

## CHAPTER 2

### Radionuclides and Inorganics in Selected Water Sources

#### INTRODUCTION

During 2008, water samples were collected for CEMRC environmental monitoring studies from five drinking water sources in the region of the WIPP. The drinking water wells in the vicinity of the WIPP site provide water primarily for livestock, industrial usage by oil and gas production operations, and monitoring studies conducted by various groups. The sources included the community water supplies of Carlsbad, Loving, Otis, and Hobbs, and the water supply for the WIPP site (Double Eagle). An additional source in the past, a private well, has been dry for the last several years.

Aquifers in the region surrounding the WIPP include Dewey Lake, Culebra-Magenta, Ogalalla, Dockum, Pecos River alluvium and Capitan Reef. The main Carlsbad water supply is the Sheep Draw well field whose primary source is the Capitan Reef aquifer. The Hobbs and WIPP-Double Eagle water supplies are drawn from the Ogalalla aquifer, while the Loving/Malaga and Otis supply wells draw from deposits that are hydraulically linked to the flow of the Pecos River. The source for the private well sampling site is a well seven miles southwest of the WIPP; this water is drawn from the Culebra aquifer when it is not dry.

CEMRC began collecting drinking water samples in 1997, and summaries of methods, data and results from previous sampling were reported in previous CEMRC reports (available at <http://www.cemrc.org>). Present results as well as the results of previous analyses of drinking water were consistent for each

source across sampling periods, with few organic contaminants detected and inorganic substances mostly below levels specified under the Safe Drinking Water Act.

Analyses reported herein are for 2008 for drinking water samples, analyzed for both inorganics and radionuclides.

#### METHODS

The alpha-emitting radionuclides  $^{238}\text{Pu}$  and  $^{239,240}\text{Pu}$  were analyzed in these drinking water samples. Discussions with stakeholders will determine if further analyses of other radioanalytes will be performed on these samples.

All drinking water samples were collected according to CEMRC protocols for the collection, handling and preservation of drinking water as follows: (1) 4 L for radiological analyses, (2) 1 L for elemental analyses, (3) 1 L for anion tests and (4) 500 mL for Hg analysis. None of the samples were filtered before analysis, but a portion of the 4 L sample was transferred to a 3 L Marinelli beaker for possible future gamma spectroscopy analyses.

CEMRC performed non-radiological analyses of drinking water samples using ICP-MS and IC, shown in Table 2-1. Radiochemistry was then applied to each sample for actinide separation and purification using multiple precipitation, co-precipitation and ion-exchange and/or extraction chromatography. Once the actinides were separated elementally, they were co-precipitated with  $\text{LaF}_3$  and deposited onto filters, which were then counted on an alpha spectroscopy system.

Aliquots were blank-corrected after application of dilution factors. In cases where blank corrections lowered solution concentrations below MDC values, concentrations greater than zero are reported; negative concentrations are reported as less than MDC.

## RESULTS AND DISCUSSION

### Radiological Drinking Water

No Pu or Am was measured above MDC (0.00008 Bq/L) in 2008 or in any drinking water samples since monitoring commenced in 1997. The federal and state action level for gross alpha emitters, which includes isotopes of Pu and U, is 15 pCi/L (0.56 Bq/L). This is over 10,000 times the levels measured by CEMRC in any drinking water sample over the last nine years.

Since 1998, Pu has not been measured above the MDC in any samples. Figures 2.1, 2.2 and 2.3 show the historic values for  $^{239,240}\text{Pu}$ ,  $^{238}\text{Pu}$  and  $^{241}\text{Am}$  at all sites. Results are averaged for each site from 1998 to 2008. All are below the MDC. Values for 2008 are listed in Table 2-1.

Figure 2.4 shows the uranium isotopes measured in drinking water samples, averaged for each year. The low concentration of  $^{235}\text{U}$  in waters samples is consistent with the lower concentration of  $^{235}\text{U}$  in the natural environment as compared to the concentrations of  $^{234}\text{U}$

and  $^{238}\text{U}$  ( $^{234}\text{U}$  is in secular equilibrium from decay of  $^{238}\text{U}$ ). One microgram of natural uranium contains 12.4 mBq [0.33 pCi (picocurie)] of  $^{238}\text{U}$ , 0.37 mBq [0.01 pCi] of  $^{235}\text{U}$ , and 12.4 mBq [0.33 pCi] of  $^{234}\text{U}$ .

### Non-Radiological Results Drinking Water

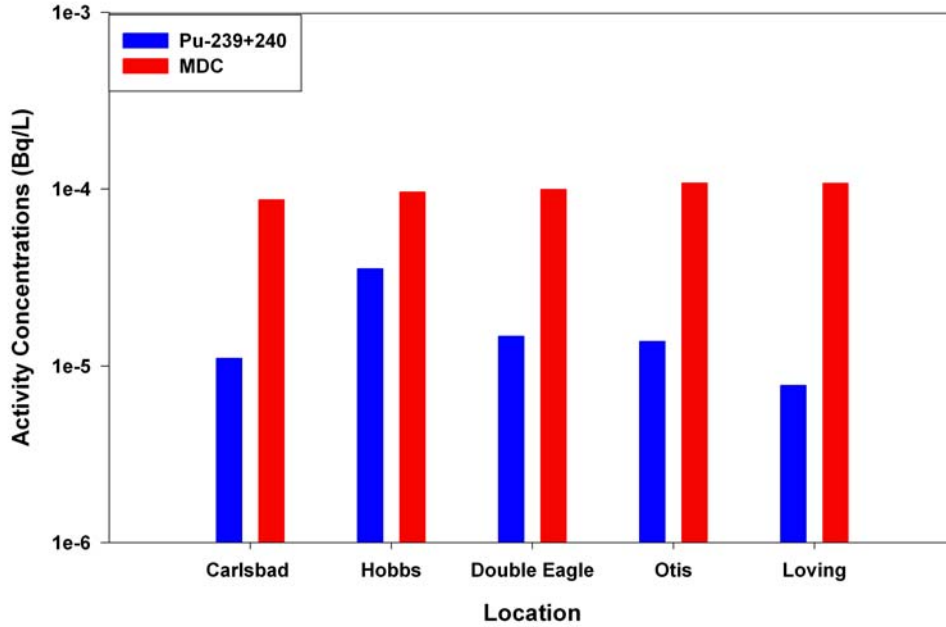
Measurements of inorganic analytes by CEMRC from the five drinking water sources showed little variation between years for each source. Differences of a factor of two or three between one set of successive years is common, as it is for all natural waters.

The 2008 measurements exhibit a high level of consistency with past results that provides a useful characterization of each source (Table 2-2).

As per the grant requirements and the fact that CEMRC does not use EPA compliance procedures, these results are not appropriate for use in assessing regulatory compliance. However, CEMRC results for drinking water collected during 2008 agreed well with, and were generally below, measurements for the same elements published in 2008 by the City of Carlsbad Municipal Water System (*2008 Annual Consumer Report on the Quality of Your Drinking Water* ([www.cityofcarlsbadnm.com/documents/CR2008.pdf](http://www.cityofcarlsbadnm.com/documents/CR2008.pdf))).

