

HAS THE HIGHWAY 290 PIPELINE CONTRIBUTED TO INCREASED GROUNDWATER PUMPAGE IN NORTHERN HAYS COUNTY?

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INTRODUCTION AND PURPOSE

In the early 2000s, the Lower Colorado River Authority (LCRA) extended a water supply line carrying surface water originating from Lake Travis in Bee Caves, TX, traversing southwest Travis County, and extending to Dripping Springs. In Hays County, the water line originally ran along Highway 290 and has been called the “290 pipeline”, and will be referred to as such in the paper. The pipeline was installed to address potentially declining groundwater availability from existing development along Highway 290 in northern Hays County. In November, 2011, LCRA decided to divest itself of many LCRA owned and operated water and waste water systems. In 2011, the West Travis County Public Utility Agency (WTCPUA) purchased the 290 pipeline and other assets. WTCPUA was formed by the City of Bee Caves, Travis County MUD No. 5 and Hays County.

The 290 pipeline terminates approximately 1/2 miles east of the intersection of Highway 290 and Ranch Road 12. Subsequently, the pipeline was extended from Highway 290 south along Nutty Brown Road to FM 1826. The pipeline heads northeast along FM 1826 where it exits Hays County and loops back into the main pipeline along Highway 290 in Travis County (see Figure 1 on next page). See Attachment 1 for background information regarding justification for installation of the pipeline.

This paper addresses the issue of whether or not installation of the pipeline and subsequent delivery of surface water has caused an increase in groundwater pumpage in northern Hays County. The purpose of this paper is to document potential changes in groundwater pumpage in northern Hays County since surface water has been brought in via pipeline since the early 2000s and develop an opinion whether or not groundwater use increased or decreased due to the construction of the 290 pipeline.

Prior to the 290 pipeline going into service, water supplies were obtained from the Trinity Aquifer. Today in 2015, both surface water and groundwater are utilized for potable water sources in Northern Hays County. Rain water harvesting has become more popular, but only provides a small number of water supplies. Surface water is not available to all residents, either for technical or economic reasons and not all water users with reasonable access have tied into the pipeline. The larger subdivisions built along Highway 290 and FM 1826, since the pipeline was installed utilize surface water. 🌿

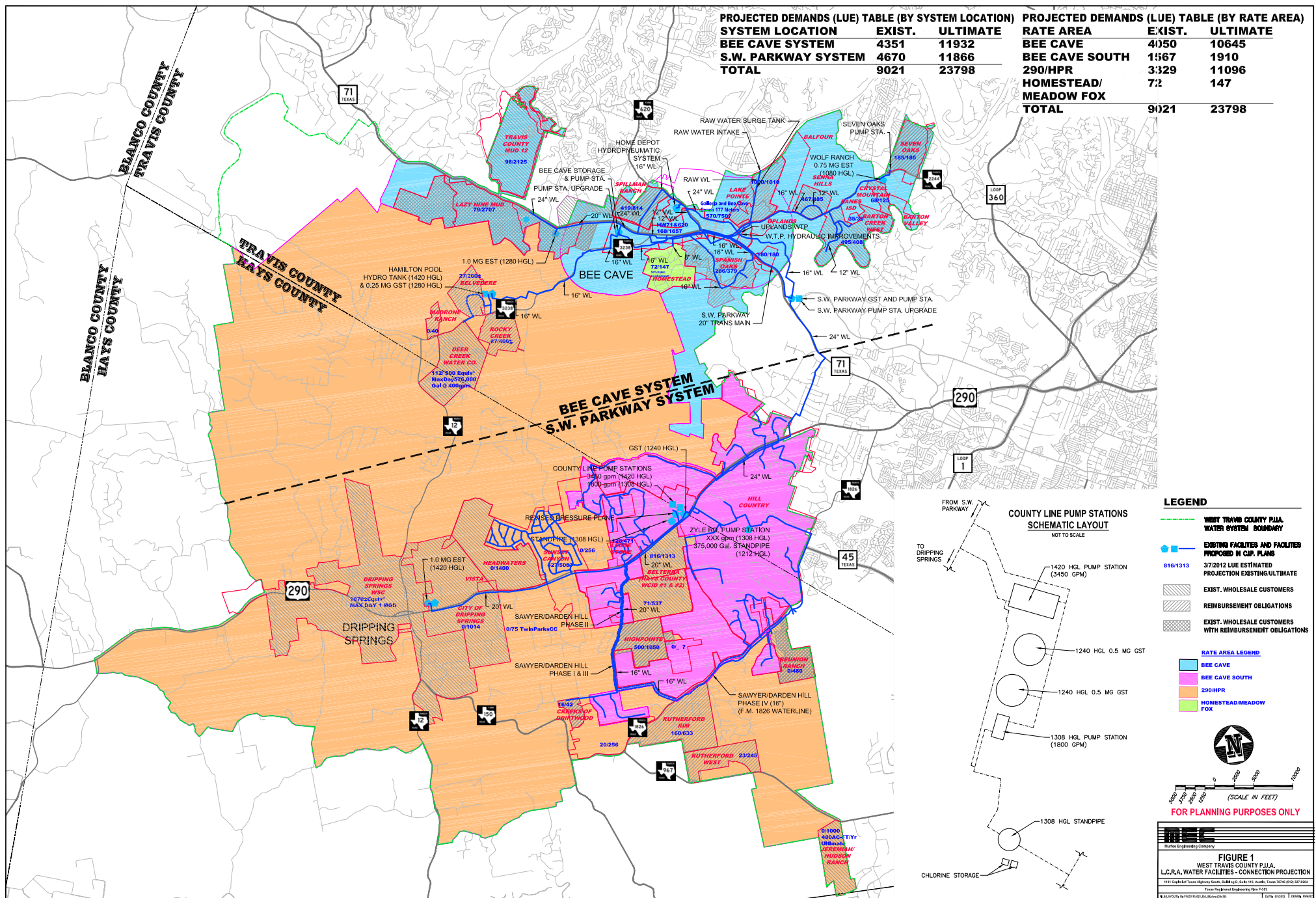


Figure 1. Water Service Area – West Travis County Public Utility Agency

Source: www.wtcpu.org

STUDY AREA

The study area for this report includes the WTCPUA preliminary retail planning area shown on Figure 1 and CCNs in northern Hays County, plus a two mile buffer area. Retail customers contract directly with the WTCPUA for their water supplies. An example of a CCN would be Dripping Springs Water Supply Corporation (DSWSC). DSWSC obtains water from WTCPUA (blends it with groundwater from their own wells) and then distributes the water throughout its service area (CCN). The study area is shown below on Figure 2. The area of Northern Hays County was selected for this study as this area has the most complete data set of groundwater pumping data maintained by the Hays Trinity Groundwater Conservation District (HTGCD). The area of Travis County in the WTCPUA does not have a similar entity that maintains similar pumping records. 🌿

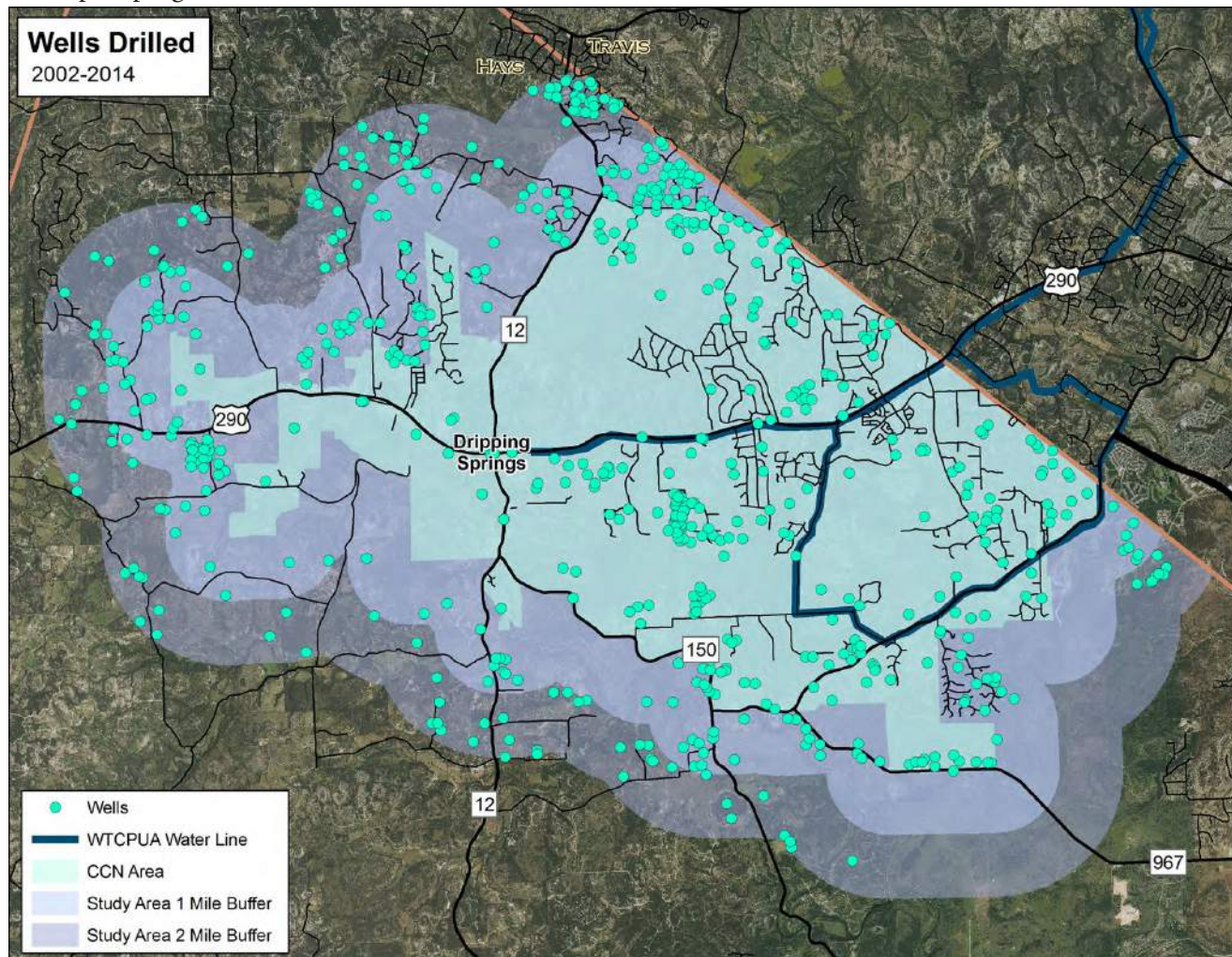


Figure 2. Wells Drilled 2002-2014

Graphic by Steven Ramirez

DATA SOURCES, ASSUMPTIONS AND LIMITATIONS OF GROUNDWATER USAGE DATA

The majority of the study area lies within the HTGCD. There are both non-exempt (permitted) and exempt (registered) wells in the study area. Wells are permitted or registered by the HTGCD. Exempt wells most commonly include uses such as domestic and agricultural. All other wells are non-exempt and require a permit. Exempt well owners are required to register their wells, but are not required to meter or otherwise track and report pumpage. Water use for exempt wells can be estimated using the HTGCD rule of thumb of 110 gallon per day (gpd), three people per household, or 330 gallons per day (gpd).

Non-exempt wells include water supply corporations, subdivision wells and others such as office buildings. Non-exempt well owners are required to measure and report pumpage to the HTGCD. DSWSC and other water utilities estimate water use for planning purposes by living unit equivalents (LUE). This paper assumes a LUE equals one single family unit or household. For consistency, water use per LUE will be estimated to be 330 gpd.

The non-exempt pumpage amounts used in this paper were obtained from the HTGCD. The HTGCD was formed in 2001 by the Texas Legislature and confirmed by popular vote in 2003. It wasn't until several years after formation that the HTGCD was able to develop rules and begin to permit wells. Initially, the HTGCD focused on permitting the larger non-exempt wells later following up with the smaller users. Pumping data from non-exempt wells was incomplete through the 2000s, but the majority of pumpage was likely reported as the largest uses were permitted. For the last number of years, reliable pumping reports from non-exempt permitted wells are the norm. Pumping data is included on Tables 1 and 2.

Table 1. Summary of Wells Drilled and Water Pumpage -Post 2002 Exempt Wells and Non-Exempt Wells

Year	Wells Drilled Within 1 Mile Study Area	Wells Drilled Within 1-2 Mile Buffer	Total Wells Drilled	Cummulative Exempt Wells Drilled in Study Area	Exempt Well Pumpage (acre-feet) in Study Area (330 gpd/well)	Non-Exempt Pumpage (Acre-Feet)
2002	19	10	29	29	11	441
2003	24	10	34	63	23	266
2004	39	18	57	120	44	51
2005	66	17	83	203	75	232
2006	100	20	120	323	119	384
2007	64	13	77	400	148	353
2008	43	12	55	455	168	450
2009	50	11	61	516	191	553
2010	16	4	20	536	198	476
2011	37	12	49	585	216	499
2012	35	9	44	629	233	375
2013	38	14	52	681	252	420
2014	47	3	50	731	270	384
Total	578	153	731			

