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OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY

BRAD HENRY
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February 13, 2008

Ursula Lennox (6SF-LL)
US EPA – Region VI
1445 Ross Avenue, Suite 1200
Dallas, TX 75202-2733

Re: Long Term Monitoring at Tar Creek, a part of After Action Monitoring

Dear Ursula:

Please find the analytical results for the ninth round of samples of the Long Term Monitoring (LTM) project at Tar Creek for the Roubidoux aquifer. The results are presented in the report attached for your review.

Please let me know if you have any comments. Thank you for your attention to this matter. If you have any questions please call me at (405) 702-5124.

Sincerely,

A handwritten signature in black ink that reads 'David A. Cates'. The signature is written in a cursive style with a long horizontal stroke at the end.

David A. Cates, P.E.
Land Protection Division

Long Term Monitoring Report (Ninth of Ten Semi-Annual Roubidoux Samples)
October 2007

Introduction:

The ninth round of samples of the Long Term Monitoring (LTM) project at Tar Creek for the Roubidoux aquifer were collected in October 2007. The analytical results are shown in Table 1. The previous results for the LTM wells are also included in the table. A map with the well locations (Figure 1) is attached along with graphs of the Picher #5 iron and sulfate concentrations over time (Figure 2), and a Piper Diagram for the water samples from the LTM wells (Figure 3).

The primary and secondary maximum contaminant levels (MCLs) are identified in the header of the table for data comparison. The tolerance limits and Roubidoux background concentrations for the indicator parameters of mine water contamination are also provided in the header and in the footnotes. The indicator parameters are: sulfate, iron, and zinc. The values for tolerance limits and Roubidoux background concentrations, respectively, are: 82 mg/l & 25 mg/l for **sulfate**; 207 ug/l & 61.5 ug/l for **iron**; and 43 ug/l & 8.8 ug/l for **zinc**. These parameters and their values were determined in Phase I of After Action Monitoring (AAM) of the Roubidoux at Tar Creek and are included in the Phase II AAM report "Summary of Roubidoux Water Quality Tests" (September, 2002).

QA/QC: Blanks, RPD, Cation-Anion Balance:

The reporting limits (detection limits) for all the parameters analyzed following the methods for metals analyses defined in the QAPP for the LTM project (EPA 200.8) are below the respective MCL values.

The Miami #1 well was back in service at the time of sampling but the nearby Miami #3 well was again substituted as the Roubidoux sample from outside the mine area for inter-well water quality comparisons. The Miami #3 well is located about 1/2 mile south of the Miami #1 well as shown on the figure. It is of similar age and completed similarly as indicated on the list of LTM wells. Historical water quality and production data is also available for the Miami #3 well.

Only one additional well was sampled this time to provide baseline data for Roubidoux background concentrations and tolerance limit calculations. This well is the Rural Water District 7 #2 well located in the NE/4 SE/4 SE/4 of Section 21-T29N-R22E about 4 miles west of the Cardin #1 well. The Miami #11 located in the NW/4 NW/4 NW/4 of Section 16-T28N-R23E, about 3 miles northeast of the Miami #1 well was not sampled this time because it was out of service due to a lightning strike. Both are relatively new wells and the construction details are included in the list of LTM wells.

Blanks were collected for all three days of sampling at three sites (Picher #6, Picher #5, & Quapaw#5) and are denoted in Table 1. The blanks for two of the three days showed no exceedances of detection limits for all parameters. However, zinc was detected at 8.8 ug/l in the blank collected at the Picher #6 well on October 22, 2007. All zinc analyses for this day (at the Picher #6 and Picher #7 wells) are flagged in Table 1. For the three duplicates taken this round of sampling, the relative percent difference (RPD) calculations showed mostly (98 of 111) less than 5 percent difference between the duplicate concentrations and the respective sample

concentrations. At the Picher #6 and Picher #5 wells a -48.65% and 157.08% difference between the sample and the duplicate were calculated for total and dissolved zinc, respectively. The 0.008 ug/l concentration value (for total zinc at the Picher #6) compares to the 0.014 ug/l concentration in the duplicate sample and the 0.042 ug/l dissolved zinc concentration at the Picher #5 compares to <0.005 ug/l concentration in its duplicate. These concentrations are so small that the relative percent difference is exaggerated and do not represent a problem. The only other RPDs greater than 10% were at the Picher #5 well: 1) for dissolved iron of 12.96% where a concentration value of 0.115 ug/l compared to 0.101 ug/l in the duplicate and 2) for dissolved sodium of 10.91% where a concentration value of 2.9 mg/l compared to 2.6 mg/l in the duplicate). These RPDs also do not indicate a problem. The cation-anion balance calculations were good (< 10 %) for all but one sample. The Fernandez well had a balance of 26.50 %. The balance is acceptable (0.39%) if hardness is used in the calculation instead of total calcium and magnesium concentrations, which indicates the reported total calcium and magnesium values may be too high. This is confirmed when the smaller dissolved calcium and magnesium values are used in the calculation.

Results:

The Commerce #5, the Quapaw #4, and the Rural Water District 4 #3 (Bluehole well) again have the best water quality, with conductivity values near 300 uS/cm, and total dissolved solids (TDS) concentrations less than 200 mg/l. The Cardin #1, Commerce #4, and Miami #3 have TDS concentrations less than 300 mg/l. The concentrations of sulfate, iron and zinc, the indicator parameters of mine water contamination, are below tolerance limits and represent background concentrations at the Commerce #5, Miami #3, Quapaw #4, and the RWD4#3 wells. The water from the Cardin #1, Commerce #4 and RWD7#2 wells were below the tolerance limits for all three indicator parameters but are representative of background for only dissolved zinc at the Commerce #4 and for both zinc and sulfate at the Cardin #1 and RWD7#2 wells. Iron was above background but below tolerance limits. Zinc at the Quapaw#4 well was again detected in the filtered sample but at concentrations near background levels.

The primary MCL for lead (15 ug/l) was not exceeded in any samples and all samples tested less than reporting limits of 5 ug/l. There were no exceedances of primary drinking water standards from any of the wells. Secondary standards were violated in the Fernandez (Fe), Picher #6 (Tot Fe), Quapaw #5 (Fe, SO₄, TDS) and RWD7#2 (Cl). The well owners will be notified of these LTM results. Two wells showed impacts by mine water: the Quapaw #5 and the Fernandez. Mine water impacts are concluded when all the indicator parameter concentrations exceed the tolerance limits. These are shown in bold type in Table 2 below.

Tests at the Quapaw #5 continue to show that the Roubidoux water from this well is of very poor quality, exceeding secondary standards for dissolved iron, total dissolved solids (TDS), and sulfate. The iron, TDS, and sulfate concentrations observed are 2,375 ug/l, 1,030 mg/l and 444 mg/l, respectively. Although it is below the MCL (10 ug/l), again an arsenic concentration of 5 ug/l was detected and a manganese concentration (31 ug/l) is below the standard of 50 ug/l. Concentrations for all three of the indicator parameters (444 mg/l; 2,375 ug/l; and 121 ug/l, respectively for sulfate, iron and zinc) are greater than tolerance limits at this well. Although the water is considered treatable (TDS < 3,000 mg/l), this well is not hooked up to the public water system due to poor water quality and low yield. In the case of the Quapaw #5 well, which is

relatively new and has casing installed to a depth of 850 feet, it is concluded that, since all three indicator parameters are exceeded, the Roubidoux aquifer is impacted by mine water near this well.

Concentrations for all three indicator parameters (111 mg/l, 526 ug/l, & 231 ug/l, respectively for sulfate, iron, and total zinc) are greater than tolerance limits at the Fernandez well. This is an old well originally installed in the 1920's at the Ontario smelter site. The previous data and the unfiltered zinc concentration for this sampling event suggest that the well itself (not the Roubidoux) is impacted by mine water probably due to inadequate or corroded casing across the Boone.

Table 2: Concentrations of Indicator Parameters in LTM Wells (October 2007).

WELL	Zinc (ug/l)		Iron (ug/l)		Sulfate (mg/l)
Background Conc.	8.8		61.5		25
Tolerance Limit	43		207		82
Secondary MCL	5,000		300		250
	Total	Dissolved	Total	Dissolved	
Cardin #1	7	<5	132	118	56.5
Commerce #4	27	<5	94	84	61.9
Commerce #5	<5	8	40	31	14.2
Fernandez	1,080	231	549	526	111
Miami #1	NS	NS	NS	NS	NS
Miami #3	<5	6	20.1	<20	14.1
Miami #11	NS	NS	NS	NS	NS
*Picher #5	<5	23.5	118	108	120.5
*Picher #6	<u>11</u>	<u>10</u>	350.5	267	170.5
Picher #7	<u><5</u>	<u><5</u>	79	71	194
Quapaw #4	<5	9.8	<20	<20	14.3
*Quapaw #5	131	121	2,790	2,375	444
RWD4 #3	<5	<5	26	<20	<10
RWD7 #1	12	7	144	81	13.4

- Note: Means are indicated by an asterisk near the well names with duplicate samples; Shaded area indicates value at or below background; A Box indicates value greater than SMCL; Bold values are above tolerance limits; Detection limit values were used in calculation of means; NS - not sampled.

The concentrations for two of the three indicator parameters observed at the Picher #6 well (iron and sulfate) exceed tolerance limits, so this well is considered impacted by mine water and probable impacts to the Roubidoux aquifer are suggested. Specifically, the iron and sulfate concentrations at the Picher #6 exceeded tolerance limits, but the zinc concentrations are near background levels, even though zinc was detected in the blank at this well. The sulfate and iron concentrations are: 170.5 mg/l and 267 ug/l, respectively. The Picher #6 continues to show improved water quality compared to the first samples collected after the well was completed in October 2000. It had been purged for about 1 week prior to collecting samples for analyses and the sulfate and iron concentrations were tested at 307 mg/l and 2,304 ug/l, respectively. The effects of long term purging prior to sampling were evaluated during the October 2004 LTM

monitoring event. Increased purging of the Picher #6 well to 4 days from 24 hours or less did not show an increase in concentrations compared to previous sampling events. The concentrations of most parameters were about the same as before with normal purging. The probable explanation for the improved iron and sulfate concentrations (compared to the initial sample) is the presence of an inflatable packer installed in the well in 2001. The packer prevents inflow of mine water into the well through the casing. During the current sampling event the packer inflation vessel (PIV), that is used to maintain pressure in the packer via the inflation line, was missing (i.e., presumably stolen). A packer seal may not be present as indicated by comparison of the pumping water level above the packer to the static water level (364 feet bgl - determined from the airline pressure of 177.6 psi compared to 255 feet bgl - determined from the airline pressure of 225 psi). This well is not hooked up to the distribution system and is not used as a public water supply well.

The iron concentration in the Picher #5 well was similar to the last sampling event and both iron and sulfate are significantly lower than previous sampling events (~3.5 years ago) as seen in Table 1 and the graph (Figure 2). The higher than normal iron concentration at the Picher #5, observed in April 2004 and the spike in 2001, were attributed to holes in the production pipe that allows some of the water to circulate out of the production pipe, down the casing, into the water column, and back into the pipe through the downhole pump. The well was taken out of service shortly after that sampling event due to low water discharge which turned out to be caused by holes in the production pipe. As a result of the frequent workovers to repair holes in the production pipe, the City replaced the iron based production pipe with stainless steel pipe (in January 2006) to reduce corrosion. This change may result in lower iron concentrations in the future samples through reduced pipe corrosion. The high iron in the water was related to production pipe corrosion and not to inflow from the Boone or impacted Roubidoux aquifer.

