

June 22, 2005

Mr. Leonard Pardee
U.S. Environmental Protection Agency
– Region VI
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Union County Water Conservation Board
Water Quality Update to
5th Semi-Annual Report to EPA
Sparta Aquifer Recovery Study
UNIONCO – 31767

Dear Mr. Pardee:

On behalf of the Union County Water Conservation Board, Burns & McDonnell is submitting the water quality results from groundwater samples collected by USGS in January 2005. Reporting of these data was delayed due to unexpectedly large volume of samples being processed by the lab in early 2005. As requested, one copy of the report is provided for EPA.

Groundwater samples were analyzed for chloride, temperature, and specific conductance. Temperature and specific conductance were measured in the field. All chloride analyses were performed by the National Water Quality Laboratory in Denver, Colorado. Procedures used to obtain and analyze the samples are described in the updated Quality Assurance Project Plan (QAPP) (B&McD, December 2003).

The attached Figure 1 shows the locations of wells which are sampled twice annually for the Study. Figure 2 summarizes the analytical results for all rounds completed to date and provides a comparison not only with the Study's first four rounds of sampling but also to selected historical data. Tabulated lab results for the 5th round follow Figure 2. During the most recent sampling round, El Dorado Well No. 17 was not available for sampling due to maintenance being performed on the well.

Based on chloride and specific conductance data from the first five rounds of sampling, no significant changes in water quality appear to have occurred in the wells being monitored. The overall trend in every well, with the exception of the well at Junction City, is very flat for its entire period of record, even when considering data collected prior to the start of the Study.

Detected levels of chloride in the Junction City well increased from an observed low of 42 milligrams per liter in October 1967 to over 90 mg/L in January 2003 (when the well was sampled for the first time as part of this Study). However, its trend since January 2003 is flat, staying within a relatively narrow range of detections between 92 and 97 mg/L. This apparent stabilization of chloride levels is encouraging, especially since the trend in potentiometric head since 2000 appears to be upward. (It should be noted however that only four measurements were made during that period – see attached graph of historical water levels from USGS). The trend in potentiometric head at this location was downward from 1967 (the beginning of the period of

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record for water level measurements in this well) through 2000. It is anticipated that as water levels in the aquifer recover chloride levels in areas that previously experienced decreasing water quality will stabilize.

If you have any questions concerning this water quality update, please don't hesitate to contact me (816-822-3887, phigg@burnsmcd.com).

Sincerely,

Patrick J. Higgins
Project Manager

Enclosures

cc w/Enclosures:

Robert Reynolds – UCWCB (3 copies)
Ken Rudder – UCWCB/UCCD (1 copy)
Brian R. Clark - USGS (1 copy)
Ginger Risinger - UCCD (1 copy)