Table 2. Non-Exempt Pumpage

Company	Status	No. of active wells	Well Location	Reported Pumpage 2002	Reported Pumpage 2003	Reported Pumpage 2004	Reported Pumpage 2005	Reported Pumpage 2006	Reported Pumpage 2007	Reported Pumpage 2008	Reported Pumpage 2009	Reported Pumpage 2010	Reported Pumpage 2011	Reported Pumpage 2012	Reported Pumpage 2013	Reported Pumpage 2014
Belterra-Hays WCID #1	Active	2	1715: 568 Trinity Hills Drive, Austin 78737 1716: 568 Trinity Hills Drive, Austin 78737	Drilled			48,000	8,599,000	13,933,205	18,663,972	4,281,955	9,139,251	9,862,750	581,000	515,002	4,000
Caliterra	Permitted			n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
Camp Ben McCulloch	Active	2	258: Lat 22-05-09, Long. 85-49-41 1636: Lat. 30-07-47, Long. -98-0-05	58,445			411,875	895,927	895,918	475,780	463,400	339,019	570,762	452,172	607,540	461,503
Center Canyon Business Park	Active	1	1882: 14101 Hwy 290 West, Austin 78737													167,270
Center Lake Business Park	Active	1	1665: 14101 Hwy 290 West, Austin 78737								363,960	546,267	569,741	161,526	632,910	538,010
CORE Healthcare Brown-Karhan	Active	1	1655: 3035 Hwy 290 West, Dripping Springs 78620			60,110	610,070	871,030	735,900	704,600	770,970	750,340	596,390	613,660	501,560	414,130
Creek Road Ranch HOA, Inc	Active	1	264: 3001 Creek Road, Dripping Springs, 78620					713,000	1,281,800	1,822,000	1,312,000	1,904,000	2,352,000	1,668,000	1,672,000	145,900
Creeside Pavilion	Active	1	941: 18315 RR 1826, Driftwood, 78619					4,630	13,297	369,195	218,200	152,604	233,265	143,352	127,112	104,184
Cypress Creek Acres Water Co.																
Dr. Guy Hodgson	Expired	0								376,260	866,170	1,173,070	permit not renewed			
Dr. Ron White	Expired	0									276	22,600	2,950	permit not renewed		
Dripping Springs WSC	Active	4	1896, 1897, 1898, 1899: 2.5 miles south of Hwy 290 on RR 12, 0.25 miles east of RR 12	114,147,000	86,604,000	16,652,304	25,970,779	62,951,100	56,963,362	70,283,800	124,207,567	97,868,400	92,422,100	69,845,689	84,560,952	82,917,000
Dripping Springs (City of) - Ranch Park	Active	1	2345: 1042-C DS Ranch Road, Dripping Springs, 78620													14,309
Elder Hill Cottages - JP& LP Rentals, LLC	Active	1	2249: 1850 Elder Hill Road, Driftwood, 78619												176,830	539,920
Epic Communications, Inc.	Active	1	2287: 18131 FM 150, Driftwood, 78619												0	27,540
Fall Creek Vineyards at Driftwood	Active	1	2518: 18059 FM 1826, Driftwood, 78619													n/r
Firehouse Business Center	Active	1	278: 14121 Hwy 290 West, Austin, 78737													0
Fitzhugh Corners POA	Active	3	2003: 11924 Fitzhugh Corners, Dripping											56,810	209,601	400,058
Gateway I	Active	1	2441: 1600 East Hwy 290, Dripping Springs, 78620													212,000
Gateway II	Active	1	1904: 900 Hays Country Acres Road, Dripping Springs, 78620				1,996,000	2,457,411	2,367,441	4,109,143	2,735,191	2,792,668	4,117,667	3,574,000	3,348,000	3,320,000
Gateway III	Active	1	1905: 1200 East Hwy 290, Dripping Springs, 78620	651,702			616,286	769,176	884,523	968,143	1,127,400	1,047,933	1,475,167	1,202,000	946,857	1,271,143

Table 2. Non-Exempt Pumpage (Continued)

Company	Status	No. of active wells	Well Location	Reported Pumpage 2002	Reported Pumpage 2003	Reported Pumpage 2004	Reported Pumpage 2005	Reported Pumpage 2006	Reported Pumpage 2007	Reported Pumpage 2008	Reported Pumpage 2009	Reported Pumpage 2010	Reported Pumpage 2011	Reported Pumpage 2012	Reported Pumpage 2013	Reported Pumpage 2014
Goldenwood West WSC	Active	3	1790: Just east of Westview Trail and north of Coyote Ridge, Dripping Springs, Texas 1791: same 1792: same	12,104,900	n/r	n/r	15,256,000	15,707,000	13,812,827	15,327,000	14,365,000	12,810,000	14,008,040	10,819,000	10,982,000	10,732,000
Heatherwood Condominiums - Papalote Homes	Active	2	576: Lat. 30-07-25; Long. -98-04-40; 233 Heatherwood, Dripping Springs 78620 643: Lat. 30-07-22; Long. -98-04-40; same							135,810	956,060	807,540	566,580	510,370	591,770	491,590
Highpointe Subdivision	Active	1	114: N 30 10' 16" W 97 59' 43.8"													0
Howard Land & Cattle (Twisted X Brewery)	Active	1	1713: 23455 FM 150, Driftwood, 78619												102,306	888,475
Interim La Ventana	Active	2	1218: 2476 La Ventana Parkway, Dripping Springs, 78620				24,894,810	23,762,000	18,192,600	24,159,120	18,061,840	18,350,400	28,357,200	26,075,900	25,723,700	17,337,284
Mandola Restaurant										1,479,770	2,431,520	1,809,940	1,585,846	1,693,719	982,454	624,211
PGM of Texas	Active	1	2225: 4620 West Hwy 290, Dripping Springs, 78620												61,390	98,830
Radiance WSC	Active	1	271: End of Shantivana Trail, Austin, 78737	2,380,610	n/r	n/r	2,480,900	2,376,950	1,927,240	2,402,270	1,956,000	1,790,500	2,473,600	1,797,000	2,122,520	1,913,870
Resubdivision of Lot19D, Douglas Estates	Active	1	1643: 137B Sullivan Ridge, Dripping Springs 78620							737,790	290,750	n/r	n/r	n/r	713,100	635,365
Roger Hanks Park	Active	1	21: 1301 Hwy 290 West, Dripping Springs, 78620				760,000	253,000	115,000	246,000	86,000	280,000	539,000	320,000	0	0
Salt Lick BBQ	Active	3	1577: 18601 FM 1826, Driftwood, 78619 1579: same 1580: same				2,538,600	5,342,000	4,010,900	4,209,500	3,920,900	2,071,417	1,294,370	382,560	344,010	134,703
Signal Hill Water System 24	Active	1	1912: 10505 Signal Hill Road, Austin, 78737	1,130,760				255,070	n/r	n/r	1,667,100	1,324,300	1,321,719	1,039,900	1,015,900	845,808
Stay N Play Pet Ranch	Active	1	2504: 2500 East Hwy 290, Dripping Springs, 78620													n/r
Texas Water Solutions	Active	1	2079: 4630 Hwy 290 West, Dripping Springs, 78620											67,755	138,099	99,425
Whisenant & Lyle	Active	1	2026: 31866 Ranch Road 12, Dripping Springs, 78620; Lat: 30 15.317'N Long: 98 3.466'W										33,250	108,912	127,300	73,620
Wizard Academy	Active	1	1737: 16221 Crystal Hills Drive, Austin, 78737					6,740	10,870	14,123	116,042	114,980	87,522	1,185,970	797,121	686,660
TOTAL ANNUAL PUMPAGE				143,823,417	86,604,000	16,712,414	75,583,320	124,964,034	115,144,883	146,484,276	180,198,301	155,095,229	162,469,919	122,299,295	137,000,034	125,098,808
TOTAL ANNUAL PUMPAGE (acre-feet)				441	266	51	232	384	353	450	553	476	499	375	420	384

Data source: Hays Trinity Groundwater Conservation District

There are no reliable sources indicating the number of pre-2002 wells in the study area, therefore no attempt was made in this paper to document the number of pre-2002 exempt wells. As the purpose of this paper is to determine changes in groundwater pumpage since the 290 pipeline was installed, it is assumed that there was no change in pumpage from pre-2002 wells and any increase in pumpage originated from new exempt wells or changes in pumpage from non-exempt wells.

When the 290 pipeline was installed, existing wells owners were not required to plug and abandon their water wells if they hooked up to the pipeline, nor were they required to hook up. It is not known how many well owners did not connect to the pipeline even though connections were available. It is possible many well owners that did connect to the pipeline still maintain dual water systems: pipeline water for potable use and well water for other uses such as landscape irrigation. A door to door survey would need to be performed to determine how many wells still exist and their use.

To determine the growth in exempt wells drilled, several data bases we reviewed. The HTGCD maintains a data base of registered wells. The well are registered and recorded in the data base when the wells are registered prior to drilling the well. Some wells are registered and never drilled. As the wells are registered prior to drilling, the well locations are identified by street address, not the GIS coordinates (latitude and longitude), making it very difficult and cumbersome to map.

The Texas Water Development Board (TWDB) maintains a Groundwater Database (GWDB). Across the state, records from over 140,000 wells have been entered, but the database is not complete and only contains a portion of the actual number of wells in existence. The TWDB has maintains the Texas Department of Licensing and Regulation's (TDLR) Submitted Driller's Report Database (SDRDB). This database contains water well reports submitted to TDLR by well drillers from February 2001 to present and is currently the most complete and functional database. None of the data bases contains a complete listing of pre-2001 wells. The SDRDB was used in this study, though no attempt was made to ground truth any of the well locations. Total wells drilled from 2002 - 2014 is shown on Figure 2. Year by year maps of wells drilled in the study are included in Attachment 2. Total wells drilled from 2002-2014 is shown on Figure 2. Year by year maps of wells drilled in the study are included in Attachment 2. 

FINDINGS

Exempt Pumping

According to the SDRDB, there have been 578 wells drilled in the study area (study area plus one mile buffer) and an additional 153 wells in the one to two mile buffer (Table 1) for a total of 731 new exempt wells. Figure 2 shows all of the wells drilled between 2002 and 2014. Year by year maps of wells drilled are included in Attachment 2. Total wells drilled by year and cumulative wells are shown below on Figures 3 and 4, respectively. There was a peak in wells drilled in 2006 (100) followed by a steady decline until 2010 (16). The decline is likely due to the slumping national economy and lack of building in the study area. Over the last five years, new wells drilled has been relatively constant at approximately 40 wells per year.

As shown on Figure 2, the new wells are relatively evenly distributed across the study area. Many of the wells are likely in small subdivisions or in areas deemed to be remote from potential pipeline service for economic considerations. There are a large concentration of wells in the northern part of the study along Fitzhugh Road and north Highway 12.

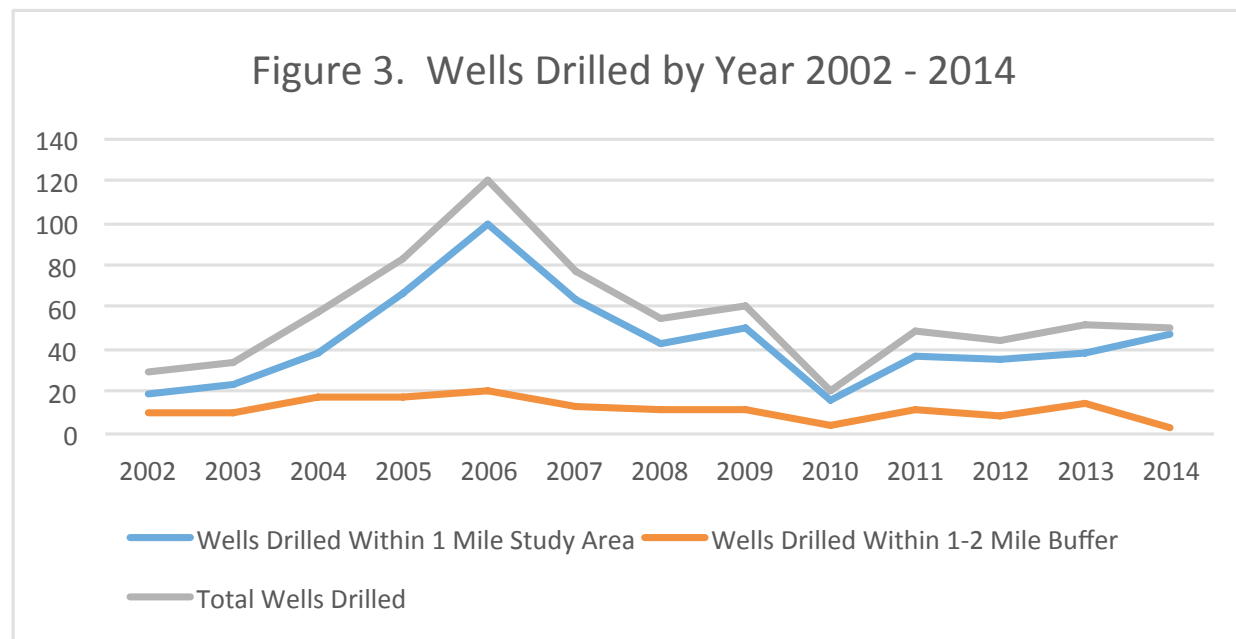


Figure 3. Total Wells Drilled 2002-2014

Figure 4. Cumulative New Exempt Wells Drilled in Study Area - Post 2002

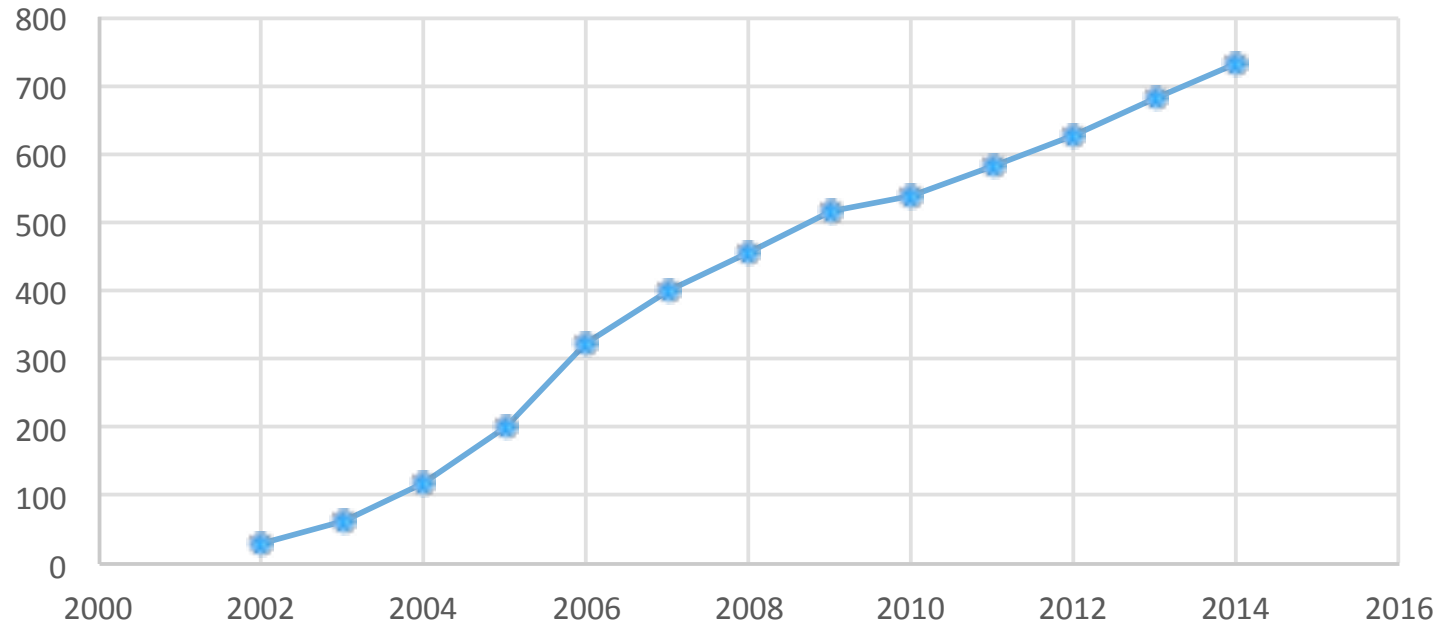


Figure 4. Cumulative Well New Exempt Wells Drilled in Study Area – Post 2002

Assuming 330 gallons/day per well, the amount of water pumped by these post -2002 wells is estimated to be 214 acre-feet/year (~70 million gallons) in 2014. The amount of exempt pumpage is shown by Figure 5 on the following page and Table 1 on page 8.