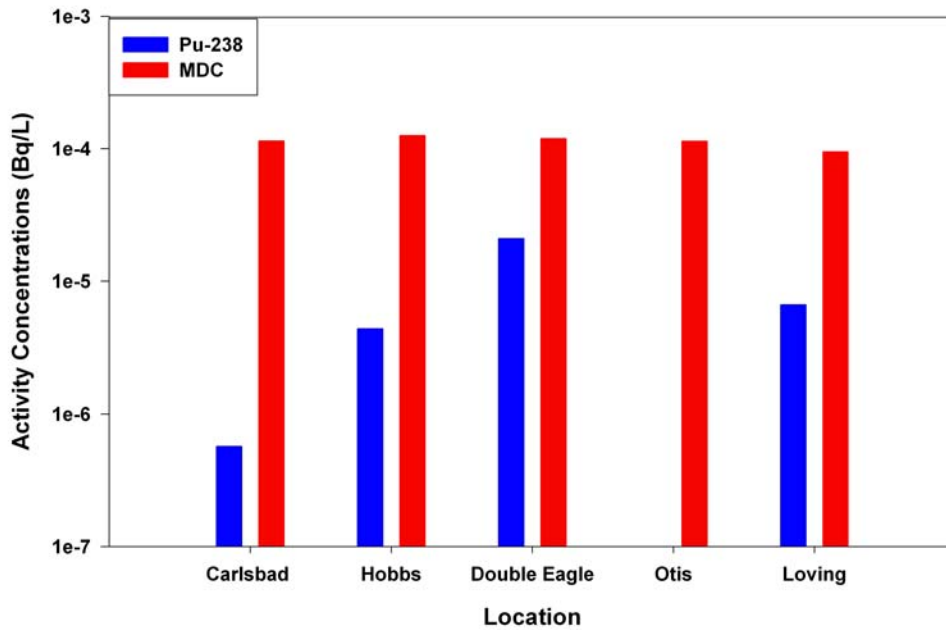
**Figure 2.1:  $^{239,240}\text{Pu}$  in Bq/L in Regional Drinking Water**

Results from 1998 to 2008 are averaged for each site. All are about 10,000 times below the EPA Action level of 0.56 Bq/L. The EPA Action level is for all alpha-emitters, including U plus Pu.



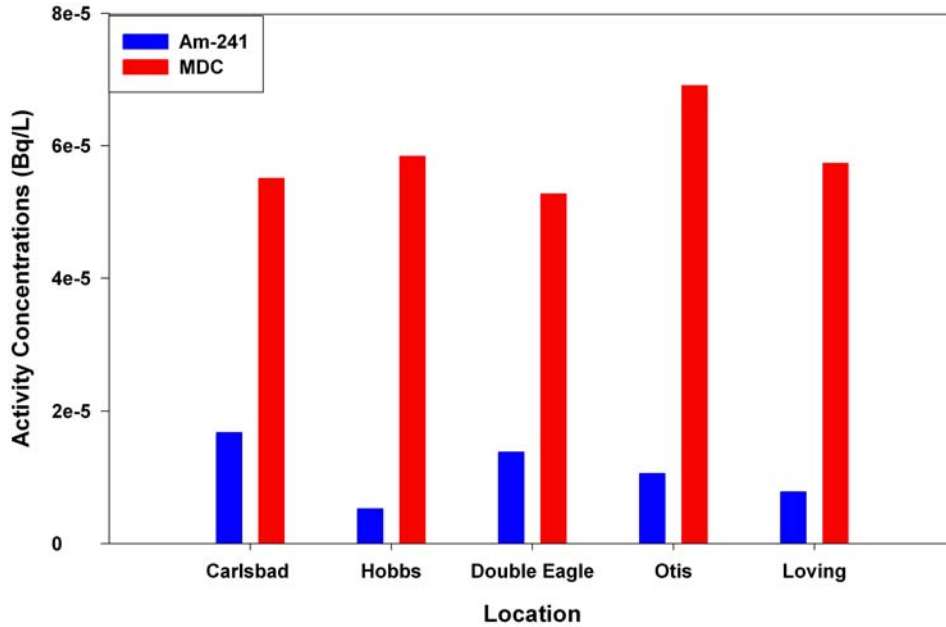
**Figure 2.2:  $^{238}\text{Pu}$  in Bq/L in Regional Drinking Water**

Results from 1998 to 2008 are averaged for each site. All are about 10,000 times below the EPA Action level of 0.56 Bq/L. The EPA Action level is for all alpha-emitters, including U plus Pu.



**Figure 2.3:  $^{241}\text{Am}$  in Bq/L in Regional Drinking Water**

Results from 1998 to 2008 are averaged for each site. All are about 10,000 times below the EPA Action level of 0.56 Bq/L. The EPA Action level is for all alpha-emitters, including U plus Pu.



**Figure 2.4:  $^{234}\text{U}$ ,  $^{235}\text{U}$ , and  $^{238}\text{U}$  in Bq/L in Regional Drinking Water**

Results from 1998 to 2008 are averaged for each site. All are below the EPA Action level of 0.56 Bq/L and within the range expected in waters from this region.