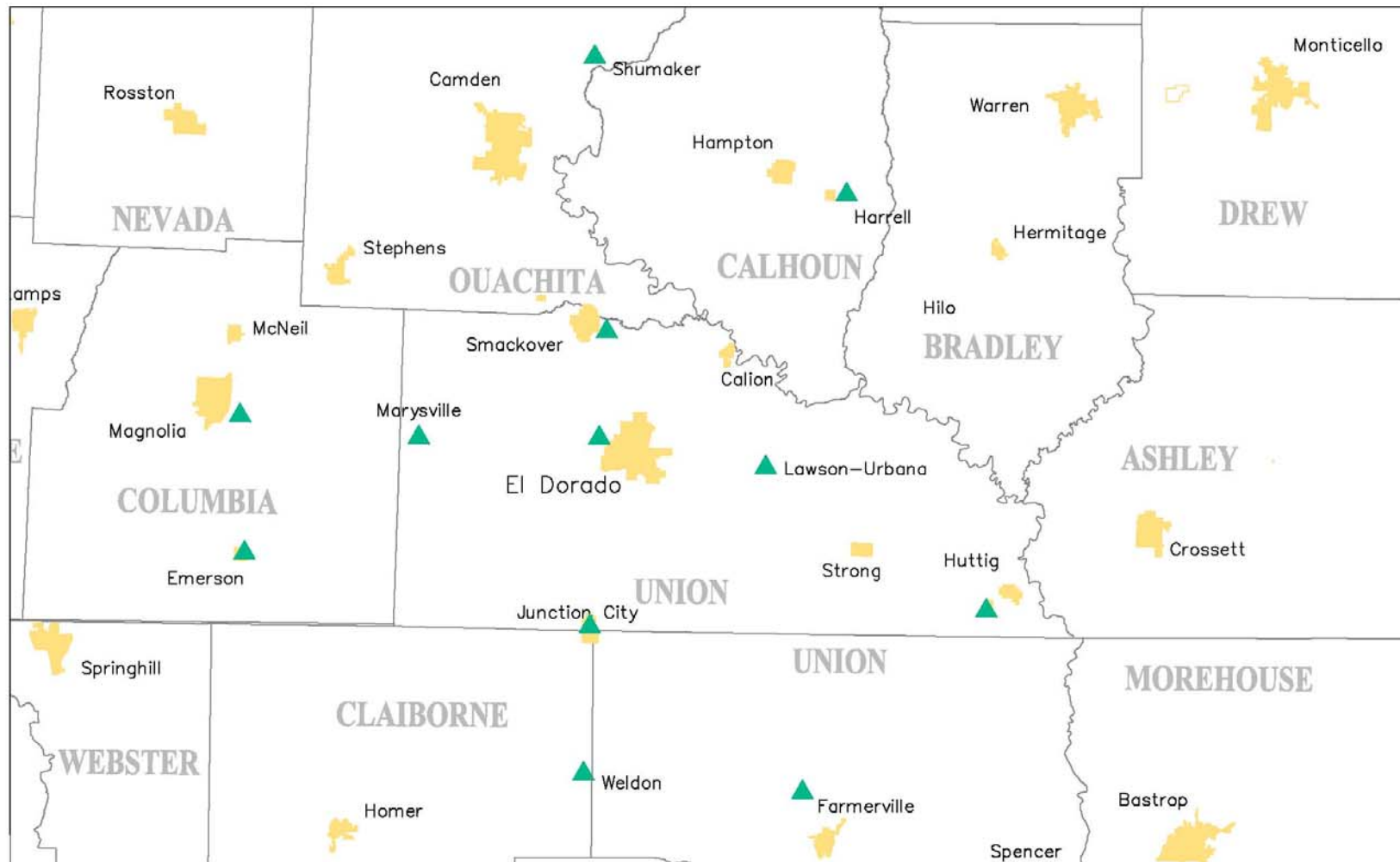
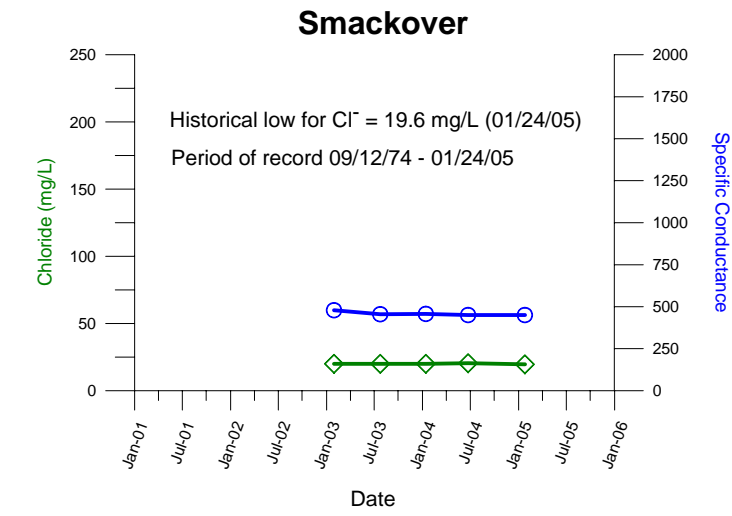
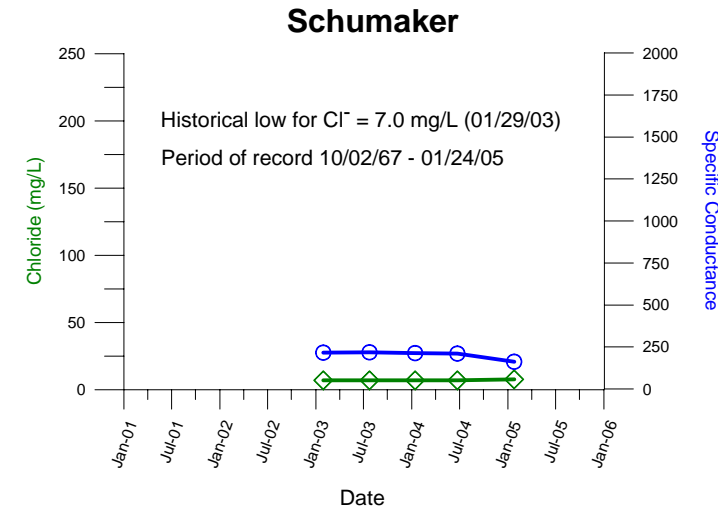