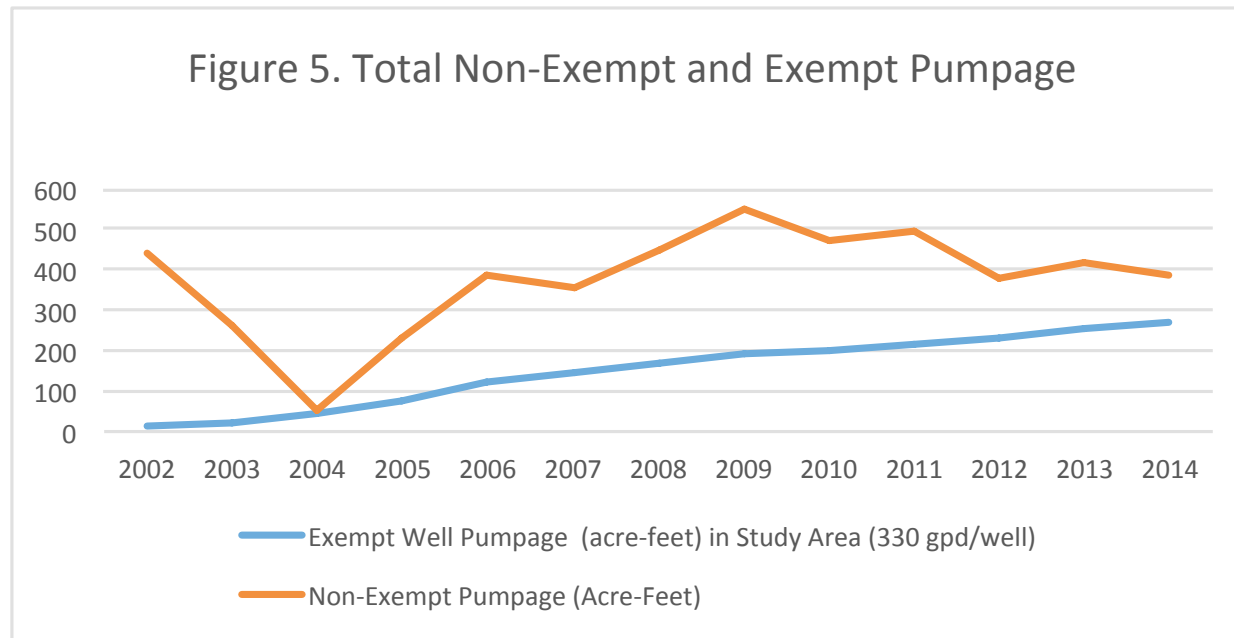


Figure 5. Total Non-Exempt and Exempt Pumpage

Non-Exempt Pumping

Data obtained from the HTGCD indicate there are approximately 30 non-exempt wells in the study area that reported annual pumpage in 2014. A summary of reported data pumpage from 2002 through 2014 is presented on Table 2 (page 9). As the HTGCD was formed in 2002, it took several years to inventory and permit all of the non-exempt wells in the study area, hence the data gaps up to the 2005-2006 time frame. Also, several previously permitted well owners have allowed their permit lapse for various reasons and no longer report annual pumpage.

Annual pumpage is shown on Table 2 (page 9) and Figure 5 (above). Reported non-exempt pumpage in 2002 was approximately 350 acre-feet/year but only a few wells were reporting. Groundwater pumpage increased to approximately 553 acre-feet in 2009 before tapering off to approximately 400 acre-feet over the last few years. Within the limitations of the data, it appears current non-exempt pumping is at a similar level to pre-290 pipeline pumpage levels, though the pumpage amongst the individual non-exempts varies by year.

The top five non-exempt well systems for total groundwater pumped for the period 2005 through 2014, in descending order are Dripping Springs Water Supply Corporation, La Ventana, Goldenwood, Belterra-Hays WCID and Gateway I-II. See Table 3 (on the next page). These five entities account for approximately 89% of the non-exempt water pumped in 2014. As shown in Figure 6 on the next page, groundwater pumpage has been relatively steady over the ten year period by the top five pumpers. Over the ten year period, several other non-exempt pumpers have significantly reduced their water usage, including the Salt Lick, Roger Hanks, Mandolas, Belterra - WCID #1 and Creekside Pavilion. Some of this reduction, such as the Salt Lick and Creekside Pavilion may have been displaced by surface water. 🌊

Table 3. Top Five Non-Exempt Well(s) 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
DSWSC	80	193	175	216	381	300	284	214	260	254
La Ventana	76	73	56	74	55	56	87	80	79	53
Goldenwood	47	48	42	47	44	39	43	33	34	33
Belterra-Hays WCID #1	0	26	43	57	13	28	30	2	2	0
Gateway II-III	8	10	10	15	12	12	17	15	13	14

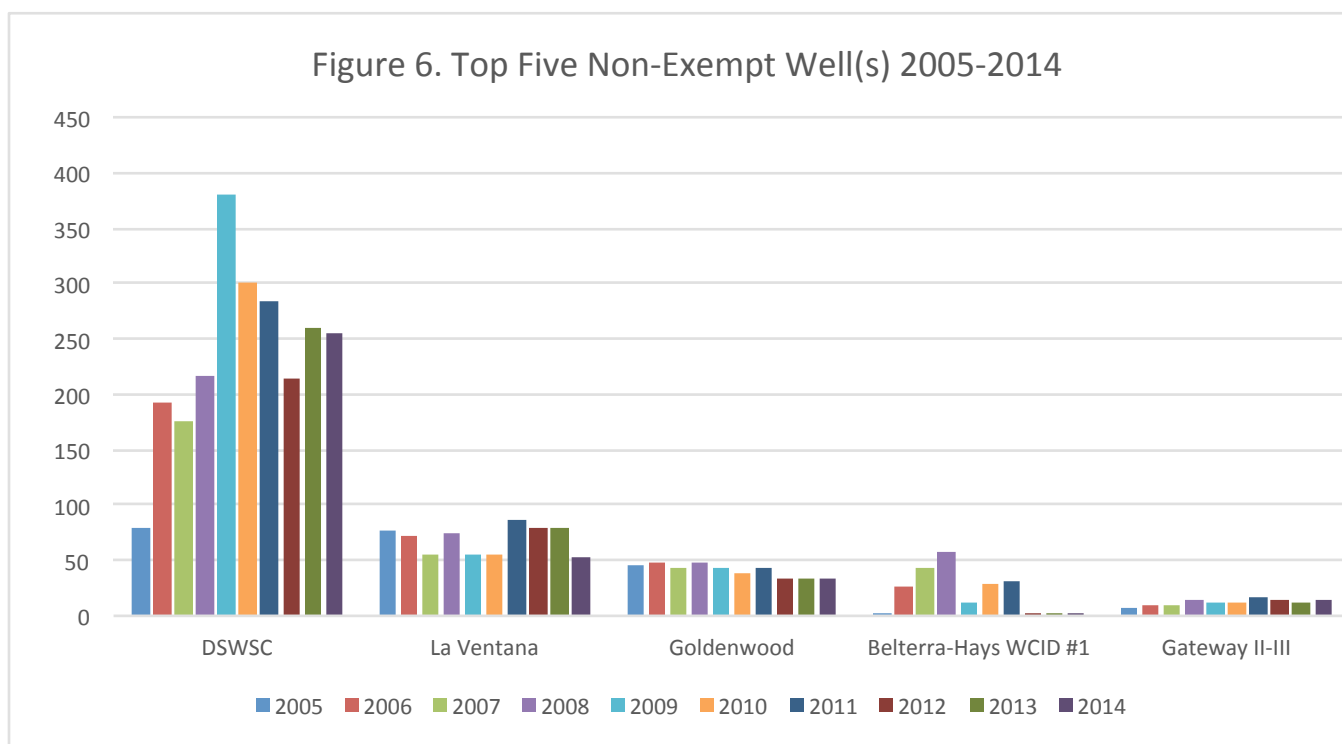


Figure 6. Top Five Non-Exempt Well(s) 2005-2014

Dripping Springs Water Supply Corporation

Dripping Springs Water Supply Corporation (DSWSC) accounts for the majority of the non-exempt groundwater pumped accounting for over 60% of the non-exempt pumpage in the study area and will likely experience the greatest growth in the future. The DSWSC service area begins just east of Highway 12 in Dripping Springs and covers the City of Dripping Springs and the portion of the study area to the west of Dripping Springs. DSWSC blends surface water and groundwater. DSWSC and total non-exempt groundwater pumpage is shown on Figure 7. In 2000, the LCRA granted DSWSC a firm raw water quantity contract that includes 1126.16 acre-feet per year with a maximum diversion of 1120 acre-feet per year (Attachment 3). In 2004 and 2005, DSWSC significantly reduced the amount of groundwater being pumped, likely replacing the demand with surface water from the 290 pipeline. The graph is somewhat skewed in that DSWSC was the only non-exempt reporting in 2003 and 2004.

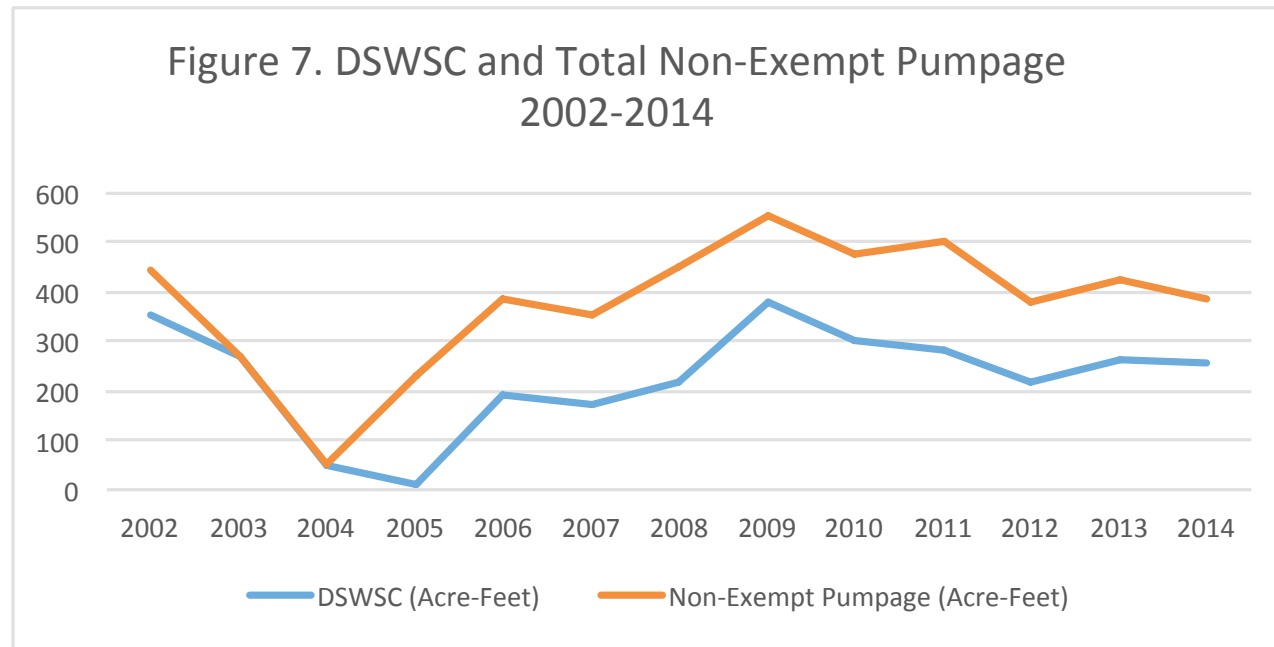


Figure 7. DSWSC and Total Non-Exempt Pumpage 2002-2014

In a June 24, 2015 report entitled “Summary of System Capacities”, prepared by Joel Wilkinson, P.E. of Neptune-Wilkinson Associates, Inc. (Attachment 3), DSWSC has 1880 current connections as of June 1, 2015, which “exceeds the total HTGCD permitted groundwater supply and WTCPUA contracted surface water supply combined equivalent connection capacity by 310...DSWSC has now committed to provide water service to an additional 1413 LUE (connections) presently developed or being developed but not yet served...Development inquiries for an additional 2363 connections have been made...” There are also 51 LUEs under construction that have not paid DSWSC fees.” A summary of the projected connection data and water usage is shown on Table 4.

Table 4. Estimated Future Water Usage - DSWSC

	LUEs	Estimated Water Use (acre-feet)*
Cuurent LUEs	1880	695
LUEs being developed-paid	1362	503
LUEs being developed-unpaid	51	19
Development Inquired LUEs	2363	873
Total	5656	2091

* Assumes 330 gal/day per LUE

The water usage for the new LUEs would be over two hundred percent of the current usage, or approximately 1400 acre-feet. As stated, DSWSC “exceeds the total HTGCD permitted groundwater supply and WTCPUA contracted surface water supply combined equivalent connection capacity.” To supply this volume of water, DSWSC will either need to obtain additional water from WTCPUA, increase groundwater pumpage via a permit increase from HTGCD or develop and bring in another source of water from outside of the immediate area. The purpose of the initial installation of the 290 pipeline was to alleviate the groundwater pumping pressure on the Trinity Aquifer. To date, there have not been long term groundwater availability studies to predict if there is sufficient available groundwater to meet this potential demand without any adverse impacts. 🌿

SUMMARY AND CONCLUSIONS

Since the 290 pipeline was installed and began serving customers in the study area, groundwater pumpage has increased, primarily due to additional exempt wells being drilled. Groundwater usage by exempt well owners has steadily increased since 2002 as development continues in areas without direct access to surface water supplies/pipelines. As these areas continue to infill, more exempt wells are to be expected. The construction of exempt wells has leveled off over the last several years at approximately 40 wells per year. Exempt pumpage is likely to continue to increase due to growth and development of the Austin metropolitan area continues to expand into northern Hays County.