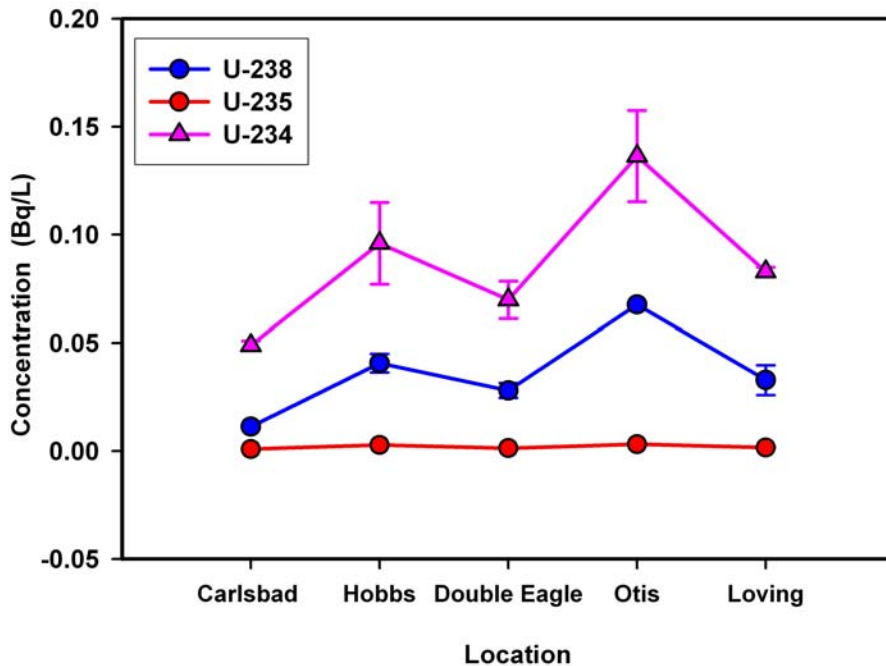


Table 2-1: Radionuclide Activity Concentrations in Drinking Water Sources

Location and Date of Sample Collection	Radionuclide	Activity <sup>a</sup> Concentration	SD <sup>b</sup> (Bq/L)	MDC <sup>c</sup> (Bq/L)
Carlsbad 12/2/2008	<sup>239+240</sup> Pu	2.13E-5	5.62E-5	2.29E-4
	<sup>238</sup> Pu	2.37E-5	6.41E-5	2.55E-4
	<sup>241</sup> Am	-7.79E-6	7.79E-6	4.19E-5
	<sup>238</sup> U	8.63E-3	2.49E-4	8.38E-5
	<sup>235</sup> U	7.80E-4	6.95E-5	5.29E-5
	<sup>234</sup> U	2.38E-2	5.93E-4	7.34E-5
	<sup>137</sup> Cs	2.34E-2	2.11E-2	6.96E-2
	<sup>40</sup> K	5.33E-1	1.86E-1	5.93E-1
Hobbs 12/2/2008	<sup>239+240</sup> Pu	1.21E-4	5.69E-5	1.48E-4
	<sup>238</sup> Pu	-6.04E-5	6.04E-5	2.84E-4
	<sup>241</sup> Am	5.08E-6	7.16E-6	2.56E-5
	<sup>238</sup> U	4.35E-2	1.06E-3	9.05E-5
	<sup>235</sup> U	3.94E-3	1.82E-4	8.40E-5
	<sup>234</sup> U	9.56E-2	2.20E-3	4.83E-5
	<sup>137</sup> Cs	-2.77E-2	2.00E-2	6.67E-2
	<sup>40</sup> K	4.10E-1	2.02E-1	6.58E-1
Double Eagle 12/2/2008	<sup>239+240</sup> Pu	-4.36E-5	6.17E-5	2.86E-4
	<sup>238</sup> Pu	-8.14E-5	8.08E-5	3.59E-4
	<sup>241</sup> Am	7.05E-6	9.83E-6	3.53E-5
	<sup>238</sup> U	2.65E-2	9.72E-4	9.17E-5
	<sup>235</sup> U	2.22E-3	1.44E-4	9.74E-5
	<sup>234</sup> U	6.20E-2	2.18E-3	9.19E-5
	<sup>137</sup> Cs	2.44E-2	1.98E-2	6.53E-2
	<sup>40</sup> K	2.98E-1	1.93E-1	6.31E-1
Otis 12/2/2008	<sup>239+240</sup> Pu	-3.86E-5	4.00E-5	2.15E-4
	<sup>238</sup> Pu	2.02E-5	6.71E-5	2.65E-4
	<sup>241</sup> Am	-9.38E-6	2.48E-5	1.13E-4
	<sup>238</sup> U	5.09E-2	1.59E-3	2.16E-4
	<sup>235</sup> U	4.49E-3	2.60E-4	1.05E-4
	<sup>234</sup> U	1.29E-1	3.84E-3	6.77E-5
	<sup>137</sup> Cs	-2.26E-2	2.17E-2	7.24E-2
	<sup>40</sup> K	9.39E-1	1.84E-1	5.51E-1
Loving 12/2/2008	<sup>239+240</sup> Pu	-4.02E-5	6.36E-5	2.84E-4
	<sup>238</sup> Pu	-2.01E-5	4.50E-5	2.16E-4
	<sup>241</sup> Am	4.13E-6	1.60E-5	6.21E-5
	<sup>238</sup> U	2.57E-2	6.46E-4	8.08E-5
	<sup>235</sup> U	1.71E-3	1.08E-4	5.56E-5
	<sup>234</sup> U	8.53E-2	1.91E-3	6.38E-5
	<sup>137</sup> Cs	-1.94E-2	2.06E-2	6.86E-2
	<sup>40</sup> K	5.43E-1	2.05E-1	6.60E-1

<sup>a</sup> Activity concentration as defined in CEMRC report 1997

<sup>b</sup> SD = Standard Deviation as defined in CEMRC report 1997

<sup>c</sup> MDC= Minimum Detectable Concentration as defined in CEMRC report 1997

**Table 2-2: Measured Concentration of Selected Inorganic Analytes in Drinking Water from 1998 to 2008 at Five Locations**

