

# Protect Groundwater Quality

The following list is a partial set of practices for protecting your groundwater quality.

- Never store pesticide and herbicide containers near wells.
- Inspect well head for surface deterioration and rodent burrows. Repair well head surface when needed.
- Make certain that check valves are installed and operating properly. State law requires the installation of check valves when injecting chemicals.
- When using a well for filling chemical or herbicide tanks, make certain the supply line is downstream of check valves. This prevents any contamination from potential back-siphoning.
- Do not leave wells uncovered. By law, open wells must be capped. Report uncovered wells to the District.
- Have your septic system inspected periodically. Failed systems may allow groundwater contamination.
- Cesspools are not allowed and are a threat for contamination. Notify the District if you discover one. 🇺🇸

## Calendar of Events

- March 7 Board Meeting  
8:30 am  
District office
- March 7 Primary  
Election Day
- April 4 Board Meeting  
8:30 am  
District office
- April 14 Good Friday  
Office Closed
- May 2 Board Meeting  
8:30 am  
District office
- May 13 General  
Election Day
- May 29 Memorial Day  
Office Closed

SOUTH PLAINS GROUNDWATER NEWS is published by the SOUTH PLAINS UNDERGROUND WATER CONSERVATION DISTRICT, PO Box 986, 802 Tahoka Road, Brownfield, TX 79316. Directors: Dan Day, Doyle Moss, Scott Hamm, Matt Hogue, Larry Yowell; General Manager: Jason Coleman; Administrative Assistant: Lindy Harris. Subscriptions are free upon request.

Phone: (806) 637-7467  
E-mail: spuwc@spuwcd.org

FAX: (806) 637-4364  
Web Address: www.spuwcd.org



SOUTH PLAINS UNDERGROUND WATER  
CONSERVATION DISTRICT  
PO BOX 986  
BROWNFIELD, TX 79316

ADDRESS SERVICE REQUESTED



*Pray for Rain*

BULK RATE  
U.S. POSTAGE  
PAID  
PERMIT NO. 986  
BROWNFIELD, TX

# GROUNDWATER SOUTH PLAINS NEWS

FEBRUARY 2006

VOLUME 13, NUMBER 2

## 2004-2005 Water Quality Results

The South Plains Underground Water Conservation District has maintained a network of water quality wells since 1998. Periodically, wells are added to or removed from the network for various reasons. In some cases, a well may no longer be used, and the pump is removed. Also, some irrigation wells are used so sparingly that it is difficult to gather a sample when the well is in use. For those reasons, there are blanks in the following table.

Nevertheless, the sampling results are listed for each well analyzed during the years 2004 and 2005. The two parameters which are reported are chloride and conductivity. These two parameters indicate the suitability of water for irrigation use. The enclosed map contains the well locations for your convenience. 🇺🇸

Well Number	Conductivity (µS/cm)		Chloride (ppm)	
	2004	2005	2004	2005
24-37-9531	1170	1140	118	200
24-37-9912	2530	2360	476	442
24-38-9711	1690	1750	216	234
24-44-3521		1560		272
24-44-8131	2760	2940	476	474
24-44-9571	680	700	28	32
24-45-2831	1490	1450	216	217
24-45-4341	1470	1620	251	292
24-45-6452		1480		234
24-45-7372	1080	1060	129	117
24-45-7841	1170	1170	142	142
24-45-9541	1260	1250	155	170
24-46-1292	1450	1450	142	156
24-46-2643	1080	910	86	45
24-46-4523	990	980	75	76
24-46-5181	1620	1540	169	200
24-46-7371	1640	1480	251	200
24-46-8651	1180	1170	129	129
24-46-9382	3110	3100	511	443

### In this issue

- *Protect Groundwater Quality*
- *Summary of Water Quality Results*
- *2004-2005 Water Quality Results*

<u>Well Number</u>	<u>Conductivity (µS/cm)</u>		<u>Chloride (ppm)</u>	
	<u>2004</u>	<u>2005</u>	<u>2004</u>	<u>2005</u>
24-47-1141	1070	1110	118	200
24-47-2421	1710		169	
24-47-3551	1320	1310	106	129
24-47-4411	2230	2280	233	234
24-47-5151	1970	1910	169	150
24-47-6531	2590	2530	336	336
24-47-9391	1250	1260	60	67
24-48-1371	1430	1510	106	142
24-48-4351	1510	1480	118	129
24-48-7891	3890	3700	635	559
24-48-8711	2910	2900	313	292
24-52-5541	670	700	52	52
24-52-5945	1390	980	86	32
24-52-6651	1670	1690	216	200
24-52-8461	1930	1880	251	252
24-53-1393	600	620	31	52
24-53-3171	1400	1530	303	228
24-53-5472	1990	1980	303	292
24-53-6491	1270	1280	208	129
24-53-7431	2640	2510	511	442
24-53-8391	2230	2030	287	272
24-53-9793	2530	2440	251	272
24-54-1281	1110	1130	81	93
24-54-2521	1560	1570	251	228
24-54-5411	1980	1890	303	292
24-54-5531	1600	1520	225	217
24-54-7611	1820	1590	326	246
24-54-7982	1240		142	
24-54-8971	1320	1350	177	164
24-55-1181	1720	1670	216	234
24-55-2712	3580	2670	635	336
24-55-3272	6810	6750	1821	1585
24-55-4131	2111	2050	336	313
24-55-4591	1200	1170	81	85
24-55-6213	1910	1950	155	200
24-55-7571	1250	2700	56	590
24-55-9541	1600	1650	96	129
24-60-2481	1950	1910	291	292
24-60-3121	1450	1400	96	95
24-60-3641	2080	2020	233	252