Concentrations greater than tolerance limits for one of the three indicator parameters were observed at the Picher #5 (sulfate = 120.5 mg/l) and the Picher #7 (sulfate = 194 mg/l). The tolerance limit for sulfate is 82 mg/l. While the iron concentrations in these wells are above Roubidoux background values, both iron and zinc concentrations are below tolerance limits of 207 and 43 ug/l, respectively. **Possible** impacts from mine water to the Roubidoux in these two wells are indicated.

The Piper diagram (Figure 3) of the April 2007 LTM water quality data shows that five wells are impacted slightly by mine water. This is graphically displayed in the lower right triangle of the diagram where the points representing the anion percentage composition of the water samples from the five wells (Quapaw #5, Picher #6, Picher #7, Picher #5 and the Fernandez well) plot midway between the mine water and Roubidoux background endpoints. The Cardin #1 and Commerce #4 well may also be slightly impacted by mine water. The RWD7 #2 well plots towards the Na and Cl apexes of the cation and anion triangles, respectively. The well is located outside the Tar Creek Superfund site by a couple of miles to the west in the direction that the Roubidoux dips. The high percentage of sodium and chloride in the Roubidoux is result of its greater depth.

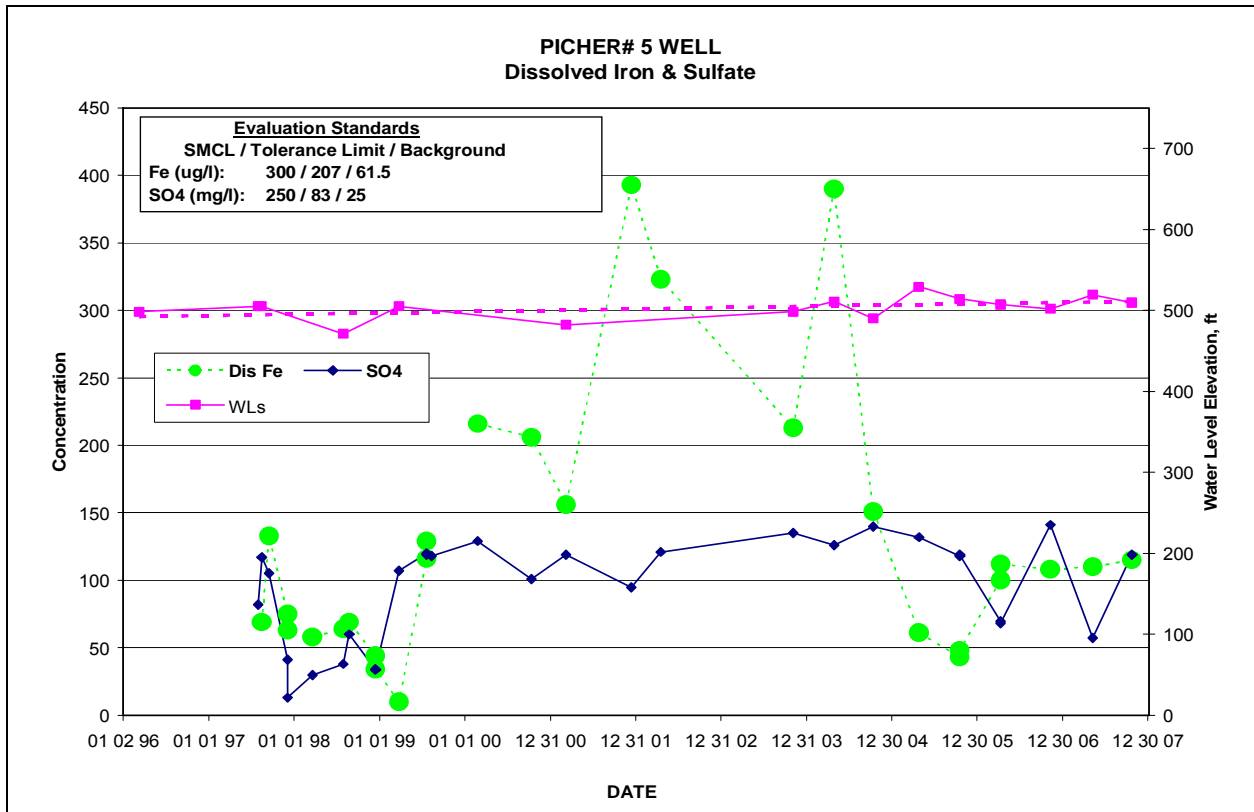


Figure 2: Picher #5 (Dissolved Iron and Sulfate Concentrations) and Roubidoux Water Levels

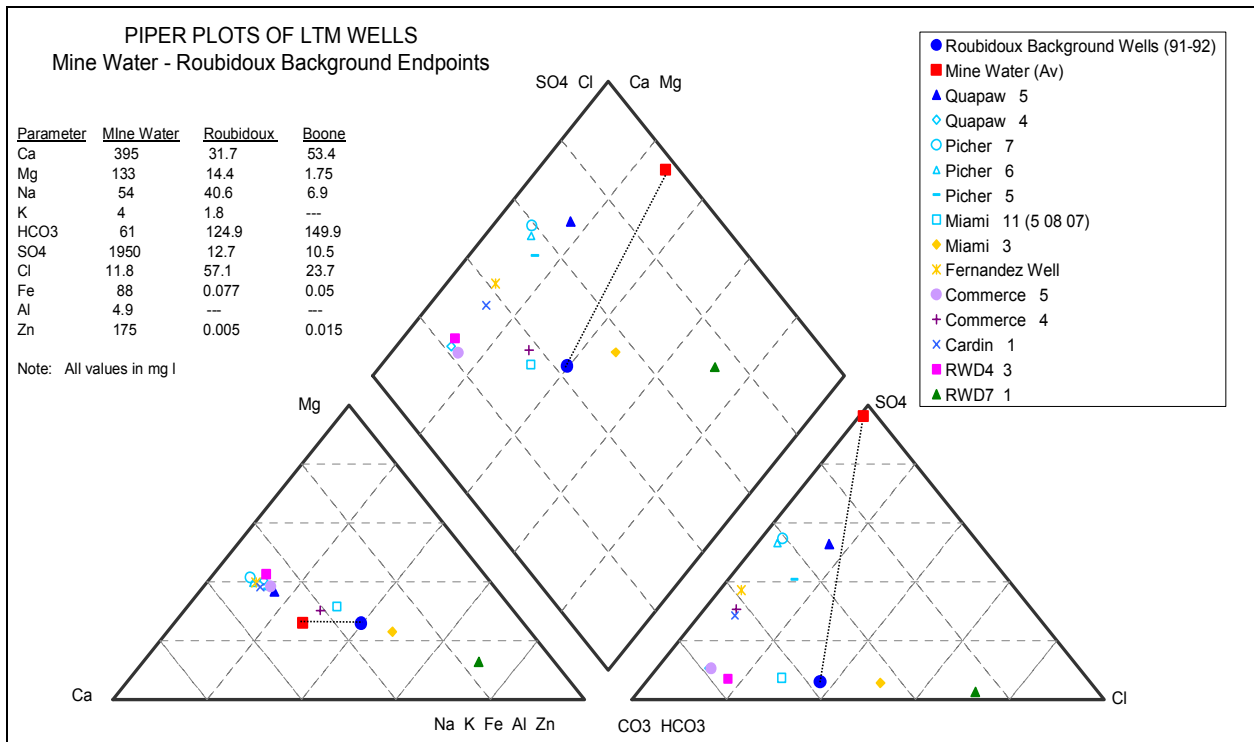


Figure 3 – Piper Diagram of Roubidoux Water Quality (LTM wells sampled in October 2007).

Water level elevations for the LTM wells are shown in Table 2 and a comparison of the elevations with those measured in previous events are shown in Table 3. The differences are variable with an overall rise in the Roubidoux water level elevation of 22 feet over the May 2007 event, most of which is at the Miami #3 well. The Roubidoux water level elevations at the Picher 5 well are plotted on Figure 2 and show a slight increasing trend over the ten years of production. The potentiometric surface map of the Roubidoux, as of April 2004, is depicted on Figure 1. It shows a large pumping center in Miami.

The following discussion concerns data obtained from the USGS web site of ‘water data’ for Oklahoma under the ‘real time’ and ‘field water-level measurements’ categories (<http://waterdata.usgs.gov/ok/nwis/gw>). The Miami well #9 shows a decline of 14 feet over a 3.5 month period from late April to mid-August 2007 which indicates increased summer time water usage. The NEO well in Miami (SWNWSE-30-T28N-R23E) showed a Roubidoux water level rise of about 100 feet in 1986 associated with the shut down of a large water user, the BFG plant. This well has records of water levels dating back to 1907 when it was artesian (28 feet above ground level). In April 2004 the depth to water was 392 feet.

Table 2: Roubidoux Water Level Elevations in LTM Wells

ID	Well Name	Loc	ID	Twn-Rng	Elev	Date	DTW	WL Elev
C1	Cardin #1	SWSESE	19	T29N-R23E	820	10/23/07	260	560
C4	Commerce #4	NWNENW	6	T28N-R23E	812	10/23/07	380	432
C5	Commerce #5	NWSENW	6	T28N-R23E	810	10/23/07	388	422
M3	Miami #3	NENW	31	T28N-R23E	783	10/23/07	428	355
M11	Miami #11	NWNWNW	16	T28N-R23E	832	5/08/07	417	415
P5	Picher #5	SESENE	29	T29N-R23E	812	10/23/07	303	509
P7	Picher #7	SWSESW	20	T29N-R23E	814	10/22/07	285	525
Q4	Quapaw #4	NWNWNW	1	T28N-R23E	845	10/24/07	434	411
Q5	Quapaw #5	SWSWNE	35	T29N-R23E	850	10/24/07	283	567
RWD4-3	RWD4 #3	NESESW	30	T29N-R24E	895	10/24/07	273	6227
RWD7-2	RWD7 #2	NESESE	21	T29N-R22E	825	10/24/07	241	584

Table 3: Previous Roubidoux Water Level Elevations

	Date	Date	Date
Well	April 2004	May 2007	October 2007
Cardin #1		551	560
Commerce #4		441	432
Commerce #5	423	426	422
Miami #3		328	355
Picher #5	511	519	509
Picher #7	513	525	525
Quapaw #4	435	413	411
Quapaw #5	525	563	567
RWD4#3	632	617	622
RWD7#2		582	584

Conclusions:

Based on analyses of water quality data obtained from the Roubidoux wells the following conclusions are made:

- The Roubidoux near the Quapaw #5 well is contaminated by mine water.
- The Fernandez well and the Picher #6 well are impacted by mine water probably through the well casings.
- The Picher #5 and the Picher #7 wells are slightly impacted by mine water with exceedances of one indicator parameter above tolerance limits.
- Within the mine area, the Commerce #5, Quapaw #4, and the RWD4 #3 wells, in addition to the Miami #3 (outside the mining area) are not affected by mine water with concentrations of indicator parameters representative of background levels. The Cardin #1 and Commerce #4 wells (within the mine area), and the RWD7 #2 well (outside the mining area) are also not impacted by mine water but show elevated concentrations of some indicator parameters above background levels.
- The Piper diagram indicates varying degrees of possible mine water impacts at the Quapaw #5, Fernandez well, Picher #5, Picher #6, Picher #7, Commerce #4, and Cardin #1 wells.
- Both increases and decreases in the Roubidoux water levels within the mining area are observed. A slight increase in Roubidoux water level is thought to best represent the overall conditions, as seen in the slight increasing trend over the last 10 years at the Picher #5 well (Figure 2).
- A large cone of depression in the Roubidoux potentiometric surface has formed at Miami from the many closely spaced wells there. This pumping center is expected to deepen and expand with time due to continued economic growth and installation of additional new wells.

