,326.85
	Easements	LF	3,200	\$12.00	\$38,400.00
	Easement Surveys and Acquisition Costs	LF	3,200	\$2.00	\$6,400.00
	Easement Acquisition Consultant	LF	3,200	\$1.00	\$3,200.00
	TOTAL EASEMENT COSTS				\$48,000.00
	Basic Engineering	10%			\$23,532.69
	Surveying	LF	3,200	\$2.00	\$6,400.00
	Construction Phase Services	1.5%			\$3,529.90
	TOTAL ENGINEERING COSTS				\$33,462.59
	TOTAL PROJECT				\$316,789.44

**Green Valley Special Utility District
Plant 1 - 1MG Ground Storage Tank**

42

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.5	\$2,500.00	\$3,750.00
2	1MG Concrete Ground Storage Tank	EA	1	\$750,000.00	\$750,000.00
3	Install 24" diameter DIP Water pipe	LF	100	\$75.00	\$7,500.00
4	Install 24" diameter valves w/box	EA	2	\$9,350.00	\$18,700.00
5	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
6	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
8	Site Power	LS	1	\$75,000.00	\$75,000.00
9	Site Controls and Communication	LS	1	\$60,000.00	\$60,000.00
10	Driveway	SY	500	\$45.00	\$22,500.00
11	Fencing	LF	1,000	\$12.00	\$12,000.00
12	Landscaping	LS	1	\$7,500.00	\$7,500.00
13	Existing ROW Pipe Coordination	LS	1	\$25,000.00	\$25,000.00
14	DEMO existing Plant 1	LS	1	\$25,000.00	\$25,000.00
	TOTAL CONSTRUCTION				\$1,033,450.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$103,345.00
	Contingencies	10%			\$113,679.50
	TOTAL				\$1,250,474.50
	Property	AC			\$0.00
	Easement Surveys and Acquisition Costs	AC			\$0.00
	Attorney	LS			\$0.00
	TOTAL EASEMENT COSTS				\$0.00
	Basic Engineering	10%			\$125,047.45
	Surveying	LS	1	\$8,000.00	\$8,000.00
	Geotechnical	LS	1	\$19,000.00	\$19,000.00
	TOTAL ENGINEERING COSTS				\$152,047.45
	TOTAL PROJECT				\$1,402,521.95

Green Valley Special Utility District **43**
16" Pipeline along FM 1044 from Green Valley Rd to Youngsford

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	19,400	\$1.00	\$19,400.00
2	Install 16" diameter C905 PVC Pipe	LF	19,400	\$100.00	\$1,940,000.00
3	Install 16" diameter valves w/box	EA	20	\$5,500.00	\$110,000.00
4	Install 12" diameter tie-ins	EA	1	\$3,000.00	\$3,000.00
5	Install 8" diameter tie-ins	EA	2	\$1,980.00	\$3,960.00
6	Ductile Iron Fittings	EA	5	\$4,500.00	\$22,500.00
7	Install Fire Hydrant Assembly	EA	20	\$4,500.00	\$90,000.00
8	Fencing Repair	LF	19,400	\$1.00	\$19,400.00
9	Final Grading & Seed	LF	19,400	\$1.00	\$19,400.00
	TOTAL CONSTRUCTION				\$2,227,660.00
	Bonds, Mobilization & Insurance	10%			\$222,766.00
	Contingencies	10%			\$245,042.60
	TOTAL				\$2,695,468.60
	Easements	LF	19,400	\$12.00	\$232,800.00
	Easement Surveys and Acquisition Costs	LF	19,400	\$5.00	\$97,000.00
	Easement Acquisition Consultant	LF	19,400	\$5.00	\$97,000.00
	TOTAL EASEMENT COSTS				\$426,800.00
	Basic Engineering	12%			\$323,456.23
	Surveying	LF	19,400	\$2.00	\$38,800.00
	Construction Phase Services	1.5%			\$40,432.03
	TOTAL ENGINEERING COSTS				\$402,688.26
	TOTAL PROJECT				\$3,524,956.86

Green Valley Special Utility District
16" Pipeline along Union Wine from FM 1044 to Sunshine Lane