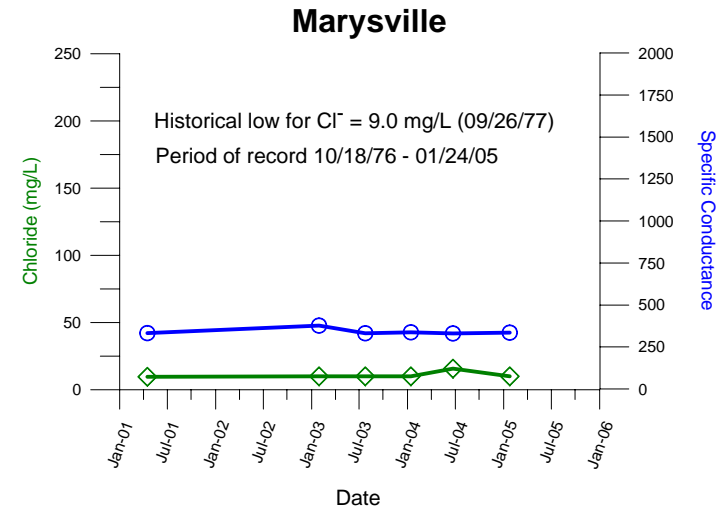
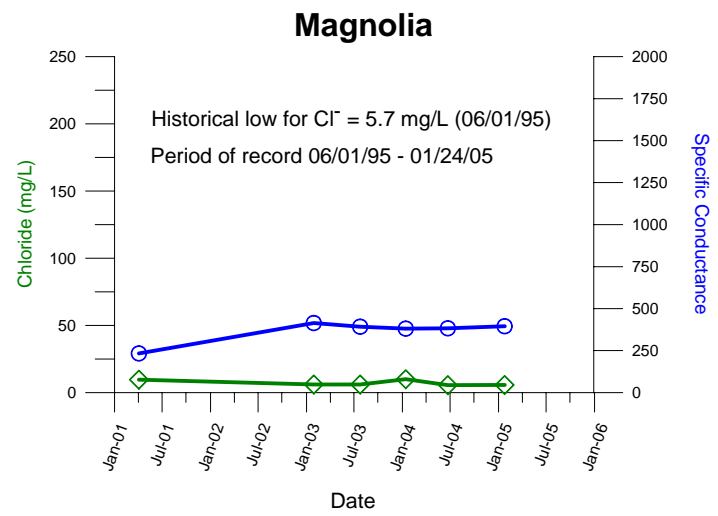