Recommendations:

The long term monitoring program is scheduled to end in the April 2008 after one more sampling event. Since mine water affects are concluded at 5 of 10 wells in the mine area and the Roubidoux aquifer is impacted by mine water near at least one site, continuation of the monitoring program is recommended for another 5 years. However, it is suggested that sample collection be conducted only once annually (i.e., during the summer time when pumping of the Roubidoux water supplies is greatest).

Table 1 – Analytical Results for Tar Creek Long Term Monitoring of Roubidoux Wells

Analytical Data for Tar Creek Long Term Monitoring of Roubidoux Wells

WELL	DATE	Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l
MCL/(SMCL)								(250)	(250)	(500)					
Roub. T.L. / Back.									82/25						
Cardin #1: SW SE SE 19-T29N-R23E; N 36 58 23.3, W 94 51 07.2, EL=817; TD=1150															
10/23/07	Totals	442	19.05	7.33	0.9	132	132	11	56.5	216	189	40.7	18.6	10	2.3
	Dissolved	-	-	-	-	-	-	-	-	-	-	40.8	19	10	2.3
5/8/07	Totals	384	18.85	7.56	1.12	125	123	< 10	28.2	167	157	38.7	18.4	11.1	2.7
	Dissolved	-	-	-	-	-	-	-	-	-	-	32.2	15.6	9.1	2.3
11/8/06	Totals	634	21.79	7.2	1.32	160	147	28	156	375	293	64	29	15	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	60	28	15	3.0
4/11/06	Totals	368	18.8	7.28	5.32	111	137	13.5	78.8	238	201	43	20	11	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	43	20	11	3.0
10/17/05	Totals	487	19.2	7.8	0.9	127	144	20.8	107	308	262	60	27	13	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	69	29	13	3.0
4/25/05	Totals	510	18.3	7.56	1.58	177	144	21	111	347	260	59	27	14	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	58	26	13	3.0
10/12/04	Totals	498	18.3	7.62	1.82	199	140	20.4	107	333	250	59	27	14	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	56	26	13	3.0
4/27/04	Totals	334	19.6	7.43	3.48	150	138	14.5	93.3	319	231	50	24	12	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	50	24	12	3.0
11/6/03	Totals	595	17.6	6.47	n.a.	145	149	27.1	134	388	281	61	30	17	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	61	30	17	3.0
	Averages	472	19.1	7.36	2.06	147	139	18.5	96.9	299	236	53	24	13	2.9
Commerce #4: NW NE NW 6-T28N-R23E; N 36 56 31.9, W 94 52 21.1, EL=812; TD=1250															
10/23/07	Totals	676	18.32	7.35	2.47	131	134	< 10	61.9	219	186	42.9	19.1	18	2.6
	Dissolved	-	-	-	-	-	-	-	-	-	-	47.1	21.2	36.5	2.7
x 5/8/07	Totals	710	20.03	7.37	3.6	136	148	75.3	125	432	291	71.9	30.9	43.1	3.4
	Dissolved	-	-	-	-	-	-	-	-	-	-	68.8	29.5	41.5	3.3
11/8/06	Totals	769	20.92	7.11	4.41	162	159	48.7	161	448	307	74	28	31	4.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	66	28	30	4.0
4/11/06	Totals	412	20.1	8.41	3.54	164	161	56.5	166	437	311	70	29	36	4.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	72	30	37	4.0
10/18/05	Totals	356	19.4	7.95	0.6	117	135	< 10	66	250	189	44	19	9	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	45	20	9	3.0
4/26/05	Totals	577	19.4	7.7	1.8	n.a.	135	60.5	76	342	214	49	22	34	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	48	21	34	3.0
10/12/04	Totals	614	19	7.47	1.61	183	148	43.5	126	403	270	65	27	29	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	63	26	29	3.0
4/27/04	Totals	403	18.7	7.75	3.39	218	144	59.5	107	409	252	54	24	35	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	56	25	35	3.0
11/6/03	Totals	615	17.9	6.42	n.a.	153	150	37.9	119	383	260	61	26	28	3.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	57	25	27	3.0
	Averages	570	19.3	7.50	2.68	158	146	44.7	112.0	369	253	59	25	30	3.2
Commerce #5 MW: NW SE NW 6-T28N-R23E; N 36 56 19.4, W 94 52 17.9, EL=812; TD=1100															
10/23/07	Totals	283	18.58	7.65	0.78	109	115	11.4	14.2	149	129	27.9	13.4	8.3	1.9
	Dissolved	-	-	-	-	-	-	-	-	-	-	25	12.3	7.6	1.7
5/8/07	Totals	308	20.04	7.74	1.49	103	111	20	12.1	155	135	27.8	13.8	11.8	2.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	27.4	13.8	12	2.1
11/8/06	Totals	313	21.2	7.74	2.12	115	111	18	17.4	157	129	28	13	11	2.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	13	10	2.0
4/11/06	Totals	301	19.9	8.57	1.44	107	115	15.3	14.6	138	124	26	13	10	2.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	13	10	2.0
10/18/05	Totals	269	20.4	7.81	0.1	145	114	10.3	13.7	173	130	29	14	8	2.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	31	14	8	2.0
4/26/05	Totals	268	18.4	8.17	5.18	n.a.	115	< 10	13.9	150	121	28	13	8	2.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	13	8	2.0
10/12/04	Totals	260	17.9	8.64	5.65	152	111	< 10	13	154	124	28	13	8	2.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	13	8	2.0
4/27/04	Totals	252	18.9	7.82	5.75	158	111	< 10	11.8	158	122	25	13	8	2.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	25	13	8	2.0
* 4/27/04	Totals	252	18.9	7.82	5.75	158	111	< 10	11.8	158	123	25	13	8	2.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	13	8	2.0
11/6/03	Totals	294	17.7	7.29	n.a.	108	112	15.6	12	155	127	26	13	11	2.0
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	13	11	2.0
	Averages	280	19.2	7.93	3.14	128	113	13.1	13.5	155	126	27	13	9	2.0

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.													.043/.009	

Cardin #1:

10/23/07	< 0.002	< 0.002	< 0.002	< 0.010	0.132	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.007	-0.84
	< 0.002	< 0.002	< 0.002	< 0.010	0.118	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
5/8/07	< 0.002	< 0.002	< 0.002	< 0.010	0.096	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	9.15
	< 0.002	< 0.002	< 0.002	< 0.010	0.076	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
11/8/06	< 0.002	< 0.002	< 0.002	< 0.010	0.103	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-5.01
	< 0.002	< 0.002	< 0.002	< 0.010	0.094	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/11/06	< 0.002	< 0.002	< 0.002	< 0.010	0.140	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-4.52
	< 0.002	< 0.002	< 0.002	< 0.010	0.121	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/17/05	< 0.002	< 0.002	< 0.002	< 0.010	0.170	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	1.44
	< 0.002	< 0.002	< 0.002	< 0.010	0.156	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.006	
4/25/05	< 0.002	< 0.002	< 0.002	< 0.010	0.193	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.036	0.61
	< 0.002	< 0.002	< 0.002	< 0.010	0.152	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/12/04	< 0.002	< 0.002	< 0.002	< 0.010	0.139	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.009	2.19
	< 0.002	< 0.002	< 0.002	< 0.010	0.114	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/27/04	< 0.010	< 0.010	< 0.005	< 0.005	0.132	< 0.010	0.009	0.00005	< 0.010	< 0.010	< 0.010	0.033	-0.39
	< 0.010	< 0.010	< 0.005	< 0.005	0.112	< 0.010	0.009	< 0.00005	< 0.010	< 0.010	< 0.010	< 0.005	
11/6/03	< 0.002	< 0.002	< 0.002	< 0.010	0.101	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.022	-1.58
	< 0.002	< 0.002	< 0.002	< 0.010	0.098	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
	0.003	0.003	0.002	0.009	0.125	0.006	0.010	0.00005	0.010	0.010	0.002	0.010	0.12

Commerce #4:

10/23/07	< 0.002	< 0.002	< 0.002	< 0.010	0.094	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.027	3.56
	< 0.002	< 0.002	< 0.002	< 0.010	0.084	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
x 5/8/07	< 0.002	< 0.002	< 0.002	< 0.010	0.151	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.028	2.59
	< 0.002	< 0.002	< 0.002	< 0.010	0.129	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
11/8/06	< 0.002	< 0.002	< 0.002	< 0.010	0.106	< 0.005	0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.015	-2.96
	< 0.002	< 0.002	< 0.002	< 0.010	0.103	< 0.005	0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.009	
4/11/06	< 0.002	< 0.002	< 0.002	< 0.010	0.079	< 0.005	0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.027	-4.55
	< 0.002	< 0.002	< 0.002	< 0.010	0.079	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/18/05	< 0.002	< 0.002	< 0.002	< 0.010	0.132	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.47
	< 0.002	< 0.002	< 0.002	< 0.010	0.104	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/26/05	< 0.002	< 0.002	< 0.002	< 0.010	0.077	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.48
	< 0.002	< 0.002	< 0.002	< 0.010	0.072	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/12/04	< 0.002	< 0.002	< 0.002	< 0.010	0.090	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.03
	< 0.002	< 0.002	< 0.002	< 0.010	0.086	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/27/04	< 0.010	< 0.010	< 0.005	< 0.005	0.087	< 0.010	0.009	< 0.00005	< 0.010	< 0.010	< 0.010	< 0.005	-3.94
	< 0.010	< 0.010	< 0.005	< 0.005	0.085	< 0.010	0.010	< 0.00005	< 0.010	< 0.010	< 0.010	< 0.005	
11/6/03	< 0.002	< 0.002	< 0.002	< 0.010	0.095	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	-0.50
	< 0.002	< 0.002	< 0.002	< 0.010	0.086	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
	0.003	0.003	0.002	0.009	0.097	0.006	0.010	0.00005	0.010	0.010	0.002	0.010	-0.98

Commerce #5 MW:

10/23/07	< 0.002	< 0.002	< 0.002	< 0.010	0.040	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.18
	< 0.002	0.002	< 0.002	< 0.010	0.031	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.008	
5/8/07	< 0.002	< 0.002	< 0.002	< 0.010	0.042	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	0.87
	< 0.002	< 0.002	< 0.002	< 0.010	0.031	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
11/8/06	< 0.002	< 0.002	< 0.002	< 0.010	0.033	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.50
	< 0.002	< 0.002	< 0.002	< 0.010	0.028	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/11/06	< 0.002	< 0.002	< 0.002	< 0.010	0.038	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-3.06
	< 0.002	< 0.002	< 0.002	< 0.010	0.026	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/18/05	< 0.002	< 0.002	< 0.002	< 0.010	0.043	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	2.47
	< 0.002	< 0.002	< 0.002	< 0.010	0.023	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/26/05	< 0.002	< 0.002	< 0.002	< 0.010	0.070	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.05
	< 0.002	< 0.002	< 0.002	< 0.010	0.034	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/12/04	< 0.002	< 0.002	< 0.002	< 0.010	0.092	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	1.70
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/27/04	< 0.010	< 0.010	< 0.005	< 0.005	0.093	< 0.010	< 0.010	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	-0.53
	< 0.010	< 0.010	< 0.005	< 0.005	0.034	< 0.010	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.010	< 0.005	
* 4/27/04	< 0.010	< 0.010	< 0.005	< 0.005	0.114	< 0.010	< 0.010	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	-0.53
	< 0.010	< 0.010	< 0.005	< 0.005	0.039	< 0.010	< 0.010	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	
11/6/03	< 0.002	< 0.002	< 0.002	< 0.010	0.080	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	-0.53
	< 0.002	< 0.002	< 0.002	< 0.010	0.048	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.010	
	0.004	0.004	0.003	0.009	0.048	0.006	0.010	0.00005	0.010	0.010	0.003	0.006	-0.13

WELL	DATE	Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l	
MCL/(SMCL)								(250)	(250)	(500)						
Roub. T.L. / Back.									82/25							
Fernandez Well: SE NW NW 24-T29N-R23E; N 36 59 04.7, W 94 46 20.3, EL=852; TD=1050																
	10/23/07	Totals	997	16.23	6.92	1.21	181	181	< 10.0	111	324	273	112	52	16	4.2
		Dissolved	-	-	-	-	-	-	-	-	-	-	60	29	12	3.2
	5/7/07	Totals	951	18.38	6.81	1.75	206	216	< 10.0	285	679	522	113	54	15	3.9
		Dissolved	-	-	-	-	-	-	-	-	-	-	106	51	14	3.7
	11/8/06	Totals	378	18.8	7.3	1.06	132	126	< 10.0	57.2	206	184	41	18	6	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	36	18	6	2.0
	4/10/06	Totals	239	17.8	6.69	1.43	153	155	< 10.0	130	306	262	25	13	5	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	26	14	5	2.0
	10/17/05	Totals	404	17.1	7.59	2.5	155	151	< 10.0	125	348	274	61	29	8	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	68	30	8	2.0
	4/25/05	Totals	402	15.8	7.27	1.4	180	136	< 10.0	72.5	241	199	44	21	7	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	43	21	7	2.0
	1/28/05	Totals	756	12.1	7.03	2.63	n.a.	211	< 10.0	282	648	477	-	-	49	13.0
	10/11/04	Totals	445	15.4	7.41	2.09	128	138	< 10.0	92.4	284	219	57	27	8	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	56	26	8	2.0
	* 10/11/04	Totals	445	15.4	7.41	2.09	128	148	< 10.0	115	327	248	57	27	8	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	54	25	7	2.0
	4/29/04	Totals	427	17.3	7.5	2.27	134	128	< 10.0	56.3	233	185	43	22	7	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2.0
	* 4/29/04	Totals	427	17.3	7.5	2.27	134	144	< 10.0	103	328	236	39	20	7	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2.0
	12/19/03	Totals	415	14.8	6.64	n.a.	125	147.0	< 10.0	85.5	274	213	46	23	8	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	46	24	8	2.0
	11/4/03	Totals	252	17.1	7.83	n.a.	115	114.0	< 10.0	16.4	138	126	27	14	5	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	27	14	5	2.0
	10/6/03	Totals	257	18.3	7.08	n.a.	130	98.9	< 10.0	14.0	148	124	26	14	5	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	26	14	5	2.0
	* 10/6/03	Totals	257	18.3	7.08	n.a.	130	98.6	< 10.0	16.4	132	126	26	14	5	2.0
		Dissolved	-	-	-	-	-	-	-	-	-	-	26	14	5	2.0
	7/30/03	Dis. Met	370	18.2	8.19	n.a.	na	145.0	11.1	126.0	368	na	60	29	8	2.0
		Averages	464	16.8	7.27	1.88	145	146.1	10.1	105.5	312	245	49	24	9	2.6
Miami #1: SW NE SW 30-T28N-R23E; N 36 52 30.9, W 94 52 23.4; EL=790; TD=1233																
	4/27/04	Totals	413	19.6	8.27	3.3	120	112	78.8	12.6	265	133	29	14	47	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	28	14	45	2
	11/4/03	Totals	500	15.7	7.15	n.a.	na	117.0	83.6	12.4	262	133	30	15	50	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	30	15	50	3
	* 11/4/03	Totals	500	15.7	7.15	n.a.	na	116.0	84.5	12.5	264	135	29	14	49	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	30	15	50	3
		Averages	471	17.0	7.52	3.30	120	115	82.3	12.5	264	134	29	15	49	3
Miami #3: NE NW 31-T28N-R23E; N 36 52 10.28, W 94 52 23.82; EL=783; TD=1252																
	10/23/07	Totals	533	16.94	7.28	1.47	114	118	90.4	14.1	274	138	29.9	14.0	52.6	2.7
		Dissolved	-	-	-	-	-	-	-	-	-	-	27.9	13.4	50.6	2.7
	5/8/07	Totals	523	19.5	7.35	0.49	108	116	87.5	11.5	266	144	28.7	13.8	53.7	2.9
		Dissolved	-	-	-	-	-	-	-	-	-	-	28.6	13.9	52.1	2.8
	11/8/06	Totals	538	18.56	7.52	1.51	116	115	95.6	16.8	275	129	27	14	54	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	27	13	52	3
	4/11/06	Totals	547	20.1	8.51	2.14	155	138	94.3	15.3	256	131	28	14	57	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	29	14	57	3
	10/18/05	Totals	492	19.3	7.7	0.7	125	118	92.8	12.9	263	138	31	14	54	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	31	14	55	3
	* 10/18/05	Totals	492	19.3	7.7	0.7	125	118	91.6	13.7	258	138	32	14	54	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	34	15	54	3
	4/26/05	Totals	527	18.8	7.77	1.47	n.a.	116	96.8	14	282	131	30	14	56	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	29	14	57	3
	* 4/26/05	Totals	527	18.8	7.77	1.47	n.a.	117	97.4	15.4	283	130	29	14	56	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	29	14	56	3
	10/12/04	Totals	506	16.5	8.00	1.65	102	114	97.2	13.4	293	134	30	14	57	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	32	15	56	3
	* 10/12/04	Totals	506	16.5	8.00	1.65	102	114	95.7	13.6	291	132	28	13	54	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	30	14	56	3
		Averages	519	18.4	7.76	1.33	118	118	93.9	14.1	274	135	29.6	14	55	3.0

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL/(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.						.207/.062							.043/.009	

Fernandez Well:

10/23/07	< 0.002	< 0.002	< 0.002	< 0.010	0.549	< 0.005	0.014	< 0.00005	< 0.010	< 0.010	< 0.001	1.080	26.50
	< 0.002	< 0.002	< 0.002	< 0.010	0.526	< 0.005	0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.231	
5/7/07	< 0.002	< 0.002	< 0.002	< 0.010	0.681	< 0.005	0.012	< 0.00005	< 0.010	< 0.010	< 0.001	0.999	1.28
	< 0.002	< 0.002	< 0.002	< 0.010	0.477	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
11/8/06	< 0.002	< 0.002	< 0.002	< 0.010	0.350	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.273	-1.93
	< 0.002	< 0.002	< 0.002	< 0.010	0.334	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.039	
4/10/06	< 0.002	< 0.002	< 0.002	< 0.010	0.302	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.090	-40.36
	< 0.002	< 0.002	< 0.002	< 0.010	0.277	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/17/05	< 0.002	< 0.002	< 0.002	< 0.010	0.393	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.251	-0.61
	< 0.002	< 0.002	< 0.002	< 0.010	0.391	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.140	
4/25/05	< 0.002	< 0.002	< 0.002	< 0.010	0.630	< 0.005	0.011	< 0.00005	< 0.010	< 0.010	< 0.001	0.689	-2.61
	< 0.002	< 0.002	< 0.002	< 0.010	0.526	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.321	
1/28/05	na	na	< 0.002	< 0.005	0.512	< 0.005	0.013	na	na	na	na	1.200	na
10/11/04	< 0.002	< 0.002	< 0.002	< 0.010	0.349	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.244	4.82
	< 0.002	< 0.002	< 0.002	< 0.010	0.343	0.015	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.148	
* 10/11/04	< 0.002	< 0.002	< 0.002	< 0.010	0.358	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.251	-1.52
	< 0.002	< 0.002	< 0.002	< 0.010	0.318	0.021	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.169	
4/29/04	< 0.010	< 0.010	< 0.005	< 0.005	0.359	< 0.010	0.006	< 0.00005	< 0.010	< 0.010	< 0.001	0.299	3.60
	< 0.010	< 0.010	< 0.005	< 0.005	0.238	0.012	< 0.005	< 0.00005	< 0.010	< 0.010	< 0.001	0.089	
* 4/29/04	< 0.010	< 0.010	< 0.005	< 0.005	0.359	< 0.010	0.006	< 0.00005	< 0.010	< 0.010	< 0.001	0.228	-14.66
	< 0.010	< 0.010	< 0.005	< 0.005	0.249	< 0.010	< 0.005	< 0.00005	< 0.010	< 0.010	< 0.001	0.037	
12/19/03	< 0.002	< 0.002	< 0.002	< 0.010	0.319	0.026	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.236	-4.30
	< 0.002	< 0.002	< 0.002	< 0.010	0.464	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.464	
11/4/03	< 0.002	< 0.002	< 0.002	< 0.010	0.316	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.083	-2.35
	< 0.002	< 0.002	< 0.002	< 0.010	0.246	0.013	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.070	
10/6/03	< 0.002	< 0.002	< 0.002	< 0.010	0.208	0.017	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.050	3.20
	< 0.002	< 0.002	< 0.002	< 0.010	0.288	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.067	
* 10/6/03	< 0.002	< 0.002	< 0.002	< 0.010	0.287	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.065	2.34
	< 0.002	< 0.002	< 0.002	< 0.010	0.224	0.008	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.033	
7/30/03	na	na	na	na	0.410	0.056	< 0.010	na	< 0.010	na	na	0.239	-0.46
	0.003	0.003	0.002	0.009	0.376	0.010	0.010	0.00005	0.010	0.010	0.002	0.270	-1.80

Miami #1:

4/27/04	< 0.010	< 0.010	< 0.005	< 0.005	1.130	< 0.010	0.012	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	-0.03
	< 0.010	< 0.010	< 0.005	< 0.005	0.042	< 0.010	< 0.005	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	
11/4/03	< 0.002	< 0.002	< 0.002	< 0.010	0.372	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.010	0.29
	< 0.002	< 0.002	< 0.002	< 0.010	0.062	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
* 11/4/03	< 0.002	< 0.002	< 0.002	< 0.010	0.057	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	-1.58
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
	0.005	0.005	0.003	0.008	0.281	0.007	0.010	0.0001	0.010	0.010	0.004	0.008	-0.44

Miami #3:

10/23/07	< 0.002	< 0.002	< 0.002	< 0.010	0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.96
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.006	
5/8/07	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.48
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
11/8/06	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-4.08
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/11/06	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-5.82
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/18/05	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.15
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
* 10/18/05	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.50
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/26/05	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.70
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
* 4/26/05	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-2.80
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/12/04	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.89
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
* 10/12/04	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-3.62
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
	0.002	0.002	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.001	0.005	-2.30