Carlsbad													
EL <sup>1</sup>	N <sup>2</sup>	N <sub>DET</sub> <sup>2</sup>	1998-2008		2007				2008				
			Min <sup>3</sup>	Max <sup>3</sup>	MDC <sup>4</sup> (ug/L)	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	MDC <sup>4</sup> (ug/L)	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	
Ag	9	2	1.23E-02	1.75E-02	N/A	N/A	N/A	N/A	1.20E-01	1.57E-02	<MDC	<MDC	
Al	12	6	2.34E+00	2.98E+02	2.34E+01	1.92E+02	<MDC	<MDC	3.10E+01	9.04E+01	2.05E+02	2.05E+02	
As	12	7	3.45E-01	1.10E+00	7.12E-01	3.15E+00	1.10E+00	1.10E+00	2.89E+01	2.74E+01	<MDC	<MDC	
B	1	1	3.07E+01	3.07E+01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ba	12	12	6.64E+01	4.13E+02	1.99E-01	-1.36E+00	7.15E+01	7.15E+01	1.24E+00	1.08E+00	4.09E+02	4.09E+02	
Be	10		N/A	N/A	N/A	N/A	N/A	N/A	1.94E+00	-1.58E+00	<MDC	<MDC	
Ca	11	11	6.32E+04	3.50E+05	1.80E+03	1.43E+04	6.32E+04	7.76E+04	1.00E+04	-3.29E+03	3.41E+05	3.41E+05	
Cd	10		N/A	N/A	N/A	N/A	N/A	N/A	4.17E-01	-1.20E+00	<MDC	<MDC	
Ce	10	2	1.71E-01	2.10E-01	3.20E-02	-7.02E-01	<MDC	<MDC	1.00E-01	-1.56E-01	1.71E-01	1.71E-01	
Co	11	9	8.80E-02	1.07E+00	6.40E-02	-1.82E-01	1.38E-01	1.38E-01	2.54E-01	1.49E-01	1.04E+00	1.04E+00	
Cr	12	10	1.24E+00	3.38E+01	2.87E-01	1.11E+00	1.24E+00	1.24E+00	5.27E-01	-5.48E-01	3.30E+01	3.30E+01	
Cu	12	11	1.23E+00	1.67E+01	1.17E+00	4.23E+01	6.55E+00	6.55E+00	8.81E-01	6.81E+00	8.81E+00	8.81E+00	
Dy	11		N/A	N/A	5.80E-02	1.49E-01	<MDC	<MDC	3.42E-01	-3.39E-01	<MDC	<MDC	
Er	11		N/A	N/A	3.70E-02	1.33E-01	<MDC	<MDC	4.60E-02	-1.95E-03	<MDC	<MDC	
Eu	9	6	1.35E-02	2.43E-02	9.30E-02	-7.61E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Fe	11	5	2.14E+01	1.12E+03	N/A	N/A	N/A	N/A	2.02E+02	1.46E+02	1.07E+03	1.07E+03	
Ga	2	2	3.24E+00	3.25E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Gd	9		N/A	N/A	5.30E-02	6.00E-02	<MDC	<MDC	4.75E-02	-5.18E-02	<MDC	<MDC	
Hg	9		N/A	N/A	N/A	N/A	N/A	N/A	2.05E-01	2.54E+00	<MDC	<MDC	
K	11	10	1.04E+03	5.41E+03	2.33E+01	2.26E+03	<MDC	1.08E+03	5.00E+02	-5.15E+02	5.24E+03	5.24E+03	
La	9	5	1.41E-02	4.48E-02	1.25E-01	2.07E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Li	9	9	6.09E+00	2.57E+01	N/A	N/A	N/A	N/A	4.93E-01	-1.32E+00	2.57E+01	2.57E+01	
Mg	11	11	3.14E+04	1.67E+05	3.43E+02	-2.56E+02	3.40E+04	3.40E+04	1.71E+02	-6.67E+00	1.61E+05	1.61E+05	
Mn	12	8	5.50E-02	9.40E-01	1.64E-01	3.22E+00	<MDC	<MDC	3.93E+00	1.64E+00	<MDC	<MDC	
Mo	11	10	7.03E-01	5.95E+00	N/A	N/A	N/A	N/A	6.25E-01	-4.48E-01	5.46E+00	5.46E+00	
Na	11	11	8.47E+03	9.94E+04	8.01E+02	2.91E+02	8.47E+03	8.47E+03	8.70E+01	9.16E+01	4.08E+04	4.08E+04	
Nd	11		N/A	N/A	8.80E-02	1.76E-01	<MDC	<MDC	6.80E-01	-3.71E-01	<MDC	<MDC	
Ni	11	10	1.01E+00	7.87E+00	1.14E+00	6.04E-01	2.06E+00	2.06E+00	2.52E-01	-5.70E-01	7.47E+00	7.47E+00	
P	3	2	7.45E+01	8.03E+01	N/A	N/A	N/A	N/A	2.49E+01	-1.25E+01	7.45E+01	7.45E+01	
Pb	10	8	1.63E-01	8.53E+00	N/A	N/A	N/A	N/A	3.20E+00	4.53E+00	<MDC	<MDC	
Pr	11		N/A	N/A	3.80E-02	6.63E-02	<MDC	<MDC	4.54E-01	-9.00E-03	<MDC	<MDC	
Rh	2	1	1.10E-02	1.10E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sb	11	6	3.00E-02	6.67E-01	N/A	N/A	N/A	N/A	1.85E-01	1.40E+00	3.36E-01	3.36E-01	
Sc	8	8	1.72E+00	9.29E+00	N/A	N/A	N/A	N/A	5.02E+00	-2.01E+01	6.59E+00	6.59E+00	
Se	8	3	9.25E-02	1.75E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Si	6	6	5.31E+03	2.82E+04	N/A	N/A	N/A	N/A	5.00E+03	-4.87E+04	2.69E+04	2.69E+04	
Sm	9	7	2.34E-02	3.64E-02	5.30E-02	1.70E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Sn	5	1	5.97E-02	5.97E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sr	12	12	3.23E+02	1.31E+03	9.30E-01	9.59E-02	3.28E+02	3.28E+02	1.02E+01	4.86E+00	1.30E+03	1.30E+03	
Th	8	1	1.98E-02	1.98E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ti	4	3	3.64E-01	4.22E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Tl	10	10	9.97E-02	4.48E-01	N/A	N/A	N/A	N/A	1.92E-01	-6.82E-02	4.10E-01	4.10E-01	
U	11	11	8.21E-01	4.35E+00	6.10E-02	1.09E-02	1.04E+00	1.04E+00	4.20E-02	-1.68E-02	4.29E+00	4.29E+00	
V	12	12	3.82E+00	2.82E+01	1.07E-01	4.84E+00	4.09E+00	4.09E+00	1.11E+01	1.60E+00	2.75E+01	2.75E+01	
Zn	12	11	2.36E+00	5.37E+01	1.78E+00	1.02E+02	<MDC	6.25E+00	4.20E+00	-4.30E+01	5.04E+01	7.33E+00	

<sup>1</sup>El = Element analyzed;

<sup>2</sup>N = Total number of samples analyzed; N<sub>det</sub> = number of samples with detectable (above MDC) values;

<sup>3</sup>Min = the lowest value measured above MDC; Max = the highest value measured;

<sup>4</sup>MDC = Minimum detectable concentration;

<sup>5</sup>Average sample values with and without subtraction of the blank value; when blank subtraction is performed, it is only done when the blank value falls outside of the range (-MDC < blank < +MDC)

<sup>6</sup>N/A = Not Applicable

**Table 2-2: Measured Concentration of Selected Inorganic Analytes in Drinking Water from 1998 to 2008 at Five Locations (Continued)**