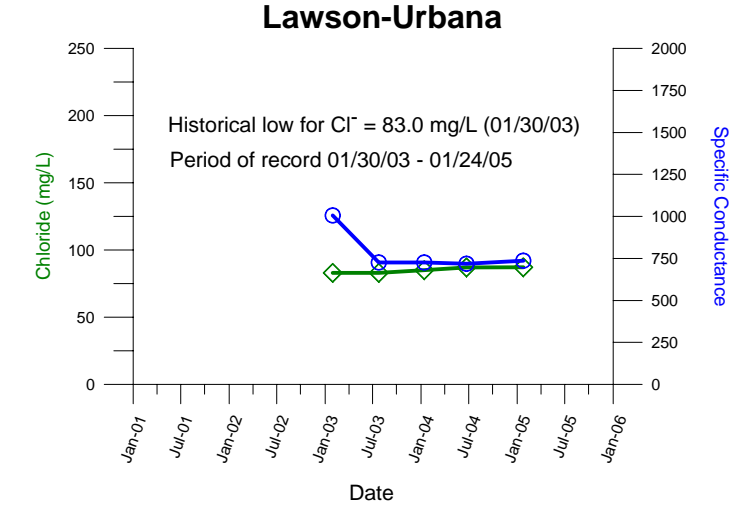
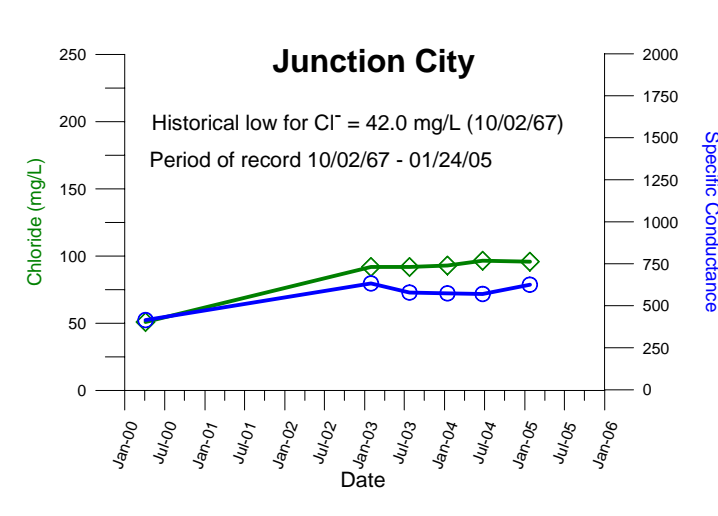
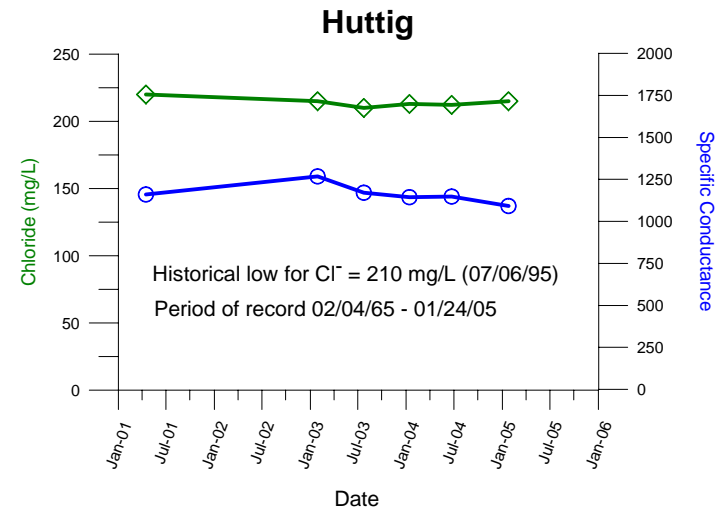