Since 2002, there have not been any large capacity, non-exempt wells developed in the study area. Non-exempt usage, particularly by the top pumpers, has remained relatively constant. Growth in water use has been accommodated by surface water.

Construction of the 290 pipeline has allowed significant growth in the study area. The new, larger subdivisions in the study area, such as Ledge Stone, High Pointe, and Sawyer Ranch, are serviced by the 290 pipeline and do not use large amounts of groundwater. The large amount of retail growth in Dripping Springs is primarily supported by DSWSC, mostly via surface water from the 290 pipeline. Home Depot, HEB, numerous restaurants and other retail businesses have been established in the last decade. This development tends to encourage growth and increased water use.

Pumpage from non-exempt wells has remained relatively constant since 2002. There was a notable increase during the period 2007-2009, but pumpage has been fairly flat at approximately 400 acre-feet per year with the bulk of the growth along the 290 and 1826 corridors has been provided by surface water.

DSWSC is the largest groundwater user as well as a provider of surface water. Though DSWSC hasn't significantly increased groundwater production over the study period, it is supplying roughly one million gallon of surface water a day in its service area allowing for significant growth. Based on the anticipated development activity in the DSWSC service area, there is not sufficient permitted surface and/or groundwater to meet future demand. To date, the majority of the growth in water supply has come from the 290 pipeline, from no use in 2000 to a million gallons per day at present. To meet demand, DSWSC will have to increase its water supply by as much as 200%. It is likely much of this supply will come from groundwater if additional surface water is not available from WTCPUA or other regional sources. If this is the case, then groundwater pumpage will increase considerably. ❀

ATTACHMENT 1.

ARTICLE FROM AUSTIN CHRONICLE — JUNE 2, 2000

<http://www.austinchronicle.com/news/2000-06-02/77473/>

High and Dry

LCRA Approves Controversial Pipeline to Dripping Springs

BY ROB D'AMICO, JUNE 2, 2000, NEWS

The Lower Colorado River Authority (LCRA) continues to proclaim that it is fulfilling its mission as an environmental steward by offering an innovative aquifer protection plan to accompany its water pipeline to Dripping Springs. But LCRA officials and the authority's board offered a slap in the face to their newfound environmental allies last week, by deciding to forge ahead with the project before completing an Environmental Impact Statement (EIS). In December, LCRA had promised to do the EIS to determine whether building the pipeline would spur new development, and thus pollution, of the Edwards Aquifer. "Some things have changed over the past six months in my view," says LCRA general manager Joe Beal. Namely, he says, the Dripping Springs area is suffering from "extreme drought conditions." Furthermore, Beal notes that Hays County has taken the lead in setting up a water and sewer authority that has the power to manage water and wastewater service. And most importantly, he adds, the LCRA has finalized its Memorandum of Understanding (MOU) with U.S. Fish and Wildlife that would impose restrictions on new developments wanting water from the pipeline. Beal pledged verbally and in the agreement with U.S. Fish and Wildlife that the pipeline would serve only existing development until the EIS is completed (contract negotiations on the project are wrapping up this week). "I think there is little risk to the environment proceeding with this water pipeline," he says.

The decision to approve the MOU and proceed with construction came in a unanimous LCRA board vote on May 24, a mere five days after the public and environmentalists learned of the authority's about-face. Last week's vote contrasted sharply with the scene last December when Mark Rose, LCRA's former general manager, got chummy with at least one faction of the environmental community -- the Save Barton Creek Association (SBCA) -- and they jointly announced a decision to conduct an EIS for the pipeline project before any construction began. At the time, SBCA members, a bit detached from more vehement opposition in the Save Our Springs Alliance (SOS), stood behind Rose with smiling faces. "We will hold off building the line until we complete this environmental study," Rose said.

Writing on the Wall

Environmentalists weren't caught totally off guard by the sudden change, says Jon Beall, SBCA president. Beall says the group had heard rumors of LCRA abandoning their promise. The writing may have been on the wall when they watched well-orchestrated publicity in early May. TV news reports showed five-gallon jugs of LCRA water being delivered to thirsty Dripping Springs-area residents with dry wells. And the Hays County Commissioners Court declared a state of emergency for the area, which garnered even more press.

Then came the barrage from elected officials -- including state Rep. Rick Green, who lives in Dripping Springs -- who held a news conference urging pipeline construction. State Sen. Ken Armbrister, whose district covers Hays County, chimed in for getting the project going. And Lt. Gov. Rick Perry telephoned LCRA's Beal, who says the two discussed "water supply issues."

In response to this flurry of pro-pipeline activity, environmentalists from the Hays County Water Planning Partnership (HCWPP), SOS, and SBCA rushed to ready their arguments against the construction. The groups crafted a "near-term solution" to the dry wells that proposed linking water to the area from an existing Hill Country Water Supply pipeline a mere 1.5 miles away. The pipeline carries city of Austin water, and several Austin City Council members were recruited to pledge their support for the idea. However, no one bothered to even ask the Hill Country Water Supply Company if they could accommodate such an expansion, and LCRA and Hays County officials quickly dismissed the idea as infeasible and a "piecemeal solution" to the water situation in Dripping Springs, particularly in Sunset Canyon, a subdivision off Highway 290 east of town that now stands to get LCRA pipeline water. Dozens of residents there have testified in petitions, surveys, and before the LCRA board that their wells are drying up at alarming rates, forcing them to buy water, or pay for costly well expansions and storage tanks. They recount how their faucets spew silt and stones and, if they're lucky, water that tastes as bad as it smells. "I have concern about the environment," says Sunset Canyon resident Linda Erwin, "but when you wake up and can't take a drink of water, you have to deal with reality."

Environmentalists say they are sympathetic to the residents' plight, and are supportive of development restrictions listed in the MOU with Fish and Wildlife. Nevertheless, they wonder how the rules for new development will be enforced, and they lament the obvious: There's no way a pipeline is ever going to be taken away once it's built, regardless of what an environmental study may show.

Breakdown of the Project

LCRA officials have been studying ways to get surface water to northwest Hays County for over a decade, which has added greatly to the frustration among residents there with ailing wells. The current project will extend a 15-mile, 24-inch-diameter pipeline carrying water to Dripping Springs along U.S. 290 from the Colorado River at the Village of Bee Cave.

The project will cost \$17.5 million, and additional treatment expansions that serve it and other projects raise that amount to \$25 million. Beyond that, residents will be responsible for paying the cost to hook up to the pipeline -- about \$4,000 to \$5,000 per home -- and for the regular monthly water fee, around \$80, depending on usage. The pipeline could be operational in 18 months.

LCRA officials originally scheduled pipeline construction for January, but vocal opposition from many Hays County residents throughout much of last year led to the hiatus and EIS process. Chief opponents included the Hays County Water Planning Partnership, a grassroots group of northern county residents that formed to fight the pipeline on the grounds that it would fuel new development and destroy the county's rural lifestyle. The HCWPP also succeeded in halting a Hays County Transportation Plan that proposed putting

in several four-lane roads over the Edwards Aquifer, and extending MoPac south to San Marcos.

Other pipeline opponents include the SOS Alliance, whose chief concern is that development fueled by the pipeline will contribute pollution to the Edwards Aquifer, and thus Barton Springs and its endangered salamander. Additionally, several members of the Edwards Aquifer Barton Springs Conservation District are concerned that development-related pollution could endanger some 45,000 people who depend on the aquifer for their drinking water. Both SOS and the HCWPP have filed intent-to-sue notices against LCRA over the project.

For its part, LCRA maintains that the pipeline is intended for about 4,000 or so existing customers, but they say that the capacity could eventually serve up to 7,000 homes at an average of 15,000 gallons a month for each customer. And additional expansion of the LCRA treatment and storage facilities could increase that amount in the future. And they agree that building the pipeline will make it easier to add extensions deeper into the Hill Country. Since the LCRA mandate is to offer water to customers within their jurisdiction, officials there also note that they would not turn down new development.

Half Empty or Half Full?

Complicating the LCRA pipeline issue is how you define a dry well. Water levels that drop during dry periods may simply require a deeper well, which means paying a substantial amount of money to a driller (usually around \$2,000-\$3,000). Many residents also say that their wells are dry when they actually just need extended periods of time to recharge. In some extreme cases, residents are not able to use their water for more than five minutes before running "dry." The solution here may also be expensive -- building a storage tank so that water may be managed more effectively without dry spells in the well.

Then there's water use to consider. One Dripping Springs-area resident lamented that he couldn't fill his hot tub and water the lawn at the same time, while others suffer from more fundamental needs -- they can't even take a shower. So defining "dry" is subjective.

It's hard to pin down who really needs surface water, and who really deserves it. The magnet for publicity over the water plight has been the subdivision of Sunset Canyon, an area of about 450 homes developed more than 15 years ago. Chief rabble-rouser for the residents is Dede Stevenson, who is pushing the LCRA for pipeline water as soon as possible. Her family recently installed a 2,500-gallon storage tank after she went to turn on the faucet one day and found only air. "We're basically looking at being without any water," she says. "Ten people had to redrill their wells in the last few months."

Alan Hardy, chair of the subdivision's water committee, spearheaded a door-to-door survey of 254 residents. Some 10% have been forced to drill new wells or deepen their existing wells, and 24% experienced significant lapses in water supply. Of those surveyed, 90% wanted LCRA surface water and were ready to pay \$4,000 for a hookup, while 7% wanted the water but couldn't afford the hookup at this time.

Only 10 households say they use rainwater collection, a system that isn't a total solution to water supply but still has potential to provide for a significant portion of the needed water.

Furthermore, LCRA pulled a host of statistics from several studies of aquifers in the area, including well monitoring that showed drops of about 80 feet in the past 10 years. HCWPP President Erin Foster did note, however, that these wells are more than 350 feet deep, so they can most often accommodate temporary drops. She says of the current drought, "I'm not sure that it constitutes a \$25 million emergency Band-Aid."

LCRA officials essentially are showing that water demand over the aquifers in the Dripping Springs area will increase 170% in the next 50 years, while population increases 233%.

Water availability and quality depends on several factors, such as the actual aquifer, whether the wells are in shallow or deep portions of the aquifer, the recharge rate, and who else is pumping or polluting the land next to you.

The most common analogy for the problem is that the aquifer is a cup and each well a straw. "There's too many straws in the cup that supplies the water, and it's only going to get worse," says David Frederick, field supervisor for U.S. Fish and Wildlife in Austin.

Frederick, who has been lauded by both environmentalists and the LCRA for his efforts in trying to resolve development concerns, felt the Sunset Canyon situation was dire enough to get things moving with the pipeline. "I do not put endangered species above health and human safety," he told the LCRA board. However, no one made much of a case that the residents' predicaments -- ranging from irritating dry spells to serious financial hardships -- are really a health concern. With bottled water they use for drinking anyway, they're not going to die of thirst, and contamination of shallow aquifer wells is most likely from new development, precisely what environmentalists are trying to control.

Many environmentalists and longtime rural homeowners are frank enough to tell Dripping Springs area residents that they should expect poor quality water and shortages, because they live in the country and depend on wells. Furthermore, it's hard for many to have pity for residents who go to great lengths to ask for surface water, but don't do anything to try and control the growth that is helping to deplete their existing source. For instance, Sunset Canyon resident Stevenson told the LCRA board that the nearby Polo Club -- an equestrian-themed, 93-lot development with \$600,000-plus houses -- is a "very nice subdivision" that needs to keep its lakes filled to make it attractive.

No one (besides environmentalists) seemed too concerned about the Coyote Crew resort planned west of Dripping Springs that would include a 300-room hotel and golf courses. One resident even told the LCRA board that bringing surface water to the east side of Dripping Springs would ease pressure on other new development that would then depend on well water. It doesn't take a visionary to see that the new developments will themselves be clamoring for surface water a few years down the road when newer neighboring subdivisions and dry spells ruin their wells.

How to Stop the Deluge

The most popular refrain from Hays County residents wanting surface water is, "Nothing is going to stop the growth. It's not 'build the pipeline and it will come.' It will come anyway."

"If we want to restrict development, let's do it through ordinances and land controls," Sunset Canyon's Hardy says. And even some environmentalists echo those sentiments. "Restricting utilities is not the way to stop growth," says Bill Bunch, the SOS legal counsel, even though he opposes the current construction until findings from the EIS are complete.

Section 7 permit reviews from the Endangered Species Act and the MOU between LCRA and U.S. Fish and Wildlife also will be important tools, if enforceable. Any new development that gets surface water from the pipeline will have to meet rigorous impervious cover standards, runoff controls, and other environmental guidelines similar to those in Austin's SOS ordinance. But other areas not covered by the pipeline will rely on regulation from Hays County and the city of Dripping Springs, not exactly a government climate that controls growth.

This is the county government that presented a surprise 25-year road plan with an extension of MoPac to San Marcos, and courted a developer that planned to put 14,000 homes over the Edwards Aquifer and recharge zone at the Rutherford Ranch site. Still, County Judge Jim Powers correctly asserts that his county has some of the strictest subdivision rules in the state. He also points to a new Hays County Water and Sewer Authority (newly authorized by the last Legislature) that will be able to control utility development to some extent.

While some bluntly describe Powers as a "pimp for developers," he simply maintains that he has always been of the mindset that growth is inevitable, and the only thing to do is plan for "quality growth." Indeed, the often-praised Hays County subdivision rules are designed to ensure that development density does not allow for contamination of wells and that it provides adequate roads and drainage. Yet current residents are quick to point out that thousands of homes and commercial buildings are still going to pollute the aquifer, clog roadways, ruin the air, and destroy rural life in Hays County, even if they are quality-made.

The county has never had much power to regulate new development, but SBCA's Jon Beall notes that it can deny subdivision plats and other development under Chapter 35 of the Texas Water Code, which states: "The commissioners court of a county in a priority groundwater management area may adopt water availability requirements in an area where platting is required if the court determines that the requirements are necessary to prevent current or projected water use in the county from exceeding the safe sustainable yield of the county's water supply."

Since the Dripping Springs area is a "priority groundwater management" area, the Hays Co. Commissioners Court could adopt strict requirements linking development with water supply, Beall says.