Double Eagle													
1998-2008					2007				2008				
EL <sup>1</sup>	N <sup>2</sup>	N <sub>DET</sub> <sup>2</sup>	Min <sup>3</sup>	Max <sup>3</sup>	MDC <sup>4</sup>	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	MDC <sup>4</sup>	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	
Ag	9	1	3.62E-03	3.62E-03	N/A	N/A	N/A	N/A	1.20E-01	1.57E-02	<MDC	<MDC	
Ag	9	1	3.62E-03	3.62E-03	N/A	N/A	N/A	N/A	1.20E-01	1.57E-02	<MDC	<MDC	
Al	11	6	2.57E+00	1.98E+02	2.34E+01	1.92E+02	<MDC	<MDC	3.10E+01	9.04E+01	1.98E+02	1.98E+02	
As	11	11	4.26E+00	3.35E+01	7.12E-01	3.15E+00	7.14E+00	7.14E+00	2.89E+01	2.74E+01	3.35E+01	3.35E+01	
B	1	1	7.00E+01	7.00E+01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ba	10	10	7.93E+01	4.17E+02	1.99E-01	-1.36E+00	8.54E+01	8.54E+01	1.24E+00	1.08E+00	4.17E+02	4.17E+02	
Be	8	1	3.63E-02	3.63E-02	N/A	N/A	N/A	N/A	1.94E+00	-1.58E+00	<MDC	<MDC	
Ca	10	10	5.18E+03	2.66E+05	1.80E+03	1.43E+04	4.24E+04	5.67E+04	1.00E+04	-3.29E+03	2.66E+05	2.66E+05	
Cd	9	3	1.87E-02	1.85E-01	N/A	N/A	N/A	N/A	4.17E-01	-1.20E+00	<MDC	<MDC	
Ce	9	3	3.18E-03	1.61E-01	3.20E-02	-7.02E-01	<MDC	<MDC	1.00E-01	-1.56E-01	1.61E-01	1.61E-01	
Co	11	7	8.45E-02	1.12E+00	6.40E-02	-1.82E-01	8.45E-02	8.45E-02	2.54E-01	1.49E-01	7.10E-01	7.10E-01	
Cr	11	11	1.22E+00	3.25E+01	2.87E-01	1.11E+00	2.10E+00	2.10E+00	5.27E-01	-5.48E-01	1.60E+01	1.60E+01	
Cu	11	11	8.09E-01	1.30E+01	1.17E+00	4.23E+01	3.56E+00	3.56E+00	8.81E-01	6.81E+00	1.30E+01	1.30E+01	
Dy	11		N/A	N/A	5.80E-02	1.49E-01	<MDC	<MDC	3.42E-01	-3.39E-01	<MDC	<MDC	
Er	11		N/A	N/A	3.70E-02	1.33E-01	<MDC	<MDC	4.60E-02	-1.95E-03	<MDC	<MDC	
Eu	10	6	1.68E-02	2.86E-02	9.30E-02	-7.61E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Fe	9	6	7.93E+01	9.32E+02	N/A	N/A	N/A	N/A	2.02E+02	1.46E+02	7.99E+02	7.99E+02	
Ga	1	1	4.46E+00	4.46E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Gd	9		N/A	N/A	5.30E-02	6.00E-02	<MDC	<MDC	4.75E-02	-5.18E-02	<MDC	<MDC	
Hg	7		N/A	N/A	N/A	N/A	N/A	N/A	2.05E+00	2.54E+00	<MDC	<MDC	
K	10	10	7.79E+02	2.94E+04	2.33E+01	2.26E+03	7.79E+02	3.04E+03	5.00E+02	-5.15E+02	1.49E+04	1.49E+04	
La	10	5	1.19E-02	6.26E-02	1.25E-01	2.07E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Li	8	8	1.29E+01	9.29E+01	N/A	N/A	N/A	N/A	4.93E-01	-1.32E+00	9.29E+01	9.29E+01	
Mg	10	10	1.09E+03	5.21E+04	3.43E+02	-2.56E+02	1.25E+04	1.25E+04	1.71E+01	-6.67E+00	5.21E+04	5.21E+04	
Mn	11	10	1.91E-01	6.04E+00	1.64E-01	3.22E+00	1.91E-01	1.91E-01	3.93E+00	1.64E+00	<MDC	<MDC	
Mo	9	9	1.48E+00	7.14E+00	N/A	N/A	N/A	N/A	6.25E-01	-4.48E-01	7.14E+00	7.14E+00	
Na	10	10	3.84E+03	1.65E+05	8.01E+02	2.91E+02	4.02E+04	4.02E+04	8.70E+02	9.16E+01	1.65E+05	1.65E+05	
Nd	11	1	5.37E-03	5.37E-03	8.80E-02	1.76E-01	<MDC	<MDC	6.80E-01	-3.71E-01	<MDC	<MDC	
Ni	11	11	8.00E-01	5.78E+00	1.14E+00	6.04E-01	1.24E+00	1.24E+00	2.52E-01	-5.70E-01	5.78E+00	5.78E+00	
P	2	1	5.22E+01	5.22E+01	N/A	N/A	N/A	N/A	2.49E+01	-1.25E+01	5.22E+01	5.22E+01	
Pb	9	9	2.56E-01	7.79E+00	N/A	N/A	N/A	N/A	3.20E+00	4.53E+00	7.79E+00	7.79E+00	
Pr	11	1	9.05E-04	9.05E-04	3.80E-02	6.63E-02	<MDC	<MDC	4.54E-01	-9.00E-03	<MDC	<MDC	
Rh	1	1	1.56E-02	1.56E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sb	9	6	2.41E-02	2.86E-01	N/A	N/A	N/A	N/A	1.85E-01	1.40E+00	2.86E-01	2.86E-01	
Sc	7	7	4.61E+00	9.08E+01	N/A	N/A	N/A	N/A	5.02E+00	-2.01E+01	1.32E+01	1.32E+01	
Se	7	4	2.28E+00	3.53E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Si	4	4	1.53E+04	7.82E+04	N/A	N/A	N/A	N/A	5.00E+03	-4.87E+04	7.82E+04	7.82E+04	
Sm	10	6	2.69E-02	4.26E-02	5.30E-02	1.70E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Sn	4	2	9.41E-02	3.36E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sr	11	11	5.06E+01	2.47E+03	9.30E-01	9.59E-02	5.52E+02	5.52E+02	1.02E+01	4.86E+00	2.47E+03	2.47E+03	
Th	8	3	4.32E-03	1.36E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ti	4	3	2.62E+00	2.87E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Tl	8	2	2.73E-02	4.84E-02	N/A	N/A	N/A	N/A	1.92E-01	-6.82E-02	<MDC	<MDC	
U	11	11	1.34E+00	1.19E+01	6.10E-02	1.09E-02	2.34E+00	2.34E+00	4.20E-02	-1.68E-02	1.19E+01	1.19E+01	
V	11	11	2.46E+01	1.23E+02	1.07E-01	4.84E+00	2.46E+01	2.46E+01	1.11E+01	1.60E+00	1.23E+02	1.23E+02	
Zn	11	9	1.80E+00	5.38E+01	1.78E+00	1.02E+02	<MDC	4.99E+00	4.20E+00	-4.30E+01	5.38E+01	1.07E+01	

<sup>1</sup>El = Element analyzed;

<sup>2</sup>N = Total number of samples analyzed; N<sub>det</sub> = number of samples with detectable (above MDC) values;

<sup>3</sup>Min = the lowest value measured above MDC; Max = the highest value measured;

<sup>4</sup>MDC = Minimum detectable concentration;

<sup>5</sup>Average sample values with and without subtraction of the blank value; when blank subtraction is performed, it is only done when the blank value falls outside of the range (-MDC < blank < +MDC)

<sup>6</sup>N/A = Not Applicable

**Table 2-2: Measured Concentration of Selected Inorganic Analytes in Drinking Water from 1998 to 2008 at Five Locations (Continued)**

