

**FINAL**  
**Off-Post**  
**Well Survey Report**



*Prepared For*

**Department of the Army**  
**Camp Stanley Storage Activity**  
**Boerne, Texas**

**March 2011**

## GEOSCIENTIST CERTIFICATION

### Off-Post Well Survey Report

For

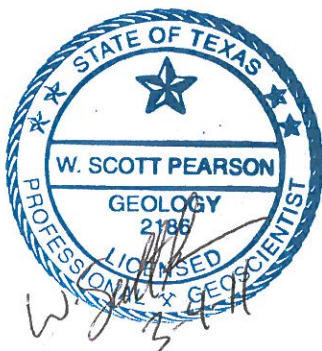
Department of the Army  
Camp Stanley Storage Activity  
Boerne, Texas

I, W. Scott Pearson, P.G., hereby certify that the Off-Post Well Survey Report for the Camp Stanley Storage Activity installation in Boerne, Texas accurately represents the site conditions of the subject area. This certification is limited only to geoscientific products contained in the subject report and is made on the basis of written and oral information provided by the CSSA Environmental Office, data regarding well locations provided by the Texas Commission of Environmental Quality and the Texas Water Development Board, and is true and accurate to the best of my knowledge and belief.



W. Scott Pearson, P.G.  
State of Texas  
Geology License No. 2186

03/04/2011



## EXECUTIVE SUMMARY

This report summarizes methods and results of an Off-Post Well Survey conducted for Camp Stanley Storage Activity (CSSA) as part of the work scoped under U.S. Army Corps of Engineers - Fort Worth District (CESWF) Contract W9126G-07-D-0028, delivery order 0050 (DO-50). This survey was conducted as an update to the original ¼-mile Off-Post Well Survey issued in August 2001. The intent of this survey was to identify the number and use of off-post wells within ½-mile surrounding CSSA, and note any changes to wells originally documented in 2001.

The land use surrounding CSSA has undergone significant changes since the 2001 Off-Post Well Survey Report. In particular, large rural tracts within one mile west of CSSA have transformed from primarily ranching land to single-family housing subdivisions. All of the new housing developments obtain their water service the San Antonio Water System (SAWS), and therefore do not rely on the Middle Trinity Aquifer for potable water.

Research began with a records review from the Texas Commission on Environmental Quality (TCEQ) and the Texas Water Development Board (TWDB). The records review generated available pertinent data regarding drilling methods, lithologic and geophysical logs, well construction details, hydraulic data (yield), available chemical and water quality data, and abandonment information. The records review was followed by a field survey of locations identified as being new or undergoing significant changes since 2001.

Wells in the area of CSSA utilize the Middle Trinity Aquifer as a potable water source. This includes municipal public water supplies (PWS), commercial properties, and privately-owned domestic or stock wells used to sustain households or ranching. The original 2001 well survey located 42 wells within ¼-mile of the CSSA boundary. This 2010 well survey update describes information regarding 86 current/former well locations that have been identified within ½-mile of CSSA.

In total, 97 well locations are identified in this 2010 Well Survey. A total of 47 locations (45 active and 2 plugged) were identified within ¼-mile radius, and another 39 locations (33 active and 6 plugged) are believed to exist between ¼ to ½-mile away from CSSA. Finally, a total of 11 locations (10 active and 1 plugged) were identified in a special interest area beyond the ½-mile survey that is considered to be downgradient of the CSSA volatile organic compound (VOC) plumes.

In summary, since 2001 the following changes to the off-post well locations have occurred:

- Six former domestic wells have been plugged and abandoned (RFR-6, RFR-7, I10-1, I10-3, OFR-2, and DOM-1);
- Two environmental wells have been drilled then subsequently plugged/abandoned as part of the Lost Creek development (CTX-1 and CTX-2);
- One environmental monitoring well has been installed and is in use by CSSA (WB04);
- Four new domestic wells have been drilled within ½-mile of CSSA (RFR-13, RFR-14, JW-3, and JW-34); and

- Four new public supply test wells have been drilled with ½-mile of CSSA (COR-1 through COR-4).
- Eleven additional wells have also been identified in the lands west further than ½-mile of IH-10 that are relevant to ongoing efforts associated with VOC plume migration away from CSSA. These wells include 8 active supply wells operated by The Oaks Water Supply Corporation (TOWSC), one plugged well owned by TOWSC, and two private wells (I10-9 and I10-10) utilized for domestic/stock purposes.

## TABLE OF CONTENTS

<b>APPENDICES.....</b>	<b>vii</b>
<b>LIST OF FIGURES.....</b>	<b>viii</b>
<b>SECTION 1 INTRODUCTION .....</b>	<b>1-1</b>
1.1    Scope Of Work .....	1-1
1.2    Study Area Boundaries.....	1-1
1.3    Demographic Changes Since 2001.....	1-3
1.3.1    Land Use.....	1-3
1.4    Local Water Purveyors .....	1-5
<b>SECTION 2 DATA REVIEW AND SURVEY .....</b>	<b>2-1</b>
2.1    Records Research .....	2-1
2.2    Windshield Survey .....	2-2
<b>SECTION 3 2010 WELL SURVEY RESULTS .....</b>	<b>3-1</b>
3.1    Comparison Methods.....	3-1
3.2    General Statistics .....	3-1
3.3    Plugged And Abandoned Wells .....	3-2
3.4    Well Locations By Geographic Area .....	3-3
3.4.1    Fair Oaks Ranch Water System.....	3-3
3.4.2    Jackson Woods .....	3-3
3.4.3    Ralph Fair Road Vicinity.....	3-4
3.4.4    Leon Springs Villa/Hidden Springs Estates .....	3-6
3.4.5    Interstate Highway 10/Old Fredericksburg Road Vicinity.....	3-7
3.4.6    The Dominion.....	3-8
3.4.7    The Oaks Water Supply Corporation .....	3-8
<b>SECTION 4 CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>4-1</b>
4.1    Conclusions .....	4-1
4.1.1    Summary of Changes within ¼-mile of CSSA .....	4-1
4.1.2    Summary of Changes between ¼-mile and ½-mile of CSSA .....	4-1
4.1.3    General Statistics .....	4-1
4.2    Monitoring Network Additions .....	4-2
4.3    Recommendations .....	4-3

**APPENDICES**

- Appendix A Well Research Records: TWDB and TCEQ (Electronic DVD Version Only)
- Appendix B State Plugging Reports
- Appendix C Geophysical Well Logs

### LIST OF TABLES

Table 2.1	Off-Post Wells Within ½-Mile of CSSA.....	2-3
Table 3.1	General Statistics for Well Surveys.....	3-2
Table 3.2	Water Wells within the Fair Oaks Ranch Geographic Area.....	3-3
Table 3.3	Water Wells within the Jackson Woods Geographic Area .....	3-3
Table 3.4	Re-Designation of Wells in Jackson Woods .....	3-4
Table 3.5	Water Wells within the Ralph Fair Road Geographic Area .....	3-5
Table 3.6	Water Wells within the Leon Springs/Hidden Springs Geographic Area.....	3-6
Table 3.7	Water Wells within the IH10/Old Fredericksburg Road Geographic Area .....	3-7
Table 3.8	Water Wells within the Dominion Geographic Area .....	3-8
Table 3.9	Water Wells within the IH-10 West Geographic Area.....	3-9
Table 4.1	General Statistics for Well Surveys.....	4-2

### LIST OF FIGURES

Figure 1.1	Survey Limits and GeoCoding .....	1-2
Figure 1.2	Land Use and Recent Development .....	1-4
Figure 1.3	Public Water Supply Systems .....	1-6
Figure 2.1	Off-Post Well Locations.....	2-8

ACRONYMS AND ABBREVIATIONS

Bexar Met	Bexar Metropolitan Water District
bgs	Below ground surface
COR	Corley Family LLC
CSSA	Camp Stanley Storage Activity
CTX	Centex Homes
DO	Delivery Order
DOM	The Dominion
FO	Fair Oaks Ranch
GBRA	Guadalupe-Brazos River Authority
GIS	Graphical Information System
GPS	Global Positioning System
HS	Hidden Springs Estates
IH	Interstate Highway
JW	Jackson Woods
LLC	Limited Liability Corporation
LS	Leon Springs Villa
OFR	Old Fredericksburg Road
PWS	Public Water Supply
RFR	Ralph Fair Road
SAWS	San Antonio Water System
TCEQ	Texas Commission on Environmental Quality
TOWSC	The Oaks Water Supply Corporation
TPDES	Texas Pollution Discharge Elimination System
TWDB	Texas Water Development Board
USACE	U.S. Army Corps of Engineers
USGS	United States Geologic Survey
VOC	Volatile organic compound
WB	Westbay™



## SECTION 1 INTRODUCTION

### 1.1 SCOPE OF WORK

This report summarizes methods and results of an Off-Post Well Survey conducted for Camp Stanley Storage Activity (CSSA) in November 2010. This survey was conducted as an update to the 2001 Off-Post Well Survey. The intent of this survey was to identify the number and use of off-post wells within ½-mile surrounding CSSA, and note any changes to wells originally documented in 2001.

In accordance with the Interim Measures requirements of the Administrative Consent Order issued to CSSA on 5 May 1999, a report was prepared in 2001 describing privately and publicly-owned groundwater wells within ¼-mile of CSSA (Offsite Well Survey Report, August 2001). In this report, Parsons has updated the well survey, as part of the work conducted under U.S. Army Corps of Engineers - Fort Worth District (CESWF) Contract W9126G-07-D-0028, delivery order 0050 (DO-50). The results presented in this report include water wells identified within ½-mile of CSSA. This report also documents changes to wells since the 2001 survey. Pertinent data from the wells has been collated in supporting text, tables, and figures.