44

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	9,200	\$1.00	\$9,200.00
2	Install 16" diameter C905 PVC Pipe	LF	9,200	\$100.00	\$920,000.00
3	Install 16" diameter valves w/box	EA	9	\$5,500.00	\$49,500.00
4	Install 12" diameter tie-ins	EA	1	\$3,000.00	\$3,000.00
5	Install 4" diameter tie-ins	EA	1	\$885.00	\$885.00
6	Ductile Iron Fittings	EA	3	\$4,500.00	\$13,500.00
7	Install Fire Hydrant Assembly	EA	9	\$4,500.00	\$40,500.00
8	Fencing Repair	LF	9,200	\$1.00	\$9,200.00
9	Final Grading & Seed	LF	9,200	\$1.00	\$9,200.00
	TOTAL CONSTRUCTION				\$1,054,985.00
	Bonds, Mobilization & Insurance	10%			\$105,498.50
	Contingencies	10%			\$116,048.35
	TOTAL				\$1,276,531.85
	Easements	LF	9,200	\$12.00	\$110,400.00
	Easement Surveys and Acquisition Costs	LF	9,200	\$5.00	\$46,000.00
	Easement Acquisition Consultant	LF	9,200	\$5.00	\$46,000.00
	TOTAL EASEMENT COSTS				\$202,400.00
	Basic Engineering	12%			\$153,183.82
	Surveying	LF	9,200	\$2.00	\$18,400.00
	Construction Phase Services	1.5%			\$19,147.98
	TOTAL ENGINEERING COSTS				\$190,731.80
	TOTAL PROJECT				\$1,669,663.65

Green Valley Special Utility District
16" Pipeline along Youngsford from FM 1044 to FM 725

45

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	20,500	\$1.00	\$20,500.00
2	Install 16" diameter C905 PVC Pipe	LF	20,500	\$100.00	\$2,050,000.00
3	Install 16" diameter valves w/box	EA	20	\$5,500.00	\$110,000.00
4	Install 12" diameter tie-ins	EA	1	\$3,000.00	\$3,000.00
5	Install 4" diameter tie-ins	EA	1	\$885.00	\$885.00
6	Ductile Iron Fittings	EA	6	\$4,500.00	\$27,000.00
7	Install Fire Hydrant Assembly	EA	20	\$4,500.00	\$90,000.00
8	Fencing Repair	LF	20,500	\$1.00	\$20,500.00
9	Final Grading & Seed	LF	20,500	\$1.00	\$20,500.00
	TOTAL CONSTRUCTION				\$2,342,385.00
	Bonds, Mobilization & Insurance	10%			\$234,238.50
	Contingencies	10%			\$257,662.35
	TOTAL				\$2,834,285.85
	Easements	LF	20,500	\$12.00	\$246,000.00
	Easement Surveys and Acquisition Costs	LF	20,500	\$5.00	\$102,500.00
	Easement Acquisition Consultant	LF	20,500	\$5.00	\$102,500.00
	TOTAL EASEMENT COSTS				\$451,000.00
	Basic Engineering	12%			\$340,114.30
	Surveying	LF	20,500	\$2.00	\$41,000.00
	Construction Phase Services	1.5%			\$42,514.29
	TOTAL ENGINEERING COSTS				\$423,628.59
	TOTAL PROJECT				\$3,708,914.44

Green Valley Special Utility District
16" Pipeline along FM 1044 from Youngsford to Wosnig Road

46

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	LF	13,800	\$1.00	\$13,800.00
2	Install 16" diameter C905 PVC Pipe	LF	13,800	\$100.00	\$1,380,000.00
3	Install 16" diameter valves w/box	EA	13	\$5,500.00	\$71,500.00
4	Install 4" diameter tie-ins	EA	2	\$885.00	\$1,770.00
5	Ductile Iron Fittings	EA	4	\$4,500.00	\$18,000.00
6	Install Fire Hydrant Assembly	EA	13	\$4,500.00	\$58,500.00
7	Fencing Repair	LF	13,800	\$1.00	\$13,800.00
8	Final Grading & Seed	LF	13,800	\$1.00	\$13,800.00
	TOTAL CONSTRUCTION				\$1,571,170.00
	Bonds, Mobilization & Insurance	10%			\$157,117.00
	Contingencies	10%			\$172,828.70
	TOTAL				\$1,901,115.70
	Easements	LF	13,800	\$12.00	\$165,600.00
	Easement Surveys and Acquisition Costs	LF	13,800	\$5.00	\$69,000.00
	Easement Acquisition Consultant	LF	13,800	\$5.00	\$69,000.00
	TOTAL EASEMENT COSTS				\$303,600.00
	Basic Engineering	12%			\$228,133.88
	Surveying	LF	13,800	\$2.00	\$27,600.00
	Construction Phase Services	1.5%			\$28,516.74
	TOTAL ENGINEERING COSTS				\$284,250.62
	TOTAL PROJECT				\$2,488,966.32