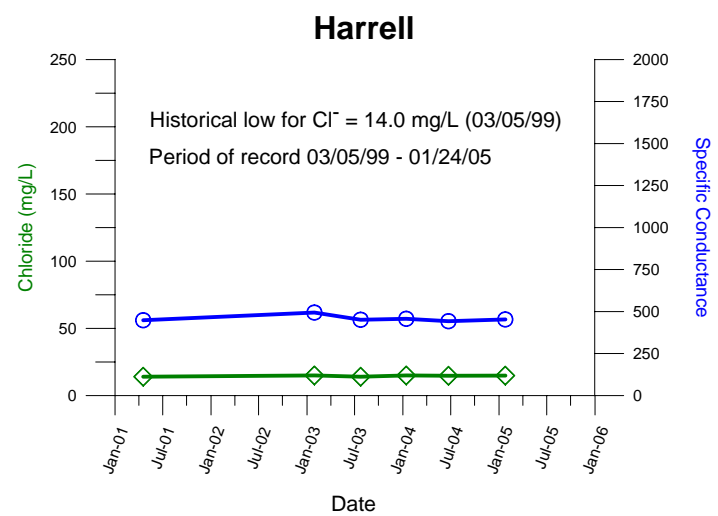
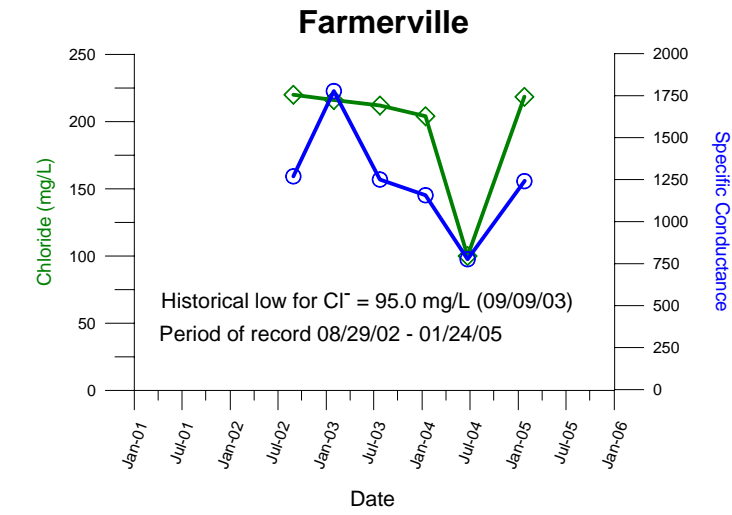