### 1.2 STUDY AREA BOUNDARIES

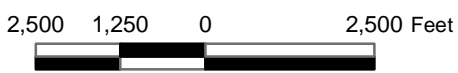
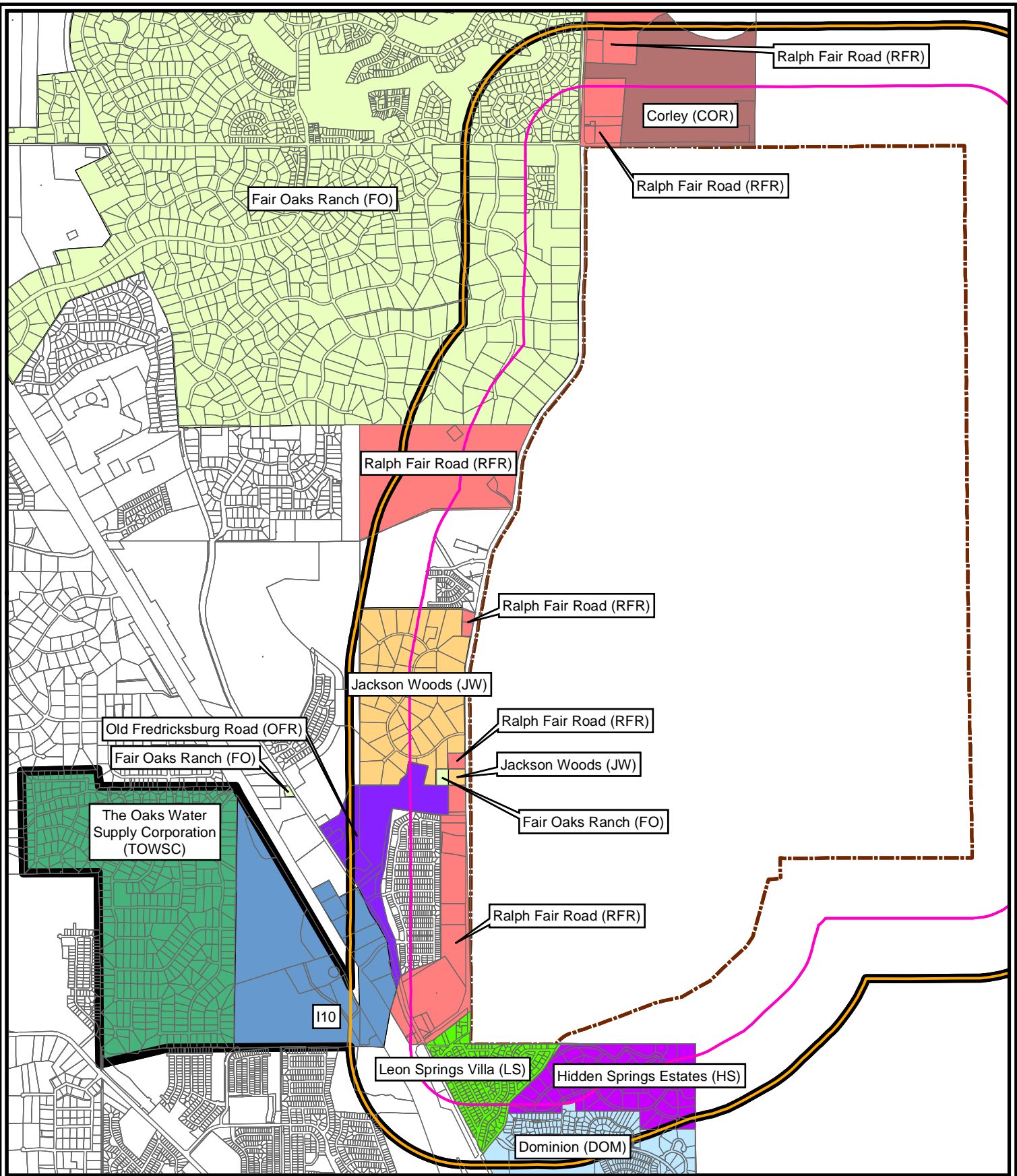
In the original 2001 well survey, Parsons researched and mapped all wells within ¼-mile of the CSSA facility boundary. For this update, the boundary was extended to include all identifiable wells and well activity on private (non-government lands) within ½-mile of CSSA. The well research and mapping consisted of a review of all private wells (domestic, stock, municipal, or commercial) within ½-mile of the CSSA facility boundary. The survey area does not include Camp Bullis (US Army) to the north, east, and south of CSSA.

For the discussion purposes of this report, the surrounding lands around CSSA have been geographically divided based on their location and primary usage. The geographic subdivisions are shown on **Figure 1.1**, and are identified by the following characteristics:

**Camp Stanley Storage Activity (CSSA) and Camp Bullis (CB)** – This geographic area includes those government lands maintained by the U.S. Army. These holdings are mostly undeveloped training and munitions storage areas.

**Corley Family Partnership (COR)** – This geographic area is a small parcel that borders CSSA northwest corner near the intersection of Ralph Fair Road and Dietz-Elkhorn Road. It is currently an undeveloped parcel of land, but appears that it may be slated for development since four Public Water Supply (PWS) test wells were drilled in 2003.

**Fair Oaks Ranch (FO)** – This geographic area is a large residential community northwest of CSSA. The development holds multiple satellite properties along Ralph Fair Road, Old Fredericksburg Road, and Interstate 10. Some of these satellite properties are maintained for water production wells.



- 1/4 Mile Buffer
- 1/2 Mile Buffer
- Survey Limit
- CSSA Boundary
- Corley (COR)
- Dominion (DOM)
- I10
- Fair Oaks Ranch (FO)
- Hidden Springs Estates (HS)
- Jackson Woods (JW)
- Leon Springs Villa (LS)
- Old Fredricksburg Road (OFR)
- Ralph Fair Road (RFR)
- The Oaks Water Supply Corporation (TOWSC)

Figure 1.1

Survey Limits and Geocoding  
Camp Stanley Storage Activity



**Interstate 10 (I10) and Old Fredericksburg Road (OFR) Vicinity** – Locations in these areas consist of both private wells serving both domestic and commercial properties. Recent housing development has occurred along this corridor as the region continues to trend from rural to multi-housing developments. The I10 geographic area was expanded in January 2011 to include wells on the west side of Interstate 10 beyond the ½-mile survey to identify wells that may be potentially downgradient of the volatile organic compound (VOC) plume originating from CSSA.

**Jackson Woods (JW)** – This geographic area is a small residential community of ranch-style homes on multiple-acre land tracts. Approximately one-third of the tracts are either undeveloped, or are jointly held as a contiguous property to a developed tract. Each developed tract has a groundwater well to furnish the homestead with potable water.

**Leon Springs (LS) Villa and Hidden Springs (HS) Estates** – This geographic area has been established for nearby private wells located along Curres Creek Road, and those municipal wells which serve those communities.

**Ralph Fair Road (RFR)** – This geographic entity has been created to capture those locations along RFR that are not included with the Fair Oaks or Jackson Woods communities. The remaining addresses along RFR are either ranch property homesteads or places of commercial business.

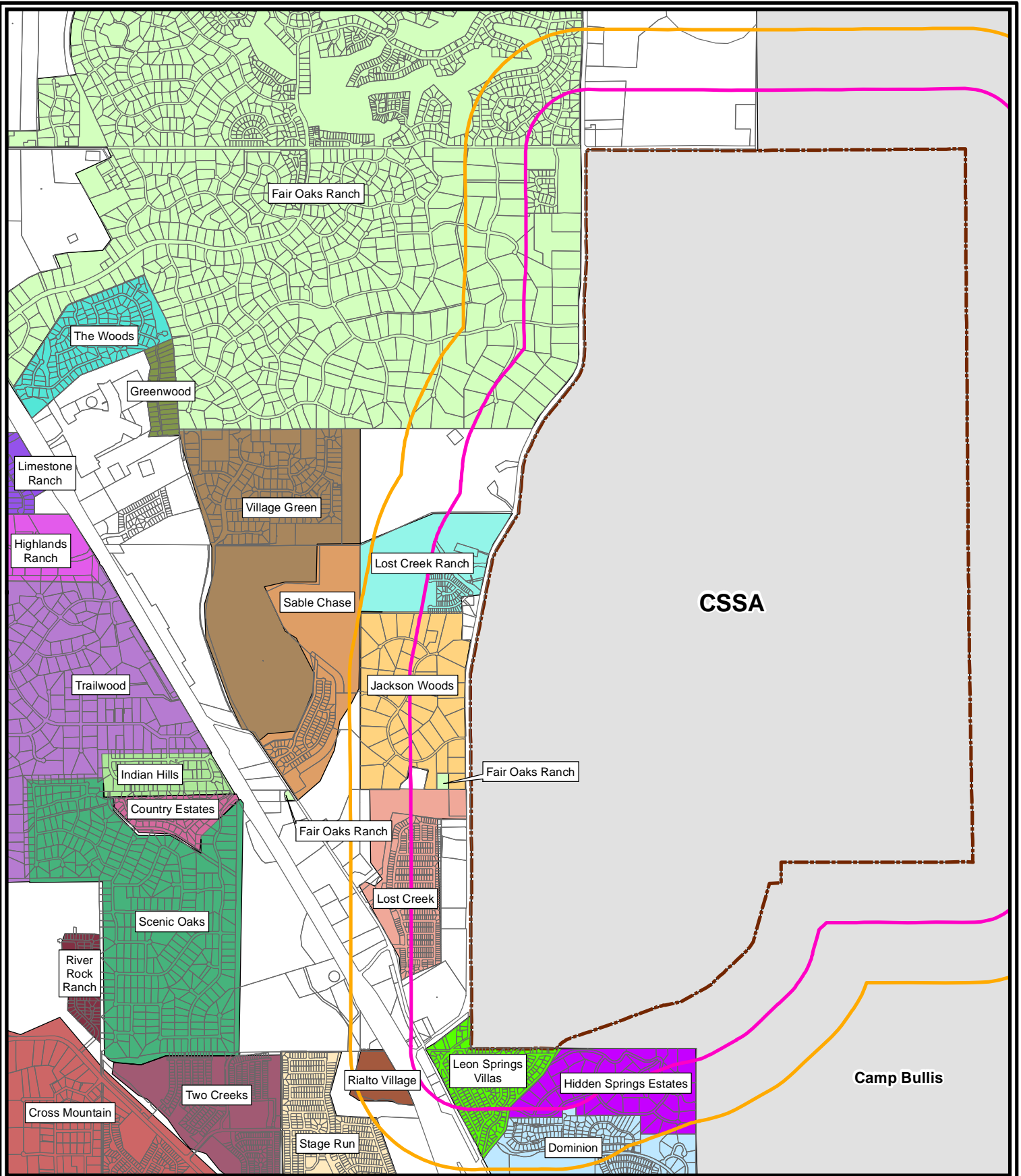
**The Oaks Water Supply Corporation (TOWSC)** - In January 2011, the extent of this survey was extended west of IH-10 to include land parcels that are considered to be potentially downgradient of the a VOC plume originating from CSSA. This extent of the additional survey area includes a residential subdivision (Scenic Oaks and Country Estates) which are serviced by a PWS system. This amendment to the original ½-mile survey extends approximately 1.8 miles west of CSSA.