Hobbs													
EL <sup>1</sup>	1998-2008				2007				2008				
	N <sup>2</sup>	N <sub>DET</sub> <sup>2</sup>	Min <sup>3</sup>	Max <sup>3</sup>	MDC <sup>4</sup> (ug/L)	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	MDC <sup>4</sup> (ug/L)	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	
Ag	8	2	3.86E-03	1.04E-01	N/A	N/A	N/A	N/A	1.20E-01	1.57E-02	<MDC	<MDC	
Al	9	6	3.03E+00	1.69E+02	2.34E+01	1.92E+02	<MDC	<MDC	3.10E+01	9.04E+01	1.69E+02	1.69E+02	
As	9	9	4.51E+00	3.21E+01	7.12E-01	3.15E+00	6.70E+00	6.70E+00	2.89E+01	2.74E+01	3.21E+01	3.21E+01	
B	1	1	1.41E+02	1.41E+02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ba	9	9	5.65E+01	3.09E+02	1.99E-01	-1.36E+00	6.52E+01	6.52E+01	1.24E+00	1.08E+00	3.09E+02	3.09E+02	
Be	7	1	5.39E-02	5.39E-02	N/A	N/A	N/A	N/A	1.94E+00	-1.58E+00	<MDC	<MDC	
Ca	8	8	8.09E+03	4.60E+05	1.80E+03	1.43E+04	8.63E+04	1.01E+05	1.00E+04	-3.29E+03	4.60E+05	4.60E+05	
Cd	8	1	1.57E-01	1.57E-01	N/A	N/A	N/A	N/A	4.17E-01	-1.20E+00	<MDC	<MDC	
Ce	8	5	5.10E-03	1.30E-01	3.20E-02	-7.02E-01	<MDC	<MDC	1.00E-01	-1.56E-01	1.30E-01	1.30E-01	
Co	9	7	9.78E-02	1.19E+00	6.40E-02	-1.82E-01	1.88E-01	1.88E-01	2.54E-01	1.49E-01	1.19E+00	1.19E+00	
Cr	9	9	7.33E-01	1.24E+01	2.87E-01	1.11E+00	8.45E-01	8.45E-01	5.27E-01	-5.48E-01	1.24E+01	1.24E+01	
Cu	9	9	1.06E+00	1.65E+01	1.17E+00	4.23E+01	4.86E+00	4.86E+00	8.81E-01	6.81E+00	1.65E+01	1.65E+01	
Dy	9	1	4.18E-03	4.18E-03	5.80E-02	1.49E-01	<MDC	<MDC	3.42E-01	-3.39E-01	<MDC	<MDC	
Er	9	9	N/A	N/A	3.70E-02	1.33E-01	<MDC	<MDC	4.60E-02	-1.95E-03	<MDC	<MDC	
Eu	8	5	1.31E-02	1.97E-02	9.30E-02	-7.61E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Fe	7	5	3.64E+01	1.67E+03	N/A	N/A	N/A	N/A	1.01E+03	1.46E+02	1.67E+03	1.67E+03	
Ga	1	1	2.56E+00	2.56E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Gd	8	8	N/A	N/A	5.30E-02	6.00E-02	<MDC	<MDC	4.75E-02	-5.18E-02	<MDC	<MDC	
Hg	6	2	1.06E-02	1.42E-02	N/A	N/A	N/A	N/A	2.05E-01	2.54E+00	<MDC	<MDC	
K	8	8	4.12E+02	2.53E+04	2.33E+01	2.26E+03	4.12E+02	2.68E+03	5.00E+02	-5.15E+02	1.16E+04	1.16E+04	
La	8	4	1.51E-02	5.01E-02	1.25E-01	2.07E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Li	7	7	2.65E+01	1.34E+02	N/A	N/A	N/A	N/A	4.93E-01	-1.32E+00	1.34E+02	1.34E+02	
Mg	8	8	2.11E+03	1.11E+05	3.43E+02	-2.56E+02	2.51E+04	2.51E+04	3.41E+01	-6.67E+00	1.11E+05	1.11E+05	
Mn	9	9	3.79E-01	1.17E+01	1.64E-01	3.22E+00	1.78E+00	1.78E+00	3.93E+00	1.64E+00	1.17E+01	1.17E+01	
Mo	8	8	2.60E+00	1.36E+01	N/A	N/A	N/A	N/A	6.25E-01	-4.48E-01	1.36E+01	1.36E+01	
Na	8	8	4.97E+03	2.49E+05	8.01E+02	2.91E+02	5.46E+04	5.46E+04	8.70E+02	9.16E+01	2.49E+05	2.49E+05	
Nd	9	3	3.01E-03	1.28E-02	8.80E-02	1.76E-01	<MDC	<MDC	6.80E-01	-3.71E-01	<MDC	<MDC	
Ni	9	9	1.08E+00	2.08E+01	1.14E+00	6.04E-01	2.46E+00	2.46E+00	2.52E-01	-5.70E-01	2.08E+01	2.08E+01	
P	2	1	1.26E+02	1.26E+02	N/A	N/A	N/A	N/A	2.49E+01	-1.25E+01	1.26E+02	1.26E+02	
Pb	8	7	9.44E-02	7.72E+00	N/A	N/A	N/A	N/A	3.20E+00	4.53E+00	<MDC	<MDC	
Pr	9	1	1.57E-03	1.57E-03	3.80E-02	6.63E-02	<MDC	<MDC	4.54E-01	-9.00E-03	<MDC	<MDC	
Rh	1	1	2.52E-02	2.52E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sb	7	6	3.88E-02	3.47E-01	N/A	N/A	N/A	N/A	1.85E-01	1.40E+00	3.47E-01	3.47E-01	
Sc	6	6	7.17E+00	9.25E+01	N/A	N/A	N/A	N/A	5.02E+00	-2.01E+01	2.20E+01	2.20E+01	
Se	5	3	3.50E+00	6.23E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Si	4	4	2.54E+04	1.32E+05	N/A	N/A	N/A	N/A	1.00E+04	-4.87E+04	1.32E+05	1.32E+05	
Sm	8	6	1.93E-02	3.27E-02	5.30E-02	1.70E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Sn	3	3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sr	9	9	7.89E+01	4.49E+03	9.30E-01	9.59E-02	1.06E+03	1.06E+03	1.02E+01	4.86E+00	4.49E+03	4.49E+03	
Th	7	2	4.54E-03	4.56E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ti	3	3	3.14E+00	7.47E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Tl	6	2	2.24E-02	2.31E-02	N/A	N/A	N/A	N/A	1.92E-01	-6.82E-02	<MDC	<MDC	
U	9	9	2.90E+00	1.77E+01	6.10E-02	1.09E-02	3.77E+00	3.77E+00	4.20E-02	-1.68E-02	1.77E+01	1.77E+01	
V	9	9	3.23E+01	1.64E+02	1.07E-01	4.84E+00	3.23E+01	3.23E+01	1.11E+01	1.60E+00	1.64E+02	1.64E+02	
Zn	9	8	1.47E+00	5.93E+01	1.78E+00	1.02E+02	<MDC	3.60E+00	4.20E+00	-4.30E+01	5.93E+01	1.63E+01	

<sup>1</sup>El = Element analyzed;<sup>2</sup>N = Total number of samples analyzed; N<sub>det</sub> = number of samples with detectable (above MDC) values;<sup>3</sup>Min = the lowest value measured above MDC; Max = the highest value measured;<sup>4</sup>MDC = Minimum detectable concentration;<sup>5</sup>Average sample values with and without subtraction of the blank value; when blank subtraction is performed, it is only done when the blank value falls outside of the range (-MDC < blank < +MDC)<sup>6</sup>N/A = Not Applicable

**Table 2-2: Measured Concentration of Selected Inorganic Analytes in Drinking Water from 1998 to 2008 at Five Locations (Continued)**