**Green Valley Special Utility District
830' EST @ Plant 3**

47

Engineering Opinion of Probable Costs

ITEM	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL COST
1	Prepare Site	AC	1.0	\$45,000.00	\$45,000.00
2	1 MG Composite Elevated Storage Tank	EA	1	\$1,500,000.00	\$1,500,000.00
3	Install 24" diameter DIP Water pipe	LF	200	\$175.00	\$35,000.00
4	Install 24" diameter valves w/box	EA	4	\$9,350.00	\$37,400.00
5	Install 24" diameter tie-ins	EA	2	\$6,500.00	\$13,000.00
6	Ductile Iron Fittings	TON	2	\$4,500.00	\$9,000.00
7	Install Fire Hydrant Assembly	EA	1	\$4,500.00	\$4,500.00
8	Driveway, Fencing, Landscape Site Dress Up	LS	1	\$30,000.00	\$30,000.00
9	DEMO Plant 3 EST	LS	1	\$30,000.00	\$30,000.00
	TOTAL CONSTRUCTION				\$1,703,900.00
	Bonds, Mobilization, Prep ROW & Insurance	10%			\$170,390.00
	Contingencies	10%			\$187,429.00
	TOTAL				\$2,061,719.00
	Property	AC			\$0.00
	Easement Surveys and Acquisition Costs	LS			\$0.00
	Attorney	LS			\$0.00
	TOTAL EASEMENT COSTS				\$0.00
	Basic Engineering	10%			\$206,171.90
	Surveying	LS	1	\$4,500.00	\$4,500.00
	Geotechnical	LS	1	\$9,500.00	\$9,500.00
	TOTAL ENGINEERING COSTS				\$220,171.90
	TOTAL PROJECT				\$2,281,890.90

ATTACHMENT 2

GVSUD PUMP RECORDS



GREEN VALLEY SPECIAL UTILITY DISTRICT (GVSUD) FACT SHEET

- Celebrated 50 years as a Superior Water System in 2013.
- Average Residential usage for YTD 2014 is 6,551 Gallons per Month.
- 10,046 Customers as of September 2014 in Guadalupe, Comal and Bexar County.
- Majority of GVSUD Customers are Residential and Light Commercial.
- Maximum day usage in past 12 months was 4,563,200 in Oct. 2013.
- Minimum day usage in past 12 months was 1,019,500 gallons in Nov. 2013.
- GVSUD currently has 4 sources of water including:
 - Edwards Aquifer
 - Trinity Aquifer
 - Lake Dunlap Surface Water
 - Carrizo Ground Water
- Average Annual growth system wide has been 4.45% over the past 10 years.
- Average Annual use per Residential connection has been 0.34 AF/connection. over the past 10 years; 2013 Average use was 0.28 AF/connection.
- GVSUD has a projected water connection total of 26,804 by the year 2034.
- GVSUD pumped 3052.5 AF of water in the past 12 months. They currently have contracts for 9,494 AF of water.
- GVSUD has an elected board with 3 current members in the City of New Braunfels city limits and ETJ.
- City of New Braunfels development and fire flow requirements are met prior to a potable water contract being presented to the Board. All subdivisions and distribution system projects have passed City and Fire Department Inspections.
- Recently TWDB projects have been completed to increase capacity to the system with over \$2 million per year spent on infrastructure upgrades. The District has several priority projects identified to maintain their level of service into the future.