**The Dominion (DOM)** – This geographic entity has been created to capture legacy domestic well locations prior to the development of The Dominion subdivision. The area is generally served by the San Antonio Water System (SAWS), but several old well locations prior to that development have been documented.

## 1.3 DEMOGRAPHIC CHANGES SINCE 2001

### 1.3.1 Land Use

The land use surrounding CSSA has undergone significant changes since the 2001 Off-Post Well Survey Report. In particular, lands within one mile west of CSSA have transformed from primarily ranching land to housing subdivisions (**Figure 1.2**). Large rural tracts of land between Ralph Fair Road (FM3351) and Old Fredericksburg Road have been developed into single-family housing developments (Lost Creek, Lost Creek Ranch, and Sable Chase). The Lost Creek Ranch subdivision is accessed directly from Ralph Fair Road, adjacent to the northwest corner of the CSSA Inner Cantonment Area (Gate 5 area). The Lost Creek subdivision is within 0.1-miles west of CSSA, and is accessed from Old Fredericksburg Road.



CSSA

Camp Bullis



- CSSA Boundary
- Private Property (Non-Development)
- Government Land
- 1/4 Mile Buffer
- 1/2 Mile Buffer

**Figure 1.2**  
**Land Use and**  
**Recent Development**  
**Camp Stanley Storage Activity**

**PARSONS**

Finally, the Sable Chase subdivision is approximately 0.5-miles west of CSSA, and is also accessed from Old Fredericksburg Road. The development of these properties resulted in the abandonment of three rural wells that were previously sampled as part of the CSSA groundwater monitoring program. All of the new housing developments obtain their water service from SAWS, and therefore do not rely on the Middle Trinity Aquifer for potable water.

Additional commercial and residential development has also occurred along the Interstate 10 corridor between Ralph Fair Road and Boerne Stage Road in Leon Springs to the south and west of CSSA. This includes commercial strip centers and further housing development along Boerne Stage Road.

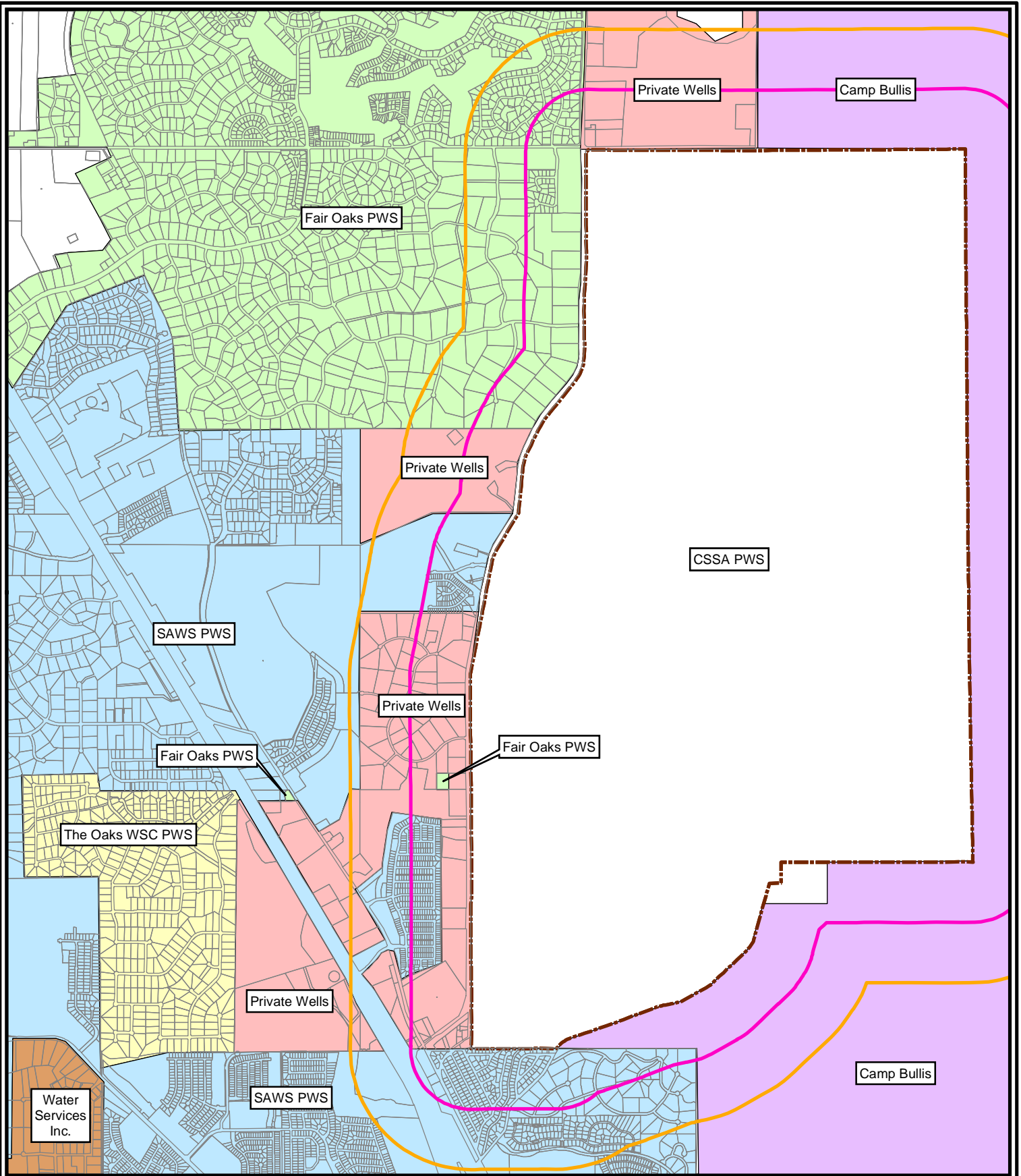
## 1.4 LOCAL WATER PURVEYORS

While there are many privately-owned water wells within a ½-mile radius of CSSA, the major of the communities in and around CSSA are served by PWS systems. **Figure 1.3** illustrates the current configuration of PWS systems in the vicinity of CSSA and the well survey area. In the survey area, nearly all wells draw from either the Lower Glen Rose or Cow Creek formational members of the Middle Trinity Aquifer. Many wells are completed across both water-bearing units to maximize their yield. Locally, the Bexar Shale (or the Hensell Sand facies counterpart) does not contribute significant quantities of groundwater to the well bore. In the past, cross-connections between the Lower Glen Rose and the Cow Creek had not been a concern of the general groundwater user since the Bexar Shale has a low collapse potential. The water quality from the Middle Trinity Aquifer is good, but is rather hard from carbonate rock mineralization.

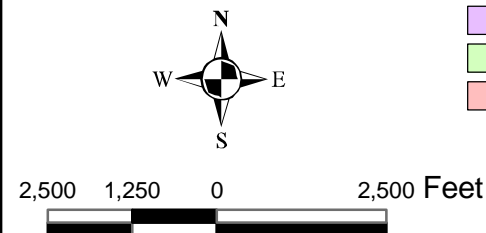
The San Antonio Water System (SAWS) (PWS ID 015008) provides the bulk of water services to the Greater San Antonio area. Most of their water is developed from the highly prolific Edwards Aquifer. Since the original 2001 Well Survey report, SAWS has expanded their services to the northwest, and now serve many communities along the IH-10 corridor surrounding CSSA. This includes Leon Springs Villa which borders CSSA to the south, and the new Lost Creek, Lost Creek Ranch, and Sable Chase developments within 0.5 miles of CSSA to the west. With the exception of a few independent utility districts, SAWS provides water to most all residents to the west of Interstate 10 in the CSSA area. SAWS has also expanded its service area through the acquisition of water systems operated by others. Relevant examples include the acquisition of service rights of Leon Springs Villa and Hidden Springs Estates, which border CSSA to the south, as well as Village Green to the west.

Leon Springs Villa, Hidden Springs Estates, and Village Green were independent water systems with their own Trinity Aquifer wells operated by the Bexar Metropolitan Water District (Bexar Met). In 2007, SAWS has purchased and incorporated all three of these service areas into their domain. At Leon Springs Villa and Village Green, the existing wells were deactivated, and the entire community was connected to the SAWS infrastructure providing Edwards Aquifer water. At Hidden Springs Estates, SAWS purchased the water system and continues to operate their four wells.





**Figure 1.3**  
**Public Water Supply Systems**  
**Camp Stanley Storage Activity**  
**PARSONS**



- Camp Bullis
- Fair Oaks PWS
- Private Wells
- SAWS PWS
- The Oaks WSC PWS
- Water Services Inc.
- CSSA Boundary
- 1/4 Mile Buffer
- 1/2 Mile Buffer

The Fair Oaks Ranch community (west of CSSA) is the largest independent water system (PWS ID 0150216) in the vicinity of CSSA. Fair Oaks Ranch produces groundwater from the Middle and Lower Trinity Aquifers from 29 wells. Fair Oaks also augments their water supply demand with treated water from the Canyon Lake Reservoir purchased from the Guadalupe-Blanco River Authority (GBRA).

Finally, TOWSC (PWS ID 0150399) operates eight Middle and Lower Trinity Aquifer wells, west of CSSA and Interstate 10. While technically this utility district is one mile west of CSSA, it was included in this well survey report because of the potential threat of volatile organic compound (VOC) contamination migrating away from CSSA.

## SECTION 2

### DATA REVIEW AND SURVEY

#### 2.1 RECORDS RESEARCH

Research began with a records review from the Texas Commission on Environmental Quality (TCEQ) and the Texas Water Development Board (TWDB). The Trinity-Glen Rose Groundwater Conservation District was also contacted, but they do not maintain a separate database of groundwater wells within their jurisdiction. The records review generated available pertinent data regarding drilling methods, lithologic and geophysical logs, well construction details, hydraulic data (yield), available chemical and water quality data, and abandonment information.

The records review was followed by a field survey of locations identified as being new or undergoing significant changes since 2001. This technical memorandum describes the efforts and results of the 2010 off-post well survey. Information in the 2001 report on wells that showed no significant change in status up to 2010 is not reiterated here.

This update was initiated in September 2010. Parsons began by obtaining well information from well databases at TCEQ and TWDB. An electronic DVD version of the agency records is included in Appendix A. The data were compared to the 2001 survey and new wells and other discrepancies were further investigated.