On the simplest level, LCRA's own doom-and-gloom groundwater projections would be enough evidence to deny all new development. Moreover, many environmentalists point out that Dripping Springs is a small city with a large extraterritorial jurisdiction (ETJ). They ask why the city can't adopt water quality ordinances similar to the SOS ordinance, or even push the envelope with requirements that all new homes and businesses be equipped with rainwater collection systems, even if they're expensive and limiting to developer profits. After all, this isn't an area known for developing new affordable housing, and developers are targeting high-income residents who want the Hill Country charm, or what's left of it, and good schools.

Dripping Springs Mayor Wayne Smith did say that officials there are in the process of developing new land use recommendations. All agree that planning for where development would have the best chance at getting adequate water and transportation without polluting or depleting the aquifers is the key. But the entities involved have yet to get past the idea that there will be some contention in the process.

For example, a past LCRA-sponsored Oversight Committee designed by Powers didn't include the main opponents of the pipeline and then dissolved before ever getting off the ground. Recent efforts have proved to be more inclusive and fruitful, such as a blue ribbon committee to advise on the county's transportation plan. (But even that effort is now fraught with controversy; see "Roadblock" below.)

In a letter to the LCRA, Rep. Rick Green wrote that regional planning efforts never got underway because of "threatened lawsuits" from SOS and HCWPP. But officials can learn something from recent Austin politics: Just because someone says nasty things about you or threatens to sue doesn't mean you don't invite them to the table. 

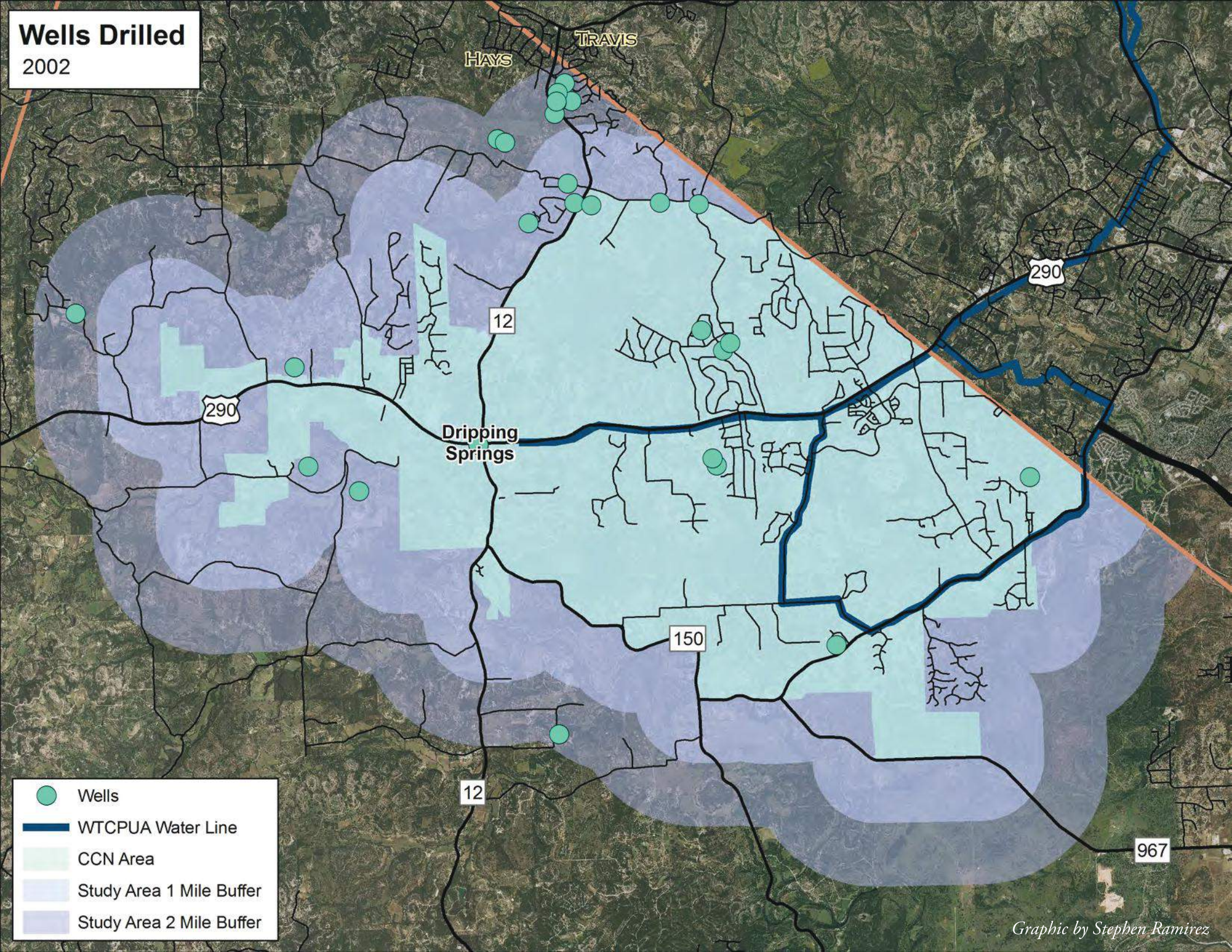
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ATTACHMENT 2.