WELL	DATE	Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l	
MCL/(SMCL)								(250)	(250)	(500)						
Roub. T.L. / Back.									82/25							
Miami #11:		NW NW NW 16-T28N-R23E; N 36 54 46.6, W 94 50 24.0; EL=830 (topo); TD=1110														
	5/8/07	Totals	345	19.1	7.73	1.30	104	108.0	33.2	11.8	168	128	24.9	13.0	24.2	1.60
		Dissolved	-	-	-	-	-	-	-	-	-	-	24.7	12.9	23.5	1.60
*	5/8/07	Totals	345	19.1	7.73	1.30	104	109.0	34.4	11.4	171	127	25.2	13.0	24.3	1.60
		Dissolved	-	-	-	-	-	-	-	-	-	-	25.1	13.0	23.2	1.60
x	11/8/06	Totals	353	19.4	7.74	1.24	111	108.0	35.9	15.6	178	117	22	12	22	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	22	12	22	2
*	11/8/06	Totals	353	19.4	7.74	1.24	275	109.0	35.1	15.5	183	115	23	12	23	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	23	12	23	2
		Averages	349	19.3	7.74	1.27	149	109	34.7	13.6	175	122	24	12	23	2
Picher #5-MW:		SE SE NE 29-T29N-R23E; N 36 57 55.6, W 94 49 54.7; GL(topo)=815; TD=1100.														
x	10/23/07	Totals	605	19.25	7.17	2.5	137	136	30	119	332	265	57.4	26.5	17.9	2.9
		Dissolved	-	-	-	-	-	-	-	-	-	-	58.2	27.3	17.5	2.9
*	10/23/07	Totals	605	19.25	7.17	2.5	137	136	28.9	122	356	268	57.9	26.8	17.6	2.9
		Dissolved	-	-	-	-	-	-	-	-	-	-	53.2	25	16.4	2.6
	5/8/07	Totals	442	20.03	7.59	1.56	119	121	38.9	57.2	256	194	40.9	20.1	25.8	2.8
		Dissolved	-	-	-	-	-	-	-	-	-	-	37.4	18.7	23.5	2.9
	11/8/06	Totals	635	21.46	7.23	0.88	139	137	27.4	141	373	282	64	28	17	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	58	27	17	3
	4/11/06	Totals	483	23.9	8.51	2.68	157	127	34.4	68.3	243	189	39	19	21	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	41	20	21	3
*	4/11/06	Totals	483	23.9	8.51	2.68	157	126	34.4	69.8	245	189	40	20	21	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	42	20	21	3
	10/17/05	Totals	544	21.8	7.81	0.3	124	135	27.1	119	332	264	60	27	18	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	71	30	18	3
*	10/17/05	Totals	544	21.8	7.81	0.3	124	135	28.3	118	307	265	61	27	18	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	73	30	18	3
	4/25/05	Totals	581	18.5	7.56	2.91	132	138	25.4	132	373	273	61	28	17	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	62	28	17	3
	10/12/04	Totals	569	18.3	7.68	2.33	122	136	26.4	140	398	279	63	29	17	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	62	28	17	3
	4/27/04	Totals	536	20.7	7.33	3.19	142	134	28.3	126	384	253	55	26	19	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	55	27	18	3
	11/5/03	Totals	590	14	6.52	n.a.	na	140	25.6	135	381	278	61	29	18	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	59	28	18	3
		Averages	551	20.2	7.57	1.98	135	133	29.6	112.3	332	250	56	26	19	3
Picher #6 MW:		SE NW NW 21-T29N-R23E; N 36 59 00.7, W 94 49 38.7, EL=824 Topo; TD=1100														
x	10/22/07	Totals	619	16.4	7.25	4.05	143	147	10.2	171	387	312	68.9	31.9	13.5	2.3
		Dissolved	-	-	-	-	-	-	-	-	-	-	66.7	31.8	13.5	2.3
*	10/22/07	Totals	619	16.4	7.25	4.05	143	147	10.2	170	406	310	68.4	31.9	13.4	2.3
		Dissolved	-	-	-	-	-	-	-	-	-	-	66.5	31.5	13.4	2.3
x	5/7/07	Totals	616	20.06	7.22	1.97	138	139	< 10	177	375	286	63.6	30.8	13.7	2.4
		Dissolved	-	-	-	-	-	-	-	-	-	-	63.7	30.8	14	2.4
*	5/7/07	Totals	616	20.06	7.22	1.97	138	139	< 10	175	381	290	64	30.9	13.6	2.3
		Dissolved	-	-	-	-	-	-	-	-	-	-	63.4	30.4	13.8	2.3
	11/7/06	Totals	602	21.4	6.94	4.17	141	136	< 10	144	339	273	56	27	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	55	27	12	2
	4/10/06	Totals	511	20.3	8.11	2.62	134	139	10	142	315	258	56	26	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	59	27	13	2
*	4/10/06	Totals	511	20.3	8.11	2.62	134	138	10	143	316	258	54	25	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	57	26	13	2
	10/27/05	Totals	453	17.8	7.73	3.79	125	136	10	125	313	249	58	26	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	59	26	12	2
*	10/27/05	Totals	453	17.8	7.73	3.79	125	137	10	125	307	251	63	27	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	59	26	12	2
	4/25/05	Totals	510	18.6	7.77	3.24	n.a.	135	< 10	125	333	251	60	26	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	58	26	12	2

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL/(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.						.207/.062							.043/.009	

Miami #11:

5/8/07	< 0.002	< 0.002	< 0.002	< 0.010	0.065	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	0.98
	< 0.002	< 0.002	< 0.002	< 0.010	0.035	< 0.005	< 0.010	< 0.00015	< 0.010	< 0.010	< 0.001	< 0.005	
* 5/8/07	< 0.002	< 0.002	< 0.002	< 0.010	0.055	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	0.58
	< 0.002	< 0.002	< 0.002	< 0.010	0.026	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
x 11/8/06	< 0.002	< 0.002	< 0.002	< 0.010	0.081	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-6.10
	< 0.002	< 0.002	< 0.002	< 0.010	0.058	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
* 11/8/06	< 0.002	< 0.002	< 0.002	< 0.010	0.080	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-4.55
	< 0.002	< 0.002	< 0.002	< 0.010	0.050	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
	0.002	0.002	0.002	0.010	0.056	0.005	0.010	0.00006	0.010	0.010	0.001	0.005	-2.27

Picher #5-MW:

x 10/23/07	< 0.002	< 0.002	< 0.002	< 0.010	0.118	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.20
	< 0.002	< 0.002	< 0.002	< 0.010	0.115	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.042	
* 10/23/07	< 0.002	< 0.002	< 0.002	< 0.010	0.118	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.15
	< 0.002	< 0.002	< 0.002	< 0.010	0.101	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
5/8/07	< 0.002	< 0.002	< 0.002	< 0.010	0.116	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	1.91
	< 0.002	< 0.002	< 0.002	< 0.010	0.110	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
11/8/06	< 0.002	< 0.002	< 0.002	< 0.010	0.118	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.03
	< 0.002	< 0.002	< 0.002	< 0.010	0.108	< 0.005	< 0.010	< 0.00015	< 0.010	< 0.010	< 0.001	< 0.005	
4/11/06	< 0.002	< 0.002	< 0.002	< 0.010	0.629	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-4.56
	< 0.002	< 0.002	< 0.002	< 0.010	0.112	< 0.005	< 0.010	< 0.00015	< 0.010	< 0.010	< 0.001	< 0.005	
* 4/11/06	< 0.002	< 0.002	< 0.002	< 0.010	0.227	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-3.23
	< 0.002	< 0.002	< 0.002	< 0.010	0.100	< 0.005	< 0.010	< 0.00015	< 0.010	< 0.010	< 0.001	< 0.005	
10/17/05	< 0.002	< 0.002	< 0.002	< 0.010	0.098	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	1.13
	< 0.002	< 0.002	< 0.002	< 0.010	0.046	< 0.005	< 0.010	0.00015	< 0.010	< 0.010	< 0.001	< 0.005	
* 10/17/05	< 0.002	< 0.002	< 0.002	< 0.010	0.107	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	1.43
	< 0.002	< 0.002	< 0.002	< 0.010	0.043	< 0.005	< 0.010	0.00010	< 0.010	< 0.010	< 0.001	0.009	
4/25/05	< 0.002	< 0.002	< 0.002	< 0.010	0.093	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.47
	< 0.002	< 0.002	< 0.002	< 0.010	0.061	< 0.005	< 0.010	0.00011	< 0.010	< 0.010	< 0.001	< 0.005	
10/12/04	< 0.002	< 0.002	< 0.002	< 0.010	0.171	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.24
	< 0.002	< 0.002	< 0.002	< 0.010	0.151	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/27/04	< 0.010	< 0.010	< 0.005	< 0.005	0.433	< 0.010	0.007	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	-2.62
	< 0.010	< 0.010	< 0.005	< 0.005	0.390	< 0.010	0.007	0.00008	< 0.010	< 0.010	< 0.010	< 0.005	
11/5/03	< 0.002	< 0.002	< 0.002	< 0.010	0.232	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.32
	< 0.002	< 0.002	< 0.002	< 0.010	0.213	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
	0.003	0.003	0.002	0.010	0.167	0.005	0.010	0.00007	0.010	0.010	0.002	0.007	-0.86

Picher #6 MW:

x 10/22/07	< 0.002	< 0.002	< 0.002	< 0.010	0.351	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.008	-0.56
	< 0.002	< 0.002	< 0.002	< 0.010	0.275	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.009	
* 10/22/07	< 0.002	< 0.002	< 0.002	< 0.010	0.350	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.014	-0.63
	< 0.002	< 0.002	< 0.002	< 0.010	0.259	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.011	
x 5/7/07	< 0.002	< 0.002	< 0.002	< 0.010	0.325	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-2.89
	< 0.002	< 0.002	< 0.002	< 0.010	0.302	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
* 5/7/07	< 0.002	< 0.002	< 0.002	< 0.010	0.327	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-2.41
	< 0.002	< 0.002	< 0.002	< 0.010	0.307	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
11/7/06	< 0.002	< 0.002	< 0.002	< 0.010	0.302	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.008	-3.52
	< 0.002	< 0.002	< 0.002	< 0.010	0.274	< 0.005	< 0.010	0.00005	< 0.010	< 0.010	< 0.001	0.008	
4/10/06	< 0.002	< 0.002	< 0.002	< 0.010	0.309	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-4.02
	< 0.002	< 0.002	< 0.002	< 0.010	0.284	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
* 4/10/06	< 0.002	< 0.002	< 0.002	< 0.010	0.301	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-5.69
	< 0.002	< 0.002	< 0.002	< 0.010	0.222	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/27/05	< 0.002	0.002	< 0.002	< 0.010	0.296	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	0.04
	< 0.002	0.002	< 0.002	< 0.010	0.238	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
* 10/27/05	< 0.002	0.002	< 0.002	< 0.010	0.298	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.006	2.74
	< 0.002	< 0.002	< 0.002	< 0.010	0.282	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.006	
4/25/05	< 0.002	0.002	< 0.002	< 0.010	0.345	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.006	1.11
	< 0.002	0.002	< 0.002	< 0.010	0.341	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.007	