Each agency maintains a separate water well file system and database. The TWDB maintains a file system of located water well locations that have been verified with a field inventory inspection by TWDB personnel. The wells are assigned a state tracking number unique to that well, and are plotted on county base maps, United States Geological Survey (USGS) topographic quadrangles, and an in-house geographic information system (GIS) database. Records also include any available analytical data attached with each drilling record. Older wells constructed prior to initiation of current reporting requirements may not be included in the database. The database contains information on approximately 130,000 wells, which is an estimated 1/10 of all wells (>1,000,000) drilled in Texas in the last century.

The TCEQ maintains a file system of plotted, partially numbered, and unnumbered water well locations. Plotted water well files are well locations that have been determined from map information submitted on well logs supplied by the drilling firm. However, this type of mapping and filing procedure ceased in 1986. Partially numbered well files are locations processed from 1986 to 1990. These wells are provided a State Identification Number (different from the TWDB-assigned number) which establishes the well within a 2.5-minute quadrant of a standard 7.5-minute USGS topographic map; however, TCEQ staff have never exactly established well locations. In the vicinity of CSSA, a 2.5-minute quadrant is approximately 7.25 square miles in area. Unnumbered water well files are locations that have been processed since June 1990. These well records are filed solely on their county location and are not provided a State Identification Number, nor are they mapped.



The information contained in the database typically includes the well drilling record submitted by the drilling contractor. This data includes location description, installation date, drilling method, lithologic log, well construction, pump information, and water level. The quality and reliability of the data is subject to the accuracy and effort put forth by the drilling firm, which can be highly variable. Non-typical information that may also be obtained from the agency records may include well inspection records, aquifer yield, or even geophysical logs.

In general, the accuracy of records obtained from the TWDB is more thorough and precise, but only reliably account for those wells utilized for public supply or recent environmental purposes. Additional wells can be identified through the TCEQ records, but are typically only reliable to a 2.5-minute quadrant locality. Other inherent problems in locating wells include inaccuracies of the records and poorly or erroneously mapped well locations. Many water well schedules may have never been submitted to the regulatory agencies by the driller, and may explain the possible unaccountability of privately-drilled wells. Additionally, grossly inaccurate or poorly scaled maps that accompany the drilling schedules make it difficult to positively identify well locations. Often, important well location information required on the water well schedules including the owner, address, or property location was omitted, incomplete, inaccurate, or generally too vague.

Although this initial effort greatly helped positively identify many well locations, there were some unresolved well records that could not be accurately matched to a precise location, and obvious well locations without records.

## 2.2 WINDSHIELD SURVEY

A windshield survey was conducted by Parsons on November 17 and 18, 2010 to positively locate wells identified during the records research as being drilled or abandoned after 2001. The success of the field survey was limited due to the inaccessibility of several wells on private property, for which there was no access agreement. The survey was conducted around the communities and commercial lots surrounding CSSA. Well locations were either visually confirmed by direct observation or, when that was not possible, were inferred based on comparison and examination of aerial photographs from 1995, 2003, 2008, and current satellite imagery. Geographic positioning system (GPS) coordinates and photographs are not available for any of the privately-owned land parcels new to the 2010 survey, due to lack of access agreement. The field survey also confirmed the obliteration of several abandoned well locations due to new construction.

**Table 2.1** lists the findings of the 2010 Records Review and Windshield Survey. The well locations are grouped by geographic location, and include relevant well construction information ascertained by the records review. Estimations on the classification of the well (PWS, Domestic, Commercial, or Other) were determined by the geographic area and known land use for a particular location. **Figure 2.1** plots the well locations relative to CSSA.

**Table 2.1**  
**Off-Post Well Survey**  
**CSSA Groundwater Monitoring Program**  
**Camp Stanley, Boerne, Texas**  
**2010 Update**

Map ID	Distance From CSSA (miles)	Longitude (UTM)	Latitude (UTM)	Elevation (Feet MSL)	Current Owner	Well Type	TWDB Aquifer Coding* or Estimated Water Source	Current Status	Address	Notes
<b>Fairco Water Company</b>										
FO-2	<0.25	536053	3288969	1351	Fairco Water Co.	Municipal	Cow Creek*	N/A	7286 Dietz-Elkhorn Road	Prior to 1975 this well was originally 384' deep. In January 1975 the well was deepened to 555'. Geophysical survey conducted on January 9, 1975. Depth to Cow Creek is 442'.
FO-5	<0.5	535625	3287693	1323	Fairco Water Co.	Municipal	Lower Glen Rose/Cow Creek*	N/A	7556 Pilimco	Depth to Cow Creek is 454'.
FO-7	<0.25	536387	3288321	1314	Fairco Water Co.	Municipal	Lower Glen Rose/Cow Creek*	N/A	28833 Ralph Fair Road	Depth to Cow Creek is 423'.
FO-8	<0.25	536366	3287621	1323	Fairco Water Co.	Municipal	Lower Glen Rose/Cow Creek*	N/A	28329 Ralph Fair Road	Depth to Cow Creek is 447'.
FO-9	<0.5	536383	3289554	1316	Fairco Water Co.	Municipal	Lower Glen Rose/Cow Creek*	N/A	29825 Ralph Fair Road	Depth to Cow Creek is 477'.
FO-20	<0.25	536379	3289244	1327	Fairco Water Co.	Observation	Glen Rose/Hensell/Cow Creek*	Observation Well	29435 Ralph Fair Road	Borehole drilled to 780' & was dry hole. Well was plugged to 435' & dynamited to fracture bedrock.
FO-21	<0.25	536384	3288864	1310	Fairco Water Co.	Municipal	Cow Creek*	N/A	29175 Ralph Fair Road	Depth to Cow Creek is 404'.
FO-22	<0.25	536178	3287349	1304	Fairco Water Co.	Municipal	Cow Creek*	N/A	28037 Ralph Fair Road	Depth to Cow Creek is 428'.
FO-J1	<0.25	535446	3284726	1268	Fairco Water Co.	Municipal	Cow Creek*	N/A	Lot 29 - Jackson Woods	
<b>Jackson Woods Subdivision</b>										
JW-1	<0.25	535351	3285886	1280	Private	Domestic	Lower Glen Rose/ Cow Creek	Used	7735 Mountain Trail	
JW-2	<0.25	535586	3285830	1280	Private	Domestic	Lower Glen Rose/ Cow Creek	Unused	26837 Fawn Mountain	
JW-3	<0.25	535423	3285587	1293	Private	Domestic	Lower Glen Rose	Used	26818 Fawn Mountain	
JW-4	<0.25	535347	3285523	1302	Private	Domestic	Lower Glen Rose	Used	26766 Fawn Mountain	
JW-5	<0.25	535300	3285278	1309	Private	Domestic	Lower Glen Rose/Cow Creek	Used	26736 Fawn Mountain	
JW-6	<0.25	535337	3285066	1268	Private	Domestic	Lower Glen Rose/Cow Creek	Used	26540 Fawn Mountain	
JW-7	<0.25	535403	3284842	1255	Private	Domestic	N/A	N/A	26541 Fawn Mountain	
JW-8	<0.25	535466	3284954	1270	Private	Domestic	Glen Rose/Hensell/Cow Creek*	Used	26531 Fawn Mountain	

**Table 2.1 (continued)**  
**Off-Post Well Survey**  
**CSSA Groundwater Monitoring Program**  
**Camp Stanley, Boerne, Texas**  
**2010 Update**

Map ID	Distance From CSSA (miles)	Longitude (UTM)	Latitude (UTM)	Elevation (Feet MSL)	Current Owner	Well Type	TWDB Aquifer Coding* or Estimated Water Source	Current Status	Address	Notes
JW-9	<0.25	535571	3285025	1312	Private	Domestic	N/A	N/A	26455 Ralph Fair Road	
JW-10	<0.25	535512	3285190		Private	Domestic	Lower Glen Rose/Cow Creek	Used	N/A	
JW-11	<0.25	535381	3285306		Not Matched	Domestic	Lower Glen Rose/Cow Creek	Used	N/A	
JW-12	<0.25	535529	3285395	1290	Private	Domestic	N/A	N/A	26753 Ralph Fair Road	
JW-13	<0.25	535535	3285339	1290	Private	Domestic	N/A	N/A	26743 Ralph Fair Road	
JW-14	<0.25	535501	3284803	1282	Private	Domestic	Lower Glen Rose/Cow Creek	Used	26435 Ralph Fair Road	
JW-15	<0.5	534972	3285722	1260	Private	Domestic	Lower Glen Rose	Used	7767 Mountain Trail	
JW-16	<0.5	535095	3285877	1273	Private	Domestic	Lower Glen Rose/Cow Creek	Used	7751 Mountain Trail	
JW-17	<0.5	535263	3285897	1280	Private	Domestic	Lower Glen Rose/Cow Creek	Used	7743 Mountain Trail	
JW-18	<0.5	535142	3285672	1260	Private	Domestic	Lower Glen Rose/Cow Creek	Used	7760 Mountain Trail	
JW-19	<0.5	535153	3285629	1280	Private	Domestic	N/A	Used	7752 Mountain Trail	
JW-20	<0.5	535214	3285471	1311	Private	Domestic	Lower Glen Rose/Cow Creek	Used	26763 Fawn Mountain	
JW-21	<0.5	535107	3285448	1280	Private	Domestic	N/A	Used	7835 Smokey View	
JW-22	<0.5	535199	3285412	1290	Private	Domestic	N/A	Used	26743 Fawn Mountain	
<del>JW-23</del> JW-31	<0.5	535017	3285353	1265	Private	Domestic	Lower Glen Rose/Cow Creek	Used	7850 Smokey View	Redesignated as JW-31 (new owner & access arrangement).
JW-24	<0.5	535093	3285266	1305	Private	Domestic	Lower Glen Rose/Cow Creek	Used	26655 Fawn Mountain	
JW-25	<0.5	535041	3285198	1300	Private	Domestic	N/A	Used	26645 Fawn Mountain	
JW-26	<0.5	535084	3285105	1290	Private	Domestic	N/A	Used	26635 Fawn Mountain	
JW-27	<0.5	535094	3284999	1272	Private	Domestic	Lower Glen Rose/Cow Creek	Used	26625 Fawn Mountain	
JW-28	<0.5	534978	3284947	1260	Private	Domestic	N/A	Used	7821 Covey Roost	
JW-29	<0.5	535003	3284836	1258	Private	Domestic	Lower Glen Rose	Used	7830 Covey Roost	
JW-30	<0.5	535100	3284828	1260	Private	Domestic	N/A	Used	7820 Covey Roost	
<del>JW-31</del> JW-32	<0.5	535140	3284934	1272	Private	Domestic	N/A	Used	7810 Covey Roost	Renamed.
JW-33	<0.5	535419	3285778	1285	Private	Domestic	N/A	Used	7727 Mountain Trail	New in 2003.
JW-34	<0.5	535176	3285137	1279	Private	Domestic	N/A	Used	26642 Fawn Mountain	New in 2010.