Loving													
EL <sup>1</sup>	N <sup>2</sup>	N <sub>DET</sub> <sup>2</sup>	1998-2008		2007				2008				
			Min <sup>3</sup>	Max <sup>3</sup>	MDC <sup>4</sup>	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	MDC <sup>4</sup>	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	
Ag	10	3	2.55E-03	1.30E-01	N/A	N/A	N/A	N/A	1.20E-01	1.57E-02	<MDC	<MDC	
Al	10	4	3.76E+00	1.88E+03	2.34E+01	1.92E+02	4.42E+01	4.42E+01	3.10E+02	9.04E+01	1.88E+03	1.88E+03	
As	10	7	1.20E+00	2.16E+00	7.12E-01	3.15E+00	1.70E+00	1.70E+00	2.89E+01	2.74E+01	<MDC	<MDC	
B	1	1	7.55E+01	7.55E+01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ba	10	10	2.86E+01	1.73E+02	1.99E-01	-1.36E+00	3.37E+01	3.37E+01	1.24E+00	1.08E+00	1.73E+02	1.73E+02	
Be	7	1	9.35E-02	9.35E-02	N/A	N/A	N/A	N/A	1.94E+00	-1.58E+00	<MDC	<MDC	
Ca	8	8	9.14E+03	4.59E+05	1.80E+03	1.43E+04	7.54E+04	8.98E+04	1.00E+04	-3.29E+03	4.59E+05	4.59E+05	
Cd	9		N/A	N/A	N/A	N/A	N/A	N/A	4.17E-01	-1.20E+00	<MDC	<MDC	
Ce	8	2	9.74E-04	1.26E+00	3.20E-02	-7.02E-01	<MDC	<MDC	1.00E-01	-1.56E-01	1.26E+00	1.26E+00	
Co	10	7	1.02E-01	1.15E+00	6.40E-02	-1.82E-01	1.33E-01	1.33E-01	2.54E-01	1.49E-01	1.15E+00	1.15E+00	
Cr	10	8	1.21E+00	3.68E+01	2.87E-01	1.11E+00	4.24E+00	4.24E+00	5.27E-01	-5.48E-01	3.68E+01	3.68E+01	
Cu	10	9	1.71E+00	9.88E+00	1.17E+00	4.23E+01	<MDC	<MDC	8.81E-01	6.81E+00	9.88E+00	9.88E+00	
Dy	10		N/A	N/A	5.80E-02	1.49E-01	<MDC	<MDC	3.42E-01	-3.39E-01	<MDC	<MDC	
Er	10		N/A	N/A	3.70E-02	1.33E-01	<MDC	<MDC	4.60E-02	-1.95E-03	<MDC	<MDC	
Eu	9	5	7.00E-03	1.01E-02	9.30E-02	-7.61E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Fe	9	4	1.56E+01	1.28E+03	N/A	N/A	N/A	N/A	2.02E+02	1.46E+02	1.28E+03	1.28E+03	
Ga	1	1	1.26E+00	1.26E+00	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Gd	8	3	2.15E-03	5.19E-02	5.30E-02	6.00E-02	<MDC	<MDC	4.75E-02	-5.18E-02	5.19E-02	5.19E-02	
Hg	5		N/A	N/A	N/A	N/A	N/A	N/A	2.05E-01	2.54E+00	<MDC	<MDC	
K	8	7	1.85E+03	1.98E+04	2.33E+01	2.26E+03	<MDC	2.04E+03	5.00E+02	-5.15E+02	1.08E+04	1.08E+04	
La	9	4	7.27E-03	2.22E-02	1.25E-01	2.07E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Li	7	7	1.66E+01	8.69E+01	N/A	N/A	N/A	N/A	4.93E-01	-1.32E+00	8.69E+01	8.69E+01	
Mg	9	9	4.04E+03	2.07E+05	3.43E+02	-2.56E+02	3.99E+04	3.99E+04	1.71E+02	-6.67E+00	2.07E+05	2.07E+05	
Mn	10	7	1.43E-02	1.77E+00	1.64E-01	3.22E+00	5.48E-01	5.48E-01	3.93E+00	1.64E+00	<MDC	<MDC	
Mo	9	7	1.41E+00	8.34E+00	N/A	N/A	N/A	N/A	6.25E-01	-4.48E-01	8.34E+00	8.34E+00	
Na	8	8	2.33E+03	1.27E+05	8.01E+02	2.91E+02	2.73E+04	2.73E+04	8.70E+02	9.16E+01	1.27E+05	1.27E+05	
Nd	10	1	3.37E-03	3.37E-03	8.80E-02	1.76E-01	<MDC	<MDC	6.80E-01	-3.71E-01	<MDC	<MDC	
Ni	10	8	1.19E+00	9.57E+00	1.14E+00	6.04E-01	2.15E+00	2.15E+00	2.52E-01	-5.70E-01	9.57E+00	9.57E+00	
P	3	1	1.69E+02	1.69E+02	N/A	N/A	N/A	N/A	2.49E+01	-1.25E+01	1.69E+02	1.69E+02	
Pb	9	8	6.33E-01	7.34E+00	N/A	N/A	N/A	N/A	3.20E+00	4.53E+00	<MDC	<MDC	
Pr	9		N/A	N/A	3.80E-02	6.63E-02	<MDC	<MDC	4.54E-01	-9.00E-03	<MDC	<MDC	
Rh	1	1	3.07E-02	3.07E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sb	8	5	3.51E-02	2.54E-01	N/A	N/A	N/A	N/A	1.85E-01	1.40E+00	2.54E-01	2.54E-01	
Sc	7	7	3.22E+00	8.97E+01	N/A	N/A	N/A	N/A	5.02E+00	-2.01E+01	9.54E+00	9.54E+00	
Se	5		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Si	5	5	8.54E+03	5.13E+04	N/A	N/A	N/A	N/A	5.00E+03	-4.87E+04	5.13E+04	5.13E+04	
Sm	9	3	8.43E-03	1.30E-02	5.30E-02	1.70E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Sn	4	1	4.45E-01	4.45E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sr	10	10	7.60E+01	3.78E+03	9.30E-01	9.59E-02	7.67E+02	7.67E+02	1.02E+01	4.86E+00	3.78E+03	3.78E+03	
Th	8	2	5.69E-03	9.63E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ti	3	3	2.68E+00	1.04E+01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Tl	8	1	4.32E-02	4.32E-02	N/A	N/A	N/A	N/A	1.92E-01	-6.82E-02	<MDC	<MDC	
U	10	10	1.98E+00	1.06E+01	6.10E-02	1.09E-02	2.13E+00	2.13E+00	4.20E-02	-1.68E-02	1.06E+01	1.06E+01	
V	10	10	1.19E+01	7.22E+01	1.07E-01	4.84E+00	1.22E+01	1.22E+01	1.11E+01	1.60E+00	7.22E+01	7.22E+01	
Zn	10	9	4.13E+00	1.23E+02	1.78E+00	1.02E+02	<MDC	1.21E+01	4.20E+00	-4.30E+01	1.23E+02	7.98E+01	

<sup>1</sup>EL = Element analyzed;

<sup>2</sup>N = Total number of samples analyzed; N<sub>det</sub> = number of samples with detectable (above MDC) values;

<sup>3</sup>Min = the lowest value measured above MDC; Max = the highest value measured;

<sup>4</sup>MDC = Minimum detectable concentration;

<sup>5</sup>Average sample values with and without subtraction of the blank value; when blank subtraction is performed, it is only done when the blank value falls outside of the range (-MDC < blank < +MDC)

<sup>6</sup>N/A = Not Applicable

**Table 2-2: Measured Concentration of Selected Inorganic Analytes in Drinking Water from 1998 to 2008 at Five Locations (Continued)**