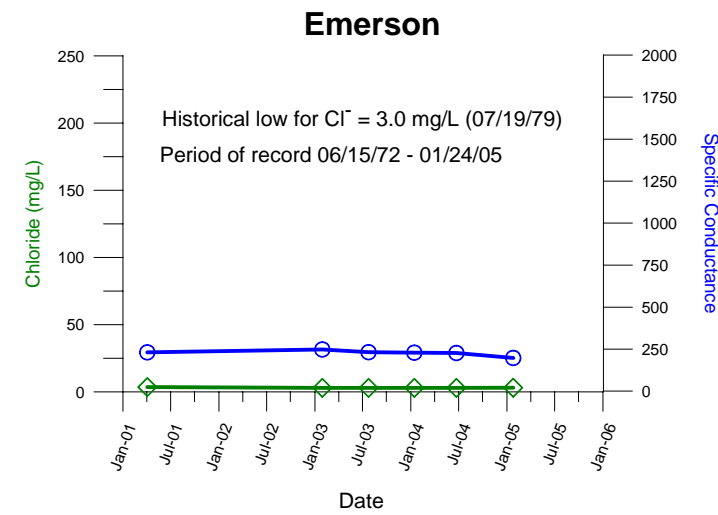
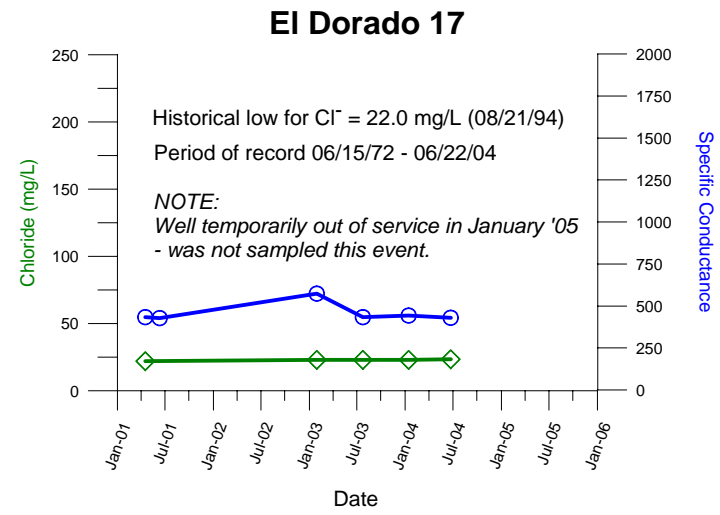
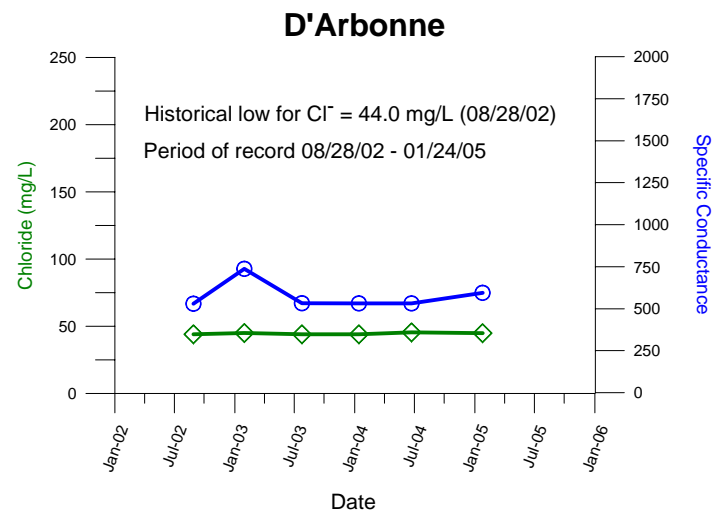