**Table 2.1 (continued)**  
**Off-Post Well Survey**  
**CSSA Groundwater Monitoring Program**  
**Camp Stanley, Boerne, Texas**  
**2010 Update**

Map ID	Distance From CSSA (miles)	Longitude (UTM)	Latitude (UTM)	Elevation (Feet MSL)	Current Owner	Well Type	TWDB Aquifer Coding* or Estimated Water Source	Current Status	Address	Notes
<b>Ralph Fair Road</b>										
RFR-1	<0.25	536455	3289071	1338	Private	Commercial	Cow Creek	Used	29202 Ralph Fair Road	Currently serves a Shell Fuel Station and other ccommercial units.
RFR-2	<0.25	536541	3289087	1352	Private	Domestic	N/A	Used	7087 Dietz-Elkhorn	Homestead location with old windmill and cistern. No data is available for this well.
RFR-3	<0.25	535865	3286916	1262	Private	Domestic	Lower Glen Rose/ Cow Creek	Used	27805 Ralph Fair Road	
RFR-4	<0.25	535769	3287011	1273	Private	Domestic	Lower Glen Rose	Used	27645 Ralph Fair Road	
RFR-5	<0.5	535585	3287118	1287	Private	Domestic	Lower Glen Rose / Cow Creek	Used	28015 Ralph Fair Road	
<b>RFR-6</b>	<b>&lt;0.25</b>	<b>535642</b>	<b>3286340</b>	<b>1320</b>	<b>Private</b>	<b>Domestic</b>	<b>Cow Creek</b>	<b>P&amp;A'd 26-Feb-07</b>	<b>27397 Ralph Fair Road</b>	<b>Covered by CENTEX construction. Plugging Report # 36724</b>
<b>RFR-7</b>	<b>&lt;0.25</b>	<b>535654</b>	<b>3286104</b>	<b>1287</b>	<b>Private</b>	<b>Domestic</b>	<b>N/A</b>	<b>P&amp;A'd 26-Feb-07</b>	<b>27207 Ralph Fair Road</b>	<b>Covered by CENTEX construction. Plugging Report # 36723</b>
RFR-8	<0.25	535647	3285778	1282	Private	Domestic	N/A	Used	27125 Ralph Fair Road	No data available for this well.
RFR-9	<0.25	535586	3284328	1290	Private	Domestic	N/A	Used	26109 Ralph Fair Road	No data available for this well.
RFR-10	<0.25	535337	3283393	1204	Private	Domestic	N/A	Used	25490 Old Fredericksburg Road	
<b>CS-WB04</b>	<b>&lt;0.25</b>	<b>535402</b>	<b>3283519</b>	<b>1222</b>	<b>Private/US Gov.</b>	<b>Monitoring</b>	<b>N/A</b>	<b>monitored by CSSA</b>	<b>Same as RFR-10.</b>	<b>Westbay multiport monitoring system</b>
RFR-11	<0.25	535322	3283195	1171	Private	Domestic	N/A	Used	25360 Old Fredericksburg Road	
RFR-12	<0.25	535269	3283115	1165	Private	Commercial	Glen Rose/Hensell/Cow Creek*	Used	IH10 @ Ralph Fair Road (Pico Gas Station)	Geophysical survey conducted September 1, 1989.
<b>RFR-13</b>	<b>&lt;0.25</b>	<b>535571</b>	<b>3284682</b>	<b>1280</b>	<b>Private</b>	<b>Domestic</b>	<b>Lower Glen Rose / Cow Creek</b>	<b>Presumed in use</b>		
<b>RFR-14</b>	<b>&lt;0.25</b>	<b>535536</b>	<b>3284906</b>	<b>1292</b>	<b>Private</b>	<b>Domestic</b>	<b>Lower Glen Rose / Cow Creek</b>	<b>Presumed in use</b>		
<b>RFR-15</b>	<b>&lt;0.25</b>	<b>536515</b>	<b>3289657</b>	<b>1303</b>	<b>Private</b>	<b>Domestic</b>	<b>N/A</b>	<b>N/A</b>	<b>No data available for this well.</b>	
<b>RFR-16</b>	<b>&lt;0.25</b>	<b>536558</b>	<b>3289798</b>	<b>1294</b>	<b>Private</b>	<b>Domestic</b>	<b>N/A</b>	<b>N/A</b>	<b>No data available for this well.</b>	
<b>CTX-1/ CTX-1</b>	<b>&lt;0.5</b>	<b>535150</b>	<b>3284590</b>	<b>N/A</b>	<b>CENTEX</b>	<b>Monitoring</b>	<b>N/A</b>	<b>Plugged</b>	<b>Lost Creek Ranch subdivision</b>	
<b>CTX-2/ CTX-2</b>	<b>&lt;0.5</b>	<b>534596</b>	<b>3283545</b>	<b>N/A</b>	<b>CENTEX</b>	<b>Monitoring</b>	<b>N/A</b>	<b>Plugged</b>	<b>Lost Creek Ranch subdivision</b>	
<b>COR-1</b>	<b>&lt;0.5</b>	<b>536935</b>	<b>3289421</b>	<b>N/A</b>	<b>Corley Family LLC</b>	<b>Municipal Test Well</b>	<b>N/A</b>	<b>N/A</b>	<b>North side Dietz Elkhorn</b>	

**Table 2.1 (continued)**  
**Off-Post Well Survey**  
**CSSA Groundwater Monitoring Program**  
**Camp Stanley, Boerne, Texas**  
**2010 Update**

Map ID	Distance From CSSA (miles)	Longitude (UTM)	Latitude (UTM)	Elevation (Feet MSL)	Current Owner	Well Type	TWDB Aquifer Coding* or Estimated Water Source	Current Status	Address	Notes
COR-2	<0.25	536721	3289174	N/A	Corley Family LLC	Municipal Test Well	N/A	N/A	North side Dietz Elkhorn	
COR-3	<0.25	537447	3289177	N/A	Corley Family LLC	Municipal Test Well	N/A	N/A	North side Dietz Elkhorn	
COR-4	<0.5	539(7)058	3289459	N/A	Corley Family LLC	Municipal Test Well	N/A	N/A	North side Dietz Elkhorn	GPS coordinates may be incorrect.
<b>I10/Old Fredericksburg Road Vicinity</b>										
I10-1	<0.5	535007	3283072	1165	Private	Commercial	N/A	Unknown	25291 IH10 West	Original location unverified.
I10-2	<0.5	535164	3283389	1165	AAA Stow Away	Commercial	Lower Glen Rose / Cow Creek	Used	AAA Stow Away 25300 IH-10 W	Verified.
I10-3	<0.5	534990	3283109	1165	Private	Domestic	Lower Glen Rose	Plugged	S. of I10-Across from Pico	This well is suspected to be the other well located at what is now a Shell (Texaco in 2001) fuel station.
I10-4	<0.5	534802	3283905	1170	Private	Domestic	Lower Glen Rose	Used	25690 IH-1- W	Verified. Residence demolished, pump removed.
I10-5	<0.5	534994	3283136	1167	Eye Ten Investments	Commercial	Lower Glen Rose / Cow Creek	Used	25331 IH-10 W	May be same as I10-1 or I10-3?
OFR-1	<0.5	534946	3284201	1195	Private	Domestic	Lower Glen Rose / Bexar Shale	Used	26044 Old Fredericksburg Road	
OFR-2	<0.5	535047	3284063	1200	Private	Domestic	N/A	Plugged	26044 Old Fredericksburg Road	Plugged 2007-2008.
OFR-3	<0.5	535177	3283478	1177	Private	Commercial	N/A	Used		
<b>Leon Springs Villa/Hidden Springs Estates Vicinity</b>										
LS-1	<0.25	536214	3283007	1190	SAWS	Municipal	LGR/Cow Creek*	Deactivated	25415 Brewer Dr.	Also recorded as 6819630, 6819631, 6820402. Reconditioned in 2003, remained offline since.
LS-2	<0.25	535590	3283048	1170	SAWS	Municipal	Cow Creek*	Deactivated	25300 Farenthold	
LS-3	<0.25	535516	3283012	1160	SAWS	Municipal	Cow Creek*	Deactivated	Farenthold Circle/ Danna Marie Drive	
LS-4	<0.5	535735	3282429	1145	SAWS	Municipal	Glen Rose*	Deactivated	24818 Ima Ruth Parkway	
LS-5	<0.25	535584	3283098	1165	Private	Domestic	N/A	N/A	7655 Cures Creek Road	Residence.
LS-6	<0.25	535504	3283057	1165	Private	Commercial	N/A	Used	7655 Cures Creek Road	Church.
LS-7	<0.25	535624	3283141	1190	Private	Domestic	N/A	Used	7529 Cures Creek Road	Residence.
HS-1	<0.25	536938	3282990	1390	SAWS	Municipal	Cow Creek*	Used	Falcon View /Rocky Hill Road	
HS-2	<0.25	536938	3283020	1375	SAWS	Municipal	Cow Creek*	Used	Falcon View /Rocky Hill Road	
HS-3	<0.25	536960	3282990	1390	SAWS	Municipal	Cow Creek*	Inactive	Falcon View /Rocky Hill Road	
HS-4	<0.25	536961	3283020	1385	SAWS	Municipal	Cow Creek*	Inactive	Falcon View /Rocky Hill Road	