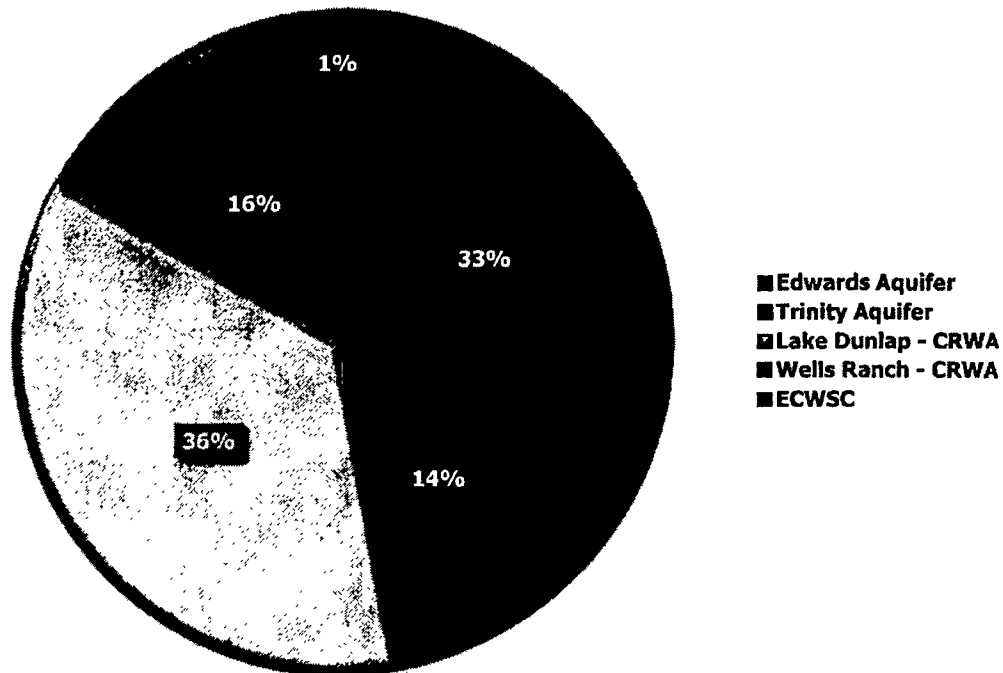


GREEN VALLEY SPECIAL UTILITY DISTRICT (GVSUD)

WATER SOURCES

SEPTEMBER 2014

<i>Water Source</i>	<i>Acre-feet</i>	<i>Percentage</i>
<i>Edwards Aquifer</i>	119.6743	33%
<i>Trinity Aquifer</i>	51.2044	14%
<i>Lake Dunlap - CRWA</i>	131.3146	36%
<i>Wells Ranch - CRWA</i>	56.9309	16%
<i>ECWSC</i>	4.4253	1%
<i>Total AF Produced</i>	<i>363.55</i>	



Green Valley SUD Operations Report October 2013 - September 2014

	October	November	December	January	February	March	April	May	June	July	August	September
Edwards Aquifer	107,207	97,610	98,816	103,863	109,703	71,394	84,747	78,805	92,229	76,357	106,097	119,674
Trinity Aquifer	0	0	0	0	7,887	38,643	38,643	51,615	45,849	43,36	45,849	51,204
Lake Dunlap - CRWA	85,232	70,160	61,248	70,621	78,097	66,237	69,474	81,79	99,192	96,341	118,980	131,314
Wells Ranch - CRWA	37,575	35,909	55,396	54,172	59,354	52,014	36,489	38,235	26,874	28,126	48,418	56,930
ECWSC	3,996	1,347	0,205	0,856	2,307	0,463	0,448	1,899	2,866	2,849	2,516	4,425
Total Gallons Produced	76,252,500	66,806,400	70,275,400	74,787,000	84,045,000	74,538,000	74,865,000	82,236,000	87,006,000	80,495,000	104,878,000	118,463,000
Total AF Produced	234,010	205,021	215,667	229,512	257,924	228,748	229,752	252,373	267,011	247,030	321,858	363,549
Average Daily Use (gallons)	2,471,500	1,952,000	2,167,600	2,367,300	2,562,000	2,603,300	2,276,700	2,468,800	2,706,900	3,000,300	3,090,200	3,574,900
Maximum Daily Use (gallons)	4,563,200	2,758,400	4,097,300	3,876,400	3,958,400	3,158,800	3,442,700	3,073,400	3,163,700	4,306,700	4,322,800	4,244,700
Minimum Daily Use (gallons)	1,180,500	1,019,500	1,403,500	1,685,700	1,625,500	2,076,600	1,526,300	1,998,600	2,149,000	2,286,500	2,362,500	2,735,700
Average Residential (gallons/month)	6,301	5,721	4,902	5,646	5,421	4,844	5,120	7,247	7,437	7,529	8,407	10,037
Average Residential gallons/month for 12 month period			6,551									

September 2014 Water Sources

	Percentage
Edwards Aquifer	33%
Trinity Aquifer	14%
Lake Dunlap - CRWA	36%
Wells Ranch - CRWA	16%
ECWSC	1%
Total AF Produced	363,549

ATTACHMENT 3

TCEQ (30 TAC §290.45)

Texas Administrative Code

<u>TITLE 30</u>	ENVIRONMENTAL QUALITY
<u>PART 1</u>	TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
<u>CHAPTER 290</u>	PUBLIC DRINKING WATER
<u>SUBCHAPTER D</u>	RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS
<u>RULE §290.45</u>	Minimum Water System Capacity Requirements

(a) General provisions.