WELLS DRILLED BY YEAR 2002-2014

Wells Drilled

2002



Wells

WTCPUA Water Line

CCN Area

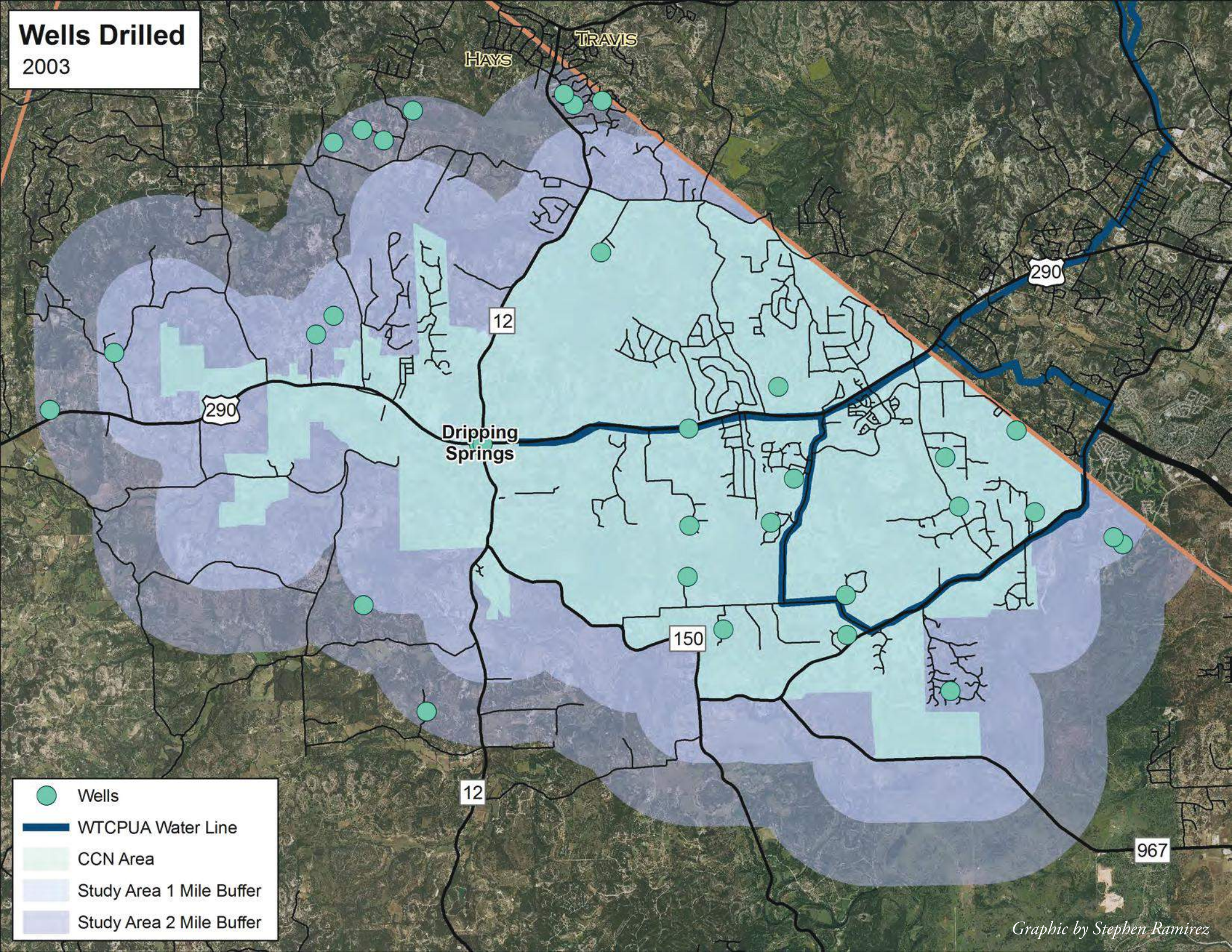
Study Area 1 Mile Buffer

Study Area 2 Mile Buffer

Graphic by Stephen Ramirez

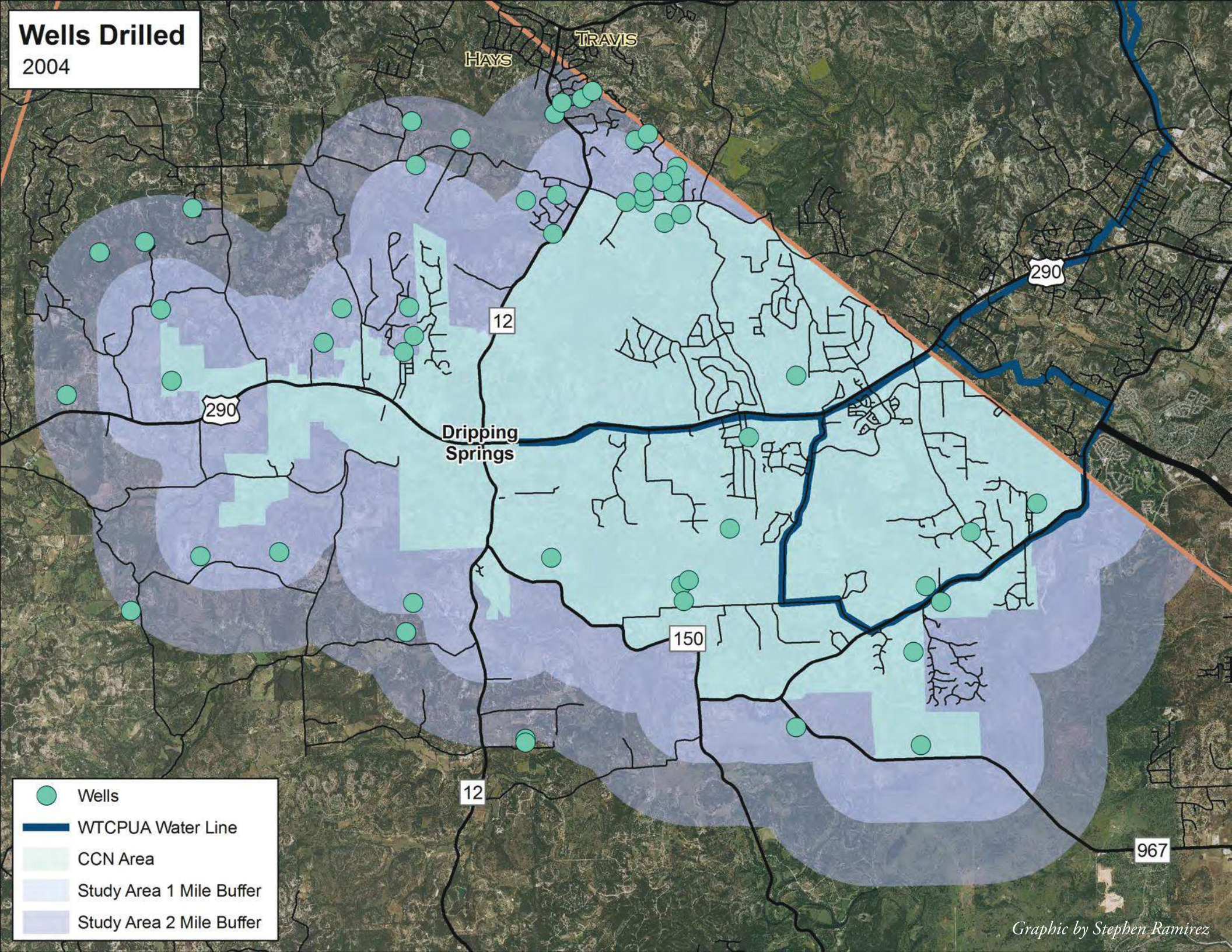
Wells Drilled

2003



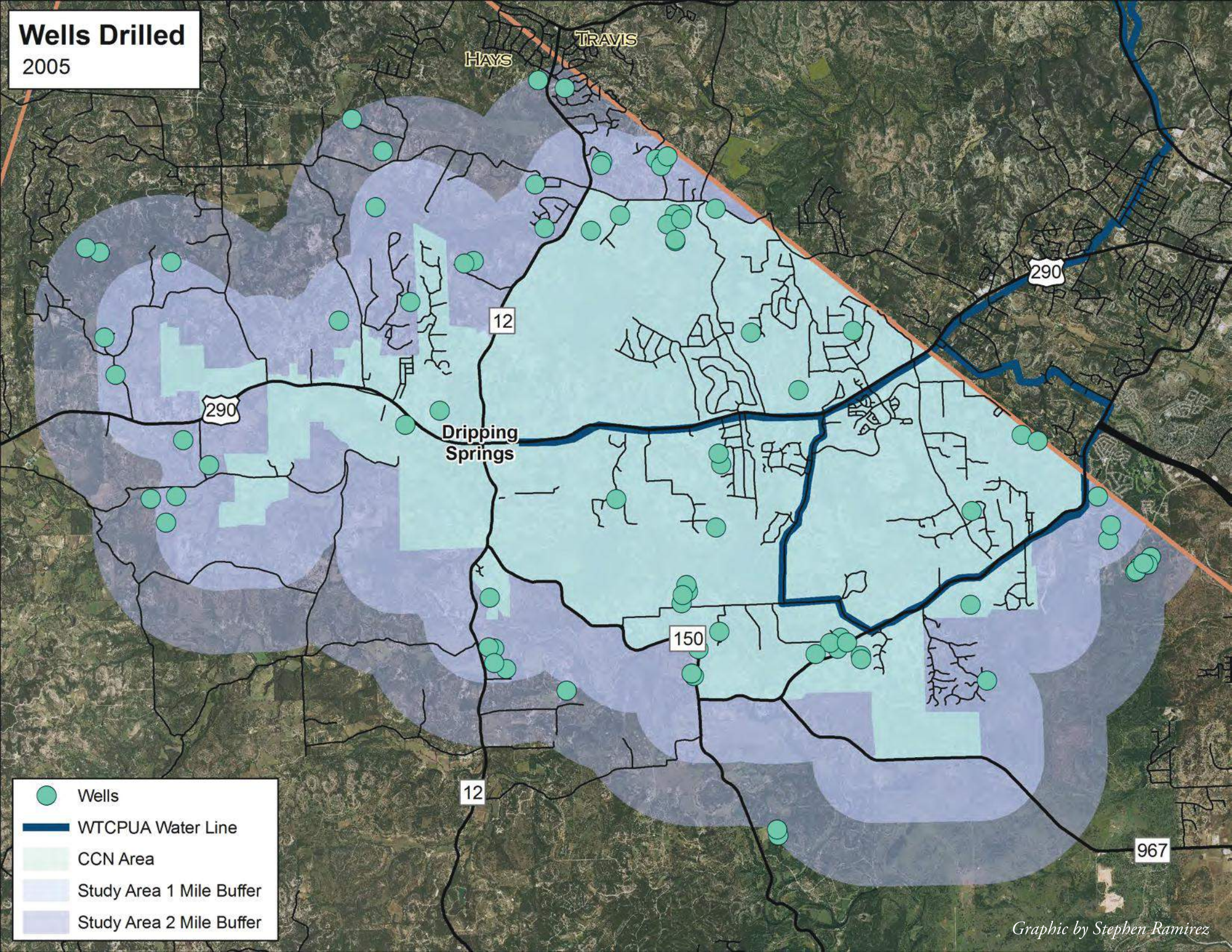
Wells Drilled

2004



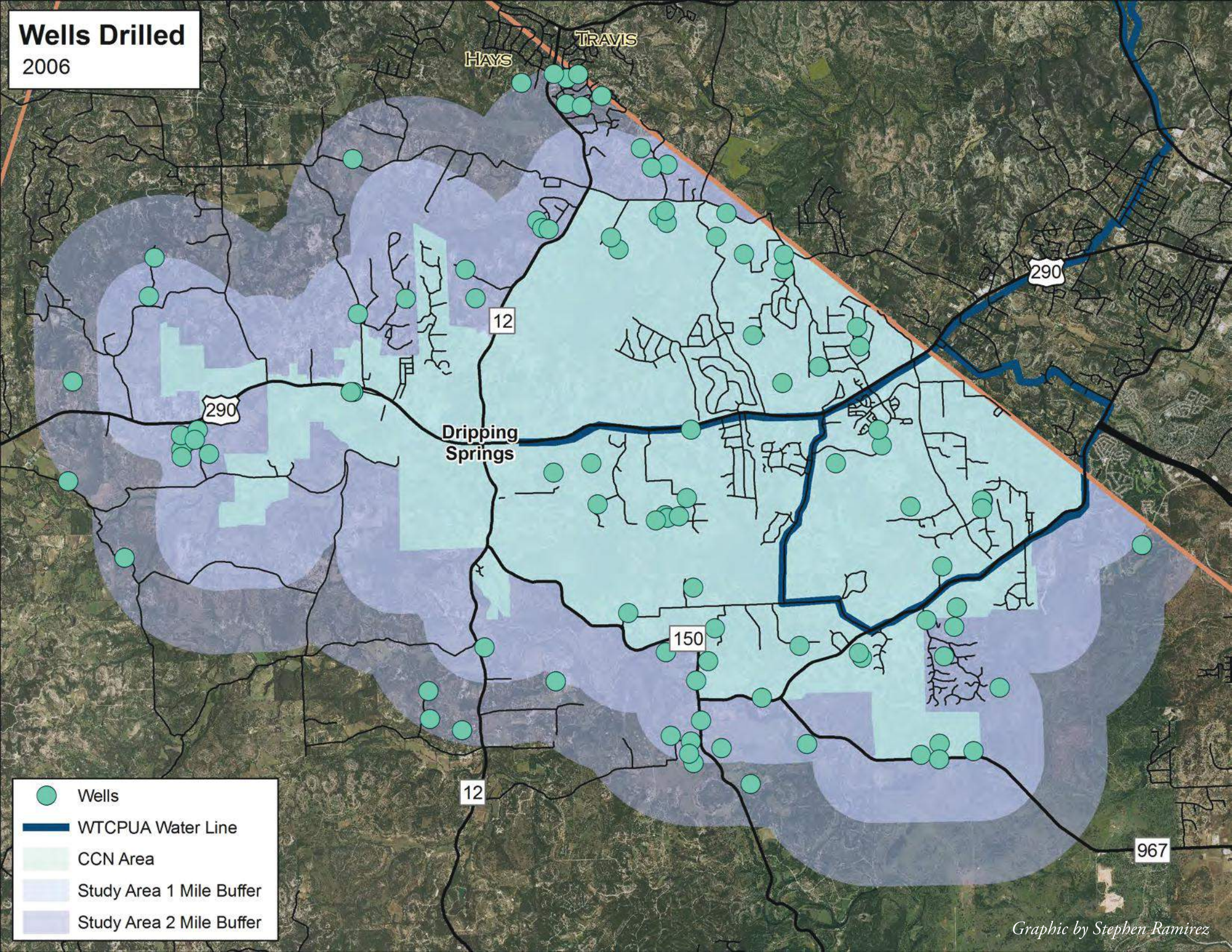
Wells Drilled

2005



Wells Drilled

2006



Wells

WTCPUA Water Line

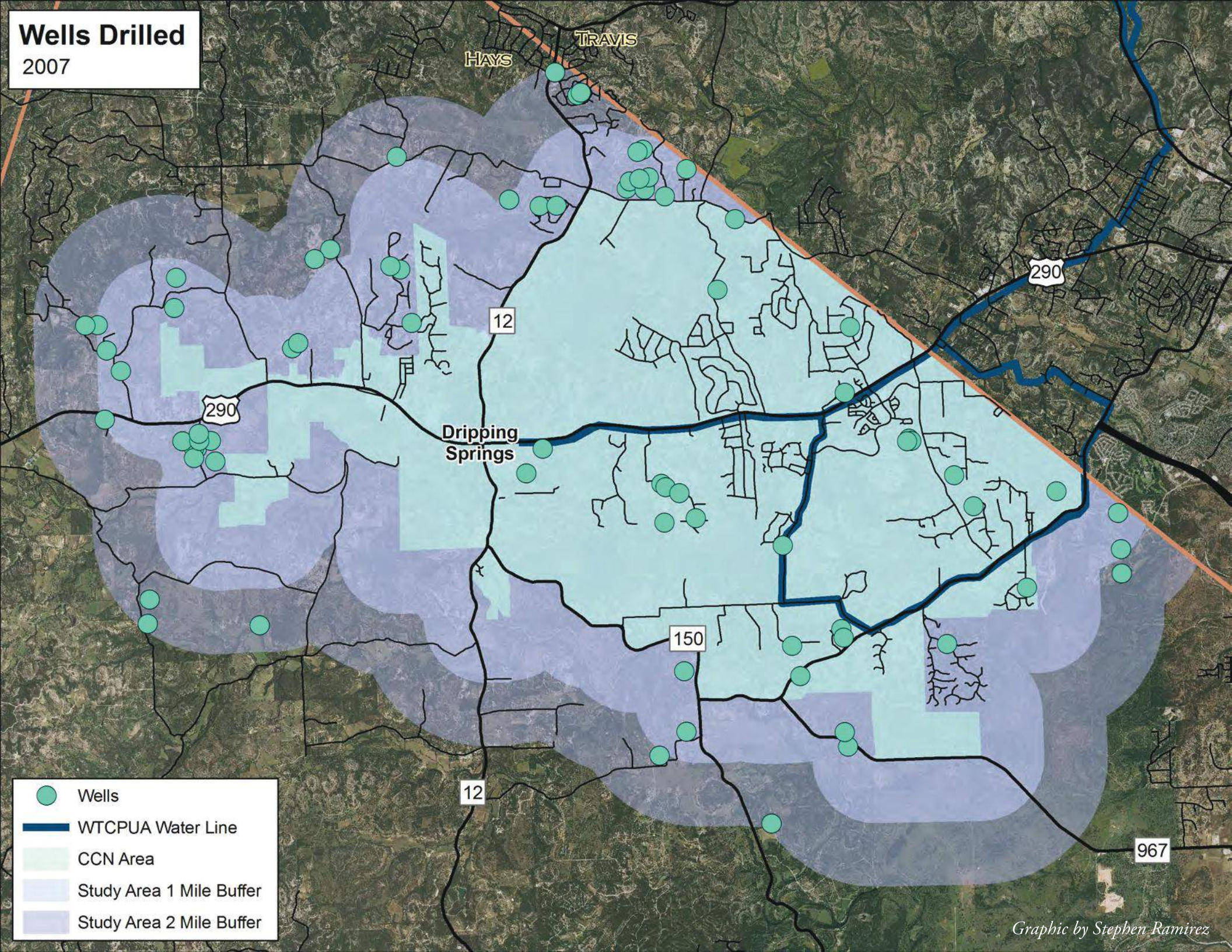
CCN Area

Study Area 1 Mile Buffer

Study Area 2 Mile Buffer

Wells Drilled

2007



Wells



WTCPUA Water Line



CCN Area



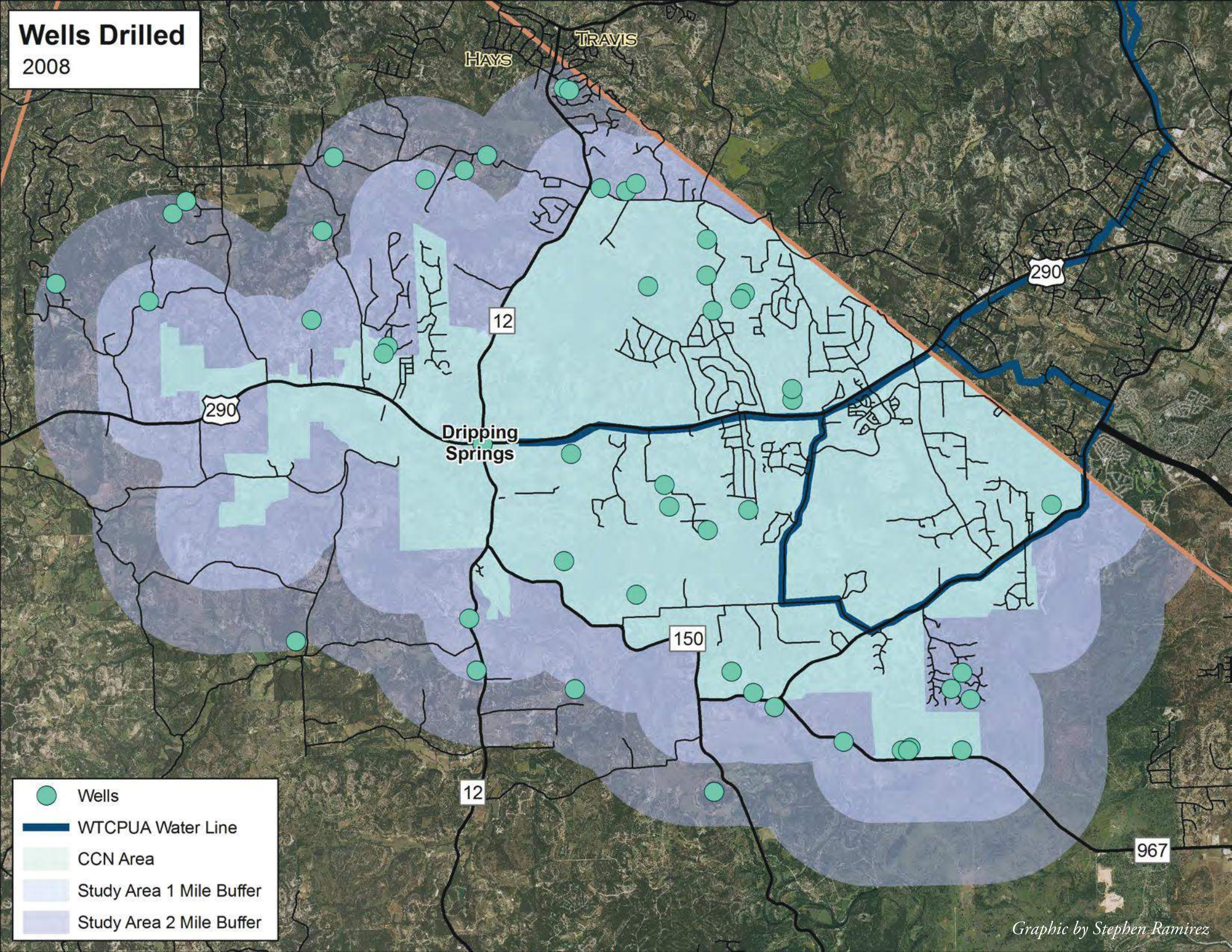
Study Area 1 Mile Buffer



Study Area 2 Mile Buffer

Wells Drilled

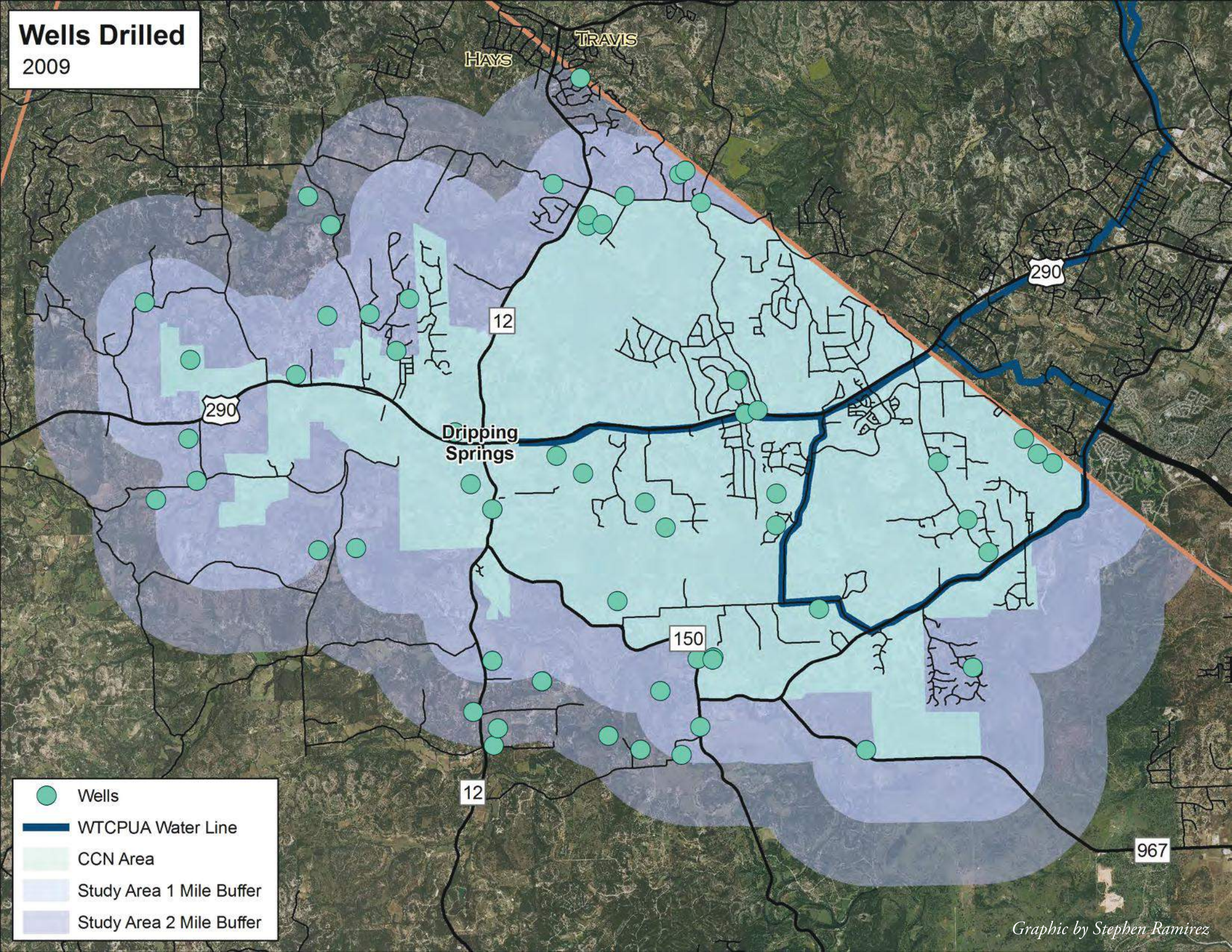
2008



Graphic by Stephen Ramirez

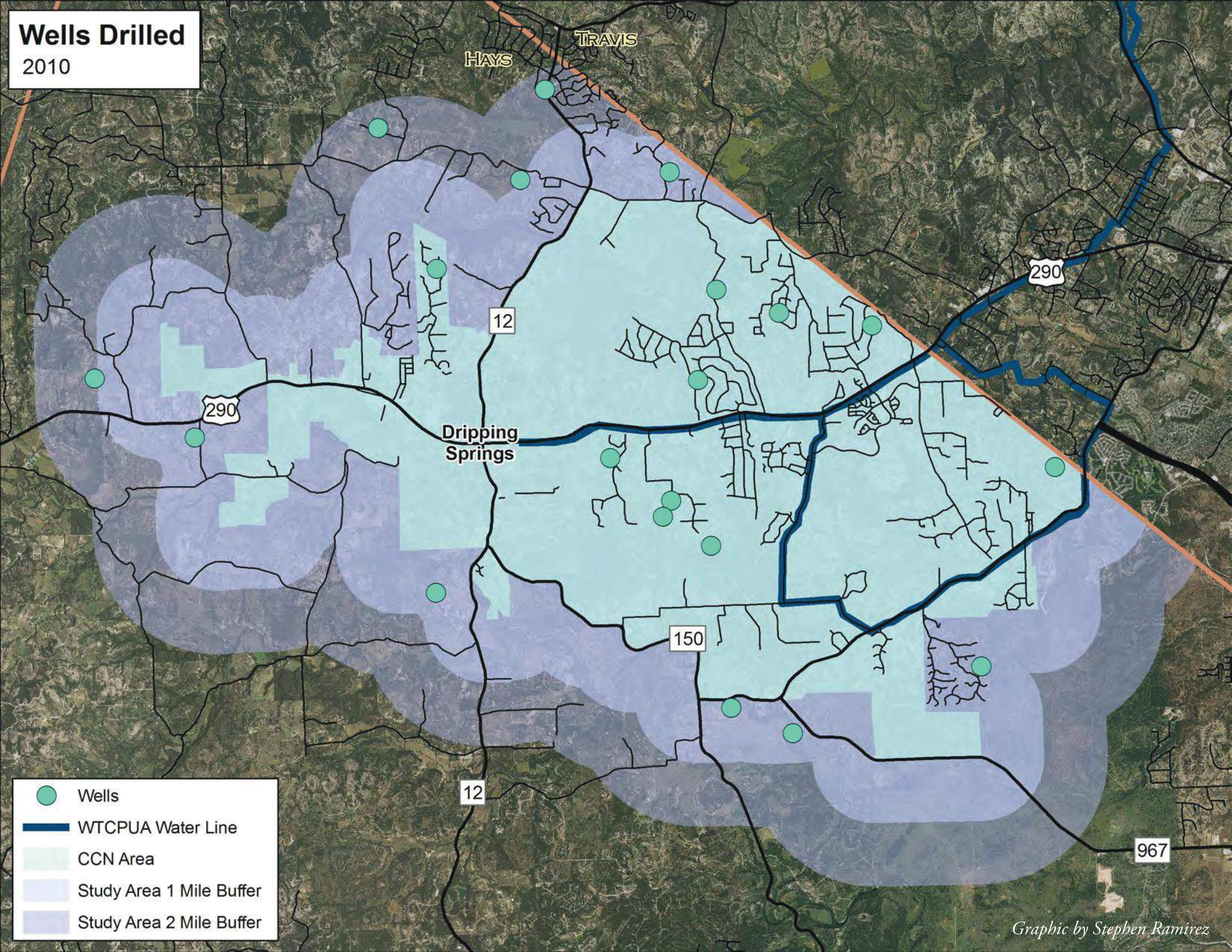
Wells Drilled

2009



Wells Drilled

2010



Wells



WTCPUA Water Line



CCN Area



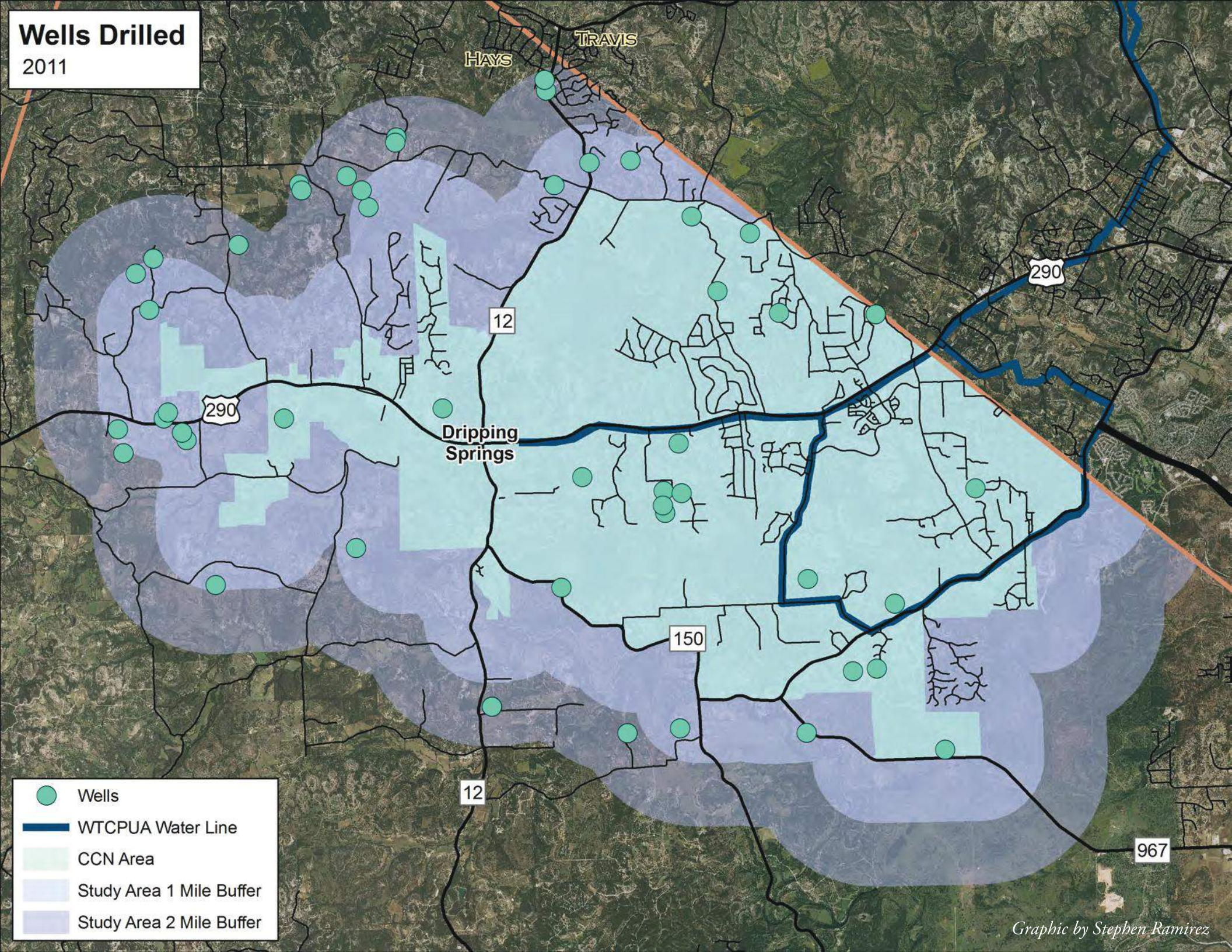
Study Area 1 Mile Buffer



Study Area 2 Mile Buffer

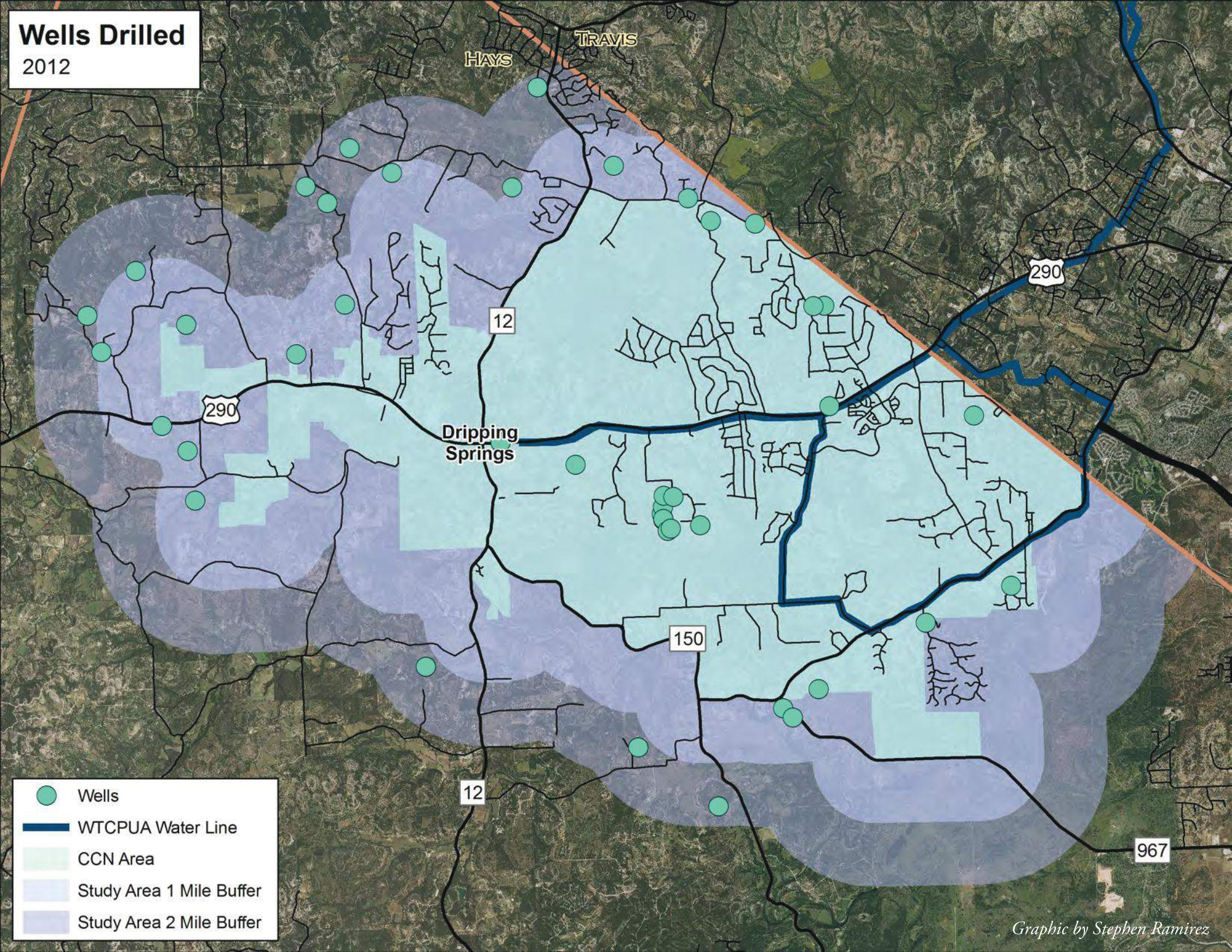
Wells Drilled

2011



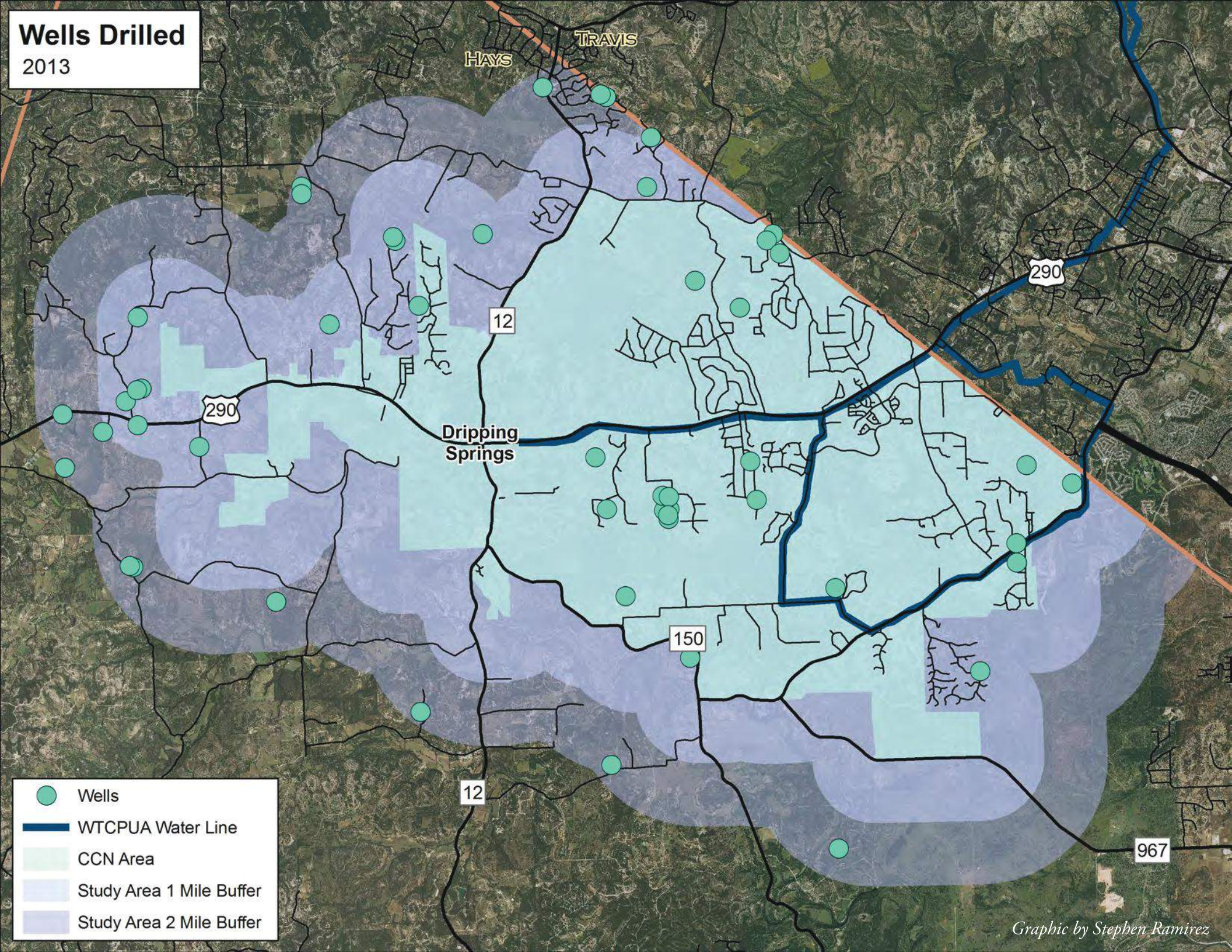
Wells Drilled

2012



Wells Drilled

2013



Wells

WTCPUA Water Line

CCN Area

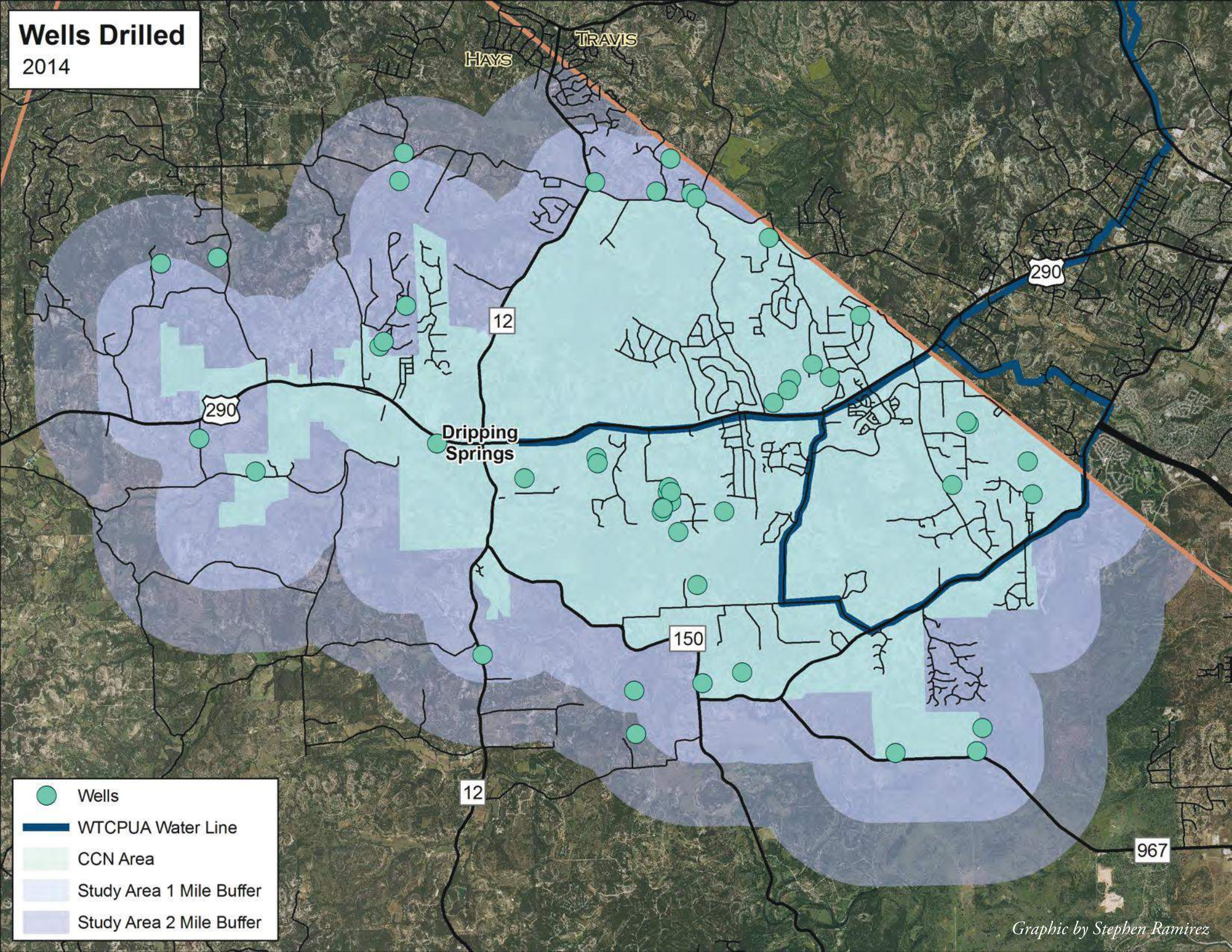
Study Area 1 Mile Buffer

Study Area 2 Mile Buffer

Graphic by Stephen Ramirez

Wells Drilled

2014



Wells

WTCPUA Water Line

CCN Area

Study Area 1 Mile Buffer

Study Area 2 Mile Buffer

Graphic by Stephen Ramirez

ATTACHMENT 3.

“SUMMARY OF SYSTEM CAPACITIES”

PREPARED BY JOEL WILKINSON, P.E. OF
NEPTUNE-WILKINSON ASSOCIATES, INC.

JUNE 24, 2015

DRIPPING SPRINGS WATER SUPPLY CORPORATION
SUMMARY OF SYSTEM CAPACITIES
June 24, 2015

GROUND WATER SUPPLY

<u>Well No.</u>	<u>Date Drilled</u>	<u>Well Depth</u>	<u>Rated GPM</u>	<u>Tested GPM / Date</u>
1	1964	820'	200	Currently Out of Service
2	1975	345'	200	255 - 02/01
3	1986	380'	500	510 - 02/01
4	1995	375'	500	510 - 02/01

Total All Wells	1,275 GPM
Total With Largest Well Reserved For Standby	765 GPM
Total Equivalent Annual Production Currently Available	1,234 Acre-Feet
Total Annual Production Permitted by the HTGCD (Hays Trinity Groundwater Conservation District)	400 Acre-Feet (248 GPM)

All wells are located on Dripping Springs Water Supply Corporation (DSWSC) property south of Onion Creek and east of Ranch Road 12.

SURFACE WATER SUPPLY