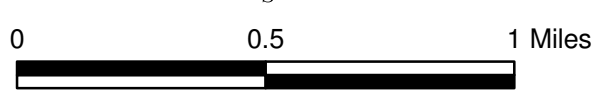
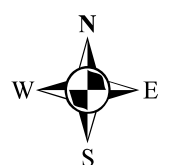
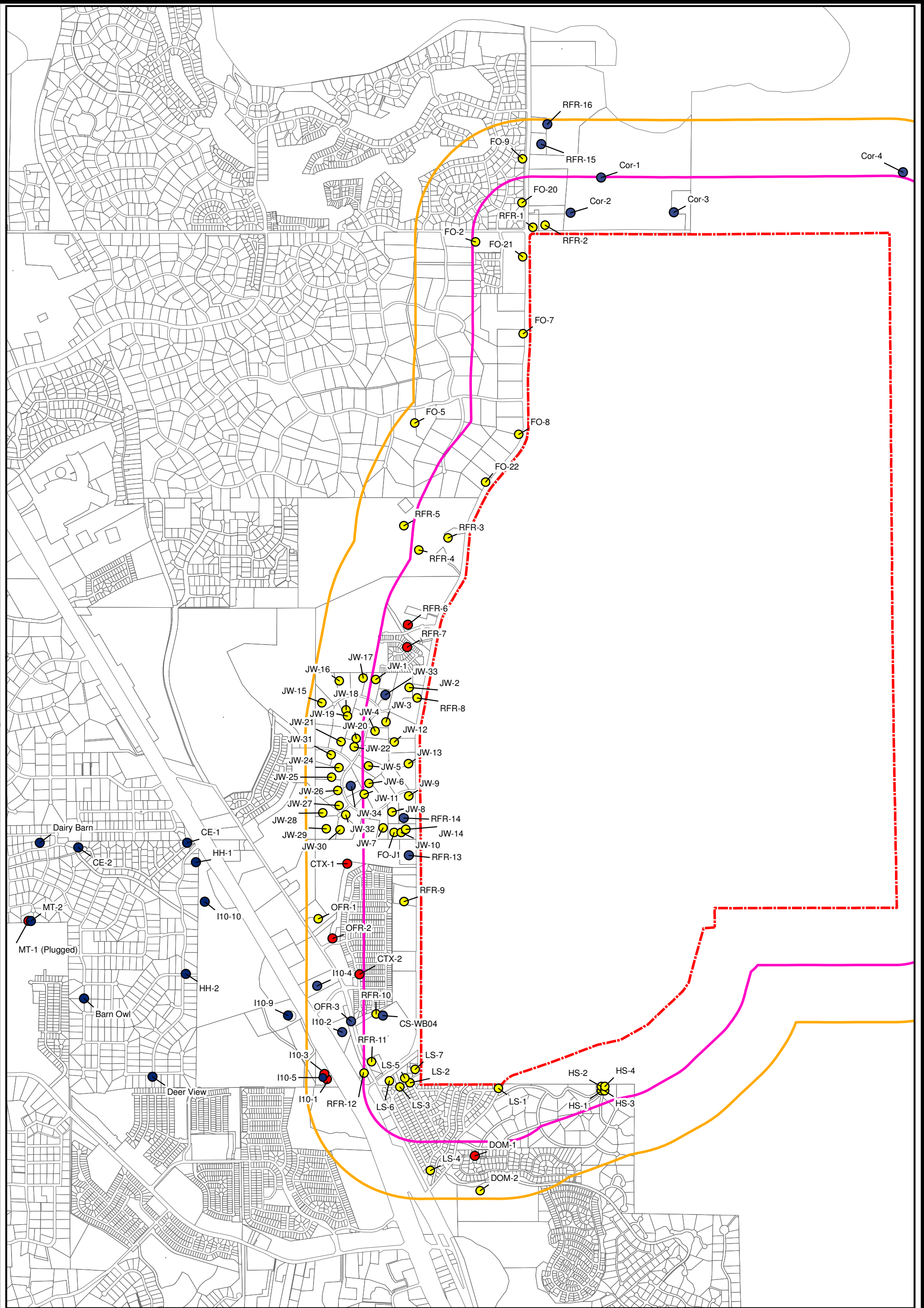
**Table 2.1 (continued)**  
**Off-Post Well Survey**  
**CSSA Groundwater Monitoring Program**  
**Camp Stanley, Boerne, Texas**  
**2010 Update**

Map ID	Distance From CSSA (miles)	Longitude (UTM)	Latitude (UTM)	Elevation (Feet MSL)	Current Owner	Well Type	TWDB Aquifer Coding* or Estimated Water Source	Current Status	Address	Notes
<b>The Dominion</b>										
DOM-1	<0.5	N/A	N/A	N/A	N/A	Domestic	N/A	presumed P&A'd	N/A	Presumed plugged. Lot covered by new construction
DOM-2	<0.5	536080	3282287	1170	Private	Domestic	N/A	Unused	191 Dominion Drive	Power disconnected.
<b>IH-10 West</b>										
I10-9	>0.5	534761	3283500	1171	Private	Domestic	N/A	Used	25581 W IH 10	Location estimated from aerial photo
I10-10	>0.5	534157	3284324	1206	Private	Domestic	N/A	Used	26087 W IH 10	Location estimated from aerial photo
TOWSC-HH1	>1.0	534085	3284597	1205	The Oaks WSC	Municipal	Sligo/Hosston*	Used	26058 Hazy Hollow	Location estimated from aerial photo
TOWSC-HH2	>1.0	534015	3283812	1220	The Oaks WSC	Municipal	LGR/Cow Creek*	Used	26058 Hazy Hollow	Location estimated from aerial photo
TOWSC-DeerView	>1.0	533781	3283089	1236	The Oaks WSC	Municipal	LGR/Cow Creek*	Used	26058 Hazy Hollow	Location estimated from aerial photo
TOWSC-CE1	>1.0	534025	3284737	1214	The Oaks WSC	Municipal	Cow Creek*	Used	26058 Hazy Hollow	Location estimated from aerial photo
TOWSC-CE2	>1.0	533260	3284703	1235	The Oaks WSC	Municipal	Cow Creek*	Used	26058 Hazy Hollow	Location estimated from aerial photo
TOWSC-BarnOwl	>1.0	533307	3283641	1295	The Oaks WSC	Municipal	Sligo/Hosston*	Used	26058 Hazy Hollow	Location estimated from aerial photo
TOWSC-DairyBarn	>1.0	532989	3284736	1261	The Oaks WSC	Municipal	Sligo/Hosston*	Used	26058 Hazy Hollow	Location estimated from aerial photo
TOWSC-MT1	>1.0	532930	3284176	1353	The Oaks WSC	Plugged	Sligo/Hosston*	Plugged	26058 Hazy Hollow	Location estimated from aerial photo
TOWSC-MT2	>1.0	532930	3284176	1353	The Oaks WSC	Municipal	LGR/Cow Creek*	Used	26058 Hazy Hollow	Location estimated from aerial photo

XXXX
XXXX

- = updated or new information since 2001.
- = updated information - well abandoned.
- \* Where denoted, the estimated water source is based upon those codes present in the TWDB database. For other wells, the water-bearing unit has been estimated based upon drilling reports or estimates based upon relative completion depth.





- Wells plugged since 2001 survey
- Wells added since 2001 survey
- Off-post wells identified in 2001
- 1/4 Mile Buffer
- 1/2 Mile Buffer
- Camp Stanley Storage Activity

Figure 2.1

2010 Off-Post Well Survey  
Camp Stanley Storage Activity

**PARSONS**

## SECTION 3 2010 WELL SURVEY RESULTS

### 3.1 COMPARISON METHODS

The 2001 report described efforts to identify and locate both privately and publicly-owned groundwater wells within ¼-mile of CSSA. For this initial well research process, Banks Information Systems provided all data available at the time in the TWDB and the TCEQ water well databases. The 2001 report results also represented a subset of wells tentatively identified as potential targets within a 1-mile radius of CSSA during preparation of an earlier Texas Pollutant Discharge Elimination System (TPDES) permit renewal application. While only wells within the original ¼-mile survey were fully described in the documentation, pertinent data from key outlying wells was collated in the supporting text, tables, and figures. Wells were identified by a variety of methods that included review of state agency records and windshield surveys of properties adjacent to CSSA. Most new locations were field-checked to verify the presence of a well.

At locations where the landowner authorized access to their property, off-post wells that had not been surveyed for horizontal control (or data unavailable) had their positions relative to CSSA confirmed by windshield survey and a GPS receiver. Field verifications included a general inspection of well construction and condition, intended use, current operational status, as well as static water levels when possible. Where vertical datum control was not available, approximations were obtained from USGS topographic surveys. All well locations within ¼-mile of CSSA were plotted on site maps. The final document was incorporated into the CSSA Environmental Encyclopedia, *Volume 5, Offsite Well Survey Report, August 2001*.

The same general methods were employed for the 2010 survey. The well research and mapping consisted of a review of all wells (domestic, stock, municipal, or commercial) within ½-mile of the CSSA facility boundary (**Figure 2.1** and **Table 2.1**). Wells were identified by a variety of methods that included review of state agency records and windshield surveys of properties near to CSSA. Most locations were field-checked to verify the presence of a well at both homestead and public supply locations.

### 3.2 GENERAL STATISTICS

**Table 3.1** shows a general comparison between 2001 and 2010 well totals results. In 2010, there are a total of 78 wells that were verified to exist within ½-mile of CSSA, which are 36 more well locations than in the 2001 ¼-mile buffer. When plugged wells are included, a total of 86 off-post well locations within the ½-mile buffer zone were reviewed for the 2010 survey. An additional 11 well locations have been identified west of Interstate 10 beyond the original ½-mile survey area, and are included separately in the general statistics. These additional wells are found in both the TOWSC and I10 geographic areas, and are collectively referred to “**IH-10 West**” in the statistical compilations presented in this report.



**Table 3.1**  
**General Statistics for Well Surveys**

Category	Well Locations within ¼-mile 2001 Survey Boundary	Well Locations within ½-mile 2010 Survey Boundary	Well Locations > ½-mile 2010 Survey Boundary (IH-10 West)*
Domestic Wells	25	50	2
Municipal (PWS) Wells	14	17	8
Commercial Wells (Public Access)	3	6	-
Monitoring Wells	-	1	-
Test Wells	-	4	-
Plugged/Abandoned Wells	-	8	1
<b>Total:</b>	<b>42</b>	<b>86</b>	<b>11</b>

\*Includes 8 active and 1 plugged PWS wells in TOWSC and 2 domestic wells in the I10 geographic area.