WELL	DATE	Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l	
MCL/(SMCL)								(250)	(250)	(500)						
Roub. T.L. / Back.																
*	4/25/05	Totals	510	18.6	7.77	3.24	n.a.	134	< 10	126	336	251	61	26	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	56	25	12	2	
	10/11/04	Totals	553	19.1	7.44	2.06	193	147	< 10	170	417	303	71	30	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	71	30	13	2	
	4/27/04	Totals	555	20.9	7.26	4.92	157	143	< 10	156	407	293	63	29	14	2
		Dissolved	-	-	-	-	-	-	-	-	-	62	29	13	2	
	12/9/03	Totals	537	18.2	6.83	n.a.	135	143	< 10	150	380	280	65	29	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	60	27	12	2	
*	12/9/03	Totals	537	18.2	6.83	n.a.	135	142	< 10	150	381	277	64	29	13	2
		Dissolved	-	-	-	-	-	-	-	-	-	61	27	12	2	
		Averages	547	18.9	7.43	3.27	142	140	10.0	149.9	360	276	62	28	13	2

Picher #7 MW: aka: PICHER - CARDIN MW; NW SE SW 20-T29N-R23E; N 36 58 28.2, W 94 50 38.3, EL=815; TD=1100

	10/22/07	Totals	700	16.05	7.3	1.38	151	155	12	194	447	347	73.4	35.8	11.7	2.8
		Dissolved	-	-	-	-	-	-	-	-	-	-	68.5	34.4	11.3	2.8
	5/8/07	Totals	647	19.65	7.41	1.14	148	146	11.8	198	405	307	67.5	34.3	12.2	2.9
		Dissolved	-	-	-	-	-	-	-	-	-	-	66.9	34.5	11.9	2.8
	11/7/06	Totals	652	19.81	7.04	2.04	153	146	12.3	175	397	329	65	33	12	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	60	31	11	3
	4/11/06	Totals	482	19.6	8.2	1.43	117	129	17.5	103	257	216	44	23	13	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	47	23	13	3
	10/17/05	Totals	527	20.4	7.82	0.2	179	142	11.4	137	326	280	62	30	11	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	72	32	11	3
	4/25/05	Totals	524	18.3	7.71	1.87	174	140	10.1	125	341	261	59	28	11	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	56	28	11	3
	10/12/04	Totals	483	17.9	7.83	1.31	129	136	13.5	112	306	244	54	26	12	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	55	27	12	3
	4/27/04	Totals	480	20.2	7.5	4.35	105	134	12.6	112	335	237	51	26	12	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	49	26	12	3
	11/5/03	Totals	563	14.7	6.89	n.a.	na	145	< 10	141	374	284	60	31	12	3
		Dissolved	-	-	-	-	-	-	-	-	-	-	59	31	12	3
		Averages	562	18.5	7.52	1.72	145	141	12.4	144.1	354	278	59	30	12	3

Quapaw #4: NW NW NW 1-T28N-R23E; N 36 56 33.4, W 94 47 11.2, EL(Topo)=845; TD=1350

	10/24/07	Totals	280	17.87	7.4	1.46	109	113	10.8	14.3	137	127	27.1	13.7	6.7	1.50
		Dissolved	-	-	-	-	-	-	-	-	-	-	23.4	12.0	5.8	1.30
	5/9/07	Totals	287	19.85	7.28	1.12	104	107	13.4	12.6	145	132	26.2	13.7	9.0	1.70
		Dissolved	-	-	-	-	-	-	-	-	-	-	26.6	13.4	8.6	1.60
	11/9/06	Totals	276	19.12	7.39	0.52	118	112	18.6	20	160	134	29	14	12	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	27	13	11	2
	4/12/06	Totals	270	18.8	8.53	1.03	92	109	< 10	15.2	118	118	24	13	5	1
		Dissolved	-	-	-	-	-	-	-	-	-	-	25	13	5	1
	10/18/05	Totals	258	19.9	7.96	1.58	96	115	18.6	16.4	184	136	30	14	11	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	30	14	11	2
	4/26/05	Totals	261	16.8	8.04	1.57	n.a.	109	< 10	13.5	138	119	26	13	6	1
		Dissolved	-	-	-	-	-	-	-	-	-	-	25	13	6	1
	10/13/04	Totals	242	17.4	7.86	1.43	124	104	< 10	12.7	149	121	27	14	5	1
		Dissolved	-	-	-	-	-	-	-	-	-	-	27	13	5	1
*	10/13/04	Totals	242	17.4	7.86	1.43	124	104	< 10	12.8	147	121	27	13	5	1
		Dissolved	-	-	-	-	-	-	-	-	-	-	27	14	5	1
	4/28/04	Totals	275	19.4	7.31	2.29	146	107	< 10	11.8	152	122	25	13	8	2
		Dissolved	-	-	-	-	-	-	-	-	-	-	24	13	7	2
	11/6/03	Totals	249	17.7	7.03	n.a.	107	109	< 10	11.1	129	120	25	13	5	1
		Dissolved	-	-	-	-	-	-	-	-	-	-	24	13	5	1
*	11/6/03	Totals	249	17.7	7.03	n.a.	107	109	< 10	11.1	131	121	24	13	5	1
		Dissolved	-	-	-	-	-	-	-	-	-	-	25	13	5	1
		Averages	263	18.4	7.61	1.38	113	109	11.9	13.8	145	125	26	13	7	1

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL/(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.						.207/.062							.043/.009	
* 4/25/05	< 0.002	0.002	< 0.002	< 0.010	0.338	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.006	1.53	
	< 0.002	0.002	< 0.002	< 0.010	0.331	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.006		
10/11/04	< 0.002	0.002	< 0.002	< 0.010	0.531	< 0.005	0.012	< 0.00005	< 0.010	< 0.010	< 0.001	0.021	-0.97	
	< 0.002	0.002	< 0.002	< 0.010	0.507	< 0.005	0.012	< 0.00005	< 0.010	< 0.010	< 0.001	0.020		
4/27/04	< 0.010	< 0.010	< 0.005	< 0.005	0.444	< 0.010	0.011	0.00005	< 0.010	< 0.010	< 0.010	0.015	-1.57	
	< 0.010	< 0.010	< 0.005	< 0.005	0.414	< 0.010	0.011	0.00005	< 0.010	< 0.010	< 0.010	0.019		
12/9/03	< 0.002	0.002	< 0.002	< 0.010	0.464	< 0.005	0.013	< 0.00005	< 0.010	< 0.010	< 0.001	0.016	-0.13	
	< 0.002	0.002	< 0.002	< 0.010	0.337	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.015		
* 12/9/03	< 0.002	0.002	< 0.002	< 0.010	0.460	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.014	-0.37	
	< 0.002	0.002	< 0.002	< 0.010	0.337	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.016		
	0.003	0.003	0.002	0.010	0.338	0.005	0.010	0.00005	0.010	0.010	0.002	0.009	-1.16	

Picher #7 MW:

10/22/07	< 0.002	< 0.002	< 0.002	< 0.010	0.079	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.95
	< 0.002	< 0.002	< 0.002	< 0.010	0.071	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
5/8/07	< 0.002	< 0.002	< 0.002	< 0.010	0.079	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-4.07
	< 0.002	< 0.002	< 0.002	< 0.010	0.075	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
11/7/06	< 0.002	< 0.002	< 0.002	< 0.010	0.124	< 0.005	0.006	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-2.60
	< 0.002	< 0.002	< 0.002	< 0.010	0.113	< 0.005	0.006	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/11/06	< 0.002	< 0.002	< 0.002	< 0.010	0.079	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-4.88
	< 0.002	< 0.002	< 0.002	< 0.010	0.065	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/17/05	< 0.002	< 0.002	< 0.002	< 0.010	0.064	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	0.88
	< 0.002	< 0.002	< 0.002	< 0.010	0.062	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/25/05	< 0.002	< 0.002	< 0.002	< 0.010	0.090	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	1.03
	< 0.002	< 0.002	< 0.002	< 0.010	0.090	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/12/04	< 0.002	< 0.002	< 0.002	< 0.010	0.127	< 0.005	< 0.010	0.00005	< 0.010	< 0.010	< 0.001	< 0.005	0.03
	< 0.002	< 0.002	< 0.002	< 0.010	0.121	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/27/04	< 0.010	< 0.010	< 0.005	< 0.005	0.078	< 0.010	0.005	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	-0.76
	< 0.010	< 0.010	< 0.005	< 0.005	0.072	< 0.010	< 0.005	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	
11/5/03	< 0.002	< 0.002	< 0.002	< 0.010	0.166	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	0.24
	< 0.002	< 0.002	< 0.002	< 0.010	0.160	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
	0.003	0.003	0.002	0.009	0.095	0.006	0.009	0.00005	0.010	0.010	0.002	0.006	-1.34

Quapaw #4:

10/24/07	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.89
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.010	
5/9/07	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.043	1.62
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.041	
11/9/06	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.10
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/12/06	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-5.03
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/18/05	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	0.23
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/26/05	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.62
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
10/13/04	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	2.20
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.005	
* 10/13/04	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	0.64
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
4/28/04	< 0.010	< 0.010	< 0.005	< 0.005	< 0.020	< 0.010	< 0.005	0.00005	< 0.010	< 0.010	< 0.010	0.005	0.94
	< 0.010	< 0.010	< 0.005	< 0.005	< 0.020	< 0.010	< 0.005	< 0.00005	< 0.010	< 0.010	< 0.010	< 0.005	
11/6/03	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	-2.49
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
* 11/6/03	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	-3.47
	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
	0.003	0.003	0.002	0.010	0.020	0.005	0.010	0.00005	0.010	0.010	0.002	0.009	-0.72