Figure 1
Groundwater Quality
Sampling Locations
Sparta Aquifer Recovery Study



LEGEND

- ◆ Chloride
- Specific Conductance



Figure 2

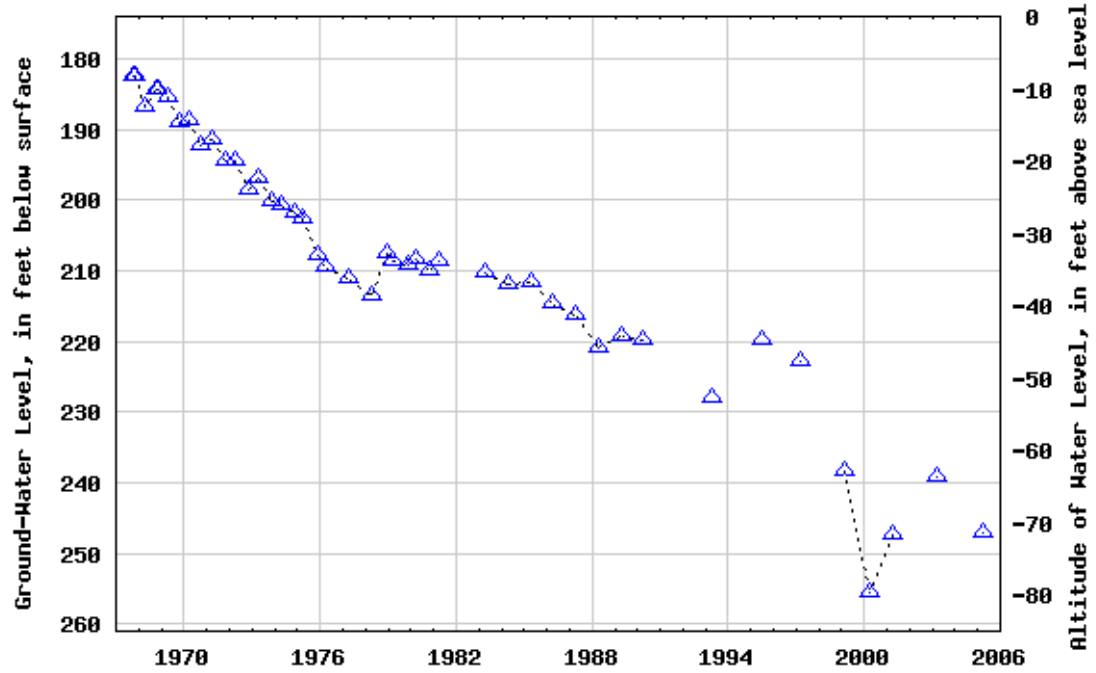
CHLORIDE AND
SPECIFIC CONDUCTANCE
IN SPARTA AQUIFER
RECOVERY STUDY WELL

	Lab ID	Station Name	Station ID	Sample Date	Sample Time	Sample Medium Code	Sample Type	Parameter Code	Result	Censored Result	Result Units	Parameter
Junction City #2	20050270061	19S 16W 35 DDC1	330107092432301	20050125	150000	6	9	90095	7.621	8	uS/cm	sp. conductance lab
Junction City #2	20050270061	19S 16W 35 DDC1	330107092432301	20050125	150000	6	9	940	0.523	0.52	mg/L	chloride-ic-low ion
Junction City #2	20050270062	19S 16W 35 DDC1	330107092432301	20050125	140000	6	9	940	95.756	95.8	mg/L	chloride, wat, fltrd
D'Arbonne #5	20050270063	CI-150	325103092434901	20050125	124000	6	9	940	44.835	44.8	mg/L	chloride, wat, fltrd
Farmerville #7	20050270064	UN-202	325004092260801	20050125	113500	6	9	940	218.47	218	mg/L	chloride, wat, fltrd
Huttig #2	20050270065	19S 11W 25 AAA1	330219092111201	20050125	101500	5	1	940	215.031	215	mg/L	chloride, wat, fltrd
Huttig #2	20050270066	19S 11W 25 AAA1	330219092111201	20050125	101000	S	1	940	215.936	216	mg/L	chloride, wat, fltrd
Huttig #2	20050270067	19S 11W 25 AAA1	330219092111201	20050125	100500	6	9	940	215.204	215	mg/L	chloride, wat, fltrd
Lawson-Urbana #2	20050270068	17S 13W 31BA1	331203092290801	20050125	85500	6	9	940	87.244	87.2	mg/L	chloride, wat, fltrd
Harrell #1	20050270069	14S 13W 12CCB1	333040092240301	20050124	162000	6	9	940	14.83	15	mg/L	chloride-ic-low ion
Magnolia #8	20050270070	17S 20W 17 CDA1	331519093115901	20050124	135000	6	9	940	5.718	5.7	mg/L	chloride-ic-low ion
Emerson #2	20050270071	19S 20W 09CAC1	330554093112801	20050124	130500	6	9	940	3.138	3.1	mg/L	chloride-ic-low ion
Marysville #1	20050270072	17S 17W 30 DCD1	331351092572701	20050124	120000	6	9	940	10.014	10	mg/L	chloride-ic-low ion
Marysville #1	20050270073	17S 17W 30 DCD1	331351092572701	20050124	120500	S	1	940	10.028	10	mg/L	chloride-ic-low ion
Marysville #1	20050270074	17S 17W 30 DCD1	331351092572701	20050124	121000	S	1	940	9.974	10	mg/L	chloride-ic-low ion
Smackover #7	20050270075	16S 16W 01 DDD1	332113092421001	20050124	112500	6	9	940	19.612	19.6	mg/L	chloride, wat, fltrd
Shumaker #4	20050270076	12S 16W 26 BA1	333944092430401	20050124	102500	6	9	940	7.667	7.67	mg/L	chloride-ic-low ion
Shumaker #4	20050270077	12S 16W 26 BA1	333944092430401	20050124	103000	S	5	940	7.653	7.65	mg/L	chloride-ic-low ion
Smackover #7	20050270078	16S 16W 01 DDD1	332113092421001	20050124	113000	S	5	940	19.579	19.6	mg/L	chloride, wat, fltrd

Historical water levels in Junction City Well



USGS 330107092432301 19S16W35DDC1



Provisional Data Subject to Revision