In August of 2000, DSWSC entered into a water service agreement with the Lower Colorado River Authority to purchase capacity in supply facilities up to, but not in excess of, a peak daily flow of 1,000,000 gallons per day with annual usage not to exceed 365,000,000 gallons (1,120 acre-feet). The LCRA has granted to DSWSC a firm raw water quantity of 1,126.16 acre-feet with a maximum diversion of 1,120 acre-feet annually. The combined ground water pumping capacity with largest well out of service and surface water supply available is about 2,101,000 gallons per day (1,459 GPM) or 6.45 acre-feet per day.

GROUND AND ELEVATED STORAGE

<u>Type</u>	<u>Capacity (MG)</u>	<u>Location</u>
Ground	0.203 MG	Well Site
Ground	0.125 MG	Loop 64 Site
Ground	0.051 MG	R.R. 12 (North Standpipe)
Standpipe	0.207 MG (0.091 Elevated)	Counts Tract (South Standpipe)
Standpipe	<u>0.323 MG</u> (0.150 Elevated)	Meadow Oaks Subd. (West Standpipe)
Total	909,000 Gallons (241,000 Elevated) ¹⁾	

SERVICE PUMPS

No.	GPM	Location	No.	GPM	Location	No.	GPM	Location
1	300	Well Site PS ¹⁾	1	700	Loop 64 PS	1	650	Springlake PS
2	300	Well Site PS	2	700	Loop 64 PS ²⁾	2	650	Springlake PS ²⁾
3	650	Well Site PS	3	500	Loop 64 PS			
			4	500	Loop 64 PS ²⁾			

Total Service Pump Capacity

4,950 GPM

Total Service Pump Capacity without Standby Units in Service

2,800 GPM

NOTES:

- 1) Presently a 500,000 gallon elevated tank is being constructed at a site adjoining the 207,000 gallon standpipe.
- 2) Standby Service

SYSTEM CAPACITIES

System Capacity	TCEQ Capacity Criteria	Current ¹⁾ Connections	Required	Permitted Capacity Available	Permitted Equivalent Connection Capacity	Permitted 85% Capacity Equivalent Connection Capacity	Capacity Available	Equivalent ²⁾ Connection Capacity Available	85% Equivalent Connection Capacity Available
Ground Water				248 gpm	413	351	765 gpm	1,275	1,084
Surface Water				694 gpm	1,157	983	694 gpm	1,157	983
TOTALS	0.6 gpm/Conn.	1,880	1,128 gpm	942 gpm	1,570	1,334	1,459 gpm	2,432	2,067
Elevated Storage	100 Gall/Conn.	1,880	0.188 MG	0.241 MG	2,410	2,049			
Ground/Total Storage	200 Gall/Conn.	1,880	0.376 MG	0.909 MG	4,545	3,863			
Service Pumps	2 gpm/Conn.	1,880	3,760 gpm	4,950 gpm	2,475	2,103			

NOTES:

- 1) The number of connections on June 1, 2015 was 1,880 of which 1,395 are standard meter connections (5/8" x 3/4") and 80 are nonstandard connections (3/4" and larger). The total of nonstandard connection equivalents is 485. The total connection equivalent for evaluating system capacity requirements is 1,880 (1,395 + 410 + 75).
- 2) Chapter 291.93(3)A stipulates capacity is considered to be the overall rated capacity in number of residential connection equivalents using the most restrictive criteria for production, treatment, storage or pumping.

CAPACITIES SUMMARY