WELL DATE	Cond. (Field) uS/cm	Temp. (Field) °C	pH (Field)	D.O. (Field) mg/l	Alk (Field) CaCO ₃ mg/l	Alkalinity CaCO ₃ mg/l	Chloride Cl mg/l	Sulfate SO ₄ mg/l	Tot Dis Sol TDS mg/l	Hardness CaCO ₃ mg/l	Calcium Ca mg/l	Magnesium Mg mg/l	Sodium Na mg/l	Potassium K mg/l	
MCL/(SMCL)							(250)	(250)	(500)						
Roub. T.L. / Back.								82/25							
Quapaw #5 MW: SW SW NE 35-T29N-R23E; N 36 57 04.4, W 94 47 07.3, EL=850 Topo; TD=1100															
x 10/24/2007	Totals	1503	17.23	6.8	5.94	279	268	95.4	429	1040	703	158	73.5	53	8.3
	Dissolved	-	-	-	-	-	-	-	-	-	-	144	67.6	48.1	7.4
* 10/24/07	Totals	1503	17.23	6.8	5.94	279	268	95.4	459	1020	707	160	75.1	53.2	8.4
	Dissolved	-	-	-	-	-	-	-	-	-	-	142	66.6	48.9	7.4
5/9/07	Totals	1477	20.6	6.7	1.46	264	253	92.9	264	1000	716	154	75	54.2	8.6
	Dissolved	-	-	-	-	-	-	-	-	-	-	154	74	53.5	8.4
11/9/06	Totals	1446	19.93	6.78	1.39	272	251	95.4	391	968	709	156	69	50	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	143	69	49	8
4/12/06	Totals	1497	20.3	7.7	1.29	244	252	93.6	434	992	767	151	69	54	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	150	68	53	8
* 4/12/06	Totals	1497	20.3	7.7	1.29	244	253	93.8	422	993	764	150	69	54	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	147	67	53	8
10/18/05	Totals	1378	20.8	7.11	3.8	308	249	95.1	417	1020	358	162	72	53	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	168	73	50	7
4/26/05	Totals	1350	19.2	7.1	1.93	n.a.	246	92.4	412	1020	733	159	72	52	7
	Dissolved	-	-	-	-	-	-	-	-	-	-	152	68	51	7
10/13/04	Totals	1341	18.6	7.01	2.43	247	250	95.9	410	1010	739	159	70	53	7
	Dissolved	-	-	-	-	-	-	-	-	-	-	144	65	48	7
4/28/04	Totals	1372	21.7	6.87	1.75	260	254	104	455	1083	754	148	71	59	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	147	72	58	7
11/6/03	Totals	1427	18.5	6.41	n.a.	265	250	102	401	1050	751	146	70	58	8
	Dissolved	-	-	-	-	-	-	-	-	-	-	147	71	59	8
	Averages	1436	19.5	7.00	2.72	266	254	96.0	408.5	1018	700	152	70	53	8
RWD4 #3 (aka: Blue hole Well): NE SE SW 30-T29N-R24E; N 36 57 38.7, W 94 44 56.3, EL(Topo)=900; TD=1100															
10/24/07	Totals	295	18.31	7.58	0.55	113	116	17.7	< 10	141	137	27.1	15.1	6.8	1.60
	Dissolved	-	-	-	-	-	-	-	-	-	-	24.3	13.6	6.0	1.30
x 5/9/07	Totals	298	19.75	7.52	0.93	125	110	17.8	< 10	151	141	26.8	15.1	7.2	1.50
	Dissolved	-	-	-	-	-	-	-	-	-	-	26.6	15.0	7.1	1.60
* 5/9/07	Totals	298	19.75	7.52	0.93	125	110	17.7	< 10	147	143	26.5	15.0	7.0	1.50
	Dissolved	-	-	-	-	-	-	-	-	-	-	26.6	15.0	7.1	1.60
11/9/06	Totals	299	20.28	7.69	1.25	116	111	18.1	11	160	135	27	15	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	15	7	2
4/2/06	Totals	309	19.4	7.98	0.86	99	114	17.9	10.5	134	130	25	15	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	15	7	2
10/18/05	Totals	295	20.4	8.09	1.05	141	114	17.7	10.4	168	140	29	16	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2
4/26/05	Totals	282	18.4	8.01	1.91	n.a.	114	16.5	10.2	157	133	28	15	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2
10/13/04	Totals	275	18.9	7.97	2.3	157	109	16.6	10.2	154	132	29	16	7	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	28	15	6	2
4/28/04	Totals	273	19.9	7.42	3.34	124	110	15.2	< 10.0	160	135	26	15	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	15	6	2
* 4/28/04	Totals	273	19.9	7.42	3.34	124	110	15.2	< 10.0	159	132	25	15	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	26	15	6	2
11/7/03	Totals	283	17.7	6.65	n.a.	110	114	14.8	< 10.0	133	135	27	15	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	15	6	2
* 11/7/03	Totals	283	17.7	6.65	n.a.	110	114	14.6	< 10.0	136	134	27	16	6	2
	Dissolved	-	-	-	-	-	-	-	-	-	-	27	16	6	2
	Averages	289	19.2	7.54	1.65	122	112	16.7	10.2	150	136	27	15	6	2
RWD7 #1: NE SE SE 21-T29N-R23E; N 36 58 33.4, W 94 55 16.6; EL=825; TD=1100.															
10/24/07	Totals	1189	20.2	7.72	0.39	142	147	277	13.4	596	168	36.2	17.4	177.0	5.70
	Dissolved	-	-	-	-	-	-	-	-	-	-	32.5	15.7	162.0	5.20
5/9/07	Totals	1181	22.4	7.62	1.41	143	139.0	272.0	13.0	573	170	35.3	17.4	184.0	6.20
	Dissolved	-	-	-	-	-	-	-	-	-	-	34.6	17.5	182.0	6.00
x 11/9/06	Totals	1446	19.9	6.78	1.39	270	139.0	286.0	18.6	606	159	37	16	172	6
	Dissolved	-	-	-	-	-	-	-	-	-	-	32	16	164	5
* 11/9/06	Totals	1446	19.9	6.78	1.39	275	140.0	287.0	18.8	598	160	36	16	171	6
	Dissolved	-	-	-	-	-	-	-	-	-	-	33	16	167	6
	Averages	1316	20.6	7.23	1.15	208	141	280.5	16.0	593	164	35	17	172	6

NOTE: 1) Detection limits used in calculation of means; 2) total and dissolved metals concentrations used in calculation of means; 3) means are in italics type;
4) Duplicate samples are highlighted with asterisk near date of sample; 5) a box indicates an MCL or SMCL violation; 6) shaded box is a Roubidoux background value
7) underline indicates a value detected in blank; 8) na indicates not analyzed; 9) dash indicates not relevant; 10) Bold type indicates value > Tolerance Limit;
11) Indicator parameters of mine water contamination with tolerance limits and Roubidoux background concentrations: **Sulfate** (82 / 25 mg/l); **Iron** (207 / 61.5 ug/l); **Zinc** (43 / 8.8 ug/l).
x - denotes location of Blank sample;

WELL	DATE	Antimony Sb mg/l	Arsenic As mg/l	Cadmium Cd mg/l	Chromium Cr mg/l	Iron Fe mg/l	Lead Pb mg/l	Manganese Mn mg/l	Mercury Hg mg/l	Nickel Ni mg/l	Selenium Se mg/l	Thallium Tl mg/l	Zinc Zn mg/l	CAT / AN BALANCE % Error
MCL(SMCL)		0.006	0.01	0.005	0.1	(0.3)	0.015	0.05	0.002	0.1	0.05	0.002	(5)	
Roub. T.L. / Back.						.207/.062							.043/.009	

Quapaw #5 MW:

x	10/24/2007	< 0.002	0.005	< 0.002	< 0.010	2.770	< 0.005	0.033	< 0.00005	< 0.010	< 0.010	< 0.001	0.130	-1.58
		< 0.002	0.005	< 0.002	< 0.010	2.420	< 0.005	0.032	< 0.00005	< 0.010	< 0.010	< 0.001	0.126	
*	10/24/07	< 0.002	0.005	< 0.002	< 0.010	2.810	< 0.005	0.034	< 0.00005	< 0.010	< 0.010	< 0.001	0.132	-2.65
		< 0.002	0.004	< 0.002	< 0.010	2.330	< 0.005	0.030	< 0.00005	< 0.010	< 0.010	< 0.001	0.116	
	5/9/07	< 0.002	< 0.002	< 0.002	< 0.010	2.620	< 0.005	0.026	< 0.00005	< 0.010	< 0.010	< 0.001	0.121	11.02
		< 0.002	< 0.004	< 0.002	< 0.010	2.450	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.114	
	11/9/06	< 0.002	0.004	< 0.002	< 0.010	2.480	< 0.005	0.035	< 0.00005	< 0.010	< 0.010	< 0.001	0.113	-0.02
		< 0.002	0.004	< 0.002	< 0.010	2.420	< 0.005	0.035	0.00005	< 0.010	< 0.010	< 0.001	0.110	
	4/12/06	< 0.002	< 0.002	< 0.002	< 0.010	2.620	< 0.005	0.027	< 0.00005	< 0.010	< 0.010	< 0.001	0.118	-2.91
		< 0.002	0.005	< 0.002	< 0.010	2.570	< 0.005	0.037	< 0.00005	< 0.010	< 0.010	< 0.001	0.112	
*	4/12/06	< 0.002	< 0.002	< 0.002	< 0.010	2.610	< 0.005	0.026	< 0.00005	< 0.010	< 0.010	< 0.001	0.119	-2.39
		< 0.002	< 0.002	< 0.002	< 0.010	2.530	< 0.005	0.037	< 0.00005	< 0.010	< 0.010	< 0.001	0.110	
	10/18/05	< 0.002	0.005	< 0.002	< 0.010	2.440	< 0.005	0.036	< 0.00005	< 0.010	< 0.010	< 0.001	0.139	0.55
		< 0.002	0.005	< 0.002	< 0.010	2.340	< 0.005	0.038	< 0.00005	< 0.010	< 0.010	< 0.001	0.143	
	4/26/05	< 0.002	0.005	< 0.002	< 0.010	2.860	< 0.005	0.039	< 0.00005	< 0.010	< 0.010	< 0.001	0.167	0.62
		< 0.002	0.005	< 0.002	< 0.010	2.680	< 0.005	0.039	< 0.00005	< 0.010	< 0.010	< 0.001	0.159	
	10/13/04	< 0.002	0.005	< 0.002	< 0.010	3.060	< 0.005	0.043	< 0.00005	< 0.010	< 0.010	< 0.001	0.178	-0.18
		< 0.002	0.005	< 0.002	< 0.010	2.750	< 0.005	0.042	< 0.00005	< 0.010	< 0.010	< 0.001	0.160	
	4/28/04	< 0.010	< 0.010	< 0.005	< 0.005	3.680	< 0.010	0.050	< 0.00005	< 0.010	< 0.010	< 0.010	0.208	-4.43
		< 0.010	0.011	< 0.005	< 0.005	3.580	< 0.010	0.049	< 0.00005	< 0.010	< 0.010	< 0.010	0.194	
	11/6/03	< 0.002	0.005	< 0.002	< 0.010	3.720	< 0.005	0.046	< 0.00005	< 0.010	< 0.010	< 0.001	0.222	-1.40
		< 0.002	0.005	< 0.002	< 0.010	3.690	< 0.005	0.047	< 0.00005	< 0.010	< 0.010	< 0.001	0.213	
		0.003	0.005	0.002	0.010	2.792	0.005	0.036	0.00005	0.010	0.010	0.002	0.146	-0.31