Otis													
EL <sup>1</sup>	N <sup>2</sup>	N <sub>DET</sub> <sup>2</sup>	1998-2008		2007				2008				
			Min <sup>3</sup>	Max <sup>3</sup>	MDC <sup>4</sup> (ug/L)	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	MDC <sup>4</sup> (ug/L)	Blank Conc. (ug/L)	Avg Conc. w/Blank Subt <sup>5</sup> (ug/L)	Avg Conc. w/o Blank Subt <sup>5</sup> (ug/L)	
Ag	8	1	2.63E-02	2.63E-02	N/A	N/A	N/A	N/A	1.20E-01	1.57E-02	<MDC	<MDC	
Al	9	2	5.74E+00	2.10E+02	2.34E+01	1.92E+02	<MDC	<MDC	3.10E+01	9.04E+01	2.10E+02	2.10E+02	
As	10	5	6.53E-01	2.34E+00	7.12E-01	3.15E+00	2.34E+00	2.34E+00	2.89E+01	2.74E+01	<MDC	<MDC	
B	2	2	1.46E+02	1.52E+02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ba	10	10	1.35E+01	7.31E+01	1.99E-01	-1.36E+00	1.60E+01	1.60E+01	1.24E+00	1.08E+00	7.31E+01	7.31E+01	
Be	7		N/A	N/A	N/A	N/A	N/A	N/A	1.94E+00	-1.58E+00	<MDC	<MDC	
Ca	8	8	2.14E+05	3.83E+05	1.80E+04	1.43E+04	2.67E+05	2.82E+05	N/A	N/A	N/A	N/A	
Cd	8		N/A	N/A	N/A	N/A	N/A	N/A	4.17E-01	-1.20E+00	<MDC	<MDC	
Ce	7	1	1.38E-01	1.38E-01	3.20E-02	-7.02E-01	<MDC	<MDC	1.00E-01	-1.56E-01	1.38E-01	1.38E-01	
Co	9	8	1.19E-01	3.17E+00	6.40E-02	-1.82E-01	4.14E-01	4.14E-01	2.54E-01	1.49E-01	3.17E+00	3.17E+00	
Cr	10	9	8.76E-01	2.20E+01	2.87E-01	1.11E+00	8.76E-01	8.76E-01	5.27E-01	-5.48E-01	2.20E+01	2.20E+01	
Cu	10	9	2.43E+00	1.93E+01	1.17E+00	4.23E+01	3.00E+00	3.00E+00	8.81E-01	6.81E+00	1.93E+01	1.93E+01	
Dy	9	1	3.39E-03	3.39E-03	5.80E-02	1.49E-01	<MDC	<MDC	3.42E-01	-3.39E-01	<MDC	<MDC	
Er	9		N/A	N/A	3.70E-02	1.33E-01	<MDC	<MDC	4.60E-02	-1.95E-03	<MDC	<MDC	
Eu	8	3	3.42E-03	9.48E-03	9.30E-02	-7.61E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Fe	9	9	2.87E+00	5.08E+03	N/A	N/A	N/A	N/A	1.01E+03	1.46E+02	5.08E+03	5.08E+03	
Ga	1	1	6.54E-01	6.54E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Gd	7		N/A	N/A	5.30E-02	6.00E-02	<MDC	<MDC	4.75E-02	-5.18E-02	<MDC	<MDC	
Hg	7		N/A	N/A	N/A	N/A	N/A	N/A	2.05E-01	2.54E+00	<MDC	<MDC	
K	9	9	6.81E+02	1.61E+04	2.33E+01	2.26E+03	6.81E+02	2.94E+03	5.00E+02	-5.15E+02	1.61E+04	1.61E+04	
La	8	2	3.97E-03	6.30E-03	1.25E-01	2.07E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Li	7	7	4.11E+01	1.87E+02	N/A	N/A	N/A	N/A	4.93E-01	-1.32E+00	1.87E+02	1.87E+02	
Mg	9	9	5.16E+04	4.37E+05	3.43E+02	-2.56E+02	7.77E+04	7.77E+04	1.71E+02	-6.67E+00	4.37E+05	4.37E+05	
Mn	9	6	1.78E-01	2.32E+00	1.64E-01	3.22E+00	<MDC	<MDC	3.93E+00	1.64E+00	<MDC	<MDC	
Mo	8	8	2.39E+00	1.23E+01	N/A	N/A	N/A	N/A	6.25E-01	-4.48E-01	1.23E+01	1.23E+01	
Na	9	9	5.81E+03	1.62E+05	8.01E+02	2.91E+02	1.02E+05	1.02E+05	8.70E+01	9.16E+01	5.81E+03	5.81E+03	
Nd	9	3	4.80E-03	3.97E-02	8.80E-02	1.76E-01	<MDC	<MDC	6.80E-01	-3.71E-01	<MDC	<MDC	
Ni	9	9	2.45E+00	2.65E+01	1.14E+00	6.04E-01	5.91E+00	5.91E+00	2.52E-01	-5.70E-01	2.65E+01	2.65E+01	
P	2	2	4.54E+01	4.99E+02	N/A	N/A	N/A	N/A	2.49E+01	-1.25E+01	4.99E+02	4.99E+02	
Pb	8	7	1.08E-01	7.20E+00	N/A	N/A	N/A	N/A	3.20E+00	4.53E+00	<MDC	<MDC	
Pr	9		N/A	N/A	3.80E-02	6.63E-02	<MDC	<MDC	4.54E-01	-9.00E-03	<MDC	<MDC	
Rh	1	1	1.29E-01	1.29E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sb	8	6	3.50E-02	4.10E-01	N/A	N/A	N/A	N/A	1.85E-01	1.40E+00	3.91E-01	3.91E-01	
Sc	7	7	3.53E+00	8.95E+01	N/A	N/A	N/A	N/A	5.02E+00	-2.01E+01	1.29E+01	1.29E+01	
Se	7		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Si	5	5	9.77E+03	4.99E+04	N/A	N/A	N/A	N/A	5.00E+03	-4.87E+04	4.99E+04	4.99E+04	
Sm	8	1	3.56E-03	3.56E-03	5.30E-02	1.70E-02	<MDC	<MDC	N/A	N/A	N/A	N/A	
Sn	4	1	9.71E-02	9.71E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Sr	10	10	1.65E+02	3.61E+03	9.30E+00	9.59E-02	2.81E+03	2.81E+03	1.02E+00	4.86E+00	1.65E+02	1.65E+02	
Th	7	2	3.44E-03	2.67E-02	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Ti	4	4	5.68E+00	3.79E+01	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Tl	7		N/A	N/A	N/A	N/A	N/A	N/A	1.92E-01	-6.82E-02	<MDC	<MDC	
U	9	9	3.73E+00	2.14E+01	6.10E-02	1.09E-02	4.42E+00	4.42E+00	4.20E-02	-1.68E-02	2.14E+01	2.14E+01	
V	10	10	1.05E+01	5.74E+01	1.07E-01	4.84E+00	1.08E+01	1.08E+01	1.11E+01	1.60E+00	5.74E+01	5.74E+01	
Zn	10	9	1.54E+00	7.44E+01	1.78E+00	1.02E+02	<MDC	3.21E+00	4.20E+00	-4.30E+01	7.44E+01	3.13E+01	

<sup>1</sup>El = Element analyzed;

<sup>2</sup>N = Total number of samples analyzed; N<sub>det</sub> = number of samples with detectable (above MDC) values;

<sup>3</sup>Min = the lowest value measured above MDC; Max = the highest value measured;

<sup>4</sup>MDC = Minimum detectable concentration;

<sup>5</sup>Average sample values with and without subtraction of the blank value; when blank subtraction is performed, it is only done when the blank value falls outside of the range (-MDC < blank < +MDC)

<sup>6</sup>N/A = Not Applicable