Dripping Springs Water Supply Corporation presently has capacity to serve an additional 169 (2,049 - 1,880) residential connection equivalents prior to reaching the 85% equivalent connection capacity criteria for elevated storage capacity. A 500,000 gallon elevated tank (2,500 equivalent connection capacity) is now being constructed and will replace the existing 91,000 gallons of elevated storage in the South Standpipe (455 equivalent connection capacity). Using the TCEQ 200 gallons per connection criteria, the 500,000 gallon elevated tank and existing 150,000 gallons of elevated storage in the West Standpipe will provide a total elevated storage connection capacity of 3,250 connections.

DSWSC now exceeds the total HTGCD permitted ground water supply and WTCPUA contracted surface water supply combined equivalent connection capacity by 310 (1,880 - 1,570) and exceeds the permitted and contract 85% supply capacity criteria by 546 (1,880 - 1,334) connections.

The combined ground and surface water capacities now available can serve an additional 552 (2,432 - 1,880) connections prior to exceeding the 0.6 gpm per connection criteria or 287 (2,067 - 1,880) prior to reaching the 85% capacity criteria.

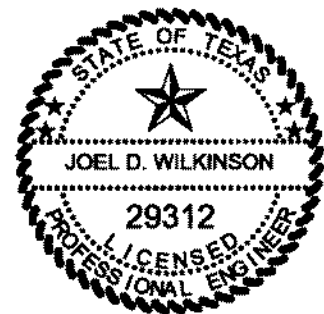
DSWSC has now committed to provide water service to about 1,413 LUEs presently developed or being developed but not yet served as tabulated on the following page 4. Development inquiries for an additional 2,363 connections have been made and are also tabulated on page 4. Additional water supply capacity is required for DSWSC to serve these developments.

LUEs Remaining to be Connected in Subdivisions that have already paid DSWSC CCF's		Subdivisions Under Construction with DSWSC CCFs Unpaid		Potential Lots for Development	
Development	LUEs	Subdivision	LUEs	Subdivision	LUEs
RDS/Burrows	73	Founders Ridge Ph 1	51	Founders Ridge Phase 2, 3 & 4	153
Arrowhead Ranch	381			Caliterra/Carter Longhorn Ranch	235
Hidden Springs	30			Scenic Greens	912
Legacy Trails/ Pound House	65			The Gardens at Howard Ranch	34
Harrison Hills	63			Gateway 26 Doors	27
Counts Estates	71			Texas Heritage Village	138
Caliterra	550			Heritage Subdivision	700
Pound House Hills (HC Carter)	26			Garnet/Laurel Canyon	91
Roger Hanks Park (43.06 acres)	53.5			Crooked Oaks	20
Howard Ranch Phases I, II & III	24			Howard Ranch Phase IV	53
Creek Road Ranch	20				
Las Maderas	5				
TOTALS	1,362		51		2,363

PREPARED FOR: Dripping Springs Water Supply Corporation

PREPARED BY:

Joel D. Wilkinson 6/24/2015
 Joel D. Wilkinson, P.E. Date
 Neptune-Wilkinson Associates, Inc. TBPE Firm# F-359



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