RWD4 #3

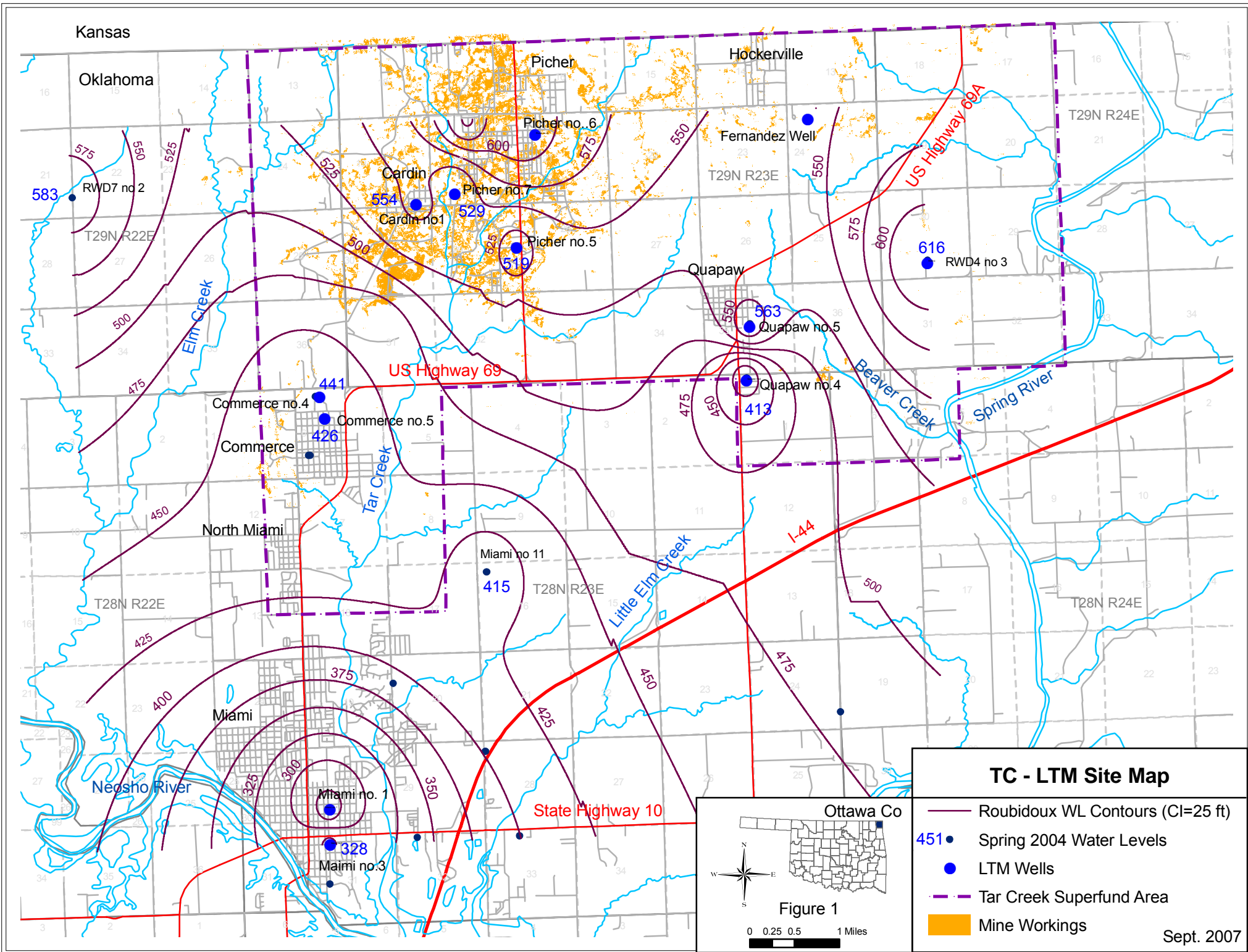
	10/24/07	< 0.002	< 0.002	< 0.002	< 0.010	0.026	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.57
		< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
x	5/9/07	< 0.002	< 0.002	< 0.002	< 0.010	0.024	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	0.40
		< 0.002	< 0.002	< 0.002	< 0.010	0.021	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
*	5/9/07	< 0.002	< 0.002	< 0.002	< 0.010	0.022	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.10
		< 0.002	< 0.002	< 0.002	< 0.010	0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
	11/9/06	< 0.002	< 0.002	< 0.002	< 0.010	0.025	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.34
		< 0.002	< 0.002	< 0.002	< 0.010	0.022	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
	4/2/06	< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-2.81
		< 0.002	< 0.002	< 0.002	< 0.010	0.022	< 0.005	0.015	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
	10/18/05	< 0.002	< 0.002	< 0.002	< 0.010	0.025	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	2.06
		< 0.002	< 0.002	< 0.002	< 0.010	0.022	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
	4/26/05	< 0.002	< 0.002	< 0.002	< 0.010	0.031	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-0.20
		< 0.002	< 0.002	< 0.002	< 0.010	0.026	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
	10/13/04	< 0.002	< 0.002	< 0.002	< 0.010	0.026	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	4.36
		< 0.002	< 0.002	< 0.002	< 0.010	< 0.020	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
	4/28/04	< 0.010	< 0.010	< 0.005	< 0.005	0.026	< 0.010	< 0.005	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	0.16
		< 0.010	< 0.010	< 0.005	< 0.005	0.027	< 0.010	< 0.005	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	
*	4/28/04	< 0.010	< 0.010	< 0.005	< 0.005	0.025	< 0.010	< 0.005	0.00005	< 0.010	< 0.010	< 0.010	< 0.005	-0.72
		< 0.010	< 0.010	< 0.005	< 0.005	0.029	< 0.010	< 0.005	< 0.00005	< 0.010	< 0.010	< 0.010	< 0.005	
	11/7/03	< 0.002	< 0.002	< 0.002	< 0.010	0.044	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	-0.17
		< 0.002	< 0.002	< 0.002	< 0.010	0.038	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
*	11/7/03	< 0.002	< 0.002	< 0.002	< 0.010	0.045	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	1.33
		< 0.002	< 0.002	< 0.002	< 0.010	0.038	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.010	
		0.003	0.003	0.003	0.009	0.027	0.006	0.009	0.00005	0.010	0.010	0.003	0.006	0.20

RWD7 #1:

	10/24/07	< 0.002	< 0.002	< 0.002	< 0.010	0.144	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.012	0.24
		< 0.002	< 0.002	< 0.002	< 0.010	0.081	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	0.007	
	5/9/07	< 0.002	< 0.002	< 0.002	< 0.010	0.118	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	2.88
		< 0.002	< 0.002	< 0.002	< 0.010	0.095	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
x	11/9/06	< 0.002	< 0.002	< 0.002	< 0.010	0.087	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-1.97
		< 0.002	< 0.002	< 0.002	< 0.010	0.076	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
*	11/9/06	< 0.002	< 0.002	< 0.002	< 0.010	0.090	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	-2.64
		< 0.002	< 0.002	< 0.002	< 0.010	0.075	< 0.005	< 0.010	< 0.00005	< 0.010	< 0.010	< 0.001	< 0.005	
		0.002	0.002	0.002	0.010	0.096	0.005	0.010	0.00005	0.010	0.010	0.001	0.006	-0.37

NOTE: 1) Detection limits used in calculation of means; 2) total and dissolved metals concentrations used in calculation of means; 3) means are in italics type; 4) Duplicate samples are highlighted with asterisk near date of sample; 5) a box indicates an MCL or SMCL violation; 6) shaded box is a Roubidoux background value 7) underline indicates a value detected in blank; 8) na indicates not analyzed; 9) dash indicates not relevant; 10) Bold type indicates value > Tolerance Limit; 11) Indicator parameters of mine water contamination with tolerance limits and Roubidoux background concentrations: **Sulfate** (82 / 25 mg/l); **Iron** (207 / 61.5 ug/l); **Zinc** (43 / 8.8 ug/l). ** - indicates no blank for that day's samples

Figure 1 – Map of Site and Long Term Monitoring Wells



Kansas

Oklahoma

Picher

Hockerville

Picher no.6

Fernandez Well

T29N R24E

583 RWD7 no 2

Cardin

Picher no.7

Quapaw

616 RWD4 no 3

Cardin no.1

Picher no.5

563 Quapaw no.5

US Highway 69

413 Quapaw no.4

Commerce no.4

Commerce no.5

Commerce

Miami no.11

415

North Miami

Miami

Miami no. 1

328

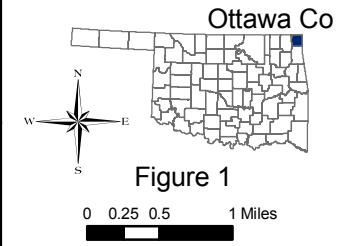
Miami no.3

State Highway 10

Ottawa Co

TC - LTM Site Map

- Roubidoux WL Contours (CI=25 ft)
- 451 ● Spring 2004 Water Levels
- LTM Wells
- - - Tar Creek Superfund Area
- Mine Workings



Sept. 2007

List of Long Term Monitoring Wells

- 1a. **Miami # 1:** SW NE SW S30-T28N-R23E (N 36° 52' 30.9'' W 94° 52' 23.4''); Public Water Supply Well; Elevation: 795'; Total Depth: 1233'; Casing Depth: 433'; Pump: 846'.
- 1b. **Miami #3:** SWNENW S31-T28N-R23E (N 36° 52' 06.0'' W 94° 52' 22.0''); Public Water Supply Well; Elevation: 783'; Total depth: 1252'; Casing Depth: 460'; Pump: 710'; al: 700'.
2. **Commerce # 5:** NW SE NW S6-T28N-R23E (N 36° 56' 19.4'' W 94° 52' 17.9''); Monitoring Well; Elevation: 810'; Total depth: 1100'; Casing Depth: 8'' @ 850'; Pump: 795'.
3. **Commerce # 4:** NW NE NW S6-T28N-R23E (N 36° 56' 31.9'' W 94° 52' 21.1''); Public Water Supply Well; Elevation: 812'; Total depth: 1,250'; Casing Depth: 680'; Pump: 680'.
4. **Cardin # 1:** SW SE SE S19-T29N-R23E (N 36° 58' 23.3'' W 94° 51' 07.2''); Public Water Supply Well; Elevation: 817'; Total depth: 1150'; Casing Depth: 500'; Pump: 615'.
5. **Picher # 6:** SE NW NW S21-T29N-R23E (N 36° 59' 00.7'' W 94° 49' 38.7''); Monitoring Well; Elevation: 822'; Total depth: 1100'; Casing Depth: 850'; Inflatable Packer at 773'; pump: 777'; Air line: 770'.
6. **Picher # 7 (aka Picher-Cardin Well):** NW SE SW S20-T29N-R23E (N 36° 58' 28.2'' W 94° 50' 38.3''); Stand-By Well; Elevation: 814'; Total depth: 1100'; Casing Depth: 850'; Pump: 795'.
7. **Picher # 5:** SE SE NE S29-T29N-R23E (N 36° 57' 55.6'' W 94° 49' 54.7''); Public Water Supply Well; Elevation: 812'; Total depth: 1,100'; Casing Depth: 8'' @ 850'; Pump: 490'.
8. **RWD4 # 3 (aka Bluehole Well):** NE SE SW S30-T29N-R24E (N 36° 57' 38.7'' W 94° 44' 56.3''); Public Water Supply Well; Elevation: 895'; Total depth: 1100'; Casing Depth: 800'; Pump: 740'.
9. **Quapaw # 5:** SW SW NE S35-T29N-R23E (N 36° 57' 04.4'' W 94° 47' 07.3''); Monitoring Well; Elevation: 850'; Total depth: 1100'; Casing Depth: 8'' @ 850'; Pump: 795'.
10. **Quapaw # 4:** NW NW NW S1-T28N-R23E (N 36° 56' 33.4'' W 94° 47' 11.2''); Public Water Supply Well; Elevation: 845'; Total depth: 1,350'; Casing Depth: 620'; Pump: 608'.
11. **Fernandez Well:** SE NW NW S24-T29N-R23E (N 36° 59' 04.7'' W 94° 46' 20.3''); Domestic Drinking Water Well; Elevation: 850'; Total depth: 1050'; Casing Depth: 450'.
12. **Miami #11:** NW NW NW S16-T28N-R23E (N 36° 54' 46.6'' W 94° 50' 24.0''); Public Water Supply Well; Elevation: 832'; Total Depth: 1,110'; Casing Depth: 660'; Pump: 613'; al: 613'.
13. **RWD7 # 2:** NE SE SE S21-T29N-R22E (N 36° 58' 33.4'' W 94° 55' 16.6''); Public Water Supply Well; Elevation: 825'; Total depth: 1100'; Casing Depth: 8'' @ 800'; Pump: 740'.