### 3.3 PLUGGED AND ABANDONED WELLS

Available agency records indicate 4 wells were plugged within the ½-mile buffer around CSSA since 2001. Domestic wells RFR-6 and RFR-7 were plugged and abandoned by Centex Homes to make way for construction of new homes in the Lost Creek Ranch subdivision. Demolition of the structures associated with these two wells was verified by windshield survey and aerial imagery. Lost Creek Ranch is provided water by San Antonio Water System (SAWS). No new wells were installed in the area for the subdivision. Two environmental wells (CTX-1 and CTX-2) in the RFR-OFR area were plugged within 48 hours of being drilled and sampled. (Note: The state plugging reports for CTX-1 and CTX-2 mistakenly list the county as Kendall instead of Bexar). State plugging reports are in Appendix B.

Up to four other wells identified in the 2001 survey are presumed to have been abandoned, but no corresponding state plugging reports were found during research for this update. The wells identified as I10-1 and I10-3 in the 2001 well survey may have been abandoned, as their locations appear to have been covered by redevelopment of the property. Due to vague and inconsistent historical data, it is possible that one of these two I-10 wells is the same well as I10-5 in the current CSSA groundwater monitoring program database, and the other is the well referred to as plugged in state records though no original plugging report is available.

The former windmill well, OFR-2, was abandoned and also presumed plugged after sale of the property and redevelopment by Centex. A fourth well, designated DOM-1 in 2001 and believed located on a parcel in the Dominion, is presumed plugged as new residential construction (served by SAWS) has covered that lot. The DOM-1 location was beyond the ¼-mile survey buffer and, therefore, was not verified in 2001.

### 3.4 WELL LOCATIONS BY GEOGRAPHIC AREA

#### 3.4.1 Fair Oaks Ranch Water System

In the Fair Oaks area shown on **Figure 2.1**, there are seven wells within ¼-mile of CSSA, and two wells between ¼ and ½-mile of CSSA, as summarized in **Table 3.2** below. Within ½-mile of CSSA, no new public supply wells have been drilled at Fair Oaks since the 2001 Off-Post Well Survey. Well FO-20 used for observing the aquifer level only as a resource management tool for determining water restrictions within the Fair Oaks Ranch community.

**Table 3.2**  
**Water Wells within the Fair Oaks Ranch Geographic Area**

Well Type	0 to ¼-mile from CSSA	¼ to ½-mile from CSSA	Total Wells
Municipal Wells	6	2	8
Observation Wells	1	-	1
<b>Total:</b>	<b>7</b>	<b>2</b>	<b>9</b>

#### 3.4.2 Jackson Woods

The Jackson Woods Subdivision is located on the west side of CSSA and south of the Fair Oaks development. The subdivision is comprised of individual lots, most of which have personal domestic wells. A total of 33 wells have been identified in the subdivision and are shown in **Figure 2.1** and **Table 2.1**. All these wells are located within ½-mile of CSSA (**Table 3.3**). It is assumed that all wells are currently in use. In 2001, records indicated that well JW-2 was unused. Since that time a residence has been built on the property and no new well drilling was observed, leading to the assumption that JW-2 now serves the residence.

**Table 3.3**  
**Water Wells within the Jackson Woods Geographic Area**

Well Type	0 to ¼-mile from CSSA	¼ to ½-mile from CSSA	Total Wells
Domestic Wells	14	19	33

Only one well has been added to this area since 2001, according to records. In August 2003, a well was drilled to 520 feet on the lot adjacent to the JW-2 lot by TR Drilling, Boerne, TX presumably for domestic purposes, and at the time owned by the same owners of the JW-2 lot, who also declined to add both wells to the CSSA monitoring schedule. The newly drilled well was designated JW-32 for CSSA program identification purposes. Geophysical log for this well

is in the CSSA Encyclopedia, **Vol. 5, Well Installation Report - Wells CS-MW11A through CS-MW19 and Westbays 01 through 04, August 2004.**

Since then, JW-32 has been renamed JW-33 due to availability of other wells for monitoring and adjustments to the well identification database. Subsequently, the well formerly referred to as JW-31 is now JW-32. JW-23, formerly unavailable for monitoring, has changed ownership since 2001 and was redesignated JW-31 after the new owners granted access for monitoring. **Table 3.4** lists the re-designation of wells in Jackson Woods during the 2010 Well Survey.

**Table 3.4**  
**Re-Designation of Wells in Jackson Woods**

2001 Well Designation	2010 Well Designation
JW-23	JW-31
JW-31	JW-32
JW-32	JW-33

### 3.4.3 Ralph Fair Road Vicinity

The Ralph Fair Road (RFR) vicinity refers to the area to the west of CSSA along Ralph Fair Road. The wells follow Ralph Fair Road from the southern boundary of CSSA to the southern boundary of the Fair Oaks Development. In the RFR area shown on **Figure 2.1** and **Table 2.1**, there are 17 wells within ¼-mile of CSSA, and 2 wells between ¼ and ½-mile of CSSA, as summarized in **Table 3.5** below.

Since 2001, three new wells have been drilled and two have been plugged in the RFR area. In August 2003, CSSA installed an environmental monitoring well (CS-WB04) on private property, approximately 180 feet east of existing well RFR-10. This well is a Westbay (WB) multi-port well installed for the CSSA groundwater monitoring program. Well RFR-10 underwent geophysical logging and pump replacement in conjunction with the WB04 installation effort.

Two private domestic wells were installed by property owners in the middle section of the RFR area, west of CSSA’s residential area. These wells were designated RFR-13 and RFR-14, and were drilled in 2004 and 2005, respectively. Both wells were drilled at 8-inch diameter. RFR-13 was drilled to 560 feet bgs, and RFR-14 was drilled to 550 feet bgs. Permission was given to CSSA by the owners of RFR-13 and RFR-14 to geophysically log the wells immediately after drilling. (Appendix C). All RFR wells are within ½-mile of CSSA boundaries. No change in status of the remaining 10 RFR wells since 2001 was found.

**Table 3.5**  
**Water Wells within the Ralph Fair Road Geographic Area**

Well Type	0 to ¼-mile from CSSA	¼ to ½-mile from CSSA	Total Wells
<b>Existing Wells</b>			
Domestic Wells	12	-	12
Monitoring Wells	1	-	1
Municipal Test Wells	2	2	4
Commercial Wells	2	-	2
<b>Total:</b>	<b>17</b>	<b>2</b>	<b>19</b>
<b>Plugged and Abandoned</b>			
Domestic (Plugged)	2	-	2
Monitoring (Plugged)	-	2	2

In 2003, four test wells (COR-1, COR-2, COR-3, and COR-4) were drilled north of CSSA, on the east side of the RFR-2 lot, on an undeveloped parcel of more than 100 acres. The wells were drilled by Louis Bergmann & Sons, Boerne, TX for presumably a development corporation, the Corely Family LLC of Charlotte, NC. A dead-ending portion of Dietz-Elkhorn Road runs between the north boundary of CSSA and the RFR-2 and Corley parcels. According to the 2003 state reports, the purpose of the wells is public supply, but the reports indicate that plans for public supply have not been approved by TCEQ. As of 2010 the parcel is still undeveloped, and it appears that the wells are unused. The location of COR-4 is uncertain and complicated by apparently erroneous geographical coordinates in the TWDB database. These coordinates place the privately drilled well almost one mile inside the boundary of Camp Bullis north of CSSA (as shown at top right of **Figure 2.1**). It is likely that that COR-4 is within the same parcel as the other 3 Corley Family LLC wells. Such errors are not uncommon in the large TWDB database.

Domestic wells RFR-15 and RFR-16, on the north side of CSSA, were speculated to exist at corresponding residences in 2001, but were outside of the original ¼-mile reporting buffer. Equipment appearing to belong to domestic water supply systems was observed on one of these lots during the November 2010 windshield survey.

### 3.4.4 Leon Springs Villa/Hidden Springs Estates

In the Leon Springs Villa/Hidden Springs area shown on **Figure 2.1** and **Table 2.1**, there are ten wells within ¼-mile of CSSA, and one well between ¼ and ½-mile of CSSA, as summarized in **Table 3.6** below. This area includes wells located outside the southwestern corner of CSSA. These included municipal wells associated with Leon Springs Villa (LS-1 through LS-4) and Hidden Springs Estates (HS-1 through HS-4), as well as domestic wells (LS-5 and LS-7) located along Curres Creek Road. Well LS-6 serves a church, and is considered a commercial well (not domestic) since it serves a general public. These are established neighborhoods and no new well activity has been observed. However, several area municipal wells have been decommissioned since 2001. LS-7 was geophysically logged by CSSA in 2002 (Appendix C).

**Table 3.6**  
**Water Wells within the Leon Springs/Hidden Springs Geographic Area**

Well Type	0 to ¼-mile from CSSA	¼ to ½-mile from CSSA	Total Wells
<b>Existing Wells</b>			
Municipal Wells	7	1	8
Commercial Wells	1	-	1
Domestic Wells	2	-	2
<b>Total:</b>	<b>10</b>	<b>1</b>	<b>11</b>

In 2003, attempts were made to recondition well LS-1 by then owner Bexar Met. The well was deepened from 525 feet to 644 feet bgs by Johnson Drilling Co., Hondo, TX, and new 6-5/8 inch steel casing liner was cemented in to 249 feet bgs. Afterward, the well remained unused despite reconditioning efforts. The use of wells LS-1, LS-2, LS-3, and LS-4 was discontinued in 2007 due to the purchase of this portion of the Bexar Met system by SAWS. The wells are off-line and no longer connected to the local distribution system. Water for the residents is now supplied by SAWS from other sources. CSSA was permitted to install QED low-flow sampling systems in LS-1 and LS-4. Parsons conducted geophysical logging and pump replacement at existing private well LS-7 in June 2002. Previously, no data was available for this well. LS-7 is 395 feet deep with 6-inch diameter casing to 18 feet below ground surface. The new pump was set at 360 feet. Geophysical log of LS-7 was previously reported in the CSSA Encyclopedia, *Volume 5, Well Installation Report - Wells CS-MW11A through CS-MW19 and Westbays 01 through 04, August 2004.*

The Hidden Springs wells (HS-1, HS-2, HS-3, and HS-4) are now owned and operated by SAWS. Presently, HS-3 and HS-4 are offline. No major change in status of the HS public supply wells since 2001 was noted.

### 3.4.5 Interstate Highway 10/Old Fredericksburg Road Vicinity

The Interstate Highway 10/Old Fredericksburg Road (I10/OFR) area includes a narrow corridor of businesses and homesteads that are located to the southwest of CSSA, and are all located at distances greater than ¼-mile from the CSSA facility boundary. In the I10/OFR area shown on **Figure 2.1**, there are five wells between ¼ and ½-mile of CSSA, and two wells west of IH-10 (greater than ½-mile) as summarized in **Table 3.7** below.