(1) The requirements contained in this section are to be used in evaluating both the total capacities for public water systems and the capacities at individual pump stations and pressure planes which serve portions of the system that are hydraulically separated from, or incapable of being served by, other pump stations or pressure planes. The capacities specified in this section are minimum requirements only and do not include emergency fire flow capacities for systems required to meet requirements contained in §290.46(x) and (y) of this title (relating to Minimum Acceptable Operating Practices for Public Drinking Water Systems).

(2) The executive director will require additional supply, storage, service pumping, and pressure maintenance facilities if a normal operating pressure of 35 pounds per square inch (psi) cannot be maintained throughout the system, or if the system's maximum daily demand exceeds its total production and treatment capacity. The executive director will also require additional capacities for a system that is unable to maintain a minimum pressure of 20 psi during fire fighting, line flushing, other unusual conditions, and systems that are required to provide fire flow as specified in §290.46(x) and (y) of this title.

(3) The executive director may establish additional capacity requirements for a public water system using the method of calculation described in subsection (g)(2) of this section if there are repeated customer complaints regarding inadequate pressure or if the executive director receives a request for a capacity evaluation from customers of the system.

(4) Throughout this section, total storage capacity does not include pressure tank capacity.

(5) The executive director may exclude the capacity of facilities that have been inoperative for the past 120 days and will not be returned to an operative condition within the next 30 days when determining compliance with the requirements of this section.

(6) The capacity of the treatment facilities shall not be less than the required raw water or groundwater production rate or the anticipated maximum daily demand of the system.

(7) If a public water system that is an affected utility fails to provide a minimum of 35 psi throughout the distribution system during emergency operations as soon as it is safe and practicable following the

occurrence of a natural disaster, a revised emergency preparedness plan or justification regarding pressure drop shall be submitted for review and approval within 180 days of the date normal power is restored. Based on the review of the revised emergency preparedness plan, the executive director may require additional or alternative auxiliary emergency facilities.

(b) Community water systems.

(1) Groundwater supplies must meet the following requirements.

(A) If fewer than 50 connections without ground storage, the system must meet the following requirements:

- (i) a well capacity of 1.5 gallons per minute (gpm) per connection; and
- (ii) a pressure tank capacity of 50 gallons per connection.

(B) If fewer than 50 connections with ground storage, the system must meet the following requirements:

- (i) a well capacity of 0.6 gpm per connection;
- (ii) a total storage capacity of 200 gallons per connection;
- (iii) two or more service pumps having a total capacity of 2.0 gpm per connection; and
- (iv) a pressure tank capacity of 20 gallons per connection.

(C) For 50 to 250 connections, the system must meet the following requirements:

- (i) a well capacity of 0.6 gpm per connection;
- (ii) a total storage capacity of 200 gallons per connection;
- (iii) two or more pumps having a total capacity of 2.0 gpm per connection at each pump station or pressure plane. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection are required at each pump station or pressure plane. If only wells and elevated storage are provided, service pumps are not required; and
- (iv) an elevated storage capacity of 100 gallons per connection or a pressure tank capacity of 20 gallons per connection.

(D) For more than 250 connections, the system must meet the following requirements:

- (i) two or more wells having a total capacity of 0.6 gpm per connection. Where an interconnection is provided with another acceptable water system capable of supplying at least 0.35 gpm for each connection in the combined system under emergency conditions, an additional well will not be required as long as the 0.6 gpm per connection requirement is met for each system on an individual basis. Each water system must still meet the storage and pressure maintenance requirements on an individual basis unless the interconnection is permanently open. In this case, the systems' capacities will be rated as though a single system existed;

(ii) a total storage capacity of 200 gallons per connection;

(iii) two or more pumps that have a total capacity of 2.0 gpm per connection or that have a total capacity of at least 1,000 gpm and the ability to meet peak hourly demands with the largest pump out of service, whichever is less, at each pump station or pressure plane. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection are required at each pump station or pressure plane. If only wells and elevated storage are provided, service pumps are not required;

(iv) an elevated storage capacity of 100 gallons per connection or a pressure tank capacity of 20 gallons per connection. If pressure tanks are used, a maximum capacity of 30,000 gallons is sufficient for up to 2,500 connections. An elevated storage capacity of 100 gallons per connection is required for systems with more than 2,500 connections. Alternate methods of pressure maintenance may be proposed and will be approved if the criteria contained in subsection (g)(5) of this section are met; and