<u>Well Number</u>	<u>Conductivity (µS/cm)</u>		<u>Chloride (ppm)</u>	
	<u>2004</u>	<u>2005</u>	<u>2004</u>	<u>2005</u>
24-60-5873	2310	2350	336	332
24-60-6711	1880	1800	291	234
24-60-8691	2110	2080	332	336
24-61-3281	1580		118	
24-61-4721	2190	2110	251	332
24-61-5281	2620	2590	360	385
24-61-6591		2290		309
24-61-7711	1800	1910	313	385
24-61-8571	1700	1590	233	234
24-61-9561	2000	1970	313	336
24-62-1832	1360	1390	155	179
24-62-2991	2240	2090	360	309
24-62-3342	1300	1540	64	129
24-62-4921	2160	2110	270	287
24-62-5651	8950	9890	3916	4151
24-62-7681	2820	2950	414	514
24-62-8861	2210	2230	433	514
24-62-9151	960	940	49	52
24-62-9972	3150	3140	634	554
24-63-2531	4240	3050	796	385
24-63-2881	2990	3210	444	559
24-63-3822	2970	2860	291	313
24-63-4462	1850	1830	199	200
24-63-6731	2320	2300	313	313
24-63-8161	2190	2280	336	336
24-63-9851	2350	2350	336	336
24-64-1231	11650	10740	2306	1719
24-64-1881		8740		1719
24-64-7681		1860		142
27-04-2191	1520	1420	199	200
27-04-2972	1330		150	
27-05-1641		1640		272
27-05-2121	2020	1980	360	413
27-05-3491	1080	1110	68	76
27-06-1844	2600	1960	433	272
27-06-2851	1820	1770	225	234
27-07-1412	2190	2090	336	252
27-07-2851	3690	3650	884	856
27-07-3941	3240	3330	713	699
27-08-1911	2960	3040	476	474

# SUMMARY OF WATER QUALITY RESULTS


Table 1 contains a short summary of water quality results since 1998. As mentioned previously, the two parameters included are chloride and conductivity, primarily because they indicate the suitability of water for irrigation use.

**Chloride** is an ion commonly found in groundwater. In large concentrations, chloride poses toxicity problems for certain crops. Chloride toxicity normally occurs as the ions are uptaken with soil water, then accumulate in the leaves during transpiration. However, chloride toxicity may also occur as leaves directly absorb water during irrigation applications. When the chloride concentration in the leaves exceeds the crop's tolerance, injury symptoms develop. These symptoms include leaf burns or dying of leaf tissue.

As symptoms worsen, yield reduction may occur. Irrigation water chloride may cause yield reduction in cotton when the concentration equals or exceeds 710 ppm. Alternatively, peanut yield reduction may occur when irrigation water exceeds 450 ppm chloride. The results of Table 1 indicate that most of the wells sampled have chloride concentrations below 450 ppm. For example, each year at least 85% of the wells sampled have been in this category.

**Conductivity** is a measure of salinity, or the quantity of dissolved salts in water. The more salts are dissolved in water, the easier it conducts electrical current. Hence, a higher conductivity indicates greater dissolved salts. These salts may be introduced naturally, or from human activity. Natural occurrences include the weathering of rocks, soil and minerals such as lime and gypsum. Salts from fertilizers and oilfield brines may also affect groundwater quality.

Because the salts are dissolved, they are applied with the irrigation water and remain in the soil as water evaporates or is used by the crops. Salts present in irrigation water or the soil may reduce crop water availability such that yield is affected. Water quality publications list various crop tolerances for certain salt levels in irrigation water. For peanuts, yield reduction may occur when irrigation water conductivity is greater than or equal to 2100  $\mu\text{S}/\text{cm}$ . Each year, about one-third of the wells sampled have been greater than or equal to 2100  $\mu\text{S}/\text{cm}$ . In cotton, yield reduction may occur when irrigation water conductivity is greater than or equal to 5100  $\mu\text{S}/\text{cm}$ . Only a few of the wells sampled each year are this high.

A map illustrating the differing areas of water quality is included on the district web site at [www.spuwcd.org](http://www.spuwcd.org) under the Hydrologic Maps link. 

<b><u>Chloride (ppm)</u></b>						
	<b><u>1998</u></b>	<b><u>2001</u></b>	<b><u>2002</u></b>	<b><u>2003</u></b>	<b><u>2004</u></b>	<b><u>2005</u></b>
<b># Samples</b>	98	97	100	94	93	95
<b>&lt;450</b>	86	85	85	82	79	81
<b>≥450 &lt;710</b>	6	6	8	7	8	9
<b>≥710</b>	6	6	7	5	6	5
<b><u>Conductivity (<math>\mu\text{S}/\text{cm}</math>)</u></b>						
	<b><u>1998</u></b>	<b><u>2001</u></b>	<b><u>2002</u></b>	<b><u>2003</u></b>	<b><u>2004</u></b>	<b><u>2005</u></b>
<b># Samples</b>	98	97	100	94	93	95
<b>&lt;2100</b>	58	64	63	62	58	63
<b>≥2100 &lt; 5100</b>	36	30	33	29	32	28
<b>≥5100</b>	4	3	4	3	3	4

**Table 1**