**Table 3.7**  
**Water Wells within the IH10/Old Fredericksburg Road Geographic Area**

Well Type	0 to ¼-mile from CSSA	¼ to ½-mile from CSSA	>½-mile from CSSA	Total Wells
Domestic Wells	-	2	2	4
Commercial Wells	-	3		3
<b>Total:</b>	-	<b>5</b>		<b>7</b>
<b>Plugged and Abandoned</b>				
Domestic (Plugged)	-	3		3

No new wells were installed in this vicinity since 2001. OFR-1 continues to participate in the CSSA groundwater monitoring program. Windmill OFR-2 was abandoned during the construction of the Lost Creek development. Existing well OFR-3 was identified and incorporated into the CSSA groundwater monitoring program shortly after submission of the 2001 survey. This well serves an inconspicuous fabrication and maintenance shop on the west side of Old Fredericksburg Road and was not observed during the 2001 survey.

Wells I10-2 and I10-4 were known to exist at their respective addresses, but their location on the properties was unverified in 2001. The locations of these two wells have now been verified, and they have become part of the CSSA monitoring program. In 2007- 2008, the I10-4 residence and adjoining structures were demolished, and the well’s downhole pump and plumbing were removed. The well remains and is unused except for CSSA program monitoring.

One of the wells identified as either I10-1 or I10-3 in the 2001 survey has been plugged according to information on file with the TCEQ. Inconsistent and vague data make exact determination of the fate of I10-1 and I10-3 inconclusive. Files at TCEQ have been updated and state tracking numbers corresponding to these two locations have been changed from those reported in 2001. The well currently in use on the property has been designated I10-5 in the CSSA monitoring program, and was reportedly drilled in May 1999. It is likely this information was not yet available during the 2000-2001 records review. Some geospatial data conversions match I10-5 coordinates with the I10-1 location, but other descriptive information would indicate a location closer to I10-3. The property was redeveloped for commercial construction since I10-1 and I10-3 were first in use, and what was identified as a Texaco station in 2001 has

changed ownership and is now a Shell station. Only one wellhead (I10-5) was observed on the commercial lot during the 2010 windshield survey. Well I10-5 has been part of the CSSA monitoring program since 2002.

Two domestic wells (I10-9 and I10-10) have also been located on private properties between the TOWSC service area and the IH-10 corridor. No information regarding the well construction is available, but their existence has been confirmed by the property owners. Those wells are currently being utilized for domestic and stock purposes, and are located on parcels slated for future residential or commercial development.

### 3.4.6 The Dominion

The Dominion is a gated community south of CSSA which has expanded significantly since the 2001 well report was completed. In the Dominion area shown on **Figure 2.1**, there are no wells within ¼-mile of CSSA, and one well between ¼ and ½-mile of CSSA, as summarized in **Table 3.8** below.

**Table 3.8**  
**Water Wells within the Dominion Geographic Area**

Well Type	0 to ¼-mile from CSSA	¼ to ½-mile from CSSA	Total Wells
Domestic Wells	-	1	1
<b>Plugged and Abandoned</b>			
Domestic (Plugged)	-	1	1

Most of the Dominion lies beyond the ½-mile zone and was not included in the original survey. New residences built in the Dominion since 2001 are serviced by SAWS. Predating the expanded construction on the north side of the Dominion were two wells past the 2001 ¼-mile boundary, but now within the ½-mile zone. One well (DOM-1) on a parcel on the north side of Dominion Drive was not located during the first well survey, but was tentatively identified as a potential target within a 1-mile radius of CSSA during preparation of a previous TPDES permit renewal application. This well is now presumed to be abandoned as new home construction has since covered most of the parcel, though no plugging report was found in TCEQ or TWDB electronic files. The second well (DOM-2) is on residential property on the south side of Dominion Drive, opposite the former DOM-1 property. Monitoring of DOM-2 was discontinued after March 2008 sampling due to electrical power to the well being disconnected. The residence is no longer occupied and the DOM-2 well is currently unused.

### 3.4.7 The Oaks Water Supply Corporation

The Oaks Water Supply Corporation geographic area (**Figure 1.1**) includes developed gated subdivisions of Scenic Oaks and Country Estates (**Figure 1.2**). While this area entirely falls outside the ½-mile survey boundary, it has been included in this report because its relevance to

monitoring of groundwater contamination originating from CSSA. In the vicinity of TOWSC shown on **Figure 2.1**, there are eight active wells ranging in distance between 0.56 and 1.7 miles from CSSA, as summarized in **Table 3.9** below.

The wells draw water from the Middle and Lower Trinity Aquifers. A ninth well (MT-1) has been plugged and abandoned, and replaced by well MT-2.

**Table 3.9**  
**Water Wells within the IH-10 West Geographic Area**

<b>Well Type</b>	<b>0.5 to 1.7-mile from CSSA</b>	<b>Total Wells</b>
Municipal Wells	8	8
Municipal (Plugged)	1	1



## SECTION 4 CONCLUSIONS AND RECOMMENDATIONS

### 4.1 CONCLUSIONS

#### 4.1.1 Summary of Changes within ¼-mile of CSSA

The original 2001 well survey located 42 wells within ¼-mile of the CSSA boundary. Since 2001, five new wells have been drilled within ¼-mile of the post boundary (RFR-13, RFR-14, WB04, COR-2 and COR-3). During that same timeframe, two wells (RFR-6 and RFR-7) originally identified in 2001 were plugged and abandoned to make room for the new single-home property developments west of CSSA. The net result is that there are 3 more active wells in 2010 than in 2001 within ¼-mile of the post.

#### 4.1.2 Summary of Changes between ¼-mile and ½-mile of CSSA

A total of 39 well records were found to exist between ¼ and ½-mile outside of CSSA. Most of these wells had been previously identified and tracked by CSSA since 2001. However, the records research did indicate that six new wells (JW-33, JW-34, CTX-1, CTX-2, COR-1, and COR-4) had been drilled since 2001. The CTX wells were environmental borings and were subsequently plugged 48 hours after their completion and sampling. Of the 39 potential well locations, six locations are confirmed or presumed to be plugged because of recent property development (I-10-1, I10-3, OFR-2, DOM-1, CTX-1, and CTX-2), resulting in 33 verified locations.

#### 4.1.3 General Statistics

This 2010 well survey update describes information regarding 86 current/former well locations that have been identified within ½-mile of CSSA (**Table 4.1**). A total of 47 locations (45 active and 2 plugged) were identified within ¼-mile radius. Another 39 locations (33 active and 6 plugged) are believed to exist between ¼ to ½-mile away from CSSA. Finally, an additional 11 locations (10 active and 1 plugged) were identified beyond ½-mile in the area west of IH-10, consisting of the TOWSC and other private lands.

In summary, since 2001 the following changes to the off-post well locations have occurred:

- Six former domestic wells have been plugged and abandoned (RFR-6, RFR-7, I10-1, I10-3, OFR-2, and DOM-1);
- Two environmental wells have been drilled then subsequently plugged/abandoned (CTX-1 and CTX-2);
- One environmental monitoring well has been installed and is in use by CSSA (WB04);
- Four new domestic wells have been drilled within ½-mile of CSSA (RFR-13, RFR-14, JW-3, and JW-34); and

- Four new public supply test wells have been drilled with ½-mile of CSSA (COR-1 through COR-4).
- Eleven additional wells have also been identified in the lands west further than ½-mile of IH-10 that are relevant to ongoing efforts associated with VOC plume migration away from CSSA. These wells include 8 active supply wells operated by TOWSC, one plugged well owned by TOWSC, and two private wells (I10-9 and I10-10) utilized for domestic/stock purposes.

**Table 4.1**  
**General Statistics for Well Surveys**

Category	2010			Total
	Wells within ¼-mile Survey Boundary	Wells between ¼ and ½-mile Survey Boundary	Wells greater than ½-mile (West of IH-10)	
Domestic Wells	25	25	2	52
Municipal Wells	14	3	8	25
Municipal Test Wells	2	2	-	4
Commercial Wells (Public Access)	3	3	-	6
Monitoring Wells	1	-	-	1
<b>Total (Active):</b>	<b>45</b>	<b>33</b>	<b>10</b>	<b>88</b>
Plugged/Abandoned Wells since 2001	2	6	1	9
<b>Total Locations (Active/Plugged)</b>	<b>47</b>	<b>39</b>	<b>11</b>	<b>97</b>

## 4.2 MONITORING NETWORK ADDITIONS

CSSA’s accessibility to off-post wells frequently changes. Sampling of off-post wells is only conducted where the landowner has granted access to CSSA. When there are changes in land ownership at well locations relevant to CSSA’s monitoring program, CSSA requests access to the property from the new landowner. Changes and lapses to well accessibility are not enumerated in this document.

Since the 2001 survey was completed, seven wells were added to the CSSA off-post groundwater monitoring network for long-term monitoring. The owners of RFR-13 and RFR-14 granted access shortly after installation and the wells have been incorporated into the CSSA groundwater monitoring program. WB04 in the RFR vicinity has been included in the CSSA off-post monitoring program since its construction in 2003. In the southwest portion of the ½-mile zone, wells OFR-3, I10-2, I10-4, and I10-5 were added to the monitoring network once their locations had been verified and access permitted subsequent to the completion of the 2001 survey report. Though off-line, LS-1 remains on the off-post monitoring list and continues as a sampling point along with LS-4 (also off-line) using QED pump systems installed by CSSA.

Access was requested but denied to wells JW-2 and JW-33. The four Corley wells and two RFR wells north of CSSA are upgradient to regional groundwater flow and would not provide any significant new data that is not already available through wells CS-H and CS-I monitoring.

### **4.3 RECOMMENDATIONS**

There are no new wells identified by this 2010 survey update that have not already been considered for the CSSA off-post groundwater monitoring program, except for the Corley wells north of CSSA. However, there is no recommendation to pursue additional monitoring points in that direction.

It is recommended that present efforts to maintain and seek new access agreements in critical areas continue, even at distances greater than ½-mile buffer. This includes the newly identified wells in the I10 and TOWSC geographic areas. Groundwater monitoring points and schedule should continue to be focused and adjusted according to long-term monitoring optimization evaluations, design, and overall project data quality objectives.

NOTE: Attachments to the foregoing Final Off-Post Well Survey Report dated March 2011 are available online.