(v) emergency power for systems which serve more than 250 connections and do not meet the elevated storage requirement. Sufficient emergency power must be provided to deliver a minimum of 0.35 gpm per connection to the distribution system in the event of the loss of normal power supply. Alternately, an emergency interconnection can be provided with another public water system that has emergency power and is able to supply at least 0.35 gpm for each connection in the combined system. Emergency power facilities in systems serving 1,000 connections or greater must be serviced and maintained in accordance with level 2 maintenance requirements contained in the current National Fire Protection Association (NFPA 110 Standard). Although not required, compliance with NFPA 110 Standard is highly recommended for systems serving less than 1,000 connections. Logs of all emergency power use and maintenance must be maintained and kept on file for a period of not less than three years. These records must be made available, upon request, for executive director review.

(E) Mobile home parks with a density of eight or more units per acre and apartment complexes which supply fewer than 100 connections without ground storage must meet the following requirements:

• (i) a well capacity of 1.0 gpm per connection; and

(ii) a pressure tank capacity of 50 gallons per connection with a maximum of 2,500 gallons required.

(F) Mobile home parks and apartment complexes which supply 100 connections or greater, or fewer than 100 connections and utilize ground storage must meet the following requirements:

(i) a well capacity of 0.6 gpm per connection. Systems with 250 or more connections must have either two wells or an approved interconnection which is capable of supplying at least 0.35 gpm for each connection in the combined system;

(ii) a total storage of 200 gallons per connection;

(iii) at least two service pumps with a total capacity of 2.0 gpm per connection; and

(iv) a pressure tank capacity of 20 gallons per connection.

(2) Surface water supplies must meet the following requirements:

- (A) a raw water pump capacity of 0.6 gpm per connection with the largest pump out of service;
 - (B) a treatment plant capacity of 0.6 gpm per connection under normal rated design flow;
 - (C) transfer pumps (where applicable) with a capacity of 0.6 gpm per connection with the largest pump out of service;
 - (D) a covered clearwell storage capacity at the treatment plant of 50 gallons per connection or, for systems serving more than 250 connections, 5.0% of daily plant capacity;
 - (E) a total storage capacity of 200 gallons per connection;
 - (F) a service pump capacity that provides each pump station or pressure plane with two or more pumps that have a total capacity of 2.0 gpm per connection or that have a total capacity of at least 1,000 gpm and the ability to meet peak hourly demands with the largest pump out of service, whichever is less. For systems which provide an elevated storage capacity of 200 gallons per connection, two service pumps with a minimum combined capacity of 0.6 gpm per connection are required at each pump station or pressure plane;
 - (G) an elevated storage capacity of 100 gallons per connection or a pressure tank capacity of 20 gallons per connection. If pressure tanks are used, a maximum capacity of 30,000 gallons is sufficient for systems of up to 2,500 connections. An elevated storage capacity of 100 gallons per connection is required for systems with more than 2,500 connections. Alternate methods of pressure maintenance may be proposed and will be approved if the criteria contained in subsection (g)(5) of this section are met; and
 - (H) emergency power for systems which serve more than 250 connections and do not meet the elevated storage requirement. Sufficient emergency power must be provided to deliver a minimum of 0.35 gpm per connection to the distribution system in the event of the loss of normal power supply. Alternately, an emergency interconnection can be provided with another public water system that has emergency power and is able to supply at least 0.35 gpm for each connection in the combined system. Emergency power facilities in systems serving 1,000 connections or greater must be serviced and maintained in accordance with level 2 maintenance requirements contained in the current NFPA 110 Standard. Although not required, compliance with NFPA 110 Standard is highly recommended for systems serving less than 1,000 connections. Logs of all emergency power use and maintenance must be maintained and kept on file for a period of not less than three years. These records must be made available, upon request, for executive director review.
- (3) Any community public water system that is an affected utility shall have an emergency preparedness plan approved by the executive director and must meet the requirements for emergency operations contained in subsection (h) of this section. This includes any affected utility that provides 100 gallons of elevated storage capacity per connection.
- (c) Noncommunity water systems serving transient accommodation units. The following water capacity requirements apply to noncommunity water systems serving accommodation units such as hotel rooms, motel rooms, travel trailer spaces, campsites, and similar accommodations.
- (1) Groundwater supplies must meet the following requirements.